SOUTH LIVERMORE VALLEY

SPECIFIC PLAN AND
GENERAL PLAN AMENDMENT

Draft
Environmental Impact Report

CITY OF LIVERMORE
MAY 1997

LIST OF EXHIBITS [2]

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1 ***Appendix 6.4*** is a separate volume not bound into this document but is available for public review at the City of Livermore Planning Department.

2 This list of exhibits distinguishes between maps / figures and *tables*, the latter in *italics*.

This Draft Environmental Impact Report (Draft EIR) considers the environmental impacts which could result from adopting and implementing the *Draft South Livermore Valley Specific Plan (Draft Plan)*, a General Plan Amendment, and rezoning. A Financing Plan, amendment of the City's Sphere of Influence, and annexation of the unincorporated South Livermore Valley Specific Plan Area (SLVSPA) also are part of the project this EIR examines. The *Draft Plan* and all its components are described in ***Chapter 2, Description of the Proposed Project.***

The City of Livermore is the lead agency for this EIR. Other government entities will be responsible agencies for various aspects of public and private activities undertaken to implement the *Draft Plan*, as outlined in ***Section 2.4 Administrative Actions.***

The Draft EIR has been prepared pursuant to the California Environmental Quality Act, Public Resources Code, Section 2100 *et seq* (CEQA), the *State CEQA Guidelines*, Code of California Regulations, Title CIV, Section 15000 *et seq (Guidelines)*, and the City's environmental guidelines and environmental review procedures to implement CEQA.

The Draft EIR is being circulated for public review and comments as required by CEQA. At the close of the public comment period, a Final EIR responding to comments on the Draft EIR will be prepared. The Final EIR will be certified by the City Council.

The Final EIR will be considered by the City and other agencies in connection with the various actions necessary to adopt and implement the *Draft Plan* as described in ***Chapter 2***. Depending on the particular activity proposed, the form of any future approval, and the circumstances existing at the time of that approval, each governmental approving action may rely on this EIR alone or may be supported by an additional environmental document which incorporates this EIR by reference or which otherwise is tiered off of this EIR. According to Section 15152 of the *Guidelines*, tiering can be used to avoid repetitiveness, wasted time, and unnecessary speculation. Tiered environmental documents, including EIRs if required, are narrow in scope and usually are site-specific. These documents would rely on this EIR for analysis and explanation of the broader environmental issues associated with a specific project.

1.1 OVERVIEW OF PLANNING PROCESS AND EIR REQUIREMENT

In 1993, Alameda County adopted the *South Livermore Valley Area Plan (Area Plan)* which culminated the joint area-wide planning process undertaken by the County, City of Livermore, and City of Pleasanton for the ± 14,000-acre South Livermore Valley. [1] The *Area Plan* was adopted to protect and enhance agriculture, particularly viticulture, and contained an "urban residential component" which allows a maximum of 1,600 new residential units to be built in the South Livermore Valley. This component provides opportunities for development at urban densities within the South Livermore Valley if impacts of that development to agricultural land, parks, and open space resources are mitigated by

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[1] *South Livermore Valley Area Plan*, Alameda County, February 23, 1993. As discussed in ***2.0 Description of the Proposed Project***, the *Area Plan* covers approximately 14,000 acres, and the *South Livermore Valley Area Plan EIR* covers 15,500 acres.

adequate protection of agricultural, park, and open space lands. The City of Livermore then amended the *City of Livermore Community General Plan* to incorporate relevant *Area Plan* policies and initiated a detailed site-specific planning process to determine the exact number and location of additional housing units in the 1,887-acre South Livermore Specific Plan Area (SLVSPA) part of the larger *Area Plan* area. [2]

During 1994, the City considered candidate development areas, estimated development potential, and selected seven SLVSPA subareas for detailed planning and analysis. In 1995, planning, economic, and environmental studies proceeded under the guidance of City staff and the Advisory Committee appointed by the City. Those efforts included identifying environmental opportunities and constraints, conducting extensive market analyses, formulating two site planning concepts for each subarea, and selecting and refining one alternative as the "preferred alternative". After Planning Commission and Council review in early 1996, the City designated a "preferred alternative" as the *Draft Plan* for public review and comment, the City Council further directed that the EIR evaluate additional land use concepts for Subarea 7.

In May 1996, the City issued a Notice of Preparation (NOP) of an EIR on the *South Livermore Valley Specific Plan*, General Plan Amendment, Prezoning, Amendment of the City's Sphere of Influence, and Annexation. [3] The Initial Study accompanying the NOP identified environmental impacts expected from adopting and implementing the *Draft Plan*, determined the probable significance of impact, and indicated topics for analysis to be conducted in preparing the documents. The Initial Study addressed the following significant or potentially significant impacts for study (grouped as presented in this EIR):

- Land use and public plans
- Geology, soils, and seismicity
- Hydrology, drainage, and water quality
- Biological resources
- Transportation and circulation
- Air quality
- Noise
- Aesthetics, light, and glare
- Public services and utilities
- Cultural resources

The NOP was sent to Federal, State, regional, and local agencies, interested organizations, local landowners, and individuals. Responses to the NOP were received from the 13 public agencies and organizations listed below. In addition, 27 individuals submitted letters in response to the NOP. [4]

Public Agencies

- Alameda County Congestion Management Agency
- Alameda County Flood Control and Water Conservation District (Zone 7)
- Alameda County Planning Department
- California Department of Transportation
- City of Dublin
- East Bay Regional Park District
- Lawrence Livermore National Laboratory
- Livermore Area Recreation & Park District

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2 "South Livermore Valley Policies", *City of Livermore Community General Plan 1976-2000.*

3 *Notice of Preparation of a Draft Environmental Impact Report, South Livermore Valley Specific Plan*, City of Livermore, May 3, 1996.

4 The NOP and responses are part of the public record for the South Livermore Valley Specific Plan EIR. They are on file and available for review at the City of Livermore Planning Department, 1052 South Livermore Avenue, Livermore, California during normal business hours.

- California Department of Fish and Game
- California Division of Mines and Geology
- Sandia National Laboratories

Organizations

- Concerned Citizens for Completion of Mines Road
- Friends of the Valley

City staff and consultants reviewed the comments raised by City officials when considering the "preferred alternative" and by responses to the NOP and expanded the scope of the EIR to address topics identified for study. Certain other potential impacts associated with adoption and implementation of the *Draft Plan* were found to be insignificant and were not analyzed in the EIR. Impacts determined to be insignificant are listed in ***Chapter 6.0 Impact Overview.***

1.2 PUBLIC REVIEW AND COMMENT

The City of Livermore will circulate this EIR widely for review and comment by public agencies, interested individuals, and organizations and will accept comments in writing or orally at a public hearing. Comments should address the adequacy of the EIR or should contain questions about the environmental consequences of adopting and implementing the *Draft Plan.* (The City will invite comments on the *Plan* itself as part of its normal public review process.) Adequacy refers to the EIR's completeness in disclosing significant environmental effects and measures to mitigate those significant impacts and in providing sufficient information for officials to make decisions about the merits of the *Draft Plan.*

Written comments on the Draft EIR should be made before the close of the 45-day public review period and mailed to

Marc Roberts
City of Livermore Planning Department
1052 South Livermore Avenue
Livermore, California 94550-4899

or delivered to the Planning Department during normal business hours. The Planning Commission will hold a public hearing on the Draft EIR at a formally noticed Commission hearing. The deadline for commenting on the Draft EIR and the date of the Planning Commission hearing are indicated in the distribution letter accompanying this document.

A Final EIR will be prepared after the close of the public review period. The Final EIR will include all the comments received by the City during public review and responses to those comments. The Final EIR will be distributed to the public for review before the City certifies the Final EIR as complete.

No action can be taken to adopt or not adopt the *South Livermore Valley Specific Plan* until the Final EIR is certified. (City certification of the EIR does not require approval of the *Plan* or any of the individual actions studied in the EIR.)

1.3 LEVEL OF DETAIL AND INCORPORATION BY REFERENCE

This Draft EIR is intended to provide the level of analysis necessary to evaluate the impacts of adopting and implementing the *Draft Plan* as described in ***Chapter 2, Description of the Proposed Project.*** As an EIR on a planning level action, the Draft EIR analyzes the secondary effects of the *Draft Plan* which can be expected to follow from adopting the *Plan.* In addition, because the *Draft Plan* includes a great deal of site-specific project information, the Draft EIR is intended to analyze the impacts of the specific components of the *Plan* at a level of detail sufficient to support the City's consideration of specific subdivision maps proposed pursuant to the *Draft Plan.*

Discretionary approvals by the City of individual projects may rely on this EIR only to the extent that the EIR provides sufficient site-specific information. The City will review individual projects and the circumstances at the time such projects are proposed to verify that no different or additional significant impacts than identified in this EIR would result from project approval. EIRs required on individual projects which may have significant environmental impacts may rely on this program EIR to:

- Focus the subsequent analyses on the probable significant environmental effects
- Dismiss from reconsideration or further analysis broad environmental issues addressed by or less-than-significant impacts identified by this program EIR

CEQA directs that EIRs refer to previously completed reports and documents to the greatest extent possible in order to avoid unnecessary repetition. This Draft EIR is based in part on the following published and unpublished reports, copies of which are on file and available for inspection at the City of Livermore Planning Department, 1052 South Livermore Avenue, Livermore, during normal business hours:

- *South Livermore Valley Specific Plan Environmental Setting and Planning Considerations,* Nichols • Berman, June 16 and 30, 1995. The June 16 report provided baseline environmental information and planning considerations related to geology, hydrology, traffic, noise, public services, and cultural resources. The June 30 report contained similar information on biological resources, land use, visual and aesthetic quality, and utilities.
- *South Livermore Valley Specific Plan Alternative Development Concepts,* Wallace Roberts & Todd, August 2, 1995. This report describes and illustrates two conceptual site plans each for the SLVSPA subareas and outlines preliminary site development principles.
- *South Livermore Valley Specific Plan Revised Development Concepts,* Wallace Roberts & Todd, November 1, 1995. This report summarizes and illustrates refined subarea site plans.
- *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Las Positas Fault, South Livermore Valley,* Rogers / Pacific, November 30, 1995. This technical report summarizes the scope and conclusions of field work and analyses conducted to confirm, locate, or deny the presence of the Las Positas and lessor inferred faults and to determine the potential impact on the specific plan.
- *South Livermore Valley Specific Plan Preliminary Design Guidelines,* Wallace Roberts & Todd, December 5, 1995. This report describes and illustrates rural design concepts and policies and includes site planning standards, architectural standards, and street standards.

- *Revised Plan Financial Feasibility Findings*, Economic & Planning Systems, December 5, 1995. The report provides an updated analysis of prior preliminary financial feasibility findings to reflect changes in the *South Livermore Valley Specific Plan* related to number of units, lot and unit sizes, sales prices, and backbone infrastructure assumptions.

- *South Livermore Valley Specific Plan Advisory Committee's Recommended Development Plan*, Wallace Roberts & Todd, March 14, 1996. This report presents the "preferred alternative" and describes and illustrates the conceptual development plan (including land use summaries and site plans for each subarea), rural development principles, the regional trail system, the agricultural mitigation program, financial feasibility, three annexation scenarios, and alternative Concannon Boulevard extension alignments.

The County prepared a Draft EIR in June 1992 and a Final EIR in November 1992 on the *South Livermore Valley Area Plan*. The *South Livermore Valley Area Plan EIR* was a "planning level" program EIR which examined an approximately 15,500-acre unincorporated planning area. [5]

The County also has prepared EIRs on a number of projects recently proposed near to but outside the SLVSPA, among them *The Course at Wente Brothers* and *Poppy Ridge Golf Course EIRs*, both certified in 1994 (State Clearinghouse numbers (SCH#) 93121107 and 93053051). The County certified the earlier *Ruby Hill Project EIR* (SCH# 89020714) in 1991. In August 1992, the City also certified a Mitigated Negative Declaration for the *Alden Lane / Vineyard Avenue General Plan Amendments* and related actions. The amendments provided for development of 255 housing units, three acres of neighborhood commercial use, and 703 acres of general agriculture / viticultural use (providing a maximum density bonus of one unit per 20 acres) on 1,200 acres west of the SLVSPA.

These documents and other background materials used to prepare this EIR are referenced in the text of the EIR and are listed in the bibliography in ***Chapter 6.0 Appendices.*** The City's project files also contain staff reports and other materials used in the planning and environmental review process, primarily providing background about Advisory Committee consideration of various components of the *Draft Plan.*

1.4 EIR OBJECTIVITY

This Draft EIR is a factual objective public disclosure document which takes no position on the merits of the *Draft Plan.* Instead, the EIR provides information on which decisions about the *Plan* can be based. Thus, the findings of this EIR do not advocate a position for or against the *Plan.*

The EIR has been prepared according to the professional standards and practices of the EIR study team members' individual disciplines and in conformance with the legal requirements and informational expectations of CEQA and the State and local guidelines to implement it. The preparers of this EIR include City staff members and independent professionals under contract to the City, listed in ***Section 7.1, Report Preparers.***

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5 As noted above and discussed in ***2.0 Description of the Proposed Project***, the *Area Plan* covers approximately 14,000 acres, and the *South Livermore Valley Area Plan EIR* covers 15,500 acres. The City of Livermore prepared an Initial Study and in June 1993 approved a Mitigated Negative Declaration on the *City of Livermore Community General Plan* amendment incorporating South Livermore Valley Policies.

1.5 REPORT ORGANIZATION

The Draft EIR is organized as follows:

- Chapter 2.0 -- ***Description of the Proposed Project*** -- describes all aspects of the *Draft Plan*, including the purpose and objectives of the Plan and its land use plan, circulation plans, and other features. This Chapter summarizes the Plan's goals, objectives, policies, and implementation programs and the time horizon for planned buildout of the SLVSPA. It also identifies the General Plan Amendment and prezoning accompanying the *Plan*, identifies the cumulative development assumptions used to conduct the analyses, and lists the administrative actions the City and other government entities must take to approve and implement the *Plan* and subsequent development projects proposed in the SLVSPA.

- Chapter 3.0 -- ***Summary*** -- highlights the important effects of implementing the *Draft Plan* and identifies some of the measures available to mitigate significant adverse impacts, refers to growth-inducing impacts and cumulative impacts analyzed in Chapter 4, and lists the effects of no significance.

- Chapter 4.0 -- ***Environmental Analysis*** -- describes the existing environmental setting, identifies probable impacts from adopting and implementing the *Draft Plan* and building out the SLVSPA according to the Plan, and recommends mitigation measures to substantially reduce or eliminate significant adverse impacts.

- Chapter 5.0 -- ***Alternatives*** -- describes and presents a comparative analysis of alternatives to the *Draft Plan*, including the mandatory "no project" and "existing zoning" ("General Plan") alternatives. This chapter also identifies the environmentally superior alternative.

- Chapter 6.0 -- ***Appendices*** -- lists the report preparers, people and organizations contacted, presents the bibliography, and includes technical background material supporting the EIR text.

IMPACT ANALYSIS

Many of the policies proposed in the *Draft Plan* are designed to reduce or avoid adverse environmental effects associated with various actions contemplated by the *Plan*. These policies were developed based on environmental information obtained in the process of preparing this EIR. To reflect this planning process, this EIR takes a three-step approach to analyzing the impacts of the project. First, the EIR evaluates potential impacts of the actions contemplated by the *Draft Plan* without considering the effect of *Plan* policies requiring environmental protection. The EIR next identifies the *Plan's* environmental protection policies and assesses the significance of potential impacts in light of those policies. Finally, for impacts the EIR concludes would be significant even after application of all policies in the *Draft Plan*, the EIR identifies potential mitigation measures such as new or revised policies to the land use plan included in the *Plan*.

In presenting mitigation measures, the EIR distinguishes between measures already contained in the *Plan* (identified as *Draft Plan* policies) and additional mitigation measures proposed by this EIR. The EIR also determines the effectiveness of both types of mitigation measures in reducing the magnitude of impact. Where there are no feasible mitigation measures, the EIR explains the basis for concluding that no additional mitigation is feasible.

In compliance with State law, prior to adoption of the *Draft Plan*, a mitigation monitoring and reporting program will be prepared and adopted for the *Specific Plan* to ensure successful implementation of required mitigation during the life of development permitted by the *Plan*.

The mitigation monitoring program will consist of the mitigation measures presented in the Draft EIR, as may be modified in response to comments on the Draft EIR. Thus, the measures presented in this document will constitute the draft mitigation monitoring program and are disclosed for public review. As stated above, this document determines the effectiveness of measures and the significance of impact after implementation. It also indicates who would be responsible for implementing the various measures and monitoring their success.

1.6 FREQUENTLY USED ACRONYMS

Acronyms used in this document are listed below:

Frequently Used Acronyms	
ABAG	Association of Bay Area Governments
ACFCWCD	Alameda County Flood Control and Water Conservation District (Zone 7)
ADT	Average Daily Traffic
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit District
BMP	Best Management Practices
Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
CDMG	California Division of Mines and Geology
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfs	Cubic feet per second
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
COE, Corps	U.S. Army Corps of Engineers
dB	Decibels
dBA	A-weighted sound
DWR	California Department of Water Resources
EBRPD	East Bay Regional Park District
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FAR	Floor Area Ratio
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
gpd	Gallons per day
gpm	Gallons per minute
LAFCO	Alameda County Local Agency Formation Commission
LARPD	Livermore Area Recreation and Park District

Frequently Used Acronyms	
LAVTA	Livermore-Amador Valley Transit Authority
L_{dn}	Day / Night Noise Level
L_{eq}	Energy Equivalent Noise Level
LLNL	Lawrence Livermore National Laboratory
LOS	Level of service
M	Richter Magnitude
MCL	Maximum Contaminant Level
MGD	million gallons per day
MGY	million gallons per year
MM	Modified Mercalli intensity
MRZ	Mineral Resource Zone
MSL	Mean Sea Level
NGVD	National Geodetic Vertical Datum (1929 MSL)
NRCS	Natural Resource Conservation Service (Soil Conservation Service)
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NURP	National Urban Runoff Program
NWI	National Wetland Inventory
OES	State Office of Emergency Services
PG&E	Pacific Gas and Electric Company
PM-10	Particulate matter, ten microns
PPM	Parts per million
psi	pounds per square inch (pressure)
RWQCB	Regional Water Quality Control Board
SCS	U.S. Soil Conservation Service (Natural Resource Conservation Service)
SDA	Special Drainage Area
SLVSPA	South Livermore Valley Specific Plan Area
SMART	San Joaquin Regional Transit District
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V / C	Volume-to-capacity ratio
VMP	Vehicle Miles Traveled
VPH	Vehicles Per Hour
Zone 7	Alameda County Flood Control and Water Conservation District (Zone 7)

2.0 DESCRIPTION OF THE PROPOSED PROJECT

This chapter of the EIR describes the location of the South Livermore Valley Specific Plan Area (SLVSPA), discusses existing land uses in and around the SLVSPA, and summarizes the *South Livermore Valley Specific Plan (Draft Plan)*. The *Draft Plan* is a separate document and both describes in detail all the policies summarized below and includes a financing plan and design guidelines. This chapter also identifies the cumulative assumptions used to analyze buildout of the SLVSPA and the administrative actions required before any future SLVSPA development could occur.

2.1 PLANNING AREA LOCATION AND EXISTING LAND USES

REGIONAL LOCATION

The 1,887-acre South Livermore Valley Specific Plan Area (1,886.7 acres, rounded) is located in unincorporated Alameda County, south of the City of Livermore (Exhibit 2.1-1). It coincides with the southeastern margin of the Livermore-Amador Valley, an east-west trending valley formed by the foothills of the Diablo-Hamilton range, and largely consists of relatively level or gently sloped terrain.

The South Livermore Valley Specific Plan Area (SLVSPA) is composed of seven separate subareas (containing 35 individual parcels) arrayed adjacent to and near the City's approximately six-mile long southern boundary. The SLVSPA is bounded by East Avenue and Tesla Road (north) in the eastern part of the SLVSPA. In the western part of the SLVSPA, it is bounded by Wetmore Road and the U.S. Department of Veterans Affairs Medical Center (south). It straddles South Vasco Road (east) and extends to Holmes Avenue / Vallecitos Road / State Route 84 (west). Each subarea is described further below (see ***SLVSPA Subareas***).

Regional access to the City and SLVSPA is provided primarily by Interstate 580 (east-west) which connects Livermore to San Francisco (approximately 45 miles northwest), elsewhere in the metropolitan area, and the San Joaquin Valley (east). State Route 84 (SR 84) also provides regional access and currently forms the western SLVSPA boundary (but is planned to be relocated to a new alignment farther west of the SLVSPA).

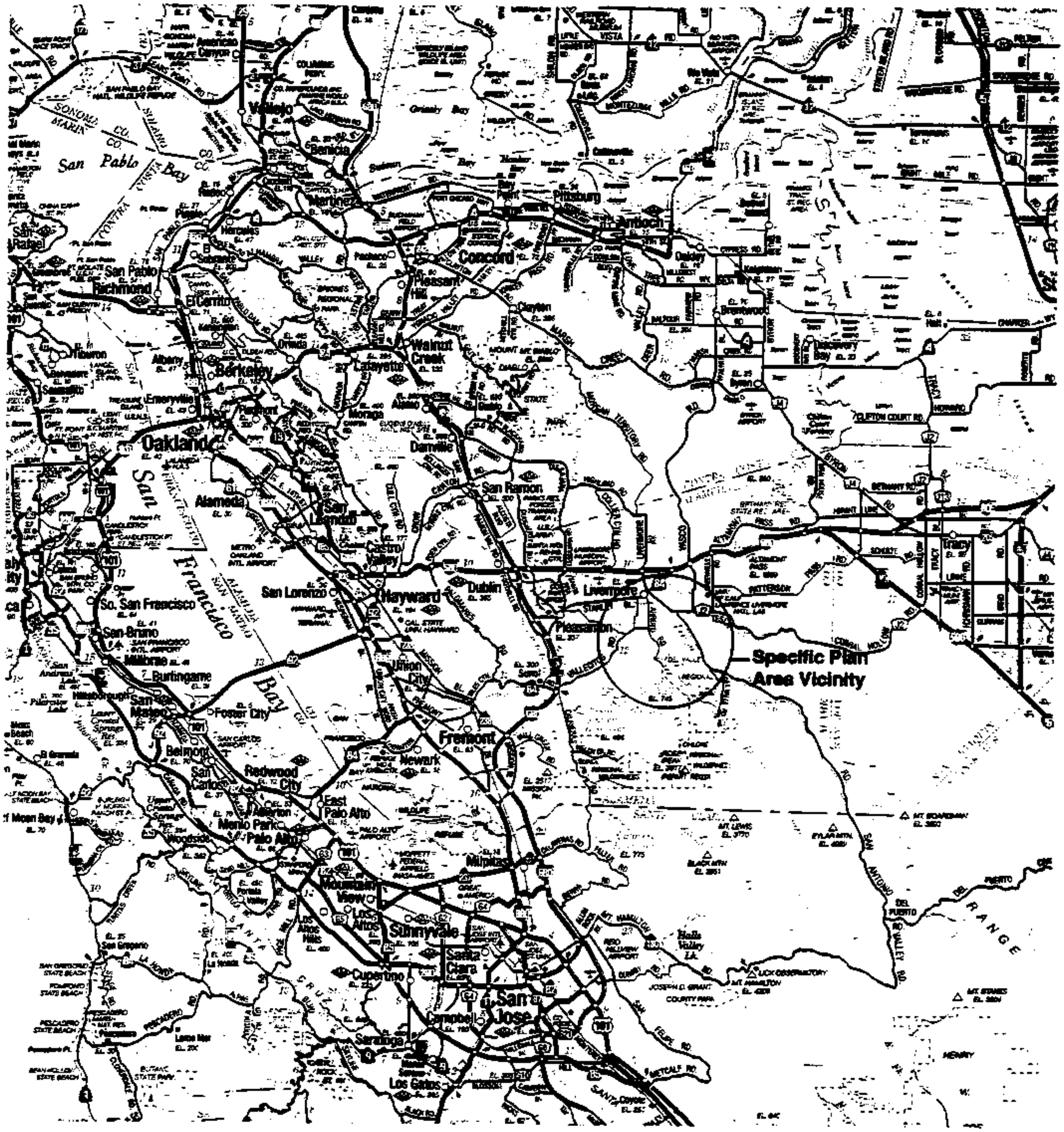
EXISTING LAND USES

Rapid urbanization since World War II resulted in the growth of the Cities of Dublin, Livermore, Pleasanton, and San Ramon and transformation of the primarily agricultural Livermore-Amador Valley and associated San Ramon Valley (the "Tri-Valley" area). The SLVSPA consists of predominantly agricultural and rural residential land uses located at the perimeter of Livermore's urban area within the County's "vineyard area" -- the permanent agricultural zone established by the *South Livermore Valley Area Plan* and devoted to viticulture and intensively cultivated agriculture (see ***Background to the Specific Plan***).

SLVSPA Subareas

Exhibit 2.1-2 illustrates the location of the SLVSPA subareas in relation to the City (north) and

Exhibit 2.1-1
Regional Location



Source: Map copyrighted 1995 by the California State Automobile Association. Reproduced by permission.

unincorporated agricultural area (south). The subareas are described below and both on-site and surrounding land uses are summarized.[1]

Subarea 1 (approximately 170 acres) is bounded by (but excludes) Sandia National Laboratory (north and east), Tesla Road (south), and South Vasco Road (west). Subarea 1 is characterized primarily by 20- to 25-acre commercial recreation (horse ranches) and surrounds the private Stivers Academy elementary school built on a five-acre parcel located on South Vasco Road. A winery and deli also are located in Subarea 1 on Tesla Road. Adjacent uses outside Subarea 1 are institutional (north and east), industrial (northwest across South Vasco Road), agricultural (east, south across Tesla Road, and west across South Vasco Road), and rural residential (southwest across South Vasco Road).

Subarea 2 (± 401 acres) is bounded by East Avenue (north), South Vasco Road (east), and private land extending both to Tesla Road (south) and Buena Vista Road (west). Subarea 2 is characterized primarily by existing and former vineyards. Adjacent uses are light industrial (northeast and east), agricultural (northwest, south, and west), and rural residential (southeast along South Vasco Road and west along Buena Vista Road). Residential neighborhoods are located immediately north of Subarea 2 across East Avenue inside the City.

Subarea 3 (± 97 acres) is bounded by Robertson Park (and Arroyo Mocho)(north), Wente Street (east), and private land extending both to Marina Avenue (south) and Arroyo Road (west). Subarea 3 consists of fallow farmland and farm buildings (both agricultural and residential). Adjacent uses include public park / recreation (north), agriculture (east and south), and residential development (rural residential to the south and new suburban residential immediately west). Concannon Boulevard currently dead ends southwest of Subarea 3 (but is planned by the *City of Livermore Community General Plan* for eventual extension east to Tesla Road beyond Subarea 3).

Subarea 4 (± 301 acres) is bounded by Marina Avenue (north), private land (northeast, east, and south), and Arroyo Road (west). The subarea is used for rural residences and agriculture, including orchards, grazing, and a horse training / stabling facility. Adjacent lands are suburban and rural residential in character (north / northwest and north / northeast, respectively) and are used or planned for agriculture (northeast, east, south, and southwest). The Ravenswood Park historic estate is located opposite Subarea 4, west across Arroyo Road, between a residential neighborhood in the City (north) and Subarea 5 (south).

Subarea 5 (± 155 acres) is bounded by private land (north), Arroyo Road (east), Wetmore Road (south), and SR 84 (west) where Holmes Street and Vallecitos Road connect. The area is rural residential and agricultural and surrounds some existing ranchettes located on Wetmore Road. A small winery (Livermore Valley Cellars) currently is located in Subarea 5 off Wetmore Road, and the Sycamore Stables are located on Holmes Street. Adjacent uses include rural and suburban residential development (northwest and north, respectively, in addition to the Wetmore Road ranchettes), existing and planned agriculture (east and south, across Arroyo and Wetmore Roads, respectively), and public park / recreation (northeast, northwest, and southwest), including Ravenswood Park, Independence Park, and Sycamore Grove Park, the latter located south of Wetmore Road and bisected by Arroyo Valle.

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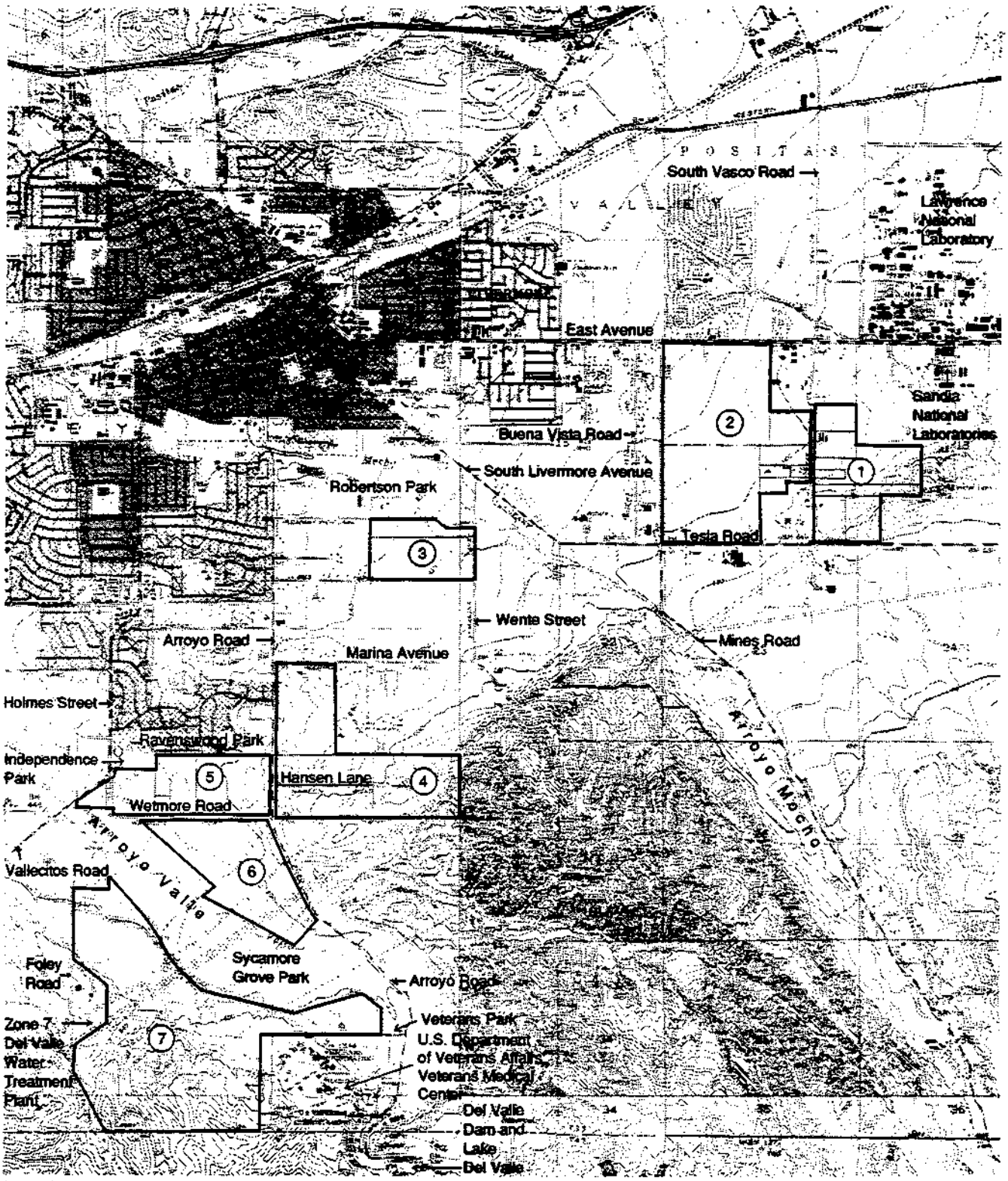
1 Subarea and nearby land uses are described in more detail in the environmental analysis (see ***Chapter 4.1 Land Use and Public Plans***).

Exhibit 2.1-2
Subarea Locations



Legend:

(1) SLVSPA Subareas

Source: Nichols-Berman

Subarea 6 (± 185 acres) is bounded by Wetmore Road (north), Arroyo Road (east), and Sycamore Grove Park (south and west). The area contains fallow agricultural land, once part of the Olivina Ranch, of which remnants remain (Olivina Gate at the Wetmore / Arroyo intersection and an allée of trees). Surrounding uses include rural residential (north), agricultural orchards and grasslands (north and east), and public park / recreation (south and west).

Subarea 7 (± 578 acres) is bounded by Sycamore Grove Park (north and east) continuing south as Veterans Park, the U.S. Department of Veterans Affairs' Medical Center (south), private land (east, south, and west), and the Alameda County Flood Control and Water Conservation District (ACFCWCD) Zone 7 water treatment plant and Vineyard Estates (west). The subarea is a functioning ranch used for livestock grazing and is the site of the former Olivina Winery. Surrounding land uses are public park / recreation (north and east), institutional (south), public (west), and agricultural (south and west), including several vineyards and the approved Vineyard Estates project. At buildout, this latter project which is part of the Ruby Hill development (located farther west, see below) will consist of 32 20-acre parcels to be developed with one housing unit each and planted with vineyards.

While all subareas are unincorporated, Subareas 1, 2, and 3 are located entirely within the City's sphere of influence established by the Alameda County Local Agency Formation Commission (LAFCO), part of Subarea 4 is inside and part is outside the sphere, and Subareas 5, 6, and 7 are entirely outside the sphere.

Parts of Subareas 1, 4, 6, and 7 are crossed by major utility corridors, including the South Bay Aqueduct, electrical transmission lines, and a high-pressure natural gas main, which traverse the SLVSPA in a northeast-southwest direction.

Other Nearby Land Uses

Among the diverse land uses located outside the SLVSPA are the following principal uses:

Agricultural Vineyards, orchards, and grazing characterize existing agricultural operations, and several established wineries operate commercially in the vicinity of the SLVSPA, including the Cedar Mountain, Concannon, Thomas Coyne, Fenestra, Murrieta's Well, Retzlaff, Stony Ridge Winery, Ivan Tamas, Wente Vineyards Estate Winery, and Wente Vineyards Visitors Center and Restaurant. Other area viticultural operations include the Detjens and Kalthoff vineyards. (The Rios-Lovell Winery and Livermore Valley Cellars currently exist inside the SLVSPA in Subareas 1 and 5, respectively.) [2]

Residential Two unincorporated enclaves, the Buena Vista Road and Marina Avenue areas, are located immediately adjacent to Subareas 2 and 4, respectively. Parcels range from one-half acre to as large as five to ten acres in size and are developed with rural residential and ranchette uses, including stabling of horses and keeping of domestic livestock.

The Ruby Hill project is located west of the SLVSPA. It consists of the Vineyard Estates area (immediately west of Subarea 7 in the City of Livermore) and Ruby Hill proper (west of Vallecitos Road in the City of Pleasanton). At buildout, the latter will be developed with 850 detached housing

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2 Farther afield are the Chouinard Vineyards and Westover Vineyards (Castro Valley) and the Elliston Vineyards (Sunol).

units on 900 acres, an inn, two wineries, and an 18-hole golf course. [3] An additional 467 acres of new vineyards will also be planted.

The Crane Ridge Vineyards project is located southwest of Tesla and Greenville Roads beyond Subareas 1 and 2. This project includes ten 18.5-acre parcels, each consisting of a one-acre home site and vineyards planted on the remaining parcel area.

Recreational Among the public and private recreational resources near the SLVSPA are the Independence, Ravenswood, Robertson, Sycamore Grove, and Veterans Parks operated by the Livermore Area Recreation and Park District (LARPD), identified above, and Lake Del Valle Regional Park operated by the East Bay Regional Park District (EBRPD). Two area golf courses (in addition to Ruby Hill's) include the 18-hole approved Course at Wente Vineyards on Arroyo Road (south of the SLVSPA) and the 27-hole Poppy Ridge Golf Course (southeast of Tesla and Greenville Roads beyond Subareas 1-2).

Institutional Several major public / quasi-public institutions are located in the immediate vicinity of the SLVSPA. Sandia National Laboratories and Lawrence Livermore National Laboratory, both U.S. Department of Energy research and development facilities, are located north, east, and farther northeast of Subarea 1. The U.S. Department of Veterans Affairs operates the 118-acre Veterans Medical Center on Arroyo Road, located between Subarea 7 (contiguous to part of the subarea's south boundary) and Lake Del Valle Regional Park. This facility includes a nursing home, sub-acute care hospital, and out-patient clinic. [4]

Industrial RMC Lonestar has quarrying permits for aggregate extraction activities along Arroyo Valle west of the SLVSPA (as previously intended for Subarea 6). The permits' reclamation plans require future conversion to a "chain of lakes" for recreation, water storage, groundwater recharge, and flood control by the ACFCWCD when mining operations are complete.

GENERAL PLAN AND ZONING DESIGNATIONS

The *Alameda County General Plan* designates the unincorporated SLVSPA for agriculture, and the County has zoned the subareas "A" (Agricultural). Agricultural zoning permits most agricultural uses and establishes a minimum 100-acre parcel size per residential unit. [5] Although the SLVSPA currently is unincorporated, the *City of Livermore Community General Plan* land use map designates the

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3 As of September 1996, approximately 99 Ruby Hill units were occupied or under construction, and Final Subdivision Maps had been approved for another approximately 400 more custom lots. Nichols • Berman conversation with Carrie Watt, Planning Department, City of Pleasanton, September 12, 1996.

4 Nichols • Berman conversation with Joel Marlow, U.S. Department of Veterans Affairs, August 29, 1996.

5 The County's *South Livermore Valley Area Plan* permits landowners to reduce the minimum lot size from 100 to 20 acres provided that the landowner plants vineyards or orchards.

following land uses: [6]

- ***Subarea 1*** Limited agriculture (20-acre minimum site)
- ***Subarea 2*** Viticulture (100-acre minimum site) and General Agriculture (100-acre minimum site)
- ***Subarea 3*** General Agriculture [7]
- ***Subarea 4*** General Agriculture [8]
- ***Subarea 5*** Limited agriculture and rural residential (one- to five-acre site) [9]
- ***Subarea 6*** Limited agriculture (20-acre minimum site)
- ***Subarea 7*** General Agriculture and Range & Grassland [10]

Subareas 1, 2, and 7 are outside the adopted development phase boundaries for Livermore residential areas shown on the City's land use map. All of Subarea 3 and parts of Subareas 4 and 5 are designated for long-range development (following short- and medium-range time periods).

The *Draft Plan* contains new land use designations and zoning classifications for the subareas (see the next subsection, ***2.2 Proposed Project***, below). Adoption and implementation of the *Draft Plan* will require an amendment of the *City of Livermore Community General Plan*, prezoning, and annexation to the City in order to permit the types and densities of development envisaged by the *Draft Plan*, and annexation must be preceded by a sphere of influence amendment (see ***2.4 Administrative Actions***).

BACKGROUND TO THE SPECIFIC PLAN

The City's *South Livermore Valley Specific Plan (Draft Plan)* is the most recent effort by the City in a joint planning process initiated in 1987 among Alameda County, Livermore, and Pleasanton to preserve, promote, and enhance viticulture and other cultivated agriculture in South Livermore Valley. Rapid post-World War II urbanization, the accompanying decline in agriculture in general and viticulture in particular, and several specific large-scale development proposals provided the impetus for initiating the process.

The County reached the first milestone in February 1993 with adoption of the *South Livermore Valley Area Plan (Area Plan)* for approximately 14,000 acres of unincorporated land (including the 1,887-acre

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6 *Livermore Community General Plan* land use map, revised as of Resolution 96-92. Part of the SLVSPA is located within the planning area of the City's *General Plan*. Until annexed to Livermore, Alameda County retains jurisdiction for land use decisions in the entire unincorporated SLVSPA. As indicated in ***2.2 Proposed Project***, one purpose of the *South Livermore Valley Specific Plan (Draft Plan)* analyzed in this EIR is to reconcile the inconsistency in land use designations between the *General Plan* and the *General Plan's* South Livermore Valley Policies

7 The land use map also shows a "major street" and "special rural route" (Concannon Boulevard) in Subarea 3.

8 The land use map only shows part of Subarea 4.

9 The map also shows a "special rural route" along Wetmore Road between Subareas 5 and 6.

10 The land use map only shows part of Subarea 7 and designates that part General Agriculture. Land not designated is assumed to be range and grassland.

SLVSPA).[11] The *Area Plan's* 14,000 acres form a wide crescent which arcs from the Interstate 580 / Greenville Road interchange (east) around the southern City of Livermore boundary to the southeast City of Pleasanton boundary (west) and covers the Valley's flat cultivable land from the approximate city limits of Livermore and Pleasanton (north) to the margin of the Valley's ridgelands (south).

The County's *Area Plan* establishes land use policies and standards designed to increase cultivated acreage and rejuvenate the South Livermore Valley as a premium wine production region.[12] The *Area Plan* permits development of up to 1,600 housing units (the *Plan's* "urban component") both to:

- Provide economic incentive programs to fund new agricultural investment and planting of vineyards and

- Define the farthest southern extent of the City of Livermore by establishing a logical and permanent urban / rural boundary through acquisition of permanent agricultural easements

The objective is to define and protect the agricultural / viticultural zone (the *Area Plan's* "vineyard area") from subsequent urbanization while accommodating growth compatible with the new urban / rural interface.

With County adoption of the *Area Plan*, the City amended the *City of Livermore Community General Plan* to incorporate relevant *Area Plan* policies. In October 1993 the City then commenced its planning process to implement the urban component of the *Area Plan* -- first to identify areas potentially suitable for development and annexation to Livermore and, beginning in March 1995, to formulate a specific plan to guide public and private efforts to facilitate planned development. Working with the City-appointed Advisory Committee, staff and consultants conducted planning, economic, and environmental studies throughout 1995 and presented planning concepts to the Livermore Planning Commission and City Council in December 1995 and March 1996, respectively. With some refinements at City officials' direction, those concepts are the subject of this EIR.

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[11] The *South Livermore Valley Area Plan*, as ultimately adopted, covers approximately 14,000 acres. The EIR which evaluated the *Area Plan* before formal adoption studied a 15,500-acre planning area. *South Livermore Valley Area Plan*, Alameda County, February 1993, and *South Livermore Valley Area Plan Draft EIR*, Alameda County, June 1992. Alameda County subsequently adopted the *East Area Plan* for a larger planning area which encompasses the *South Livermore Valley Area Plan*. Both are addressed in ***4.1 Land Use and Public Plans***, but references to the *Area Plan* in this ***Chapter 2 Project Description*** are to the County's *South Livermore Valley Area Plan*.

[12] The *Area Plan* and *City of Livermore Community General Plan* both refer to "cultivated agriculture" and "vineyards and orchards" interchangeably. City staff review of the goals and policies of both plans concluded that vineyards and orchards are the only cultivated agriculture which would meet plan requirements. *South Livermore Valley Planning Program-Preferred Alternative Plan*, Staff Summary Report, City of Livermore, March 19, 1996.

2.2 PROPOSED PROJECT

The proposed project assessed in this EIR consists of the *South Livermore Valley Specific Plan (Draft Plan)* and associated actions required to approve and implement the *Draft Plan*, including a General Plan Amendment, prezoning, amendment of the City's sphere of influence (where required), and annexation. The EIR also assesses ensuing development undertaken to carry out the *Draft Plan* once adopted, including construction of roads, installation of public facilities and utilities, and private residential and commercial development projects proposed in the individual subareas. Because some detailed aspects of development projects cannot be known until individual projects actually are proposed, this EIR identifies both development standards and guidelines contained in the *Draft Plan* and additional assumptions needed for the purposes of environmental analyses (see ***Design Guidelines*** and ***EIR Assumptions***, below).

SOUTH LIVERMORE VALLEY SPECIFIC PLAN

The *Draft Plan* consists of detailed land use, circulation, and infrastructure plans, policies, and implementation strategies, including a financing plan and design guidelines, for 1,887 acres in the seven South Livermore Valley Specific Plan Area (SLVSPA) subareas. The *Draft Plan* provides for development during a 15- to 25-year buildout period (by about year 2020) of up to 1,494 housing units and possible commercial sites catering to wine country visitors. [13]

Policies

The *Draft Plan* contains goals, policies, objectives, and programs with the overall intent of implementing the previously adopted South Livermore Valley Policies of the *City of Livermore Community General Plan* to "preserve and expand the number of vineyards and wineries in the South Livermore Valley area, enhance the recognition and image of the area as an important premium wine-producing region in California, create incentives for investment and expansion of vineyards and other cultivated agriculture in the Valley, and to coordinate the land use policies of Livermore, Pleasanton, and Alameda County so that these goals can be achieved". [14] Among the objectives the planning process was designed to achieve were to:

- Preserve most of this historic wine region and bucolic rural valley from the pressures of future urban development
- Establish a logical and permanent urban / rural boundary through the acquisition of permanent agricultural easements along the City's southern edge

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[13] As discussed in ***Cumulative Conditions***, the EIR analyzes SLVSPA buildout by year 2010, the time horizon projected by such regional agencies as the Association of Bay Area Governments (ABAG) and the Alameda County Congestion Management Agency (CMA), although the actual completion of development in subareas is not expected to occur before about year 2020.

[14] South Livermore Valley Policies, "Land Use Element Proposals" (Part IV (B)), *City of Livermore Community General Plan*. The consistency of the *Draft Plan* with the City's detailed South Livermore Valley Policies and with other relevant public policies is analyzed in ***4.1 Land Use and Public Plans***.

- Plan and design the proposed development so it will be compatible with the existing rural environment of the South Valley and will itself be "rural" in character

In order to accomplish those aims, the *Daft Plan* enumerates six overall land use goals: [15]

- To allow development of a limited amount of urban land within the South Livermore Valley in a manner that protects and expands the acreage that is actively cultivated with agriculture, particularly viticulture
- To establish a permanent urban boundary for the south edge of the City of Livermore
- To minimize growth-related impacts by distributing urban development over a broad geographic area
- To integrate urban development and agricultural uses in a manner that preserves and protects agricultural viability while enhancing the urban environment
- To establish development patterns that minimize urban uses on valuable agricultural land while providing for a low density, rural development pattern
- To establish development patterns that establish identifiable neighborhoods and foster a shared sense of community

Detailed policies of the *Draft Plan* are presented in the relevant topical analyses of this EIR in ***Chapter 4.0 Environmental Analysis*** and in the *Draft Plan* which is incorporated in this EIR by reference.

Proposed Land Uses

The *Draft Plan* identifies residential development opportunities in six subareas (Subareas 1-5 and 7), preliminarily identifies potential commercial sites for new wine country related development in five subareas (Subareas 3-7) [16], sets aside a 20-acre school site (Subarea 3), establishes trail corridors and public open space, and reserves open space for landscaping and intensive cultivation with vineyards and orchards. In order for such development to occur, specific conditions enumerated by the *Plan* and required by the accompanying General Plan Amendment would need to be met. Those conditions include complying with all *Area Plan* and *General Plan* South Livermore Policies, providing agricultural mitigation land, and fulfilling the appropriate requirements the *Draft Plan* identifies for each respective subarea. Otherwise, urban development could not occur, and the base density of one unit per 100 acres would remain in effect.

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[15] The *Draft Plan's* Land Use Element contains additional residential and commercial goals, and the Circulation, Conservation and Resource Management, Community Services & Facilities, Public Utilities, and Community Design Elements similarly present other relevant goals. All the elements also present detailed policies.

[16] While the planning process identified up to 14 potential commercial sites for examination in this EIR, the *Draft Plan* only shows 13 commercial sites. The 14th site could be an equestrian facility in Subarea 7 (analyzed in ***Chapter 5 Alternatives)*** where the *Draft Plan* shows a medium winery. Additional existing commercial sites also are located in the SLVSPA, including wineries in Subareas 1 and 5 and equestrian facilities in Subareas 1, 4, and 5.

Exhibits 2.2-1 through 2.2-5 illustrate land uses envisaged for Subareas 1 through 7, and Exhibit 2.2-6 summarizes land uses by type and subarea.

Residential Use

The *Draft Plan* provides a development potential of 1,494 new single-family detached housing units distributed among all subareas (except Subarea 6) as described below, assuming that all conditions relevant to each respective subarea are met. The *Plan* generally retains existing units located in the SLVSPA (except in Subarea 3 where full implementation of the development concept now envisaged would remove four (4) existing occupied units). [17]

- ***Subarea 1*** (Exhibit 2.2-1) would accommodate construction of up to 133 new units within a 57-acre development area (of which 39 acres would be devoted to residential lots) if conditions for urban development in Subarea 1 are met. Lots would range in size from 10,000- to 15,000-square feet and result in a gross density of 2.3 units per acre (2.6 units per net acre).

- ***Subarea 2*** (Exhibit 2.2-1) is designated for development of 574 new units within a 206-acre development area, assuming conditions for urban development in Subarea 2 are met. Lots would range in size from 8,000- to 12,750-square feet and account for 131 acres. Buildout would result in a gross density of 2.8 units per acre (3.0 units per net acre).

- ***Subarea 3*** (Exhibit 2.2-2) would be developed with 177 units within a 76-acre development area if conditions for urban development in Subarea 3 are met. Lots would range in size from 8,500 to 14,000 square feet and would account for 41 acres of the development area. Implementation would produce a residential density of 2.3 units per gross acre (3.2 units per net acre).

- ***Subarea 4*** (Exhibit 2.2-3) is envisaged for development of 130 units within a 74-acre development area (of which 54 acres would be devoted to residential lots), assuming conditions for urban development in Subarea 4 are met. Lots would range in size from 12,000 to 24,000 square feet. The residential density at buildout would be 1.8 unit per gross acre (1.9 unit per net acre).

- ***Subarea 5*** (Exhibit 2.2-4) would accommodate construction of 176 units within a 87-acre development area, if conditions for urban development in Subarea 5 are met. Lots would range in size from 9,750 to 26,000 square feet and would account for 56 acres. Implementation would produce a residential density of 2.0 units per gross acre (2.2 units per net acre).

- ***Subarea 7*** (Exhibit 2.2-5) is assumed to be developed with 304 units within a 129-acre development area (of which 80 acres would be devoted to residential lots), if conditions for urban development in Subarea 7 are met. Lots would range from 6,000 to 26,000 square feet in size. Residential density at buildout would be 2.4 units per gross acre (2.7 units per net acre).

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[17] Two other existing units would remain (one each in Subarea 3 and 4) but are assumed to be converted to commercial uses some time in the future (to a bed and breakfast inn and an olive oil press, respectively).

Residential Use	Subarea							Total
	1	2	3	4	5	6	7	
Housing Units	133	574	177	130	176	0	304	1,494
Lot Size [a]	10,000-15,000	8,000-12,750	8,500-14,000	12,000-24,000	9,750-12,000	0	6,000-26,000	-
Residential Area [b]	39.4	130.8	40.5	54.0	56.3	0	80.1	401.1
Development Area [c]	56.7	206.0	75.8	73.5	87.1	0	128.6	627.7
Units Per Gross Acre [d]	2.3	2.8	2.3	1.8	2.0	0	2.4	-
Units Per Net Acre [e]	2.6	3.0	3.2	1.9	2.2	0	2.7	-

a Square feet.

b Acres. Total area devoted exclusively to residential lots, including housing units, garages, outbuildings, etc., *plus* yards and gardens.

c Acres. Total area devoted to newly developed uses, including residential lots and streets, developed public facilities (such as school and community park land), and landscaped open space but *excluding* commercial development. Other subarea land uses *outside* residential development areas include undeveloped regional park, trails, and productive agricultural land. The *Draft Plan* uses the development area shown above to calculate residential density and agricultural mitigation. The total land area committed to developed uses also includes commercial sites and existing uses to remain (see Exhibit 2.2-6). However, commercial sites, if not developed, would revert to agricultural, not developed, used.

d Units per gross acre reflect the number of units within the development area given above.

e Units per net acre reflect the number of units in the residential area *plus* street rights-of-way (see Exhibit 2.2-6) *without* public facilities or landscaped open space.

The *Draft Plan's* design guidelines define rural design concepts and policies and provide site planning and architectural standards for residential development throughout the SLVSPA (see ***Design Guidelines***, below).

Commercial Use

The *Draft Plan* assumes development of some wine country commercial uses and preliminarily shows potential sites based on landowner wishes expressed during the planning process. The City will select the final number and location of commercial sites as part of the environmental review and *Plan* approval process. Types of commercial uses and their general characteristics are summarized below (followed by site locations in the subareas):

- ***Small Winery*** Assumed to occupy two to three acres, be developed with about 10,000 square feet of building area (including bottling / crushing facilities, lab and office space, tasting room, storage, and, possibly, an indoor events room), have a small outdoor event or picnic area, and produce 5,000-10,000 cases per year. [18]

- ***Medium Winery*** Assumed to occupy six to eight acres, be developed with about 50,000 square feet of building area (including crushing facilities, lab and office space, tasting room, storage, and, possibly, indoor events space), have a large outdoor event or picnic area, and produce 70,000-100,000 cases per year.

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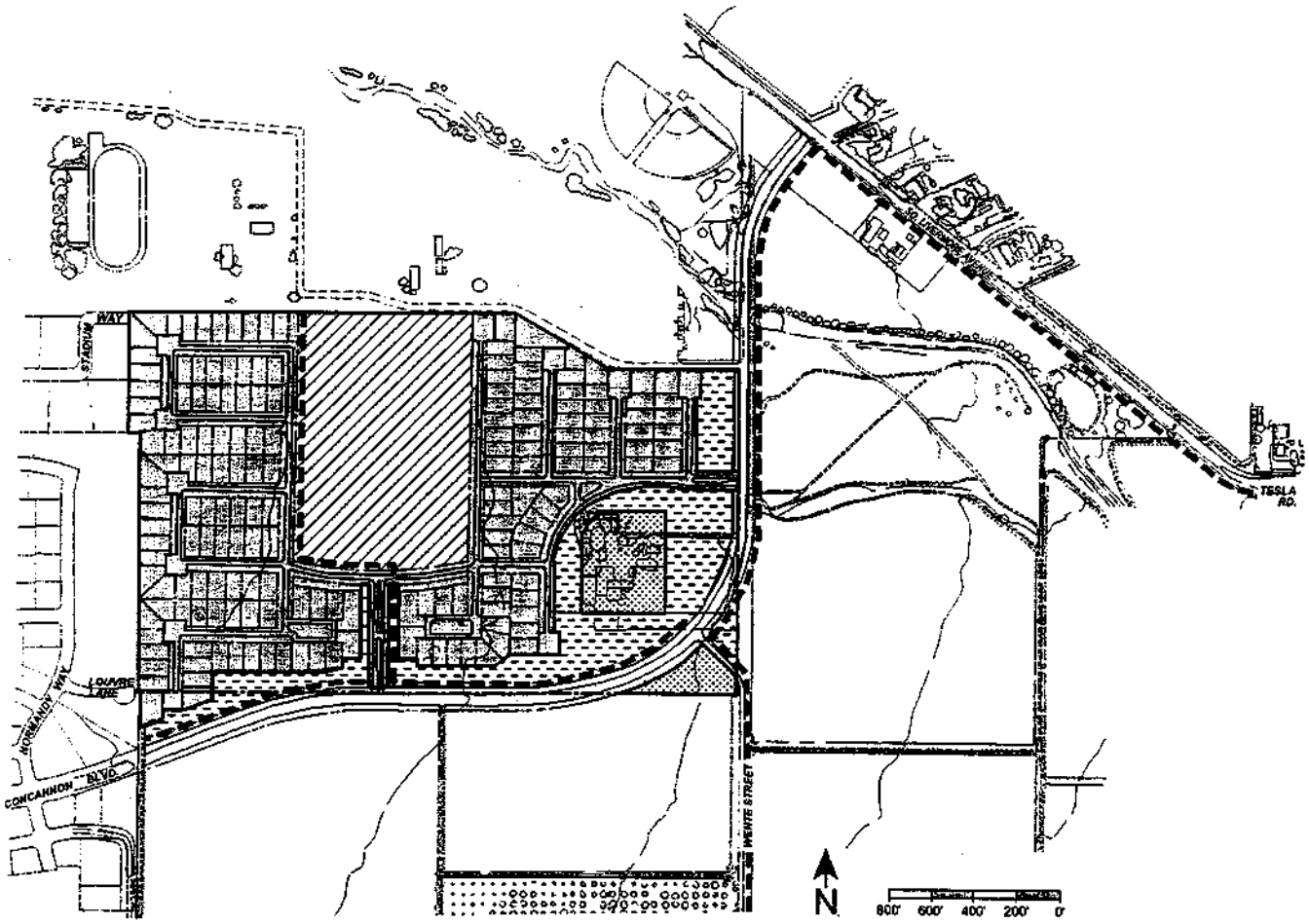
18 Earlier in the planning process, small wineries were assumed to lack crushing facilities. For the purposes of environmental review, in order to identify effects associated with such operations, this EIR assumes that both small and large wineries would have their own crushing facilities.

Exhibit 2.2-2
Subarea 3 Site Plan

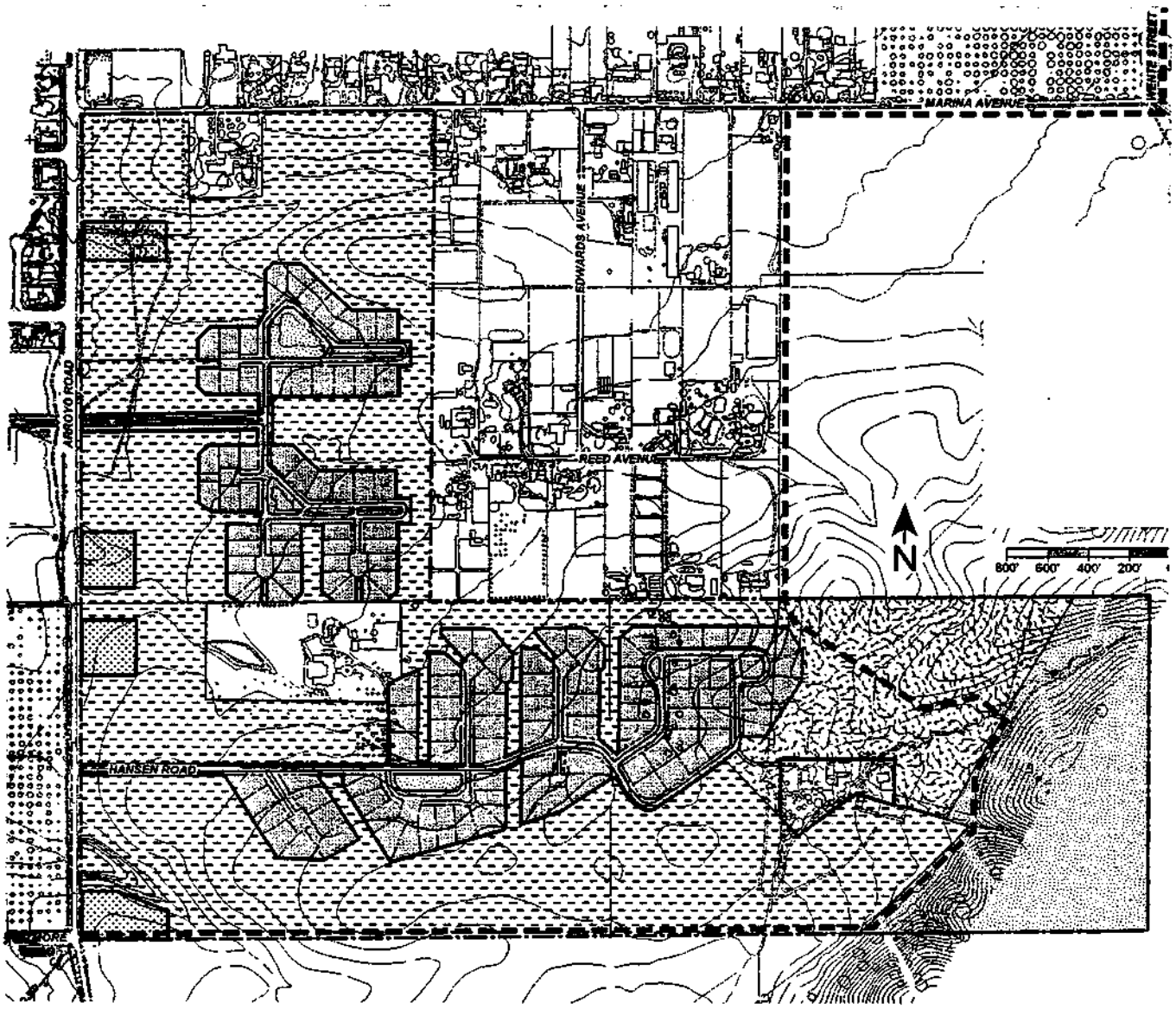


Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

Exhibit 2.2-3
Subarea 4 Site Plan

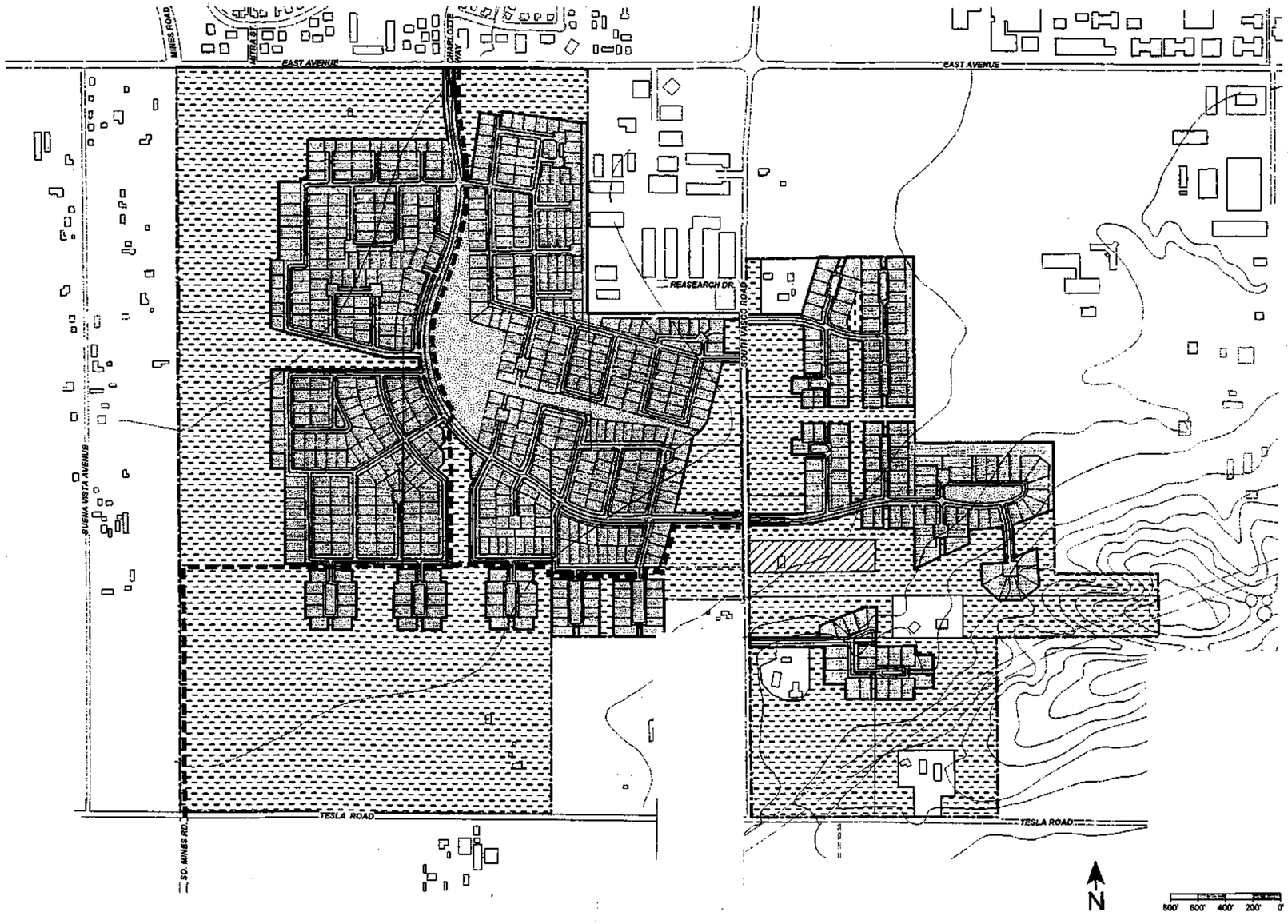


Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

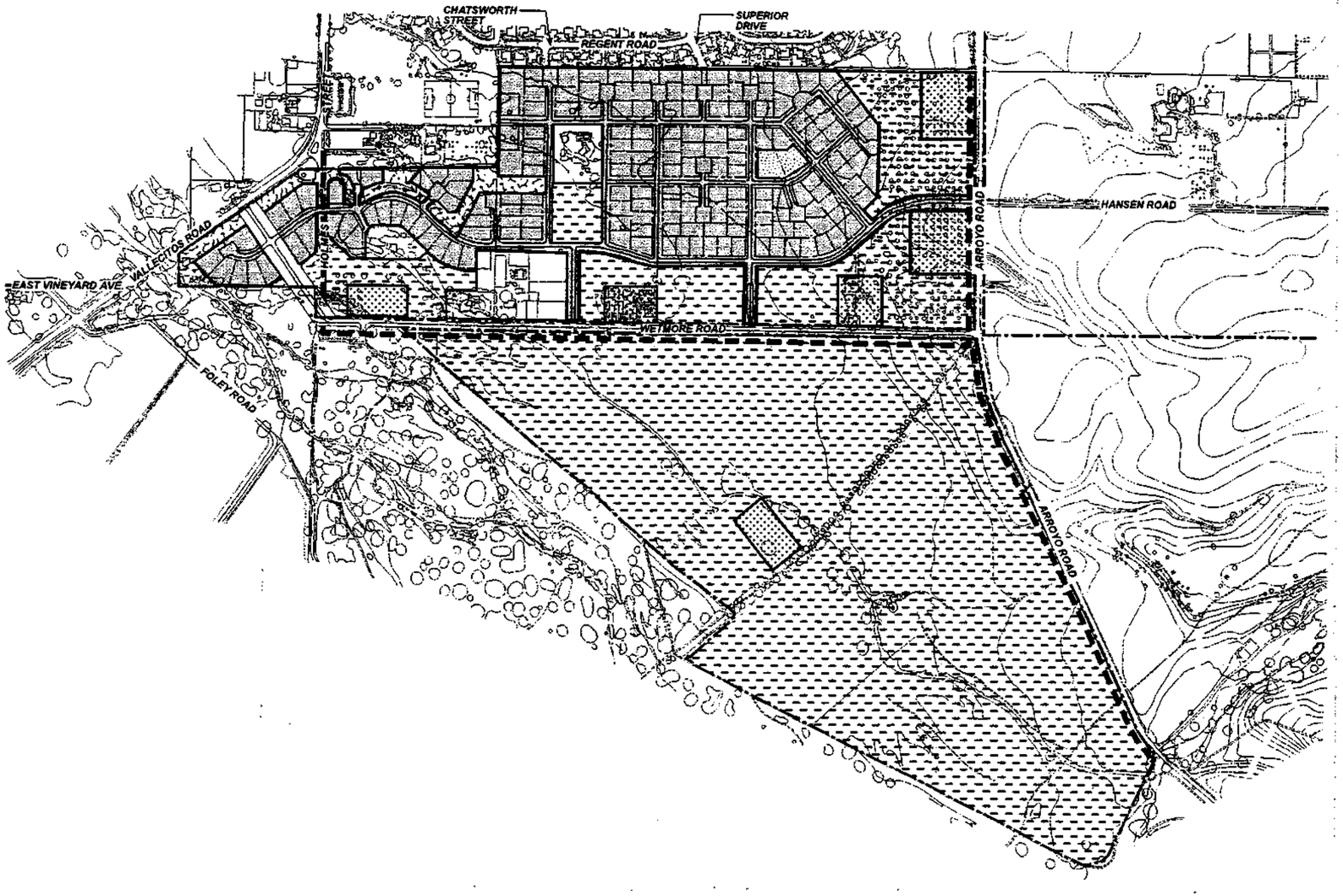
Exhibit 2.2-1
Subareas 1-2 Site Plans



Legend:
- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

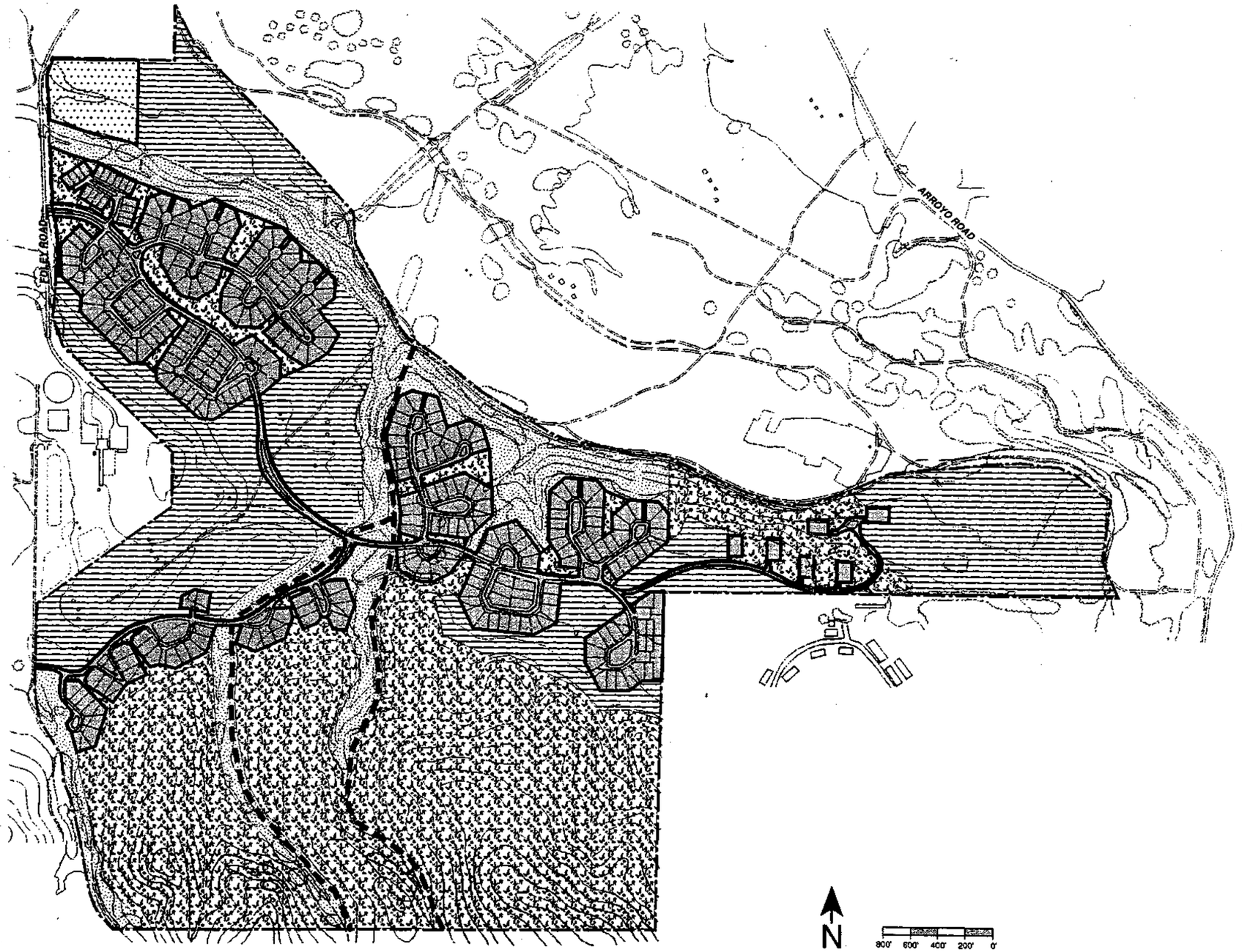
Exhibit 2.2-4
Subareas 5-6 Site Plans



Legend:
- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

Exhibit 2.2-5
Subarea 7 Site Plan



Source: Wallace Roberts & Todd

Exhibit 2.2-6
Land Use Summary

Land Use	Subarea [a]							Total
	1	2	3	4	5	6	7 [b]	
Residential (lots)	39.4	130.8	40.5	54.0	56.3	0.0	80.1	401.1
Commercial (sites) [c]	0.0	0.0	4.0	10.0	12.0	8.0	8.0	42.0
Streets (rights-of-way)	11.1	58.5	14.6	15.9	23.6	0.0	32.4	156.1
School Site	0.0	0.0	20.0	0.0	0.0	0.0	0.0	20.0
Open Space								
• Landscaped Areas	4.9	4.2	0.7	2.1	6.0	0.0	16.1	34.0
• Neighborhood Parks	1.3	12.5	0.0	1.5	1.2	0.0	0.0	16.5
• Regional Park	0.0	0.0	0.0	32.3	0.0	0.0	80.0 [d]	112.3
• Regional Trail Corridor	0.0	5.5	1.1	3.1	1.5	3.8 [e]	[d]	15.0
Existing Uses to Remain	18.5	0.0	[f]	35.2 [f]	11.2	0.0	0.0	64.9
Potential Agricultural Land [g]	95.2	189.2	15.7	146.9	42.9	173.6	361.3	1,024.8
Total Area	170.4	400.7	96.6	301.0	154.7	185.4	577.9	1,886.7
Acreages Rounded	*170*	*401*	*97*	*301*	*155*	*185*	*578*	*1,887*

Source: Wallace Roberts & Todd

a Acres. These areas are broken down further in the detailed descriptions of proposed land uses in the text.

b Subarea 7 acreages in this exhibit throughout the EIR use the Advisory Committee's recommended development scenario and illustrate only one of the alternatives under consideration by the City. All alternatives are discussed in ***Chapter 5.0 Alternatives***.

c Potential new sites. Assumes maximum potential development areas of three (3) acres per small winery, eight (8) acres per medium winery, one (1) acre per small restaurant, one (1) acre per bed and breakfast inn, three (3) acres per 30-room inn, one (1) acre per olive press, and three (3) acres per commercial center. No additional area is assumed for the large restaurant on the three-acre 30-room in site. These new commercial sites include acreages now occupied by residential uses in Subareas 3 and 4 ("existing uses to remain", below) but assumed to be converted to commercial uses some time in the future (see *e*, below).

d Area includes protective setbacks along riparian corridors and drainageways measuring 100 feet on each side (for a total width of about 200 feet within which trails would be developed). Land would be designated and managed as regional parkland.

e Approximately 3.8 acres of trail would be located in Subarea 6 along Arroyo Road. Planning documents show this area in Subarea 2's public trail acreage as a mitigation credit.

f Some existing buildings to remain could be converted to different uses. The existing Caldeira home in Subarea 3 would remain but is assumed to be converted to a bed and breakfast inn or small winery. An existing housing unit and barn on the Subarea 4 Hansen property is assumed to be converted to a small olive oil press.

g This includes some areas which may not be appropriate for intensive agriculture.

- ***Olive Press*** Assumed to occupy a maximum of one acre and be developed with up to 5,000 square feet of building area (including pressing facilities, lab and office space, tasting room / sales area, storage, and an indoor events room).

- ***Small Restaurant*** Assumed to occupy one acre, be developed with no more than 3,000 square feet of building area, have 50 or fewer seats, and, possibly, serve lunch only. Service would be sit-down (no take-out).

- ***Large Restaurant*** Assumed to be developed with no more than 7,500 square feet of building area (on the 30-room inn site, below), have 50 to 100 seats, and serve lunch and dinner.

- ***Bed & Breakfast Inn*** Assumed to be owner-occupied establishments on one-acre minimum sites, fewer than ten guest rooms, and food service limited to breakfast.

- ***Wine Country Inn*** Assumed to occupy three acres, provide up to 30 rooms, and possibly include a large restaurant (above).

- ***Wine Country Center*** Assumed to occupy a maximum of three acres and be developed with a maximum of 25,000 square feet of building area (providing such uses as restaurants, delis, art galleries or shops, bicycle rental, or other wine country-related uses).

The *Draft Plan* does not address features of these uses further apart from policies on setbacks and design (see ***Design Guidelines***, below).

Potential commercial sites could be located in Subareas 3-7 (but no new sites in Subarea 1 and no sites at all in Subarea 2).

- ***Subarea 3*** (Exhibit 2.2-2) could include two potential commercial sites -- a bed-and-breakfast inn or small winery at the existing Caldeira residence and a tasting room or small restaurant southwest of the Concannon / Wente intersection.

- ***Subarea 4*** (Exhibit 2.2-3) could include four new commercial sites -- a 5,000-square foot olive oil press in an existing barn and proposed new building, two small wineries, and a small restaurant or winery.

- ***Subarea 5*** (Exhibit 2.2-4) could include five new commercial *sites* -- a 20,000- to 25,000-square foot wine country commercial center on two to three acres, 30-room inn and large restaurant, two small new wineries, and possible bed-and-breakfast inn. [19]

- ***Subarea 6*** (Exhibit 2.2-4) could include a single commercial site -- a medium-sized winery.

- ***Subarea 7*** (Exhibit 2.2-5) could include a single commercial site -- also a medium-sized winery.

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[19] According to the *Draft Plan*, a bed and breakfast inn in Subarea 5, if developed, would be located on two residential lots, thus reducing the total number of units built in Subarea 5 from 176 to 174 units. Exhibit 2.2-6 shows development of all potential residential units but only four commercial *sites* in Subarea 5. The table immediately below shows all six potential new commercial *uses*. Note that two of those uses are assumed on one *site* (30-room inn and large restaurant).

These uses are summarized as follows:

Commercial Use	Subarea[a]							Total
	1	2	3	4	5	6	7	
Small Winery			1[b]	3[c]	2			6
Medium Winery						1	1	2
Small Restaurant			1[b]					1
Large Restaurant					1[d]			1[d]
Bed & Breakfast					1[e]			1
30-Room Inn					1[d]			1[d]
Olive Press				1				1
Commercial Center					1			1
Total New Sites	0	0	2	4	5[d]	1	1[f]	13[d]

a Number of potential new commercial sites.
b The bed and breakfast or small winery is shown as a small winery and the tasting room or small restaurant is shown as a restaurant. These and the assumptions shown below were selected to assess worst case site sites (see Exhibit 2.2-6).
c The small restaurant or winery is shown as a small winery.
d The 30-room inn and large restaurant are shown as two separate *uses* but are assumed to be developed together as a single project on one *site*.
e If developed, it would replace two residential lots and result in a total of 174 rather than 176 units in Subarea 5.
f An equestrian facility near the medium winery on Subarea 7 is assessed in ***Chapter 5 Alternatives*** but is not analyzed as part of the *Draft Plan*.

Open Space

The *Draft Plan* sets aside open space in each of the subareas. Open space would consist of land designated for public parkland, public trails, and landscaped open space buffers. Productive agricultural land within the subareas -- planted with vineyards or orchards -- also is shown here as open space to indicate that the land is not developed and to distinguish these SLVSPA agricultural lands from other cultivated land in the adjacent vineyard area of the County's *Area Plan*.

- ***Community Park*** The *Draft Plan* would provide a ± 13-acre park in Subarea 2. (A 20-acre school site in Subarea 3, see below, also may accommodate some non-school recreational opportunities for nearby residents during off-hours.)

- ***Regional Parkland*** The *Draft Plan* would preserve 112 acres of new regional parkland in the eastern hillsides of Subarea 4 (32 acres) and along arroyos and drainages in Subarea 7 (80 acres).

- ***Trail Corridor*** The *Draft Plan* would create trail corridors within about 15 acres of Subareas 2-7 as an amenity for future SLVSPA residents and visitors and to provide critical connections to the existing and planned regional trail network (see ***Circulation***, below, for a description of routes and facilities).

- ***Landscaped Areas*** Every subarea (except Subarea 6) would contain some landscaped open space land, ranging from less than one acre in Subarea 3 to about 16 acres in Subarea 7, for a total of 34 acres. These landscaped open space areas are proposed in order to maintain openness and rural character in the SLVSPA.

- ***Agricultural Land*** This land could be planted with productive vineyards or orchards outside the development areas but within the boundaries of the subareas. It could account for as many as

1,025 acres and would occur around existing uses to remain and the new uses identified above. Such agricultural areas would provide buffers between existing and future land uses both inside and outside the subareas. They also would provide visual interest and retain the SLVSPA's rural character for residents and visitors driving through the wine country. The *Draft Plan* primarily recommends the planting of vineyards in most subareas but also anticipates planting of olive orchards in Subarea 4 and would allow grazing on upper elevation open space land in Subarea 7. For the purpose of agricultural mitigation credit (discussed below), agricultural land must be intensively cultivated with vineyards or orchards.

Open space uses are summarized as follows:

Open Space Use	Subarea[a]							Total
	1	2	3	4	5	6	7	
Neighborhood Park	1.3	12.5	0.0	1.5	1.2	0.0	0.0	16.5
Regional Park	0.0	0.0	0.0	32.3	0.0	0.0	80.0[b]	112.3
Trail Corridor	0.0	5.5[c]	1.1	3.1	1.5	3.8[c]	0.0[d]	15.0
Landscaped Areas	4.9	4.2	0.7	2.1	6.0	0.0	16.1	34.0
Open Space Subtotal	*6.2*	*22.2*	*1.8*	*39.0*	*8.7*	*3.8*	*96.1*	*177.8*
Agricultural Land[e]	95.2	189.2	15.7	146.9	42.9	173.6	361.3	1,024.8
Total Undeveloped Land	101.4	211.4	17.5	185.9	51.6	177.4	457.4	1,202.6

a Acres.
b Area includes protective setbacks along riparian corridors and drainageways measuring about 100 feet on each side (for a total width of about 200 feet) within which trails would be developed. The land would be designated and managed as regional parkland.
c Approximately 3.8 acres of trail would be located in Subarea 6 along Arroyo Road. Planning documents transfer this area to Subarea 2's public trail acreage as a mitigation credit.
d Subarea 7 trails would be located within the regional parkland shown above and are not shown separately here.
e This includes some areas which may not be appropriate for intensive agriculture.

The *Draft Plan* provides a mitigation acreage ratio applicable to regional parkland. A General Plan Amendment would be required in order to establish credit for provision of parkland in Subareas 4 or 7.

Other Land Uses

- **Public School** The *Draft Plan* designates a 20-acre site in Subarea 3 for Livermore Valley Joint Unified School District (LVJUSD) development of a public school, potentially a 900-student joint elementary / middle school. As noted above, this site also may be used informally for recreation.

- **Public Streets** A total of 156 acres would be devoted to public street rights-of-way (ROW) within the subareas and would include both paved roadways and landscaped ROWs (see ***Circulation*** below).

Agricultural Mitigation

The City is considering SLVSPA development in response to the County's *Area Plan* which provides for limited urban development as a way to secure permanent agricultural easements for the rest of the planning area and to end the threat of urban expansion on valuable agricultural land. The County *Area Plan's* mitigation program requires the planting and protection through easements of one agricultural acre for each developed acre *and* the planting and protection of an additional acre for each housing unit built. The *Draft Plan* requires provision of permanent easements for 2,051.2 acres to compensate for

557.2 acres of land plus construction of 1,494 housing units. The *Draft Plan* defines the development area requiring mitigation as consisting of:

- Residential lots (401.1 acres)
- Streets and public rights-of-way (156.1 acres)

The *Draft Plan* does not require mitigation for the following land uses designated by the *Plan*:

- Natural open space not disturbed by development (112.3 acres)
- Public parks (16.5 acres)
- Trails and developed open space open to the public (15.0 acres)
- Public school sites (20.0 acres)
- Landscaped open space (34.0 acres)

The *Draft Plan* also identifies land suited neither for development nor agriculture and recommends giving mitigation credit for the permanent presentation of such land, including:

- Agricultural areas
- Regional trail corridors
- Arroyo corridors
- Steep slopes
- Regional open space

The calculation of agricultural mitigation is summarized below. Land to be preserved could include agricultural land inside the SLVSPA subareas or elsewhere in the County's vineyard area.

The *Draft Plan* does not take potential commercial sites into account in calculating mitigation acreage requirements. [20] Commercial development would be required to pay a mitigation fee of $2.50 per space-foot of retail uses. The fee only would be imposed on area devoted to retail activities but not to winery production areas.

Agricultural Mitigation	Subarea							Total
	1	2	3	4	5	6	7	
Acreage Conversion								
• Residential Lot Area *plus* [a]	39.4	130.8	40.5	54.0	56.3	0.0	80.1	401.1
• Street Right-of-Way Area	11.1	58.5	14.6	15.9	23.6	0.0	32.4	156.1
Land Requirement Subtotal [b]	*50.5*	*189.3*	*55.1*	*69.9*	*79.9*	*0.0*	*112.5*	*557.2*
Housing Development								
• Land Requirement *plus*	50.5	189.3	55.1	69.9	79.9	0.0	112.5	557.2
• Housing Units Developed	133.0	574.0	177.0	130.0	176.0	0.0	304.0	1,494.0
Total Mitigation Required [c]	*183.5*	*763.3*	*232.1*	*199.9*	*255.9*	*0.0*	*416.5*	*2,051.2*

a The *Draft Plan* does not take potential commercial sites into account in calculating agricultural mitigation requirements (see immediately below). All numbers are in acres except for the fourth bullet ("housing units developed").

b One acre of vineyard required per one acre developed.

c One acre of vineyard required per one unit developed.

[20] Commercial sites are located on land the *Draft Plan* otherwise designates as agricultural land.

Circulation

The *Draft Plan* identifies internal circulation and access throughout the SLVSPA, including streets and trail routes within the subareas and connections to the existing off-site transportation network. The design guidelines also contain street standards for the subareas.

Roadways

- ***Subarea 1*** (Exhibit 2.2-1) Access would be provided from South Vasco Road at three locations. One Subarea 1 roadway would be located opposite the primary proposed Subarea 2 roadway and form a four-way intersection with South Vasco Road. Emergency vehicular access would connect the northern and middle development areas of Subarea 1 internally, but the southern development area roadway would dead-end in a cul-de-sac.

- ***Subarea 2*** (Exhibit 2.2-1) Access would be provided to Subarea 2 from East Avenue (north) and South Vasco Road (at two locations)(east). The primary internal roadway would connect East Avenue to South Vasco Road through Subarea 2. Internal streets would be provided off this roadway and a secondary access roads (which also would connect to South Vasco Road).

- ***Subarea 3*** (Exhibit 2.2-2) Access would be provided to Subarea 3 from the Concannon Boulevard extension (south) and Wente Street (east). The *Draft Plan* provides for the extension of Concannon Boulevard (presently stubbed out southwest of the subarea) via one of two alternatives (Exhibit 2.2-7). [21] Both alignments would follow the southern subarea boundary and cross the southeast corner of the subarea. Alternative A would connect to Wente Street (with a modified Wente Street / South Livermore Avenue intersection), and Alternative B would cross Wente Street and connect Tesla Road at the Tesla Road / South Livermore Avenue intersection. Alternative A would create a new "T" intersection with South Livermore Avenue; Alternative B would create a new three-way intersection. Either alternative would require construction of a bridge across Arroyo Mocho. With implementation of Alternative A, the new Concannon Boulevard alignment would provide access to the commercial site in the southeast corner of the subarea. Because Alternative B would cross this potential commercial site, implementation of Alternative B would involve providing this commercial development elsewhere in Subarea 3. Access to the Caldeira parcel commercial site would be from Wente Street or Concannon Boulevard.

- ***Subarea 4*** (Exhibit 2.2-3) Access to residential development would be provided from two locations on Arroyo Road (west) -- one opposite the entrance to Ravenswood Park and one at Hansen Road. All commercial sites would have direct access from Arroyo Road separate from the subarea roadways. An emergency vehicle access road would link the northern and southern development areas.

- ***Subarea 5*** (Exhibit 2.2-4) Access would be provided at three locations -- Arroyo Road opposite Hansen Road (east), Wetmore Road (south), and Vallecitos Road (west). Wetmore Road would be extended west to provide a new "T" intersection with Vallecitos Road, This intersection would form a major entry into the SLVSPA, re-routing existing trips from the Holmes Street segment (to be closed to vehicular traffic but retained as an equestrian trail) and eliminating the difficult

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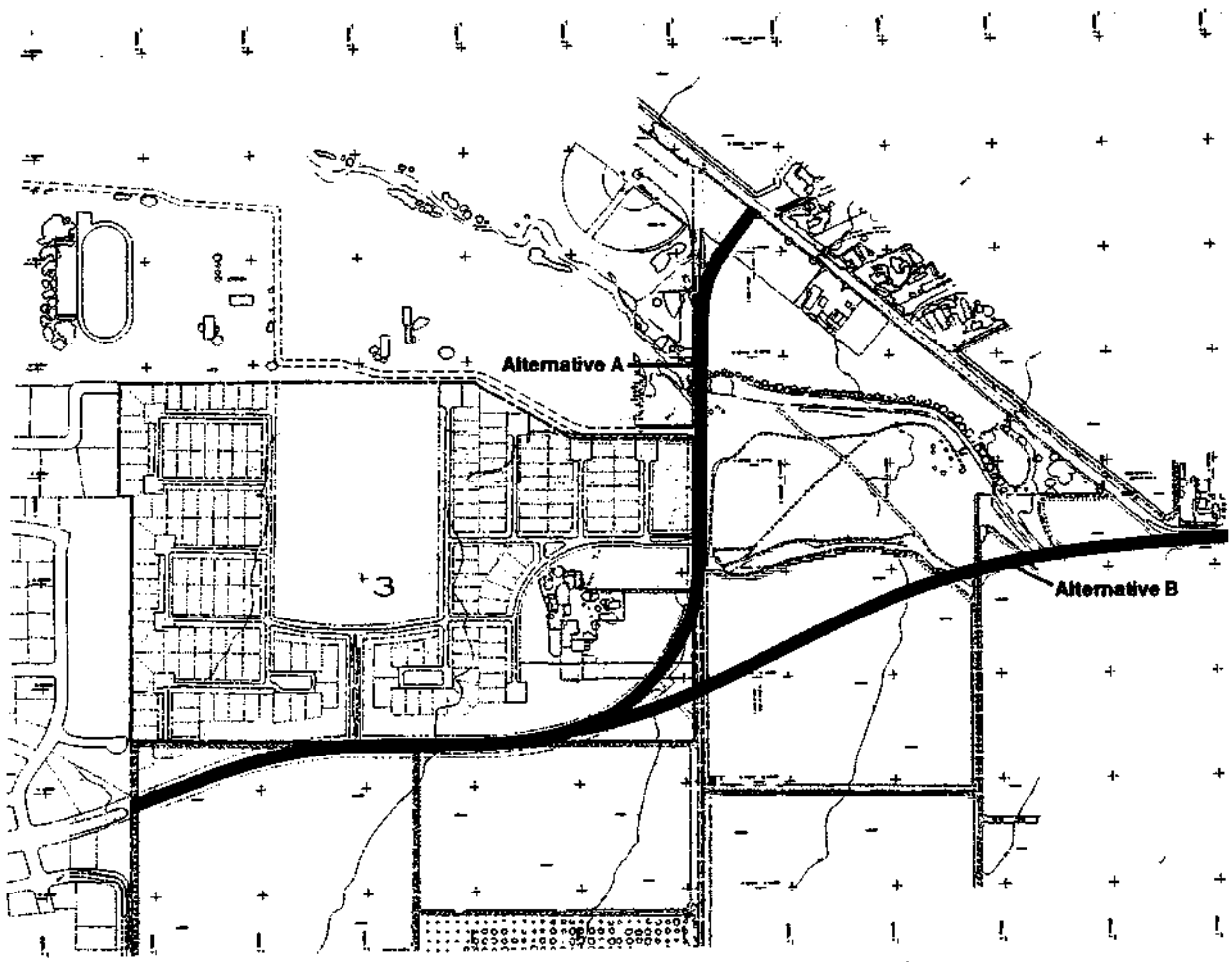
[21] The *City of Livermore Community General Plan* currently calls for the extension of Concannon Boulevard. The *Draft Plan* acknowledges that existing City policy and shows alternative alignments adjacent to Subarea 3.

Exhibit 2.2-7
Concannon Boulevard Extension Alignment Alternatives



Source: Wallace Roberts & Todd and Fehr & Peers Associates

Holmes / Vallecitos "Y" which currently exists. Internal Subarea 5 street rights-of-way would extend to (but not connect) Chatsworth Street and Superior Drive located immediately north of the subarea in the existing neighborhood. The *Draft Plan* provides for barriers to through traffic at these locations but would allow emergency access. Access to commercial sites would be from County roads (two from Arroyo Road and two from Wetmore), except a possible bed and breakfast inn which would require access from an internal subarea roadway.

- ***Subarea 6*** (Exhibit 2.2-4) In order to preserve the Olivina Gate, a new access road to a Subarea 6 commercial site would be provided from Arroyo Road 300 feet south of the Arroyo Road / Wetmore Road "T" intersection in the northeast corner of the subarea.

- ***Subarea 7*** (Exhibit 2.2-5) Access to Subarea 7 would be provided by Vallecitos Road via Foley Road, a private road paved as far south as the Zone 7 water treatment facility where a gate currently restricts access on the unpaved segment which continues south to Foley Ranch. Access from Vallecitos Road would occur at the planned East Vineyard Avenue / Vallecitos Road intersection, relocated as required to mitigate the Ruby Hill project. Foley Road would provide two entrances to the residential development area -- one north and one south of the present Zone 7 site. The *Draft Plan* describes improvements to Foley Road which developers of Subarea 7 would need to make to accommodate such access as a roadway cross section consisting of two 12-foot wide travel lanes. Internal circulation within the subarea would be provided by a looped primary roadway serving local streets and culs-de-sac. Access to the Subarea 7 commercial site would be via Foley Road and the current ranch entrance. (As a separate action from the *Draft Plan*, the LARPD is providing new access and parking for Sycamore Grove Park on the south side of Arroyo Valle via Vallecitos Road and Foley Road adjacent to Subarea 7.)

Road widths would vary according to type of road, and public street rights-of-way would range from 20 to 80 feet, respectively, for alleys and divided subarea entry roads (see ***Design Guidelines, Street Standards***, below). Paved widths would be narrower than the right-of-way cross-sections.

Trails

The *Draft Plan* describes 14 specific off-street trail segments, all planned to accommodate separate bicycle / pedestrian and equestrian use and all designed to permit continuous travel from Subarea 1 to Subarea 7, a distance of 6.5 miles, with minimal road crossings (such as South Vasco Road, Tesla Road, and Arroyo Road). The regional trail system would consist of 25- and, in some cases, 40-foot wide corridors each developed with a ten-foot wide paved bicycle / pedestrian path and an eight-foot wide compacted gravel or earth equestrian trail. Trail segments are listed below and shown on Exhibit 2.2-8.

1. East Avenue to southern edge Subarea 2
2. South Vasco Road to western edge Subarea 2
3. Western edge Subarea 2 to Tesla Road
4. Mines Road to Wente Street
5. South Livermore Avenue to Marina Avenue
6. Robertson Park to Concannon Boulevard Extension
7. Wente Street to Subarea 4
8. Wente property to Arroyo Road
9. Ravenswood to Wetmore Road
10. Holmes Street to Wetmore Road
11. Arroyo Road to Holmes Street
12. Wetmore Road to Sycamore Grove Park
13. Vallecitos Road to Sycamore Grove Park
14. Sycamore Grove Park to southern edge Subarea 7

The *Draft Plan* requires private developers to dedicate and improve their respective trail corridor

segments within the subareas as conditions of development. Developers of individual projects and the Livermore Area Recreation and Park District (LARPD) would split off-site trail costs equally to acquire and improve segments between subareas.

Public Facilities and Utilities

The *Draft Plan* provides for the extension of existing and installation of new or upgraded public facilities and utilities, including water distribution, sewage collection, and stormwater disposal lines. Service to the subareas will be funded by the financing plan or landowners / developers of individual projects, and the costs to make local extensions and service connections would be the responsibility of individual developers on a project-by-project basis. Private developers also would be responsible for extending gas, electric, and telephone facilities to their own projects, as required by the respective utility providers. The *Draft Plan's* Public Utilities Element identifies all facilities required to serve SLVSPA development, and, apart from normal internal subarea water delivery and sewage collection lines, off-site extensions or connections, project-by-project drainage systems, key facilities include:

- Expansion of the existing Altamont reservoir to serve Subareas 1 and 2
- Construction of a new 500,000-gallon reservoir in Subarea 4 to serve Subareas 3 and 4
- Expansion of facilities at Pump Station #26 to serve Subareas 3 and 4
- Construction of a new 500,000-gallon reservoir in Subarea 7 at an elevation of 760 feet
- Construction of a new sewer main from Subarea 5 to Isabel Avenue with connections for Subareas 6 and 7
- On-site stormwater detention facilities in Subarea 1, 2 (in the designated park), and 4

Design Guidelines

The *Draft Plan's* discussion of rural development principles identifies three characteristics of the South Livermore Valley's rural landscape -- openness, simplicity / economy, and variety within structure. The *Plan's* design guidelines incorporate 19 separate principles as policies and provide specific site planning, architectural design, landscape design, and street standards to implement the policies. General topics the design guidelines address are listed below, followed by a selected list of specific standards used to assess aspects of development in this EIR. The design guidelines only would govern residential development.

Site Planning Standards

- ***Residential lot pattern*** Minimum lot widths would be 60 feet, and most lots would be at least 8,000 square feet in size.

- ***Floor area ratio*** Building area (of a housing unit) is recommended to average 33 percent of lot size and should not exceed 38 percent (floor area ratios (FARs) of 0.33 and 0.38, respectively). [22]

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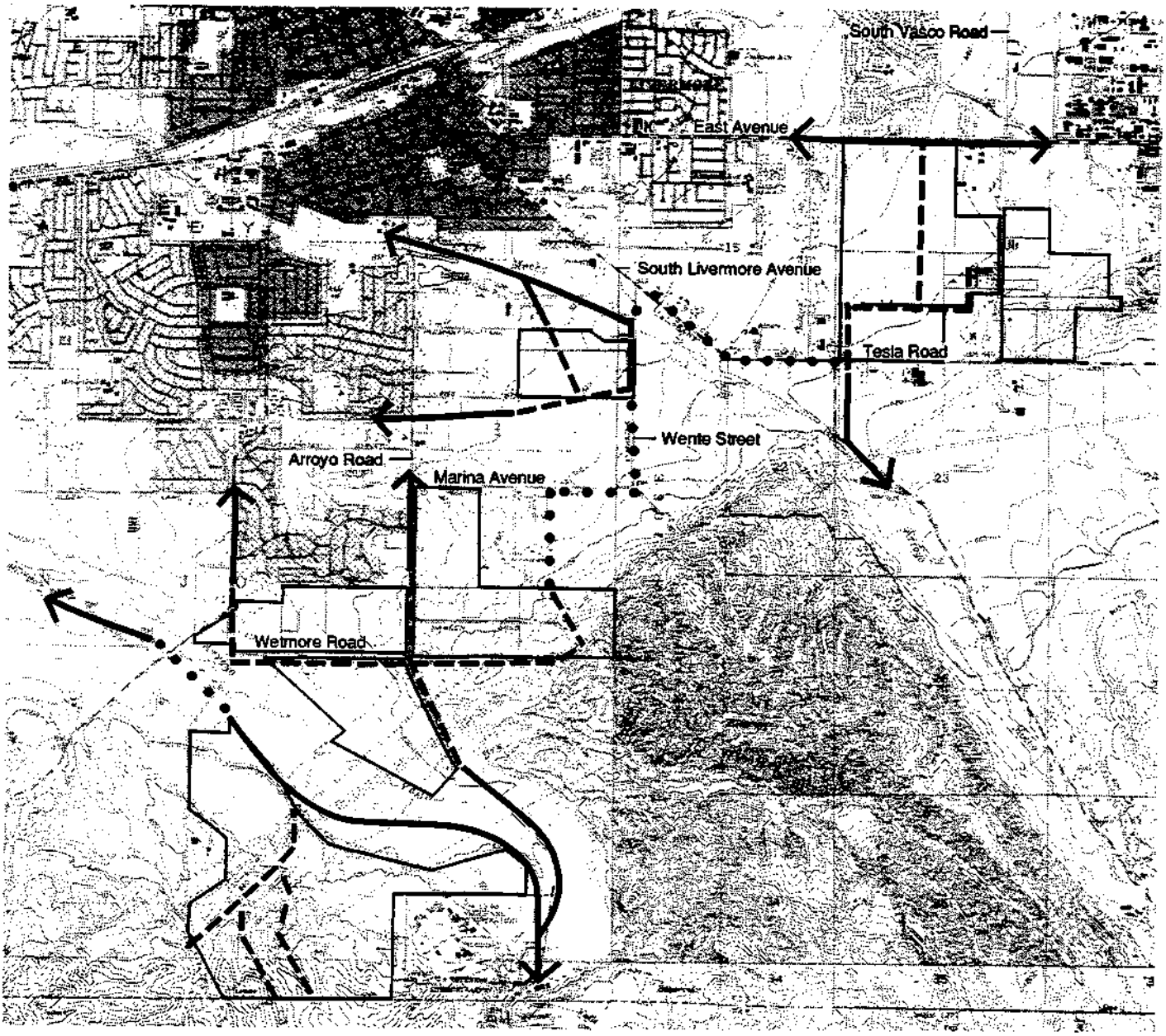
[22] Floor area ratio (FAR) regulates the amount of development on a parcel, based on a proportion of parcel size. An FAR of 0.33 applied to a 11,700-square foot SLVSPA parcel would permit development of a 3,860-square foot housing unit. (Lots would range in size from 6,000 to 26,000 square feet, and the average lot size is estimated to be 11,700 square feet based on 401.1 acres of residential lots and 1,494 lots or units. This is derived as follows: 401.1 acres x 43,560 square feet per acre = 17,471,916 square feet of residential lot area ÷ 1,494 lots = 11,695 square feet per lot, rounded to 11,700 square feet.) In addition to the housing unit, a 600-square foot garage could be built on each lot and could contain 600 square feet of second-story habitable area beyond that permitted in the main structure by the FAR.

Exhibit 2.2-8
Trail Corridors



Legend:
- Proposed project trail improvements
- Proposed joint project/LARPD trail improvements
- Existing/planned trail connections

Source: Wallace Roberts & Todd

- ***Setbacks and building siting*** Building setbacks should vary, but a minimum of 20-foot front, 20-foot rear, and five-foot side setbacks would be provided.

- ***On-site parking*** Garages would be required to be sited to minimize prominence, driveways should be no wider than ten feet (single) to 16 feet (shared), and driveways should be constructed of porous (permeable) materials.

- ***Fencing*** Three-foot high fences would be allowed in front yards, six-foot high fences would be allowed in side and rear yards, and fences adjoining agricultural or open space land should be of open design (such as post and rail or gridded wire mesh).

Architectural Standards

- ***Building hierarchy*** Housing units should be larger in scale, sited more prominently, and articulated in greater detail than other structures on a site.

- ***Separate buildings*** Accessory uses should be accommodated in secondary buildings.

- ***Massing*** Simple gabled or hipped roofs should be buildings' most significant feature, and moderate secondary building elements should not diminish dominance of the main roof.

- ***Roof pitch*** The main house roof pitch should range from 8 : 12 to 12 : 12 (rise over run), up to 30 percent of units in a given subarea may have shallower roofs, but no main house roof pitch should be less than 6 : 12.

- ***Building height*** Maximum building heights should be 35 feet for two-story houses, 20 feet for one-story houses, and 15-20 feet, respectively, for one- and two-story secondary structures.

- ***Exterior materials and color*** Natural materials left unpainted can be used anywhere, color ranges for exterior walls and roof materials are specified, reflective materials are not allowed.

- ***Windows*** All windows should have vertical proportions with a vertical / horizontal ratio ranging from 1.5 : 1 to 2:1.

- ***Skylights*** Skylights should be flat and non-reflective, not domed or reflective.

Street Standards

- ***Rural entry road (divided)*** 80-foot minimum right-of-way (ROW)
- ***Rural entry road (undivided)*** 54-foot minimum ROW
- ***Rural collector street*** 68-foot minimum ROW
- ***Rural residential street*** 50-foot minimum ROW
- ***Residential court*** 80-foot minimum ROW
- ***Farm compound access drive*** 40-foot minimum ROW
- ***Farm compound court*** 100-foot minimum ROW
- ***Alley*** 20-foot ROW
- ***Regional trail*** 25- and 40-foot ROWs

Note that paved widths would be narrower than these right-of-way cross-sections.

Detailed design guidelines were not formulated for commercial uses. However, the *Draft Plan's* contains the following policies which relate to commercial land use:

- ***Policy 4-5*** Only those commercial uses identified in this Plan will be permitted. All Commercial development applications will be subjct to a site plan approval. Additional accessory activities that support the listed uses may be permitted with the approval of a conditional use permit.

- ***Policy 4.6*** Commercial uses will maintain a small pedestrian scale and will not exceed an FAR of 0.25.

- ***Policy 4.7*** Building setbacks for commercial uses shall be 100 feet from road frontages. All setback areas shall be planted with vineyards or orchards.

- ***Policy 4.8*** The design of commercial facilities shall be consistent with the rural wine country character of the area.

- ***Policy 4.9*** The City shall adopt design standards and guidelines to guide the City's evaluation of applications for commercial uses within the South Livermore Valley. Commercial adevelopment will not be permitted within the Specific Plan area until such stancards and guidelines are adopted by the City.

EIR Assumptions

Because the "project" examined in this EIR is the *Draft Plan* -- plus the associated actions which would enable but do not formally propose the actual buildout of the SLVSPA -- some details of future development are not known at this time. Nor will they be identified until landowners / prospective developers eventually submit formal applications for specific development projects to the City. In the absence of such details, this EIR makes the following assumptions for evaluation purposes because it assesses full buildout conditions in the SLVSPA in order to disclose the effects of the "entire" project which could occur with implementation of the *Plan*.

Building Area and Lot Coverage This EIR estimated that a total of approximately 7,791,702 square feet of residential and commercial *building area* could be constructed in the SLVSPA at buildout. This total includes approximately 7,558,532 square feet of residential building area (housing units and garages), assuming construction according an average 0.33 floor area ratio (FAR) and another 233,170 square feet of commercial area with full development of all commercial sites at their maximum allowable area. These assumptions are broken down as follows (in square feet) in Exhibit 2.2-9.

The residential and commercial FARs relate only to total building area and do not account for either two-story construction (which reduces the footprint of land covered by development) or for coverage by other types of impermeable surfaces (decks, patios, streets, etc.). The EIR assumed an estimated 9,769,440 square feet (224.3 acres) of all types of *impervious surfaces* in order to calculate surface water runoff in relation to potential drainage impacts (see ***4.3 Hydrology)***, also as shown in Exhibit 2.2-9.

Exhibit 2.2-9
Building Area and Lot Coverage

Maximum Building Area	Subarea							Total
	1	2	3	4	5	6	7	
Residential								
• Housing Unit [a]	566,367	1,880,224	582,179	776,239	809,301	0	1,151,422	5,765,732
• Garage [b]	159,600	688,800	212,400	156,000	211,200	0	364,800	1,792,800
Residential Subtotal	*725,967*	*2,569,024*	*794,579*	*932,239*	*1,020,501*	*0*	*1,516,222*	*7,558,532*
Commercial [c]								
• Small Winery	0	0	10,000	30,000	20,000	0	0	60,000
• Medium Winery	0	0	0	0	0	50,000	50,000	100,000
• Small Restaurant	0	0	3,000	0	0	0	0	3,000
• Large Restaurant	0	0	0	0	7,500	0	0	7,500
• Bed & Breakfast [d]	0	0	0	0	0	0	0	0
• 30-Room Inn [e]	0	0	0	0	32,670	0	0	32,670
• Olive Press	0	0	0	5,000	0	0	0	5,000
• Commercial Center	0	0	0	0	25,000	0	0	25,000
Commercial Subtotal	*0*	*0*	*13,000*	*35,000*	*85,170*	*50,000*	*50,000*	*233,170*
Total New Development	725,967	2,569,024	807,579	967,239	1,105,671	50,000	1,566,222	7,791,702
Coverage by Impervious Surfaces								
Residential								
• Housing Unit [f]	454,810	1,509,877	467,508	623,344	649,894	0	924,627	4,630,060
• Garage [g]	79,800	344,400	106,200	78,000	105,600	0	182,400	896,400
Residential Subtotal	*534,610*	*1,854,277*	*573,708*	*701,344*	*755,494*	*0*	*1,107,027*	*5,526,460*
Streets								
• Collector [h]	122,400	686,800	168,300	173,400	258,400	0	387,600	1,796,900
• Residential [i]	144,000	513,000	288,000	234,000	257,700	0	552,000	1,988,700
Street Subtotal	*266,400*	*1,199,800*	*456,300*	*407,400*	*516,100*	*0*	*939,600*	*3,785,600*
Commercial Total [j]	*0*	*0*	*43,560*	*108,900*	*130,680*	*87,120*	*87,120*	*457,380*
Total Coverage	801,010	3,054,077	1,073,568	1,217,644	1,402,274	87,120	2,133,747	9,769,440

Source: Wallace Roberts & Todd

a 401.1 acres x 43,560 square feet / acre = 17,471,916 square feet x 0.33 FAR = 5,765,732 square feet.

b Based on 600 square feet / garage x 1,494 units = 896,400 square feet x 2 stories = 1,792,800 square feet.

c Based on the number of sites and the sizes described above (see ***Commercial Use***).

d Counted above as housing units. If developed instead of two residential lots on a one-acre site, a 10,890-square foot bed-and breakfast inn could be built. This is derived as follows: 1 acre x 43,560 square feet / acre = 43,560 square feet x 0.25 FAR = 10,890 square feet.

e This is derived as follows: 3 acres x 43,560 square feet / acre = 130,680 square feet x 0.25 FAR = 32,670 square feet.

f Residential use assumes 50 percent of units are one- and 50 percent are two-story units and that two-story unit footprints represent 60 percent of total FAR (for larger first and smaller second stories), as follows: 401.1 acres x 43,560 square feet / acre = 17,471,916 square feet ÷ 2 = (8,735,958 square feet x 0.33 = 2,882,866 square feet) + (8,735,958 square feet x 0.20 = 1,747,192 square feet) = 4,630,058 square feet, rounded to 4,630,060 square feet. (4,630,060 square feet ÷ 43,560 square feet / acre = 106.29 acres.)

g Garage footprints assume 600 square feet x 1,494 units = 896,499 square feet (20.58 acres).

h Collector streets assume 52,850 linear feet x 34 feet wide = 1,796,900 square feet (41.25 acres).

i Residential streets assume 66,290 linear feet x 30 feet wide = 1,988,700 square feet (45.65 acres).

j Commercial use assumes 42 acres x 43,560 = 1,829,520 square feet x 0.25 FAR = 457,380 square feet (10.50 acres).

Estimated Population and Employment Residential and commercial development in the SLVSPA would increase population and employment in Livermore. The future residential population is estimated to be 3,915-4,160 people, based on the range of 2.62 to 2.78 persons per household (pph) projected by the Association of Bay Area Governments (ABAG) for Alameda County and Livermore, respectively, by the year 2010. [23]

Development of 13 potential commercial sites assumed by the *Draft Plan* could create a total of more than 189 jobs at buildout, based on the following employee density and generation assumptions: [24]

- Ten (10) employees per winery consistent with County *Area Plan* employment assumptions
- Two (2) employees per bed and breakfast also consistent with the *Area Plan*
- One (1) restaurant employee per 400-450 square feet
- One (1) employee per room (for the 30-room inn) [25]
- One (1) employee per 400 square feet of neighborhood / specialty commercial retail space

Population / Employment	***Subarea***							***Total***
	1	***2***	***3***	***4***	***5***	***6***	***7***	
Housing Units	133	574	177	130	176	0	304	1,494
Population [a]								
• 2.62 pph (rounded)	350-	1,500-	465-	340-	460-	0	800-	3,915-
• 2.78 pph (rounded)	370	1,600	490	360	490		850	4,160
Employment [b]								
• Wineries (5 new)	0	0		20	10	10	10	50
• Restaurants (3)	0	0	7	7	18	0	0	32
• Bed and Breakfasts	0	0	2	0	2	0	0	4
• 30-Room Inn (1)	0	0			30			30
• Olive Press (1)	0	0	0	10	0	0	0	10
• Commercial Center	0	0	0	0	63	0	0	63
Total Employment	0	0	2	37	123	10	10	189

a Number of residents assuming 2.62 persons per household (pph) countywide and 2.78 pph for Livermore by 2010, *Projections 94, Forecasts for the San Francisco Bay Area to the Year 2010.*

b Number of employees using the assumptions listed in the text (above).

Commercial Development Design The *Plan's* design guidelines only address residential development and provide no guidelines for commercial development. The EIR assumes a maximum FAR of 0.25 (25 percent of lot area) and maximum building height of 35 feet for commercial sites, irrespective of use.

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23 *Projections 94, Forecasts for the San Francisco Bay Area to the Year 2010,* Association of Bay Area Governments, December 1993.

24 Economic and Planning Systems (*Draft Plan's* economists) and *South Livermore Valley Area Plan EIR, op. cit.*, Table III-1. The 14th potential site, an equestrian facility in Subarea 7, is only considered as a Subarea 7 alternative (***Chapter 5.0 Alternatives***) and would be built instead of the medium winery assumed at that location by the *Draft Plan.*

25 This employee generation rate applies to high-end / luxury hotels. The rate for motels is 0.8 employee per room. These two rates would result in a six-employee difference for the 30-room inn (24-30 employees). The actual number of employees cannot be determined until such a facility is planned and its target market is identified.

GENERAL PLAN AMENDMENT AND PREZONING

This EIR also covers the following additional actions by the City.

General Plan Amendment

The project evaluated in this EIR includes several "conforming amendments" to the *City of Livermore Community General Plan (General Plan)*. The amendments are intended to ensure that the *South Livermore Valley Specific Plan (Draft Plan)* is consistent with the *General Plan*. The *General Plan* currently contemplates urban development with up to 1,600 housing units within the SLVSPA as part of the City's and County's plan to create a permanent urban-rural boundary to protect agriculture -- specifically viticulture -- in the South Livermore Valley. The *General Plan* also specifies a number of conditions which must be satisfied by any urban development proposed in the SLVSPA. Thus, adoption of the *South Livermore Valley Specific Plan* will require an amendment of the *General Plan* to establish the proposed SLVSPA land uses, circulation network, and other features and to achieve internal consistency between the two plans. This is for several reasons.

One is that the *General Plan* currently designates part (but not all of) the SLVSPA for different types of agricultural use (General Agriculture, Limited Agriculture, Viticulture, and Range & Grassland).[26] Conversion of the SLVSPA from agricultural to predominantly residential use would require an amendment of existing land use designations to designations appropriate to permit such use, providing that conditions enumerated in the *Draft Plan* for each subarea are met. Conversion also would require the designation of subareas not currently classified by the City's land use map with the appropriate land use classifications.

Moreover, the *General Plan* does not presently contain residential land use designations comparable to those envisaged by the *Draft Plan* and which would be unique to the SLVSPA. Therefore, new designations must be incorporated into the *General Plan*.

Another reason would be to permit regional parkland preserved in Subareas 4 and 7 to meet agricultural mitigation requirements and in order to establish mitigation ratio to do so.

Depending on the final form of the *South Livermore Valley Specific Plan* when adopted by the City, the General Plan Amendment potentially would need to modify the existing South Livermore Valley Policies of the *General Plan* for consistency between the two City documents.

The General Plan Amendment establishes (and the *Draft Plan* would maintain) Agriculture / Viticulture as the underlying General Plan land use designation. A new zoning district "Planned Development South Livermore Valley Specific Plan" was also created for use as the zoning district throughout the SLVSPA. The zoning designation provides a base density of one residential unit per 100 acres but allows a density bonus consistent with the *Draft Plan* under specific conditions. Those conditions require meeting all of the requirements of the *Draft Plan* including land use, circulation, utilities, design,

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[26] The City's land use map only shows land use designations for all of Subareas 1-3 and 5-6 but only parts of Subareas 4 and 7. The entire unincorporated SLVSPA currently is designated for agricultural use by Alameda County's *General Plan*. While cities can show land use designations of areas within their respective spheres of influence, the County designation prevails for all land use and development actions unless a general plan amendment is approved or the land is annexed to a municipality. The City of Livermore's sphere, established by the Alameda County Local Agency Formation Commission (LAFCO), is described in ***2.4 Administrative Actions, Annexation Scenarios***, below.

and agricultural mitigation.

In building on existing provisions of the *General Plan*, the conforming amendments would:

- Create a new "Conditional Urban Overlay District" which would allow density bonuses on designated lands where the impacts of urban densities of development would be mitigated through preservation of agricultural, environmental,, and scenic resources in the district. These districts would include four general land use categories: residential development areas, vineyard commercial, agricultural preserve, and regional open space.
- Apply the "Conditional Urban Overlay District" to seven subareas (the SLVSPA) within the vineyard area defined by the County's *Area Plan* and specify the density bonuses available within each subarea.
- Authorize projects with impacts which primarily affect unique rural scenic qualities and wildlife habitats to mitigate those impacts by dedicating designated regional open space lands in lieu of the *General Plan's* existing agricultural land mitigation requirement.
- Exempt projects with the vineyard area from the City's competitive growth management review process and, instead, allow development of up to 200 units per year within the vineyard area.
- Encourage annexations within the vineyard area only where the project sponsor has entered a preannexation agreement with the City establishing a cooperative annexation process and specifying development conditions applicable to the lands to be annexed.

Prezoning

While cities' general plans can address geographical areas outside their corporate boundaries (and designate desired land uses), the regulatory authority of municipal zoning classifications applies only to areas within city limits. A city can *prezone* unincorporated areas to indicate its intended zoning district when the areas annex to the city. However, prezoning does not apply until the land is annexed by the Local Agency Formation Commission (LAFCO)(see ***2.4 Administrative Actions, Alameda County LAFCO***, below). In the meantime, Alameda County zoning of the SLVSPA prevails. County zoning is "A" (Agricultural) which permits most agricultural uses and provides for a minimum parcel size of 100 acres per residential unit. County zoning in the vineyard area permits 20-acre parcels developed with one residential unit per parcel, consistent with the *Area Plan*.

State planning law requires a parcel's zoning to be consistent with its general plan land use designation. Because the City intends to establish altogether new land use designations for the SLVSPA, it also must create new zoning districts which will reflect the uses permitted and provide the restrictions applicable to the SLVSPA in order to enable enforcement of the newly adopted public policies. Therefore, the City must add a new district (Planned Development / South Livermore Valley Specific Plan) to the zoning code and then prezone land in the SLVSPA with the new districts.

As noted above, the City would classify the entire SLVSPA as Planned Development / South Livermore Valley Specific Plan. This zoning district would support the General Plan land use density of one unit per 100 acres under base conditions (100-acre parcels), or the *Draft Plan* densities for each subarea with full compliance with the provisions enumerated by the *Plan*. The 100-acre parcel densities would continue existing County densities.

2.3 CUMULATIVE CONDITIONS

In order to present a realistic assessment of the effects of SLVSPA buildout under the *Draft Plan*, this EIR considers the project's direct and indirect impacts on the existing environment and also considers the project's "cumulative" impacts. Cumulative impact refers to two or more individual effects which, considered together, are considerable or compound or increase other environmental impacts. This section of the EIR summarizes the background conditions which form the basis for analysis of cumulative impacts in ***Chapter 4*** of this EIR. Cumulative impacts are discussed for each topical area in ***Chapter 4*** immediately following the discussion of the direct and indirect impacts of the project alone (and the mitigation measures for those impacts).

Cumulative impacts may arise from multiple impacts associated with a single project or from impacts associated with multiple separate projects. In this EIR, cumulative impacts arising from the interaction of projects due to the *Draft Plan* are considered in the analysis of the project's direct and indirect impacts. In evaluating cumulative impacts from multiple projects, this EIR considers the change resulting from the incremental impact of SLVSPA buildout under the *Draft Plan* in combination with the impacts of closely related past, present, and reasonably foreseeable probable future projects.

The background conditions for the cumulative impact analyses in this EIR vary depending on the factors relevant to the topical area under consideration. In conformance with the *CEQA Guidelines*, the cumulative impact analyses in this EIR are based on either (1) a summary of planning projections designed to evaluate relevant regional or areawide conditions or (2) a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts. Where necessary, both approaches are used within a single topical subject. The first approach is used to evaluate cumulative impacts in topical areas predominantly affected by regional growth (such as traffic and air quality). The discussion below describes the planning projections used for those analyses in this EIR. The second -- the list of projects -- approach is used for topics where cumulative impacts are more likely to be associated with specific projects in the vicinity of the SLVSPA (such as hydrology and biological resources). A summary of past, present, and reasonably anticipated future projects considered in this cumulative impact analysis is presented at the conclusion of this section.

PROJECTED GROWTH

The cumulative conditions considered in the cumulative impact analyses in this EIR are based in part on the geographic scope appropriate to the topical area in question. In some cases, a reasonable evaluation of cumulative impacts will require an understanding of growth anticipated throughout the Tri-Valley region (such as air quality), and in others the evaluation will be focused on growth within a more narrowly defined area (such as the City in relation to demand for police services). These analyses are based on the following growth projections for the SLVSPA, *Area Plan*, City (including Sphere of Influence), and Tri-Valley region:

The *Draft Plan's* Growth Management policies provide for the gradual construction of housing units with development of no more than 200 units in any given year. The *Plan* assumes that the first 200 units would be approved in 1998 for construction in 1999 and that 200 additional units per year would be developed thereafter until buildout. Based on full implementation of these allocations beginning in 1999, buildout could occur as early as year 2006, as follows:

SLVSPA Growth	1995	1995-2000	2000-2005	2010	Cumulative Growth [a]
Housing units	0	400	1,000	94	1,494
Population					
• 2.62 pph	0	1,050-	2,620-	245-	3,915-
• 2.78 pph		1,110	2,780	260	4,160
Employment [b]		51	127	11	189

a Based on assumptions summarized in *2.2 Project Description*. Numbers do not add due to rounding, but the estimates shown are consistent with those presented in *Section 2.2*.

b The *Draft Plan's* Growth Management policies do not address commercial development. For analysis purposes in comparison with the following growth rates presented below, job creation is shown to occur at the same rate as housing development. This results in increments of 27, 67, and six percent in the respective five year periods shown above.

Area Plan residential growth would occur on 20-acre parcels south of the SLVSPA and would be in addition to the urban component growth envisaged by the City's *Draft Plan* for the SLVSPA part of the unincorporated area. According to the *Area Plan*, up to about 290 rural residential housing units could be built in the vineyard area. These units could increase the population immediately outside the SLVSPA by an estimated 760-810 people. [27]

The *Area Plan* also envisages up to 20 potential new wineries with ten employees each (200 jobs) and 25 bed and breakfast establishments with two employees each (50 jobs) for a combined total of 80,000 square feet of rural development employing a total of 250 people. The *Area Plan* also estimates development of another approximately 100,000 square feet of urban commercial development in the vineyard area (which potentially could account for 250 additional jobs). [28]

The County's total level of commercial development generally included the 14 uses which might be developed in the SLVSPA. [29] Therefore, the difference between growth assumed by the *Area Plan* and the potential 14 SLVSPA commercial uses (on 13 potential sites) considered in this EIR would constitute cumulative growth. This would result in an adjustments to cumulative growth assumptions to avoid double-counting and would reduce the 500 potential jobs estimated above to a net increase in new unincorporated *Area Plan* employment of 311 jobs.

Cumulative Area Plan Growth		
Population	760-810	new residents (same as above)
Housing	290	rural residential units (same as above)
Jobs	311	jobs (500 Area Plan less 189 SLVSPA jobs)

Although actual buildout of the entire SLVSPA subareas could occur over a 15- to 25-year period (until approximately year 2020), the Association of Bay Area Governments (ABAG) has projected growth in Livermore and elsewhere in the nine Bay Area counties until the year 2010. This results in a "worst

27 Calculated using ABAG's household density projections for the entire County (2.62 persons per household) and Livermore (2.78 pph) and on the basis of 290 new housing units estimated by the *Area Plan*.

28 Assumes the same employee generation rate used above (one employee per 400 square feet of neighborhood / specialty commercial retail area).

29 Nichols • Berman conversations with Steven Buckley, *op. cit.*

case" analysis of potential impacts. The Alameda County Congestion Management Agency's (CMA's) Tri-Valley Traffic Model (TVTM) also projects conditions to year 2010. Thus, this EIR adopts the year 2010 as the horizon year for evaluation purposes. ABAG's population, housing, and employment projections for year 2010 for Livermore and its existing sphere of influence are as follows: [30]

ABAG Growth	1995	2000	2005	2010	Cumulative Growth [a]
Population	66,600	77,000	87,600	98,200	31,600
Housing	23,000	26,690	30,780	35,100	12,100
Jobs	23,940	27,770	37,620	43,540	19,600

a Fifteen-year increase between 1995 and 2010.

This level of growth includes residential and commercial development which the County's *Area Plan* estimated in its unincorporated planning area. [31] Projected *Area Plan* growth consists of both some additional rural residential development within the vineyard area and some commercial development associated with the area's intensive agriculture, including agricultural support (such as wineries) and wine country promotional facilities (such as bed and breakfast inns and restaurants for tourism).

LIST OF PROJECTS

Major cumulative development projects in eastern Alameda, southern Contra Costa, and western San Joaquin Counties include the following:

Alameda County

- **Bernal Property** Preliminary approval has been obtained for approximately 1,900 housing units and 577,000 square feet of commercial development.

- **North Livermore** Both the City of Livermore and Alameda County's General Plan provide for development of up to 12,500 housing units in North Livermore and, depending on the plan, for 300,000 to 1,000,000 square feet of commercial uses. In addition, the City currently is reviewing the proposed expansion of commercial development at the existing Shea Business Park immediately adjacent to (west of) North Livermore.

- **Ruby Hill Subdivision** Construction of the Ruby Hill Subdivision presently is underway in the City of Pleasanton, immediately west of the SLVSPA, and when complete will include 850 housing units, an inn, two wineries, and an 18-hole golf course.

Contra Costa County

- **Cowell Ranch** Environmental review currently is underway for this mixed-use project which

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30 *Projections 94, Forecasts for the San Francisco Bay Area to the Year 2010*, Association of Bay Area Governments, December 1993. All projections are for the incorporated City and its sphere of influence, both north and south of the existing City limits.

31 Table III-1, Rural Development, *South Livermore Valley Area Plan*, Alameda County, *op. cit.*, and Nichols • Berman conversations with Steven Buckley, Planning Department, Alameda County, August 28 and September 4, 1996.

proposes development of up to 5,226 housing units, 1,860,000 square feet of commercial and office buildings on an approximately 1,280-acre site.

- ***Dougherty Valley Specific Plan*** The Dougherty Valley project currently is under construction and at buildout will encompass 11,000 housing units and approximately 4,000,000 square feet of commercial space on approximately 6,000 acres. Total population is expected to be approximately 29,810 people.

- ***East Dublin Specific Plan*** Preliminary approval has been obtained for development of 12,356 housing units and approximately 11,000,000 square fee of commercial uses in the approximately 3,500-acre East Dublin Specific Plan area. Total population at buildout is expected to be 32,510 people.

- ***Tassajara Valley*** The environmental review process has begun for this project which proposes development of approximately 5,950 housing units and approximately 4,700,000 square feet of commercial uses on approximately 4,491 acres. The project would have approximately 14,487 residents at buildout.

- ***Westside San Ramon Specific Plan*** This project involves development of approximately 1,289 housing units on 3,300 acres. Total population at buildout is expected to be 3,854 people.

San Joaquin County

- ***Mountain House*** The land use program for this master plan provides for development of 16,105 housing units plus commercial, industrial, and public facility uses on 4,784 acres. Full buildout of this project could result in approximately 43,500 new residents and 21,925 new jobs.

Cumulative Project	Residential [a]	Population	Commercial [c]	Other Uses
Bernal Property	1,900	4,980 *d*	577,000	-
North Livermore	12,500	32,750 *d*	300,000-1,000,000	Shea Business Park *b*
Ruby Hill	850	2,230 *d*	*b*	Inn, 2 wineries, golf course
Cowell Ranch	5,226	13,690 *d*	1,860,000	
Dougherty Valley	11,000	29,810	4,000,000	
East Dublin	12,356	32,510	11,000,000	
Tassajara Valley	5,950	14,487	4,700,000	
Westside San Ramon	1,289	3,854	*b*	
Mountain House	16,105	43,522	*b*	
Total	67,176	124,183+	18,717,000-23,137,000	

a Housing Units
b Not estimated where not given above.
c Square Feet
d Staff estimate based on ABAG 1994, 2000, Alameda County Household populations projections.

CUMULATIVE STUDY AREAS[32]

Biology

The study area for biological resource impacts varies depending upon the range of the special status species affected by the project. In general, the study area includes the Tri-Valley area and major projects in that area.

Traffic

The study area for cumulative traffic impacts includes the entire Alameda County Congestion Management Agency's CMP network, which consists of freeways and State Routes in the Project area. The Tri-Valley Transportation model used for the analysis includes foreseeable development projects within the entire Tri-Valley area. Such projects include:

A worst case analysis was performed because it did not take into consideration any traffic improvement projects for which current funding cannot be identified.

Air Quality

Cumulative air quality assumptions are identical to the amount of growth used for the cumulative traffic analyses within the Tri-Valley area. That geographical area corresponds to the Livermore-Amador Valley subregional air basin.

Public Services

The geographic areas of potential cumulative impact differ for the six public service analyses presented in ***4.9 Public Services*** according to the service area of each agency or department.

Water Service The cumulative impact area for water supply corresponds to the Alameda County Flood Control and Water Conservation District's Zone 7 and for water distribution corresponds to the California Water Service Company's and City of Livermore Water Resources Division's respective service areas.

Wastewater Service The cumulative impact area for wastewater collection and treatment corresponds to the service area of the City's Water Resources Department. The cumulative impact area for disposal of treated wastewater corresponds with the Livermore-Amador Valley Waste Management Agency (LAVWMA) and covers the cities of Livermore and Pleasanton and the Dublin-San Ramon Services District.

Fire Protection The cumulative impact area consists of the existing and planned service area of the Livermore-Pleasanton Fire Department, formed by the consolidation in 1997 of the former fire departments of the Cities of Livermore and Pleasanton. The existing area coincides with the existing city boundaries of Livermore and Pleasanton, but the planned service area includes North Livermore which presently is unincorporated. Through mutual aid agreements, the department can request aid

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[32] The geographical areas of potential impact for the following topics would coincide with the SLVSPA or the immediately adjacent land not involving the cumulative projects or growth assumptions discussed above: land use (except as noted in the text), geology, noise, visual and aesthetic quality, and cultural resources.

from or responds to requests from other fire protection agencies. These include the Lawrence Livermore National Laboratory, California Division of Forestry, and Alameda County fire departments.

Police Protection The cumulative impact area consists of the existing and planned service area of the Livermore Police Department. The existing service area is confined to the current city boundary but would be expanded to include North Livermore when annexed to the City and developed.

Parks and Recreation The existing boundaries of the Livermore Area Recreation and Park District (LARPD) include both incorporated and unincorporated areas in and around the City of Livermore while the East Bay Regional Park District (EBRPD) encompasses land in both Alameda and Contra Costa Counties. The EIR focuses on cumulative impacts on the LARPD, including ultimate development of North Livermore.

Schools As with the LARPD, the Livermore Valley Joint Unified School District (LVJUSD) covers the City and surrounding areas. The EIR similarly focuses on cumulative impacts on the LVJUSD with development of North Livermore.

Library Services The City of Livermore libraries serve city residents, to be expanded with annexation and development of North Livermore.

2.4 ADMINISTRATIVE ACTIONS

The City of Livermore and other government entities must take a number of actions to review and approve the *South Livermore Valley Specific Plan* or various aspects of development in accordance with the *Plan*. This EIR is designed to provide responsible agencies with environmental information to use in making their decisions. These various actions are summarized below in their approximate sequence.

CITY OF LIVERMORE

The City of Livermore must take the following actions before it can adopt the *South Livermore Valley Specific Plan* or the City and individual developers can implement aspects of the *Plan*:

- Prepare and certify the Final EIR.
- Prepare and adopt the Final *South Livermore Valley Specific Plan*.
- Amend the *City of Livermore Community General Plan* to add the new *South Livermore Valley Specific Plan* land use designations in order to permit the types and densities of development envisaged in the SLVSPA, to modify the City's land use map, or revise previously adopted South Livermore Valley Policies.
- Prezone land in the SLVSPA to conform with the *South Livermore Valley Specific Plan* land use designations.

City certification of the EIR and adoption of the *Plan* will involve Livermore's normal notification and hearing procedures for both Planning Commission and City Council action.

ALAMEDA COUNTY LAFCO

The State requires every county in California to establish a Local Agency Formation Commission (LAFCO) in order to discourage urban sprawl by fostering a logical pattern and sequence of growth, preserve agricultural land, and coordinate the efficient provision of public services. LAFCOs are responsible for reviewing and evaluating proposals to incorporate cities, forming special districts, annexing land to the boundaries or service areas of those local government entities, and consolidating or merging districts. [33] To do this, LAFCOs establish "spheres of influence" which indicate probable ultimate physical boundaries and service areas of these cities and districts. By indicating what lands LAFCO will permit local government to annex, these cities and districts can formulate public plans and policies for their eventual land uses and development patterns.

Sphere of Influence

In Alameda County, LAFCO normally reviews spheres every approximately five years but has not done

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[33] *California Government Code*, Section 65000.

so for Livermore or Pleasanton recently. [34] The sphere LAFCO has established for Livermore includes part and excludes the remainder of the SLVSPA as follows (Exhibit 2.4-1):

- Subareas 1, 2, and 3 are located entirely within the sphere
- Part of Subarea 4 is inside and part is outside the sphere
- Subareas 5, 6, and 7 are local outside the sphere

After the City adopts the *South Livermore Valley Specific Plan*, amends the *City of Livermore Community General Plan*, and prezones the SLVSPA, Livermore then must apply to LAFCO to amend its sphere and annex the SLVSPA to the City. The *California Government Code* requires LAFCOs to make written determinations addressing the following topics when establishing the sphere of influence of each local agency: [35]

- The present and planned land uses in the area, including agricultural and open space lands
- The present and probable need for public facilities and services in the area
- The present capacity of public facilities and adequacy of public services which the agency provides or is authorized to provide
- The existence of any social or economic communities of interest in the area if the Commission determines that they are relevant to the agency

The *Government Code* further requires LAFCOs to consider the following factors in reviewing and deciding on annexation requests: [36]

- Population, population density; land area and land use; per capita assessed valuation; topography, natural boundaries, and drainage basins; proximity to other populated areas; the likelihood of significant growth in the area, and in adjacent incorporated and unincorporated areas, during the next ten years
- Need for organized community services; the present cost and adequacy of governmental services and controls in the area; probable future needs for those services and controls; probable effect of the proposed incorporation, formation, annexation, or exclusion and alternative courses of action on the cost and adequacy of services and controls in the area and adjacent areas
- The effect of the proposed action and of alternative actions on adjacent areas, on mutual social and economic interests, and on the local governmental structure of the county
- The conformity of both the proposal and its anticipated effects with both the adopted Commission policies on providing planned, orderly, efficient patterns of urban development, and the policies and priorities set forth in Section 56377

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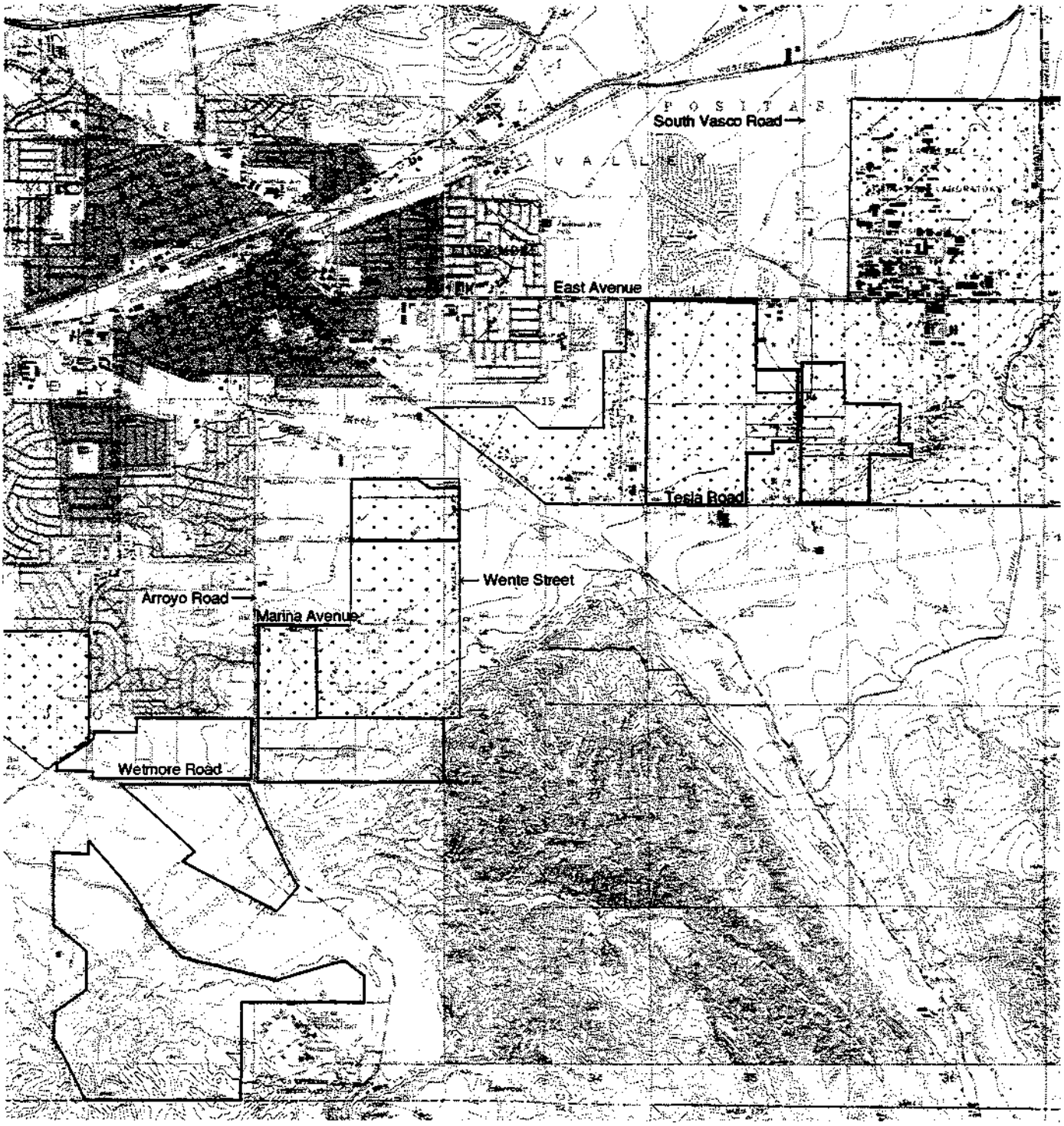
[34] Nichols • Berman conversation with Don Graff, Administrative Analyst, Alameda County Local Agency Formation Commission, August 26, 1996.

[35] *California Government Code*, Section 56425.

[36] *Ibid.*, Section 56841.

Exhibit 2.4-1
Sphere of Influence



Legend:

City of Livermore Sphere of Influence

Source: Alameda County Planning Department

- The effect of the proposal on maintaining the physical and economic integrity of agricultural lands, as defined by Section 56016

- The definiteness and certainty of the boundaries of the territory, the nonconformance of proposed boundaries with lines of assessment or ownership, the creation of islands or corridors of unincorporated territory, and other similar matters affecting the proposed boundaries

- Consistency with city or county general and specific plans

- The sphere of influence of any local agency which may be applicable to the proposal being reviewed

- The comments of any affected local agency

Annexation Scenarios

The South Livermore Valley planning process identified three potential annexation scenarios for analysis in this EIR to determine differences in outcome among the scenarios. This occurred because the large agricultural buffers, extensive areas of open space and cultivated cropland, and scattered winery and commercial development envisaged by the *Plan* raised questions about where City boundaries should be located in order to provide logical and effective service boundaries and maintain adequate City control of future development. The scenarios are summarized as follows (Exhibit 2.4-2):

- ***Minimum Annexation*** assumes annexation of the development areas of SLVSPA subareas only and retention in the unincorporated County of parts of subareas devoted to open space or agricultural use

- ***Moderate Annexation*** assumes annexation of the entire subareas including both developed and undeveloped areas but excluding Subarea 6

- ***Maximum Annexation*** assumes annexation beyond the SLVSPA subareas to create boundaries logical to public service providers to distinguish between City and County service areas

Any of the scenarios would require an amendment of the City's sphere.

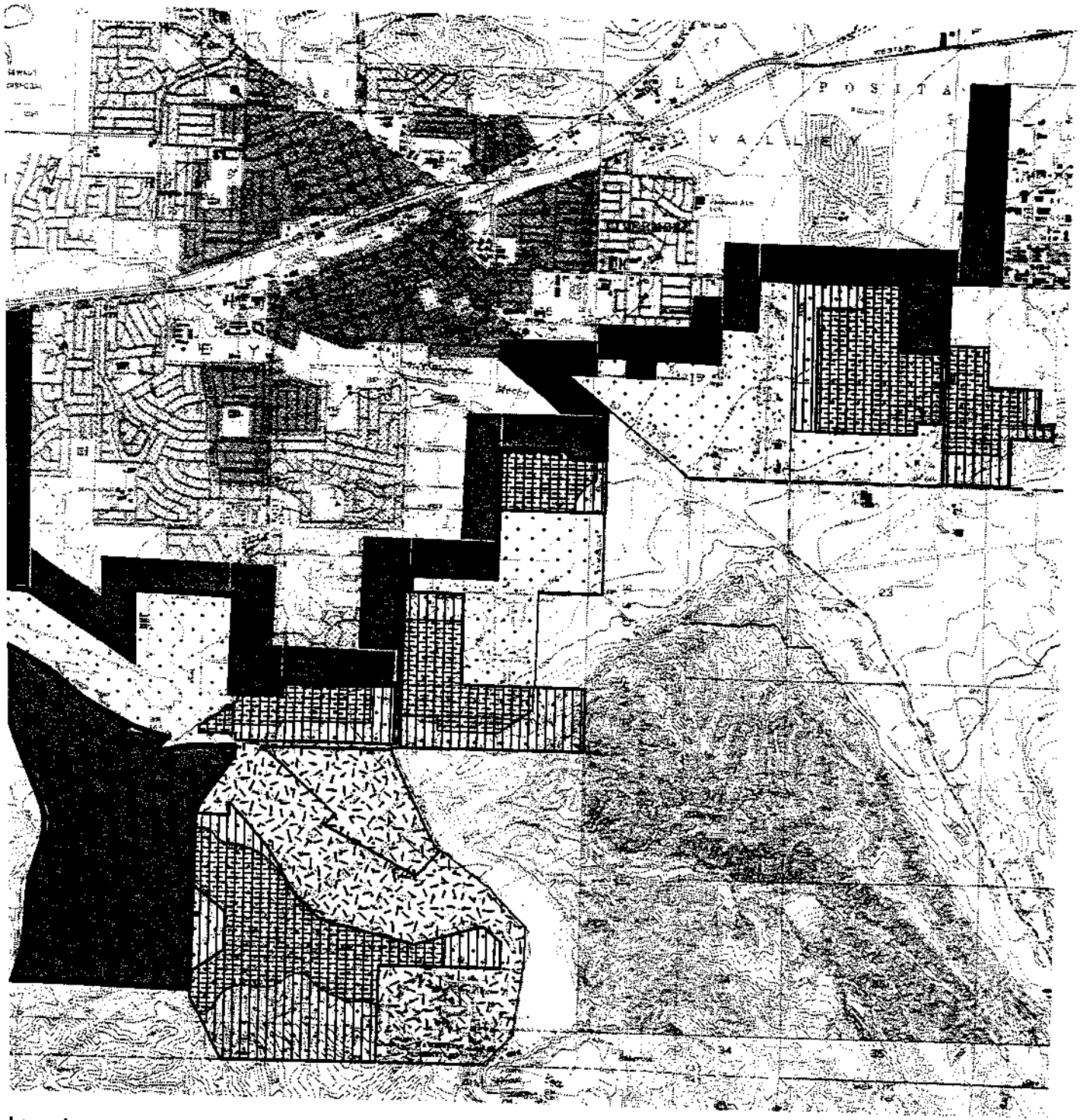
The City selected a modified version of the Moderate Annexation scenario for the *Draft Plan* and to request of LAFCO. The *Draft Plan* scenario assumes annexation of all seven subareas and also includes annexation of Sycamore Grove and Veterans Parks and the U.S. Department of Veterans Affairs Medical Center.

The EIR determined that environmental effects of the *Draft Plan* or alternative scenarios primarily would differ in considering the provision of public services and conversion of land designated for agricultural use. Those analyses identify the impacts of the *Draft Plan* (modified Moderate Annexation) and, where different from the *Plan*, the alternative annexation scenarios (see ***Chapter 4.1 Land Use*** and ***4.9 Public Services***).

LAFCO Actions

LAFCO can use this EIR to satisfy its CEQA requirements and to provide information on making decisions about amending Livermore's sphere and annexing land to the City. LAFCO can also require

Exhibit 2.4-2
Annexation Scenarios



Legend:

Minimum annexation

Moderate annexation

Modified moderate annexation*

Maximum annexation

City limit and area within

Note: *Modified moderate version is an addition to the moderate annexation.

Source: City of Livermore

additional environmental review deemed necessary at the time the Commission considers the City's application.

After the application is made, LAFCO can consider either a sphere amendment and annexation request for the entire SLVSPA or a series of requests (such as for phased implementation of SLVSPA buildout on a subarea-by-subarea basis). LAFCO understands that the City's current preference is for a single amendment and annexation. [37]

OTHER ADMINISTRATIVE ACTIONS

Upon annexation of the SLVSPA, individual property owners / developers who propose to build on their respective parcels would be responsible for implementing necessary improvements according to the *Plan*, as coordinated and reviewed by the City. These owners and / or developers would be subject to the City of Livermore's normal planning process and building permit requirements for their own projects. They also could be subject to the additional requirements of resource and other agencies with jurisdiction and permit-granting authority over the specific private development activities proposed on a project-by project basis. Some of these latter requirements could include:

- ***U.S. Army Corps of Engineers (Corps)*** The Corps regulates the filling of wetlands under Section 404 of the Clean Water Act. Both public and private activities could modify seasonal wetlands and / or drainage channels (bridges for roads, filling for development, etc.) in Corps jurisdiction which would require permits. The Corps evaluates the need to hold a public hearing when a permit is required. Any person may request that a public hearing be held.

- ***California Department of Fish and Game (CDFG)*** Sections 1601 and 1603 of the California Fish and Game Code give the CDFG responsibility for activities which would disrupt the natural flow or alter the channels, beds, or banks of streams or their tributaries. Modifications of seasonal drainages by public or private projects would require Streambed Alteration Agreements. Such agreements would include requirements that there be no net loss of wildlife habitat values or that lost acreage would be replaced. The Federal Fish and Wildlife Coordination Act gives the CDFG authority to comment on Corps permits. Any waterway subject to CDFG jurisdiction also is subject to Corps regulations. A Streambed Alteration Agreement would be a prerequisite for obtaining any required Corps permit.

- ***Regional Water Quality Control Board (RWQCB)*** The RWQCB has jurisdiction over discharges affecting water quality. The RWQCB issues General Construction Activity Stormwater Permits -- one form of the National Pollutant Discharge Elimination System (NPDES) permit. The RWQCB would use this EIR or other subsequent environmental documents to determine the acceptability of mitigation measures before granting permits. The RWQCB may delegate formal action in compliance with this requirement to Alameda County whereupon the County would be responsible. In addition, the RWQCB issues the State certification for any required Corps permit.

- ***Bay Area Air Quality Management District (BAAQMD)*** The BAAQMD has jurisdiction over regional air quality and could require Authority to Construct and / or Permission to Operate permits.

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[37] Nichols • Berman conversation with Don Graff, *op. cit.*

Among other interested public agencies are those which commented on the Notice of Preparation (NOP)(see ***Chapter 1 Introduction, Overview of the Planning Process and EIR Requirement***), including:

- ***Alameda County*** will monitor the consistency of the City's *South Livermore Valley Specific Plan* with its *South Livermore Valley Area Plan* and *East Area Plan* and the ultimate designation of County-owned land in the SLVSPA (Subarea 5).

- ***Alameda County Flood Control and Water Conservation District (ACFCWCD Zone 7)*** is responsible for SLVSPA drainage into the area's arroyos, for downstream flooding, sedimentation, and water quality, and for providing water to the subareas for domestic use and fire flows.

- ***City of Pleasanton*** is the immediately contiguous city along the western City of Livermore boundary and western SLVSPA boundaries.

- ***East Bay Regional Park District*** operates the Lake Del Valle Regional Park south of the SLVSPA and is responsible for acquiring and maintaining segments of the regional trail system.

- ***Livermore Area Recreation and Park District*** operates Ravenswood, Robertson, and Sycamore Grove Parks located immediately adjacent to Subareas 5, 3, 6 and 7, respectively, and the agency to be responsible for providing local park and recreation opportunities to future SLVSPA residents.

This section summarizes the findings of the EIR. It highlights the direct and indirect effects of adopting and implementing the *South Livermore Valley Specific Plan (Draft Plan)*, lists measures to mitigate significant impacts, and identifies the alternatives studied.

The project evaluated by this EIR is City approval the *Draft Plan*, a General Plan Amendment, and prezoning of the South Livermore Valley Specific Plan Area (SLVSPA). The *Draft Plan* covers 1,887 acres of partly developed but mostly undeveloped land located in seven separate subareas along the southern boundary of Livermore, generally bounded by East Avenue (northeast), Wetmore Street and undeveloped rangeland (southwest and farther southwest), South Vasco Road and public and private land (east and farther east), and Vallecitos Road (west). The *Draft Plan* provides policies for the future use and development of the SLVSPA, including buildout of primarily residential land and up to 13 potential commercial sites.

The environmental impacts of *Draft Plan* are summarized in Exhibit 3.0-1, presented at the end of this chapter. A detailed discussion of the impacts is found in ***Chapter 4.0 Environmental Setting, Impacts, and Mitigation Measures***. The following levels of significance were used to identify impacts in the summary table and elsewhere in the EIR:

- ***Significant Unavoidable Impact (SU)*** or potentially significant impact which cannot be avoided with mitigation. These include impacts which could be partly mitigated but could not be reduced to a less-than-significant level. (A potentially significant impact is identified when not enough information is known to determine if the impact would be significant.)

- ***Significant Impact (S)*** or potentially significant (PS) impact which can be mitigated to a less-than-significant level

- ***Less-than-Significant Impact (LTS)*** which would be directly or indirectly attributable to the project but would not exceed the threshold(s) of significance

Chapter 4.0 lists the thresholds or criteria used to determine significance for each environmental topic.

3.1 SIGNIFICANT UNAVOIDABLE IMPACTS

The EIR identifies the following significant unavoidable (SU) impacts which could not be eliminated or reduced to a less-than-significant level through implementation of the policies contained in the *Draft Plan* or the additional mitigation measures required by the EIR. The impacts are described in detail in ***Chapter 4.0***. Numbers in the margin refer to the ***Chapter 4.0*** impact discussions.

- 4.1-2 Loss of prime farmland
- 4.3-5 Inundation from Del Valle Dam failure
- 4.5-1 Roadway and freeway traffic (local roads)
- 4.5-7 Year 2000 CMP roadway network impacts
- 4.6-3 Traffic-generated regional impacts
- 4.7-4 Construction period noise
- 4.7-5 Cumulative noise impacts
- 4.9-1 Water supply
- 4.9-4 Treatment plant / export pipeline capacity
- 4.9-16 Cumulative school impacts

3.2 SIGNIFICANT IMPACTS

The EIR identified the following significant (S) or potentially significant (PS) impacts which could be eliminated or reduced to a less-than-significant level by implementing mitigation measures required by the EIR. They, too, are described in detail in ***Chapter 4.0***, according to the numbers in the margin.

- 4.1-1 Changes in land supply
- 4.1-3 Conversion of Williamson Act lands
- 4.1-4 Compatibility of adjacent land uses
- 4.1-5 Urban-rural conflicts
- 4.2-5 Seismicity
- 4.3-1 Subarea drainage patterns
- 4.4-2 Loss of sensitive communities / trees
- 4.4-3 Loss and fragmentation of wildlife habitat
- 4.5-3 Marina Avenue traffic-related impact
- 4.5-4 Buena Vista Road traffic-related impact
- 4.5-6 Pedestrian / bicycle safety and mobility
- 4.5-7 Year 2000 CMP roadway network
- 4.6-1 Construction period air quality impacts
- 4.6-4 Potential air quality-land use conflicts
- 4.7-3 Noise from new commercial sites
- 4.8-8 Visual impacts -- Subarea 7
- 4.9-3 Construction of water infrastructure
- 4.9-7 Wildland-building fire exposure

3.3 LESS-THAN-SIGNIFICANT IMPACTS

The following topics were analyzed in the EIR, but, upon examination, their effects were found to be less-than-significant (LTS). This list only consists of project effects which would require no mitigation whatsoever. It includes effects resulting from implementation of the policies enumerated in the *Draft Plan* but excludes significant effects which could be reduced to less-than-significant levels through mitigation (listed above).

- 4.1-6 Growth inducing impacts
- 4.2-1 Landsliding
- 4.2-2 Grading for landslide repair
- 4.2-3 Slope stability
- 4.2-4 Expansive soils
- 4.2-6 Faulting and ground surface rupture
- 4.2-7 Liquifaction
- 4.2-8 Mineral and aggregate resources
- 4.3-2 Site peak flow rates and localized flooding
- 4.3-3 Erosion and downstream sedimentation
- 4.3-4 Water quality
- 4.4-1 Loss of grassland / agricultural cover
- 4.4-4 Disturbance to wetlands and other waters
- 4.4-5 Loss of habitat for special-status species
- 4.5-2 Intersection impacts
- 4.5-5 Transit impact
- 4.6-2 Carbon monoxide impacts
- 4.7-1 Traffic noise increases
- 4.7-2 Noise-land use compatibility
- 4.8-1 Visual impacts -- Subarea 1
- 4.8-2 Visual impacts -- Subarea 2
- 4.8-3 Visual impacts -- Subarea 3
- 4.8-4 Visual impacts -- Subarea 4
- 4.8-5 Visual impacts -- Subarea 5 Residential
- 4.8-6 Visual impacts -- Subarea 5 Commercial
- 4.8-7 Visual impacts -- Subarea 6
- 4.9-2 Groundwater resources
- 4.9-5 Construction of wastewater infrastructure
- 4.9-6 Fire / emergency medical service demand
- 4.9-8 Emergency roadway impacts
- 4.9-9 Cumulative fire / emergency services
- 4.9-10 Police protection service impacts
- 4.9-11 Cumulative police protection service
- 4.9-12 LARPD Park demand
- 4.9-13 Trails consistency
- 4.9-14 Recreational use conflicts with residents
- 4.9-15 School impacts
- 4.9-17 Library impacts
- 4.10-1 Archaeological resources
- 4.10-2 Historic resources

3.4 CUMULATIVE IMPACTS

Cumulative impacts were identified for the following topics, numbered to correspond to the ***Chapter 4*** impact discussions and indicating the disposition of the impact, whether less-than-significant *(LTS)*, significant or potentially significant *(S* or *PS)*, or significant and unmitigable *(SU)*:

- 4.3-3 Erosion / downstream sedimentation *LTS*
- 4.3-4 Water quality *LTS*
- 4.5-1 Roadway and freeway impacts *SU*
- 4.5-2 Intersection impacts *S*
- 4.5-3 Potential impacts on Marina Avenue *PS*
- 4.5-4 Potential impacts on Buena Vista *PS*
- 4.5-5 Year 2000 CMP roadway network *SU*
- 4.6-3 Traffic related regional impacts *SU*
- 4.7-5 Cumulative noise impacts *SU*
- 4.9-1 Water supply *SU*
- 4.9-4 Treatment plant / export pipeline *SU*
- 4.9-9 Cumulative fire / medical service *LTS*
- 4.9-11 Cumulative police protection *LTS*
- 4.9-16 Cumulative school impacts *SU*

3.5 GROWTH INDUCING IMPACTS

The growth inducing effects of adopting and implementing the *South Livermore Valley Specific Plan* are discussed in ***Impact 4.1-6*** and were found to be less-than-significant *(LTS)*.

3.6 ALTERNATIVES EVALUATED

This EIR examines the following alternatives (***Chapter 5, Alternatives to the Proposed Project***). Four alternatives evaluate the entire SLVSPA (all seven subareas), and another category of alternatives (consisting of nine subalternatives) focuses on different development and non-development concepts for Subarea 7 (but assumes implementation of the *Draft Plan* in the other six subareas). The EIR assesses all alternatives compared with the effects of the *Plan*.

- The ***No Development*** variation of the ***No Project Alternative*** assumes no new development whatsoever in the SLVSPA. This alternative would maintain the *status quo* and, thus, would not achieve the goals of the *Draft Plan*. This alternative identifies baseline environmental conditions against which the effects of implementing the *Draft Plan* and other alternatives can be compared. The *No Development Alternative* also identifies existing conditions which would persist without mitigation.

- The ***Existing General Plan*** variation of the ***No Project Alternative*** assumes development at the density of one unit per 20 acres permitted by the County's *South Livermore Valley Area Plan (Area Plan)* and Cultivated Agriculture Overlay District. This alternative assumes 86 housing units, each developed on no more than ten percent of a parcel (up to two acres) with the remaining 90 percent of each parcel (18 acres) devoted to intensively cultivated agriculture. This alternative compares the effects of development under adopted land use designations with those of the *Draft Plan*.

- The ***1,200-Unit Development Alternative*** assumes construction of 1,200 units distributed among the seven SLVSPA subareas, a neighborhood park in Subarea 2, a school site in Subarea 3, but no commercial sites. Housing and ancillary facilities would commit less land to developed uses, and the remaining undeveloped land is assumed to be devoted to agricultural use. This alternative compares the effects of about 20 percent less development than under the *Draft Plan* with those of the *Plan*.

- The ***1,482-Unit Consolidated Development Alternative*** assumes construction of 1,425 units distributed among Subareas 2, 3, and 5 plus a park (Subarea 2), school site (Subarea 3), but no commercial sites in the City. It also assumes 57 additional units on 20-acre parcels in Subareas 1, 4, 5, and 7 (ten percent developed and 90 percent cultivated) plus potential commercial sites in the County. This alternative examines the effects of concentrating urban density development in subareas closest to the City.

- The ***Subarea 7 Subalternatives*** assume development with 17, 52, 159, 205, 226, 260, or 304 housing units, commercial development with a medium winery or equestrian facility, and preservation of regional parkland, agricultural land, or both ***or*** public purchase for open space.

The *No Development Alternative* would be the environmentally superior alternative because it would avoid the environmental impacts expected from construction of the other alternatives. The other "No Project" alternative, the *Existing General Plan Alternative* would follow. The *1200-Unit Development Alternative* would result in the fewest environmental impacts of the build alternatives.

The *Permanent Open Space Alternative* (Subalternative 9) would be the environmentally superior Subarea 7 alternative, while the *159-Unit Alternative* (Subalternative 6) would be environmentally superior build alternative.

3.7 AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

AREAS OF CONTROVERSY

The EIR examined a number of topics which received special attention during the planning process in an effort to provide information to facilitate decision making. These also represent issues to be resolved by the City as part of the planning process, based on public input on the *Draft Plan* and this EIR, and include:

- The number and location of new commercial sites in the SLVSPA
- Inclusion of Subarea 7 in the SLVSPA and, if so, the pattern and density of development there
- Impacts on Buena Vista Road attributable to buildout of the SLVSPA and the potential need for a Buena Vista-North Mines Road Extension
- Potential differences in impact from larger or smaller annexation areas

Commercial Sites

Discussions during the planning process leading to preparation of the *Draft Plan* focused primarily on how much residential development could be accommodated in subareas and how to apply the *Plan's* agricultural mitigation program requirements to SLVSPA land uses. Potential commercial sites were identified after most features of the subarea site plans had been settled, but questions arose about how many total commercial sites would be appropriate and where such sites should be located. Planning process participants looked to the EIR to provide information which would indicate how many of the 13 potential sites could be accommodated without causing adverse impacts or information which could distinguish among the specific sites.

However, the EIR analysis did not identify significant impacts attributable solely to commercial sites which might shed light on better or worse locations for such development or the relative advantages or

disadvantages of potential sites. The EIR concluded that commercial development alone or combined with residential development would not constitute significant environmental impacts which could be mitigated by relocating or eliminating one or more of the commercial sites. Thus, selection of which potential commercial sites to include in the *South Livermore Valley Specific Plan* ultimately will be based on reasons other than environmental input.

Subarea 7 Development

Planning process participants discussed the inclusion of Subarea 7 in the SLVSPA throughout the process of defining what subareas would be appropriate locations for growth. Main considerations dealt with the location of Subarea 7 in relation to existing City neighborhoods. Concerns focused on creating logical extensions of existing development, establishing the permanent urban edge by preventing "leap-frog development" and subsequent growth inducements, and minimizing costs of extending infrastructure substantially beyond the location of existing facilities. The City directed the EIR to analyze the effects of urban density growth in Subarea 7 to provide a basis for including or excluding Subarea 7 from the final *South Livermore Valley Specific Plan* when adopted.

A secondary but equally important question dealt with the amount and location of development in Subarea 7 if included in the SLVSPA and built out under the *Plan*. Seven alternative site plans were prepared in addition to the development concept illustrated in the *Draft Plan* in order to test different patterns and densities of development suggested by planning process participants, including the landowner. All the alternatives were designed to be economically feasible development concepts.

Subarea 7 is the most environmentally sensitive of all the SLVSPA subareas geologically, hydrologically, and especially biologically, together with its visual prominence in relation to Sycamore Grove Park in particular and the SLVSPA as a whole. The EIR found that development according to the *Draft Plan* would result in significant but mitigable geologic, hydrologic, and biotic impacts. Other environmental effects (such as traffic, noise, or air quality impacts) were found to be no different than expected in other of the subareas -- less-than-significant or significant but mitigable. Thus, the analyses did not result in insights about the appropriateness or inappropriateness of developing Subarea 7 except from a public policy perspective.

Annexing Subareas 5 and 6 and Sycamore Grove Park to the City -- the *Draft Plan's* modified moderate annexation scenario -- would provide a bridge or "adjacency" more directly connecting Subarea 7 to existing City neighborhoods. This in turn would permit urban density development of Subarea 7 which otherwise would potentially conflict with the *City of Livermore Community General Plan's* Land Use Goal B to locate new development "so as to create a consolidated pattern of urbanization, particularly with respect to minimizing the costs of urban services and achieving maximum public and private benefits from existing services and facilities".

Apart from the planning analysis, the environmental evaluations did not identify impacts associated only with Subarea 7 development or conclude that development there would result in unmitigable impacts which would indicate the appropriateness or inappropriateness of the subarea for urban density growth. However, the EIR found that the alternative development concepts for Subarea 7 would result in different impacts. The 205-Unit Subarea Alternative would avoid or minimize significant geologic, hydrologic, and, importantly, biotic impacts and either would require no additional mitigation or substantially less mitigation compared with the *Draft Plan* or 52-Unit Subarea 7 Alternative. The principal reason for the superiority of the 205-Unit Subarea 7 Alternative would be preservation in the central part of the subarea of the main drainageway and related habitat through the subarea and in relation to critical adjacent habitat in Sycamore Grove Park.

Buena Vista Road-North Mines Road Extension

A number of residents of Buena Vista Road responded to the Notice of Preparation (NOP) to prepare this EIR and attended City Planning Commission and Council meetings in late 1995 and early 1996

reviewing the "preferred alternative" for circulation as the *Draft Plan*. Those individuals expressed concerns about existing traffic conditions on Buena Vista Road and the extent to which SLVSPA development-generated traffic and / or cumulative traffic from other non-SLVSPA development would exacerbate those conditions in the future. Buena Vista Road is a narrow two-lane rural road located west of Subarea 2 which connects East Avenue (north) and Tesla Road (south). Travel lanes are approximately ten feet wide, each flanked with a one-foot wide shoulder, and the posted speed limit is 25 miles per hour (mph). The unincorporated Buena Vista neighborhood is developed with predominantly small- and modest-size housing units separated from the roadway by narrow front yards and mature trees but not set back the additional widths (such as by urban sidewalks). Buena Vista Road provides direct access to 75 units.

Residents expressed concerns about safety of pedestrians walking along Buena Vista Road and effects on the neighborhood's rural character from increased traffic. These concerns partly reflect residents' perceptions that the road currently is used as a commuter route between Vallecitos Road / State Route 84 and the Lawrence Livermore and Sandia National Laboratories (LLNL and SNL). Residents asked the City to investigate construction of a new roadway between East Avenue and Tesla Road located east of and parallel to Buena Vista Road (but west of Subarea 2) -- the Buena Vista Road-North Mines Road Extension (as distinguished from the Union Pacific Railroad-North Mines Road Overpass described below). Mines Road presently consists of several separate segments -- a segment from Tesla Road south to Del Valle Regional Park and beyond, a segment from East Avenue north through Livermore neighborhoods to the Union Pacific Railroad track (UPRR), and a segment from the UPRR railroad north to First Street and ultimately Las Positas Road. Construction is underway on an overpass across the UPRR tracks, and completion is planned by early 1998. The UPRR-North Mines Road Overpass will provide uninterrupted access between East Avenue and Las Positas Road.

In response to these concerns, the City expanded the scope of the EIR to document existing conditions and project future conditions on Buena Vista Road in order to determine whether changes would occur, identify whether changes would be attributable to traffic generated by SLVSPA development (the project assessed in this EIR), and evaluate the significance of changes (the basis for requiring mitigation, if needed). The Buena Vista Road-North Mines Road Extension represented one potential measure for consideration in the event the EIR identified significant impacts requiring mitigation. The first step in the expanded scope was to document existing conditions which included visiting and observing land use patterns, counting weekday morning and afternoon peak hour traffic volumes at the East Avenue / Buena Vista Road and Tesla Road / Buena Vista Road "T" intersections, determining levels of service (LOS), estimating auto emissions of local air pollutants (carbon monoxide levels), and measuring ambient noise levels.

For the purposes of analysis, the City defined the Mines Road extension between Tesla Road and East Avenue as a two-lane roadway with the following characteristics. The roadway would have a 36-foot wide pavement section made up of two 12-foot wide lanes and two six-foot wide paved shoulders. The roadway would make a transition a minimum 400 feet from the current intersection at East Avenue and Mines Road to a north-south alignment along the east side of the existing electrical transmission line towers to Tesla Road. Due to the location of the existing tower north of Tesla Road and the proximity of existing buildings, the existing Tesla Road / Mines Road intersection would be shifted east to align with the new roadway. A minimum 1,000-foot long transition would need to extend south from Tesla Road to realign the existing segment of Mines Road. The edge of the pavement would be a minimum of ten feet away from the foundation of the transmission line towers, and the west edge of pavement would be 40 feet from the west property line of the existing vineyards. This alignment would require a minimum right-of-way acquisition of 83 feet wide and approximately 5,200 feet long extending along

the west property line of the vineyards from East Avenue to Tesla Road. Additional right-of-way required to make the roadway transitions at the intersections would include approximately 4,000 square feet along the east side of the occupied parcel west of the existing tower at East Avenue and approximately 35,000 square feet for the transition to the existing segment of Mines Road located south of Tesla Road. A total of 10.8 acres of right-of-way would need to be acquired.

Improvements required for the new roadway would include necessary grading and drainage, a structural section of four-inch asphalt concrete over 23 inches of aggregate base / subbase, rural roadway lighting every 500 feet, signing and striping, and traffic signal modifications at East Avenue.

Based on typical improvement and right-of-way costs used for the City's Traffic Impact Fee (TIF), the extension would cost approximately $2,800,000 without the cost of mitigation. Based on the need for 10.8 acres required for the new right-of-way and assuming that all of the area except that used for transitions currently is devoted to viticulture, a total of 20.7 acres of mitigation would be required by *Draft Plan* policies (one acre for each acre of development plus one acre for each acre of intensive agriculture removed by the roadway). At $18,000 per acre for mitigation, the total roadway cost with mitigation would be approximately $3,175,000.

The findings are summarized below and discussed further in the respective topical sections in ***Chapter 4*** where relevant.

Traffic

Existing Conditions The Tri-Valley Traffic Model estimates that the roadway capacity of Buena Vista Road is 600 trips per hour. Roadway capacity is higher than environmental capacity. Environmental capacity refers to the volume of traffic generally considered acceptable to people who live along residential streets and is estimated to be 2,000-3,000 trips per day (or 200 trips per hour). A residential street is defined as a roadway which only provides access to fronting uses.

Based on traffic counts taken by Alameda County in 1995 and the City of Livermore in 1996, average daily traffic (ADT) on weekdays is 1,537 trips and on weekends is 1,216 trips, both within the street's environmental capacity. Based on traffic counts taken by the EIR traffic consultant in 1996, 150 peak hour trips are made on Buena Vista Road during the morning peak hour and another 150 trips are made during the evening peak hour, also within the hourly environmental capacity considered acceptable for a residential street.

The EIR's traffic consultant also calculated existing turning movement conditions at the East Avenue / Buena Vista Road intersection. Service levels were found to be LOS F in the AM and LOS D in the PM weekday peak hours. These conditions represent delays for northbound Buena Vista traffic waiting for gaps in East Avenue through traffic to turn onto East Avenue.

According to a City of Livermore speed survey on Buena Vista Road, 85 percent of vehicles travel at a speed of 41 MPH, and an Alameda County survey conducted in 1995 indicates that 85 percent traveled at 45-46 MPH. (The California Vehicle Code uses the 85th percentile to set speed limits.)

Future Conditions The EIR's traffic consultant estimated future conditions assuming completion of planned roadway improvements (the UPRR-North Mines Road, Concannon Boulevard, and Isabel Avenue Extensions) under year 2010 cumulative traffic volumes first without and then with SLVSPA-generated traffic.

Without adding SLVSPA-generated traffic, the planned completion of an Isabel Avenue Extension, expected congestion on Interstate-580 (I-580), and reduced employment anticipated at Lawrence Livermore National Laboratory (LLNL) by year 2010 are projected to reroute commute traffic away from local streets and change traffic patterns noticeably. The combined effect of these projected traffic reductions on Buena Vista Road would decrease traffic volumes from 150 to 120 trips in the AM and 130 trips in the PM peak hour. These resulting traffic volumes would improve turning movement conditions for northbound traffic at the East Avenue / Buena Vista Road intersection from the current LOS F to a future LOS C in the AM peak hour and from LOS D to B in the PM peak hour.

The addition of SLVSPA-generated traffic would not be expected to change future AM or PM peak hour roadway segment volumes or turning movement conditions significantly. With SLVSPA traffic, year 2010 cumulative peak hour volumes on Buena Vista Road would remain 120 trips and LOS C in the AM and would increase to 140 trips and LOS C in the PM.

SLVSPA-generated traffic on Buena Vista Road also would increase average daily traffic (ADT) volumes slightly, compared with future conditions without the project. The year 2010 ADT without SLVSPA traffic is expected to be 1,250 trips and with SLVSPA traffic is projected to be 1,300 trips. However, this represents a reduction of 19 percent from existing conditions without SLVSPA traffic and a reduction of 15 percent from existing conditions including SLVSPA traffic. The ADTs would result in an average of 45 trips per hour (without SLVSPA traffic) and an average of 47 trips per hour (with SLVSPA traffic) during non-peak periods on Buena Vista Road, compared with 130 trips per peak hour without SLVSPA traffic and 140 trips per peak hour with SLVSPA traffic. [1]

Although the Tri-Valley transportation Model shows decreases in total volumes for Buena Vista for future conditions, traffic speed surveys show that vehicle speeds on Buena Vista Road currently are higher than the posted speed limit, resulting in a traffic safety problem. Therefore, any significant increase in traffic volumes on Buena Vista Road would exacerbate an existing traffic safety problem. Due to the difficulties in predicting individual driver behavior on low traffic volume streets, the EIR takes a very conservative approach and assumes there is a low possibility of some increase in additional traffic and, therefore, an exacerbation of the traffic speeding problem.

Although it is not possible to determine the exact number of trips expected to use the new Mines Road extension, the 75 units with direct access on Buena Vista Road would continue to account for at least 750 trips by local residents per day. Thus, with the projected year 2010 volume of 1,300 trips per day on Buena Vista, the maximum number which could be diverted would be 550 trips. In the absence of significant traffic calming devices on Buena Vista, the number likely to divert to the new Mines Road extension could be less since drivers would choose either road interchangeably. However, a Buena Vista-North Mines Road Extension would not necessarily reduce the speed of vehicles on Buena Vista. Without the use of traffic calming techniques on Buena Vista Road, it is not likely that driver behavior would change even if traffic volumes decrease. For this reason, the Buena Vista-North Mines Road Extension was not chosen as a required mitigation for the potential impact of an exacerbation of the traffic speeding problem.

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[1] These numbers were estimated by subtracting the AM and PM peak hour traffic from the daily volumes (ADTs) under year 2010 conditions without and with SLVSPA traffic, respectively, to determine trips during the 22-hour non-peak period and dividing those trips by 22 hours to determine average trips per hour.

Noise

The EIR noise consultant conducted one 24-hour noise measurement and a second "spot" measurement to quantify ambient noise levels in the vicinity of Buena Vista Road. The 24-hour measurement was made adjacent to the roadway in August 1996, and recorded noise levels were calculated to represent an L_{dn} of 57 dBA.[2] The ten-minute spot measurement was made east of Buena Vista Road in the vineyard between Subarea 2 and this neighborhood in May 1995 and recorded an L_{eq} of 45 dBA. Both measured levels primarily reflect noise exposure to existing traffic volumes and represent noise environments appropriate for residential use. With no traffic volume increases expected on Buena Vista Road in the future either with or without SLVSPA development-generated traffic, noise levels would not be expected to increase. Fewer actual trips on Buena Vista Road in the future probably would decrease ambient noise levels.

Air Quality

The EIR meteorologist estimated future carbon monoxide levels at the East Avenue / Buena Vista Road and Tesla Road / Buena Vista Road intersections for year 2010 traffic conditions both with and without SLVSPA development. Carbon monoxide is a local pollutant, the major source of which is automobiles. Concentrations relate to traffic volume and congestion along streets or at intersections. Estimated levels at both intersections would be lower than the most stringent State or Federal standard for either the one- or eight periods. SLVSPA traffic-generated emissions would be the same as or two tenths higher than pollutant levels expected without SLVSPA-generated emissions. Worst-case carbon monoxide emissions were found to be less-than-significant at these two intersections and the other intersections studied.

The summaries of these three assessments illustrate that development of the SLVSPA according to the *Draft Plan* would not result in impacts on Buena Vista Road in excess of thresholds of significance identified in this EIR for which mitigation measures would be required. Instead, the EIR found that future conditions would improve with or without SLVSPA development once areawide transportation improvements are completed and employment decreases at LLNL. In the meantime, existing conditions would persist until improvements have been made or employment changes occur at LLNL. The County's pilot "traffic calming" program will proceed and is likely to be implemented before planned transportation improvements are built. In the absence of significant impacts attributable to a project for which the City is responsible and which would be mitigated by the extension, the decision of whether to extend North Mines Road between Tesla Road and East Avenue ultimately will be a policy decision based on reasons other than environmental impact.

Other Topics

In the event that a Buena Vista Road-North Mines Road Extension were to be built, there would be a number of environmental effects not evaluated elsewhere in this EIR, primarily land use impacts.

An alignment designed to make a straight connection to the existing segments of Mines Road (north of East Avenue and south of Tesla Road) would encroach on yards of existing residents who live on the east side of Buena Vista Road. Residential land would need to be acquired for part of a roadway cross-

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[2] L_{dn} represents the average day-night noise level weighted an additional ten decibels at night to reflect people's greater sensitivity to nighttime noise, and L_{eq} describes the noise level for the period measured.

section, and existing structures located within the cross-section would be removed. Alternatively, a alignment farther east would be necessary. An eastern alignment could reduce the total loss of residential land but still would encroach on northern and southern parcels where a roadway alignment would need to curve to meet the existing road segments and create four-way intersections. Avoiding the loss of residential land would require "T" intersections at East Avenue and Mines Road off-set from the intersections formed by the existing Mines Road segments. Such a staggered connections would reduce the effectiveness of a Buena Vista Road-North Mines Road Extension.

The alignment chosen by staff for the Mines Road extension would result in the loss of approximately 9.9 acres of existing vineyard planned to remain in cultivation. Minimizing the loss of residential land would result in a greater loss of agricultural land and visa versa. SLVSPA Subarea 2 consists entirely of prime soils. The existing vineyard growing between Subarea 2 and the Buena Vista Road neighborhood is located on the same prime soil mapping units as occur in Subarea 2. Therefore, construction of a Buena Vista Road-North Mines Road Extension via any alignment would result in the permanent irrevocable loss of prime soils.

Building a Buena Vista Road-North Mines Road Extension would create man-made buffer between existing residents and agricultural operations but would facilitate access to vineyards passers-by where no such access currently exists. According to local agriculturalists, their greatest impacts from urban-rural conflicts result from damage to vineyards from cars running off roads. Introducing a new roadway through a vineyard would increase exposure to this impact.

A major utility corridor is located in an easement between Subarea 2 and the Buena Vista Road neighborhood. It contains a 230 kilovolt (kV) electrical transmission line and a high pressure natural gas pipeline both operated by Pacific Gas and Electric Company (PG&E). PG&E restricts grading under electrical transmission lines and over high pressure gas facilities and requires any tower relocation to be performed at a project proponent's expense. The presence of these facilities affected the location of the roadway alignment.

The vineyard which a Buena Vista-North Mines Road Extension would traverse is intensively cultivated agricultural land where native biotic habitat has been removed. Management practices limit the amount of cover available for wildlife, although some adaptable species which use vineyards would be displaced by road construction. In most cases, effects would be less-than-significant, and, in other cases, it is likely that impacts could be mitigated to less-than-significant levels (such as to survey for burrowing owls and relocate owls if found). Geologic and hydrologic impacts also would be less-than-significant or mitigable to less-than-significant levels.

The EIR traffic consultant did not calculate potential traffic distribution changes with a Buena Vista-North Mines Road Extension to assign trips rerouted from Buena Vista Road and South Vasco Road or attracted from other north-south routes to the Extension. However, as noted above, an Extension would not eliminate trips on Buena Vista Road which would continue to be used by residents ($\pm$ 750 trips per

day based on 75 houses which use Buena Vista Road for direct access).[3] Therefore, a Buena Vista-North Mines Road Extension would not necessarily eliminate speeding on Buena Vista Road. A Buena Vista-North Mines Road Extension would reduce emissions of carbon monoxide at the two Buena Vista Road intersections and relocate the proportionate amount to the new North Mines Road intersections. In neither case would emissions exceed the most stringent State and Federal one- and eight-hour standards.

However, construction of a Buena Vista-North Mines Road Extension would expose residents on two sides to traffic-generated noise. While most Buena Vista housing units are located near the roadway, some are set back towards eastern parcel boundaries with a potential Buena Vista-North Mines Road Extension alignment. The distance of the new roadway alignment from these units or outdoor activity areas would determine noise exposure and the extent to which mitigation would be required. An alignment farther away from existing units would result in lower noise levels at the residences and also would provide a wider footprint to build a berm to further buffer noise attenuation. A closer alignment would expose adjacent residents to higher noise levels, and less separation would require structural solutions in the more restricted space available to mitigate noise impacts.

Annexation Alternatives

Before publishing the *Draft Plan* for public review and comment, the City considered various annexation alternatives and selected the modified Moderate Annexation scenario for the *Plan*. All alternatives ranged in the amount of land to be annexed to the City with approval and implementation of the *Draft Plan*, but none would increase the size of development areas within the SLVSPA or increase the number of housing units constructed at buildout.

Minimum Annexation

The Minimum Annexation scenario would expand the City of Livermore boundary to add the approximately 740 acres of land in the SLVSPA the *Draft Plan* designates as developed area but would exclude about 1,020 acres of SLVSPA land the *Plan* designates as undeveloped regional park and potential agricultural land which would remain unincorporated County land. Cities are better suited to providing urban-level facilities and services whereas counties' interests and abilities are more appropriately focused on serving and preserving agricultural and other rural activities. Therefore, Local Agency Formation Commissions (LAFCOs) normally exclude farmland intended to remain in agricultural production from annexation to cities, among other reasons to avoid expanding the urban shadow and inducing conversion and urban development. This alternative would place future urban uses in the City and leave rural, primarily agricultural, uses in the County. However, it would result in a patchwork land use pattern and irregular corporate boundary. This compact but uneven boundary would not reflect a logical extension of urban use except in Subareas 3 and 5. The resulting ragged urban edge would suggest impermanence where permanence is desired and would accentuate a sense of transition along the southern boundary of Livermore which could stimulate pressures to expand the urban area to fill in gaps, contrary to the *Draft Plan* and *Area Plan*. The *Draft Plan* only would apply

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[3] While it is not possible to determine the exact number of trips which would be made on a Mines Road Extension, local residents would continue to account for at least 750 trips per day to and from the 75 houses with direct access on Buena Vista Road, assuming ten trips per unit per day. Based on a projected year 2010 volume of 1,300 trips per day on Buena Vista Road, a maximum of 550 trips could divert to North Mines Road Extension. In the absence of significant traffic calming devices on Buena Vista Road, the number to divert to a North Mines Road Extension could be less since drivers would choose either road interchangeably.

to activities in the annexed development areas of the SLVSPA.

Moderate Annexation

The Moderate Annexation scenario would expand the City to add the entire 1,760-acre SLVSPA, including both developed areas (about 740 acres) and undeveloped land (about 1,020 acres) within the subareas. Both urban development and agricultural activities would be subject to the *Draft Plan*, including rural land uses and farmland which cities traditionally do not encompass except on an interim basis (until converted and developed).

Annexing entire subareas with the Moderate Annexation scenario (compared with just parts of subareas with the Minimum Annexation scenario) would result in an irregular City boundary only somewhat less uneven than with the Minimum Annexation scenario. The pattern of developed and agricultural land around the existing City boundary would not necessarily be more logical under the Moderate Annexation scenario, although the urban shadow would occur within the City. This might accentuate pressures to convert land the *Draft Plan* designates as potential agricultural land in the SLVSPA in the event urban-rural conflicts lead to abandonment of farming. The main difference between alternatives would be to annex whole parcels rather than just parts of parcels. (Under the Minimum Annexation alternative, some parcels would straddle two jurisdictions unless formally subdivided along the corporate boundary in addition to being subdivided to create proposed residential lots.)

Maximum Annexation

The Maximum Annexation scenario would annex both the subareas and intervening agricultural and rural residential land located between the SLVSPA subareas. Annexed land not covered by other scenarios would include the Buena Vista Road neighborhood and land on the north side of Tesla Road from Subarea 1 (east) to South Livermore Avenue (west), land west of Wente Street south to Marina Avenue, both sides of Marina Avenue (including the Edwards / Reed area), and the "transitional area" west of the SLVSPA bounded by Alden Lane (north), Vallecitos Road (east), East Vineyard Avenue (south), and Isabel Avenue (west), in addition to land assumed to be annexed by the modified Moderate Annexation scenario (Subarea 6, Sycamore Grove Park, Veterans Park, and the U.S. Department of Veterans Affairs Medical Center). The additional annexation area is characterized by active agricultural land (extensive producing vineyards and some orchards), rural ranchettes (including stabling of horses), and public lands.

This alternative would consolidate the present variety of uses into a linear edge largely defined by man-made boundaries (mostly streets and also some property lines). This boundary would be expected to contain the urban shadow within the City, at least for the short-term, but also would include active agricultural operations better suited to remain unincorporated. While the urban-rural edge would be fixed, pressures could develop in the long-term to convert annexed agricultural land remaining within the SLVSPA and / or to intensify rural residential land inside the new City boundary, despite the intent of the *Draft Plan* and *Area Plan* to prevent further urban growth in addition to that defined by the *Draft Plan*. Vineyards along Tesla Road and South Livermore Avenue could be vulnerable to pressures to fill in urban land, even in view of their proximity to the permanent agricultural vineyard area south across Tesla Road and South Livermore Avenue. The Buena Vista Road and Marina Avenue / Edwards / Reed rural residential neighborhoods also could be susceptible to gradual intensification and conversion to higher density suburban or urban neighborhoods also through infill and redevelopment. The extent to which these development pressures could occur and threaten to change these intervening annexation lands would depend partly on the success of projects built in the SLVSPA subareas according to the

Draft Plan and partly on implementation of plans currently in progress to divert growth in the City to North Livermore.

Although potential land use effects involve some speculation, the EIR found that annexation alternatives' impacts on delivering public services generally would be inconsequential and indistinguishable among the alternatives. In terms of firefighting, for example, the Minimum Annexation scenario could be the most confusing in relation to jurisdictional response at an uneven wildland-urban edge. In practice, although fire personnel from stations from the jurisdiction respond backed-up by other stations and / or agencies according to manpower and equipment needs to put fires out, delays can occur in dispatching while the agency with the proper equipment is contacted.

ISSUES TO BE RESOLVED

In addition to the issues of controversy discussed above, the City also must resolve:

- Presence and potential impact of special-status species
- Determine the extent of jurisdictional seasonal wetlands

Special-Status Species

After completion of preliminary reconnaissance surveys during the constraints analysis prepared during formulation of the Draft Plan, the EIR biologist conducted additional field work and identified the potential presence of a number of sensitive biological resources. Furthermore, detailed surveys must be conducted to determine whether populations of special-status species (such as endangered freshwater shrimp and rare plants) and seasonal wetlands which meet the criteria for jurisdictional wetlands under Section 404 of the Clean Water Act occur in a number of subareas. While the EIR analyses concluded that implementation of the Draft Plan could mitigate possible impacts on biological resources (if found), focused site-specific surveys still must be performed during the appropriate seasons to determine definitively the presence and location of such resources and precisely identify necessary mitigation measures required to address the individual species or exact conditions found.

Exhibit 3.0-1
Summary of Impacts and Mitigation Measures

Impact [a]		Mitigation
Land Use and Public Plans		
4.1-1	Changes in land supply *S*	Encourage LARPD to permit managed grazing Amend *Plan* to allow grazing in part of Subarea 4
4.1-2	Loss of prime farmland *SU*	No feasible measure available to fully mitigate loss
4.1-3	Conversion of Williamson Act lands *S*	Amend *Plan* for City not to approve projects on land subject to Williamson Act contracts or not to cancel contract to allow projects to proceed
4.1-4	Compatibility of adjacent land uses *PS*	Implement setbacks, planting trees in buffer areas, separate residential and commerical access driveways
4.1-5	Urban-rural conflicts *PS*	Modify right-to-farm ordinance to to require that an Information Officer be designated by each developer to formalize communications between homeowners and agriculturists, amend the *Draft Plan* to encourage assembly or consolidation of potential agricultural land and / or for coordinated long-term agricultural operations on those parcels
4.1-6	Growth Inducing Impacts *LTS*	No mitigation required but consider acquiring specific agricultural easements and adopting an urban growth boundary
4.1-7	Conformance with plans *PS*	Modify the *Plan* and / or amend existing policies
Geology		
4.2-1	Landsliding *LTS*	No mitigation required
4.2-2	Grading for landslide repair / development *LTS*	No mitigation required
4.2-3	Slope stability *LTS*	No mitigation required
4.2-4	Expansive soils *LTS*	No mitigation required
4.2-5	Seismicity *S*	Design development to conform with SEAONC recommendations, Secure breakable objects / focus work stations away from potential hazards
4.2-6	Faulting and ground surface rupture *LTS*	No mitigation required
4.2-7	Liquefaction *LTS*	No mitigation required
4.2-8	Mineral and Aggregate Resources *LTS*	No mitigation required

[a] *LTS* = less-than-significant *PS* = potentially significant *S* = significant *SU* = significant unmitigable

Impact [a]		Mitigation
Hydrology		
4.3-1	Subarea drainage patterns *S*	Coordinate installation of Drainage 4B storm drain system upstream with expansion of existing Corbett pond
4.3-2	Site peak flow rates / localized flooding *LTS*	No mitigation required
4.3-3	Erosion / downstream sedimentation *LTS*	No mitigation required
4.3-4	Water quality *LTS*	No mitigation required
4.3-5	Inundation from Del Valle Dam failure *SU*	No measures available short of full avoidance
Biology		
4.4-1	Loss of non-native grassland / agricultural cover *LTS*	No mitigation required
4.4-2	Disturbance to sensitive natural communities / loss of native trees *S*	Adjust creek crossings and siting of lots to avoid oaks / ornamental trees in Subarea 7, Adjust roadway alignments and two lots in Subarea 5, Preserve sycamore and oak trees in Subarea 6.
4.4-3	Loss / fragmentation of wildlife habitat *S*	Eliminate development from central part of Subarea 7, Set intensive agriculture away from native grassland / riparian vegetation, Control access to main Subarea 7 creek, Provide access to eastern half of Subarea 7 from Arroyo Road
4.4-4	Disturbance to wetlands / other waters *LTS*	No mitigation required
4.4-5	Modification / elimination of special-status species' habitat *LTS*	No mitigation required
Traffic		
4.5-1	Roadway / freeway traffic *SU*	Unless funded and implemented, measures available cannot be assured of reducing over-capacity conditions on Isabel Avenue / Vallecitos Road
4.5-2	Intersection impacts *LTS*	No mitigation required
4.5-3	Potential traffic-related impacts on Marina Avenue *PS*	Work with County to monitor traffic patterns and implement traffic calming measures
4.5-4	Potential traffic-related impacts on Buena Vista Road *PS*	Work with County to monitor traffic patterns and implement traffic calming measures
4.5-5	Transit impact *LTS*	No mitigation required

[a] *LTS* = less-than-significant *PS* = potentially significant *S* = significant *SU* = significant unmitigable

Impact [a]		Mitigation
4.5-6	Pedestrian / bicycle safety / mobility *S*	Design trail crossings according to *Livermore Bicycle / Pedestrian Plan Update* and *Equestrian Trails Study*
4.5-7	Year 2000 CMP roadway network impact *SU*	Unless funded and implemented, improvements in current Tri-Valley Action Plan capable of fully mitigating impacts could not reduce impacts to less-than-significant levels
Air Quality		
4.6-1	Construction period impacts *PS*	Require implementation of BAAQMD basic and (for sites of four-plus acres) enhanced construction dust control measures
4.6-2	Carbon monoxide impacts *LTS*	No mitigation required
4.6-3	Traffic-generated regional impacts *SU*	Wire units for electronic technology to encourage home employment, accommodate electric car recharge, and provide outdoor electrical use, Limit number of fireplaces
4.6-4	Potential air quality related land use conflicts *PS*	Notify buyers of lots located east of agricultural operations of possible nuisances, and mitigations under Mitigation 4.1-5
Noise		
4.7-1	Traffic noise increases *LTS*	No mitigation required
4.7-2	Future land use compatibility *LTS*	No mitigation required
4.7-3	Noise from new commercial sites *PS*	Conduct acoustical review of site plan and equipment layout for Subarea 4 olive press
4.7-4	Construction period noise *SU*	Imposition of specific measures in Subareas 3 and 5 would reduce impacts but not to less-than-significant levels
4.7-5	Cumulative noise impacts *SU*	No mitigation available
Visual and Aesthetic Quality		
4.8-1	Subarea 1 *LTS*	No mitigation required
4.8-2	Subarea 2 *LTS*	No mitigation required
4.8-3	Subarea 3 *LTS*	No mitigation required
4.8-4	Subarea 4 *LTS*	No mitigation required
4.8-5	Residential development in Subarea 5 *LTS*	No mitigation required
4.8-6	Commercial development in Subarea 5 *LTS*	No mitigation required

[a] *LTS* = less-than-significant *PS* = potentially significant *S* = significant *SU* = significant unmitigable

Impact [a]	Mitigation
4.8-7 Subarea 6 *LTS*	No mitigation required
4.8-8 Subarea 7 *PS*	Screen homesites with trees or eliminate lots to reduce impacts on views from Sycamore Grove Park
Public Services	
4.9-1 Water supply *SU*	*Plan* policies would eliminate impacts due to lack of water, but implementation may have significant impacts depending on the particular method Zone 7 selects to make adequate water supply available
4.9-2 Groundwater resources *LTS*	No mitigation required
4.9-3 Construction impacts of water infrastructure *PS*	Paint, landscape, or site water tanks to mitigate secondary impacts
4.9-4 Treatment plant / export pipeline capacity *SU*	*Plan* policies reduce cumulative impacts caused by lack of sewer capacity, but until capacity is allocated and pipeline is developed to accommodate cumulative development in Livermore, impact will remain significant
4.9-5 Construction of wastewater infrastructure *LTS*	No mitigation required
4-9-6 Fire / emergency medical service demand *LTS*	No mitigation required
4.9-7 Wildland-building fire exposure *S*	Implement fire prevention measures during construction in Subareas 4, 6, and 7
4.9-8 Roadway impacts *LTS*	No mitigation required
4.9-9 Cumulative fire / emergency medical service demand *LTS*	No mitigation required
4.9-10 Police protection service impacts *LTS*	No mitigation required
4.9-11 Cumulative police protection service *LTS*	No mitigation required
4.9-12 LARPD park demand *LTS*	No mitigation required
4.9-13 Trails consistency *LTS*	No mitigation required
4.9-14 Recreational use conflicts with residents *LTS*	No mitigation required
4.9-15 School impacts *LTS*	No mitigation required
4.9-16 Cumulative school impacts *SU*	No mitigation can be identified until specific high school sites have been determined
4.9-17 Library impacts *LTS*	No mitigation required

[a] *LTS* = less-than-significant *PS* = potentially significant *S* = significant *SU* = significant unmitigable

Impact [a]	Mitigation
Cultural Resources	
4.10-1 Archaeological resources *LTS*	No mitigation required
4.10-2 Historic resources	No mitigation required

[a] *LTS* = less-than-significant *PS* = potentially significant *S* = significant *SU* = significant unmitigable

4.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter contains an analysis of each environmental topic identified by the City's scoping process for the EIR described in ***Chapter 1.0 Introduction*** (Initial Study, Notice of Preparation, and consultation with public agency representatives, etc.). Environmental topics addressed in this chapter include:

- 4.1 Land Use and Public Plans
- 4.2 Geology, Soils, and Seismicity
- 4.3 Hydrology, Drainage, and Water Quality
- 4.4 Biological Resources
- 4.5 Transportation and Circulation
- 4.6 Air Quality
- 4.7 Noise
- 4.8 Visual and Aesthetic Quality
- 4.9 Public Services
- 4.10 Cultural Resources

Sections 4.1 through 4.10 of this chapter describe existing environmental conditions as they relate to each specific topic, identify potential impacts from implementing the *South Livermore Valley Specific Plan (Draft Plan)* and building out the South Livermore Valley Specific Plan Area (SLVSPA), and present mitigation measures required to reduce significant adverse impacts to a less-than-significant level. Where relevant, cumulative impacts of SLVSPA buildout combined with other growth elsewhere in the immediate vicinity of the planning area are analyzed, as discussed in ***2.3 Cumulative Projects***.

FORMAT OF TOPICAL ANALYSES

Existing conditions are described in the respective "setting" sections. These descriptions summarize information compiled during the study process to formulate the *Draft Plan* and prepare the EIR (see ***1.2 Information Used to Prepare the EIR***). Information originally presented in the *South Livermore Valley Specific Environmental Setting and Planning Consideration (Constraints Analysis)* reports was updated and expanded, where needed. Background materials used in the EIR are referenced in footnotes and listed in the appendices (see ***6.3 Bibliography***).

Standards used to evaluate the magnitude of impacts are listed in the "significance criteria" subsections for each topic analyzed. Under CEQA, a significant effect is defined as a substantial or potentially substantial adverse change in the environment -- namely, in any of the "physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance". The *State CEQA Guidelines (Guidelines)* direct that the significance of an impact be determined on the basis of scientific and factual data. The significance criteria used in this EIR were derived from the following main sources -- the *Guidelines*, *City of Livermore Community General Plan*, and other City policies and guidelines, environmental documents prepared recently on other projects in Livermore and Alameda County, and the professional standards and practices of the technical analysts who conducted the EIR evaluations. The significance criteria used for the EIR originally were identified during preparation of the *Constraints Analysis* and only modified as appropriate for the EIR's examination of the *Draft Plan*.

The "impacts and mitigation" subsections identify three types of environmental effects:

- ***Significant Unavoidable Impact (SU)*** A significant (or potentially significant) impact which cannot be avoided with mitigation. These include impacts which could be partly mitigated but could not be reduced to a less-than-significant level. (A potentially significant impact is identified

when not enough information is known to determine if the impact would be significant.)

- ***Significant Impact (S)*** A significant (or potentially significant) impact which can be mitigated to a less-than-significant level.

- ***Less-than-Significant Impact (LTS)*** A change or effect directly or indirectly attributable to the project which would not exceed the threshold(s) of significance.

All impacts and numbered consecutively by topic. Significant unavoidable (SU) and significant (S) impacts are followed by measures required to reduce the magnitude of impact. No mitigation measures are required for less-than-significant impacts (LTS), although in some cases additional measures can further reduce the environmental effects identified. Mitigation measures also are numbered to correspond to the respective impacts.

For each significant unavoidable (SU) impact identified in the Final EIR, the City would be required to adopt findings and a Statement of Overriding Considerations explaining the reasons for approving the project (if approved) despite the impacts identified.

DETAIL OF MITIGATION MEASURES

The City coordinated preparation of the *Draft Plan* and EIR throughout the planning process in an effort to avoid or minimize impacts from the outset. Environmental consultants first provided input for the *Constraints Analysis* which the planning consultants took into account in designing site plans for the SLVSPA subareas. In this way, subarea plans were initially designed to avoid environmentally sensitive parts of the SLVSPA.

During formulation of the *Draft Plan* and preparation of the EIR, policies were included in the *Plan* and also were identified as additional mitigation measures for the EIR. *Draft Plan* policies were designed to mitigate general areawide conditions throughout the SLVSPA (rather than within just one or two subareas) and to supplement already adopted City policies and programs, such as those contained in the *City of Livermore Community General Plan.* In addition to those *Plan* policies, EIR mitigation measures provide further site- or project-specific measures required to augment *Plan* policies on a subarea-by-subarea or project-by-project basis.

Individual projects proposed in the future would need to conform with the *Plan* policies and / or incorporate those policies directly into their respective development concepts. The additional EIR measures will be implemented as conditions of approval for individual development projects as they eventually are proposed during buildout of the SLVSPA.

Where it is infeasible to obtain sufficient information to develop specific mitigation requirements, the mitigation measure sets forth the studies which would be required and the standards which must be satisfied in order to reduce the potentially significant or significant impact to a less-than-significant level.

In order words, this EIR's mitigation measures are "performance based" measures which identify the objectives to be achieved as prerequisites for development to proceed. The specific measures identify standards which the studies and / or detailed designs must satisfy or with which they must comply. City approval of individual development projects would be conditional (contingent) on these standards being met. Thus, projects could not be implemented until the relevant studies, designs, or plans are completed

in conformance with the EIR's performance standards.

In some cases it also is infeasible to obtain detailed information concerning site conditions to definitively conclude that proposed mitigation measures would be effective in reducing the impact to a less-than-significant level or would do so without causing adverse secondary impacts. An example includes the lack of detailed information about subsurface geologic conditions which either would confirm or dismiss the presence of potential ancient bedrock landslides in Subarea 7. Policies in the *Draft Plan* require that areas where landslides or hazards are found be avoided. Therefore, no significant impacts would result, neither direct nor secondary.

Therefore, the EIR adopts a conservative approach to these circumstances at this stage in the planning process in order to disclose potential "worst case" impacts of implementing the *Draft Plan*. The EIR identifies impacts as significant but also indicates that the mitigation measures, while capable of substantially reducing the severity of impact, could result in significant secondary impacts. As a result, it would be speculative to state conclusively that measures would mitigate the impacts without having other unintended effects. Therefore, these secondary impacts are identified as significant unavoidable unless development in these areas is avoided.

4.1 LAND USE AND PUBLIC PLANS – THE SETTING [1]

Historic Regional Land Use

Land in the Livermore Valley was used for grazing throughout the Spanish Mission and Mexican rancho periods and later was cultivated for wheat and barley. In the early 1880s, farmers discovered that the gravely soils and microclimate at the South Livermore Valley were suited for growing wine grapes. By the turn of the century, more than 5,000 acres of vineyards were planted, and wineries (including Concannon, Cresta Blanca, Olivina, Ruby Hill, Wente) had been built. Other agricultural lands supported almond, apricot, and pear orchards and dairy farms.

After 1900, phylloxera infestation, depression, and Prohibition reduced viticulture in the South Livermore Valley. Establishment of Lawrence Livermore National Laboratory (LLNL) spurred expansion of the town of Livermore, with residential development occurring around the old town center. As housing and jobs moved away from the inner ring of Bay Area cities from the 1960s to present, residential subdivisions and business parks expanded onto agricultural land throughout the Livermore-Amador-San Ramon Valley (Tri-Valley) area. By the late 1960s, only six wineries and 1,500 acres of vineyards remained in the Valley.

Current SLVSPA Land Use

The 1,887-acre South Livermore Valley Specific Plan Area (SLVSPA) is located at the interface of urban development and the valley's remaining vineyards, hillsides, and arroyo open spaces. The seven subareas currently are used primarily for agriculture (grazing, vineyards, and orchards), commercial recreation (horse ranches for training, instruction, and stabling) [2], and rural residential development. Altogether, agricultural production or agricultural land account for 90 percent of SLVSPA land uses, commercial recreation (horse breeding, training, boarding) for five percent, rural residential for four percent, industrial one percent, and institutional less than one percent of the subareas. Surrounding uses include agriculture, park and open space land, rural and suburban residential development, and pockets of commercial and industrial development.

Exhibit 4.1-1 shows current land uses in and around the SLVSPA, and Exhibit 4.1-2 summarizes land uses by type and subarea. Subarea and surrounding uses are described further below.

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1 The "environmental setting" is based on the descriptions of existing land use and geology (soils) conditions prepared by Wallace Roberts & Todd and Nichols • Berman, respectively, in 1995 and updated by Nichols • Berman in 1996. *South Livermore Valley Specific Plan Environmental Setting and Planning Considerations, Nichols • Berman*, June 1995. The 1995 report is part on file and available for public review at the City of Livermore Planning Department, 1052 South Livermore Avenue, during normal business hours.

2 This analysis distinguishes between rural residential land use where owners keep horses for their recreational use and equestrian facilities where horses are borded, bred, trained, or ridden in instruction. Equestrian facilities are rural in character and are permitted uses in agricultural zones, but farmers and agricultural professionals define agriculture as the production of commodities (food and fiber). Horses used in agricultural production include draft horses and cutting stock, such as to manage ranches and feed lots.

Subarea 1

Subarea Uses Subarea 1 primarily consists of 20- to 25-acre lots used for commercial recreation and owners' residences, productive agricultural land planted with vineyards, and vacant agricultural land used for grazing. Equestrian facilities include Mathews Paint Horses (boarding and lessons) on the Miller parcel, 4M Arabian on the Minaker parcel, and the Wise & Reid parcel with a large paddock and lighted riding ring. The 26-acre Rios property on Tesla Road is developed with small vineyard, winery, deli, and owners' residence. The 49-acre Coast Realty, Inc. parcels on South Vasco Road are vacant and surround the five-acre Stivers Academy, a private elementary school.

Surrounding Uses The Sandia National Laboratories complex is the largest developed use adjacent to Subarea 1 (contiguous to the north and east), although it is oriented towards East Avenue and LLNL.[3] Elsewhere vineyards and rural residential uses characterize both immediately surrounding and farther distant lands.

The 413-acre Sandia site was established in 1956 to provide engineering support for LLNL.[4] It now is a multi-program engineering and science laboratory operated for the U.S. Department of Energy and employs 1,000 people. The site's 96 major buildings are surrounded by an undeveloped security buffer (with both outer property line and inner buffer area fences) which sets development back 200 feet or farther from Subarea 1. According to Sandia's Master Plan, no development will occur in the buffer zone, although development of new and improvement and replacement of existing buildings are planned. Existing uses nearest Subarea 1 include product development, site support, and technical support buildings.

Vineyards are located east, south, and west of the subarea. The Cedar Mountain Winery is located on Tesla Road to the east. Extensive Wente Brothers vineyards are located south of Tesla Road (where the only non-vineyard use is a large RV / trailer storage lot), and additional vineyards are growing at the South Vasco / Tesla intersection west of the subarea. Low-scale light industrial park, vacant agricultural land, and rural residential uses are located along South Vasco Road (west of Subarea 1 from north to south, respectively).

Subarea 2

Subarea Uses Subarea 2 is characterized by existing and former agricultural and horticultural / industrial uses. Agricultural uses include current and past Wente Brothers vineyards, the vacant Dymond Development and Scott parcels on South Vasco Road used for grazing, and the Volkman tree farm and residence. Davey Tree Surgery's office and equipment storage yard also are located on South Vasco Road in the subarea.

Surrounding Uses Both developed and agricultural uses surround Subarea 2. Development includes light industrial and warehouse buildings in the Shaheen Industrial Park (northeast corner of Subarea 2 at the East Avenue / South Vasco Road intersection), several multi-unit residential complexes (north across East Avenue), and rural residential development (on Buena Vista Road west of intervening

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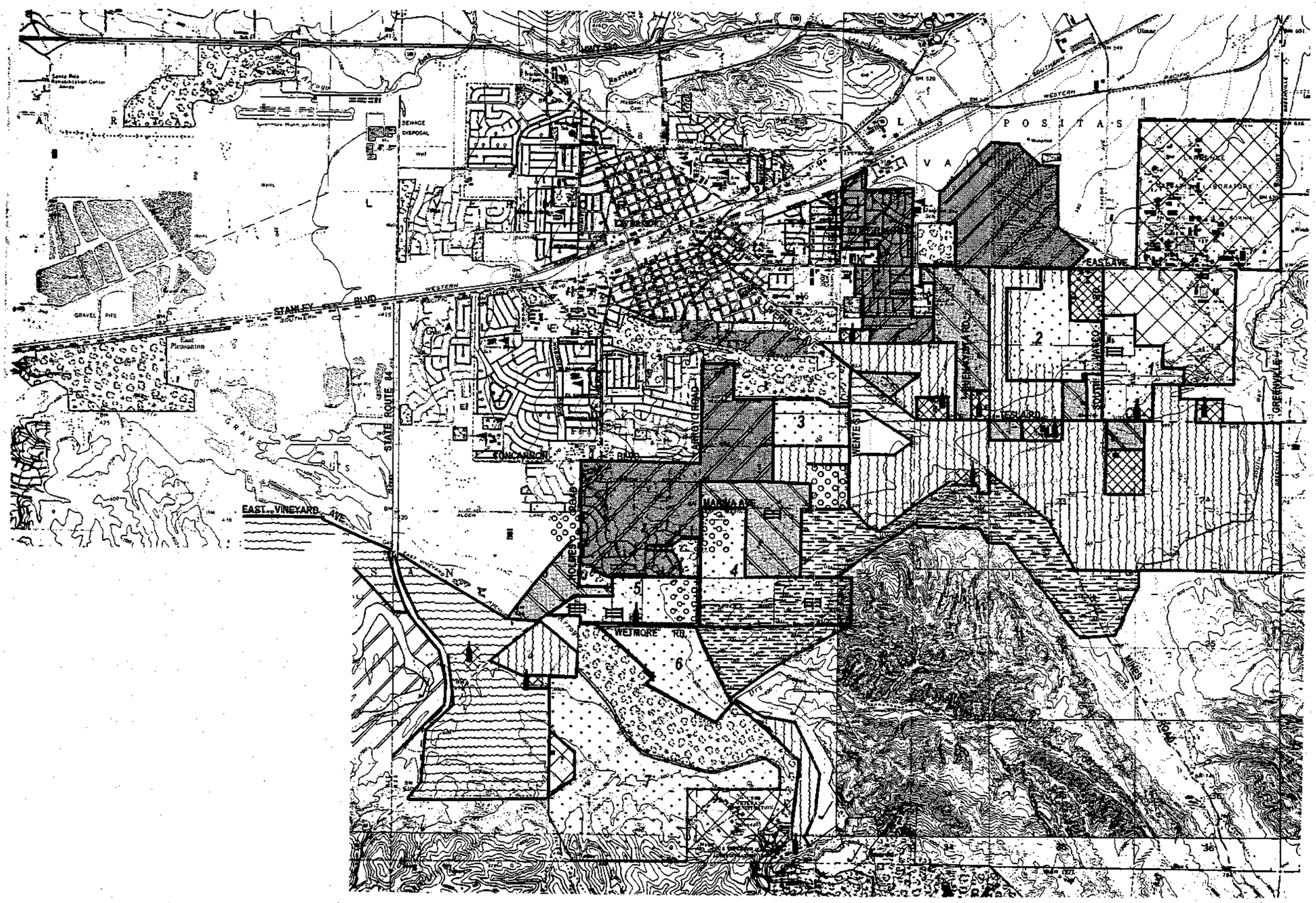
3 Orientation within subareas or direction of approach determine how residents or visitors traveling those corridors perceive surrounding land uses and how those uses characterize surrounding lands. This EIR discusses land uses in sequence of compass direction in relation to each subarea's surroundings.

4 *Site Development Plan*, Sandia National Laboratories, Fiscal Year 1995.

Exhibit 4.1-1
Land Use



Legend:

- Commercial/Industrial
- Commercial/Winery
- Institutional
- Schools
- Suburban Residential
- Rural Residential
- Parks
- Golf Course
- Existing Vineyard
- Proposed Vineyard
- Orchard
- Grazing/Agricultural
- Horse Farm

Source: Wallace Roberts & Todd

Exhibit 4.1-2
Summary of Existing Land Uses

Land Use	Subarea [a]							Total
	1	2	3	4	5	6	7	
Residential [b]	13.5	0.0	25.6	8.5	11.2	0.0	0.0	58.8
Commercial [c]	57.2	0.0	0.0	26.7	9.0	0.0	0.0	92.9
School	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
Industrial	0.0	9.8	0.0	0.0	0.0	0.0	0.0	9.8
Agriculture	94.7	390.9	71.0	265.8	134.5	185.4	577.9	1,720.2
Total	170.4	400.7	96.6	301.0	154.7	185.4	577.9	1,886.7
Acreages rounded	*170*	*401*	*97*	*301*	*155*	*185*	*578*	*1,887*

Land Use	Acreage	Percent of Total	Percent Rounded
Residential	58.8	3.1	3
Commercial	92.9	4.9	5
School	5.0	0.3	0
Industrial	9.8	0.5	1
Agriculture	1,720.2	91.2	91
Total	1,886.7	100.0	100

a Acres, rounded
b Rural residential
c Commercial recreation (equestrian facilities)

vineyards and on Tesla Road both southeast to South Vasco Road and southwest to Mines Road).

Wente Brothers vineyards abut Subarea 2 on the northwest, west, and south and also are located both along and south of Tesla Road. The vineyards extend between East Avenue and Tesla Road (setting part of Subarea 2 back from East Avenue and separating all of the subarea from the Buena Vista Road area) and also extend between the southern subarea boundary and Tesla Road. The Wente Brothers Winery and Tasting Room is located south of Tesla Road.

The nearby Buena Vista Road area is located between Wente (east) and Concannon vineyards (west), the latter at the southern end of the road. Parcels sizes vary and largely are developed with small older homes built closer to the narrow roadway (in the northern part) and somewhat larger newer homes set farther back from the roadway (in the southern part). Residential development is interspersed with remnants of orchards, and livestock is kept on some parcels (horses, geese, etc.).

Subarea 3

Subarea Uses Subarea 3 consists of disced but uncultivated agricultural land and five rural residences -- three located along the northern subarea boundary and two near the eastern boundary. The latter include the Caldiera residence and a second unit, both part of a farm compound consisting barns, water tower, and assorted out-buildings. All Subarea 3 residences are occupied.

Surrounding Uses Subarea 3 is bounded by Robertson Park (north), Wente Street (east), planted and

unplanted Concannon Winery land (farther east) and the Norman vineyards (entire southern edge), and residential development (west).

Robertson Park, located on the Arroyo Mocho, is an active recreation park developed with the City's corporation yard at the east end adjacent to Subarea 3. Lighted soccer fields are located in the middle, and the rodeo / equestrian complex is at the west end. The complex includes the Livermore Valley Stadium which is home of the City's rodeo. Access to Robertson Park extends from Wente Street (east) along the northern subarea boundary and Arroyo Road (west).

A single-family residential neighborhood abuts the northwest corner Subarea 3, and the newer single-family Tapestry Subdivision adjoins the subarea on the west. Stadium Way stubs out at the northwest corner of Subarea 3, Louvre Lane ends in a cul-de-sac at the southwest corner, and Concannon Boulevard stubs out at the Norman property line about 250 feet farther south (but is planned to be extended to Tesla Road / South Livermore Avenue).

Subarea 4

Subarea Uses The 300-acre subarea consists of four parcels currently devoted to agricultural, commercial recreational, and rural residential use. The 98-acre Hansen parcel contains the Hansen home on Marina Avenue, another residence and barn near the Marina Avenue / Arroyo Road intersection with access from Arroyo Road, and olive orchards along Arroyo Road. The 50-acre Corbett property (developed with a single-family home and recently planted with additional olive saplings) and vacant 50-acre McKissack property (used for grazing) straddle Hansen Road which extends east from Arroyo Road to the 102-acre Zumbach property (developed with a horse ranch / boarding / riding facility and family residence and also used for cattle grazing).

Surrounding Uses Land surrounding Subarea 4 is varied in character, as is the terrain which changes from gently rolling (west) to much steeper foothills (east). Rural residential uses predominate north and east of the L-shaped subarea, including five-acre ranchettes along Marina Avenue and Edwards Street, many of which stable horses. Wente Land & Cattle owns undeveloped grazing land east of the Edwards / Reed Avenue area (and north of the Zumbach parcel) which is planned for future vineyard use. Wente Land & Cattle also owns grazing land and vineyards south of Subarea 4. Uses across Arroyo Road include residential subdivisions (northwest), the Ravenswood Park historic estate (west), remnant orchards in Subarea 5 (southwest), and the vacant former Olivina Ranch (farther southwest at the Arroyo / Wetmore intersection).

Subarea 5

Subarea Uses Subarea 5 is typical of farmlands on the fringe of suburban development and consists of former orchards and vineyards, rural residential, and commercial recreational uses. Alameda County's 77-acre Wetmore Ranch (east end at the Arroyo / Wetmore intersection) contains an abandoned walnut orchard and grasslands, and Livermore Valley Cellars winery and vineyards are located in the central part of the subarea on the Lagiss property. Six rural residences have been developed in Subarea 5, including three ranchettes on Wetmore Road (mid-way along the southern boundary), one with access from Holmes Street (farther west), and two caretaker residences on the triangular Tolentino horse boarding facility (bounded by Holmes Street, Arroyo Valle, and Vallecitos Road).

Surrounding Uses Subarea 5 is surrounded by distinctly different land uses, including three contiguous LARPD facilities, residential development, and existing and former agricultural land.

Independence Park is a neighborhood park with access from Holmes Street (northwest), Ravenswood Park is a restored wine country estate surrounded by vineyards (northeast), and Sycamore Grove Park extends southeast along Arroyo Valle from the Holmes / Wetmore intersection to Veterans Park and the entrance to the U. S. Department of Veterans Affairs Medical Center on Arroyo Road. Access and parking for Sycamore Grove Park originally was located opposite the west end of Subarea 5 on Wetmore Road. Construction began in September 1996 on a bridge across the arroyo and new entrance to the south side of the park from Vallecitos Road via Foley Road.

A single-family subdivision and two stubbed-out streets abut the middle, and a 25-foot wide access easement owned by Lone Star Industries is adjacent to the eastern part of Subarea 5 (north). Land uses beyond Arroyo Road (east) and Wetmore Road (south) are undeveloped grazing and public park lands, respectively.

Subarea 6

Subarea Uses The 185-acre subarea currently is vacant and consists of fallow agricultural land. Major man-made features include the landmark Olivina Gate at the Arroyo / Wetmore intersection (the former entrance to the Olivina Ranch) and remnants of an allée of trees from the gate to the Olivina Winery and home site (both located in Subarea 7).

Surrounding Uses Subareas 4 and 5 are located north and northeast of Subarea 6, rangeland extends east beyond Arroyo Road, and Sycamore Grove Park forms the southern subarea boundary.

Subarea 7

Subarea Uses The 578-acre subarea was part of the Olivina Ranch. It is devoted entirely to grazing except for a mobile home (occupied) and the remains of the Olivina Winery both located in the northern part of the subarea near Sycamore Grove Park.

Surrounding Uses Uses surrounding Subarea 7 consist primarily of agriculture, open space, and some developed facilities.

Vineyards predominate northwest and west of the subarea. These include the 16-acre vineyard and residence on Foley Road (the northwest corner of Subarea 7), the Detjens vineyards and residence and Thomas Coyne Winery (west), and the Kalthoff vineyards and residence (southwest). Farther west, rolling grasslands between the Kalthoff and Detjens vineyards are planned as vineyards for the Ruby Hills / Vineyard Estates project. Private rangeland extends south from the western half of Subarea 7 to Lake Del Valle Regional Park.

Sycamore Grove Park forms the northern and far eastern subarea boundary. Veterans Park extends public park use farther south from Sycamore Grove Park along Arroyo Valle parallel to Arroyo Road.

Two developed facilities also are adjacent to Subarea 7. On the west, Zone 7 of the Alameda County Flood Control and Water Conservation District (ACFCWCD) maintains its Del Valle water treatment plant on 29 acres at the end of the paved segment of Foley Road. On the southeast, the U.S. Department of Veterans Affairs (VA) operates a 45-bed subacute care hospital, 120-bed nursing home, and outpatient clinic on a 118-acre site off Arroyo Road which employs 550 people.

Agriculture

Current Agricultural Uses

As shown in Exhibit 4.1-2, the majority of the SLVSPA (91 percent) is devoted to present or past agricultural use, including vineyards, orchards, rangeland, and uncultivated farmland. Livestock grazing currently accounts for the largest agricultural land use (about 654 acres) (or about 1,100 acres when including vacant parcels periodically used for grazing or growing of forage). Another 391 acres currently are (or recently were) cultivated with vineyards, and parts of about 229 acres support existing or former orchards, including olives and nuts, respectively. These agricultural uses are summarized in Exhibit 4.1-3.

Exhibit 4.1-3
Summary of SLVSPA Agricultural Uses

Parcel (s)	Subarea	Activity	Acreage	Area Subtotal
Grazing / Vacant (grazing and dry land farming)				
Crohare (2 parcels)	7	Grazing	577.9	
Zumbach	4	Grazing	75.7	
Coast (2 parcels)	1	Vacant (grazing)	49.0	
Scott	2	Vacant (grazing)	17.4	
Dymond	2	Vacant (grazing)	24.8	
McKissack	4	Vacant (grazing)	50.4	
Frydendel	1	Vacant	23.5	
Caldiera (2)	3	Vacant	71.0	
Nelson, Denton	5	Vacant	24.7	
Lone Star	6	Vacant	185.4	
Grazing Subtotal				*653.6*
Vacant (Grazing and Dry Land Farming) Subtotal				*446.2*
Grazing / Vacant Subtotal				***1,099.8***
Existing / Former Vineyard				
Rios	1	Vineyard / winery	22.2	
Wente (2 parcels)	2	Vineyard / vacant	336.7	
Lagiss	5	Vineyard / winery	32.4	
Vineyard Subtotal				***391.3***
Other Agriculture				
Volkman	2	Tree farm / grazing	12.1	
Hansen	4	Olive orchard	94.2	
Corbett	4	Olive orchard	45.4	
Alameda County	5	Former orchard	77.4	
Other Agriculture				***229.1***
Total Agricultural Land				***1,720.2***

As shown in Exhibit 4.1-3, all of Subarea 7 and parts of Subareas 1, 2, 3, and 4 are used for grazing and / or dry land farming. Parcels in hillier rangeland areas tend to be used only for grazing (as in Subareas 4 and 7). Parcels in flatter subareas rotate pasture and dry land farming uses. The number of years per cycle and the time devoted to grazing and grain production, respectively, depends on the

crop(s) grown.

Vineyards currently are growing in parts of Subareas 1 and 5 but recently were removed from Subarea 2. Those in Subarea 5 are in poor condition. Orchards are located in parts of Subareas 4 and 5, although walnut trees on Subarea 5 have been abandoned and are not in good condition.

Olive trees have been introduced at several locations in Subarea 4 where phased planting has resulted in visible differences in maturity. Interest has been expressed in expanding olive growing to diversify the SLVSPA somewhat so that the agricultural economy will not depend on intensive cultivation of a single crop.

An estimated 2,100 acres currently are planted in vineyards in the South Livermore Valley. Wente Brothers Winery estimates that, with extension of water lines for irrigation, an additional 6,500 acres are suitable and available for growing wine grapes. [5]

Prime Soils and Important Farmlands

Climate, water, and management practices are of equal or greater importance to Livermore viticulturists than soil types [6], although producers of other agricultural commodities there and elsewhere use soil classifications to determine the suitability of land for certain intensive cultivation, extensive grazing, or other types of agricultural operations.

Despite local viticulture practices, this EIR examines the SLVSPA according to the classification systems established by the Natural Resource Conservation Service, commonly known as the Soil Conservation Service (SCS), and the California Department of Conservation's *Farmland Mapping and Monitoring Program (FMMP)*. This is because Appendix G of the *State CEQA Guidelines* states that a "project normally will have a significant effect on the environment if it would convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land". [7]

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5 Nichols • Berman conversation with Terry Huff, Natural Resources Conservation Service, October 1996, who confirmed that this general estimate appears appropriate.

6 Nichols • Berman conversation with Mike Gatzman, Wente Brothers Winery, May 1995.

7 Appendix G, "Significant Effects", *Guidelines for the Implementation of the California Environmental Quality Act (State CEQA Guidelines)*, Governor's Office of Planning and Research, revised as of December 1995, as presented in *Guide to the California Environmental Quality Act*, Remy, Thomas, Moose, and Manley, 1996.

In 1993, the California Legislature required the Department of Conservation to prepare a model Land Evaluation Site Assessment (LESA) system -- based on LESA criteria originally developed by the SCS to implement the Federal *Farmland Protection Policy Act* -- to provide a decision-making methodology for assessing potential environmental impact of State and local projects on agricultural land. *Successful CEQA Compliance: A Step-by-Step Approach*, Bass and Herson, 1994.

The Department completed a number of studies in Stepember and December 1995 but, as of September 1996, had not published a final methodology. They include *LESA Guidelines for Local Jurisdictions -- Project Size and Water Resource Availability Factors*, September 1995, *Statewide LESA Methodologies Report -- Project Size and Water Resource Availability Factors*, September 1995, and *Minimum Parcel Size Requirements in the Williamson Act: Problems and Recommendations*, December 1995, prepared for the Department by Nichols • Berman. In the meantime, this EIR relies on Appendix G of the *Guidelines*.

The SCS and FMMP have defined prime soils and prime farmlands in Alameda County based on specific soil mapping unit characteristics, and the SCS further indicates the suitability or limitations of soil types for agriculture and provides guidance for their use and management. Seven Class I, II, III, and IV mapping units present in the SLVSPA meet the criteria for prime farmland in Alameda County (designated with a *P*, below). Prime soils account for 98 percent of Subarea 2, 90 percent of Subarea 3, and 70 percent each of Subareas 1 and 6. Two additional units are defined as farmlands of statewide importance (designated with as *S*).

- Clear Lake clay, drained, three to seven percent slope, present in Subarea 7 (Class III) *P*
- Danville clay loam, zero to three percent slope, present in Subarea 7 (Class II) *P*
- Livermore gravely loam, present in Subarea 7 (Class II) *P*
- Livermore very gravely coarse loam, present in Subareas 2, 3, 5, 6, and 7 (Class IV) *S*
- Pleasanton gravely loam, zero to three percent slope, present in Subareas 2, 5, and 6 (Class II) *P*
- Pleasanton gravely loam, three to 12 percent slope, present in Subareas 1, 2, and 6 (Class III) *S*
- Rincon loam, zero to three percent slope, present in Subareas 1 and 2 (Class II) *P*
- Zamora silt loam, zero to four percent slope, present in Subareas 3 and 5 (Class I) *P*
- Zamora silty clay loam, zero to three percent slope, present in Subareas 1 and 2 (Class I) *P*

Exhibit 4.1-4 lists all soils present in the subareas, and Exhibit 4.1-5 summarizes the distribution of prime and non-prime soils by subarea. Of the entire 1,887-acre SLVSPA, 848 acres (45 percent) are classified as "prime" soils, and 1,039 acres (55 percent) constitute non-prime types.

The SCS also uses a second classification method to indicate the relative suitability of particular soils for intensive agricultural cultivation. Storie index ratings reflect soil characteristics and account for soil depth, surface layer texture, subsoil density, drainage, salts and alkali, and relief but not for other factors which could affect the desirability of soils for growing certain plants, such as availability of water for irrigation, climate, or distance from markets. Soil type ratings of one to 100 equate to six grades, as follows:

Grade	Storie Index	Soil Suitability for Farming
1	80-100	Excellent and well suited for general intensive farming
2	60-80	Good and also well suited for farming but less desirable than Grade 1 soils
3	40-60	Only fairly well suited for farming
4	20-40	Poorly suited for farming
5	10-20	Very poorly suited for farming
6	1-10	Soil and land types not suited to farming

Four of the soil types listed above are considered excellent and well suited for agriculture, based on Storie ratings:

Exhibit 4.1-4
Soil Conservation Service Soil Classifications

Soil Type	Sub-Area	Capability Unit [a]	Storie Index	Acres Countywide	Percent of County	Present Use
Azule clay loan, 3-30 percent slopes	7	IVe-5	39	2,858	0.9	Pasture, range, some dry-farmed grain, hay
Clear Lake clay, drained, 3-7	7	IIIw-5	46	1,316	0.4	Dry-farmed grain, grain-hay
Danville silty clay loam, 0-30	7	IIs-3	86	410	0.1	Irrigated vegetables, apricots, pasture, dry-farmed grain, grain-hay
Diablo clay, 15-30	7	IVe-5	36	5,565	1.7	Dry-farmed grain, grain-hay, pasture, range
Diablo clay, 30-45	7	VIe-5	19	7,836	2.4	Pasture, range, some dry-farmed grain, hay
Linne clay loam, 30-45	7	VIe-5	18	6,761	2.1	Pasture, range
Linne clay loam, shallow, 45-75	7	VIIe-5	6	1,797	0.7	Pasture, range
Livermore gravelly loam	7	IIs-4	63	4,308	1.3	Wine grapes, dry-farmed grain, hay
Livermore very gravelly coarse sandy loam	2-3, 5-7	IVs-4	36	1,134	0.4	Wine grapes
Millsholm silt loam, 30-45, eroded	7	VIe-8	14	12,334	3.7	Pasture, range
Pleasanton gravelly loam, 0-3	2, 5-6	IIs-3	68	2,587	0.8	Grapes, dry-farmed grain, hay
Pleasanton gravelly loam, 3-12	1-2, 6	IIIe-3	58	3,071	1.0	Dry-farmed grain, hay
Positas gravelly loam, 2-20, eroded	1, 4-7	IVe-3	22	8,984	2.8	Pasture, range, dry-farmed grain, hay
Positas gravelly loam, 20-40, eroded	1, 4, 7	VIe-3	12	8,179	2.5	Pasture, range
Positas gravelly loam, 40-60, eroded	4, 7	VIIe-3	6	3,335	1.0	Grazing
Positas gravelly loam, thick surface, 2-10, eroded	4-7	IIIe-3	41	2,271	0.7	Pasture, range, dry-farmed grain, hay
Rincon loam 0-3	1-2	IIs-3	80	2,075	0.7	Dry-farmed grain, hay
Riverwash	3, 5	VIIIw-4	2	2,925	0.8	-
Shedd silt loam, 45-75, severely eroded	7	VIIe-8	7	1,171	0.4	Pasture range
Zamora silt loam 0-4	3,5	I-1	95	2,280	0.7	Irrigated row crops, alfalfa, drain, hay
Zamora silty clay loam 0-3	1-2	I-1	86	680	0.2	Irrigated roses, row crops, alfalfa, grain, hay

Source: *Soil Survey of Alameda Area*, Soil Conservation Service, U. S. Department of Agriculture, 1966.

a I has very few limitations, widest range of use, and least risk of damage. II and greater represent progressively more limitations (Alameda County has no V).

e soil is limited by risk of erosion
s soil is limited as shallow, droughty, or stony
w soil is limited by water

1 an erosion hazard, slope, or both
3 problem or limitation caused by shallow depth of soi
4 problem or limitation caused by coarse soil texture or excessive amounts of gravel
5 problem or limitation caused by fine soil texture
8 problem or limitation caused by shallow root zone because of impermeable hardpan, bedrock, or other layer that limits available moisture

Exhibit 4.1-5
Distribution of Prime and Non-Prime Soils

Soil Unit		Subarea															
		1		2		3		4		5		6		7		Total	
Prime Soils [a]	*Mapping Unit* [a]	*Acres*	*%* [b]	*Acres*	*%* [b]	*Acres*	*%* [b]	*Acres*	*%* [b]	*Acres*	*%* [b]	*Acres*	*%* [b]	*Acres*	*%* [b]	*Acres*	*%* [c]
Clearlake	*CdB III*													21	*4*	21	*2*
Danville	*DaA II*													9	*2*	9	*0*
Livermore	*Lg II*	3	*2*											4	*0*	7	*0*
Livermore	*LM IV*			71	*18*	27	*28*			8	*5*	75	*40*	46	*8*	227	*12*
Pleasanton	*PgA II*			70	*18*					4	*3*	24	*13*			98	*5*
Pleasanton	*PgB III*	9	*5*	7	*2*							31	*17*	25	*4*	72	*4*
Rincon	*Rc II*	17	*10*	214	*53*											231	*12*
Zamora	*Za I*	90	*53*			60	*62*			3	*2*					153	*8*
Zamora	*Zc I*			30	*7*											30	*2*
Prime Subtotal		119	*70*	392	*98*	87	*90*	0	*0*	15	*10*	130	*70*	105	*18*	848	*45*
Non-Prime Soils		51	*30*	9	*2*	10	*10*	301	*100*	140	*90*	55	*30*	473	*82*	1,039	*55*
Total		170	*100*	401	*100*	97	*100*	301	*100*	155	*100*	185	*100*	578	*100*	1,887	*100*

a Soil mapping unit names, *codes*, and *classes*. See Exhibit 4.1-4 for complete names and other characteristics.
b Percent of subarea.
c Percent of SLVSPA.

- Zamora silt loam, zero to four percent slope, present in Subareas 3 and 5 (Storie Index 95)
- Zamora silty clay loam, zero to three percent slope, present in Subareas 1 and 2 (Storie Index 86)
- Danville clay loam, zero to 30 percent slope, present in Subarea 7 (Storie Index 86)
- Rincon loam, zero to three percent slope, present in Subareas 1 and 2 (Storie Index 80)

Exhibit 4.1-5 also shows the distribution of these four soil types in the SLVSPA. It indicates that 423 acres dispersed among five subareas (1-3, 5, and 7) have Storie Index rations of 80 to 100.

The California Department of Conservation's *Farmland Mapping and Monitoring Program (FMMP)* maps and classifies the State's agricultural lands as "Prime Farmlands", "Farmlands of Statewide Importance", "Unique Farmlands", "Farmland of Local Importance" (designated by each county's board of supervisors), "Grazing Land", and "Urban and Built-Up Land".[8] The Alameda County Board of Supervisors has determined that there will be no "Farmland of Local Importance" for Alameda County, and, accordingly, that category is omitted from the following discussion. Exhibit 4.1-6 defines the other categories.

Williamson Act Contracts

The Williamson Act (Government Code Section 51200 *et seq*) enables jurisdictions to establish programs to protect agricultural land by providing tax benefits in exchange for restrictions on development. Under the Williamson Act, an owner agrees to limit land to agriculture and compatible uses for a minimum period of ten years. In turn, the county where the land is located agrees to tax the land based on its agricultural use rather than at its development value. As partial compensation for lost tax revenues, the State Legislature pays a subvention to cities and counties.

Williamson Act contracts are entirely voluntary and self-renewing -- that is, contracts are automatically renewed each year unless the owner or the County files for non-renewal. To withdraw from a contract, an owner must submit a Notice of Non-Renewal the respective city or county. Withdrawal involves a ten-year period of tax adjustments based on full market value before land can be removed from the preserve program. Under certain conditions, the city or county where the contracted land is located can cancel the contract (eliminating the ten-year withdrawal period). If cancellation occurs before contract expiration, a penalty must be paid. Contracts can be canceled on parts of pacels at the discretion of the city or county (in the unincorporated area).[9]

Alameda County policies relating to the Williamson Act restrict property under contract to agricultural use, including wineries, and one single-family residence per 40 acres. A house on less than 40 acres is allowed if it is accessory to an existing intensive commercial agricultural use. New structures are limited to a development envelope of two acres or less and must not take lands out of production. The County also requires that land under contract must be zoned Agricultural (A), unless there has not been intensive commercial agricultural use for the past ten years or the zoning requires dedicated agricultural easements.

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8 *Farmland Conversion Report 1990 to 1992*, Farmland Mapping and Monitoring Program, California Department of Conservation, June 1994. The 1990-1992 period is the most recent for which information has been compiled. The Department of Conservation also designates "Other Land" (which does not meet the criteria of any other category) and "Water" (with an extent of at least 40 acres).

9 Nichols • Berman conversation with Henri Phelan, Assessor's Office, Alameda County, October 23, 1996.

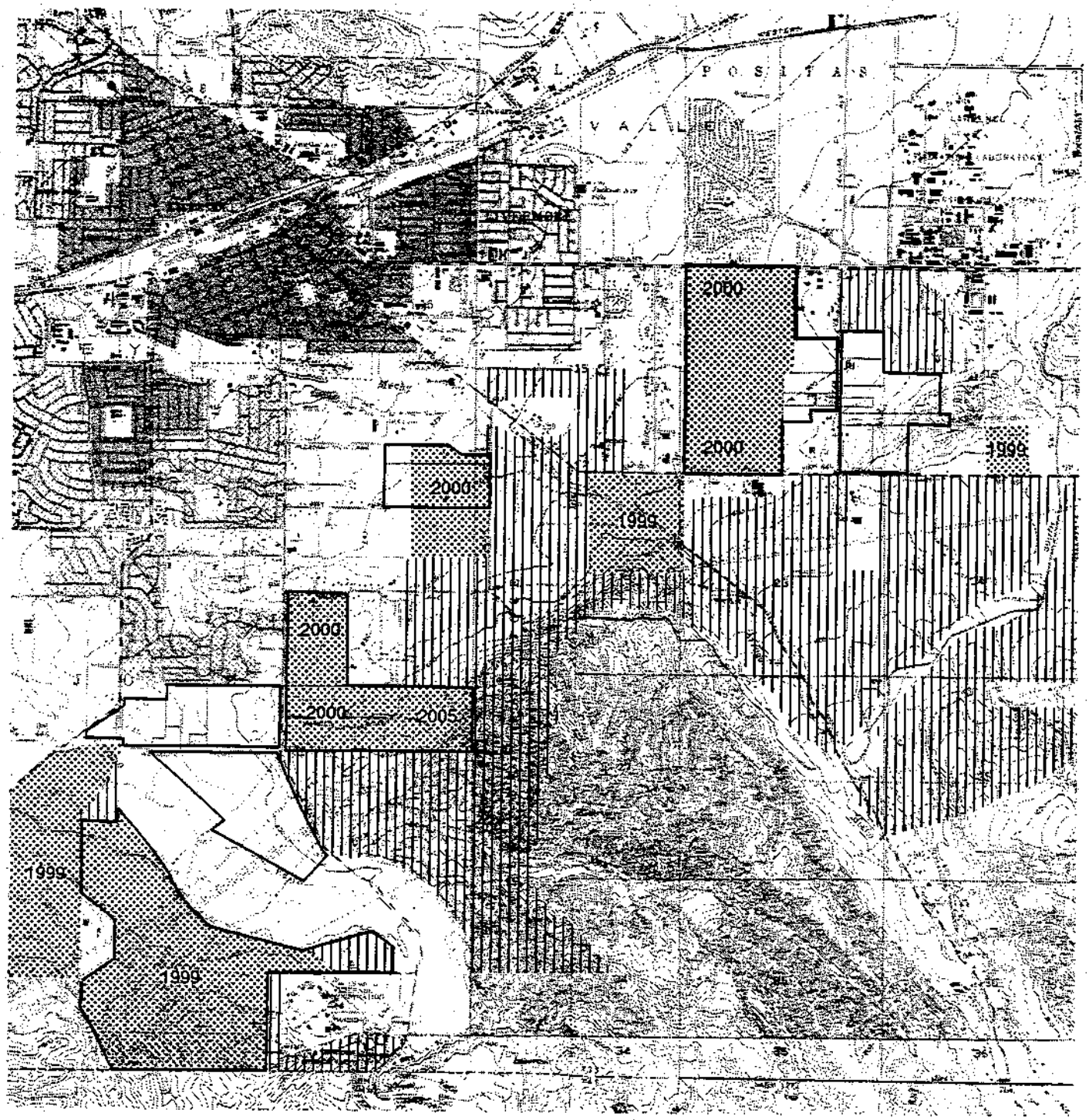
Exhibit 4.1-6
State Farmland Mapping and Monitoring Classifications

Farmland Category	Sub Area	Acres Countywide		Change	Description
		1992	*1994*		
Prime Farmland	2	8,073	7,942	-131	This land possesses the best combination of physical and chemical features able to sustain long-term production of agricultural crops. This land also has the soil quality, growing season, and moisture supply characteristics needed to produce sustained high yields. The land must have been used for the production of irrigated crops at some time during the Farmland Monitoring and Mapping Program's (FMMP) two prior update cycles to qualify as prime farmland.
Farmland of Statewide Importance	2-3	1,774	1,751	-23	This land is similar to Prime Farmland except for minor shortcomings, such as greater slopes or less ability to hold and store moisture, and must have been used to produce irrigated crops at some time during the last two FMMP update cycles.
Unique Farmland	4-5	1,455	1,431	-24	This is land of lesser quality soils used to produce the state's leading agricultural crops. The land usually is irrigated but also includes non-irrigated orchards or vineyards. As with the two prior classifications, the land must have been in production during the prior two update cycles.
Grazing Land	1, 4-7	251,615	251,112	-503	This is land where the existing vegetation is suited to livestock grazing. [a] The minimum mapping unit for Grazing Land is 40 acres. The vast majority of Alameda County's agricultural land consists of grazing land.
Urban and Built-Up Land	1, 5	134,986	135,451	+465	This land is occupied by structures at a building density of at least one unit to 1.5 acres or approximately six structures to a ten-acre parcel.

Source: *Farmland Conversion Report, 1992 to 1994*, Farmland Mapping and Monitoring Program, Department of Conservation, June 1996.

a This category is used only in California and was developed in cooperation with the California Cattlemen's Association, the University of California Cooperative Extension Service, and other groups interested in knowing the extent of grazing activities. *Farmland Conversion Report, op. cit.*

Exhibit 4.1-7
Williamson Act Contract Lands



Legend:

- Williamson Act Parcels
- Non-renewal Filed (Date denotes year contract expires)

Source: Wallace Roberts & Todd

Nine parcels in four SLVSPA subareas (Subareas 2, 3, 4, and 7) are under Williamson Act contracts of which eight contracts have not been renewed. [10] The ninth, the eastern ± 48-acre Crohare parcel in Subarea 7, is under an on-going Williamson Act contract. Contracts will expire by January 2000 except the western ± 529-acre Crohare parcel in Subarea 7 (1999) and Zumbach parcel in Subarea 4 (2005).

Public Plans

The City and County have adopted policies which directly relate to future land use and planning considerations in the SLVSPA. In addition, other adopted policies apply equally to the SLVSPA and the larger planning areas addressed by those jurisdictions' respective plans.

The primary planning document to guide decisions about the SLVSPA is the *City of Livermore Community General Plan* which contains South Livermore Valley Policies and citywide policies. The County's *South Livermore Valley Area Plan* covers the SLVSPA as part of its larger planning area. The County subsequently adopted the East Area Plan which encompasses a substantially larger planning area in both north and south Livermore.

Policies specifically relevant to the City's *South Livermore Valley Specific Plan (Draft Plan)* and the SLVSPA are presented in Exhibits 4.1-9 through 4.1-11 together with an analysis of the consistency of the *Draft Plan* and SLVSPA buildout under the *Plan* with those policies.

As noted in the following discussion of ***Impacts and Mitigation Measures***, the consistency analysis is presented to assist decision-makers in determining conformance of the proposed actions with adopted public plans and policies. The following determinations represent the EIR preparers' best judgment based on a strict interpretation of policies. However, policy consistency ultimately must be determined by the City of Livermore City Council.

4.1 LAND USE AND PUBLIC PLANS -- IMPACTS AND MITIGATION MEASURES

Scope of Topics Addressed

The *Draft Plan* is intended to identify long-term land use and development patterns in the SLVSPA in order simultaneously to accommodate a specified increment of planned growth and also preserve and revitalize intensive agricultural production on adjacent lands in the valley. This analysis focuses on the following land use issues involved with implementation of the *Draft Plan* in the SLVSPA and adjacent lands:

- Changes in the supply of land suited or designated for particular uses with full implementation of the *Draft Plan*, compared with the existing mix of land use types, including loss of existing housing and businesses

- Losses of agricultural land, including range and pasture land used for grazing, with conversion to other non-agricultural uses and of land with prime and other valuable agricultural soils

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[10] *Ibid.*

- Compatibility of land uses, focusing primarily on adjacent existing and new land uses and on potential urban / rural conflicts at the interface of developed and agricultural uses

- Conformance with adopted plans and policies

Significance Criteria

The 1992 Alameda County *South Livermore Valley Area Plan (Area Plan) EIR* indicates that implementation of the *Draft Plan* would have a significant impact on land use if it:

- Resulted in the loss of significant amounts of cultivated lands or of State-identified farmlands
- Conflicted with present and planned uses in the area, including agricultural and open space lands
- Conflicted with existing land use policies and zoning
- Resulted in incompatible land uses or nuisance impacts

Appendix G of the *CEQA Guidelines* also contains criteria to use in determining the significance of impact. Similar to the *Area Plan EIR*, the *Guidelines* indicate that a project could have a significant land use effect if it:

- Disrupted or divided the physical arrangement of an established community

- Converted prime agricultural land to non-agricultural land or impaired the productivity of prime agricultural land

- Conflicted with adopted environmental plans and goals of the community where it is located and, as a result, caused "substantial changes in the physical conditions which exist in the area affected by the proposed project"

Neither the *Area Plan EIR* nor Appendix G quantifies what amount of loss would constitute a "significant amount", particularly in relation to conversion of existing or former agricultural land to non-agricultural uses. The Natural Resources Conservation Service (NRCS) has not established criteria to measure the significance of farmland loss in Livermore [11], and the California Department of Conservation has not adopted or recommended a Land Evaluation Site Assessment (LESA) methodology for use in CEQA analyses.

Impact 4.1-1 Changes in Land Supply

Implementation of the South Livermore Valley Specific Plan *would transform land uses in the predominantly agricultural planning area. The net loss in agricultural acreage would be accompanied by conversion of land extensive grazing and other low intensity operations to land intensive cultivation. A similar acreage-intensity change would occur with commercial land, and residential uses would expand and intensify dramatically. S*

The *Draft Plan* would redesignate existing agricultural land use classifications and would transform actual land uses throughout the SLVSPA. Changes in land use are discussed below and summarized in Exhibit 4.1-8.

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[11] Nichols - Berman conversation with Terry Huff, *op. cit.*, October 1996.

Exhibit 4.1-8
Comparison of Existing and Planned Land Uses [a]

Land Use	Subarea 1		Subarea 2		Subarea 3		Subarea 4		Subarea 5		Subarea 6		Subarea 7	
	Existing	*Planned*	*Existing*	*Planned*	*Existing*	*Planned*	*Existing*	*Planned*	*Existing*	*Planned*	*Existing*	*Planned*	*Existing*	*Planned*
Residential [b]	13.5	57.9	0.0	130.8	25.6	40.5	8.5	62.5	11.2	67.5	0.0	0.0	0.0	80.1
Commercial [c]	57.2	0.0	0.0	0.0	0.0	4.0	26.7	36.7	9.0	12.0	0.0	8.0	0.0	8.0
Streets	0.0	11.1	0.0	58.5	0.0	14.6	0.0	15.9	0.0	23.6	0.0	0.0	0.0	32.4
School	5.0	5.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Space [d]	0.0	6.2	0.0	22.2	0.0	1.8	0.0	39.0	0.0	8.7	0.0	3.8	0.0	96.1
Industrial	0.0	0.0	9.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture	94.7	95.2	390.9	189.2	71.0	15.7	265.8	146.9	134.5	42.9	185.4	173.6	577.9	361.3
	170.4	170.4	400.7	400.7	96.6	96.6	301.0	301.0	154.7	154.7	185.4	185.4	577.9	577.9

a Acres
b Includes existing rural residential to remain (or be converted) and new residential.
c Includes commercial recreational and potential new wine country commercial sites.
d Includes parks, landscaped areas, and trails.

Land Use	Subarea 1	Subarea 2	Subarea 3	Subarea 4	Subarea 5	Subarea 6	Subarea 7	SLVSPA
	Change	*Change*	*Change*	*Change*	*Change*	*Change*	*Change*	*Net Change*
Residential [b]	+39.4	+130.8	+14.9	+54.0	+56.3	0.0	+80.1	+323.4
Commercial [c]	-57.2	0.0	+4.0	+10.0	+3.0	+8.0	+8.0	-24.2
Streets	+11.1	+58.5	+14.6	+15.9	+23.6	0.0	+32.4	+156.1
School	0.0	0.0	+20.0	0.0	0.0	0.0	0.0	+20.0
Open Space [d]	+6.2	+22.2	+1.8	+39.0	+8.5	+3.8	+96.1	+177.8
Industrial	0.0	-9.8	0.0	0.0	0.0	0.0	0.0	-9.8
Agriculture	+0.5	-201.7	-55.3	-118.9	-91.6	-11.8	-216.6	-695.4

Agricultural Use Agriculture currently represents the largest existing and former land use in the SLVSPA (1,720 acres), and adoption and implementation of the *Draft Plan* would affect agricultural land proportionately. The *Draft Plan* provides for use of approximately 1,025 acres in the SLVSPA as potential agricultural land but ultimately would result in a net loss of about 695 acres of agricultural land through planned urbanization and permanent conversion to residential, commercial, and related developed uses.

Of the present 1,720 acres of agricultural land in the SLVSPA, about 1,100 acres (64 percent) are devoted to low intensity and / or land extensive operations, including grazing, dry land farming, and currently fallow land (Exhibit 4.1-3). Some of the low intensity agricultural uses are located in the transitional parts of the SLVSPA where rural ranchettes and other non-agricultural uses have encroached and parcel size and ownership are fragmented. These operations appear to include marginally viable activities which often occur where land is being held for its potential development value rather than for long-term productive use and leased for agriculture in the meantime. These include parcels with no Williamson Act contracts or with contracts which have not been renewed. Other of the low intensity uses are located in the agricultural zone beyond the urban-rural interface where parcel sizes remain large enough to support land extensive grazing operations.

While the *Draft Plan* would decrease the supply of agricultural land *per se* it also would introduce and / or reintroduce intensive agricultural production in the SLVSPA with planting or expansion of vineyards and orchards. Such uses probably would be concentrated in Subareas 1 through 6 (the last planted entirely with vineyards). However, some of the ± 1,025 acres of potential agricultural land is located in the southern upland part of Subarea 7 where this EIR's ***Biological Resource*** analysis discourages intensive agriculture. [12] Therefore, some but not all future agricultural land would be farmed more intensively.

Of the 1,720 acres of agricultural land in the SLVSPA, about 391 acres are or have been planted with vineyards, and about 229 acres are existing or former orchards (a total of 620 acres, about one-third of the planning area). About 318 acres of those vineyards and orchard lands are not productive and either consist of old and abandoned plants or the vines have been removed. Productive vineyards are located in Subareas 1 and 2, and acreage planted with olive trees is expanding gradually in Subarea 4. The 695-acre loss would not displace actively cultivated agricultural land. Instead, such actively cultivated land would be preserved and expanded with implementation of the *Draft Plan*.

In addition to providing for potential agricultural use within the SLVSPA, the *Draft Plan* explicitly addresses the loss of existing agricultural land there with its agricultural mitigation program. The purpose of that program and one main goal of the *Draft Plan* is to secure permanent agricultural easements in the County's vineyard area outside the SLVSPA. Full implementation of the *Draft Plan* would result in preservation and planting of 2,051 acres to compensate for development of 557 acres with residential lots and streets and construction of 1,494 housing units in the SLVSPA plus another $2.50 per square foot of retail commercial space. Land preserved through agricultural mitigation would be located both inside (the *Plan's* first priority) or outside the SLVSPA. The *Draft Plan* identifies the location of potential agricultural land inside but not outside the SLVSPA.

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[12] Policy 6-8 of the *Draft Plan* would prohibit intensive agricultural use on hillside slopes of Subarea 7 above the elevation of 650 feet in order to protect native and non-native grasslands. However, low intensity livestock grazing could be managed compatibly with grassland protection, thus potentially retaining agricultural productivity.

The addition of 2,051 acres of vineyards or orchards would exceed the initial loss of existing agricultural land (695 acres) and nearly double current vineyard acreage in the South Livermore Valley (an estimated 2,500 acres), increasing vineyards when planted by 80 percent.

Based on the estimated supply of 6,500 acres in County's vineyard area considered suitable for viticulture with provision of irrigation water, sufficient land would be available to accommodate the balance of mitigation land not planted in the SLVSPA itself (1,026 acres). As would occur with the planting of vineyards inside the SLVSPA, the agricultural mitigation program would replace lower intensity land extensive uses, primarily grazing, with higher intensity cultivated uses.

In terms of acreage alone, the changes in agricultural land supply and intensity of agricultural use attributable to implementation of the *Draft Plan* would constitute a less-than-significant impact. (The loss of prime farmland and prime agricultural soils is evaluated in ***Impact 4.1-2***, below.)

The first goal of the *Draft Plan's* Land Use Element is:

- To allow development of a limited amount of urban land within the South Livermore Valley in a manner which protects and expands the acreage that is actively cultivated with agriculture, particularly viticulture.

In addition, the *Plan's* Conservation and Resource Management Element contains an agricultural mitigation program to preserve and protect agricultural land in proportion to the amount of land converted to urban development and the number of housing units or amount of commercial area built (as outlined in ***2.2 Project Description***):

- ***Policy 6-1*** New residential development in the Specific Plan area will be required to mitigate the loss of agricultural land according to the following parameters ... .

- ***Policy 6-7*** Retail uses and for-profit major attractions in the Specific Plan area will be required to pay an agricultural mitigation fee of $2.50 per square foot to the South Livermore Valley Agricultural Land Trust ... .

The *Plan* also identifies priorities indicating where land to be preserved for agriculture would be located:

- ***Policy 6-2*** Land outside a given subarea shall be eligible for meeting the mitigation acreage requirement for that subarea only after the City determines that lands within the subarea with a Specific Plan designation "Agricultural Preserve" have been planted and protected with an agricultural easement. Lands within the subarea may also count as mitigation acreage if all of the requirements of the Specific Plan for mitigation are met.

Commercial Use Commercial land is the second largest existing land use in the SLVSPA (about 93 acres) and consists primarily of horse boarding and training facilities located in Subareas 1, 4, and 5. In addition, two wineries are located in Subareas 1 and 5 (one each). The *Draft Plan* assumes that several existing commercial uses would remain, including the existing Zumbach Ranch in Subarea 4 and the Rios-Lovell and Livermore Valley Cellars' wineries in Subareas 1 and 5, respectively. However, the *Draft Plan* assumes that existing commercial recreation land comprising four equestrian facilities in Subareas 1 and 5 eventually would be converted to residential use and that new wine country commercial uses would be developed at as many as 13 potential sites in Subareas 3 through 7.

The net result would be a ± 24-acre reduction in commercial land (from about 93 acres to 69 acres) and the loss of four equestrian facilities which either would be relocated or cease operation altogether. Relocated facilities would be expected to move outside the SLVSPA. This is because, while permitted on agricultural land, equestrian facilities would not qualify as agricultural mitigation under the County's *Area Plan* or the City's *Draft Plan*, which is defined as cultivated agriculture and interpreted to consist of vineyards and orchards. Nevertheless, the *Draft Plan* would provide equestrian trails throughout the SLVSPA and connections to regional trails for riders.

As discussed above in relation to the transformation of agricultural land from lower to higher intensity uses, the *Draft Plan* would commit less land to more intensive commercial use. The land use impact of changes in the amount of commercial land and intensity of commercial use would be less-than-significant.

Residential Use Residential land is the third largest land use in the SLVSPA (about 59 acres) and consists of large-lot rural ranchette development in Subareas 1, 3, 4, and 5 plus residences associated with agricultural land (a total of 20 SLVSPA housing units). The *Draft Plan* would make the most dramatic change in this land use type by expanding the supply of residential land to a total of 401 acres and providing for development of 1,494 new housing units. In addition, the *Draft Plan* would retain 14, convert two, and remove four of the existing units. [13]

The character of residential land would change in addition to the amount of land devoted to this use. Existing rural residential densities range from about one unit per one-and-one-half acres (0.66 unit / acre) to one unit per eight acres (0.125 unit / acre). The *Draft Plan* envisages densities ranging from 1.7 units per gross acre (1.9 units / net acre) to 2.8 units per gross acre (3.0 units / net acre). [14]

The basic goals of the *Draft Plan* are to establish Livermore's permanent southern boundary and accommodate housing development (up to 1,600 new units) within that urban limit in order to permanently preserve agricultural land outside the city and revitalize viticulture there. These Land Use Element Goals, in addition to those noted above, are:

- ***Goal*** To establish a permanent urban boundary for the south edge of the City of Livermore.
- ***Policy 4-1*** Restrict residential development in the Specific Plan area to no more than 1,494 dwelling units. The number of units permitted in each of the development subareas shall not exceed the following ... .

Therefore, the planned transformation would represent a less-than-significant land use impact.

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13 The units to be removed are located in Subarea 3 where the *Draft Plan* assumes that a fifth Subarea 3 unit, the Calderia residence, would be converted to a bed and breakfast inn. The other existing housing unit the *Draft Plan* assumes would beconverted is located in Subarea 4 and is designated as a commercial site (an olive press). The *Plan* does not address a 15th unit located at 5624 Tesla Road in Subarea 2 and surrounded by existing and future agricultural land. The subarea was expanded during the planning process in order to include the existing vineyards but not to change the status of the house and associated farm coumpound.

14 Gross acres express density in terms of total land area while net acres account for land not devoted to residential lots, such as public streets. A maximum density of 3.2 units per net acre in Subarea 3 would reflect the amount of land devoted to the 20-acre school site.

Other Land Uses Implementation of the *Draft Plan* would result in other less substantial land use changes.

The *Plan* would designate formal open space where no equivalent land use presently exists. About 176 acres would be preserved for public use or appreciation as parks, trails, and landscaped open space in the SLVSPA which currently only provides visual (private) open space.

The *Plan* would retain the existing private Stivers Academy (Subarea 1) and provide a 20-acre school site (Subarea 3) for a net increase in school area.

Finally, implementation of the *Draft Plan* eventually would displace the only active industrial use inside the SLVSPA, Davey Tree Surgery in Subarea 2. According to the *Draft Plan's* site plan for Subarea 2, part of the 9.8-acre site would be developed with residential uses, and the remainder along South Vasco Road would be retained for agriculture. Davey presently uses the eastern half of the parcel (adjacent to South Vasco Road) for the firm's administrative offices, shop, and equipment storage which support activities operated out of satellite facilities. [15] Davey has followed the planning process to date but has not formulated a relocation plan to move out of the SLVSPA as development proceeds. The firm has identified its options which include developing the western half with new residential uses and retaining the firm's existing facilities in the eastern half or selling the parcel and relocating operations outside the SLVSPA when development reaches its site. The first option would conflict with the *Plan* and, therefore, would not be feasible. This is because the *Plan* requires full complianace with all provisions before the City would approve any development. This means that agricultural mitigation land on the part of the Davey parcel must be planted and under easement (dislocating the existing facilities) before housing development would be permitted on the western part. Davey does not consider the potential need to relocate in the future as an impact because the site's increased value for development would fund the firm's move.

These changes would not constitute significant land use impacts.

An indirect effect of implementing the *Draft Plan* expected both inside and outside the SLVSPA would be the incremental loss of pasture and rangeland through outright conversion to non-agricultural uses and intensification of agricultural uses. [16] The supply of grazing land has been decreasing slowly for the past decade and longer due primarily to land divisions ("parcelization" into progressively smaller sizes and many ownerships) and conversions (to rural ranchettes, other non-productive uses, and urbanization). Ranchers need an available supply of relatively large blocs of land to buy or lease in order to rotate pasture and rangeland for management purposes or to accommodate cyclic fluctuations in herd sizes which can require more or less land from year-to-year. As the land supply shrinks, costs to ranchers increase to transport livestock or equipment from parcel-to-parcel which can affect the viability of operations. The *Draft Plan* generally would contribute to this regional trend, but the impact cannot be quantified solely on the basis of acreage affected.

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15 Nichols • Berman conversation with Rick Edson, Treasurer, Davey Tree Surgery, November 1996. Davey Tree Surgery is a subsidiary of Davey Tree Experts and serves utilities in the western United States.

16 Nichols • Berman conversation with Larry Soenen, District Conservationist, Contra Costa County, Natural Resources Conservation Service, September 1996. Mr. Soenen confirmed that impacts on grazing are occurring in both Alameda and Contra Costa Counties.

As urbanization encroaches onto agricultural and rangeland, active production frequently is discontinued on parcels near the urban-rural boundary in anticipation of conversion to non-agricultural (developed) use. [17] Such parcels may be leased for grazing, used for other low-investment low-intensity interim uses, or left fallow while holding them for eventual development. It is estimated that about 40 percent of Grazing / Vacant land shown in Exhibit 4.1-3 is being held for eventual development and includes parcels in SLVSPA subareas closest to existing urban uses (Subareas 1, 2, 3, and 5 as well as Subarea 6).

Another current companion trend is the leasing of grazing rights on public lands, including on State park, regional park, and watershed lands. Such grazing is controversial in some places and among some people but can have a number of benefits. They include fire control, income to the public agency landowners, and, depending on point of view, rangeland management. In the last case, grazing is seen as either enhancing or harming forage and vegetation composition, although proponents believe that proper management can produce vegetation and habitat characteristics owners desire.

Annexation Alternatives Land use impacts would differ among the annexation alternatives. One primary function of Local Agency Formation Commissions (LAFCOs) is to protect agricultural land. Therefore, alternatives which would annex more land to the City, especially land outside SLVSPA subareas, would conflict with LAFCO's agricultural preservation policies. By contrast, alternatives which would annex only selective parts of subareas would conform better to LAFCO agricultural land policies. Therefore, the Minimum Annexation Alternative would be superior, and the other alternatives would be progressively less consistent with LAFCO agriculture policies, depending on the type and amount of land annexed.

Annexation alternatives which placed agricultural land in the City -- potential new agricultural land in SLVSPA subareas or agricultural land on intervening parcels -- would conflict with LAFCO efforts to preserve agricultural land and avert or minimize pressures to convert agricultural land to urban use. Because annexation normally is a precursor to urbanization, LAFCOs do not usually encourage annexation of land intended to remain in agricultural use. Instead, annexation is viewed as a mechanism to foster planned growth in an orderly and cost-effective manner. Despite currently identical policy approaches by the City and County in the South Livermore Valley, LAFCO may not deem it prudent to remove a traditional barrier to urban development by allowing annexation of agricultural land to the City. Alternatively, while annexation with adoption of the *Draft Plan* potentially could be viewed as an additional protection not now available under the County's *Area Plan*, the *Draft Plan* is intended to be the "urban component" of the *Area Plan*. Moreover, as is discussed in ***Impact 4.1-6, Growth Inducing Impacts***, public policies can be altered and amended and cannot be relied on to provide permanent protection. This potential applies equally to City or County policies. Thus, a hypothetical new City policy direction could expose annexed land to future urbanization not intended by the *Draft Plan*. However, non-annexation would not guarantee any better protection in the County which could shift its policy in the future. In the end, both examples are speculative, and both are contrary to the respective entities' adopted policies for the South Livermore Valley, and urbanization under either scenario would be frustrated by the fact that the South Livermore Valley Land Trust would own the development rights to most of the adjacent agricultural lands.

With adoption of the *Draft Plan* (which assumes implementation of the modified Moderate Annexation

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[17] Discontinuing optimum agricultural use also occurs at the urban-rural interface due to land use conflicts. Such impacts are discussed below (see ***Impact 4.1-5***).

Alternative), the City would annex all of Subareas 1-7 (including the parts designated as potential agricultural land by the *Plan*) plus three additional areas which do not contain farmland (Sycamore Grove Park, Veterans Park, and the U.S. Department of Veterans Affairs Medical Center). From a LAFCO perspective, annexation of potential agricultural land to the City of Livermore, especially in Subarea 6, would represent effective loss of farmlands. In order to reduce the significance of this agricultural land loss and to ameliorate the extent of this conflict with LAFCO policy, the *Draft Plan* contains the following policy which states:

- ***Policy 6-10*** In order to ensure a permanent open space boundary along the City's southern edge, all open space lands in the planning area, but outside the urban development areas, shall have permanent agricultural and / or open space easements placed on them or be dedicated in fee title to the City or a public open space agency designated by the City prior to Final Map approval.

Mitigation Measure 4.1-1 Adoption and implementation of *Draft Plan* Policies 6-1 and 6-3 would carry out the agricultural mitigation program initially established by the County's *Area Plan* and subsequently included in the *City of Livermore Community General Plan's* South Livermore Valley Policies. No additional mitigation would be required to address significant adverse impacts. However, the City could encourage the Livermore Area Recreation and Parks District which ultimately will manage regional parkland established in the SLVSPA to consider permitting planned and carefully monitored livestock grazing as a management tool in addition to providing for recreation and park opportunities there. In that context and in order to reduce the incremental loss of grazing and rangeland attributable to development in the SLVSPA, the *Draft Plan* should be amended to include the following policy:

- Opportunities shall be encouraged to continue low-intensity land-extensive grazing on upland parts of Subareas 4 and 7 where intensive cultivation would not be appropriate due to steep slopes or other environmental factors. Controlled grazing shall be used as a land management technique compatible with native grass preservation and regeneration and with fire prevention methods employed to reduce fuel buildup in regional park, open space, and agricultural lands.

Significance after Mitigation Implementation of Mitigation Measure 4.1-1 would reduce the potential loss of agricultural land. In addition, implementation of Policy 6-6 would improve the *Draft Plan's* conformance with LAFCO agricultural land preservation policies. However, only LAFCO can determine consistency with its policies. LAFCO will make its determination when considering the City's sphere amendment and annexation requests. Agricultural land is one of several considerations LAFCO will weigh in making its decision.

Responsibility and Monitoring Individual public or private landowners would be responsible for maintaining grazing and / or making leases available to livestock operators. Private (but not public) landowers also would be responsible for establishing and dedicating easements, and the City would be responsible for monitoring compliance. Any alternate agency designated by the City would be responsible for notifying the City when it receives deed restrictions. This will inform the City that conditions of approval imposed on individual development projects have been fulfilled so that the City could grant site alteration and development permits.

Impact 4.1-2 Loss of Prime Farmland

SLVSPA development would permanently remove prime soils and prime, important, and unique farmland and convert these resources to urban use. While the purpose of the Draft Plan *is to protect and revitalize agriculture by establishing the City's urban boundary and by providing agricultural easements for (and planting of) vineyards and orchards, any loss of these irreplaceable agricultural resources would be a significant impact. Because water availability and management practices are as important as soil capability in viticulture, mitigation measures (such as modifying the* Plan *to avoid prime soils and farmland or requiring protection of a compensatory amount of these resources in the vineyard area) would not necessarily benefit the type of intensive agriculture planned for the South Livermore Valley. Moreover, such mitigation would not be capable of replacing permanently lost resources. SU*

Soils classified by the SCS as prime are present in all subareas except Subarea 4. The extent of these soils varies among the subareas but ranges from about 15 acres (ten percent) in Subarea 5 to 392 acres (98 percent) in Subarea 2 (see Exhibit 4.1-5). Altogether, the SLVSPA contains about 848 acres of prime soils (about 45 percent of the planning area).

In Subarea 6, vineyards would retain all 130 acres of the prime soils plus the subarea's 55 acres of non-prime soils, depending on the location of the medium winery site (six to eight acres). Elsewhere in the SLVSPA, development areas in Subareas 1, 2, 3, 5, and 7 would correspond with prime soils and convert parts of their areas to non-productive uses. These areas include residential lots, as well as streets, parks, and schools. Potential agricultural lands in other parts of those five subareas would be located on remaining areas of prime soils. Nevertheless, any loss of prime soils would constitute a significant impact.

All or parts of approximately 743 lots and five potential commercial sites are located on prime soils. Their distribution is summarized below. The Subarea 2 park and Subarea 3 school sites would also be located on prime soils.

Subarea	Prime Soils		Non-Prime Soils		Total	
	Lots [a]	*Sites* [b]	*Lots* [a]	*Sites* [b]	*Lots* [a]	*Sites* [b]
1	87	0	46	0	133	0
2	574	0	0	0	574	0
3	22	2	155	0	177	2
4	0	0	130	4	130	4
5	27	1	149	4	176	5
6	0	1	0	0	0	1
7	33	1	271	0	304	1
Total	*743*	*5*	*751*	*8*	*1,494*	*13*

a Residential lots.
b Potential commercial sites.

Despite the presence of prime soils in the SLVSPA, the State FMMP only designates "Prime Farmlands" in Subarea 2. This probably reflects mapping unit size in the other subareas where prime soils are located because FMMP designations normally reflect prime soil classifications. Elsewhere in the SLVSPA, "Farmland of Statewide Importance" is mapped in Subarea 3 on one of two SCS prime soil units present. In addition, "Unique Farmlands" are mapped in Subareas 4 and 5 but on non-prime soils. In Subareas 1, 5, 6, and 7, the FMMP classifies prime SCS soils as grazing land or, as in the case of Subarea 5, "Urban and Built-Up Land", as shown below.

Subarea	Prime Farmland	Important Farmland	Unique Farmland	Grazing Land	Urban / Built Up Land
1 [a]	-	-	-	Lg, PgB, Rc, Zc	PgB
2	PgA, PgB, Rc, Zc	Lm	-	-	-
3	-	Lm	-	-	Za
4	-	-	PtB2 [b]	-	-
5			PoC2 [b]	PgA, Lm, Za	Lm, Za
6	-	-	-	PgA, PgB, Lm	-
7	-	-	-	DoA, CdB, Lg, Lm, PbB	-

a Uses the soil type abbreviations shown in Exhibit 4.1-5. Full soil mapping units names are given in Exhibit 4.1-4.
b Non-prime soil unit.

As with SCS prime soils, both development and potential agricultural uses would occur on FMMP "Prime Farmlands", "Farmland of Statewide Importance", and "Unique Farmlands". Also as with SCS prime soils, any loss of FMMP mapped farmlands would constitute a significant impact.

The amount of loss is not quantified for prime soils or FMMP land classifications. This is because any loss is considered significant. Furthermore, the locations, classifications, and extent of prime soils and important farmlands outside the SLVSPA (but elsewhere in the County's vineyard area) have not been identified.

This is for two reasons. First, identifying prime land outside the SLVSPA and preserving it would not compensate for the loss of such prime land inside the SLVSPA. This is because prime resources outside the SLVSPA must be preserved regardless of a loss of the same quality resources inside the SLVSPA. Put another way, the loss of non-SLVSPA resources would be significant with or without changes in the supply of such prime soils and farmland in the SLVSPA. Thus, the resources in one location cannot be used to replace the loss elsewhere because they are irreplaceable wherever they occur. [18]

Second, local viticulturists consider water availability and land management techniques to be equally or more important than soils types *per se* in determining what lands are suitable for cultivation as vineyards. [19]

Mitigation Measure 4.1-2 As with Mitigation Measure 4.1-1, above, approval and implementation of

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18 In other situations, mitigation can compensate for the loss of one resource through restoration and improvement or recreation of an equal or greater amount of the resource. An example is biological habitat mitigation measures. It is technically possible to improve non-prime areas to increase the productivity and enhance the agricultural capability of farmland, such as through provision of irrigation, use of agricultural chemicals (including fertilizers), and management practices. However, a secondary effect of this approach would be to decrease the supply of grazing or rangeland proportionately and, thus, contribute cumulatively to the incremental depletion of that resource (see ***Mitigation Measure 4.1-2***, below).

19 Local agriculturalists also estimate that, with extension of water, approximately 6,500 acres in the South Livermore Valley would be suitable for viticulture. This means that a greater supply of land believed suitable for viticulture exists outside the SLVSPA than would be lost inside the subareas with implementation of the *Draft Plan*, even assuming complete conversion of all ± 848 acres of prime soils (rather than a combination of development on some and potential agriculture on the rest).

the *Draft Plan* would carry out the City's already adopted agricultural mitigation program contained in the *General Plan's* South Livermore Valley Policies. However, that program would not mitigate the permanent loss of irreplaceable agricultural resources, and additional mitigation available would not address the impact and reduce it to a level of insignificance.

One potential mitigation measure would be to redesign the Draft *Plan* site plans. This measure would involve relocating residential lots and other non-agricultural land uses away from prime soils and prime, important, and unique farmlands and retaining those agricultural resources in productive use. This measure either would reduce the housing capacity of the SLVSPA or would require the addition of land with non-prime characteristics. (Additions could be expansions of SLVSPA subareas or identification of other subareas.) Without regard to local viticulture practices which do not rely exclusively on soil capability, such a revision to the *Draft Plan* would preserve prime soils and farmlands and would avoid, thus, mitigate, the impact.

The feasibility of this measure cannot be evaluated accurately. This is due primarily to the variability of local soils and their location in relation to the City. The SCS has identified 78 soil mapping units in Alameda County (of which 20 are classified as prime). Prime soils are the least constrained, and non-prime soils are progressively more constrained and / or require progressively greater management. The prime soils generally are located on flatter parts of the valley floor, and non-prime soils are located around the valley margin and hillsides. These latter areas are not adjacent to existing City boundaries. Relocation of SLVSPA housing to outlying non-prime lands could mitigate impacts from the loss of prime soils but would have secondary impacts. Such impacts would range from growth inducements due to leap-frog development and the extension of urban services to support relocated development to geologic, hydrologic, biological resource, and visual impacts (including substantial grading, potentially increased erosion and sedimentation with concomitant impacts on water quality, loss of vegetation and habitat, and associated visibility of graded areas, building sites, and structures).

An alternative to relocation would be to revise the planning program (and objectives) of the *Draft Plan*. Removal of residential lots currently envisaged on prime soils without relocation of an equivalent number of lots elsewhere could preserve significant agricultural resources but also would have secondary effects. Development of fewer total acres and fewer total housing units would reduce the amount of agricultural mitigation land permanently preserved in the vineyard area. This potentially could affect the "critical mass" of productive agricultural operations needed to restore the past prominence of viticulture in the South Livermore Valley and to ensure long-term viability of expanded vineyard acreage. Removal of residential lots similarly would reduce the SLVSPA's housing capacity and decrease its contribution to the City's housing supply proportionately. Development of different housing types and higher densities (such as attached townhouses or apartments) might compensate for some loss of housing capacity (detached units) but would alter the rural character sought in the SLVSPA.

Significance after Mitigation No feasible measure would be available to mitigate this impact to a less-than-significant level, and the impact would remain a significant unmitigable effect of adopting and implementing the *Draft Plan*.

Impact 4.1-3 Conversion of Williamson Act Lands

Non-renewal notices have been filed for eight of nine SLVSPA parcels covered by Williamson Act contracts. Contracts will expire in January 1998 through January 2005 on all except the Crohare's 48-acre eastern parcel for which a notice of non-renewal has not been filed. The entire parcels would be "non-renewed", not solely development areas of parcel. S

Except for the Crohare 48-acre eastern parcel located between Sycamore Grove Park and the U.S. Department of Veterans Affairs (VA) Medical Center, owners of all parcels covered by Williamson Act contracts have filed notices of non-renewal. These include the following:

- A notice of non-renewal was filed in 1989 for the Crohare 529-acre western parcel in Subarea 7, and the Williamson Act contract will expire in January 1998.
- Notices of non-renewal were filed in 1990 for six parcels covered in Subareas 2, 3, and 4 (except the Zumbach parcel), and those contracts will expire in January 1999.
- The Zumbachs filed a notice of non-renewal in 1996 for their parcel in Subarea 4, and that contract will expire in January 2005.

Future development of the 48-acre Crohare parcel as envisaged by the *Draft Plan* would conflict with the agricultural purpose of the Williamson Act. This means that development of Subarea 7 according to the *Draft Plan* could not proceed until nine years after non-renewal of the remaining Crohare contract. Alternatively, development could not proceed without cancellation of the contract by the City. Given the ten-year Williamson Act contract expiration period and the 15- to 25-year SLVSPA buildout period, this would not appear to constitute a significant constraint to implementing the *Draft Plan.*

Because most of the notices of non-renewal were filed before site planning was complete for the various SLVSPA subareas, notices were filed for entire parcels, not simply the development areas envisaged by the *Draft Plan.*[20] This means that Williamson Act protections and benefits will be removed from potential agricultural land within the subareas. Therefore, the assessed value of potential agricultural land will reach equilibrium with the market (development) value of contiguous development areas within the SLVSPA.

To the extent that Williamson Act contracts inhibit premature or speculative conversion of agricultural land (due to the ten-year withdrawal period), the absence of such contracts would remove one hurdle to conversion, development, and ultimate loss of additional agricultural land. This is because public plans and policies alone are not permanent and, in order to be flexible enough to respond to changing conditions or needs, can be modified or amended periodically.

Several aspects of the project address apects of conversion of Williamson Act contract lands.

First, the *General Plan Amendment* accompanying the *Draft Plan* would add a provision to the *City of Livermore Community General Plan's* South Livermore Valley Policies requiring sponsors of individual development projects in the SLVSPA to enter into pre-annexation agreements in order to avoid premature annexations.

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[20] Notices of non-renewal were filed by the individual landowners on their own initiative. While an indirect result of both the City and County's planning process for the South Livermore Valley, non-renewal is not a formal part of the planning process leading to formulation the the *Draft Plan.*

Second, the *Amendment* would establish both a base land use designation and urban overlay district for the SLVSPA. It would designate Agriculture-Viticulture as the base land use and require an 100-acre minimum parcel size. The overlay district would permit urban development and associated land uses provided that conditions governing development of the respective subareas are met. The urban overlay district would provide for the following land uses: [21]

- ***Wine Country Residential*** which would allow development of no more than 1,494 single family housing units with densities ranging from 1.5 to 3.5 units per acre as expressly provided on a subarea-by-subarea basis

- ***Wine Country Commercial*** which would allow development of no more than 13 commercial projects on specifically identified sites with uses and maximum sizes designated by the *Plan*

- ***Agricultural Preserve*** which would encompass all potential agricultural land inside the SLVSPA and allow intensive cultivation of vineyards and orchards

In addition, the *Amendment* would provide that Wine Country Commercial areas not developed as commercial sites would revert to Agricultural Preserve.

These land use designations only would be available upon full compliance with the conditions enumerated in the *Draft Plan* and with the urban overlay district established by City approval of the *Plan*. Otherwise, the Agriculture-Viticulture designation would govern land use. It would retain land in sufficiently large blocks to permit continued agriculture (or allow reintroduction of agriculture), thus indirectly promoting one objective of Williamson Act contracts. Subdivision into smaller parcels generally discourages a long-term commitment to agriculture.

Mitigation Measure 4.1-3 The *Draft Plan* should be amended to include the following policy to mitigate the potential conflict with the Williamson Act from development of Subarea 7:

- The City shall not approve any individual development project(s) on land subject to Williamson Act contracts and shall not cancel contracts on land within the South Livermore Valley in its jurisdiction. Parcels proposed for development according to the *Plan* shall be free of contracts before site alteration or construction activities are permitted, including installation of infrastructural facilities.

Significance after Mitigation Adoption and implementation of the *General Plan Amendment* provisions described above and amendment of the *Draft Plan* as described in Mitigation Measure 4.1-3 would be required to mitigate this impact to a less-than-significant level.

Responsibility and Monitoring The City would be responsible for implementing and monitoring Mitigation Measure 4.1-3.

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21 Other land use categories included in the *Amendment* are "school", "parks", and "open space".

Impact 4.1-4 Compatibility of Adjacent Land Uses

- *New predominantly residential development would occur near existing residential and non-residential land uses. Residential uses generally tend to be more sensitive to non-residential activities and operations than other uses, but most adjacent uses would be similar and / or compatible in type and character. LTS*

- *Encroachment of a new residential population in close proximity to non-residential uses (which formerly were isolated from neighboring uses) could cause new or intensify previously encountered conflicts. While most of the impacts from these changes would not be expected to be significant, potentially significant conflicts may exist between the compatibility of residential development in Subarea 1 and activities on the adjacent Sandia National Laboratories site. PS*

Land use compatibility in the SLVSPA encompasses a number of interrelated issues which, for the EIR, are divided into two components:

- Compatibility of new predominantly residential uses with existing or new residential or other urban uses inside or outside the SLVSPA. This is analyzed in ***Impact 4.1-4***.

- Urban-rural conflicts due to introduction and expansion of a residential population in close proximity to active agricultural operations These are analyzed in ***Impact 4.1-5***, below.

SLVSPA Uses Certain land uses are considered more sensitive to different land uses than others. This is because activities or operations of some types of uses can have impacts on adjacent or nearby uses. Sources of conflicts between dissimilar uses can include noise, air pollutants, odors, dust generation, and potential hazards due to operations or by-products of activities conducted (such as risks of fire, explosion, release of toxic substances, etc.). Residential uses tend to be most sensitive to non-residential activities. Similarly sensitive land uses include schools and hospitals. Commercial and industrial uses are considered progressively less sensitive developed uses. (Agricultural uses, discussed further below, are highly sensitive to adjacent residential uses where urban and rural uses are contiguous while generally more compatible with commercial and industrial operations.)

Within the SLVSPA subareas, the great majority of new development would be residential. Additional park and school uses would complement residential uses. The combined effect would be similar to other neighborhoods located elsewhere in Livermore, although perhaps with different resulting densities and characters. This combination of typical suburban uses would be considered compatible from a land use perspective.

SLVSPA commercial sites would differ in character from neighborhood and community commercial uses developed elsewhere in Livermore. The sites would cater primarily to visitors and tourists and would include commercial retail, food and lodging, and quasi-industrial uses. Such uses are not necessarily incompatible with residential uses, although in conventional suburban areas they normally are segregated from residential areas. In the SLVSPA, the commercial sites would be located at the perimeter of residential development areas and would have direct access from areawide roads, thus separate from residential streets serving the subareas. Commercial sites would generate traffic and noise due to operations (wineries, kitchens at restaurants, and vehicular noise in parking lot, loading docks, trash disposal areas, etc.). Such conflicts are examined in the appropriate topical sections of the EIR.

Uses Outside the SLVSPA In addition to scattered rural residential and ranchette development in the vicinity of the SLVSPA, existing residential neighborhoods are adjacent to or near several of the

subareas on one or more sides, and various non-residential developed uses also are located contiguous to close to the subareas.

Residential development is located north and west of Subarea 2 (north of East Avenue and along Buena Vista Road, respectively), west of Subarea 3, north and west of Subarea 4 (north in the Reed-Edwards area, farther north across Marina Avenue, and west across Arroyo Road), and north of Subarea 5. Residential development is planned west of Subarea 7 in the Vineyard Estates' project. SLVSPA development would extend these established land uses. In a land use context, adjacent residential areas would be compatible with each other. In some subareas, new housing would be developed near rural residential and commercial recreation parcels where domestic livestock is kept. Conflicts over such animals could be similar to traditional urban-rural conflicts (see ***Impact 4.1-5***, below) except that efforts to reconcile problems would not be expected to affect commercial viability as occurs when farmers at the urban-rural interface pull operations back from residential uses to minimize conflicts.

The U.S. Department of Veterans Affairs (VA) Medical Center located south of Subarea 7 provides both on-site and out-patient care. Residential facilities include a 120-bed nursing home and 45-bed sub-acute care hospital. The out-patient clinic functions as do medical (professional) offices at other locations. The 118-acre campus is south and uphill of Subarea 7.[22] Access is via Arroyo Road (south of the Wetmore Avenue intersection), separate from Subarea 7 access which would be provided from the west (via Vallecitos and Foley Roads). Rather than the VA Medical Center representing a potential conflict with Subarea 7 development, a new residential population in such close proximity to this facility could increase incidents of trespass and affect patients' privacy. Most of the grounds of this public facility are fenced, including the entire patient area.[23] In addition, the VA has its own police force which handles problems at the site.

Non-residential development is more varied in character. The most prominent non residential uses include:

- The Sandia National Laboratories research and development facility north and east of Subarea 1
- The Shaheen Industrial Park northeast of Subarea 2
- Robertson Park which contains the City's corporation yard, active sports, and rodeo / equestrian facilities north of Subarea 3
- Ravenswood and Independence Parks north of Subarea 5, Sycamore Grove Park contiguous to Subarea 6 (south) and Subarea 7 (north), and Veterans Park east of Subarea 7
- The Zone 7 water treatment plant west of Subarea 7

Sandia National Laboratories[24] The 413-acre Sandia National Laboratories (SNL) complex consists

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22 The eastern panhandle part of Subarea 7 is contiguous with the Veterans Affairs' (VA) facility. The VA facility is south of and overlooks the eastern part of the subarea. The western upslope part of Subarea 7 is separated from the western VA boundary by intervening parcels. Those parcels are neither part of Subarea 7 nor the VA facility.

23 Nichols • Berman conversation with Jim Pitzer, Engineering Department, Livermore Division, U.S. Department of Veterans Affairs. November 1996.

24 Nichols • Berman conversation with Steve Carpenter, Facilities Planning and Engineering Department, Sandia National Laboratories (SNL), December 5, 1996, and the following SNL materials: *Fiscal Year 1995 Site Development Plan, February 1996 Sandia National Laboratories Fact Sheet*, and letters to Marc Roberts, City of Livermore Planning Department from Steve Carpenter, *op. cit.*, July 16 and August 28, 1996.

of a 246-acre industrial core area surrounded by a 167-acre security buffer zone, both of which are fenced, lighted at night, and patrolled by armed security guards 24 hours a day. [25] SNL's research and development operations are located in the core area and include an Integrated Manufacturing Technologies Laboratory and a Hazardous Test Area. [26] The Hazardous Test Area is used to store and test high explosive, high pressure, dynamic materials and components. It is located about 950 to 1,500 feet from Subarea 1 and is partly buried and bermed to contain accidental explosions.

SNL uses, stores, and disposes of hazardous substances in the site's core area in accordance with its California Hazardous Materials Management Plan submitted to Alameda County's Hazardous Materials Program annually. These materials currently are limited to chemical substances, but SNL expects that biological substances typically used in standard bacterial recombinant DNA research may be introduced in the future.

SNL's security buffer zone contiguous to Subarea 1 contains percolation ponds operated by Lawrence Livermore National Laboratory (LLNL). LLNL currently pumps 11.5 million gallons of potable water into the ponds per month, is expected to increase this amount to 13 million gallons per month by mid-1997, and is anticipated to reduce flows gradually for at least 50 years thereafter. Maintenance involves draining and discing one pond every three to six months with farm equipment. One pond is located about 200 feet from Subarea 1. [27]

The *Draft Plan's* site plan for Subarea 1 would set 30 of 33 contiguous residential lots back 50 feet from the boundary with SNL's security buffer zone which would provide an additional 200-foot setback from the facility's core area. [28] SNL's setback was designed to prevent intruders from entering its facilities at a time when surrounding land uses were agricultural, and residential and other development was not envisaged. The setback also functioned secondarily to buffer predominantly agricultural off-site land uses from potential hazards created on the SNL site.

From SNL's perspective, introducing non-agricultural development immediately outside its security buffer zone would not be ideal, and continued agricultural use, including intensive viticulture, would be preferable. Therefore, the *Draft Plan*, as presently envisaged, would result in a potentially significant impact. An alternate site plan -- to relocate Subarea 1's potential agricultural land closer to the SNL boundary and residential development areas closer to South Vasco Road -- would be more appropriate from SNL's point of view. However, such an alternative would conflict with *Draft Plan* objectives. The *Draft Plan's* site plan would provide wide setbacks between the road and development and would plant the setback with vineyards to reinforce the rural character of South Vasco Road and create a wine

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25 The security buffer zone fence along the property line contiguous to Subarea 1 currently is a livestock fence. Upon approval and construction of residential development in Subarea 1, SNL would replace this fence with an eight-foot high chain link security fence topped with outriggers and strung with barbed wire. Security personnel train and practice at a firing range located in the site's southern hills between 8:00 AM and 10:00 PM (but not continuously). Night firing is necessary for security force training (see ***4.7 Noise***).

26 The Integrated Manufacturing Technologies Laboratory facility is illuminated all night by high intensity lighting. SNL plans to install additional exterior lighting along the Sandia Drive loop road. Both are visible from Subarea 1.

27 The ponds reportedly are the source of odors believed to result from decomposing vegetation (see ***4.6 Air Quality***).

28 SNL's buffer is the minimum width necessary to ensure the facility's security. Budget considerations determined how much security buffer land SNL originally acquired in the 1950s.

country entrance desired there. An alternate plan which would move development parallel and close to the roadway would not provide such a gateway.

Shaheen Industrial Park The Shaheen Industrial Park is a low-rise low-density office and business complex developed with free-standing buildings on separate parcels. Businesses located on the perimeter of the complex (adjacent to the northeast corner of Subarea 2) primarily include building contractors and related enterprises. Some of these businesses are American Fitness, Award Signs, Chuck's Custom Cabinets, Cunningham's Affordable Caskets, Coast Fire Equipment, Construction and General Laborers' Union Local 304, Environmental Care, Inc., Jennings Cabinets, L. Karle Co., Inc., Production Machining, Lumicon, Orange Coast Cooperative, Plumbing by Thomas, RAS Builders, Ranch Industrial Supply, and Thurman & Company Painting and Decorating.

Except for L. Karle Co., Inc., most of these uses nearest to residential development envisaged in Subarea 2 are office and support facilities for off-site activities dispatched from the industrial park and are not engaged in activities on-site which would conflict with adjacent residential uses. L. Karle manufacturers screws at its Shaheen Industrial Park site, but all activities are conducted inside its facilities. According to company staff, operations comply with Occupational Safety and Health Administration noise level requirements and would not affect nearby residential uses in Subarea 2 (see ***4.7 Noise***). However, the company stores metal chips outside to be sold for scrap which could become an attractive nuisance (such as potentially attracting children who live in adjacent housing units who might trespass, possibly injure themselves on the L. Karle site, or take metal chips).

Another Shaheen Industrial Park business, Environmental Care, Inc., is a commercial landscape maintenance contractor which dispatches crews throughout the day between 6:00 AM and 5:00 PM. [29] On-site operations include storing and repairing equipment (indoors), holding plant materials until needed at work sites (outdoors), and collecting organic debris (lawn cuttings, leaves, etc.) not recycled at work sites (outdoors). The company has experienced trespass, vandalism, and theft despite site security (a cyclone fence topped with razor wire and nighttime lighting) and would be concerned about increased incidents by adjacent residents after development of Subarea 2.

Except for some exposure to or visibility of nighttime lighting by future SLVSPA residents, compatibility questions involving these adjacent land uses relate more to potential impacts on existing industrial use anticipated from a residential population than on residents from nearby industrial operations.

Maintenance Services Facility The City of Livermore's Maintenance Services facility is located in the eastern part of Robertson Park, north of Robertson Park Road which forms the northern Subarea 3 boundary. Robertson Park is an active sports complex which includes the rodeo stadium, soccer fields, and baseball diamonds (discussed below under *Public Parks and Recreation Areas*). Robertson Park Road and adjacent landscaping separate the Maintenance Services facility and subarea by more than 50 feet. This four-year old facility houses the City's parks and trees, streets, electrical, and vehicle maintenance operations and equipment storage. It is fenced and locked during off-hours. On-site

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29 The EIR consultant only contacted selected (not all) businesses located on the perimeter of the Shaheen Industial Park and chose those with names which suggested potential land use conflicts -- either impacts on future residents due to their operations or impacts on their operations due to the proximity of a large new residential population. Examples are summarized above. Environmental Care, Inc. was contacted to determine whether the firm was involved with hazardous materials on- or off-site. It is not.

vehicle maintenance work is conducted inside between 5:30 AM and 5:00 PM, although crews for off-site park, tree, street, and electrical work are dispatched from the facility at any hour of any day, especially when emergency repairs are needed during winter storms. In addition to City vehicles, the facility maintains other jurisdictions' vehicles (such as the Tracy Fire Department, Dougherty Fire Department, Livermore Valley Unified School District, and Zone 7). Operations account for traffic on Robertson Park Road to and from both Wente Street (east) and Arroyo Road (west) (in addition to traffic attributable to the park). Maintenance Services facility activities, including vehicle repair and service, are typical of a corporation yard. They are not suited within residential zones but are not incompatible with adjacent residential neighborhoods -- the areas where those services are needed on a day-to-day and emergency basis.

Public Parks and Recreation Areas Residential and park uses normally represent compatible land uses, although some types of activities, particularly community-scale parks with team sports areas, ballfields, or facilities lighted at night, result in complaints by neighbors who hear or see park activities, especially at night. Such potential conflicts are examined in the appropriate topical sections of the EIR.

In Robertson Park, routine day-to-day park and recreation activities would be similar in character to those expected in the school yard / playground of the Subarea 3 school site, thus compatible with new residential development. Activities with a greater potential for generating community response would occur periodically (such as the rodeo, July 4th commemoration, and outdoor concerts). Complaints about noise would be expected with use of amplified public address and sound systems. Large special events could result in influxes of cars parked on neighborhood streets. These types of nuisances would not constitute land use conflicts and, while potentially annoying, would not pose health or safety hazards. Thus, they would not represent significant impacts.

Ravenswood, Sycamore Grove, and Veterans Parks differ from Robertson Park and each other. Ravenswood Park encompasses an historic estate for visitors to tour and consists of restored buildings and a vineyard. Sycamore Grove and Veterans Parks are low-intensity open space areas for walking, jogging, riding (bicycles and horses), and nature appreciation. All three parks would be more sensitive to the introduction or intensification of urban land uses nearby and represent less of a potential conflict with new residential uses in adjacent SLVSPA subareas. Buildout of adjacent subareas would change visitors' experiences at these parks due to the proximity of new development and evidence of normal residential activities typical of neighborhoods throughout the City.

The change could be most profound at Sycamore Grove. This park's location beyond the urban-rural interface isolates it from the City and from ranchette development present in Subarea 5. The current park experience results from the sense of a larger open space area than actually contained in the park boundaries -- namely undeveloped Subareas 6 and 7 which flank the park. Planting of vineyards in Subarea 6 would reinforce the buffer, sense of separateness, and feel of expansiveness which characterize Sycamore Grove Park. However, the proximity of a new subdivision on Subarea 7 would enclose the southern park boundary and alter the existing perception of unlimited expanse of open space which recedes from the lower flood terraces up the rangeland hillsides beyond the horizon. Except for residential development in the northeast corner of Subarea 7, development elsewhere in the subarea would not be visible from the park.

Despite these changes, none would represent a land use conflict or significant land use impact *per se*.

Zone 7 Del Valle Water Treatment Plant Zone 7's Del Valle Water Treatment Plant is located west of Subarea 7 where it has operated for approximately 20 years. Water from the South Bay Aqueduct is

pumped into the facility, treated, and distributed to customers. Treatment presently involves use of ammonia and chlorine gas. Chlorine gas is a dangerous substance which poses a special hazard to people located downhill from an accidental release because it is heavier than air. In 1997 Zone 7 will substitute liquid sodium hypochlorite for chlorine gas. Sodium hypochlorite poses a much lower risk to people.

Water treatment occurs inside the on-site building, but waste separated during treatment is discharged into outdoor ponds. Indoor and outdoor operations involve the use of valves, blowers, and vehicles (such as front-end loaders which clean the settlement ponds). The site is fenced, and standard outdoor street and parking area lights illuminate the facility at night.

Traffic to and from the treatment plant on Foley Road includes daily tanker truck trips delivering chemicals, Zone 7 employee trips, and maintenance contractor trips. Most traffic occurs between 8:00 AM and 4:00 PM daily and when shifts change. (The maximum number of employees on-site during the day shift is 15.)

Plant personnel anticipate that development in Subarea 7 would result in complaints to Zone 7 by new residents about site operations and also expect that development would increase security requirements at the facility. Some new residents might not be aware of the proximity of the plant or might not be familiar with the purpose and operational characteristics of the facility when they move into Subarea 7. Except for traffic, plant activities would be confined to the Zone 7 site. Off-site noise incidents (such as from daily tanker truck trips up Foley Road) could annoy or irritate residents but would be too isolated to constitute an impact.

Mitigation Measure 4.1-4 Off-site uses where increased incidents of trespass, vandalism, or theft are expected as a result of the new residential population introduced by SLVSPA buildout already are fenced for security. Existing fences afford as much protection as would be reasonable in consideration of the expected significance of impact. The following measures (already included in Draft Plan site plans and described in Land Use Element development concepts) would further reduce impacts if incorporated as a condition of project approval:

- Fifty-foot or wider landscaped and cultivated setbacks would separate residential lots from subarea boundaries and from different adjacent uses or densities. Fifty-foot setbacks would be located in Subareas 1 and 2, adjacent to SNL and the Shaheen Industrial Park, respectively. Cultivated setbacks of varying widths would provide both visual and functional buffering from existing on- and off-site land uses in all subareas (see ***Impact 4.1-5***, below).

- Within the 50-foot wide landscaped buffer in Subarea 1 adjacent to the SNL property line, planting trees 30 feet away from the boundary and allowing only low-growing shubbery or ground cover in the intervening buffer to permit visibility for security purposes and avoid creating places for intruders to hide or obtain access to SNL while shielding and privacy for residential uses in Subarea 1.

- Separate access driveways would be provided to commercial sites and residential neighborhoods within the SLVSPA to segregate residential and non-residential traffic. Except for use of Hansen Road in Subarea 4 and Foley Road to Subarea 7, subarea access generally would be separate from access to existing uses. (Hansen Road currently serves the Corbett and Zumbach parcels and would be used to provide access to new development on those and the McKissack parcels. Traffic to the existing Zone 7 facility and future Subarea 7 development would use Foley Road for access.)

Significance after Mitigation The features of the *Draft Plan* as detailed in the Mitigation Measure above would not eliminate the potentially significant land use compatibility impact expected to result from residential development adjacent to SNL. However, combined with Conservation and Resource Management Policy 6-42 (discussed in ***4.7 Noise*** which would require owners of residential property in Subarea 1 to grant easements to SNL giving it the right to generate noise), the impact would be reduced to a level the City deems acceptable, thus resulting in less-than-significant impacts.

Responsibility and Monitoring The City would be responsible for working with SNL and / or for requiring sponsors of individual development project(s) in Subarea 1 to work with SNL to select, install, and maintain landscaping satisfactory to all parties. Especially in the latter case, the City would be responsible for monitoring successful resolution and implementation.

Impact 4.1-5 Urban-Rural Conflicts

Encroachment of non-agricultural land uses in close proximity to agricultural activities inevitably results in urban-rural conflicts on agriculturalists and non-agriculturalists alike. However, farmers typically alter their practices in response to complaints in order to resolve conflicts which, in turn, can affect the efficiency or viability of operations. PS

Urban-Rural Conflict Overview

A fundamental goal of the proposed South Livermore Valley Specific Plan is to allow a limited amount of urban land within the South Livermore Valley in a manner that protects and expands the acreage that is in agriculture. The design concept is to integrate urban development and agricultural uses in a manner that both protects the agricultural viability and at the same time enhances the urban environment. New residential units would benefit from the permanently protected adjacent agricultural land. Agricultural land protection in turn relies on development of a limited number of new homes. However, this design goal has the potential to create land use conflicts between residential and agricultural uses.

The term "urban-rural conflicts" refers to impacts on farmers from non-agricultural activities and on non-agricultural land uses (most often residential) from agricultural operations when these different uses are located in close proximity. These conflicts occur when non-agricultural uses are introduced in agricultural areas due to land conversions and development. They result when people with urban habits and expectations are exposed to agricultural activities which account, for instance, for spray drift from applications of agricultural chemicals, dust fall from discing of fields and wind blowing across bare ground, and noise from operating agricultural equipment. They also result in increased access to farmlands by non-agriculturalists as a consequence of encroaching urbanization and account for in trespass, theft, and vandalism in fields, of produce, and of equipment by people and their pets. Because proximity to the urban shadow increases the value of land (for its development, not agricultural, value), some farmers on the urban edge convert to planting high value crops -- crops which may not be processed or treated with agricultural chemicals. Due to their accessibility, crops at the urban edge are particularly prone to theft.

Urban-rural conflicts are not confined to the interface of urban or suburban density residential development with farmland. They occur where the primary land use is residential, even rural density residential and ranchette development, and where there is a rural character and appearance expressly sought by residents. This occurs when residents of low density rural residential and ranchette development are not actively (or historically) engaged in commercial farming or ranching occupations on their parcels or in the surrounding agricultural zone, or where residents do not understand the needs

of agricultural operations. Such residents can be less tolerant of and become irritated by agricultural practices. They also can be annoyed by the times of day agricultural activities occur, especially when sleeping at night or in early morning hours.

Where urban-rural conflicts occur, farmers usually alter their operations to reduce or avoid complaints from and impacts on non-agricultural neighbors. They initiate changes voluntarily in order to be neighborly or to protect themselves from potential harassment and do so without the knowledge or encouragement of public officials. The result can be to pull back operations, decrease productive area, and reduce profitability due to less land farmed less efficiently. Examples for some operations include when irregularly shaped parcels are created which hamper maneuverability of equipment or require substantially increased manual labor to farm. [30]

Agricultural operations can result in periods of intense activity which may last for 15 hours or longer a day. During these periods, people are present and equipment is used in vineyards, orchards, and fields. These periods occur during frosts and also correspond to other seasonal activities, including harvests. Such activities can generate audible noise in the early morning or late evening and disturb nearby residents who are not involved in agricultural production themselves.

Dust is generated by wind blowing across exposed soils not planted with cover crops and by operation of vehicles and equipment on dirt roads where movement suspends particles. It is expensive to grow cover crops in soils with high gravel content, but gravelly soils (such as present in parts of the South Livermore Valley) are less susceptible to dust generation than other soil types. [31] In general, viticulture does not generate much dust, especially when compared with row crops.

Agricultural chemicals (such as sulfur) do not pose significant health hazards and are not applied frequently, but their use can bother people, especially due to winds in the valley, who complain directly to farmers or the County's Agricultural Commissioner. However, County regulations limit spraying to periods when winds are less than five mile per hour to reduce drift.

In the South Livermore Valley, agricultural professionals, agriculturalists, and government representatives have different perspectives and experiences with urban-rural conflicts. Some report that noise, dust generation, and spray drift (or over-spraying) are the most frequent complaints by residents who live near the urban-rural interface. [32] Others report that problems mainly consist of damage when cars run off roads. [33]

However, Livermore Valley viticulturists have not generally suffered significant conflicts with adjacent residential uses over the years. There are likely a number of reasons why this is the case. The first is

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30 The agricultural community is making concerted efforts to develop and refine technology and practices to reduce or minimize urban-rural conflicts. These include quieter machinery, equipment for applying agricultural chemicals more judiciously and efficiently (such as one which senses the presence of a plant or tree before spraying), and integrated pest control and other growing techniques. Even when readily available, however, new equipment is expensive.

31 Agricultural operations which require discing of fields (such as for cultivation of row crops) typically generate ten times more dust than grape growing. Nichols • Berman conversation with Terry Huff, *op. cit.*

32 Nichols • Berman conversation with Terry Huff, *op. cit.*

33 Nichols • Berman conversation with Mike Gatzman, *op. cit.*

that impacts from viticulture are less intense than many other high value crops that require substantial amounts of discing and spraying to succeed. Other wine regions in California generally report less conflicts between viticulture and adjacent residential uses as compared to more intensively farmed row crops. Second, the Community has a long-term cultural acceptance of viticulture as an important asset to the region. Intensive agriculture is not seen as a temporary or transient use. Therefore, homeowners do not have an expectation that eventually the agricultural uses will be abandoned. To the contrary, the permanence of the agricultural resource adds value to the homes in the area that benefit from this permanent "open space" use.

Third, ongoing informal communication between the agriculturists and residents has been instrumental in maintaining good relations between these very different land uses. Especially in areas with new homes, local agriculturists periodically brief homeowners on the operations and upcoming activities so that the they are informed about the agriculture use. Moreover, these interactions provide an opportunity for each group to better understand what issues are important to the other. This means that there is less likelihood of activities that will be an irritation or nuisance. Finally, it is essential to establish realistic expectations by the new homeowners about what it means to live adjacent to agricultural activities. This has been done informally in the past through Realtor information to new home buyers, although the City now proposes to formalize this notification process through a right-to-farm ordinance.

Right-to-Farm Ordinances

One approach to reducing the impacts from urban-rural impacts on agriculturalists is the adoption of right-to-farm ordinances. Such ordinances are enacted to protect farmers from liability claims based on their use of agricultural equipment and from engaging in routine agricultural practices in rural areas where non-agricultural development is encroaching on farming operations, and to provide adequate notice of farming operations to new residents. The concept underlying right-to-farm ordinances is that farming preceded non-agricultural development, and the ordinances assert the priority to farm as a public policy. In addition to providing notice to new residences, ordinances are intended to make it more difficult for owners of non-agricultural property to claim infringement on their rights by nearby farm operations.

The City has prepared a draft right-to-farm ordinance and plans to adopt it as part of the package of actions taken to approve and implement the *South Livermore Valley Specific Plan.*[34] The draft ordinance would declare that a farm operated in compliance with Federal, State, and local laws is not a nuisance. It also would require the placement of "right to farm deed restrictions" on non-agricultural land located within 1,000 feet of agricultural land or agricultural operations. The required deed language would notify first-time and subsequent buyers of the proximity of agricultural activities and the types of practices they could encounter. The *Draft Plan* contains the following policies which relate generally to the right-to-farm ordinance and specifically to one source of urban-rural conflicts the ordinance would address:

- ***Policy 6-44*** The City of Livermore shall adopt and enforce a right-to-farm ordinance.
- ***Policy 6-45*** All new home-buyers in the Specific Plan area will be notified in their deeds of the potential for noise conflicts associated with agricultural activities and the existence of the City's

[34] If adopted by the City, the right-to-farm ordinance would add a new Chapter 8.16 to the Livermore Municipal Code.

right-to-farm ordinance. The deed declaration will make explicit that noise generated from normal agricultural operations with and required to perform agricultural operations is allowable and is not subject to control or regulation in response to complaints from the adjacent residential property owners.

Local government in agricultural regions sometimes augment right-to-farm ordinances with zoning regulations which require specified setbacks of habitable non-agricultural development from agricultural land. The distance varies from place-to-place, and no rule-of-thumb setback has been shown to be effective or to represent a minimum standard. In Livermore, setbacks of 25 to 100 feet have been used. Alameda County's *East County Area Plan (ECAP)* establishes a program to develop guidelines for creating buffers between agricultural and potentially incompatible uses, including setbacks and / or barriers. [35] Elsewhere in California setbacks range from about 100 to 200 feet, depending partly on the type and sensitivity of crops cultivated or the presence or absence of natural or man-made barriers which would prevent or discourage intrusions into the agricultural zone by non-agriculturalists. Experience generally has shown that a combination setback and barrier (fence or wall) is most successful in reducing urban-rural conflicts, that setbacks alone or barriers alone are less successful, and roads are least effective barriers (and actually facilitate access). Some agriculturalists estimate the width of the urban shadow to be one-third mile (approximately 1,760 feet), defined as the area most susceptible to impacts from non-agricultural development.

The *Draft Plan's* Conservation and Resource Management Element contains the following policy related to provision of agricultural buffers in the SLVSPA:

- ***Policy 6-9*** To enhance the wine country character of proposed development, agricultural buffers between external public roadways and development areas shall be developed in accordance with the site plans set forth in this Specific Plan. In addition, site designs shall integrate areas of active agriculture with developed areas to the extent consistent with maintaining agricultural viability.

Project and Impacts

The potential for urban-rural conflicts could occur inside or outside the SLVSPA subareas. Within the subareas residential activities and productive use of "potential agricultural land" could conflict. In addition, it is less likely due to setbacks within subareas, but SLVSPA residential use and new or ongoing agricultural operations outside the SLVSPA could conflict.

As noted above, suburban residential development and adjacent vineyards have coexisted in Livermore for 20 years and have done so without a right-to-farm ordinance. The successful coexistence of residential and agricultural land uses in the Valley can be attributed to the informal ongoing communications between these groups, as described above. Examples include residential development on East Avenue and Guilford Drive in the City and on Buena Vista Road in the County. Based on this premise, development envisaged by the *Draft Plan* is expected to trigger some complaints but not result

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35 *East County Area Plan*, Alameda County, May 1994, Program 31:

> The County shall develop guidelines for establishing *buffers* between existing agricultural uses and potentially incompatible uses. Buffers may take the form of precluding incompatible uses within a certain distance of agricultural operations, erecting physical barriers to nuisances such as ebrms of foliage, or mitigation of impacts to non-agricultural uses (e.g., noise insulation). Buffers may consist of a topographic feature, a substantial tree stand, watercourse, or similar feature.

in significant conflicts. To the extent that future conditions after *Plan* implementation conform with past experience, no significant impacts would occur.

However, given the possibility for conflict describe above, a full discussion of potential impacts are included below, as are a description of the Draft Plan's site plans and an analysis of the effectiveness of the City's proposed right-to-farm ordinance.

Inside the SLVSPA, "potential agricultural land" would be located around the perimeter of residential lot areas or along the boundaries of subareas. The site plans illustrate the Draft Plan goal:

- To integrate urban development and agricultural uses in a manner which preserves and protects agricultural viability while enhancing the urban environment.

Subarea 1 According to the *Draft Plan's* site plans, potential agricultural land would separate clusters of existing and new housing units in Subarea 1, thus filling in intervening land (and also joining the existing Rios vineyard). No new residential lots would be created immediately adjacent to existing on- or off-site vineyards. The actual urban-rural interface would consist almost exclusively of new housing and new agricultural land within Subarea 1. Ninety-one (91) units would abut agricultural land. Other lots would be set back from off-site agricultural operations on the SNL land by the subarea's security buffer.

Subarea 2 New vineyards primarily would separate residential development from South Vasco Road, acting as a setback, and secondarily would separate some clusters of new housing units within Subarea 2. New residential lots would be created immediately contiguous to existing vineyards which surround the development area on three sides. Sixty-five (65) new units in Subarea 2 would be adjacent to (or across a new road from) new agricultural land, and 90 new units would be located immediately contiguous to existing vineyards. This is the only subarea where new residential development would adjoin existing agricultural land without any intervening roadway or setback buffer to separate agricultural and non-agricultural land uses.

Subarea 3 New agricultural land within the subarea would set new residential development back from perimeter streets. Thirty-five (35) lots would be next to (or across a new on-site road from) new subarea vineyards. No new Subarea 3 residential lots would be developed next to existing vineyards. All existing vineyards near Subarea 3 are located across existing (Wente Street) or planned (Concannon Bouelvard) roadways from the subarea.

Subarea 4 The *Draft Plan* suggests the expansion of existing olive orchards and addition of new vineyards in the southern part of Subarea 4 (the former primarily on the Hansen and some of the Corbett parcels and latter primarily on the McKissack parcel). Some clusters of new residential lots would be separated by orchards and vineyards. One hundred twenty (120) new lots would abut some type of agricultural land -- existing agricultural land to remain (including grazing land), potential new agricultural land, and / or setbacks planted with agricultural crops (such as adjacent to existing rural residential parcels in the Edwards / Reed Avenue area outside of Subarea 4). Agricultural land off-site includes rangeland separated from developed parts of the subarea by potential new agricultural land or new public open space. Future agriculture in Subareas 5 and 6 would be located across Arroyo Road from agricultural land in Subarea 4.

Subarea 5 Potential new agricultural land would set most new residential lots back from perimeter roads and separate some existing homes from new on-site housing clusters. Potential new agricultural

land within Subarea 5 would revitalize some existing agricultural operations but also would be located near substantially more new agricultural land across Arroyo Road (in Subarea 4) and Wetmore Road (in Subarea 6). Thirty-five (35) new residential lots would adjoin potential new agricultural land within Subarea 5 directly or face agricultural operations across subarea roadways.

Subarea 6 This subarea would be planted with new vineyards and potentially only developed with a commercial site (assumed to be a medium-size winery).

Subarea 7 This subarea presently is used for grazing. The *Draft Plan* suggests that potential agricultural land would convert some rangeland to intensive agriculture (and assumes vineyards) while retaining some rangeland on the upper elevations of the southern part of the subarea. Potential new agricultural land would surround the subarea's three main development areas and result in 42 housing units immediately contiguous to intensive agricultural use. On-site agricultural lands would adjoin off-site agricultural lands located north and south of the subarea, and Foley Road would separate both new residential and agricultural lands in Subarea 7 from existing agricultural lands off-site.

These site planning configurations were designed to provide maximum exposure of new residential lots to agricultural land -- "to create a sense for future residents that they 'live in the vineyards' ". They also present opportunities for two types of urban-rural conflicts. One would be between on-site residential and on-site agricultural uses. The other would be between on-site residents and off-site agricultural operations.

Within the subareas, yards of individual lots, on-site access roads, and landscaped areas would set housing units back from new SLVSPA vineyards or orchards. Except in Subarea 2, new SLVSPA vineyards and orchards also would set new housing back from adjacent agricultural operations currently located inside or outside the SLVSPA. (In Subarea 2, new lots would be immediately contiguous to existing vineyards inside the SLVSPA.) The minimum house setback on lots contiguous to agricultural land would be 20 feet.

Perimeter lots contiguous to productive agricultural land likely would be among the most desirable and most valuable residential sites in the SLVSPA. Such lots would be marketed expressly for their proximity to vineyards or orchards. From this perspective, prospective buyers simply would need to be informed about exposure to agricultural operations and agriculturalists' right-to-farm. This presumes that people bothered by farming activities would not buy homes near productive agricultural land.

While deed restrictions and notification requirements contained in the City's draft right-to-farm ordinance would affirm the preeminence of agriculture and technically would protect farmers inside and outside the SLVSPA from complaints, the ordinance would not eliminate the potential nuisance of receiving or responding to complaints. Moreover, the ordinance would not prevent the potential for increased incidences of trespass, vandalism, or theft by new residents or people newly attracted to the SLVSPA.

The *Draft Plan's* site plans would concentrate potential urban-rural impacts -- those which affect agriculture -- on the SLVSPA's potential new agricultural land immediately contiguous to new residential development. The *Draft Plan* designated these lands to create a rural agricultural character for SLVSPA wine country visitors driving along area roads and to provide vineyard and / or orchard views for new SLVSPA residents as an amenity. Where present, they also might help buffer new residential uses and on-going agricultural operations outside the SLVSPA. However, these SLVSPA agricultural bands would range in depth from about 100 to 500 feet, only a fraction of the 1,760-foot

estimated width of the hypothetical urban shadow. Therefore, the potential SLVSPA agricultural land bands may serve a future visual function but may not fully protect off-site agricultural operations from impacts attributable to encroachment of non-agricultural uses.

Based on the *South Livermore Valley Area (Area Plan)*, a 19-acre intensively cultivated parcel is deemed to constitute a viable agricultural unit. (An additional acre for construction of a housing unit would complete the minimum site size of 20 acres in the *Area Plan's* vineyard area.) In terms of total land alone, 15.7 acres in Subarea 3 would not meet the 19-acre minimum standard. Total agricultural land in all other subareas would exceed 19 acres in size, thus theoretically viable agricultural parcels.

The "fingers of agriculture" provided by the *Draft Plan's* site plans would create fragments of vineyards or orchards in some of the subareas, but most would not be isolated entirely as islands surrounded by residential development. Several small islands of isolated agriculture would be created in Subarea 5 by other land uses or roadways, and others would be created in Subareas 2 and 7. Those in Subarea 7 would exceed the minimum 19-acre standard, albeit separated from other intensively cultivated lands in the subarea.

The adjacency of most of these fragmentary "fingers" to larger blocs of agricultural land elsewhere in the subareas suggests that the size of most would be adequate to sustain agriculture. However, unless consolidated and / or managed as single units -- within subareas or together with adjacent non-SLVSPA operations -- land ownership patterns in several subareas would produce isolated fragments, agricultural parcels smaller than 19 acres, or both. These primarily would be created in Subareas 1, 2, and 5.

The significance of these agricultural land patterns in relation to urban-rural conflicts is that adverse impacts on farmers of small or isolated parcels would be more substantial and difficult to mitigate than on larger and / or coterminous parcels. This is because such disproportionate impacts potentially could lead to abandonment of productive operations on SLVSPA agricultural land (although vineyards or orchards remaining on these lands could continue to appear agricultural). Because the *Draft Plan* gives priority to SLVSPA agricultural lands to satisfy agricultural mitigation requirements, any cessation of farming due to urban-rural conflicts would be inconsistent with one underlying purpose of the *Plan*.

Mitigation 4.1-5(a) The package of actions the City plans to consider at the same time as the *Draft Plan* includes a right-to-farm ordinance. The ordinance currently encourages dispute resolution methods to address any significant conflicts. The ordinance should be modified to require that an Information Officer be designated by each developer to formalize communications between homeowners and agriculturists. The role of the Information Officer should include at a minimum:

- Responsibility for organizing periodic briefings on agricultural activities.
- Responsibility for receiving grievances related to use conflicts in the South Valley.
- Responsibility for coordinating and facilitate meetings between homeowner associations and agriculturalists so that there is ongoing communication between these groups.
- Responsibility for preparing a quarterly newsletter describing what activities are upcoming in the vineyard and agricultural areas.
- Responsibility for developing a brochure which describes the role of the Information Officer and provides telephone and facsimile numbers for grievances or information requests. The brochure should be provided to new homeowners prior to close of escrow.

In the event of a conflict between a homeowner and an adjacent use, the Information Officer's responsibilities would include:

- Obtaining a clear understanding of the conflict.
- If the agricultural operation is within typical agricultural practices, the Information Officer would explain the operation including equipment, the reason for the operation and likely duration of the operation to the resident.
- If the agricultural operation is performing activities which are not consistent with typical agricultural practices the Information Officer will contact the operator. If after discussion the Information Officer is not satisfied that typical agricultural practices are being followed, the Officer shall contact the City of Livermore. The City would be responsible for enforcing applicable policies and ordinances.
- In the event that either the agricultural operation or the resident is located in the County, the County's right-to-farm ordinance and grievance procedures would apply.

Periodic briefings should correspond to cyclical agricultural activities (e.g. spraying, harvesting, etc.) that have the potential to create a nuisance to nearby homeowners. Such briefings and meetings should be held at least twice a year (more if significant grievances are being communicated to the Information Officer).

The ordinance should modify the distance of the "right-to-farm deed restrictions." This modification would change the distance of 1,000 feet presently provided by the draft ordinance to a distance of 2,000 feet. This latter distance exceeds the width of the urban shadow which agriculturists generally estimate extends beyond urbanized areas into farmland.

Mitigation 4.1-5(b) Amend the *Draft Plan* to encourage assembly or consolidation of potential agricultural land and / or for coordinated long-term agricultural operations on those parcels. The latter could be accomplished through leases by single farmers within individual subareas to plant, manage, and harvest agricultural mitigation land located within the SLVSPA, and could be accomplished as part of the review of the required eight-year maintenance contract.

Significance after Mitigation Implementation of Mitigation Measures 4.1-5(a) and 4.1-5(b) could substantially reduce the severity of urban-rural impacts which are inevitable at the urban edge but not eliminate these impacts altogether. However, the City's approach to permitting urban and rural uses to coexist in close proximity would conform with the approach already identified by Alameda County and the Cities of Livermore and Pleasanton. The approach has been adopted by the County and incorporated into the City of Livermore Community General Plan. The mitigation would reduce impacts to a locally acceptable and therefore less-than-significant level.

Responsibility and Monitoring The City would be responsible for revising and adopting the right-to-farm ordinance, as modified from the pending draft, and also for amending the *Draft Plan*. In order to allay some agriculturists concerns, the City should enact and begin enforcing the ordinance immediately.

Impact 4.1-6 ***Growth Inducing Impacts***
Although the Draft Plan *would cause direct growth within the SLVSPA, a major goal of the* Draft Plan *is to establish a permanant urban boundary for the south edge of the City. Policies in the* Draft Plan *coupled with existing conditions will avoid significant growth-inducing impacts outside the SLVSPA. LTS*

Areas Subject to Growth Pressures

Some areas near the SLVSPA are developed already and, thus, would not be exposed to growth pressures. These areas include land east of Subarea 1 (Sandia National Laboratories), west of Subarea 7 (Ruby Hill), and southeast of Subarea 7 (the U. S. Department of Veterans Affairs Medical Center).

Other areas near the SLVSPA would be susceptible to development pressures, principally areas south of Subareas 1 and 2 and east of Subareas 3 and 4. Much of this land either is in active viticultural production or is used for grazing. The large majority of this land is owned by the Wente family.

Public policies have been adopted to protect this area from non-agricultural development. For example, *East County Area Plan (ECAP)* Policy 303 would "prohibit development in the unincorporated portions of the South Livermore Valley unless it will directly further the purpose of expanding and enhancing cultivated agriculture". In the *South Livermore Valley Area Plan (Area Plan)*, Annexation and Urban development Policy 2(D) states that urban development shall not displace any significant amounts of actively farmed vineyards.

A main land use goal of the *Draft Plan* is "to establish a permanent urban boundary for the south edge of the City of Livermore". To help accomplish this goal, *Draft Plan* Policy 6-6 requires placement of permanent open space and / or agricultural easements on all open space lands in the SLVSPA outside of development areas, as follows:

- ***Policy 6-10*** In order to ensure a permanent open space boundary along the City's southern edge, all open space lands in the planning area but outside the urban development areas shall have permanent agricultural and / or open space easements placed on them or be dedicated in fee title to the City or a public open space agency designated by the City prior to final map approval.

The agricultural mitigation program also would protect land outside the SLVSPA by requiring the introduction of intensive agricultural production and preservation through permanent agricultural easements on mitigation land.

However, these *Draft Plan* policies would not directly protect the agricultural land south of Subareas 1 and 2 and east of Subareas 3 and 4. These parcels, as numbered in the South Livermore Valley Parcel Database, are 84, 114-117, 129, 135, 138, 145-148, and 227, [36] because these parcels are largely in viticultural production already.

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36 These are ***Database*** and *Assessor* parcel numbers in ***bold*** and *non-bold italics*, respectively, followed by the owner as of June 1995, the date of the Database, given in (parentheses): ***84*** / *99-675-2* (Wente Land & Cattle), ***114*** / *99-850-3* (Tesla Vineyards), ***115*** / *99-850-5-4* (Wente Bros), ***116*** / *99-850-1* (Bezis), ***117*** / *99-850-2* (Tesla Vineyards), ***129*** / *99A-2300-1-4* (Eirc, Phil, C Wente), ***135*** / *99A-2300-4-5* (Wente Bros), ***138*** / *99A-2340-9-2* (Raboli), ***145*** / *99A-2340-5-2* (Wente Bros), ***146*** / *99A-2340-6* (Wente Bros), ***147*** / *99A-2340-7-2* (Migliore), ***148*** / *99A-2340-8* (Wente Bros), ***227*** / *99A-1610-1-2* (Wente).

Removing Obstacles to Development

New development often can stimulate growth pressures by creating and making available an infrastructure which can lead to easier future development. This type of impact can include the construction of roadways and installation of water, sewer, and other urban services into previously difficult-to-access areas. Although implementation of the Draft Plan would extend sewer and water facilities into agricultural areas. These urban facilities have been designed to serve only the development within the SLVSPA to avoid creating pressures to develop agricultural areas immediately outside the SLVSPA.

Due to topography, infrastructure built in the SLVSPA could not be used for future development in some locations beyond the subareas. For example, the water system required for Subarea 7 would include a water tank, currently envisaged to be located at an elevation of 760 feet. Any future development farther south than residential lots currently identified in Subarea 7 would be located at a higher elevation and would require an additional water tank. A similar situation would occur in Subarea 4 where Draft Plan development would require a water tank at an elevation of 760 feet. Any future development southeast of Subarea 4 would require an additional water tank.

Topography is not a constraint in other areas. Accordingly, water and sewer lines into Subareas 1, 2, and 3 are limited to serving development within these subareas. The extension of these services would not be facilitated by the *Draft Plan.*

It is unlikely that new roadways in the SLVSP would create any growth-inducing impacts. No new major roadways would be constructed to serve development. Any new roadways would be sized and located to serve development within the subareas, and internal roadways would not extend or "stub out" next to adjacent undeveloped land. While Concannon Boulevard might be realigned and extended to the east of Subarea 3 (which could induce growth in these areas), this proposed extension is not a part of this project.

Land Values

In some cases, the introduction of non-agricultural uses in agricultural areas can influences land values and ultimately price agriculturalists out of the market. This is because non-agricultural uses become the "highest and best" economic uses of land. In an area where land-extensive use (such as agriculture) is the dominant use, conversion of land to more intensive uses also increases land costs which reflect the non-agricultural value. This pressure would be seen most strongly in areas directly adjacent to newly developed areas.

The degree to which adjoining development affects land values is influenced by a number of factors. In the area adjoining the SLVSPA, the primary factors are (1) the nature of the infrastructure improvements discussed above, (2) local government policies promoting agricultural and discouraging non-agricultural development, and (3) the existence of Williamson Act contracts and other mechanisms to promote retaining agricultural lands in agricultural use. In this case, each of these factors tends to limit the likelihood that non-agricultural uses will lead to an increase in land values for lands designated as agricultural.

With respect to infrastructure, the *Draft Plan* limits infrastructure improvements in such a way that those improvements will add little value to lands not designated for urban development.

Similarly, the City and County policies described above provide clear policy direction promoting

agricultural uses and discouraging non-agricultural uses on lands not designated for urban development. The City also has a right-to-farm ordinance designed to minimize conflicts between agricultural and non-agricultural uses and keep the costs of agricultural production to a minimum. Although it is possible that local government policies protecting agriculture could be amended, no such amendments are currently proposed. Because the *Draft Plan* itself is the result of a long-term agreement between Alameda County and the Cities of Livermore and Pleasanton (as reflected in the South Livermore Valley Area Plan), there is no basis to expect significant revisions to those policies in the foreseeable future.

Out of the 13 parcels of agricultural land south of Subareas 1 and 2 and east of Subareas 3 and 4 (as described above) that could be subject to growth pressure, 11 are currently enrolled in Williamson Act contracts (and none have applied for non-renewal).[37] Williamson Act contracts could be expected to protect these parcels from development for at least the next ten years. In addition to Williamson Act, agricultural lands may be permanently protected by conservation easements acquired by the South Livermore Valley Agricultural Land Trust. Over the next twelve years the Trust is expected to purchase permanent conservation easements for a least 1,200 acres. A major factor in the Trust's acquisition criteria is the parcel's proximity to urban development, other agricultural operations, or open space.

Taken together, the foregoing factors operate to limit the likelihood that the policies of the *Draft Plan* will induce significant growth outside the SLVSPA. Measures to further limit the possibility of growth outside the SLVSPA are described below.

Mitigation Measure 4.1-6 No mitigation would be required. However, the following mitigations would further reduce already less-than-significant growth-inducing impacts:

- Encouraging acquisition of agricultural easements on those parcels that could be subject to growth-inducing impacts (South Livermore Valley Parcel Database parcels 84, 114-117, 129, 135, 138, 145-148, and 227). Parcels most immediately at risk are 116, 117, and 147, which are not under Williamson Act contracts. Note that Policy 6-2 in the *Draft Plan* already requires the protection of land outside of the subareas, once land inside the subareas is under protection.

- Livermore could adopt an Urban Growth Boundary that would not allow the development of services and infrastructure to be extended beyond the limits of development in the SLVSPA.

Impact 4.1-7 ***Conformance with Plans***

The Draft Plan *would conform or potentially conform with some existing public policies previously adopted by the City in the* City of Livermore Community General Plan. *City adoption of the* Plan *will be accompanied by a General Plan Amendment to ensure conformance and compatibility between the two* Plans *when implemented. Individual development projects subsequently proposed in the SLVSPA would be required to conform with the* South Livermore Valley Specific Plan *and the* General Plan. *City officials ultimately will be responsible for determining project consistency with the Plans. PS*

The consistency of the *Draft Plan* with relevant public plans and policies is presented in Exhibits 4.1-9 through 4.1-11. The policy conformance evaluation primarily focuses on the South Livermore Valley

37 Parcels which are not enrolled in the Williamson Act (identified by their *Database* numbers) are 116, 117, and 147.

Policies of the *City of Livermore Community General Plan (General Plan)* and secondarily on specific policies of the *General Plan* and the County's *South Livermore Valley* and *East County Area Plans* (the *Area Plan* and *ECAP*).

This approach of focusing on the City's adopted South Livermore Valley Policies was adopted for this EIR in recognition of the fact that these policies were found to be consistent with the *General Plan* at the time the City amended the *General Plan* to incorporate them. Consequently, the South Livermore Valley Policies represent the City's most relevant direction and recommendations for the SLVSPA itself in support of the broader citywide policies of the *General Plan* which apply equally to the SLVSPA and anywhere else in Livermore.

The City's South Livermore Valley Policies also are identical to those first enumerated by the *Area Plan* and later incorporated and expanded somewhat by the *ECAP*. The discussion of consistency of SLVSPA buildout under the *Draft Plan* with the South Livermore Valley Policies presented in Exhibit 4.1-9 cross-references the same *SLVAP* and *ECAP* goals, objectives, policies, and programs. (*SLVAP* policies are not presented separately, except as they are duplicated by the *ECAP* which is identified in Exhibit 4.1-11.)

This analysis also focuses only on activities planned in the SLVSPA, not the entire vineyard area which would remain in County jurisdiction and is intended to be the intensively cultivated agricultural zone. Therefore, this discussion omits some policies deemed not relevant or only peripherally relevant to the SLVSPA.

In addition, some policies not included in this analysis address details of specific projects yet to be proposed in the SLVSPA. Project-specific details of individual development proposals eventually submitted to the City for review and approval will not be defined until the sponsors design their projects and make formal applications to the City. The broad concepts of the *Draft Plan* would apply to these subsequent projects, and the projects would be required to conform with the *Plan*. However, it is not possible to determine definitively that individual projects would conform with some of the public policies enumerated below without speculating.

The consistency determination presented in Exhibits 4.1-9 through 4.1-11 represents the EIR preparers' best judgment based on a strict interpretation of individual policies. However, many of the policies include overlapping or competing goals that must be balanced against each other to determine if, taken as a whole, the project meets the intent of the policies. Also many of the policies include broad language to minimize a certain impact. The determination of whether the goal is met must include consideration of whether the goal was met while meeting other goals of the *Draft Plan*. Many of the policies determined Partly Inconsistent identify areas where the *Draft Plan* attempts to balance competing goals. Ultimately, policy consistency must be determined by Livermore's City Council. [38] For these reasons, the EIR employs the terms *consistent, inconsistent, partly inconsistent,* and *potentially consistent* to assess the conformance of the *Draft Plan* or *Plan* development with the policies examined in Exhibits 4.1-9 through 4.1-11, as follows:

- ***Consistent*** is used when the *Plan* would comply with all requirements of the relevant policy

38 The *Draft Plan* is not required to conform with County plans, although the joint City-County planning process ultimately led to preparation of the *Plan*.

- ***Inconsistent*** is used when the *Plan* would conflict with the policy

- ***Partly Inconsistent*** is used when some aspects of the *Plan* may conflict with the policy while others would conform

- ***Potentially consistent*** is used when too few details of *Plan* implementation (primarily individual development projects which would be proposed by specific landowners or prospective developers) are available to make a definitive conclusion but where it appears that projects could be designed or implemented to conform

Exhibits 4.1-9 through 4.1-11 do not list ways to bring the *Draft Plan* or future development covered by the *Plan* into conformance with the individual policies examined. This partly is because the *Plan* already incorporates environmental mitigation measures through the iterative process engaged in during its formulation. This included input during an analysis of environmental constraints and opportunities early in the planning process and then during the EIR's preparation.

This also was because the *Plan* will not be finalized until public review and comment which may lead to revisions or modifications. Finally, some aspects of SLVSPA development proposed to implement the *Plan* cannot be anticipated fully until designed in detail and submitted to the City for reivew and approval. At that time, individual development projects would be required to conform with the *Plan* as well as the policies examined in Exhibits 4.1-9 through 4.1-11.

Mitigation Measure 4.1-7(a) The City can choose among the following approaches to achieving conformance between the *Draft Plan* and already adopted City of Livermore policies:

- Modify the *Plan* before finally adopting and implementing it

- Amend South Livermore Policies of the *City of Livermore Community General Plan* or the *General Plan* itself to better reflect more current thinking and more detailed site-specific planning the *Draft Plan* represents

Mitigation Measure 4.1-7(b) The County will review and comment on both the *Draft Plan* and this EIR in response to which the City may review or modify aspects of the *Plan* before adopting it formally. In recognition of the mutual interests of the City and County in the South Livermore Valley, preceded by the joint planning process which led to formulation of both the *Area Plan* and *Draft Plan*, the following measure is recommended:

- The City should work with the County to resolve County concerns and policy conflicts (if any) before adopting and implementing the *South Livermore Valley Specific Plan*. This could include reaffirming continued cooperative programs and / or establishing a framework to coordinate further on specific concerns as the City implements specific aspects of the *Plan*.

Significance after Mitigation The City's consistency determinations will determine the significance of impact.

Exhibit 4.1-9

Conformance with South Livermore Valley Policies of the City of Livermore Community General Plan

Policy	Consistency
Goal 1 Promote the South Livermore Valley as a unique and historic Wine Region. *(Same as SLVAP Goal 1 and ECAP Goal* [1]*)*	*Consistent* This is one of the underlying goals which the *Draft Plan* was formulated to achieve. The *Draft Plan's* site plans would set development back from roads and designate the setbacks as potential agricultural land for planting (such as with vineyards or orchards). The *Plan's* design guidelines were developed to maintain and enhance the area's rural character, and *Plan* policies recommend preservation of specific historic sites and buildings (Caldiera home, Zumbach ranch complex, etc.). The *Plan* also provides for commercial winery sites.
Goal 2 Take a proactive approach to protect, enhance, and increase viticulture and other cultivated agriculture. *(Same as SLVAP Goal 2 and ECAP Goal)*	*Consistent* Implementation of the *Draft Plan's* agricultural mitigation program would establish easements and plant ± 2,050 acres of intensively cultivated agriculture (defined as vineyards or orchards) from residential buildout alone (plus additional mitigation for non-residential development).
Goal 3 Preserve the area's unique rural and scenic qualities. *(Same as SLVAP Goal 3 and ECAP Goal)*	*Consistent* Same as Goal 1. Buildout of the SLVSPA would introduce development in foreground views where cultivated setbacks would separate and buffer the visibility of structures, but development would not interfere with distant views or alter the scenic qualities of the South Livermore Valley.
Goal 4 Discourage and minimize development on lands with existing vineyards and on lands suitable for viticulture. *(Same as SLVAP Goal 4 and ECAP Goal)*	*Partly inconsistent* The *Draft Plan's* site plans would preserve the existing approximately 22-acre vineyard in Subarea 1 and 189 acres of vineyards in Subarea 2 (where the existing landowner has removed 208 acres of vines), and the *Plan* envisages development in most of the existing 32-acre vineyard in Subarea 5. However, the *Plan* would provide about 1,025 acres of potential agricultural land throughout the SLVSPA subareas, including about 43 acres which could be planted with new replacement vineyards elsewhere in Subarea 5 and about 174 acres which would be planted with new vineyards in Subarea 6 to replace those already removed from Subarea 2. While implementing the *Plan* would convert some localized areas of prime soils to developed uses (but also preserve other areas of prime soils and farmland as potential agricultural land), soils types *per se* are not the sole prerequisites for viticulture which also requires an adequate supply of water and site-specific management practices.
Goal 5 Generally direct development and development speculation away from	*Partly inconsistent* One express purpose of the *Draft Plan* is to determine the pattern

1 *South Livermore Valley Area Plan (SLVAP)* and *East County Area Plan (ECAP)*, Alameda County, 1993 and 1994, respectively. *ECAP* goals are not numbered. All goals and policies are presented in Exhibit 4.1-11, but the consistency discussions are not repeated for goals and policies which are identical to the City's. In those instances, consistency discussions in this exhibit (Exhibit 4.1-9) are referenced.

productive and potentially productive agricultural land, particularly that land classified as having the better quality soil for wine grapes. *(Same as SLVAP Goal 5 and ECAP Goal)*	and location of final buildout of the southern edge of Livermore in order to permanently preserve viticulture beyond that edge. Parts of Subareas 3 and 5 are immediately contiguous to established City neighborhoods, and Subareas 1, 2, and 4 are near but not contiguous to neighborhoods (located across roads from the existing City boundary). Subareas 6 and 7 are located farther away and are separated by intervening land uses, although Subarea 7 is adjacent to the City boundary and the Vineyard Estates project. Subareas 1, 2, 3, and part of 4 are located within the City's sphere of influence, and the rest of the SLVSPA is outside Livermore's sphere. In addition, all of Subareas 3 and 5, parts of Subareas 1, 2, 4, and 7, and the northwest corner of Subarea 6 are located within one-third-mile (1,760 feet) of the City boundary. This distance represents the transitional band generally identified as the "urban shadow". This term applies to the area where urban-rural interface conflicts tend to be concentrated and be most acute, the effects of which typically lead to abandonment of agriculture and urban development. Implementation of the *Draft Plan* would convert some land already susceptible to eventual development and stabilize this inherently speculative area. In other subareas (such as 4 and 7), development potentially could extend the urban shadow. Elsewhere, due to the presence of developed uses in or near these subareas, buildout could be interpreted as constituting infill development (such as out to the Lawrence Livermore and Sandia National Laboratories sites, Shaheen Industrial Park, and residential neighborhoods adjoining Subareas 2-5). See also Goal 4, above.
Goal 6 Coordinate land use planning of the area between Alameda County and the cities of Livermore and Pleasanton, so as to increase certainty over future land uses and to reduce speculation. *(Same as SLVAP Goal 6 and ECAP Goal)*	*Consistent* The County's *South Livermore Valley Area Plan* was prepared in cooperation with the Cities of Livermore and Pleasanton, and each city is responsible for implementing the *Area Plan*. Formulation of the *Draft Plan* by the City of Livermore is part of that on-going process. Alameda County participated in the *Draft Plan's* preparation as a SLVSPA landowner, and, upon completion of the *Draft Plan* and *Draft EIR*, Livermore distributed copies of both to Alameda County and the City of Pleasanton for review and comment.
Objective 1 Expansion of cultivated agricultural, particularly viticultural, use in the South Livermore Valley from the current 2,100 acres to the maximum acreage possible, with a minimum acceptable level of 5,000 acres. *(Same as SLVAP Objective 1 and ECAP Policy 302)*	*Potentially consistent* Full implementation of the *Draft Plan's* agricultural mitigation program would result in the planting of 2,050 acres of new vineyards (or orchards). The 2,050 acres of new vineyards, combined with the estimated 2,500 acres of existing vineyards, would not fulfill this minimum objective alone. Preservation of a combined 4,550 acres with full implementation of the *Plan* would achieve more than 90 percent of this objective, although Objective 1 does not intend that the urban component of plans for the whole valley fulfill the entire 5,000-acre area. The extent to which new vineyards attributable to the *Plan* would be a catalyst for placing easements and planting of additional vineyards still cannot be estimated.

Objective 2 Development of additional wineries with a range of sizes, and other wine-country uses that promote the area as a premier wine-producing area. *(Same as SLVAP Objective 2 and ECAP Policy 306)*	*Consistent* The *Draft Plan* identifies 13 potential commercial sites for wine country uses, including six possible small- and two possible medium-size wineries. Other commercial uses could include restaurants, overnight accommodations, and shops.
Objective 3 Formation of a land trust to permanently protect productive and potentially productive cultivated agricultural lands in the South Livermore Valley. *(Same as SLVAP Objective 3 and ECAP Policy 310)*	*Consistent* The South Livermore Valley Agricultural Land Trust (SLVALT) was established independent of the City of Livermore's process.
Objective 4 Prohibition of additional development unless it will directly further the Plan's purpose of expanding and enhancing cultivated agriculture. *(Same as SLVAP Objective 4)*	*Consistent* The *Draft Plan* identifies the maximum number of housing units (1,494 units) and commercial sites (up to 13) which could be built in the SLVSPA with adoption and implementation of the *Plan* and was designed to provide a permanent urban boundary along the southern edge of the City. The *Plan's* agricultural mitigation program also requires planting and placing a permanent easement on one acre of vineyards for every acre developed in the SLVSPA plus one acre planted and preserved for every housing unit built in the SLVSPA. The County's *Area Plan* would result in a similar protection and planting program with the same ratio.
Objective 5 Limitation on further urbanization within the Plan Area to areas under City jurisdiction and to development that substantially enhances cultivated agriculture. *(Same as SLVAP Objective 5)*	*Consistent* The SLVSPA subareas presently are not under City jurisdiction and would need to be annexed to Livermore before the City could implement the land use and development concepts contained in the *Draft Plan*. Once annexed, urban density development would be confined within the new City boundary inside the SLVSPA, although the County could approve rural density residential development (one unit per 20 acres in the Cultivated Agricultural Overlay District). A prerequisite of County approval would be intensive cultivation of 90 percent of a parcel. Therefore, no urban density development would occur in the County, only on land annexed to the City and after meeting all conditions established by the *Plan*.
Objective 6 Creation of a permanent boundary and open space buffer between the cities of Pleasanton and Livermore in the South Livermore Valley. *(Same as SLVAP Objective 6 and ECAP Policy 315)*	*Consistent* The Vineyard Estates project adjacent to Subarea 7 was designed to separate these two cities. Although the *Draft Plan* was not designed to create a specific open space buffer between the cities, Subarea 7 offers an opportunity to provide a permanent buffer between the City-subarea boundary and unincorporated grazing lands farther south. This is because development would be clustered primarily in the lower elevations of the northern part of the subarea (with some additional development envisaged up one of the main drainageways to the southwest) and because the southern upper elevations of Subarea 7 would remain undeveloped and retained as regional park or potential agricultural land.
Objective 7 Establishment of a framework, consistent with other Plan goals and objectives, for the consideration of development entitlements that will result in the planting of the maximum number of acres of new vineyards, with a minimum acceptable level of 5,000 acres, and fees necessary to achieve the overall goals and objectives of the Plan in a timely and reasonable manner. *(Same as SLVAP Objective 7)*	*Potentially consistent* Same as Objective 1.

Agricultural Preservation and Enhancement Policies	
Policy 1 Encourage the cooperation of Alameda County, Livermore, and Pleasanton in reaching the goals and objectives of the [Area] Plan through coordination of land use plans, use of pre-annexation, development, joint powers, tax-sharing, or other agreements, or other appropriate devices to coordinate future land uses and appropriate mitigation measures. *(Same as SLVAP APH Policy 1* [2]*)*	*Consistent* Same as Goal 6.
Policy 2 Establish a South Livermore Valley Agricultural Land Trust as an autonomous non-profit corporation with Federal and State Tax-exempt status. Alameda County, the City of Pleasanton and the City of Livermore should have appointment authority to the Trust Board of Directors. The Trust should be enabled to purchase or accept donations of lands in the Plan Area, in fee or easement, that will further the goals of the Plan, with reconveyance subject to unanimous agreement by the Board of Directors. Agricultural mitigation funds required to be paid by the Ruby Hill development, other future urban development in the Plan Area, and other appropriate sources should be used to fund Trust purchases. Standards and priorities for acquisition of land or easements by the Trust shall be based on the following considerations: *(Same as SLVAP APH Policy 2)*	*Consistent* Same as Objective 3.
a. Development of a critical mass to sustain agricultural operation in the south Livermore Valley.	*Potentially consistent* Same as Objective 1.
b. Preservation of lands best suited for agriculture and most threatened by development pressures.	*Partly inconsistent* Same as Goal 4. However, the *Draft Plan* designates all of Subarea 6 for agricultural use. The proximity of existing ranchettes in Subarea 5 suggests the vulnerability of Subarea 6, just outside the 1,760-foot band of the existing urban shadow, to conversion and development, especially with further development in Subarea 5 which could occur either with or without adoption of the *Plan*. Besides its value for agriculture, Subarea 6 also provides additional buffering to Sycamore Grove Park which is contiguous to the subarea on the south. In order to preserve Subarea 6 for agriculture, the *Plan* identifies Subarea 2 for development. Prime soils cover nearly all (98 percent) of Subarea 2. However the entire northern half of Subarea 2 is located in the urban shadow of residential (north) and industrial (northeast) development in Livermore and the transitional Buena Vista Road area of low density residential development (west) in the County.
c. Preservation of contiguous tracts of agricultural land of a size large enough to maintain commercial agricultural operations.	*Partly inconsistent* The SLVSPA subareas contain single and multiple parcels of varying sizes and relationships to other agricultural lands in the vineyard area outside the SLVSPA which represent the type of fragmentation called "parcelization".

[2] Agricultural Preservation and Enhancement (EPE) Policy.

	Parcelization refers to parcel size and ownership patterns which make it difficult to assemble or reassemble land into viable agricultural units whether developed or not. Implementation of the *Draft Plan* would further fragment some and newly subdivide other parcels for residential development but also would retain 1,025 acres of potential agricultural land throughout the seven subareas. The future SLVSPA agricultural land supply would range from 16 (Subarea 3) to 360 acres in total size (Subarea 7). Potential agricultural land within individual subareas would consist of contiguous parcels, some retained in relatively large blocs or undivided ownerships. Potential agricultural land remaining around new development in subareas already composed of the smallest or most varied parcel sizes and ownerships would be further fragmented in the future (such as Subareas 1, 3, and 5), although project sponsors would be required to place permanent easements on those fragments and plant them as conditions or approval for urban development. To be viable, farming of potential agricultural land on parcels smaller than 20 acres in size would need to reassemble contiguous fragments created by or left over after *Draft Plan* development. The minimum parcel size in the County's Cultivated Agriculture Overlay District is 20 acres, a size generally considered to be viable commercially for high value crops (such as wine grapes).
d. Minimization of conflicts with non-farm uses.	*Consistent* Urban-rural conflicts would be inevitable in the SLVSPA with adoption and implementation of the *Draft Plan*. Some conflicts would occur where the subareas abut the vineyard area, due to the effects on SLVSPA residents from operations in the permanent agricultural zone and on farmers from urban encroachment and improved access by non-agriculturalists. Other conflicts would occur in the subareas with introduction (reintroduction) of farming operations where the *Plan* designates potential agricultural land. The City has prepared a draft right-to-farm ordinance to be adopted as part of the package of actions involved in approving the *Plan* in order to address urban-rural conflicts. Such ordinances can reduce impacts on non-farm uses to less-than-significant levels, thus consistent with this policy, although they may not be as successful in mitigating impacts on farm uses.
e. Creation of a permanent urban boundary.	*Consistent* As noted above (Goal 5), the *Draft Plan* is intended to create such a boundary to contain urban development in the City and preserve agriculture outside the City. Once approved, the adopted *Plan* would establish the land use pattern and define the maximum amount of development permitted to occur within the SLVSPA. The *Plan's* site plans contain various techniques to reinforce this aim. Subarea site plans take adjacent land uses into account and create logical extensions of existing development in some areas and isolate clusters of development in other areas in order to make a gradual transition from existing urban density development in the City to rural land uses outside the City.

f. Protection of critical habitat areas within the South Livermore Valley.	*Consistent* The EIR's biological resource analysis identified measures to mitigate impacts of development on sensitive habitat which were incorporated into the *Draft Plan* as policies in order to reduce the severity of impact to a less-than-significant level. For potential biological resources requiring further investigation, *Plan* policies require avoidance if found, even if this reduced the number of residential lots or other urban uses currently identified in the *Plan.*
Policy 3 Encourage the promotion of the South Livermore Valley as a premier wine-producing center by encouraging appropriate tourist attracting and supporting uses, such as bed and breakfast establishments, bicycle and equestrian facilities, a conference center, a wine museum, or other uses, and by establishing clear, well-signed travel corridors from major highways to the area. *(Same as SLVAP APH Policy 3 and ECAP Policy 307)*	*Consistent* Same as Objective 2. In addition to providing sites for potential commercial development, including bed and breakfast inns, the *Draft Plan* provides 14 specific off-street trail segments to accommodate separate bicycle / pedestrian and equestrian use and which would permit continuous travel from Subarea 1 to Subarea 7. The *Plan's* site plans also address vehicular access to the South Livermore Valley wine region. The *Plan* would provide an altogether new entrance to the vineyard area from the west via Vallecitos Road through Subarea 5. In addition, the *Plan's* site plans both would set development back from SLVSPA roadways and provide for agricultural uses in the setback areas to enhance the rural character and the visibility of vineyards in the area, including along South Vasco Road, the main wine region entrance in the eastern part of the SLVSPA. State Route 84 currently uses Vallecitos Road north and south of the SLVSPA, and South Vasco Road connects to Interstate 580 north of the SLVSPA.
Policy 4 Maintain and enhance the visual quality of the Plan Area by limiting inappropriate uses in viticultural areas and encouraging good design through establishment of appropriate design guidelines. *(Same as SLVAP APH Policy 4 and ECAP Policy 312)*	*Consistent* The *Draft Plan* establishes land uses appropriate in the SLVSPA (primarily residential and wine country commercial development plus park, open space, and potential agricultural lands). The *Plan* also contains design guidelines and standards for site planning, residential architecture, streets and rights-of-way, and landscaping in SLVSPA subareas.
Policy 5 Strongly discourage the non-renewal or early termination of Williamson Act contracts. County and City agriculture preserve guidelines and individual contracts may be modified to specifically accomplish the objectives of preserving and promoting agriculture, in conformance with Plan policies. *(Same as SLVAP APH Policy 5 and ECAP Policy 309)*	*Consistent* Owners of all except one parcel with Williamson Act contracts within the SLVSPA have filed notices of non-renewal, and contracts will begin expiring as soon as 1998. Landowners acted independently and separately from the City's planning process for the SLVSPA but clearly appear to have done so in anticipation of the City's preparation and approval of the *Draft Plan*. Because of these blanket non-renewals for entire parcels before completion of the planning process, owners did not selectively designate which parts of their parcels to remove from Williamson Act contracts (areas envisaged for development) and which parts to maintain under contract, entitled to the benefits of lower property tax rates (areas designated for potential agricultural use). However, it is not the *Draft Plan* which is inconsistent with this policy but owners' actions. The Plan requires placement of permanent agricultural easements (or dedication for regional open space) over parts of subareas not developed with residential or commercial use as a condition of approval for any development.

Policy 6 Encourage the establishment and permanent protection of existing and new cultivated agriculture through use of agricultural easements, density bonuses, or other means. *(Same as SLVAP APH Policy 6 and ECAP Policy 304)*	*Consistent* The *Draft Plan's* agricultural mitigation program requires the provision of permanent agricultural easements on 2,050 acres to compensate for 557 acres of land converted and developed and construction of 1,494 housing units.
Policy 7 Require that urban development within the Plan Area mitigate impacts on and substantially enhance cultivated agriculture, by means of paying agricultural mitigation fees to the South Livermore Agricultural Land Trust, by the direct planting of new vineyards, by dedicating agricultural easements on lands within the Plan Area, and / or by including major wine-oriented attractions that would increase recognition of the South Livermore Valley as a premium wine-producing region. *(Same as SLVAP APH Policy 7 and ECAP Policy 314)*	*Consistent* Same as Goal 2, Objective 3, and Policy 6.
Policy 8 Consider adopting other policies and programs establishing other sources of funds for the Agricultural Land Trust, such as fees on appropriate development outside of the Plan Area. *(Same as SLVAP APH Policy 8 and ECAP Policy 311)*	*Consistent* The *Draft Plan* focuses on future use and development within the SLVSPA and provides for mitigation there or in the unincorporated vineyard area. Thus, this policy is beyond the scope of a specific plan, and the consistency of the *Plan* with this policy is not relevant. However, in addition to its agricultural mitigation program for residential development, the *Plan* would establish a mitigation fee of $2.50 per square foot of retail development at future commercial sites built in the SLVSPA.
Policy 9 Encourage the development of additional sources of irrigation water for vineyards and other cultivated agriculture by investigating wastewater reclamation and development of other supply and delivery resources. Encourage Zone 7 to consider developing a pump monitoring and cost allocation system to cover the cost of new water in the event that additional supplies are needed. *(Same as SLVAP APH Policy 9 and ECAP Policy 305)*	*Consistent* Policies of the *Draft Plan* require parks, public open space areas and agricultural areas to use recycled water to the extent feasible. The Draft Plan also requires each residential unit to contribute funds specifically for development of a system of treatment and distribution of recycled water.

Land Use Policies and Standards, *Transitional Areas*	
Policy 1 Designate appropriate City areas within the Plan as "Transitional Areas" due to physical isolation from the main part of the Plan Area, adjacency and relationship to existing urbanized areas, and / or location within the existing City. [3]	*Consistent* The County's *Area Plan* identified two "transitional areas" (East Vineyard Avenue in Pleasanton and Alden Lane in Livermore), both outside the SLVSPA, and *Draft Plan* does not designate additional "transitional areas" inside the SLVSPA. However, the *Draft Plan* designed development clusters in some subareas expressly to make a transition between the City's urban and County's rural areas. Moreover, potential agricultural land provided within setback areas of some subareas could be interpreted as providing a transition between developed urban and undeveloped rural uses by separating, thus buffering, these different uses. Examples include potential agricultural land along the west side of Wente Street in Subarea 3, along the southern boundary of the McKissick parcel in Subarea 4, and along the north side of Wetmore Street in Subarea 5 adjacent or opposite existing or future agricultural land.
Land Use Policies and Standards, *Wine Region Corridors*	
Policy 1 Encourage appropriate design, landscaping and signage to establish Greenville Road, between I-580 and East Avenue, the future Isabel Avenue alignment, between I-580 and Vallecitos Road, and roadways between I-680 and Vallecitos road, via downtown Pleasanton and Vineyard Avenue, as important "wine region corridors" as development occurs. Retain existing land use designations and policies.	*Potentially consistent* By focusing on the SLVSPA and the roadways located on the perimeter of and through the planning area, the *Draft Plan* does not address the regional roadways listed by this policy. However, as discussed above (Agricultural Preservation and Enhancement Policy 3), the *Plan* addresses specific entries or gateways to the SLVSPA in addition to internal streets in the subareas which will provide access to development areas and commercial sites.
Annexation and Urban Development Policies	
Policy 1 Actively discourage the annexation of lands within the Vineyard Area unless the following criteria are met: *(Same as SLVAP AUD Policy 1 and ECAP Program 130* [4]*)* a. An urban development project is proposed that would significantly contribute to the goal of maximizing the number of acres of permanently protected vineyards or other cultivated agriculture in the [County's] Plan Area with a minimum acceptable level of 5,000 acres, and that meets the criteria in paragraph 2 below.	*Potentially consistent* All SLVSPA subareas currently are unincorporated land outside the corporate boundaries of the City of Livermore. The modified annexation scenario selected for the *Draft Plan* assumes annexation to the City of all seven subareas (including both development areas and potential agricultural land), Sycamore Grove Park, Veterans Park, and the U.S. Department of Veterans Affairs Medical Center. The *Plan's* agricultural mitigation program would preserve 2,050 acres upon annexation and full buildout of the SLVSPA which would contribute significantly to the 5,000-acre aim but not accomplish the preservation alone. Due to the substantial contribution, the *Plan* would be potentially consistent (but partly inconsistent with the minimum acceptable acreage identified by Objectives 1 and 7).

3 Transitional Area policies 2 and 3 are omitted as not relevant to the SLVSPA.

4 Annexation and Urban Development (AUD) Policy.

b. To the extent that annexation is reasonably incidental to an annexation described in subparagraph (a) above, properties may be annexed which are under agricultural easements that permanently limit development to a gross density of one residence per 20 acres, and 90 percent of the parcel is set aside and planted in vineyards or other cultivated agriculture, as described in Vineyard Area Policy #2 of the South Livermore Valley Area Plan.	*Consistent* Adoption and implementation of the *Draft Plan*, approval of the General Plan Amendment, prezoning, and annexation of the SLVSPA would establish Agriculture / Viticulture as the underlying land use designation, establish Planned Development / Agriculture District, and allow the new densities of the *Draft Plan* as envisaged for the urban component by the County's *Area Plan*. Unincorporated land remaining in the vineyard area would be subject to the County's Cultivated Agriculture Overlay District which contains requirements identical to those enumerated in Policy 1(b).
Policy 2 Require any urban development proposal within the Vineyard Area to meet the following criteria, at a minimum: *(Same as SLVAP AUD Policy 2 and ECAP Program 131)* a. All necessary public utilities and services are available.	*Consistent* The Community Services & Facilities and Public Utilities Elements of the *Draft Plan* describe and illustrate the provision of "backbone infrastructure" required to support the type, density, and location of SLVSPA development envisaged by the *Plan*. In addition, the Financing Plan, also part of the *Plan*, identifies the mechanisms and phasing to fund installation of required facilities to ensure their availability as development proceeds. However, while potential additional water supplies are identified, sufficient supplies are not secured at this time to meet needs attributable to the *Plan* at buildout, and SLVSPA development under cumulative conditions (including growth in North Livermore) would generate wastewater flows in excess of existing treatment plant and export pipeline capacity. Nevertheless, the Public Utilities Element would prohibit development of either urban or agricultural uses unless adequate water supplies exist for domestic use, firefighting, and irrigation.
b. The project will contribute funds for a recycled water treatment system. Contributions should equal or exceed the cost of providing recycled water equal in volume to 120 percent of anticipated water use of the development.	*Consistent* Policy 8-5 of the *Draft Plan* requires residential units to contribute funds for recycled water. The existing Zone 7 water connection fee includes funds for recycled water so the additional fee provides an additional 20 percent of the water connection fee for a total of 120 percent of the anticipated water use.
c. The project will not require cancellation of a Williamson Act contract unless the development proponent can show, to the satisfaction of the City of Livermore, that cancellation will result in a more compact development pattern than development of proximate non-contracted lands. Require that an area within the Vineyard Area equal or greater in area to the parcel(s) on which cancellation would occur be cultivated and placed under permanent agricultural easement and a long-term maintenance contract, prior to final approval of any cancellation.	*Consistent* Same as Agricultural Preservation and Enhancement Policy 5 and Objective 1.
d. The project site will not displace a significant amount of any actively farmed vineyards, defined as vineyards that produced and harvested wine grapes in 1991.	*Consistent* As discussed above (Goal 4), one existing vineyard in Subarea 1 would remain, former vineyards already removed from Subarea 2 would be developed (and remaining vineyards would be retained), and remnants of a vineyard in Subarea 5 would be restored.

e. The project site is contiguous to the existing boundaries of the City of Livermore. As discussed in paragraph 4 below, the City of Livermore shall determine the exact location of urban development through the adoption of a Specific Plan and / or General Plan Amendment.	*Consistent* Subareas 1, 2, 3, 4, 5, and 7 are contiguous to the City boundary. Subarea 6 is not located adjacent to the City's boundary, but is not proposed for development. Adoption of the *South Livermore Valley Specific Plan* (this *Draft Plan*) would identify development areas for the SLVSPA as illustrated by the individual subarea site plans.
f. At a minimum, the project protects and promotes viticulture or other cultivated agriculture through the following means: (i) Development is located and clustered, to the maximum extent feasible, adjacent to existing City boundaries to minimize loss of better quality soils for wine grapes, and is sited and designed to create a logical, permanent urban edge to Livermore;	*Partly inconsistent* Same as Goals 4 and 5.
(ii) To mitigate the loss of cultivable soils, a minimum of one acre in the Vineyard Area is planted in new vineyards or other appropriate cultivated agriculture, and permanently protected through dedication of agricultural easements for each acre developed. Mitigation acreage thus planted and protected should be contiguous to the extent possible to ensure mitigation acreage of sufficient size to form a viable agricultural unit;	*Consistent* Same as Objective 4. Other than potential agricultural land within the SLVSPA subareas, the *Draft Plan* does not identify the specific location of the balance of agricultural mitigation land required to be placed under easement and planted. The *Plan* recommends that, to the extent possible, mitigation land should be contiguous to form a viable agricultural unit and that potential agricultural land inside subareas should be protected before designating land outside the SLVSPA as mitigation land.
(iii) To enhance cultivated agriculture in the Vineyard Area, a minimum of one acre within the Vineyard Area, in addition to acreage required in ii, above, is planted in vineyards or other appropriate cultivated agriculture, and is permanently protected through dedication of agricultural easements for each new dwelling unit permitted in the project. Mitigation acreage thus planted and protected should be contiguous to the extent possible to ensure mitigation acreage of sufficient size to form a viable agricultural unit;	*Potentially consistent* Same as Objective 4 and Policy 2(f)(ii), immediately above.
(iv) Mitigation acreage required under ii. and iii. above is not eligible for bonus densities, as permitted under the Cultivated Agricultural Overlay District described in the South Livermore Valley Area Plan.	*Consistent Draft Plan* Policies 6-1 and 6-8 apply this restriction. Implementation of the agricultural mitigation program in the unincorporated vineyard area would need to conform with County policies and zoning, including the provisions of the *Area Plan* and Cultivated Agriculture Overlay District.
(v) Require mitigation acreage for urban development in the Vineyard Area be dedicated and planted, and that evidence of a long-term maintenance contract (eight years or more) be given, prior to approval of a final map. This requirement can be phased, as long as phasing is consistent with final map phasing.	*Consistent Draft Plan* Policy 6-1 contains these requirements.
(vi) Require that new cultivated agriculture resulting from Plan policies use water conserving best management programs, including the use of drip irrigation wherever feasible.	*Consistent Draft Plan* Policies 8-3 and 8-4 provide for incorporation of water conservation methods in vineyards, parks, and recreation areas through use of low flow irrigation systems and use recycled water if feasible. As a practical matter, local agriculturalists are gradually converting old irrigation systems and installing new low water use methods.

(vii) Development includes at least one major draw or attraction that would increase recognition of the South Livermore Valley as a premium wine-producing region. Examples of appropriate attractions include a wine-related institute, research center or conference center, wine museum, cultural arts center or a resort hotel. Consideration should be given to creating a "Wine Country Center" that would serve as a focal point for visitors to the region by combining one or more major attractions with ancillary retail uses, such as restaurants, art galleries or shops, bicycle rentals, delis, or other appropriate small-scale uses that would complement the major attraction. Ancillary retail uses would be limited and should be carefully considered to complement businesses in Downtown Livermore. Retail uses and for-profit major attractions should be subject to an agricultural mitigation fee of $2.50 per square foot, Fee amounts should be adjusted annually to reflect changes in the Consumer Price Index.	*Potentially Consistent* The *Draft Plan* identifies 13 potential commercial sites scattered among five of the SLVSPA's seven subareas. These new sites would provide some of the types of attractions enumerated by this policy but would be developed on a project-by-project basis. As discussed above (Agricultural Preservation and Enhancement Policy 8), the *Plan* would establish a mitigation fee of $2.50 per square foot of future retail development built at the SLVSPA commercial sites. In addition the *Draft Plan* levies a $750 per house Major Attraction Fee which will be used to develop at least one major draw or attraction in the South Livermore Valley.
Policy 3 Accommodate development meeting the above criteria with sufficient flexibility in growth management awards to permit development in a timely and economical manner. Appropriate development will be considered by the City in a timely manner through use of joint powers, pre-annexation, tax-sharing, and / or development agreements, or other appropriate means. *(Same as SLVAP AUD Policy 3)*	*Consistent* One reason for preparing a specific plan is to anticipate desired growth and provide for an orderly pattern and sequence for that growth to occur. The Financing Plan, part of the *Draft Plan*, provides mechanisms to implement the land use and development concepts contained in the *Plan*, specifically to install backbone infrastructure to ensure that urban facilities and services would be available to support development when individual projects proceed. The *Plan's* growth management provisions also would phase development by allocating construction of 200 units per year.
Policy 4 The City will adopt a General Plan Amendment, Specific Plan and / or Planned Unit Development that will specify the amount, timing, and location of urban development in the Vineyard Area consistent with Plan policies, within three years of an application for urban development in the Vineyard Area. *(Same as SLVAP AUD Policy 4)*	*Consistent* The City amended the *City of Livermore Community General Plan* in 1993 to include South Livermore Valley Policies and proceeded with the process now underway to formulate a specific plan for the SLVSPA (the *Draft Plan*), the accompanying General Plan Amendment, and prezoning to the Planned Development Agriculture District.

Exhibit 4.1-10
Conformance with Selected City of Livermore Community General Plan Policies [1]

Policy	Consistency
Environmental Resources Management Goals and Policies	
1. Geologic Resource Policies	
Policy 1(f) The City shall carefully condition hillside development with respect to road design, grading, structural foundations, surface and subsoil drainage, excavation, earthfills, and other operations to avoid soil erosion, scarring of the natural landscape, obstruction of scenic vistas, and the loss of natural vegetation and wildlife habitat.	*Consistent* The *Draft Plan's* site plans show some development on lower hills of Subareas 1, 4, and 7. The slope stability policies of the *Plan's* Conservation and Resource Management Element would guide the detailed design of individual development projects in conformance both with conditions present in the SLVSPA and *Geologic Resources Policy 1(f).*
3. Water Resource Management Policies	
Policy 3(b) The City shall preserve recharge areas or highly permeable soils. Developers shall be required to mitigate possible adverse impacts upon such areas, and no development shall be permitted that would have a substantial adverse impact.	*Partly inconsistent* The northeast corners of Subarea 3 and 7 are identified as having very rapid infiltration characteristics. The *Draft Plan's* site plans show residential development in most of that area in Subarea 3 and designates that area in Subarea 7 as potential agricultural land. Maximum coverage under the *Plan's* design guidelines would be 38 percent of residential lot area and 25 percent of commercial site area (average residential coverage would be 33 percent).
Policy 3(d) The City shall take all necessary measures to regulate runoff from urban uses to protect the quality of surface and groundwaters and other resources from detrimental conditions.	*Consistent* Implementation of *Draft Plan* Public Utilities Element policies would prevent water quality impacts attributable to sedimentation or degradation due to urban pollutants.
Policy 3(e) Proposed public and private projects shall employ methods for management of vegetative cover, surface water runoff, groundwater recharge, erosion, and sedimentation processes.	*Consistent* The *Draft Plan* contains policies to minimize effects on these resources. In addition to water quality policies referred to above, ***Impact 4.4-1*** lists *Plan* policies related to impacts on vegetative cover.
Policy 3(f) To the greatest extent possible, arroyos and creeks shall be preserved in their natural state, and flood plains shall be required and maintained as an alternate to reconstructing channels to accommodate flood flows.	*Consistent* The *Draft Plan's* site plans set development back from the intermittent creeks located in the SLVSPA, primarily in Subareas 4 and 7, and would preserve these drainageways in their natural state. Except for the western corner of Subarea 5 and eastern corner of Subarea 7 (where no development is envisaged), the SLVSPA is outside the 100-year flood zone of the area's arroyos and on-site drainages. The *Draft Plan* contains policies related to drainage and flooding (see ***Impacts 4.3-1*** and ***4.3-2***).

[1] Policies evaluated in Exhibit 4.1-10 are those presented in the *Environmental Setting and Planning Considerations (Constraints Analysis)*, June 16 and 30, 1995. The *Constraints Analysis* was prepared as part of the overall planning process for the SLVSPA. Those policies were selected as ones which provided direction to take into account while formulating the *Draft Plan.*

4. Soils and Agricultural Resource Policies	
Policy 4(a) The City shall control site preparation procedures and construction phasing to reduce erosion and exposure of soils to the maximum extent possible.	*Potentially consistent* As noted above (Policy 3(b)), the *Draft Plan* contains policies to reduce erosion and sedimentation impacts of individual development projects. Of those, one requires preparation and implementation of Stormwater Pollution Prevention Plans on a project-by-project basis for sites five acres or larger in size, as discussed in ***4.3 Hydrology, Impact 4.3-3.***
Policy 4(b) The City shall prohibit construction on soils with "severe" and "very severe" erosion hazards unless it can be demonstrated that the project will not cause an increase in erosion of sedimentation.	*Potentially consistent* The City will require conformance with this and other project-specific policies on a project-by-project basis. Soils units classified as "severe" and "very severe" primarily are located in Subarea 7 but also are present in parts of Subareas 1 and 4 (see Exhibit 4.3-6).
Policy 4(c) The City shall carefully control development on soils with "moderate" to "high" shrink-swell potential as to site grading, foundation design, and construction to avoid site and structural damage resulting from those soil conditions. [2]	*Potentially consistent* The *Draft Plan* contains a policy to address potential expansive soils impacts and requires detailed site-specific survey and design of development to incorporate data obtained from site-specific investigations in Subarea 7. Expansive soils are present in several subareas, primarily Subarea 7.
Policy 4(d) The City shall prohibit development on expansive soils which are subject to a high probability of sliding; developments proposed below areas of expansive soils in foothill and mountainous areas shall be conditioned to avoid damage from potential slide areas.	*Potentially consistent* In addition to Geologic Resource Policy 1(f) and Soils and Agricultural Resource Policy 4(c), above, the *Draft Plan's* Conservation and Resource Management Element contains policies addressing slope stability, including grading for landslide repair.
Policy 4(e) The City shall take all possible steps to preserve the vineyards. Expansion of viticulture on lands rated "good" and "very good" for the production of wine grapes, as defined by the Soil Conservation Service shall be encouraged.	*Partly inconsistent* Same as South Livermore Valley Policies' Goal 4 (Exhibit 4.1-9).
Policy 4(f) The City shall encourage the retention in open space of as much land as possible for agriculture, viticulture, rangeland, and grassland.	*Partly inconsistent* The *Draft Plan's* site plans designate about 178 acres for some type of open space and 1,025 acres as potential agricultural land, a combined total of about 64 percent of the SLVSPA. It is expected that potential agricultural land in most subareas would be cultivated intensively with vineyards and orchards. While implementation of the *Plan* would foster the expansion of viticulture in the SLVSPA and adjacent vineyard area, committing a more land to intensive cultivation could convert range and pasture land and contribute to the incremental loss of the area's supply of grazing land.
Policy 4(h) The City shall give priority to the preservation of Class I and II soils and favor agricultural use over expansion of mineral extraction operations on such lands. Furthermore, only agricultural and related uses shall be permitted in areas designated for exclusive agriculture.	*Partly Inconsistent* The *Draft Plan* designates land for urban development and potential agricultural use but not for mineral extraction. However, some development would occur on prime soils, as discussed in South Livermore Valley Policies Goal 4 (Exhibit 4.1-9), above.

[2] Exhibit 4.3-6 in the Hydrology section lists the shrink-swell potential of the soil units present in the subareas.

5. Vegetation and Wildlife Resources Policies	
Policy 5(a) Riparian woodlands and freshwater marshes shall be preserved. Developers shall be required to mitigate possible adverse impacts upon these resource areas. No development shall be allowed that would have a substantial adverse impact or significant effect on such areas.	*Potentially consistent* The *Draft Plan* contains general policies addressing disturbance to wetlands and other waters and specific policies related to the creek corridors, primarily in Subarea 7. Policies provide for required wetland delineations and either avoidance or compensation for losses. These policies and measures are discussed in ***4.4 Biological Resources, Impacts 4.4-3*** and ***4.4-4.***
Policy 5(b) Habitats of rare or endangered species shall be preserved. Proposed development in such areas shall demonstrate a high degree of compatibility with, and minimal adverse impact on, these habitats.	*Potentially consistent* The *Draft Plan* contains specific policies requiring surveys to identify for rare plants in Subarea 7, fairy shrimp in suitable vernal pool and swale habitat (Subareas 2, 4, 5, 6, and 7), California tiger salamander in the vernal pool (Subarea 7), and raptors (Subareas 5, 6, and 7)(***Impact 4.4-5***). The *Plan* calls for avoidance of plant and animal species encountered by the surveys and, where disturbance and loss of essential habitat cannot be avoided, for preparation and implementation of a detailed habitat protection, replacement, and restoration plan.
Policy 5(h) Grading and excavation in woodland areas shall avoid disturbances to subsurface soil, water, or rooting patterns for natural vegetation.	*Consistent* The *Draft Plan* contains policies to mitigate impacts from the potential loss of trees and disturbance to sensitive natural communities and includes specific site development guidelines concerning development and construction activities, as discussed in ***4.4 Biological Resources, Impact 4.4-2.***
Policy 5(i) The City shall encourage agricultural interests to maintain or develop areas of natural habitat for wildlife compatible with farm management objectives.	*Consistent* Completion of surveys recommended by the *Draft Plan* would provide the City with a basis for requiring conformance with this policy on potential agricultural land. Intensive agricultural uses outside the SLVSPA would be subject to *Area Plan* Vineyard Area Policy 2(b), as monitored by the County.
Policy 5(j) The City shall prohibit removal of trees within the incorporated area without special permission of the City.	*Potentially consistent* After approval of the *Draft Plan* and annexation of the SLVSPA to the City, future activities involving trees would be subject to this policy. The *Plan* provides supplementary policies which address this issue.
6. Archaeological and Historical Resources Policies	
Policy 6(b) If an archaeological site is discovered during construction, all work in the immediate vicinity shall be suspended pending site investigation by qualified professionals. If, in the opinion of a qualified professional, the site will yield new information or important verification of previous findings, the site shall not be destroyed.	*Potentially consistent* The *Draft Plan's Conservation and Resource Management Element* contains policies to preserve the SLVSPA's cultural resources. After approval of the *Plan* and annexation to the City, future activities also would be subject to Archaeological and Historical Resources Policy 6(b).
Policy 6(e) The City shall encourage and, when possible, require the preservation of places, sites, areas, buildings, structures, and works of man which have cultural, archaeological, or historical significance or other special distinction to the community.	*Consistent* The former Olivina Winery is the only officially designated historic resource located in the SLVSPA, although other sites, artifacts, and buildings of historic interest are present in the planning area. The *Draft Plan* also would specifically preserve additional resources including the Caldiera home (Subarea 3), Zumbach ranch complex (Subarea 4), Wetmore home ruins (Subarea 5), Olivina Gate and entry drive (Subarea 6), and unbuilt Olivina Estate residence site (Subarea 7).

Policy 6(f) The City shall make architectural design requirements conditions of approval for use permits for relocating or renovating of historical buildings. Similar restrictions shall be applied to the modification or construction of structures adjacent to historical buildings.	*Potentially consistent* Specific projects would be required to conform to this policy and supplementing policies of the *Draft Plan* as development proceeds in the SLVSPA.
7. Visual Resources Policies	
Policy (7)(a) The City shall allow no structural development in hillside areas involving skylines, ridgelines, or silhouettes.	*Consistent* Implementation of the *Draft Plan* site plans would keep ridgelines free of development and would not result in silhouettes.
Policy (7)(b) The City shall maintain in open space that portion of the hills which are seen from the freeway, I-580, and which are within the I-580 Scenic Corridor as defined in the Scenic Route Element; any development within the Scenic Corridor is subject to conditions set forth in the Scenic Route Element. (Resolution. No. 167-83)	*Consistent* Development in SLVSPA subareas would not be visible from I-580 due to the distance from the freeway and the fact that the *Draft Plan's* site plans would confine development to lower elevations, even of hilly subareas. Subareas would be visible from existing and proposed scenic corridors, but the visibility of development set back behind 100-foot and deeper vineyards or orchards would not result in significant impacts.
Policy (7)(c) The City shall permit no intensive development of the hills. Development including roads, buildings and other structural or land coverage, shall be located, sited and designed to fit and be subordinate to the natural landforms. Under no circumstances shall development create uniform, geometrically terraced building sites which are contrary to the natural landforms, and which detract, obscure or negatively effect the visual quality of the landforms.	*Consistent* Gentle to steep hillslopes in developed parts of the SLVSPA are confined to Subareas 1, 4, and 7. The *Draft Plan's* site plans indicate that some clusters of limited development would be located at the bases and lower slopes of hills but envisage no intensive hillside development. In addition, *Plan* policies would impose increasingly stringent limits on grading (including prohibiting grading on slopes steeper than 25 percent).
Policy (7)(d) The City shall permit no structure or appurtenance to exceed the height of the tree canopy in woodland areas.	*Potentially consistent* Architectural standards contained in the *Draft Plan's* design guidelines set maximum building heights of 35 feet for two-story housing units (20 feet for one-story units), and 15-20 feet for one- and two-story secondary structures. The City would be responsible for reviewing individual development projects on a site-by-site basis to determine whether building heights lower than these maximum heights would be necessary in order to conform with this policy.
Policy (7)(e) The intensity of land use in woodland areas shall reflect the density of the trees so as to perpetuate the woodland character.	*Consistent* Except for Subarea 7 where this habitat is most widespread, woodlands occur in isolated parts of the SLVSPA or beyond the development areas envisage by the *Draft Plan*. *Plan* policies to protect woodland areas are summarized in Vegetation and Wildlife Resource Policy 5(h) and EIR ***Impact 4.4-2***.
Policy (7)(f) Development in woodland, grassland, or grassland / woodland areas will employ colors and materials which are in harmony with, rather than contrast with the vegetation cover of the site. (Resolution. No. 167-83)	*Consistent* Architectural standards contained in the *Draft Plan's* design guidelines state that natural materials left unpainted can be used anywhere, specifies color ranges for exterior walls and roof materials, and would not allow reflective materials.
Policy (7)(g) The City shall maintain an area of non-urbanized land surrounding Livermore to serve as a buffer between communities. Uses which are considered compatible with this area are agriculture, grazing, open space, recreation and reclaimed sand / gravel extraction.	*Consistent* The *Draft Plan* is intended to establish the southern boundary of Livermore beyond which agricultural land in the vineyard area would constitute a non-urbanized buffer around the City. In addition, the *Plan's* site plans provide buffers along SLVSPA roadways which would be designated as potential agricultural

	land and would set the actual edge of new subarea development back from travel corridors.
Policy (7)(h) Open space shall be used to protect and enhance local community character and identity, and to guide the physical shape and direction of urban growth to preserve the rural characteristics of the area.	*Consistent* In addition to potential agricultural land discussed above, the *Draft Plan's* site plans provide landscaped open space throughout developed parts of subareas and designate different types of parkland (local parks in Subareas 1, 2, 4, and 5 and regional parks in Subareas 4 and 7). The *Plan* also describes the three characteristics of the South Livermore Valley's rural landscape that the design guidelines were formulated to enhance and emulate -- openness, simplicity / economy, and variety within structure.
Policy (7)(i) Open space shall be used as a buffer between incompatible land uses within urban or essentially undeveloped areas.	*Consistent* Setbacks of 50 feet and wider within subareas to buffer adjacent land inside and outside the SLVSPA from existing and future uses, some conflicts could be expected. This EIR determined that all would be mitigable.
Policy (7)(j) The City shall protect and enhance public views within and from established scenic corridors, including the arroyos and development shall not be allowed to obscure, detract from, or negatively affect the quality of these views.	*Partly inconsistent* Bands of vineyards planted 100 feet and deeper along SLVSPA roadways would set development back from roadways and would keep new residential uses from encroaching into views of scenic corridors. However, development in Subarea 3 would be visible from Arroyo Mocho where the arroyo enters the urban area of Livermore, and some development in Subarea 7, while set back from Sycamore Grove Park, would be visible from Arroyo Valle. Subarea 6 also is contiguous to Sycamore Park on the opposite bank of Arroyo Valle but would be devoted primarily to agriculture and developed with a medium-size winery.
Policy (7)(k) The City shall permit no development to wholly obstruct or significantly detract from views of any scenic area as viewed from a scenic corridor. (See the Scenic Element). Resolution. No. 167-83.	*Consistent* As noted in relation to Visual Resources Policy 7(b), subareas would be visible from existing and proposed scenic corridors, but the visibility of development set back behind 100-foot and deeper vineyards or orchards would not result in significant impacts.
Policy (7)(l) The City shall permit no development, with the exception of agricultural uses, on grassland in upland areas unless such development will be screened effectively from existing or proposed public viewing areas or scenic corridors.	*Consistent* Upland areas of Subareas 1, 4, and 7 support native and non-native grasslands. The *Draft Plan's* site plans envisage some new development in Subarea 1 grasslands clustered near existing development and conversion of the remaining grasslands to potential agricultural land for intensive cultivation. In Subarea 4, upland area grasslands would be preserved as a regional park, although grasslands elsewhere would be transformed with development clusters and intensively cultivated agriculture (primarily extensions of olive orchards and possibly new vineyards). Development in Subarea 7 would be confined to lower elevations and surrounded by new vineyards. Grasslands farther uphill of the 650-foot elevation either would be established as regional parklands or designated for non-intensive agricultural use, such as continued livestock grazing.

Policy (7)(n) Site planning, architectural, and landscape architectural design review shall be required so that development will be attractive from the highway and roads, and a harmonious relationship will exist among the various elements of proposed and existing developments and the visual qualities of the scenic corridor. Careful consideration shall be given to natural land contours. (Resolution. No. 167-83)	*Potentially consistent* The *Draft Plan's* design guidelines provide site planning, architectural design, and landscaping standards. The City would be responsible for reviewing the conformance of individual development projects with *Plan* guidelines and this policy.
Policy (7)(o) The City shall develop a coordinated system of "street furniture". This includes fire hydrants, litter containers, newspaper vending machines, paving patterns, planters, signposts, traffic signals, benches, and light standards.	*Potentially consistent* These urban design elements are intended for developed City neighborhoods and would be too urban for the rural character desired in the SLVSPA. However, the *Draft Plan's* design guidelines contain roadway standards and provisions for some suburban type design components (such as project entrance markers), and implementation of *Plan* guidelines would produce some design consistency among the subareas.
Policy (7)(p) The City shall develop a Community Design Element which would identify standards and principles governing the visual design of neighborhood, commercial and industrial development and redevelopment. This element shall provide policies to enhance and protect the appearance of the City and shall be incorporated as part of specific plans.	*Consistent* The *Draft Plan's* design guidelines would fulfill this function in the SLVSPA.
Policy (7)(q) The size, height, number and type of on-premise signs allowed shall be the minimum necessary for identification. Their design, materials, color, texture and / or location shall relate to the type of activity to which they pertain and be compatible with the visual character of the area surrounding them.	*Potentially consistent* Although the City has not sponsored the preparation of commercial design guidelines to provide direction suitable to the character desired for commercial sites in the SLVSPA, the *Draft Plan's* commercial land use policies direct the City to adopt design standards and guidelines before permitting commercial development in the SLVSPA.
Policy (7)(r) The City shall not permit off-premises outdoor advertising, except for an approved informational or directional panel, i.e., signs used for advance notice to motorists or to identify groups of uses.	*Potentially consistent* See Visual Resource Policy 7(q), above. The City can incorporate this policy in its commercial design guidelines when formulated.
Policy (7)(s) Utility distribution lines shall be placed underground in new developments and upon redevelopment.	*Potentially consistent* Details of individual development projects would not be known until sponsors submit applications for City review and approval at which time the City would be responsible for ensuring compliance with this policy.
Visual Resources Policy (7)(t) Existing overhead utilities shall be placed underground through a phased program of conversion.	*Not applicable* The electrical power transmission lines which cross the SLVSPA (Subareas 1, 4, and 7) would remain above ground within PG&E's existing utility easements. However, according to staff, the policy was desired to address lower voltage local distribution lines (not high voltage transmission lines) located in already developed parts of the City.

Visual Resources Policy (7)(u) Off-street parking areas shall be screened preferably by natural vegetation in conjunction with low earth berms.	*Partly inconsistent* The *Draft Plan's* design guidelines provide for guest parking on certain streets and in bays of one or two spaces in residential areas and for resident parking in garages and driveways. As discussed for Policies 7(q) and 7(r), the City has not prepared equivalent guidelines for SLVSPA commercial development and either can do so or can apply existing policies to those sites. In the meantime, no project-specific details about commercial site parking are known or have been assumed for this EIR.
Policy (7)(v) Existing land uses or those of public necessity which are visually offensive shall be screened from view from the highway and roads, or inconspicuously located if within a scenic corridor. (Resolution. No. 167-83)	*Consistent* As discussed above, the *Draft Plan's* site plans provide visual buffers of 100 feet and wider along area roadways and designates the buffers as potential agricultural land for intensive cultivation with vineyards or orchards. These site planning features would shield existing development to remain and new residential development from significantly affecting views of travelers on the roadways .
Policy (7)(w) Trees, shrubs, and other landscaping shall be planted along scenic roads in accordance with a landscape plan approved by the City.	*Consistent* See immediately preceding policy. In addition, the *Draft Plan's* design guidelines contain landscaping guidelines and lists appropriate tree species to plant in the SLVSPA. The *Plan* also contains policies to preserve native trees, including oaks and sycamores (see ***4.4 Biological Resources, Impact 4.4-2***).
Policy (7)(x) Existing healthy specimen trees and shrubs on private property shall be preserved.	*Consistent* As noted above, the *Draft Plan* contains policies to preserve native trees, including oaks and sycamores (see ***4.4 Biological Resources, Impact 4.4-2***).
Policy (7)(z) Scenic corridor development shall include provision for cycling, hiking, and riding trails within or adjacent to street rights-of-way where feasible.	*Consistent* All new construction would provide trails within or adjacent to street rights-of-ways including Vasco Road, Telsa Road, South Livermore Avenue, Concannon Boulevard, Wente Street, Marina Avenue, Wetmore Road, Arroyo Road, and all entry roads.
8. Seismic Safety Policies	
Policy 8(a) Urban development within earthquake fault zones and areas of high landslide susceptibility shall be carefully regulated. Open space shall be considered the most desirable use for these areas.	*Consistent* Subsurface explorations were conducted on some SLVSPA subareas as part of the planning process, and the *Draft Plan's* site plans reflect the findings of those geologic investigations by setting development back from the mapped trace of the Las Positas fault in Subarea 1 and probable location in Subareas 4, 6, and 7. The *Plan* also contains policies to address seismicity, as discussed in ***4.2 Geology, Soils, and Seismicity, Impacts 4.2-6*** and ***4.2-7***.
Policy 8(c) No structure for human occupancy shall be placed across the trace of any active fault within the Planning Area. The Greenville [and] Las Positas faults shall be assumed active, and the Livermore fault shall be assumed potentially active unless and until proven otherwise. Urban development within 600 feet of a fault, shall be approved only after an approved geologic investigation and submissions of a report by an engineering geologist registered in the State of California proves development to be safe and demonstrates the hazard of surface displacement is low. (Resolution No. 307-80)	*Consistent* Same as Seismic Safety Policy 8(a), immediately above.

Land Use Goals and Policies	
Goal B It is a goal of the City that new development be located so as to create a consolidated pattern of urbanization, particularly with respect to minimizing the cost of urban services and achieving maximum public and private benefits from existing services and facilities.	*Partly inconsistent* The *Draft Plan's* site plans were designed to make a transition from urban to rural rather than to extend existing development patterns and densities. In view of this policy, while development in Subareas 3 and 5 would create the most logical extensions to existing development, the resulting pattern of urbanization in other parts of the SLVSPA would vary from subarea-to-subarea. Development in Subarea 2 could be interpreted as representing infill (out to the Shaheen Industrial Park) whereas Subarea 1 development would cross a man-made barrier (South Vasco Road) and locate development clusters at the outer extent of the SLVSPA but still might be interpreted as infill (out to the Sandia National Laboratories site). While Subarea 4 also would extend development across man-made barriers (Marina Avenue and Arroyo Road), implementing the *Draft Plan* might be considered infill (building out land between suburban neighborhoods and an area of lower density residential development and ranchettes). Subarea 6 crosses a man-made barrier (Wetmore Road) but, apart from a possible winery, would not be developed. Completion of the Vineyard Estates development west of Subarea 7 would introduce low density residential development in tandem with vineyards on contiguous land. The *Draft Plan's* site plan for Subarea 7 would introduce urban density development beyond the natural barrier formed by Arroyo Valle. Natural barriers are far more effective than man-made barriers in reducing urban-rural conflicts (which lead to abandonment of agriculture and conversion to developed uses) and in preventing urban sprawl. Subareas 1,2 3, and part of 4 are located inside the City's sphere of influence which designates the ultimate urban area, but Subareas 5, 6, 7 and the southern three parcels in Subarea 4 are located outside the sphere. The *Plan's* financing plan addresses the costs to extend urban services to all subareas, including Subarea 7.
General Policies	
Policy a A filling in of neighborhoods where the development pattern is now fragmented.	*Partly inconsistent* In addition to the potential infill aspects of development in Subareas 1, 2, and 4 discussed immediately above, Subarea 5 represents an example of the transitional nature of rural residential and ranchette development which either can gradually feather development from urban to rural densities or can presage urban density development.

Policy b Only modest expansion, in the short-range, of neighborhoods where new development has been a contiguous expansion of existing neighborhoods.	*Partly inconsistent* Development adjacent to Subareas 3 and 5 which occurred at different times (recently and longer ago) anticipated further development in the subareas. Streets in these existing residential neighborhoods stub out near the subarea boundaries which suggests planning to accommodate eventual extensions of streets to serve the adjoining subareas. Although it is logical to assume that Subareas 3 and 5 would develop first, in the short-term, the sequence of SLVSPA buildout would not be known until individual development projects are proposed. In the meantime, in addition to the *Draft Plan's* growth management policies, its Implementation Element and financing plan would provide for the installation of urban infrastructure which in turn would determine where development could be supported. Finally, implementation of the *Plan* would build out and permanently establish the southern edge of the City.
Policy c Encouraging further contiguous development to fill in locations within existing neighborhoods.	*Partly inconsistent* The *Draft Plan* would not accomplish this type of infill development and was not formulated to do so but, instead, would create the permanent southern boundary of Livermore. However, when an urban area is defined and officials actively support infill, reuse, and redevelopment policies, planned growth is directed into established development and designated expansion areas rather than spilling beyond the urban limit. Creating Livermore's urban edge is intended to reinforce agricultural activities in the adjacent vineyard area. Thus, the combination of a defined urban edge and commercially viable agricultural zone ultimately would create conditions in conformance with this policy.
Policy d The preparation and adoption of specific plans for "Planning Units" or neighborhoods which will include a schedule for extension of City services and facilities.	*Consistent* The draft *South Livermore Valley Specific Plan (Draft Plan)* includes an Implementation Element and financing plan. Together they would phase the sequence of extending urban services and facilities to the SLVSPA subareas and provide mechanisms to fund the installation of that "backbone infrastructure".
Policy e Development shall conform to adopted specific plans.	*Potentially consistent* The City would be responsible for ensuring conformance of individual development projects with this policy when reviewing and approving applications on a project-by-project basis.
Policy f Except where special conditions warrant, the City shall allow development only on those properties immediately adjacent to established urban neighborhoods.	*Partly inconsistent* Same as Goal B.
Policy g Planned open space within and adjacent to the City shall be preserved to implement the trailways system, preserve scenic and historic resources, provide common areas within higher density developments, and promote the public health, safety, and welfare. ...	*Consistent* The *Draft Plan* provides 14 separate trail segments to permit continuous travel in the SLVSPA and to make connections to existing and planned trails, maintains different types of open space areas (potential agricultural land and public parkland), preserves cultural resources, and contains an agricultural mitigation program which would establish easements and plant vineyards (or orchards) according to a ratio of land and housing units developed in the SLVSPA.

Transportation - Circulation Goals and Policies	
General Circulation System	
Goal 2 Plan local circulation system improvements with adequate consideration of their effects on existing land uses and the future land use pattern.	*Consistent* The *Draft Plan's* Transportation and Circulation Element contains a goal to provide a circulation system for the SLVSPA which safely accommodates increased traffic associated both with buildout under the *Plan* and with wine country tourism while preserving the area's rural agricultural character.
Goal 5 Base City circulation policies and improvement programs on a goal to maintain a peak-hour volume / capacity ratio not higher than 0.85 for major intersections in the City.	*Consistent* The Transportation and Circulation Element establishes this V / C ratio as the standard not to be exceeded for more than two hours per average day in the SLVSPA.
Goal 6 Emphasize in local circulation planning the need to minimize adverse environmental impacts and protect neighborhood quality.	*Consistent* The Element also contains policies to avoid extensive development of new roads outside the SLVSPA, and "over design" streets (capable of accommodating, thus attracting, more traffic than attributable to implementation of the *Draft Plan*.
Roadway System Policies -- Proposed Roadway System	
System 6 ***Intracounty Routes*** Intracounty routes are medium-speed, low-capacity rural roads on the City's urban fringe which are components of the subregional intercommunity road system ... [including the Concannon Boulevard Extension, South Vasco Road, and Tesla Road]. These routes are typically maintained at county two-lane rural standards (no curbs or gutters).	*Consistent* Element policies designate these roads as Wine Trail segments and also recommended maintaining them as two-lane rural roadways.
System 7 ***Special Rural Routes*** Special rural routes include highways, major streets, and intra-county routes [Concannon Boulevard extension, South Vasco Road, Tesla Road, and Wetmore Road] that pass through or by areas designated as having special rural features which warrant incorporation of protection and enhancement measures in the roadway design. Special rural routes are designated through and entering City-identified vineyard lands. These routes should incorporate special road design standards which serve to protect and complement the "wine country" character of these lands, including width restrictions, landscaping features, and special signs. Special rural routes shall be developed at two-lane rural standards (no curbs, gutters, or sidewalks) but shall include combined bike / pedestrian / equestrian trails.	*Consistent* Same as System 6-Intracounty Routes immediately above.
Roadway System Policies, Roadway Improvement Policy 6 For the purposes of development associated traffic studies, road improvement design and capital improvement priorities, the City shall consider a peak-hour volume / capacity ratio of 0.85 for periods of 2 hours or more per average day to be the upper limit of acceptable service at major intersections in Livermore.	*Consistent* Same as Transportation - Circulation Goal 5, above.

Roadway System Policies, Roadway Improvement Policy 10 Provide a street system which minimizes traffic on local, minor (non-collector) streets in order to create and preserve a high quality residential environment.	*Consistent* The *Draft Plan's* design guidelines and Element fully describe and the site plans illustrate the various types of local streets to provide access to and through the subareas. Only two new roadways in the SLVSPA, neither designated as a local or minor street, would accommodate traffic other than trips generated by planning area development -- the Concannon Boulevard Extension (Subarea 3) previously planned by the *City of Livermore Community General Plan* and new Wetmore entrance to the SLVSPA from Vallecitos Road (contained in the *Draft Plan*).
Roadway System Policies, Roadway Improvement Policy 11 Design local roadway improvements to minimize adverse land use, air quality, noise, community appearance, vegetation and wildlife, drainage, and other environmental impacts. Whenever possible, roadway routing and improvements shall avoid significant impacts to the habitats of rare and endangered species.	*Consistent* The *Draft Plan's* site plans reflect environmental input collected during the constraints analysis and EIR's preparation to minimize environmental impacts from making roadway improvements to serve SLVSPA development. The *Plan* also contains policies to avoid environmental resources or, where resources cannot be avoided, to mitigate impacts.
Roadway System Policies -- Roadway Improvement Policies	
Policy 12 Consider public perceptions of the Livermore community, including its overall form, character, and image when deciding upon the precise alignment and design standards to be incorporated in the road system improvements set forth herein.	*Consistent* Part of the process of formulating guidelines for residential development included defining road design in keeping with desired rural characteristics. The Element's roadway design standards were defined to incorporate rural features which recognize the area's openness and views and to provide simple functional streets.
Policy 13 In designing and considering future improvements to designated special rural roads, i.e., roads which traverse designated vineyard lands, the City shall endeavor to protect and enhance the "wine country" character of the area.	*Consistent* Same as Transportation - Circulation Goal 2 and Roadway Improvement Policy 12, immediately above.
Roadway System Policies -- Parking Policies	
Policy 2 Limit curbside parking in accordance with the criteria set forth in this Circulation Element for the seven roadway classifications and in accordance with the *Livermore Urban Design Implementation Program.*	*Partly inconsistent* The *Draft Plan's* design guidelines provide for guest parking on certain streets and in bays of one or two spaces in residential areas and for residents in garages and on driveways.
Roadway System Policies -- Roadway and Parking Improvement Program Policies	
Policy 8 Major Intersections. Avoid staggered T intersections (i.e., where major streets and collectors are planned to intersect, including the . . . Concannon Boulevard-Tesla Road intersections. These intersections should have four-way configurations and traffic signals. To the extent feasible, major intersections shall be spaced no closer than 1,000 feet.	*Partly inconsistent* Development of Subareas 1 and 2 according to the *Draft Plan's* site plans would result in a staggered "T" intersection on South Vasco Road. The northern of three Subarea 1 access roads would form a staggered "T" (just north of a secondary Subarea 2 access road). The southern Subarea 1 access roads would form a single "T" on South Vasco Road within 1000 feet of the southern Subarea 2 entrances. Subarea 3's eastern entry road would be within 1000 feet of Robertson Park Road and Wente Street intersections.

Policy 12 Noise Abatement. Incorporate appropriate noise abatement measures, including those suggested in the City's Noise Element, in the design of roads which may generate significant noise intrusion into residential and other noise-sensitive land uses (hospitals and schools). Design noise barriers in accordance with guidelines set forth in the City's *Urban Design Implementation Program* to reduce adverse visual impacts.	*Partly inconsistent* The *Draft Plan's* site plans would set new development back from existing roadways to avoid exposure to noise levels in excess of the City's land use compatibility standards, augmented in Subarea 5 adjacent to Vallecitos Road with a berm designed to satisfy this policy to further buffer noise attenuation. However, after completion of the Concannon Boulevard Extension, SLVSPA generated traffic would contribute to cumulative noise impacts on existing segments of this road.
Policy 16 Existing Street Trees. Design designated future improvements to roads which are currently lined with mature trees (portions of East Avenue, South Livermore Avenue, . . and Arroyo Road) to minimize tree loss or damage to the extent possible. Maintain an ongoing program of roadside tree care and replacement.	*Potentially consistent* The *Draft Plan* envisages some widenings of existing off-site roadways in the vicinity of SLVSPA access roads including at entrances to Subareas 1 and 2 on South Vasco Road, to Subareas 4 and 5 on Arroyo Road at Hansen Road, and on Foley Road between Subarea 7 and the planned realigned Vallecitos / East Vineyard / Foley intersection. The *Plan's* Conservation and Resource Management Element contains policies to comply with City Vegetation Preservation Conditions and to preserve or compensate for removal of native trees.
Policy 17 Grading. Incorporate design measures which minimize adverse visual impacts of grading where designated roadway improvements traverse hilly terrain. Adhere to the grading guidelines set forth in the City's *Scenic Route Element* and *Urban Design Implementation Program* in the design of such road segments.	*Consistent* The *Draft Plan's* grading policies require any cut and filled areas where slopes have grades of ten to 25 percent to be contoured to match the natural terrain and prohibit any grading on slopes steeper than 25 percent.
Policy 25 Residential Development on Major Streets. All residential development adjacent to major streets and Arroyo Road (South of Arroyo Mocho) shall be designed to limit access between the development and the street. This may be accomplished by either backing the lots to the street or providing a frontage road.	*Consistent* All residential development would be served by SLVSPA access roads connecting to major off-site streets (see Policy 8-Major Intersections, above), and no new driveways would be constructed to serve individual housing units. (New driveways would be built to serve commercial sites.)
Roadway System Policies -- Specific Roadway Improvement Criteria	
Policy 2 Concannon Boulevard-Tesla Road Extensions. Create an additional east-west connector in southern Livermore by extending Concannon Boulevard to connect with Isabel Avenue and South Livermore Avenue, in order to reduce operational impacts on the southern Livermore road system (East Avenue, 4th Street, and Stanley Boulevard) due to anticipated year 2010 and buildout traffic volumes. Base the design of improvements on the following criteria:	*Consistent* The *Draft Plan* provides for the extension of Concannon Boulevard from its current easternmost stub along the southern boundary of Subarea 3 either to Wente Street (with a realigned Wente / South Livermore intersection) or to Tesla Road (a new intersection south of South Livermore Avenue). The *Plan's* Transportation and Circulation Element would make residential development in Subarea 3 conditional upon completion of the Concannon Boulevard extension.
• In extending Concannon Boulevard east of Arroyo Road to South Livermore Avenue, City goals to preserve the rural quality of its designated vineyard lands shall be the overriding consideration and a 2-lane rural design standard shall be maintained, with separate left-turn lanes to facilitate access to Arroyo Road, Buena Vista Avenue, Mines Road, Vasco Road, and Greenville Road. Where the roadway is located through areas of urban development, right-of-way sufficient for a four-lane facility shall be obtained.	*Potentially consistent* The *Draft Plan's* site plan for Subarea 3 provides a minimum 100-foot setback along the Concannon Boulevard extension to be planted with vineyards. While the *Plan* provides for construction of this roadway, its ultimate design by the City is a separate action from approving and implementing the *Draft Plan*. Thus, it will be the City's responsibility to design a two-lane rural roadway in conformance with this policy. The alternative alignments shown in the *Plan* would not extend Concannon Boulevard farther east than South Livermore Avenue or Tesla Road and would not affect access to Buena Vista Avenue, Mines Road, Vasco Road, or Greenville Road.
Pedestrian and Bicycle System, General Bicycle Circulation	

Policy 1 Further develop and maintain a comprehensive bikeway system throughout the City which interconnects major activity centers, scenic routes, and recreation areas. [Future bicycle network segments shown on Arroyo Road, Concannon Boulevard extension, Tesla Road, South Vasco Road, and Wetmore Road.]	*Consistent* Same as Visual Resource Policy 7(z).
Bicycle Program 1 Specific Improvement Priorities. Construction of additional on-street routes and off-street paths, including along Concannon Boulevard, Tesla Road, Vasco Road, ... Arroyo Road	*Consistent* See above (same as Visual Resource Policy 7(z)).
Transit Policies	
Transit System Programs 2 Turnouts and Shelters. Require the installation of bus turnouts and shelters along existing and planned transit routes, coincident with new development, financed by developers, and in cooperation with the [Livermore-Amador Valley Transit Authority] and BART.	*Potentially consistent* The *Draft Plan's* transit policies direct future developers to provide transit stops and associated amenities (shelters, etc.), to be coordinated with the Livermore-Amador Valley Transit Authority (LAVTA).
Livermore Road System Improvements List [3] ***Concannon Boulevard.*** Extend from Arroyo Road to Livermore Avenue; 2 lanes (or 4 lanes through urban development).	*Potentially consistent* Same as Roadway System-Specific Roadway Improvement Criteria Policy 2.
Public Facilities and Services	
Goal b It is the goal of the City to provide urban services through a phased program ensuring the orderly implementation of policies and proposals of the General Plan, including the annexation of areas to be served and provisions for meeting the costs of such services.	*Consistent* Same as Land Use Policy d. As discussed above, the *Draft Plan* includes a Implementation Element and financing plan. Together they would phase the sequence of extending urban services and facilities to the SLVSPA subareas and provide mechanisms to fund the installation of that "backbone infrastructure".

3 As of April 1989, Circulation Element, *City of Livermore Community General Plan*, revised as of October 1993.

2. General Facilities Policies	
Policy a(2) *Domestic Water Systems* Urban development shall be prohibited unless the City can find that (a) there exists an adequate domestic water supply. This shall be based on an approximate 1,150 gallons per day per single family residence peak water demand.	*Consistent* Policy 8-1 of the *Draft Plan* prohibits development unless there exists adequate water supply.
Policy c(2) *Sewage Treatment* Urban development shall occur only if there exists an adequate sewer treatment capacity.	*Consistent* Policy 8-12 states that adequate sewage treatment export capacity shall be reserved at the time of the Specific Plan adoption. However, as discussed in Exhibit 4.1-9 (South Livermore Valley Policies, Annexation and Urban Development Policy 2(a), SLVSPA growth under cumulative conditions (including growth in North Livermore) would generate wastewater flows in excess of existing treatment plant capacity (and also in excess of export pipeline capacity).
Policy d(2) *Fire Protection* The City shall provide fire fighting equipment, facilities, and manpower sufficient to assure: (1) quick response to all calls by the "first due" company, (2) availability of additional companies for serious fires in high value areas, (3) capacity for handling simultaneous fires, and (4) a water system capable of sustaining prerequisite fire flow at all times.	*Consistent* Response times to the SLVSPA would be acceptable, personnel and equipment would be adequate to fight structural fires, and the *Draft Plan's* water system was designed to provide supply and pressures sufficient for firefighting. An additional wildland fire engine would be required to meet potential wildland-interface fire demands (at the interface of high value SLVSPA development), and is required by the *Draft Plan*.

Exhibit 4.1-11
Conformance with Selected Alameda County East County Area Plan Policies

Policy	Consistency
Goal To take a proactive approach to protect, enhance, and increase viticulture and other cultivated agriculture in the South Livermore Valley.	*Consistent* Same as South Livermore Valley Policies, Goal 2, Exhibit 4.1-9.
Policy 302 The County shall encourage the expansion of cultivated agricultural, particularly viticultural, use in the South Livermore Valley from the current 2,100 acres to the maximum acreage possible, with a minimum acceptable level of 5,000 acres.	*Potentially consistent* Same as South Livermore Valley Policies, Objective 1, Exhibit 4.1-9.
Policy 303 The County shall prohibit additional development in the unincorporated portions of the South Livermore Valley unless it will directly further the purpose of expanding and enhancing cultivated agriculture.	*Potentially consistent* The *Draft Plan's* modified moderate annexation scenario would result in City annexation of the SLVSPA subareas plus Sycamore Grove Park Veterans Park, and the U.S. Department of Veterans Affairs Medical Center. Development envisaged by the *Plan* would be in the incorporated City. Development proposed in the unincorporated vineyard area outside the SLVSPA would be subject to County jurisdiction and this policy. (Also see South Livermore Valley Policies Objective 5, Exhibit 4.1-9, and *City of Livermore Community General Plan* Goal B, Exhibit 4.1-10.)
Policy 304 The County shall encourage the establishment and permanent protection of existing and new cultivated agriculture, through use of agricultural easements, density bonuses, or other means.	*Consistent* Same as South Livermore Valley Policies, Agricultural Preservation and Enhancement Policy 6, Exhibit 4.1-9.
Overall South Livermore Valley Plans and Policies	
Goal To promote the South Livermore Valley as a unique and historic Wine Region.	*Consistent* Same as South Livermore Valley Policies, Goal 1, Exhibit 4.1-9.
Policy 306 The County shall encourage the development of additional wineries with a range of sizes, and other wine-country uses that promote the South Livermore valley as a premier wine-producing area.	*Consistent* Same as South Livermore Valley Policies, Objective 2, Exhibit 4.1-9.
Policy 307 The County shall encourage the promotion of south Livermore Valley as a premier wine- producing center by encouraging appropriate tourist attracting and supporting uses, such as bed and breakfast establishments, bicycle and equestrian facilities, a conference center, a wine museum, or other uses, and by establishing clear, well-signed travel corridors from major highways to the area.	*Consistent* Same as South Livermore Valley Policies, Agricultural Preservation and Enhancement Policy 3, Exhibit 4.1-9.
Goal To discourage and minimize development on lands with existing vineyards and on lands suitable for viticulture.	*Partly inconsistent* Same as South Livermore Valley Policies, Goal 4, Exhibit 4.1-9.

Policy 309 The county shall strongly discourage the non-renewal or early termination of Williamson Act contracts in the south Livermore Valley. County agricultural preserve guidelines and individual contracts may be modified to specifically accomplish the objectives of preserving and promoting agriculture, in conformance with South Livermore Valley Area Plan policies.	*Consistent* Same as South Livermore Valley Policies, Agricultural Preservation and Enhancement Policy 5, Exhibit 4.1-9.
Goal To direct development and development speculation away from productive and potentially productive agricultural land, particularly that land classified as having the better quality soil for grapes.	*Partly inconsistent* Same as South Livermore Valley Policies, Goal 5, Exhibit 4.1-9.
Policy 310 The County shall create a land trust to permanently protect productive and potentially productive cultivated agricultural lands in the South Livermore Valley.	*Consistent* Same as South Livermore Valley Policies, Objective 3, Exhibit 4.1-9.
Policy 311 The County shall encourage Livermore and Pleasanton to adopt policies and programs establishing other sources of funds for the Agricultural land Trust, such as fees on appropriate development outside of the South Livermore Valley.	*Consistent* Same as South Livermore Valley Policies, Agricultural Preservation and Enhancement Policy 8, Exhibit 4.1-9.
Goal To preserve the South Livermore Valley's unique rural and scenic qualities.	*Consistent* Same as South Livermore Valley Policies, Goal 3, Exhibit 4.1-9.
Policy 312 The County shall maintain and enhance the visual quality of the South Livermore Valley by limiting inappropriate uses in viticultural areas and encouraging good design through establishment of appropriate design guidelines.	*Consistent* Same as South Livermore Valley Policies, Agricultural Preservation and Enhancement Policy 4, Exhibit 4.1-9.
Goal To coordinate land use planning in the South Livermore Valley between Alameda County and the cities of Livermore and Pleasanton, to increase certainty over future land uses and to reduce speculation.	*Consistent* Same as South Livermore Valley Policies, Goal 6, Exhibit 4.1-9.
Policy 313 The County shall work with Livermore and Pleasanton to limit further urbanization in the south Livermore Valley to areas under city jurisdiction and to development that substantially enhances cultivated agriculture.	*Partly inconsistent* Same as South Livermore Valley Policies, Goals 4 and 5, Exhibit 4.1-9.
Policy 314 The County shall require that urban development within the south Livermore Valley mitigate impacts on and substantially enhance cultivated agriculture, by means of paying agricultural mitigation fees to the South Livermore Agricultural Land Trust, by the direct planting of new vineyards, by dedicating agricultural easements on lands within the south Livermore Valley, and / or by including major wine-oriented attractions that would increase recognition of the South Livermore Valley as a premium wine-producing region.	*Consistent* Same as South Livermore Valley Policies, Agricultural Preservation and Enhancement Policy 7 (and same as Goal 2, Objective 3, and Policy 6), Exhibit 4.1-9.
Policy 315 The County shall encourage the creation of a permanent boundary and open space buffer between the cities of Livermore and Pleasanton in the South Livermore Valley.	*Consistent* Same as South Livermore Valley Policies, Objective 6, Exhibit 4.1-9.

Policy 316 The County shall encourage the cooperation of Alameda County, Livermore, and Pleasanton in reaching the goals and objectives of the South Livermore Valley Are Plan through coordination of land use plans, use of pre-annexation, development, joint powers, tax-sharing, or other agreements, or other appropriate devices to coordinate future land uses and appropriate mitigation measures.	*Consistent* Same as South Livermore Valley Policies, Agricultural Preservation and Enhancement Policy 7 (and Goal 6), Exhibit 4.1-9.
Program 130 The County shall actively discourage the annexation of lands within the Vineyard Area unless the following criteria are met:	
a. An urban development project is proposed that would significantly contribute to the goal of maximizing the number of acres of permanently protected vineyards or other cultivated agriculture in the south Livermore Valley with a minimum acceptable level of 5,000 acres, and that meets the criteria described in Program 131, *East County Area Plan*, and shown below.	*Potentially consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 1(a), Exhibit 4.1-9.
b. To the extent that annexation is reasonably incidental to an annexation described in criteria (a) above, properties may be annexed which are under agricultural easements that permanently limit development to a gross density of one residence per 20 acres, and 90 percent of the parcel is set aside and planted in vineyards or other cultivated agriculture, as described in Program 116 for the Vineyard Area.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 1(b).
Program 131 The County shall require any urban development proposal within the Vineyard Area to meet the following criteria, at a minimum:	
a. All necessary public utilities and services are available.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(a), Exhibit 4.1-9.
b. The project will contribute funds for a recycled water treatment system. Contributions should equal or exceed the cost of providing recycled water equal in volume to 120 percent of anticipated water use of the development.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(b), Exhibit 4.1-9.
c. The project will not require cancellation of a Williamson Act contract unless the development proponent can show, to the satisfaction of the City of Livermore, that cancellation will result in a more compact development pattern than development of proximate non-contracted lands, and that an area within the Vineyard Area equal or greater in area than the parcel(s) on which cancellation would occur will be cultivated and placed under permanent agricultural easement and a long-term maintenance contract, prior to final approval of any cancellation.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(c), Exhibit 4.1-9.
d. The project site will not displace a significant amount of any actively farmed vineyards, defined as vineyards that produced and harvested wine grapes in 1991.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(d), Exhibit 4.1-9.

e. The project site is contiguous to existing development within the city of Livermore. As discussed in Program 134 below, the City of Livermore shall determine the exact location of urban development through the adoption of a Specific plan and / or General Plan Amendment.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(e), Exhibit 4.1-9.
f. At a minimum, the project protects and promotes viticulture or other cultivated agriculture through the means given below and described in detail in the *East County Area Plan*. (i) Development is located and clustered, to the maximum extent feasible, adjacent to city boundaries to minimize loss of better quality soils for wine grapes, and is sited and designed to create a logical, permanent urban edge to Livermore.	*Partly inconsistent* Same as South Livermore Valley Policies, Goals 4 and 5, Exhibit 4.1-9.
(ii) To mitigate the loss of cultivable soils, a minimum of one acre in the Vineyard area is planted in new vineyards or other appropriate cultivated agriculture, and is permanently protected through dedication of agricultural easements for each acre developed.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(f)(ii) and Objective 4, Exhibit 4.1-9.
(iii) To enhance cultivated agriculture in the Vineyard Area, a minimum of one acre within the Vineyard Area, in addition to the acreage described in (ii) above, is planted in vineyards or other appropriate cultivated agriculture, and is permanently protected through dedication of agricultural easements for each new dwelling unit permitted in the project.	*Potentially consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(f)(iii) and Objective 4, Exhibit 4.1-9.
(iv) Mitigation acreage required under (ii) and (iii) above is not eligible for bonus densities, as permitted under the Cultivated agricultural Overlay District.	*Potentially consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(f)(iv), Exhibit 4.1-9.
(v) Mitigation acreage for urban development in the Vineyard Area is dedicated and planted, and evidence of a long-term contract (eight years or more) is given prior to approval of a final map. This requirement can be phased, as long as phasing is consistent with final map phasing.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(f)(v), Exhibit 4.1-9.
(vi) New cultivated agriculture resulting from the South Livermore Valley Area Plan policies uses water conserving best management programs, including use of drip irrigation wherever feasible.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(f)(vi), Exhibit 4.1-9.
(vii) Development includes at least one major draw or attraction that would increase recognition of the south Livermore Valley as a premium wine-producing region.	*Potentially Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 2(f)(vii), Exhibit 4.1-9.

Program 134 The County shall encourage the city of Livermore to amend the City General Plan to include relevant policies for the South Livermore Valley within one year of adoption of the South Livermore Valley policies by the county. The city shall also be encouraged to adopt a Specific Plan and / or a General Plan Amendment that would specify the amount, timing, and location or urban development in the Vineyard Area, consistent with County policies, within three years of an application for urban development in the Vineyard Area. Failure of the city to meet these time limits would be grounds for the County to reconsider its South Livermore Valley policies.	*Consistent* Same as South Livermore Valley Policies, Annexation and Urban Development Policy 4, Exhibit 4.1-9

4.2 GEOLOGY, SOILS, AND SEISMICITY -- THE SETTING [1]

Introduction

The South Livermore Valley Specific Plan Area (SLVSPA) consists of seven subareas, located southeast and east of the City of Livermore in the Livermore-Amador Valley area of eastern Alameda County. Subareas 1 and 2 (farthest northeast) are contiguous and located east / southeast of the city center in generally flat terrain. Access is via East Avenue and Tesla Road. Subarea 3 is located southeast of the city, also in generally flat terrain. Access is via South Livermore Avenue and Wente Street. Subareas 4, 5, and 6 are contiguous and located south of the City boundary in generally flat terrain (except for the southeast corner of Subarea 4). Access is via Arroyo Road and Vallecitos Road. Subarea 7 (the southernmost) is located south of Subareas 4, 5, and 6 in hilly terrain and bordered by a terrace upland of Arroyo Valle. Access to Subarea 7 is from Vallecitos Road via private roads.

Subareas 1 and 2 are located in the U.S. Geological Survey's (USGS) 7.5 minute Altamont Quadrangle. Parts of Subareas 3 and 4 are shown on the Altamont and Livermore Quadrangles. Subareas 5 and 6 are located within the Livermore Quadrangle. Part of Subarea 7 is shown on the Livermore and La Costa Valley Quadrangles.

Previous Geologic Work

A number of geologists have mapped the Livermore Valley and environs in various levels of detail. A.S. Huey [2] mapped the area for the California Division of Mines and Geology (CDMG). The CDMG used geologic work in the area by C.A. Hall [3] and A.S. Huey to prepare the San Jose Sheet of the California Geologic Atlas Series in 1966. [4] The CDMG also used a 1964 California Department of Water Resources (DWR) publication to present faulting in the Livermore Valley on the San Jose Sheet. [5]

T.W. Dibblee and R. C. Crane mapped the general geology of the area in 1980 and 1994, respectively. [6]

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1 Rogers / Pacific (the EIR geologist) revised and expanded "Geology", *Environmental Setting and Planning Considerations (Constraints Analysis)*, Nichols • Berman, June 16, 1995, and analyzed impacts for the EIR.

2 "Geology of the Tesla Quadrangle", A.S. Huey, *California Division of Mines and Geology Bulletin*, California Division of Mines and Geology (CDMG), 1948.

3 "Geology and Paleontology of the Pleasanton Area", C.A. Hall, Jr., *Geol. Sci. Bulletin*, 1958.

4 *Geologic Map of California, San Jose Sheet*, O.P. Jenkins, CDMG, 1966.

5 *Alameda Creek Watershed above Niles: Chemical Quality of Surface Water*, California Department of Water Resources (DWR), 1964.

6 *Preliminary Geologic Map of the Livermore Quadrangle*, T.W. Dibblee, Jr., U.S. Geological Survey (USGS), Open-File Report 80-533-B,1980, and "Geologic Map of the Livermore Quadrangle", R. C. Crane, *Northern California Geological Society Field Trip Guide to the Geology of the San Ramon Valley and Environs*, 1994.

D.W. Carpenter performed site-specific geologic and seismic hazard studies for the Lawrence Livermore National Laboratory (LLNL) in 1980 and 1982.[7] [8] Between 1977 and 1995, faulting and seismicity in the area have been investigated by D.G. Herd, M.G. Bonilla, W.L. Ellsworth and S.M. Marks, T.C. Smith, J.F. Scheimer, and Rogers / Pacific.[9]

Topography

The seven SLVSPA subareas generally are located in an arc extending from flat and moderately sloped terrain north of Crane Ridge in the east (Subareas 1 and 2) to the northern tip of Rocky Ridge in the west (Subarea 7). The subareas consist of nearly flat, gently rolling, and some steeper terrain on alluvial fans, floodplain terraces, and hillsides formed by and located between Arroyo Seco and Arroyo Mocho on the east and Arroyo Mocho and Arroyo Valle on the west. Elevations range from about 450 feet NGVD in Subarea 5 (at the Wetmore-Holmes intersection) to 900 feet NGVD in Subarea 7 (near the southern SLVSPA boundary)[10], and areas of slopes steeper than 25 percent occur in Subareas 4 and 7, in the eastern and southern parts of the subareas, respectively.[11]

Maximum relief is found in Subarea 7 (approximately 533 feet). This range is from approximately 475 feet at the northwest corner to a northwest-trending ridge at the southeast corner of the subarea. The southeastern corners of Subareas 1 and 4 have hilly terrain of lesser relief. Subareas 2, 3, 5, and 6 have generally flat to gently rolling terrain.

The hills of Subareas 1 and 4 are largely controlled by faulting. The north-trending ridges and valleys of the southern part of Subarea 7 are generally controlled by the underlying bedrock materials. An

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7 *Status Report on the Geology of the Lawrence Livermore National Laboratory Site and Adjacent Areas (Preliminary Draft)*, D.W. Carpenter *et al*, Lawrence Livermore National Laboratory (LLNL), 1980.

8 *Geologic Studies for Seismic Hazard Assessment, Las Positas Fault Zone*, D.W. Carpenter and R.J. Clark, CDMG Special Publication 62, 1982.

9 These include:

- Geologic Map of the Las Positas, Greenville, and Verona Faults, Eastern Alameda County, California, D.G. Herd, USGS Open-File Report 77-689, 1977
- Surface Faulting Near Livermore, California, M.G. Bonilla et al, USGS Open-File Report 80-523, 1980.
- Seismicity of the Livermore Valley Region, California, 1969-1979, W.L. Ellsworth and S.M. Marks, USGS Open-File Report 80-515, 1980.
- *Fault Evaluation Report FER-112*, T.C. Smith, CDMG, 1981.
- *Seismicity of the Livermore Valley Region, 1969-1981*, J.F. Scheimer *et al*, CDMG Special Publication 62, 1982.
- *Preliminary Evaluation of the Available Data Regarding the Locations and State-Activity of the Las Positas and Livermore Faults*, Rogers / Pacific (EIR geologists), August 11, 1995 (1995), *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Livermore Fault*, Rogers / Pacific, November 27, 1995 (1995a), and *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Las Positas Fault*, Rogers / Pacific, November 30, 1995 (1995b).

10 1929 National Geodetic Vertical Datum (NGVD).

11 "Figure IVC-1, Slopes Greater than 25 Percent", *South Livermore Valley Area Plan EIR*, Alameda County Planning Department, June 1992.

approximately 75-foot high relatively steep escarpment between two river terraces in the northern part of Subarea 7 was formed by down-cutting of the former river valley bottom by Arroyo Valle.

Regional Geology

The SLVSPA subareas are located in the southern margin of the Livermore-Amador Valley, an east-west trending basin within the Diablo-Hamilton range, part of the Coast Range structural and geomorphic province of California. [12] The Coast Range is a broad and complex area of folded and faulted rocks situated along the western edge of the North American continent. The province is characterized by numerous active faults and frequent earthquakes, and the San Andreas fault system, a major tectonic and structural feature of the Coast Range province, forms the boundary between the Pacific and North American plates. The Livermore-Amador Valley is bounded on three sides by faults of the San Andreas fault system -- the Greenville fault zone along the Altamont Hills on the east, the Calaveras fault zone along Pleasanton Ridge and the East Bay Hills on the west, and the Las Positas fault step-over zone along the southern perimeter of the valley and the SLVSPA.

Generalized geologic mapping of the San Francisco region shows that the SLVSPA subareas are characterized by Tertiary and Mesozoic (TMzs), Quaternary and Tertiary (QTs), and Quaternary alluvium (Qal) units. [13]

The Tertiary and Mesozoic units (TMzs) of Pre-Quaternary and Quaternary age (older and younger, respectively, than 1.6 million years) consist of marine and non-marine sedimentary rocks which are found in upland areas and underlie younger sedimentary units. The TMzs basement rocks consist of moderately to highly consolidated and hardened (indurated) chert, sandstone, shale, and conglomerate.

The Quaternary and Tertiary (QTs) sedimentary rocks are weakly to moderately consolidated indurated mudstone, sandstone, and conglomerate which originate from older sedimentary deposits and vary in thickness depending on erosion and tectonic deformation. These QTs units, which include Livermore gravels, are believed to reach more than 5,000 feet deep in the hills south of Livermore. [14]

Quaternary Alluvium (Qal) generally consists of unconsolidated to weakly consolidated silt, sand, and gravel deposited within the last two million years.

Movement on the Calaveras and Greenville faults created the Livermore-Amador Valley in the Pliocene era of Pre-Quaternary time (more than 1.6 million years ago). [15] Sand and gravel eroding from sedimentary rocks which compose the hills of the Diablo-Hamilton range on the south side of the valley were deposited in the valley and then were partly exposed by subsequent uplift and erosion. Local geologic mapping classifies the surface geologic units present in the seven subareas as Tertiary (Miocene

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12 *Geology of California*, R.M. Norris and R.W. Webb, 1990.

13 "Generalized Geologic Map", *Maps Showing Maximum Earthquake Intensity Predicted in the Southern San Francisco Bay Region for Large Earthquakes on the San Andreas and Hayward Faults*, USGS Miscellaneous Field Studies Map MF-709, 1975.

14 *Geologic Map of Late Cenozoic Deposits, Alameda County*, Helley *et al*, USGS, Miscellaneous Field Studies Map MF 429, 1972.

15 *South Livermore Valley Area Plan EIR, op. cit.*

and Pliocene) sedimentary bedrock units, overlain locally by Quaternary-age alluvium, older alluvium, and stream gravel. These units are described in Exhibit 4.2-1.

Exhibit 4.2-1
Geologic Units in South Livermore Valley Specific Plan Subareas

Geologic Unit		Distribution (by subarea)
Qal	***Alluvium*** This Holocene-Pleistocene unit is composed of unconsolidated sand, silt, gravel, and clay deposits generally subject to redistribution by fluvial processes. Stream channels generally are incised and are subject to unstable banks which can slump into the channel due to under-cutting.	1-7
Qoal	***Older Alluvium*** This Holocene-Pleistocene unit consists of predominantly floodplain deposits composed of unconsolidated to semi-consolidated sand, gravel, silt, and clay. Areas of older alluvium typically are slightly elevated above modern drainage courses and less likely to be reworked by streams than alluvium.	4-7
Qg	***Stream Gravel*** This Holocene-Pleistocene unit consists of unconsolidated deposits of pebbles and cobbles with minor sand and clay.	6
TQl	***Livermore Gravel*** This Plio-Pleistocene unit is characterized by massive buff to reddish-gray cobble-pebble gravel containing debris from Franciscan complex rocks. Livermore gravel also contains minor to major amounts of gray claystone and scattered vertebrate fossils. Landslides in this unit are concentrated along the canyon walls or bluff-like edges of the deposit.	1, 4, 7
Tmss	***Cierbo Formation*** This Upper Miocene formation consists of a variety of rock types, mainly tan, arkosic, marine sandstone which is locally fossiliferous. White quartzose sands are also common. The sands are poorly sorted, coarse grained, massive to cross bedded, friable, and contain rounded pebbles of quartz and chert. This unit is one of the dominant rock units in the Livermore Valley and vicinity and is very susceptible to slope failures. Some larger landslides and landslide complexes occur in this formation. Abundant fault strands may locally weaken the rocks.	7
Tps	***Non Marine Sedimentary Rocks*** This Pliocene unit is a weakly indurated pebble conglomerate, sandstone, and greenish claystone.	7

a *Landslide Hazards in the Livermore Valley and Vicinity, op. cit.*

Geology of the Specific Plan Subareas

Although the subareas are not very distant from one another, geologic conditions vary throughout the SLVSPA.

- ***Subarea 1*** is the farthest east. Its generally level northwestern half is underlain by Quaternary alluvium (Qal). The gentle slopes of the southeastern half are underlain by the Plio-Pleistocene Livermore Formation, represented here by silty clay with sand. The Las Positas fault traverses the southeast part of Subarea 1. [16]

16 *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Las Positas Fault* (Rogers / Pacific 1995b), *op. cit.*

- ***Subarea 2***, located immediately west of Subarea 1, is relatively level and is underlain by Quaternary alluvium (Qal), likely underlain at depth by the Livermore Formation.

- ***Subarea 3***, located in the middle of the SLVSPA, is also relatively level and is underlain by Quaternary alluvium (Qal).

- ***Subarea 4*** contains both level and hilly terrain. The relatively level western part is underlain by Quaternary alluvium (Qal). The foothills of the southeast part are underlain by sedimentary bedrock of the Livermore Formation of Plio-Pleistocene age. Sedimentary units include siltstone, clay and gravel. The mapped trace of the Las Positas fault traverses the southeast part of this subarea. [17]

- ***Subarea 5***, located immediately west of Subarea 4, is generally flat-lying and is underlain by Quaternary alluvium (Qal).

- ***Subarea 6***, located immediately south of Subarea 5, is generally flat-lying and is underlain by Quaternary alluvium (Qal). The mapped trace of the Las Positas fault traverses the southeast corner of the subarea.

- ***Subarea 7*** is the southern subarea. It is underlain on the north by Quaternary alluvium in the form of both recent valley bottom alluvium and older alluvial terrace deposits on an upland plateau. The southern half of Subarea 7 is in hilly terrain which is underlain by both Plio-Pleistocene sedimentary bedrock of the Livermore Formation and by Miocene-age marine sedimentary bedrock of the Cierbo Formation, represented here by interbedded siltstone and sandstone. The Las Positas fault traverses the western third of Subarea 7. [18]

Exhibits 4.2-2 through 4.2-6 illustrate geologic features of the subareas.

Geomorphology and Landsliding

A landslide refers to the downward movement of slope-forming materials (such as rock, soil, or fill). This downward movement typically occurs along a surface (glide plane, landslide plane, or discrete slip surface). Landslides are caused by:

- Adding weight (driving force) to the top of a potential slide area
- Removing mass (toe support) from the base of a potential slide area
- Increasing the volume of water to create heightening of pore water pressures
- Vibrations from earthquakes which also can serve to heighten pore pressures

Engineering geologists identify potential landslide areas by evaluating site geology, geomorphology (land shape), and topography (land surface). Grading a site before building and installing drains, retaining walls, or caissons are examples of standard landslide mitigation methods. These methods can eliminate or minimize the potential for damage to man-made structures when properly implemented.

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[17] *Ibid.*

[18] *Ibid.*

Typical disbursement of the various landslides and surficial soil deposit types present in the subareas are shown on Exhibits 4.2-2 through 4.2-6 -- interpretive maps prepared on reduced copies of *South Livermore Valley Specific Plan (Draft Plan)* topographic base maps using previous mapping by Nilsen [19] and supplemental aerial photographic analysis and field reconnaissance by the EIR geologist.

Review of geologic reference maps, site-specific maps, and aerial photographs indicates that parts of Subareas 1, 4, and 7 are underlain by landslides and / or colluvial deposits (Exhibits 4.2-2, 4.2-4, and 4.2-6). The most plentiful of the landslide types present in the SLVSPA are shallow coalescing earth and debris flows, with a lesser number of rotational and translational slump landslides. Most of these landslides appear to have occurred within unstable colluvial deposits and the Plio-Pleistocene nonmarine sedimentary rocks. Many of these slides appear to be relatively shallow earthflows. The earthflows generally occupy natural swales developed on the higher ridges. Deeper-seated rotational slump blocks generally exist along the lower slopes, within thicker colluvial (slope wash) deposits. For the most part, large bedrock slumps are ancient slides which move in small increments adjacent to steep-sided ravines subjected to channel downcutting.

Large-scale ancient bedrock landslides may exist in Subareas 4 and 7. Exhibit 4.2-4 shows two large possible ancient bedrock landslides on northwest-facing slopes in Subarea 4, including one possible very large deep-seated ancient bedrock landslide in the southeast part of the subarea. In Subarea 7, several possible large ancient landslides are located on generally north-trending ridges, south of the river terrace and west of the off-site U.S. Department of Veterans Affairs complex. While subsequent detailed field investigation may determine that one or more of these features may not be landslides, their anomalous appearance warrants such further evaluation.

The possible ancient bedrock slide complexes subsequently have been dissected by smaller near-surface erosional processes (such as colluvium production, earthflows, and simple erosion). These smaller features represent more geologically youthful events, more typical of those physical processes dominating the area during the past 11,000 years (Holocene epoch -- the present interglacial warm period in which we presently are living). Such recent slides were mapped on the south flank of a northwest-trending drainage at the southeast corner of Subarea 4, and more recent-appearing slope failures were observed on the steep escarpment at the north edge of the upland terrace of Subarea 7.

Artificial Fill

The SLVSPA subareas are largely undeveloped. Therefore, the minimal artificial fill present is adjacent to existing development, access roads, and utilities.

Groundwater

The SLVSPA is located within Zone 7 of the Alameda County Flood Control and Water Conservation District (ACFCWCD), and all seven subareas are located within the Livermore-Amador Groundwater Basin which is composed of several subbasins. Of those, the Mocho I, Mocho II, and Amador

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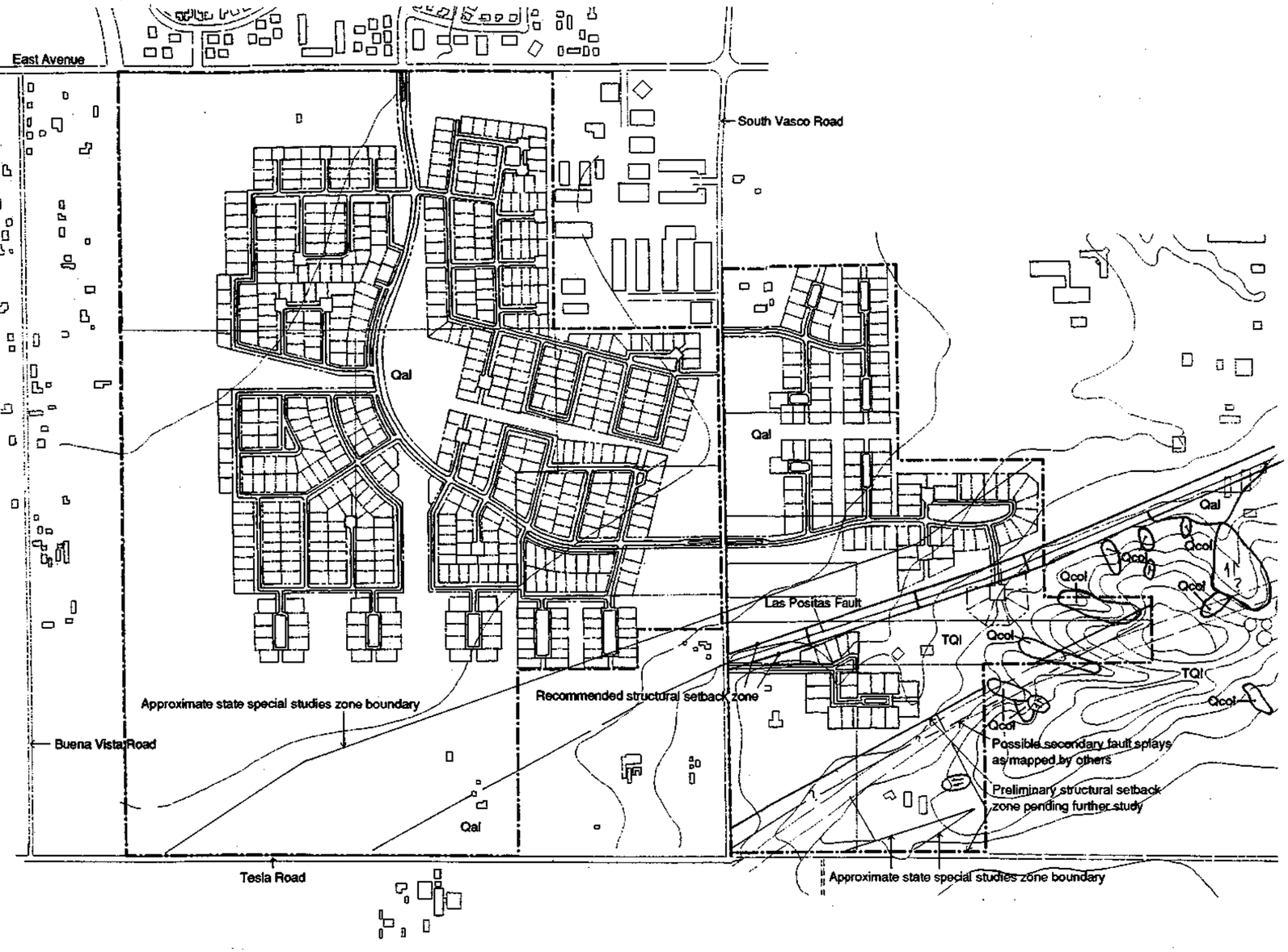
19 *Preliminary Photointerpretation Map of Landslide and Other Surficial Deposits of the Altamont Quadrangle*: T.H. Nilsen, USGS Open-File Map 75-277-1, 1975 (1975), *Preliminary Photointerpretation Map of Landslide and Other Surficial Deposits of the La Costa Valley Quadrangle*, T.H. Nilsen, USGS Open-File Map 75-277-23, 1975 (1975a), and *Preliminary Photointerpretation Map of Landslide and Other Surficial Deposits of the Livermore 7 ½' Minute Quadrangle*, T.H. Nilsen, USGS Open-File Map 75-277-26, 1975 (1975b).

Exhibit 4.2-2
Subareas 1-2 Geologic Features



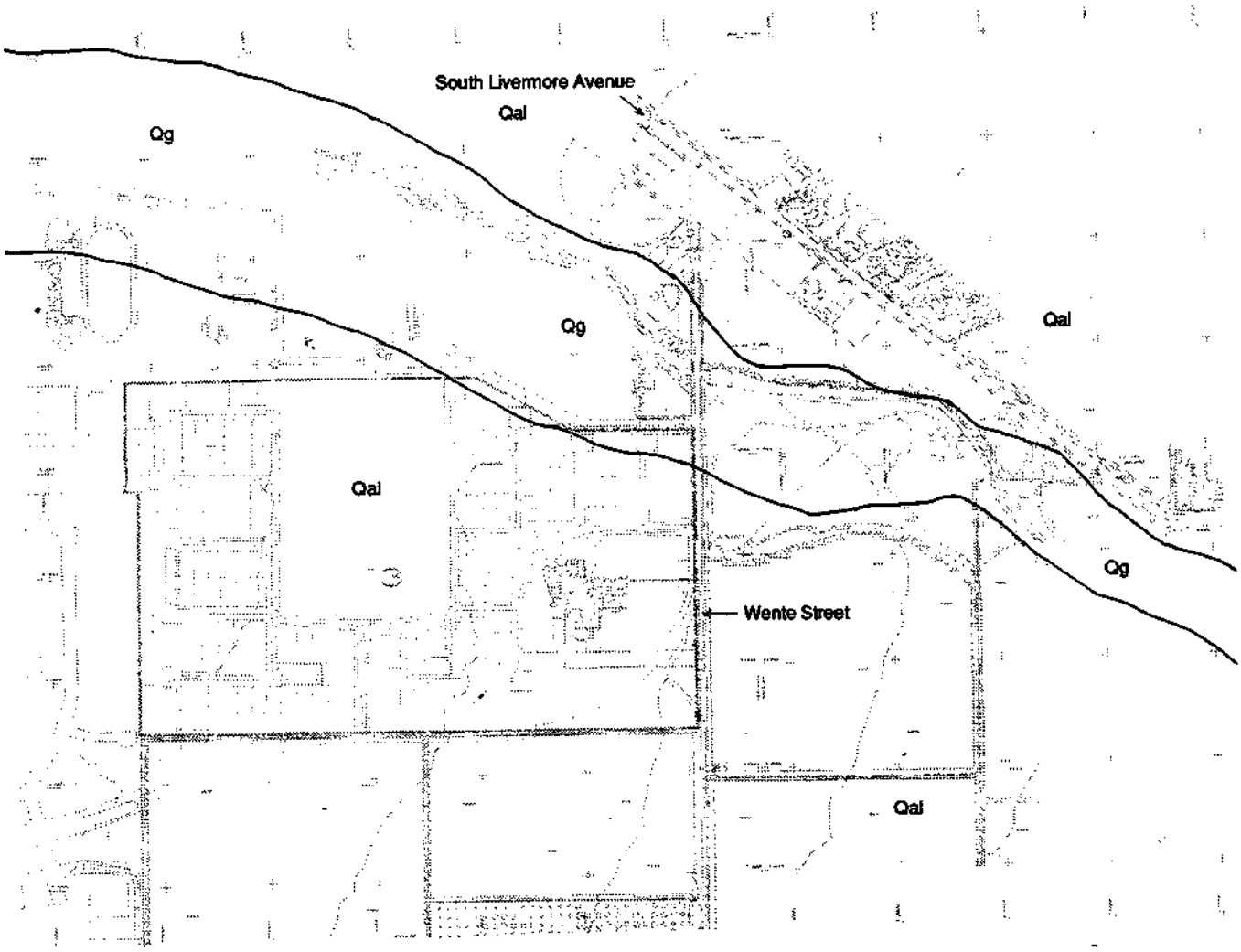
Legend:

- Qal Alluvium
- Qcol Colluvial Soils
- TQl Livermore Gravel
- Landslide (questioned where uncertain)

Source: Geologic contacts adapted from Majmundar (1991);
Fault location and setbacks by Rogers/Pacific (1995)

Note: Conceptual, not meant for construction purposes. For precise location of setbacks, refer to survey conducted for the planning process available from the City.

Exhibit 4.2-3
Subarea 3 Geologic Features

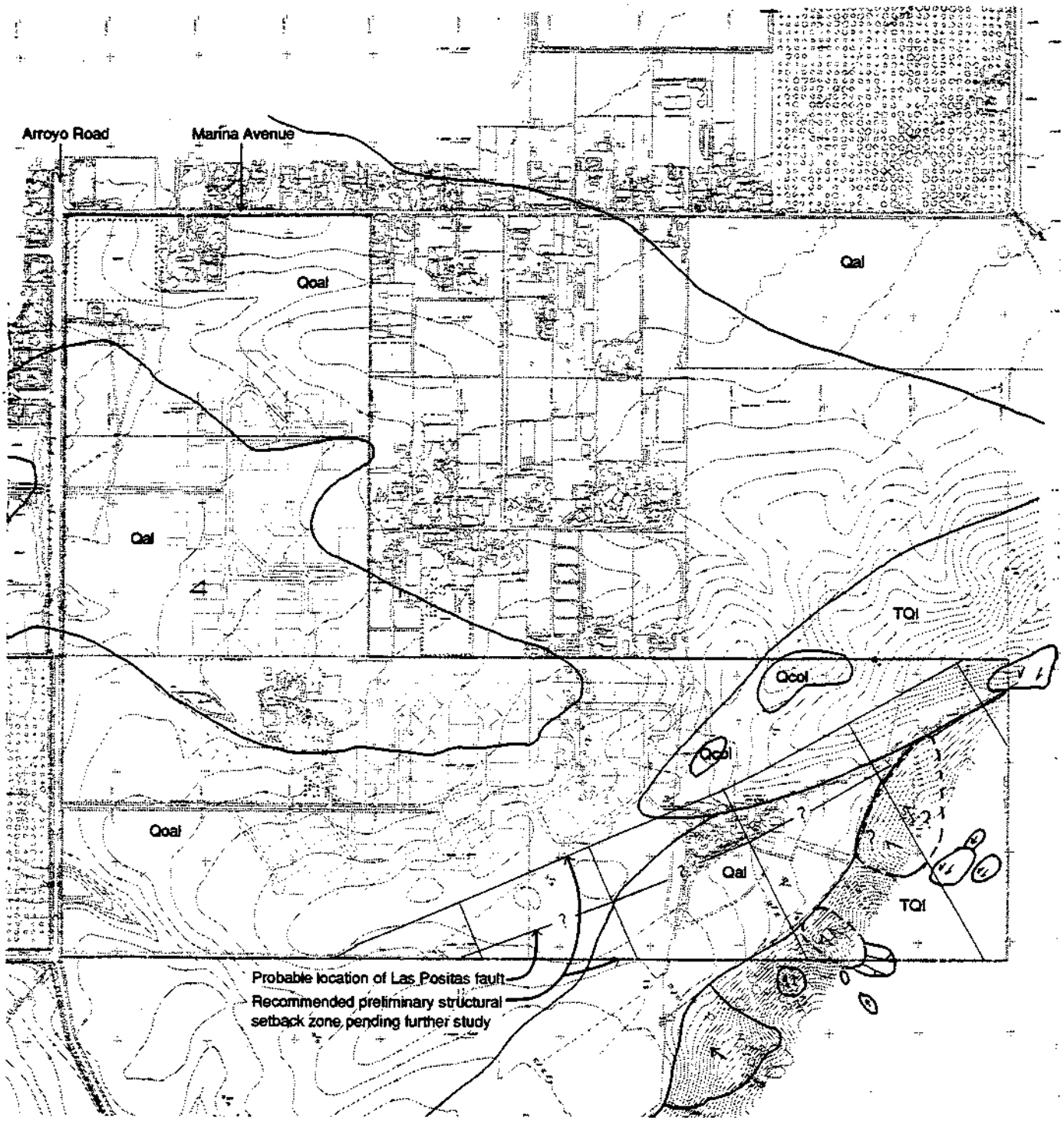


Legend:

Qal Alluvium
Qg Stream Gravel

Source: Geologic contacts adapted from Majmundar (1991)

Exhibit 4.2-4
Subarea 4 Geologic Features



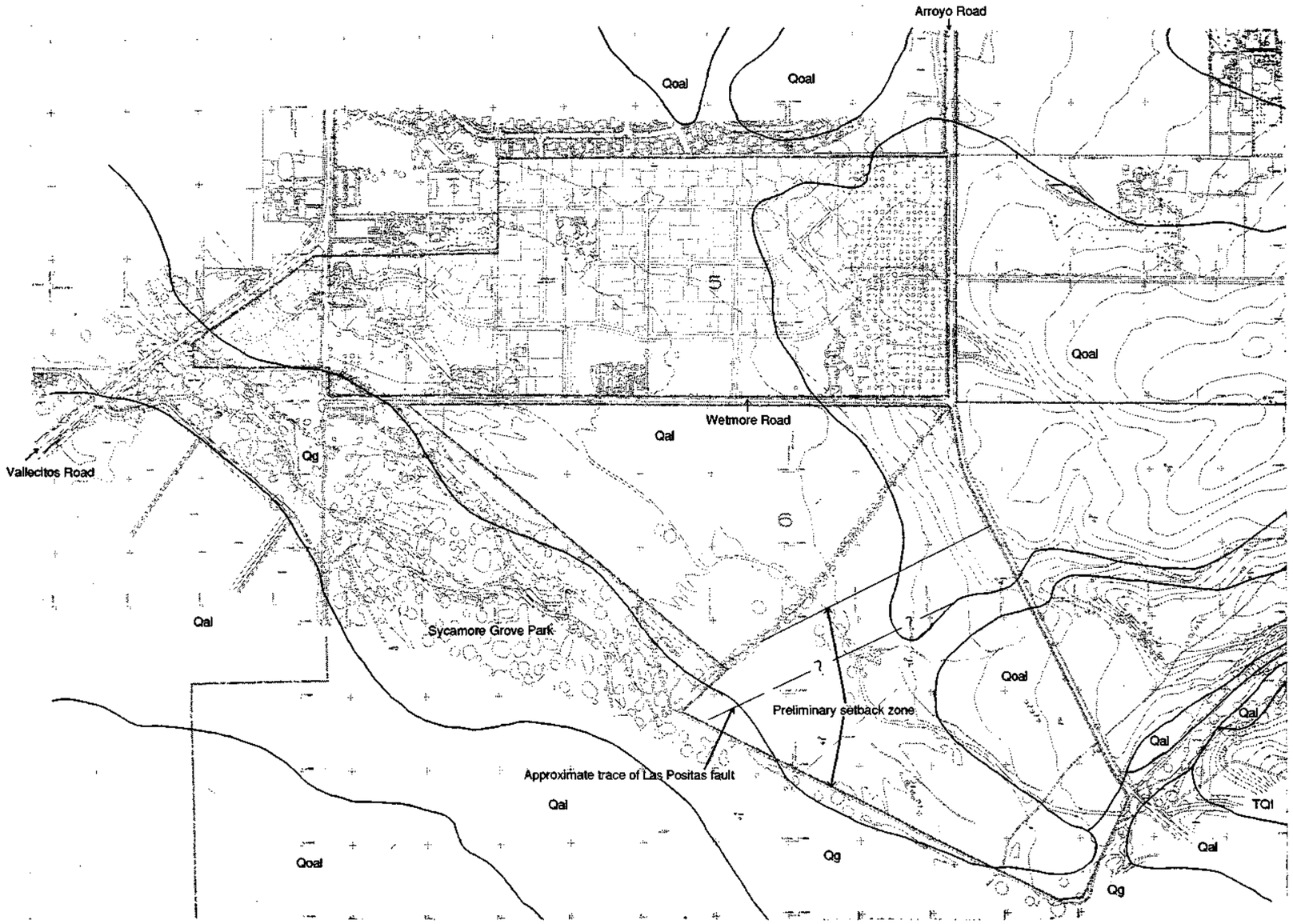
Legend:

Qal Alluvium
Qcol Colluvial Soils
Qoal Older Alluvium
TQl Livermore Gravel

(11) Landslide (questioned where uncertain)
(1,2) Possible Ancient Landslide
(1) Landslides mapped by others (Nilsen, 1975)

Source: Geologic contacts adapted from Majmundar (1991) and fault location and setbacks by Rogers/Pacific (1995)
Note: Conceptual, not meant for construction purposes. For precise location of setbacks, refer to survey conducted for the planning process available from the City.

Exhibit 4.2-5
Subareas 5-6 Geologic Features



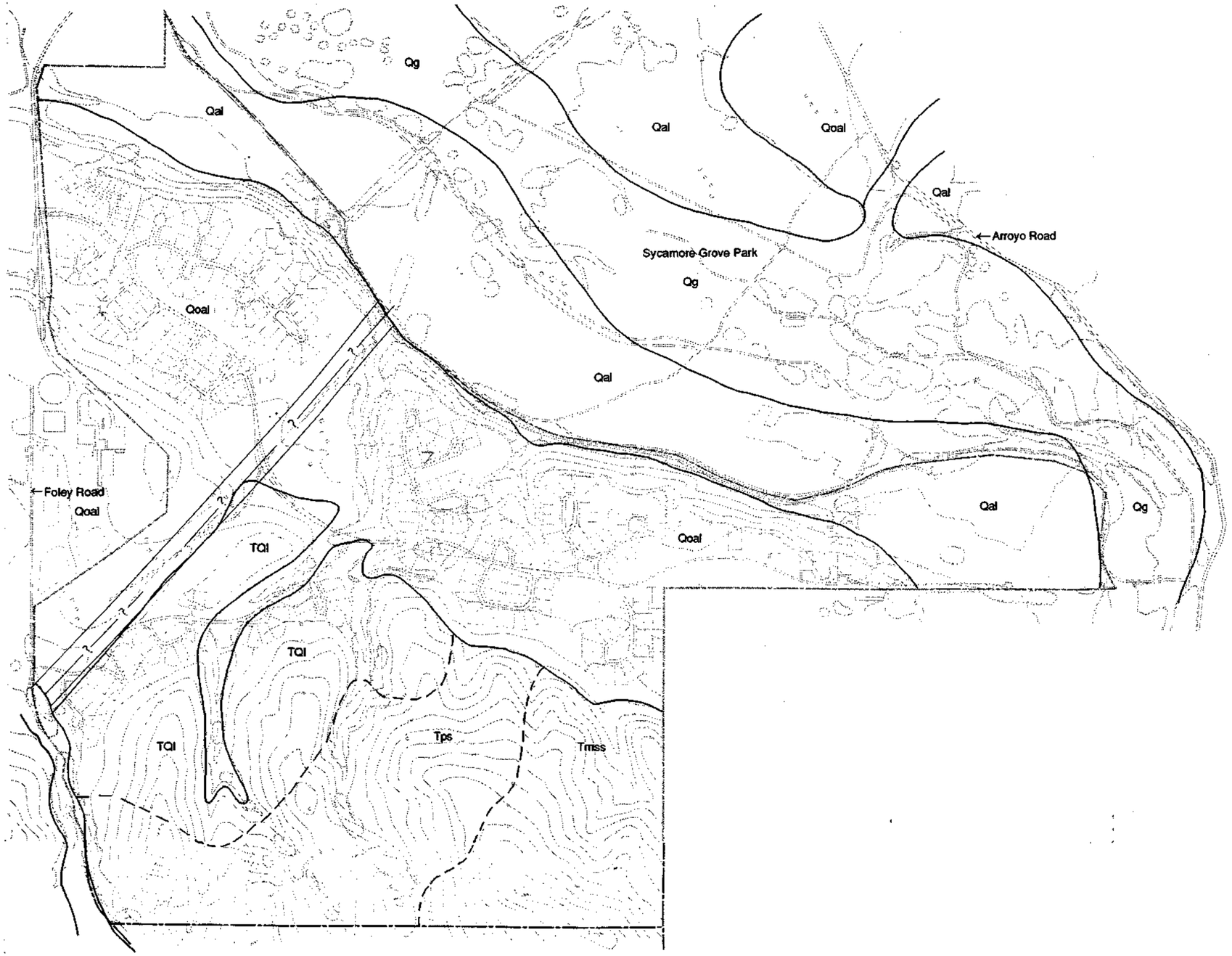
Legend:

Qal Alluvium
Qg Stream Gravel
Qoal Older Alluvium
TQl Livermore Gravel

?. Approximate trace of Las Positas fault with preliminary building setback (subject to revision if future exploration is performed)

Source: Geologic contacts adapted from Majmundar (1991) and fault location and setbacks by Rogers/Pacific (1995)
Note: Conceptual, not meant for construction purposes. For precise location of setbacks, refer to survey conducted for the planning process available from the City.

Exhibit 4.2-6A
Subarea 7 Geologic Features



Legend:

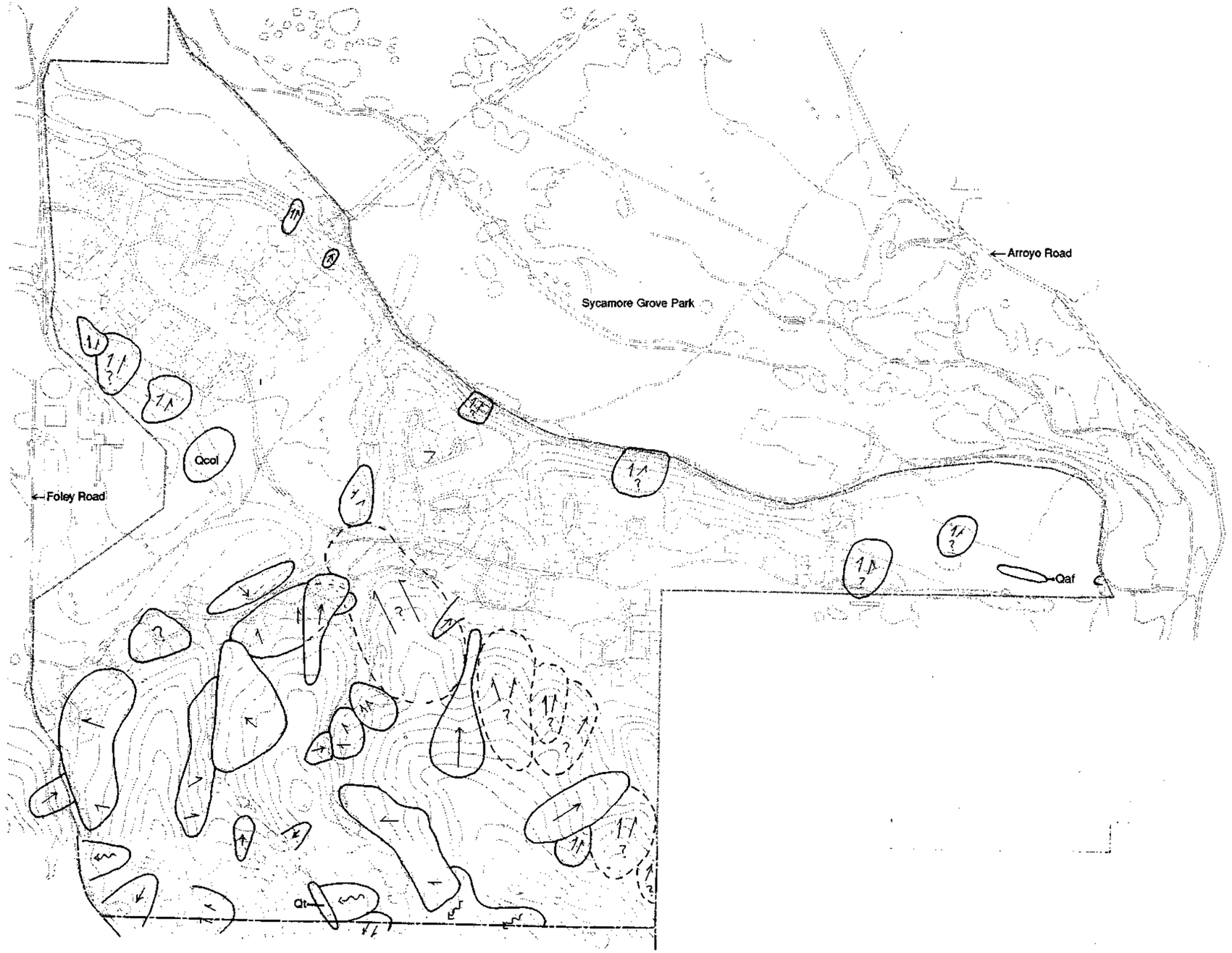
Qal	Alluvium
Qg	Stream Gravel
Qoal	Older Alluvium
TQl	Livermore Gravel
Tps	Nonmarine Sedimentary Rocks
Tmss	Cierbo Formation

Approximate trace of Las Positas fault with preliminary building setback (subject to revision if future exploration is performed)

Source: Geologic contacts adapted from Majmundar (1991) and fault location and setbacks by Rogers/Pacific (1995)

Note: Conceptual, not meant for construction purposes. For precise location of setbacks, refer to survey conducted for the planning process available from the City.

Exhibit 4.2-6B
Subarea 7 Geologic Features



Legend:

- Qaf Artificial Fill
- Landslide (questioned where uncertain)
- Possible Ancient Landslide
- Qcol Colluvial Soils
- Qt Terrace Deposits
- Area of Creep Affected Soils
- Landslides mapped by others (Nilsen, 1975 and Majmundar, 1991)

Source: Geologic contacts adapted from Majmundar (1991) and fault location and setbacks by Rogers/Pacific (1995)

Note: Conceptual, not meant for construction purposes. For precise location of setbacks, refer to survey conducted for the planning process available from the City.

Subbasins underlie the seven subareas. [20]

Subareas 1 and 2 are located on the southern margin of the Mocho I Subbasin. The elevation of the groundwater table in the fall of 1995 reportedly was about 530 feet. This represents an approximate minimum depth of about 80 feet below ground surface beneath Subarea 1 and an approximate minimum depth of about 40 feet beneath Subarea 2.

Subarea 3 is located in the Mocho II Subbasin. Groundwater contours mapped beneath this subarea in 1995 indicate a northwesterly flow direction and elevations of 550 feet near the southeast corner and about 525 feet near the northwest corner. This represents an approximate average depth to groundwater across the subarea of about ten feet. A groundwater well located near the northern margin of Subarea 3 had a recorded water depth of 13.5 feet in the fall of 1995. [21]

Subarea 4 is mapped in an area known as the Livermore Upland which is outside the groundwater basin. A well located near the northeast corner of the subarea reportedly had a depth to groundwater of 166.3 feet in the fall of 1995. [22]

Subareas 5, 6, and 7 are located in the Amador Subbasin. The western two-thirds of Subarea 5 are located inside the basin, and the eastern third is outside the basin. Groundwater elevations beneath the subarea in 1995 ranged from approximately 465 feet near the eastern third to approximately 440 feet at the western edge of the subarea. This represents a depth of about 35 feet near the eastern third and about ten feet near the west margin. Groundwater elevations beneath Subarea 6 range from about 485 feet near the southeast corner to about 450 feet at the northwest corner. This represents a depth to groundwater of about 15 feet near the southeast corner and about 20 feet at the northwest corner. Subarea 7 is located on the southern margin of the Amador Subbasin. While the highlands in the southern part of Subarea 7 are outside the groundwater basin, the northern half of the subarea is within the alluvial basin of Arroyo Valle. Groundwater elevations mapped in 1995 ranged from about 500 feet near the eastern tip of the subarea to approximately 440 feet near the northwestern tip of the subarea. This represents a depth to groundwater of about 20 feet along the low terrace at the northeast corner of the subarea, a depth of about 30 feet near the northwest corner.

Seismicity

The entire San Francisco Bay Area, including the Livermore-Amador Valley, is located in the seismically active region where the Pacific and North American tectonic plates meet. The Pacific plate consists of most of the Pacific Ocean floor and California coastline, and the North American plate includes the North American continent and parts of the Atlantic Ocean floor. [23] The San Andreas fault forms the primary boundary between the plates, and many smaller faults, including the Hayward, Calaveras, and Greenville

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[20] *Evaluation of Ground Water Resources: Livermore and Sunol Valleys*, DWR, Department of Water Resources Bulletin 118-2, 1974. Additional information on groundwater is presented in ***4.3 Hydrology, Drainage, and Water Quality.***

[21] Alameda County Flood Control and Water Conservation District (ACFCWCD), January 30, 1996.

[22] *Ibid.*

[23] *Geology of California*, Norris and Webb, 1990, *op. cit.*

faults, branch from and join the northwest trending San Andreas fault zone.[24] The faults are fractures where movement occurs as the Pacific plate grinds northwest past the North American plate, and constant creep along the fractures produces stress which can accumulate and cause earthquakes when released. Faults are distinguished by abrupt changes in rock structure or composition, and movement along faults can create underground spaces which trap water, minerals, and other resources.

Seismic risk to the Livermore-Amador Valley area can be attributed to ground shaking from potential events on active faults in the region (see Exhibit 4.2-7). The known active faults with the potential for producing the highest ground accelerations at the site are the Las Positas, Greenville, Verona, Calaveras, Hayward, Concord / Green Valley, and San Andreas faults.

Exhibit 4.2-7
Seismic Parameters

Potential Causative Fault	Fault to Site Distance (kilometers / miles)	Maximum Probable[a] Earthquake (movement magnitude)	Peak[b] / Probable[c] Maximum Ground Acceleration
Las Positas	0 / 0	6.3	0.37 g / 0.24 g
Greenville	7 / 4	6.8	0.36 g / 0.23 g
Verona	4 / 2	6.2	0.32 g / 0.21 g
Calaveras	13 / 8	6.3	0.19 g / 0.12 g
Hayward	23 / 14	7.1	0.17 g / 0.11 g
Concord / Green Valley	36 / 22	6.9	0.10 g / 0.07 g
San Andreas	54 / 34	7.8	0.09 g / 0.07 g

a S.G. Wesnousky, 1980.
b D.M. Boore, 1986.
c J.E. Slosson and M.R. Ploessel, 1974.

As discussed below, the Las Positas fault traverses Subareas 1, 4, 6, and 7. The Greenville fault is located approximately two miles east of the SLVSPA, the Verona fault is about two miles west, the Calaveras fault is about eight miles west, the Hayward fault is 14 miles west, the Concord / Green Valley fault is about 22 miles northwest, and the San Andreas fault is approximately 34 miles west.

Due to the proximity of the SLVSPA to these known active faults, moderate to strong ground shaking should be expected during the lifetime of any proposed structures. The Working Group on California Earthquake Probabilities estimated in 1990 that the probability of one or more large (greater than M7) earthquakes on one of the faults listed above over the next 30 years is about 67 percent.

Exhibit 4.2-7 lists the maximum credible earthquake (MCE) magnitudes estimated for these faults. Exhibit 4.2-8 presents the Modified Mercalli Intensity Scale, and Exhibit 4.2-9 compares Richter magnitudes and Modified Mercalli intensities.

Historically, the most damaging earthquakes in California have occurred along the San Andreas fault

24 *Ibid.*

Exhibit 4.2-8
1931 Modified Mercalli Intensity Scale

Earthquake Intensity (MM)	Approximate Richter Magnitude (M)	Description
I	M2	Not felt except by a very few under especially favorable circumstances.
II	M2	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	M3	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	M4	During the day, felt indoors by many and outdoors by few. At night, some awakened. Dishes, windows, doors disturbed, and walls make cracking sound. Sensation like a heavy truck striking a building. Standing motorcars rocked noticeably.
V	M4	Felt by nearly everyone, many awakened. Some dishes, windows, etc. broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	M5	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	M5 or M6	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by people driving motorcars.
VIII	M6	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. People driving motorcars disturbed.
IX	M7	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	M7 or M8+	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	M8+	Few, if any, masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	M8+	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.

Exhibit 4.2-9
Comparison of Richter Magnitude and Modified Mercalli Intensity

Richter Magnitude (M)	Expected Modified Mercalli Maximum Intensity at Epicenter (MM)	
2	I-II	Usually detected only by instruments
3	III	Felt indoors
4	IV-V	Felt by most people; slight damage
5	VI-VII	Felt by all; many frightened and run outdoors; damage minor to moderate
6	VII-VIII	Everybody runs outdoors; damage moderate to major
7	IX-X	Major damage
8+	X-XII	Total and major damage

Source: "Earthquakes", *California Geology*, California Division of Mines and Geology, September 1984 citing *Elementary Seismology*, Charles Richter, 1958.

zone, and damaging earthquakes also have occurred on other active faults in the region which belong to the San Andreas fault system (Exhibits 4.2-10 and 4.2-11). [25]

Active Faults

Las Positas Fault The Las Positas fault reportedly is a left-lateral northeast-trending strike slip fault located at the southern margin of the Livermore Valley. It generally consists of two or more parallel (or *en echelon* strands) extending for a distance of approximately 15 kilometers from the Greenville fault in the lower Altamont foothills (east of Livermore) [26] to the alluvial and landslide deposited soils in the Vallecitos Valley (to the southwest) and possibly onward to connect with the Calaveras fault system farther southwest. The Las Positas fault may represent a step-over where slip movement is transferred from the Greenville fault to the Calaveras-Concord-Green Valley fault system via a left step. [27]

History Geologic field mapping of the Las Positas fault in the 1970s found geomorphic features indicative of active faulting in the southern Livermore Valley. [28] This included fault scarps, off-set

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25 The written history of damaging earthquakes (of about magnitude (M) 7 or greater) in California began in 1800 with reports of damage to Mission San Juan Bautista. Newspaper coverage began in 1849 but concentrated on population centers of San Francisco and Sacramento in the 1850s to 1870s. "Earthquake History of California", Tousson Toppozada *et al, California Geology*, CDMG, February 1986.

26 The Greenville fault is described below.

27 *Preliminary Evaluation of the Available Data Regarding the Locations and State-Activity of the Las Positas and Livermore Fault*, Rogers / Pacific, 1995, *op. cit.*

28 These were conducted by:

- *Geologic Map of the Las Positas, Greenville, and Verona Faults, Eastern Alameda County*, Herd, 1977, op. cit.
- *Map of Quaternary Faulting along the Northern Calaveras Fault Zone; Las Trampas Ridge, Diablo, Dublin, Niles, and La Costa Valley Quadrangles, California*, Herd and Brabb, USGS Open File Report 78-307, 1979.
- *Status Report on the Geology of the Lawrence Livermore National Laboratory Site*, Carpenter, 1980, *op. cit.*
- *Seismicity of the Livermore Valley Region*, Ellsworth and Marks, 1980, *op. cit.*

Exhibit 4.2-10
Earthquakes Resulting in Significant Damage in the Bay Area

Year	Fault	Epicenter	Richter Magnitude (M)	Modified Mercalli Intensity (MM)
1836	Hayward	Hayward	7 +	IX-X
1838	San Andreas	San Francisco	7 +	X
1852	San Andreas	San Francisco Peninsula	?	VIII
1858	Hayward	San Jose	?	VIII
1861	Calaveras	Livermore	7 +	VIII
1865	San Andreas	Santa Cruz Mountains	7 +	VIII-IX
1868	Hayward	Hayward	6.7	IX-X
1906	San Andreas	San Francisco	8.3	XI
1911	Hayward	San Jose	6.6	VII-VIII
1954	San Andreas	Watsonville	5.2	VIII
1969	Healdsburg	Santa Rosa	5.7	VII-VIII
1989	San Andreas	Santa Cruz Mountains	7.1	IX-X

Source: *San Francisco Bay Area Earthquakes Resulting in Significant Damage*, "Effects of Loma Prieta Earthquake October 17, 1989", David Montgomery, *California Geology*, January 1990.

Exhibit 4.2-11
Magnitude 5.8+ Earthquakes Within 100 Kilometers of Hayward, 1850-1984

Date	Magnitude [a]	Region Damaged [a]
1858	6.1	San Jose (VIII) to San Francisco (VII)
1864	5.9	San Jose (VI) to Monterey (VI)
1865	6.3	New Almaden (IX) to San Jose (VIII)
1866	5.8	None reported (located between Stockton and San Jose)
1868	6.8	Western Alameda County (IX)
1870	5.8	Los Gatos (VII) to Santa Cruz)
1881	5.9	Holister (VI) to Stockton (VI)
1884	5.9	Monterey (VI) to San Francisco (VI)
1889	6.0	Collinsville (VIII) to Martinez (VII)
1890	6.0	Sargents (VII) to San Juan Bautista (VIII)
1892	6.4	Vacaville (VIII) to Winters (VIII)
1892	6.2	Vacaville (VIII) to Winters (VIII)
1897	6.2	Gilroy (VIII) to San Felipe (VIII)
1898	6.2	Mare Island (IX) to Port Costa (VIII)
1899	5.8	Watsonville (VII) to Pleasanton (VII)
1903	5.8	Evergreen (VIII) to San Francisco (VII)
1906	8.3	San Francisco Bay area (IX)
1911	6.6	Coyote (VIII) to San Jose (VII)
1926	6.1 & 6.1	Carmel (VII) to Santa Cruz (VII)
1979 [b]	5.8	Gilroy (VII) to Holister (VII)
1980	5.8	Livermore Valley (VII)
1984	6.2	Morgan Hill (VII)

Source: "Morgan Hill Earthquake of April 1984", Tousson Toppozada, California Geology, California Division of Mines and Geology, July 1984

a Magnitudes and regions damaged by pre-1900 earthquakes were estimated by Toppozada, Real, and Parke (1981) from reported earthquake effects. Roman numerals are the Modified Mercalli Intensities at the locations indicated.

b No earthquakes of M 5.8 or greater occurred near San Francisco Bay between 1926 and 1979. The largest earthquake to occur in the area between 1926 and 1979 was the M 5.7 Santa Rosa earthquake of 1959.

drainage channels, off-set younger alluvial soils deposits, and groundwater barriers observed in surface soils.

These features are relatively well-defined northeast of Arroyo Mocho near the intersection of Tesla and Vasco Roads. Southwest of this drainage, traces of the fault are somewhat obscured by landslide debris, stream channel erosion, and old alluvium. Evidence for the well-concealed fault-trace between the foothills west of Arroyo Valle (near Vallecitos Road / State Route 84) and Arroyo Mocho (near Mines Road) is derived from faint tonal lineaments observed on aerial photographs. Researchers alsohave noted hillslope benches, sag ponds, linear drainages, and offset drainages as possible evidence of the fault in this area of the Livermore Valley.

Following a swarm of earthquakes in January 1980 on the nearby Greenville fault, possible minor ground surface rupture was detected along northeast parts of the Las Positas fault. Reconnaissance level mapping performed by the CDMG following these earthquakes detected surface fractures in the asphaltic concrete in Vasco Road, Mines Road, Tesla Road, and Greenville Road. [29] Similar minor surface off-sets may have been detected within a USGS ground surface monitoring array located on Las Positas Road following the January 1980 earthquakes. [30] What appeared to be fresh ground rupture also was observed in June 1981 by Earl W. Hart of the CDMG and David L. Carpenter of LLNL. These observations of minor left-lateral faulting prompted the CDMG to include the southern branch of the Las Positas fault adjacent to Tesla Road within the State Alquist-Priolo Earthquake Fault Zone.

LLNL has performed limited trenching to study suspected traces of the fault northeast of Arroyo Mocho. Dating soils during this study reportedly demonstrated that the fault has been seismically active within the past 17,000 years. [31] In 1995, the EIR geologist performed a preliminary geologic investigation of the Las Positas fault in the SLVSPA. This study confirmed the presence and active nature of the fault southwest of the LLNL study. [32] The results are summarized below.

State Alquist-Priolo Earthquake Fault Zone Based on information available in 1982, CDMG staff felt there was sufficient evidence to suggest that the northeast segment of the Las Positas fault was active and sufficiently well-defined to establish an Alquist-Priolo Earthquake Fault Zone for the segment of the Las Positas fault northeast of Arroyo Mocho. [33] The fault zone was mapped through SLVSPA Subarea 1. The CDMG did not have sufficient information to extend the zone southwest through the other subareas. CDMG geologists studying aerial photographs of the fault southwest of Arroyo Mocho (through SLVSPA Subareas 4, 6, and 7) found it to be poorly exposed and concealed in places by alluvial soils greater than 11,000 years old (pre-Holocene). Based on these findings and lack of any field data, this latter area was not zoned at that time.

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29 *Status Report on the Geology of the Lawrence Livermore National Laboratory Site, op. cit, Surface Faulting Near Livermore, California,* Bonilla *et al,* 1980, *op. cit.,* and *Fault Evaluation Report FER-112, Supplement No. 1,* E.W. Hart, CDMG, 1981.

30 *Surface Faulting Near Livermore, California, Ibid.*

31 *Status Report on the Geology of the Lawrence Livermore National Laboratory Site, op. cit.*

32 *Ibid.*

33 *State of California Special Studies Zones, Altamont Quadrangle,* CDMG, 1982.

In 1995, the EIR geologist conducted field reconnaissance and trenching studies along both segments of the Las Positas fault.[34] The segment trenched in Subarea 1 was found to be active as previously was postulated. The EIR geologist also investigated the southwest part of the Las Positas fault -- the only geologic field reconnaissance or site-specific work performed to date on that segment. Because the 1995 on-site trenching indicated that the most probable location of the fault is along the linear valley developed as a utility corridor (which, thus, could not be explored), the precise location and state of activity of the fault in this area has not yet been determined. No other Alquist-Priolo Earthquake Fault Zones are mapped in the SLVSPA subareas.

Greenville Fault The 0.6-mile wide Greenville fault zone extends about 80 miles from Mt. Diablo (north) to Altamont Pass (south) and consists of closely-spaced northwest trending parallel fault segments. [35] This active fault ruptured most recently during the 1980 Livermore earthquakes when a M 5.8 earthquake and two M 4+ aftershocks occurred on January 24 followed by a M 5.2 earthquake on January 26. The earthquake series produced discontinuous surface rupturing along approximately 7.4 miles of the fault zone. [36] Off-set was predominantly right-lateral but had a vertical component of up to 5.12 inches, although vertical displacement varied. Local effects of the 1980 Livermore earthquakes included cracked roads, rockfalls, landslides, snapped gas lines, broken chimneys, broken windows, overturned bookshelves, swaying and cracking of buildings, movement of mobile homes off their jacks and / or cement block bases, overpass fill settlement, and power outages. [37] The 1980 earthquake magnitudes were less than the maximum credible earthquake of 6.8-7.3. The Greenville fault is the largest movement source near the SLVSPA. [38]

Verona Fault The Verona fault is not well understood. While it is zoned by the State, the Special Study Zone map notes that the fault features identified may be due to landsliding and not necessarily fault related. Previous work indicates that the fault off-sets Pliocene and Pleistocene age sediments and possibly could be active. [39] If present, the fault outcrop pattern shows it to represent a northeasterly dipping thrust fault. Additional work dates possible off-set materials as just less than 10,000 years of age. [40] This would classify the fault as active.

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[34] *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Livermore Fault* (Rogers / Pacific 1995a), and *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Las Positas Fault* (Rogers / Pacific 1995b), *op. cit.*

[35] *Maralisa Planned Development Final Environmental Impact Report, op. cit.* The northeast corner of the Maralisa Planned Development project site is located in the Alquist-Priolo Earthquake Fault (State Special Study) Zone of the Greenville fault.

[36] *Ibid.* According to the California Division of Mines and Geology, surface faulting on the Greenville fault in 1980 occurred over a total length of 6.5 kilometers (about four miles). *Fault-Rupture Hazard Zones in California*, CDMG, Special Publication 42, 1994.

[37] *Ibid.*, citing "The Livermore Earthquakes of January 1980, Contra Costa and Alameda Counties, California, *California Geology*, CDMG, 1980.

[38] Marc Roberts, City of Livermore Planning Department, conversation with Robert Snydor, CDMG, June 196. This conversation constituted the CDMG's comments on the Notice of Preparation (NOP) to prepare this EIR.

[39] *Geologic Map of the Las Positas, Greenville, and Verona Faults, Eastern Alameda County, op. cit.*

[40] *Map of Quaternary Faulting along the Northern Calaveras Fault Zone, op. cit.*

Calaveras Fault The CDMG classifies the Calaveras fault in three segments (northern, central, and southern parts) which extend about 73 miles from Danville to the Paicines and San Benito faults. [41] In the Livermore-Amador Valley, this major active regional fault is located along the base of the Pleasant Ridge. Historic movement includes the estimated M 7.0 Livermore earthquake (1861), M 5.9 Gilroy earthquake on the San Benito / Santa Clara segment (1979), M 6.2 Morgan Hill earthquake on the Morgan Hill-Santa Clara segment (1984), and tectonic creep near Holister. [42] However, the Calaveras fault has not generated earthquakes along the segment in the Livermore-Amador Valley recently. [43] The maximum credible earthquake is predicted to be M 7.0.

Hayward Fault The Hayward fault is a major seismically active element of the San Andreas fault system. [44] The 62-mile long Hayward fault extends from San Pablo Bay (north) to an obscure convergence with the Calaveras fault near Mount Misery east of San Jose and forms the southern segment of an extensive 175-mile long fracture zone which consists of the Hayward, Rodgers Creek, Healdsburg, and Maacama fault segments. Historic earthquakes with estimated magnitudes of M 6 (MM VIII) or greater occurred on the Hayward fault in 1836, 1858, 1868, and 1911, including the destructive M 6.7 1868 earthquake which caused widespread damage throughout the then sparsely populated Bay Area. Future earthquakes of M 6.5-7.5 are considered to be a "reasonable expectation". The assumed M 7.5 earthquake scenario would subject an area from Napa and Petaluma (north) to San Jose (south), including the populated areas of eastern Contra Costa County and the Livermore Valley to strong MM VIII intensity ground shaking.

Concord / Green Valley The Concord / Green Valley fault, a right-lateral strand of the San Andreas fault system, is well expressed through the center of the City of Concord and to the north by scarps, small hills, a sag pond, and a groundwater barrier where it extends for approximately 35 miles. [45] This fault creeps about three millimeters per year, off-setting sidewalks, curbs, and other cultural features. [46] Recent exploration sponsored by the USGS indicates that the overall slip rate of the fault probably is greater than 6.4 millimeters per year and that large earthquakes (M6.5 or greater) possibly occur approximately every 750 years. [47]

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41 *Preliminary Fault Activity Map of California*, CDMG, 1992.

42 "Morgan Hill Earthquake of April 1984", Tousson Toppozada, *California Geology*, CDMG, July 1984. The 1984 Morgan Hill earthquake reportedly produced intensities of IV and V in Livermore, 40 miles away, according to the *Maralisa Planned Development Final EIR, op. cit.*, citing *The San Francisco Bay Area-On Shaky Ground, op. cit.*

43 *Maralisa Planned Development Final EIR, Ibid.*

44 "Earthquake Planing Scenarios for a Magnitude 7.5 Earthquake on the Hayward Fault, San Francisco Bay Area", Karl Steinbrugge *et al, California Geology*, CDMG, July 1986.

45 *Slip Rate and Earthquake Recurrence on the Concord Fault at Galindo Creek, California* (unpublished), David L. Snyder and Glenn Borchardt, Final Technical Report to the United States Geological Survey, 1995.

46 "Creep Rates and Creep Characteristics of Eastern San Francisco Bay Area Faults: 1979-1992", Galehouse, in *Proceedings of the Second Conference on Earthquake Hazards in the Eastern San Francisco Bay Area*, Glenn Borchardt *et al*, editors, CDMG Special Publication 113, 1992.

47 This exploration has been reported in numerous publications, including:

- "Initial Paleoseismic Study of the Concord Fault, California", David L. Snyder, Glenn Borchardt, and C.J. Wills, *EIS: Transactions of the American Geophysical Union*, 1994.

San Andreas Fault The San Andreas fault system traverses California for 750 miles from Cape Mendocino (north) to the Mexican border (south) and, due to the several large damaging historical earthquakes along it, is the region's most well-known fault. Right-lateral strike-slip movement on the San Andreas fault has displaced geologic units more than 200 miles during the last 15 to 20 million years with movement occurring at an average rate of about two inches per year. Of California's three great historic earthquakes (Richter magnitude of 8.0 or greater (M 8+)), two occurred on the San Andreas Fault -- Fort Tejon in 1857 and San Francisco in 1906. The most recent activity was the M 7.1 Loma Prieta earthquake of 1989, centered about ten miles northeast of Santa Cruz, to which surface slip was attributed on the Calaveras fault. [48] The maximum credible earthquake on the San Andreas fault is estimated to be M 8.3. [49]

Previously Presumed Fault

Livermore Fault There has been little past research on the existence or state-of-activity of the Livermore fault system. No subsurface investigations were performed prior to work by the EIR geologist in 1995 to verify the existence of active faulting. [50] Based on an apparent groundwater barrier and on faint tonal lineaments and deflected drainages observed on aerial photographs, early research by geologists concluded that a series of three parallel northwest-trending strike slip faults were present beneath the Livermore Valley. [51] These lineaments trend through Subareas 4, 5, and 6. However, due to the equivocal nature of these surface features, other researchers discounted the existence of this fault altogether and did not include the Livermore fault in published geologic maps. [52] For the same reasons, the State of California did not include the Livermore fault within a Special Study Zone.

Aerial photographic analysis and field exploration, of the mapped traces of this fault by the EIR geologist indicate that these tonal lineaments only represent ancestral stream terraces (or erosional channel

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- *Slip Rate, Recurrence Interval, and Behavior of the Concord Fault at Galindo Creek*, David L. Snyder and Glenn Borchardt, NEHRP Technical Summary for FY 94, USGS Open File Report No 95-210, 1994.
- "Preliminary Results of Paleoseismic Studies of the Concord Fault at Galindo Creek, Concord, California", C.J. Wills, David L. Snyder, and Glenn Borchardt, *Proceedings of the Workshop on Paleoseismology*, C.S. Prentice, D.P. Schwartz, and R.S. Yeats (editors), USGS Open File Report 94-568, 1994.
- *Slip Rate and Earthquake Recurrence on the Concord Fault at Galindo Creek, California* (unpublished), *op. cit*

48 *Maralisa Planned Development Final EIR, op. cit.*, citing *Damage Scenario for a Magnitude 8.3+ Earthquake of the San Andreas Fault in the San Francisco Bay Area*, Davis *et al*, CDMG Special Publication 62, 1992.

49 A M 8.3 earthquake on the San Andreas fault could produce Modified Mercalli (MM) intensities of VII or VIII in Livermore, according to the *Maralisa Planned Development Final EIR, op. cit.*, citing *The San Francisco Bay Area-On Shaky Ground*, Association of Bay Area Governments, 1987. Maps published in 1985 which show the combined effects of the highest probable earthquakes on all of the major faults in the San Francisco Bay Area (San Andreas, Hayward, Calaveras, and Concord-Green Valley) indicate that the Livermore Valley would be subject to strong shaking with MM VII and VIII intensities. "When the Big One Strikes", Vivian Gratton, *California Geology*, CDMG, April 1985.

50 *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Las Positas Fault, op. cit.*

51 *Geology of the Tesla Quadrangle, California, op. cit.*, and *Livermore and Sunol Valleys, Evaluation of Groundwater Resources Through 1968*, R.S. Ford *et al*, DWR Memorandum Report, 1979.

52 *Geologic Map of the Las Positas, Greenville, and Verona Faults, Eastern Alameda Count, op. cit.*, and *Preliminary Geologic Map of the Livermore Quadrangle, Alameda and Contra Costa Counties, op. cit.*

features) of Arroyo Mocho. [53] Several old previously mapped alluvial terraces are not off-set along the trend of the two easternmost hypothetical fault splays. [54] Research and aerial photographic analysis also indicates that the westernmost lineament appears to represent the margin between the old alluvial terrace material and more recent alluvial deposits. The EIR geologist did not find any evidence for the existence of the Livermore fault system during this investigation. Therefore, it appears likely that the fault, if it exists, is an older feature not expressed in the Holocene or upper Pleistocene aged sediments, thus classified as inactive. This is also the opinion of the CDMG. Therefore, the Livermore fault system should be considered inactive for planning purposes.

Faulting of the Specific Plan Subareas

Subareas 1 and 2 The EIR geologist located the main trace of the Las Positas fault at two sites in Subarea 1. Previous evidence of surface fault rupture [55] and the youthful faulting recently observed in Trench T-3 provide direct evidence that the Las Positas fault has been active during Holocene time (the past 10,000 years). This conclusion supports the CDMG's previous findings that structural building setbacks should be provided adjacent to this fault trace within the Alquist-Priolo Earthquake Fault Zone.

The approximate location of the main trace of the fault in Subareas 1 and 2 is shown in Exhibit 4.2-2. This location almost exactly corresponds to previous mapping by the CDMG. Exhibit 4.2-2 also shows the boundaries of the Alquist-Priolo Earthquake Fault Zone and a recommended 100-foot wide structural setback zone (centered 50 feet on each side of the surveyed location of the main fault trace). The *Draft Plan* setbacks shown on Exhibit 4.2-2 are adequate for planning purposes in Subareas 1 and 2. No definitive evidence was found of secondary fault splays in Subareas 1 or 2. One southerly lineament shown on the CDMG map was trenched in T-2 and was found to be of depositional rather than fault origin. [56] No evidence of faulting was found in development areas of Subarea 2. Additional secondary fault splays could be present in unexplored, intermediate areas of either subarea. Therefore, before development of structures proposed within the Alquist-Priolo Earthquake Fault Zone in Subareas 1 and 2 trenching of building sites would be needed to positively confirm that they are free of active faulting in accordance with State requirements.

Subarea 3 Subarea 3 is not located within an Alquist-Priolo Earthquake Fault Zone for areas of active faulting. No known active faults traverse the subarea. Therefore, Subarea 3 should be considered free of fault rupture hazards, and structural building setbacks for planning or development purposes are not deemed necessary.

Subarea 4 Subarea 4 is not located within the Alquist-Priolo Earthquake Fault Zone for the Las Positas Fault. To determine if structural building setbacks would be recommended, the EIR geologist trenched

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[53] *Preliminary Evaluation of the Available Data Regarding the Locations and State-Activity of the Las Positas and Livermore Faults, op. cit.*

[54] *Geologic Map of the Livermore Quadrangle*, R.C. Crane, Northern California Geological Society Field Trip Guide to the Geology of the San Ramon Valley and Environs, 1994.

[55] *Fault Evaluation Report FER-112, Supplement No. 1, op. cit.*

[56] Rogers / Pacific did not explore a second fault mapped southeast of the subarea. While outside the SLVSPA and not covered either by the *Draft Plan* or this EIR, additional fault trenching should be performed if development is ever contemplated in this area.

through two previously inferred lineaments and determined that these lineaments are not fault related, thus not deeming structural setbacks from these features necessary. However, the Las Positas fault probably does extend through the southeastern edge of the subarea as shown on Exhibit 4.2-4. Trenches only were excavated to within 50 feet of the northern electrical transmission line. Because it is likely that the Las Positas fault is present somewhere in the utility corridor farther south, a preliminary building setback zone for planning purposes is provided on Exhibit 4.2-4. If structures are contemplated south of the line shown on Exhibit 4.2-4, it is recommended that the area of proposed development be traversed by fault trenching to preclude the presence of active faulting in this area. Otherwise, no other trenching or structural building setbacks are recommended in Subarea 4.

Subarea 5 The EIR geologist's review and detailed subsurface investigation found no youthful (Holocene age) fault-related features in Subarea 5. Exploration of the previously inferred lineaments of the Livermore fault determined that these features represent the lateral margins of old alluvial terraces and are not related to faulting. Therefore, the subarea probably is free of fault rupture hazards, and structural building setbacks for planning or development purposes are not deemed necessary.

Subarea 6 Subarea 6 is not located within the State Alquist-Priolo Earthquake Fault Zone for the Las Positas Fault. However, mapped trends of the Las Positas Fault suggest that this fault traverses the extreme southeast corner of this subarea. No site-specific trenching has been performed to determine the presence of the fault in this area. Site-specific fault investigation should be performed if development is contemplated within 200 feet of this potential trace of the Las Positas fault (or within the recommended setback area shown on Exhibit 4.2-5) before submittal of any future development plans.

A mapped trace of the Livermore Fault traverses the northeast boundary of Subarea 6. This is the same lineament which traverses Subarea 5 to the northwest. As indicated in the EIR geologist's investigation report for this lineament in Subarea 5, the lineament mapped on Subarea 5 was determined to represent the lateral margins of old alluvial terraces and was not related to faulting. It therefore appears unlikely that the mapped traces of the Livermore fault in Subarea 6 represent recent faulting or would warrant setbacks.

Subarea 7 Subarea 7 is not located within the State Alquist-Priolo Earthquake Fault Zone for the Las Positas Fault. To determine if structural building setbacks would be recommended, the EIR geologist trenched through a previously inferred lineament and determined that this lineament is not fault-related. Therefore, structural setbacks from this feature would not be necessary. However, the Las Positas fault probably does extend along the northwest edge of the subarea near the Zone 7 Water Treatment Plant somewhere within the utility corridor which crosses this valley (as shown on Exhibit 4.2-6). A preliminary structural setback zone is recommended to center on the most probable location of the fault to assist in planning purposes. If structures are proposed to be built within the recommended setback zone shown on Exhibit 4.2-6, the area of proposed development should be traversed by fault trenching to preclude the presence of active faulting there. Otherwise, no other trenching or structural building setbacks are recommended in Subarea 7.

Seismic Hazards

Seismic hazards include surface rupture along a fault, ground shaking, and earthquake-related ground failures, including seismically induced landslides, liquefaction, lateral spreading, and differential settlement.

Surface Rupture Off-set along a fault can rupture the ground surface and displace natural and man-

made features, including buildings and infrastructure, and can occur suddenly or gradually, as the result of earthquakes or creep. Because ground movement can cause structural damage to buildings and other improvements located on or near fault traces, the CDMG established Special Study Zones which delineate areas where surface ruptures could occur and where evaluations of specific sites are required to determine potential hazards to proposed structures and their occupants. [57] Habitable structures are not allowed to straddle the fault traces mapped within the Las Positas Special Study Zone, and specific geotechnical investigations are required to determine structural design standards for buildings proposed within 50 feet of fault traces.

Ground Shaking Earthquake magnitude, epicenter distance, and local soil and groundwater conditions all influence ground shaking intensity. Intensity of ground shaking at a specific location is a function of the distance from the earthquake epicenter and the way seismic waves propagate through different kinds of subsurface materials. [58] At a given distance from the epicenter, ground motion will be strongest in poorly consolidated deposits or artificial fill, somewhat less strong in alluvium, and of minimal strength in bedrock. Local topography can also increase the severity of ground shaking by focusing seismic waves onto narrow ridgetops. The severity of damage depends on both magnitude and frequency of ground acceleration and on the design of structures. Because neither the location nor the magnitude of earthquakes can be controlled, potential damage from ground shaking can only be mitigated by tailoring structural designs and land use to the local geologic setting. A moderate to major earthquake on the Hayward, Verona, Concord / Green Valley, Calaveras, Greenville, or Las Positas faults or a major earthquake on the San Andreas fault could produce severe ground shaking at the subareas. [59] Large magnitude earthquakes could occur during the expected life of residential and other structures developed in the SLVSPA.

Landslides Seismic events can initiate landslides and reactivate older massive landslides, particularly if earthquakes coincide with rainy periods when soils are saturated. [60] The shaking processes associated with earthquakes apply horizontal and vertical loads to hillsides in ways which can activate landslides where none would occur under static conditions. Under earthquake conditions, some landslide activity also can be expected in areas of demonstrated instability under static conditions. Landslides vary in both type and rate of movement, and the weakness of slope materials, steep or undermined slopes, unfavorable geologic structural conditions, absence of vegetative cover, and prolonged precipitation are factors which cause or contribute to landslides. [61] The CDMG has mapped the general susceptibility of the SLVSPA and the Livermore Valley as a whole to landslides based on the area's combination of weak materials and steep slopes. As discussed above, the EIR geologist supplemented State mapping with other references and field reconnaissance for this analysis and prepared the site-specific maps shown in Exhibits 4.2-2 through 4.2-6.

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57 *Fault-Rupture Hazard Zones in California, op. cit.*

58 "Effects of the Loma Prieta Earthquake, October 17, 1989, San Francisco Bay Area", David Montgomery, *California Geology*, CDMG, January 1990.

59 *Maralisa Planned Development Final EIR, op. cit.*

60 "Effects of the Loma Prieta Earthquake, October 17, 1989, San Francisco Bay Area", David Montgomery, *op. cit.*

61 "Landslide Hazards in California", Clifton Gray, *California Geology*, CDMG, August 1984.

Liquefaction Liquefaction is the loss of shear strength and bearing capacity of shallow, saturated, loose, fine sands subjected to intense shaking. Fine-grained well-sorted sands within about 50 to 100 feet of the surface are most susceptible to liquefaction. Stream zones and adjacent sandy deposits are most susceptible to liquefaction. This is because seismic shaking settles saturated loosely packed sand, reducing the pore space, increasing pore pressures, and reducing the effective stress. [62] Structures built on areas which liquefy may collapse as a result of the ground failure and movement.

Other Hazards Lateral spreading, differential settlement, and lurch cracking also constitute potential seismic hazards. Lateral spreading and differential settlement occur when severe ground motions cause rapid compaction and settlement of underlying soil [63], and lurch cracking refers to irregular ground surface ruptures which form during or after an earthquake. [64] These phenomena can result in local subsidence and can damage buildings, infrastructure, and other improvements.

Soils Conditions

Subarea soils generally are grouped in three associations. Soils of terraces, alluvial fans, and floodplains (two associations) are found on six subareas while upland soils (one association) are present on one subarea: [65]

Yolo-Pleasanton Association These soils are nearly level to sloping, grayish-brown, very deep, and are located on floodplains and low terraces in Subareas 1, 2, 3, 5, and 7.

Positas-Perkins Association Soils grouped in this association are nearly level to very steep, brown, shallow to moderately deep, and are located on high terraces in Subareas 1, 2, 4, 5, 6, and 7.

Millsholm-Los Gatos-Los Osos Association This upland association is present only in Subarea 7 and consists of moderately sloping to very steep, brownish soils located on moderately hard sedimentary rocks.

The suitability of soils for agriculture, as classified by the Natural Resources Conservation Service and California Department of Conservation's Farmland Mapping and Monitoring Program, is discussed in ***4.1 Land Use and Public Plans***.

Mineral Resources

About 80 non-fuel minerals are known to have been available commercially throughout California in the past of which about 35 presently are mined. [66] Of the approximately 1,100 mines currently active statewide, the most numerous are construction aggregate operations, followed by industrial minerals,

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62 "Effects of the Loma Prieta Earthquake, October 17, 1989, San Francisco Bay Area", David Montgomery, *op. cit.*

63 *South Livermore Valley Area Plan Draft EIR, op. cit.*

64 *Maralisa Planned Development Final EIR, op. cit.*

65 "General Soil Map", *Soil Survey of Alameda Area*, Soil Conservation Service (recently renamed the Natural Resources Conservation Service), U. S. Department of Agriculture, 1966.

66 "Mineral Land Classification in California", Ralph Loyd *et al, California Geology*, January / February 1994.

and metals. The CDMG has identified Rhodes & Jamison (2), Lone Star Industries (1), and Kaiser Sand & Gravel's (1) sand and / or sand and gravel extraction operations west of the SLVSPA as significant aggregate production sites. [67] To be considered significant, a mineral deposit must meet the State Mining and Geology Board's 1983 marketability and threshold value criteria. [68]

The Board has adopted Mineral Resource Zone (MRZ) definitions which reflect varying degrees of mineral resource potential, and the CDMG has classified mineral lands in the state, including in the subareas.

MRZ-1 These are areas where adequate information indicates that no significant mineral deposits are present. Parts of Subareas 1 and 2 are classified MRZ-1.

MRZ-2 These are areas where adequate information indicates that significant mineral deposits are present or are judged that a high likelihood of their presence exists. Parts of Subareas 2, 3, and 5 are classified MRZ-2.

MRZ-3 These areas contain mineral deposits the significance of which cannot be evaluated from available data. Parts of Subareas 3 through 7 are classified MRZ-3.

MRZ-4 These are areas where available information is inadequate for assignment to other MRZ zones. No subareas are classified MRZ-4.

4.2 GEOLOGY, SOILS, AND SEISMICITY -- IMPACTS AND MITIGATION MEASURES

Scope of Topics Addressed

Seismic and landslide hazards are the two geologic conditions of most significant potential concern to future development in the SLVSPA. The basic approach taken by the *Draft Plan* to both hazards primarily is avoidance and secondarily is provision of sufficient mitigation, in the form of *Plan* policies, to minimize the significance of impact.

Limited very focused fault trenching work was conducted in 1995 as part of the planning process before formulation of the *South Livermore Valley Specific Plan*. It was performed to confirm the presence and location of the Las Positas Fault and preliminarily identify appropriate setbacks for new development. The work substantiated the presence of the main fault trace in Subareas 1 and 2 and established setbacks for structures from the main fault and secondary splay in those subareas (well inside the Alquist Priolo Earthquake Fault Zone). The EIR geologist also identified setback areas in Subareas 4, 6, and 7 where the fault's presence is inferred but not confirmed (and where no Alquist Priolo Earthquake Fault Zone is designated by the CDMG). The 1995 work also confirmed the findings of the CDMG's previous evaluations that the "Livermore fault system" is either an old (and inactive) buried

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[67] *Mineral Land Classification: Aggregate Materials in the San Francisco-Monterey Bay Area, California*, CDMG, Special Report 146, 1986.

[68] "Mineral Land Classification in California", *op. cit.* Criteria vary for different minerals depending on (1) whether they are strategic or non-strategic minerals, (2) their uniqueness or rarity, and (3) their commodity-type category (metallic minerals, industrial minerals, or construction minerals). The marketability of sand and gravel depends on transport distance, the cost of which by truck doubles each 40 to 50 miles.

feature or does not exist and concluded that it should be considered inactive for planning purposes.

In a seismically active region (such as the Bay Area), short of no development whatsoever, site planning to avoid active faults on specific sites reduces the likelihood of surface ground rupture beneath development and reduces the significance of other seismic impacts to a generally accepted level but does not eliminate these impacts altogether. Thus, the analysis conducted for this EIR focused on examining the *Draft Plan's* policies and site plans to verify that lots for future development would be set back from the known fault location and also from fault setbacks mapped by the EIR geologist in Subareas 1, 2, 4, 6, and 7. (Although the *Draft Plan* would locate development outside the setback area, some development within Subarea 1 still would be located in the Alquist-Priolo Earthquake Fault Zone of the Las Positas fault -- a zone which is wider than the fault setback area. Development is allowed in earthquake fault zones as long as subsurface investigations are conducted according to CDMG requirements and the findings are followed.)

As with the presence of faults, avoidance of landslides partly reduces but does not entirely eliminate potential hazards to development from future movement. While it technically is feasible to mitigate landslides if identified, investigated, and repaired before development occurs, mass grading for landslide repair can result in significant secondary impacts (such as vegetation removal and associated impacts on biological habitat, sedimentation and concomitant impacts on downstream water quality, and short- and, possibly, long-term visual impacts). The analysis conducted for this EIR included mapping of specific landslides in the subareas to determine the location and potential nature of the slides followed by a review of proposed development areas shown on *Draft Plan* site plans in relation to those slide features.

Review of the *Draft Plan's* site plans for this EIR indicates that development generally would avoid parts of the SLVSPA exposed to significant geologic hazards. While some individual lots (primarily in Subarea 7) appear to be located on or in close proximity to mapped features which appear to represent landslides, the *Draft Plan* contains policies which prohibit development on or downslope from mapped active or potential ancient landslides in order to avoid impacts from these hazards.

Significance Criteria

Geologic conditions of significance include those which would:

- Increase risks to life or property from seismic, slope, or soils hazards in the area
- Affect significant mineral or soils resources
- Result in mass grading on slopes steeper than ten percent to create lots or prepare roads for urban development or to repair landslides

Impacts and Mitigation Measures

Impact 4.2-1 Landsliding

Large magnitude movements of any of the potential large landslides present in the SLVSPA (particularly in Subarea 7) could risk human life, damage or destroy structures, block or damage roadways and escape routes (isolating residents and limiting access of emergency services), and sever utility lines. LTS

One significant geologic hazard in the SLVSPA is landsliding. Landslides of various types blanket parts of the hilly terrain in Subareas 1, 4, and 7 (Exhibits 4.2-2, 4.2-4, and 4.2-6). Landslides which pose potential hazards to development would require repair. Detailed investigations would be necessary to accurately identify all potential landslide hazards and provide the basis for formulating stabilization

plans.

Two types of landslides potentially present in the SLVSPA are ancient deep-seated bedrock landslides and young shallow earthflow slides. Evidence of young shallow earthflow slides usually is visible on the surface and can be detected through a combination of on-site surface reconnaissance and aerial photographic interpretation, as was done for this EIR. Features characteristic of potential ancient bedrock landslides are more subdued and, while evident in the field and through examination of topographic maps, can neither be verified nor their stability assessed without subsurface investigation. Thus, the EIR describes these features as "potential" ancient bedrock landslides based on the EIR geologist's observations and experience.

Where landslides are present on undeveloped land, movement can occur naturally during prolonged rainstorms when soils are saturated. Groundshaking during an earthquake also can trigger landslides, especially under saturated conditions. When development occurs on or near landslides, both people and property are exposed to these hazards. In addition, without repair construction activities and routine use and maintenance, grading, and drainage changes caused by development can reactivate long-dormant or more recent landslides which otherwise would remain stable under static conditions. This can occur because earthmoving changes the ground surface and subsurface, altering the shape and stability of the slide mass and changing drainage and groundwater conditions. Unmitigated dormant landslides also can be reactivated, at least in part, through the effects of residential landscape irrigation, primarily over-watering attributable to lawn care and planting of non-drought tolerant ornamental species. Over the long-term, irrigation generally increases moisture levels sufficiently to precipitate land slippage during years with greater than normal rainfall. [69]

Development in hillside areas where landslides are present would be subject to the following *Draft Plan* policy, and, if landslides are confirmed, development would be prohibited in the affected areas:

- ***Policy 6-38*** No development shall occur on any portion of a site that contains, or could affect or be affected by, an identified active or ancient landslide or other geologic hazards. Proposed site plans shall be accompanied by a report prepared by an engineering geologist certified by the State of California certifying that the proposed development area (1) does not include any active or ancient landslide or other geologic hazards and (2) will not affect or be affected by any active or ancient landslide or other geologic hazards.

The sliding present in Subareas 1 and 4 is outside *Draft Plan* development areas, and hazards to development in flatland areas of Subareas 1 and 4 envisaged by the *Draft Plan* should be minimal. However, in Subarea 7 there are numerous shallow earthflow and possible ancient landslides in the foothills where development is contemplated. These areas must be thoroughly explored before formulation of detailed development plans to determine their extent and severity. Because of their subdued topography, the existence of ancient bedrock landslides is questionable and cannot be determined definitively without subsurface investigation. Development on or downslope of any of these features also would be subject to *Draft Plan* Policy 6-38.

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[69] A residential subdivision can introduce the equivalent of more than 100 inches of rainfall per year, although use of drip and low-flow irrigation systems and planting of native and drought resistant species substantially mitigates this moisture increase. Agricultural irrigation techniques currently used in vineyards and orchards similarly could minimize water consumption. "Long-Term Behavior of Urban Fill Embankments", J.D. Rogers, *Stability and Performance of Slopes and Embankments-II*, American Society of Civil Engineers Geotechnical Special Publication No. 31, 1992.

Mitigation Measure 4.2-1 With full implementation of *Draft Plan* Policy 6-38, potential impacts from landsliding would be averted, and no additional mitigation would be required.

Impact 4.2-2 Grading for Landslide Repair and Development
Substantial grading could be necessary in Subarea 7 in order to safely develop areas on or downslope from landslides. Grading for any reason could affect the stability of landslides negatively or result in significant secondary impacts, if the potential landslides are not identified and mitigated. LTS

Grading operations are used consistently throughout California to repair landslides (as well as to prepare sites for development) and could be necessary in parts of Subarea 7. Grading with site-specific under-construction input from engineering geologists historically has lowered the incidence of urban landslides. Without mitigative grading in landslide affected terrain, the potential for slide reactivation and related incidents is increased substantially.

In grading for landslide repair, specific conditions of individual sites dictate how much grading is necessary in order to successfully mitigate the types of features present. These typically include minimal grading and mass grading, although it is the depth and volume of earthmoving activities which define these types of grading, not necessarily the areal extent of surface disturbance.

Minimal site grading may involve a large area in plan view but generally is shallow and involves the least amount of earthmoving necessary to reach the desired finished building grades. Because minimal grading may not stabilize major geologic hazards (such as bedrock landslides), it is usually only appropriate on geotechnically stable sites with favorable geologic conditions.

Mass mitigative grading (such as that used in buttress fill slope reconstruction) involves approximately the same slope area as minimal grading, although the depth of earthmoving and volume of soil affected are much greater.

Extensive grading for landslide repair can result in significant unavoidable secondary impacts. These could include removal of vegetation and accompanying loss of habitat and visual impacts, adverse hydrologic effects on springs, seeps, and other water features with similarly unintended impacts on biological resources, increased erosion and sedimentation, and potential traffic impacts from off-site disposal of soil removed from unstable areas but not reused in landslide repair.

Implementation of *Draft Plan* Policy 6-34 (presented above) and locating development to avoid landslide features would eliminate any potential need to grade sites for landslide repair. Thus, SLVSPA development according to the *Plan* would not result in impacts from grading for landslide repair. Alternatively, any proposal which would involve mass grading would be inconsistent with the *Draft Plan.*

Grading for site preparation can result in increasingly severe impacts in proportion to the steepness or instability of slopes if not mitigated through the design and implementation of the grading operations. While it technically is feasible to do so, there may be public policy and associated reasons to minimize or avoid grading, especially in certain terrain or in consideration of other conditions. Examples include secondary effects on the presence of sensitive biological resources, the potential for triggering or accelerating erosion and concomitant downstream sedimentation, or the visual effects of exposed retaining walls supporting deep cuts. (In the SLVSPA, sedimentation affects aquatic organisms, overall water quality, and groundwater recharge.) Therefore, the *Draft Plan* contains the following policy on

grading:

- ***Policy 6-37*** For development on slopes of less than ten percent, grading shall be permitted up to the boundary of any lot or developed open space, and contiguous lots may be graded contiguously. No grading shall be permitted in adjacent undeveloped open space areas as part of the subdivision development. For development on slopes between ten and 25 percent, grading shall be limited to roads, driveways, and the building envelope as defined by the applicable setbacks. No grading shall be allowed on slopes in excess of 25 percent. Where development requires cut and fill grading, such cut and fill shall not exceed a ratio of 3 : 1 and shall be contoured to match the natural terrain. Notwithstanding the foregoing, the City may issue a grading permit where grading is required to repair previously graded areas or future failures in natural areas which affect building sites or roads and the proposed repairs are consistent with the policies of this Plan or deemed appropriate by the City.

Mitigation Measure 4.2-2 As with Mitigation 4.2-1, with full implementation of *Draft Plan* Policies 6-37 and 6-38, no significant impacts requiring mitigation would result from buildout according to the *Plan*. Therefore, no mitigation would be required.

Impact 4.2-3 Slope Stability

Cut, filled, and natural slopes could be unstable in hilly areas. Without design and mitigation to account for locally unstable conditions, development could aggravate or be exposed to potential landslides. LTS

Because of the existence of landslides and colluvial deposits in the SLVSPA, the potential instability of cut, fill, and natural slopes could be significant in the hilly parts of Subareas 1, 4, and 7. There also is a significant possibility of erosion of graded slopes if proper drainage facilities are not provided. It is particularly important to control water in landslide areas (where concentrated runoff could lower stability of landslides). These areas also are prone to increased erosion and surficial instability because of their low long-term strength when saturated. The potential for impacts from construction on any cut, filled, or natural slopes in conformance with the grading and drainage sections of the Uniform Building Code would reduce the potential for slope stability impacts to a less-than-significant level. The *Draft Plan* contains the following policy to initiate geologic and geotechnical engineering investigations for integration in the planning and design process:

- ***Policy 6-39*** Geologic and geotechnical engineering investigations shall precede formulation of development plans in proposed hillside development areas, and project designs shall incorporate detailed slope stability measures to be monitored during subsequent grading.

Mitigation Measure 4.2-3 Implementation of Policy 6-39 and compliance with the Uniform Building Code (or more stringent provisions adopted by the City) would avert potential instability impacts, and no additional mitigation would be required.

Impact 4.2-4 Expansive Soils

Structures built on expansive soils can be damaged by seasonal cycles of shrinking and swelling. LTS

While most of the soils present in the SLVSPA have low expansion potential, some soils of the Los Osos Association are mapped in the foothills of Subarea 7. Expansive soils may also be present locally in areas underlain by clayey bedrock or alluvial formations. Such soils generally are cohesive, have a

high clay content, and appear desiccated when dried.

Expansive soils are naturally prone to large volume changes through the absorption of pore water. The physical manifestation of such moisture change most often is expansion or swelling during the winter and subsequent shrinkage due to drying or desiccation in the summer. This cyclic volume change can exert large forces on nearby structures, causing damage to concrete slabs and foundation elements and cosmetic damage to interior and exterior wall surfaces.

The *Draft Plan* contains the following policy which addresses expansive soil conditions:

- ***Policy 6-40*** Design of development in Subarea 7 shall take into account the potential hazards of specific geologic and soils conditions. Consistent with the requirements of the Uniform Building Code (UBC), site-specific tests and investigations shall be completed prior to detailed project planning and design. An Engineering Geology Report shall be submitted which contains the results of the site-specific investigation and which includes specific recommendations for design and implementation measures required to mitigate local conditions.

Mitigation Measure 4.2-4 With implementation of Policy 6-40, potential impacts attributable to expansive soils would be avoided, and no mitigation would be required.

Impact 4.2-5 Seismicity

Active faults in and near the SLVSPA will expose future structures, utilities, and other improvements to strong groundshaking some time during the life of development. S

Because of the known presence of the Las Positas fault within Subarea 1, the probable location of the Las Positas fault elsewhere in Subareas 4, 6, and 7, and the proximity of the SLVSPA to the Greenville, Verona, Calaveras, Hayward, Concord / Green Valley, San Andreas, and other active faults, there is a high probability that development will experience strong groundshaking during the lifetime of any proposed improvements. This groundshaking could produce seismically-induced landsliding in Subareas 1, 4, and 7 (see ***Impacts 4.2-1*** and ***4.2-3***, above) and liquefaction in Subareas 3, 5, 6, and 7 (see ***Impact 4.2-7*** below).

Another potential seismic impact not addressed elsewhere in this section would be the effect of strong groundshaking on commercial sites, especially wineries. As summarized in Exhibit 4.2-8, earthquakes of different intensities would affect objects in buildings as well as the buildings themselves. Breakage of merchandise and furnishings would be expected at commercial sites. In addition, groundshaking could generate oscillations of liquids stored in vats, tanks, or barrels used to produce and age wine before bottling. [70] Shaking also could potentially topple stacked bottles and their contents and possibly present a hazard to workers.

The *Draft Plan* contains the following policies to reduce the severity of impacts from groundshaking but not eliminate seismic impacts altogether:

- ***Policy 6-34*** Require development in Subareas 1,4, 6, and 7 to maintain building setbacks of at least 50 or 100 feet from the Las Positas Fault as shown in the site plans.

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[70] This action on the surface of lakes or other enclosed bodies of water is called seiches.

- ***Policy 6-35*** Applications for site plan approval for any development within an Alquist-Priolo Earthquake Fault Zone or within 500 feet of a known or inferred active fault shall be accompanied by a report prepared by an engineering geologist certified by the State of California identifying appropriate building setbacks and building standards for that development sufficient to ensure that the risk of property damage for that development is not greater than that for development elsewhere in the Plan area. Such a geologic investigation shall include a detailed fault trenching study (with continuous trenches oriented approximately perpendicular to the fault). The trenching should cover the limits of the proposed building site and a minimum of 50 feet beyond it in each direction.

Landowners / developers of individual development projects also would be required to comply with all applicable seismic design provisions of the Uniform Building Code (UBC) in effect when filing a project's Final Map in order to receive a building permit from the City.

Mitigation Measure 4.2-5 In addition to implementing Policies 6-34 and 6-35 and satisfying the routine requirements expected of any development in the City, individual landowners / developers owners should:

- Take the recommendations of the Structural Engineers Association of Northern California (SEAONC) into account when designing and implementing site development
- Secure breakable objects or focus work stations away from such potential hazards

Significance after Mitigation This measure would reduce but not eliminate seismic impacts. However, because implementation of these measures would reduce the risks to humans and structures to levels ordinarily considered acceptable according to engineering standards in earthquake-prone areas, implementation of Mitigation 4.2-5 would reduce this impact to a less-than-significant level.

Responsibility and Monitoring Individual landowners / developers would be responsible for implementing this measure when building and installing infrastructure to support residential and commercial development. The City's plan reviewers and construction inspectors would be responsible for monitoring this measure when reviewing building permit applications and inspecting construction.

Impact 4.2-6 Faulting and Ground Surface Rupture

Surface rupture impacts could break or disrupt roads or utilities which cross faults, even if development is set back required distances from mapped or probable fault locations. LTS

The Las Positas fault traverses parts of Subarea 1 and, possibly, also parts of Subareas 4, 6, and 7.[71] Studies have shown that this fault has been active in Holocene time. Therefore, the possibility of on-site surface ground rupture in the vicinity of this fault is considered high.

Surface rupture is the breaking and disruption of the ground surface which occurs along a fault when movement caused by an earthquake or fault creep occurs on the fault. Setbacks of structures from the fault in Subarea 1, through adherence of the *Draft Plan* site plans to the Alquist-Priolo Earthquake

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[71] The mapped and probable locations of Las Positas fault splays are shown on Exhibits 4.2-2, 4.2-4, 4.2-5, and 4.2-6 but at a scale only suitable for report graphics. The EIR geologist's 200-scale maps are on file at the City of Livermore Planning Department, in *Preliminary Subsurface Geologic Investigation and Fault Hazard Evaluation of the Las Positas Fault, South Livermore Valley*, Rogers / Pacific, November 1995.

Fault Zone, should prevent deformation, damage, and possible collapse of structures. However, roads and underground utilities which cross the fault to serve the southern development cluster in Subarea 1 could be displaced, cracked, or damaged.

The *Draft Plan's* site plan for Subarea 1 already incorporates the required 50-foot setback from the known active trace of the Las Positas fault investigated by the EIR geologist and the required 100-foot setback from the possible second fault splay mapped by other geologists on CDMG Alquist-Priolo Earthquake Fault Zone maps. The *Draft Plan's* site plans for Subareas 4 and 7 also provide 100-foot setbacks from the probable location of the Las Positas fault identified by the EIR geologists.

The *Draft Plan* further contains the following policies which address faulting and potential surface rupture impacts:

- ***Policy 6-36*** To the extent feasible, design underground utilities to accommodate anticipated offsets caused by fault creep or surface rupture. Include standard automatic shut-off mechanisms on both sides of the fault to minimize leakage in the event that lines are broken during fault rupture.

As long as development adheres tp Policy 6-36, abides by the setbacks established for the approapriate subaras by the *Draft Plan's* site plans, and complies with Alquist-Priolo Earthquake Fault Zone requirements, potential fault and ground surface rupture impacts would be less-than-significant.

Mitigation Measure 4.2-6 No mitigation would be required provided that all State and local guidelines are adhered to during site specific fault hazard investigations, that such reports are adequately reviewed by the City (or City's consultant), and that appropriate building setbacks are observed, the potential for property damage from primary ground rupture would be less-than-significant.

Significance after Mitigation It should be understood that significant damage still could result from groundshaking should an earthquake occur on one of the many nearby active faults in the region.

In the event the City adopted either the Minimum or Moderate Annexation alternative (rather than the Modified Moderate -- the *Draft Plan* -- or Maximum Annexation alternatives), development of a medium-sized winery on Subarea 6 would require approval from Alameda County. The *South Livermore Valley Area Plan EIR* contains the following measure to mitigate the impact from increasing the number of structures and people within the area and increasing the risk of groundshaking and associated secondary effects on life and property. [72] That EIR's Mitigation Measure C-2 states:

- The County should require geotechnical studies to be performed on a project-by-project basis and recommended measures from those studies to be implemented in all areas known to be subject to landslide and seismic hazards. This includes identified hazard areas on State landslide hazard maps and, when available, State seismic hazard maps in conformance with the requirements of the Seismic Hazards Mapping Act (SHAMA) of 1990.

Therefore, no additional measures would be required to mitigate impacts in the event the City adopts either the Minimum or Moderate Annexation alternative.

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[72] Impact and Mitigation Measure C-2, *South Livermore Valley Area Plan EIR*, Alameda County Planning Department, June 1992.

Responsibility and Monitoring Landowners' / developers' consultants would be responsible for adequately exploring all proposed development sites within Earthquake Fault Zones mapped by the State, even if development is proposed to be located outside the setback areas included in this Draft EIR. This would be especially important in Subareas 4, 6, and 7 in the event development were proposed inside the setbacks, although not envisaged there by the *Draft Plan*, since the CDMG has not established Earthquake Fault Zones in those subareas. The City would be responsible for reviewing submittals by individual applicants' consultants. The City's plan reviewers and construction inspectors would be responsible for monitoring compliance by applicants with required building setbacks and infrastructure design. The City's geotechnical consultant would peer review fault trenching.

Impact 4.2-7 Liquefaction
Seismically induced liquefaction could damage structures built on loosely compacted soil and underlain by shallow groundwater. LTS

Liquefaction is a process by which a cohesionless soil (such as sand, coarse silt, or fine gravel) becomes "liquefied" upon losing its shear strength through intense shaking. This phenomenon is common in loosely compacted sandy fills or natural soils of low density near large sources of water or in areas with a high water table, as is the case in parts of Subareas 3, 5, 6, and 7. Depending on soil conditions, liquefaction can occur during seismic shaking if groundwater is present within about 40 feet of the ground surface.

The soil and ground water conditions within the SLVSPA vary from subarea-to-subarea. However, because of shallow groundwater conditions in Subareas 3, 5, 6, and parts of 7, further site-specific evaluations are required to determine the potential risks from liquefaction which may be present. Such evaluations should employ standard penetration testing (SPT) and liquefaction analysis.

The *Draft Plan* contains the following policy on development in areas exposed to potential effects of liquefaction:

- ***Policy 6-41*** Development in Subareas 3, 5, 6, and 7 will be required to evaluate liquefaction potential on a site-specific basis as part of each project's overall geotechnical investigation and identify detailed engineering solutions to address liquefaction potential if present. Development shall not occur if a project cannot mitigate liquefaction impacts and if the project cannot mitigate liquefaction impacts without causing other impacts. In those cases, proposed development will be relocated to a site where it would not be exposed to liquefaction potential or will be eliminated.

Mitigation Measure 4.2-7 With implementation of Policy 6-41, potential impacts attributable to liquefaction would be avoided, and no mitigation would be required.

Impact 4.2-8 Mineral and Aggregate Resources
Buildout of SLVSPA development areas and intensive cultivation of agricultural land in the subareas would preclude future exploitation of potential mineral and aggregate resources. LTS

The State Mining and Geology Board has classified parts of Subareas 2, 3, and 5 as MRZ-2 -- areas where information indicates that significant mineral deposits are present or areas judged to have a high likelihood of being present. Parts of Subareas 3 through 7 are classified MRZ-3 -- areas which contain deposits, the significance of which cannot be evaluated from available data.

The Livermore Formation, which underlies much of the SLVSPA, also is referred to as the Livermore gravels and is a source of commercial aggregate materials. However, the unit is relatively extensive regionally and is used little in proportion to its regional extent. Therefore, the impact of development on a portion of this deposit would not represent a detrimental loss of resources to the local community. Other more proven sources of aggregate resources are available elsewhere.

Mitigation Measure 4.2-8 No mitigation would be required.

4.3 HYDROLOGY, DRAINAGE, AND WATER QUALITY -- THE SETTING [1]

Climate

The Livermore Valley is influenced by hot dry summers with variable winds and mild to cooler wet winters. Temperatures typically range from the low 50 degrees Fahrenheit to the 90s during July, August, and September and from the middle 30s to upper 50s and lower 60s in the winter with nighttime temperatures of 32 degrees or lower in December and January. [2] Mean annual precipitation ranges from about 14 inches for the eastern subareas (Subareas 1-3) to 15 inches (Subareas 4-7) [3] with more than 60 percent of yearly rainfall occurring in winter months of December, January, and February. The Federal Emergency Management Agency (FEMA) has estimated that 4.86 inches of rain could fall in a 24-hour period during a 100-year intensity storm. [4]

Regional Hydrology

The Livermore-Amador Valley is drained by Arroyo Valle, Arroyo Mocho, and Arroyo Las Positas, the largest streams with the largest watersheds, and a number of smaller streams, including Alamo, Cottonwood, South San Ramon, and Tassajara Creeks. [5] West of Pleasanton, these stream courses converge into the Arroyo de la Laguna which drains the Sunol Valley south to Alameda Creek. Alameda Creek in turn flows west through Niles Canyon and ultimately discharges into San Francisco Bay.

Arroyo Valle is dammed south of the subareas, forming Lake Del Valle which has a capacity of 77,100,000 acre-feet. [6]. The dam and reservoir, a unit of the State Water Project completed in 1969, compose a combined water supply and flood control project of the California Department of Water

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1 Clearwater Hydrology (the EIR hydrologist) revised and expanded "Hydrology", *Environmental Setting and Planning Considerations (Constraints Analysis)*, Nichols • Berman, June 16, 1995, and analyzed impacts for the EIR.

2 *City of Livermore Community General Plan 1976-2000*, adopted March 1976.

3 "Mean Annual Precipitation", *Evaluation of Ground Water Resources in Livermore-Sunol Valleys*, California Department of Water Resources, 1974.

4 *Flood Insurance Study*, Federal Emergency Management Agency, 1990, cited in *Barnett Property Draft EIR*, LSA Associates, August 1994, and *Maralisa Planned Development Final EIR*, Environmental Science Associates, June 1994. A "100-year storm" refers to a storm which lasts 24 hours with an intensity such that the probability of occurrence is on the average of once every 100 years or a one percent probability that this intensity rainstorm could occur during any given year.

5 *Evaluation of Ground Water Resources in Livermore-Sunol Valleys, op. cit.*

6 *California Water Plan Update*, California Department of Water Resources, DWR Bulletin 160-94, 1994. An acre-foot (AF) is the amount of water which covers one acre to a depth of one foot and is equivalent to 325,829 gallons.

Resources (DWR) and U.S. Army Corps of Engineers (Corps), respectively. [7] The Alameda County Flood Control and Water Conservation District (ACFCWCD), Zone 7, owns the water supply, and the DWR operates the dam, releasing water when requested by the ACFCWCD [8], with the volume determined by California Department of Fish and Game (CDFG) stream flow requirements, reservoir storage capacity, flow into the reservoir, and groundwater recharge requirements. [9] The Corps has jurisdiction for the reservoir's capacity in excess of 40,000 acre-feet and regulates discharges during periods of downstream flood conditions. [10]

Zone 7 flood control policy does not include any provisions for regulating stormwater discharge quantities or rates from new development in its jurisdiction. Unlike other Bay Area flood control districts and municipalities, Zone 7 does not require on- or off-site stormwater detention to ameliorate potentially adverse impacts on downstream drainage and flood control facilities. Rather, it imposes drainage fees on new development to improve its existing flood control facilities. The District also mandates a 20-foot development setback from all drainageways in the unincorporated areas of Alameda County, as part of its Watercourse Ordinance. [11]

The flood control channels and other stormwater facilities currently maintained and operated by Zone 7 are identified as Special Drainage Areas (SDAs). Exhibit 4.3-1 shows Zone 7 drainage and flood control facilities, including those subject to SDA drainage fee assessments. The District's SDA 7-1 Program provides for reimbursement of funds expended by area developers for channel / stormwater improvements implemented within designated SDAs. The only qualification for reimbursement under these conditions is that the constructed improvements adhere to published Zone 7 design and construction standards.

Local Hydrology

Arroyo Valle, Arroyo Mocho, and Arroyo Seco (a tributary of Arroyo Las Positas identified above) drain the seven subareas. [12] All are intermittent "blue line" streams and are fed by a number of smaller unnamed "blue line" streams and drainage courses originating in the hills inside and outside (farther south of) the subareas. [13] The Corps and CDFG have regulatory authority over activities affecting "blue line" and other streams, such as stream channel modifications, stream bank alterations, or placement of fill materials in or along streams with incised channels and which carry permanent, intermittent, or ephemeral flows. This jurisdiction is derived from Section 404 of the Clean Water Act

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7 Nichols • Berman conversation with Martin Niemi, Delta Field Division, Department of Water Resources, May 8, 1995.

8 *Ibid.*

9 *South Livermore Valley Area Plan Draft EIR*, Alameda County, June 1992.

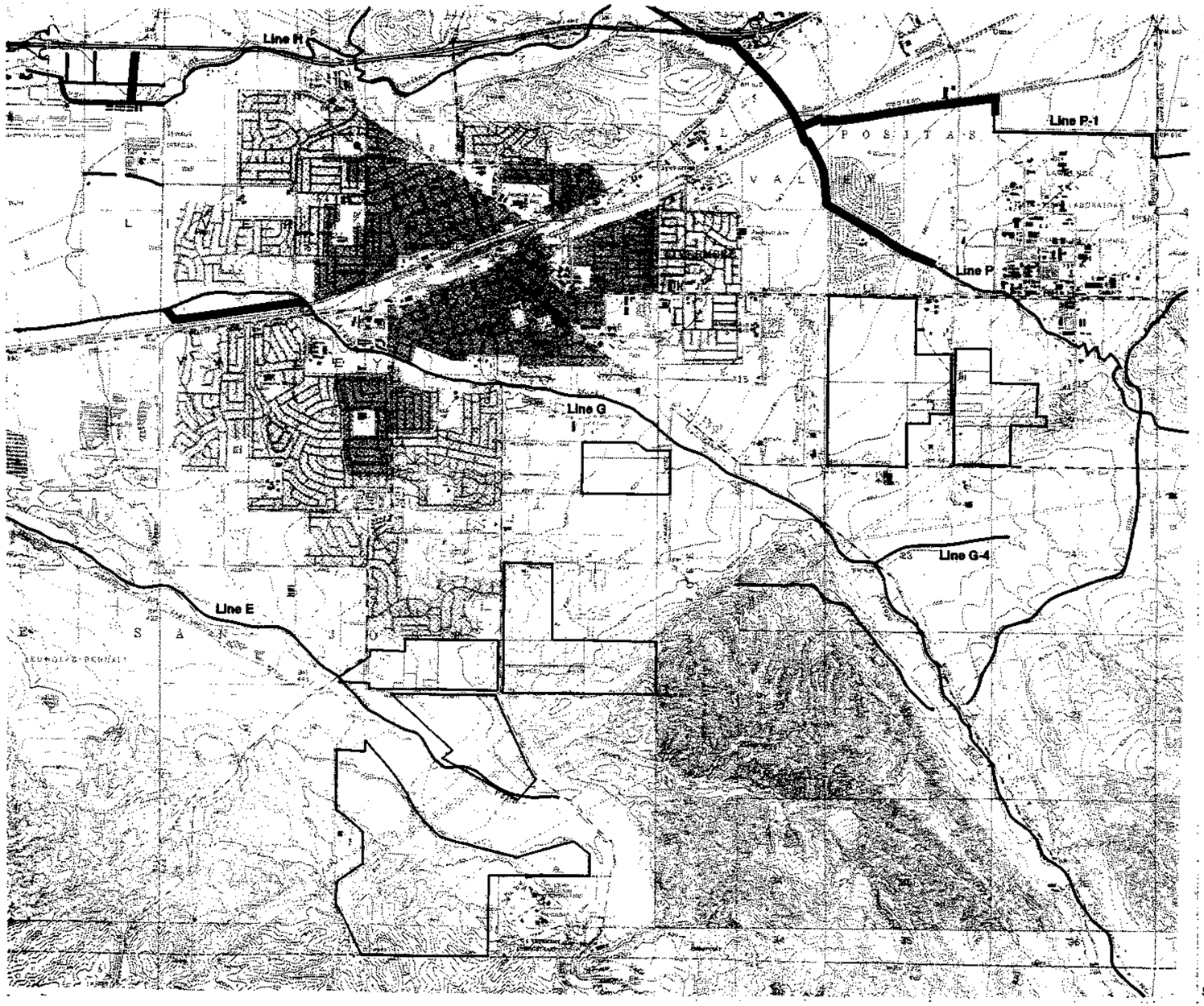
10 Nichols • Berman conversation with Martin Niemi, *op. cit.*

11 Letter of Dennis Gambs, Zone 7, Alameda County Flood Control and Water Conservation District, June 1996.

12 *South Livermore Valley Area Plan Draft EIR, op. cit.*

13 The term "blue line" stream refers to perennial (year-around) and intermittent (seasonal) streams shown on U. S. Geological Survey topographic maps (7.5 minute quadrangles and other USGS maps).

Exhibit 4.3-1
Zone 7 Drainage and Flood Control Facilities



Legend:
- Fully improved and owned channel
- Partially improved or owned channel
- Channel not owned or maintained by Zone 7

Source: Zone 7 Alameda County Flood Control and Water Conservation District

(Corps) and Sections 1601 and 1603 of the California Fish and Game Code (CDFG). All three arroyos are natural stream courses in the vicinity of the subareas, although other reaches have been channelized or otherwise altered (such as by in-stream aggregate extraction operations).

Exhibits 4.3-2 through 4.3-5 show the alignments of all intermittent streams and drainageways entering or exiting the subareas.[14] These maps also identify locations of other hydrologic features (such as freshwater seeps, springs and ponding areas, and principal culvert structures).

Arroyo Valle drains the largest watershed of these streams, nearly 150 square miles upstream from the South Livermore Valley Specific Plan Area (SLVSPA).[15] Arroyo Valle flows northwest from the dam and reservoir, parallel to Arroyo Road, through the Livermore Regional Park District's Veterans and Sycamore Grove Parks (adjacent to Subareas 6 and 7), parallel to East Vineyard Avenue beyond the SLVSPA, and ultimately to Arroyo de la Laguna west of Pleasanton.

Arroyo Mocho drains a watershed of nearly 40 square miles upstream from the SLVSPA.[16] Arroyo Mocho flows northwest, parallel to Mines Road, through the City of Livermore's Robertson Park (north of Subarea 3), and north of Interstate 580 (I-580) before eventually converging with Arroyo de la Laguna west of Pleasanton.

Arroyo Seco drains an approximately 14-square mile watershed upstream from the SLVSPA. Arroyo Seco flows northwest, parallel to Tesla Road, crosses East Avenue east of Subareas 1-2, crosses South Vasco Road north of Subareas 1-2, and joins Arroyo Las Positas near I-580 and North Livermore Avenue.

Three other "blue line" streams are located within the Specific Plan subareas, including one unnamed "blue line" stream in the eastern part of Subarea 4 and two unnamed "blue line" streams in Subarea 7. No "blue line" streams are located within Subareas 1, 2, 3, 5, or 6.

The Subarea 4 stream (labeled 4E in Exhibit 4.3-3) originates in the hills separating Arroyo Mocho (north) and Dry Creek (a tributary of Arroyo Valle)(south). It flows west into the Zumbach property and continues in a south-southwest direction toward its apparent outlet in Subarea 6, southwest of the Arroyo Road / Whetmore Road intersection (south of Subarea 4). Both Subarea 7 blue line streams (7A and 7B) originate off-site, south of the SLVSPA. One supplies two stock ponds developed in Subarea 7, and the second traverses the southwest corner of Subarea 7, supplies a stock pond downstream from the SLVSPA, and flows north to Arroyo Valle.

Other drainage courses and swales convey seasonal flows overland to the intermittent stream courses, or, in some cases, this runoff fans out onto the higher abandoned stream terraces parallel to major area streams (such as Arroyo Valle) In addition to ponds or man-made livestock water supplies, natural depressions also accumulate runoff and hillslope seepage during wet periods. Potentially significant

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[14] No hydrologic features are located in Subarea 3 which is not mapped.

[15] *South Livermore Valley Area Plan Draft EIR, op. cit.* Watershed acreages are rounded. They were approximate in the original and also were measured upstream of a somewhat different (larger) geographical study area than examined in this report. Thus, the areas are given to illustrate relative order of magnitude.

[16] *Ibid.*

areas of such seasonal ponding and wetland characteristics include small parts of Subareas 2, 4, 5, 6, and 7. The area subject to seasonal ponding in Subarea 2 receives roadside runoff along South Vasco Road and local upslope runoff from Subarea 1.

In Subarea 4, Drainages 4A and 4B form backwater ponds just upstream of Arroyo Road culvert crossings. Also on Drainage 4B, a small pond is maintained on the Corbett property. Aerial photographic evidence from 1957 suggests that the local watershed drained by Drainage 5A formerly may have reached to Arroyo Road and into Subarea 4. More recent field and photographic evidence indicate that agricultural operations on the broad terrace lands of Subarea 5 have altered natural drainage patterns. These local alterations probably are responsible for the ponding mapped near the southwest corner of the Alameda County property which extends into Subarea 6 (see Exhibit 4.3-42).

Subarea 7 contains the only partially perennial drainage in the SLVSPA. The upper reach of the west fork of Drainage 7B is fed by a perennial spring located in the upper end of the watershed. A stock pond also exists on that drainage, located 1,500 feet upstream of the confluence with the east fork. At maximum capacity this pond stores approximately 1.8 acre-feet of hillslope runoff and groundwater discharge. A 36-inch diameter pipe spillway conveys pond overflow through the earthen embankment and into a broad flat channel bottom. Year-round embankment seepage sustains hydrophytic vegetation in this flat reach of the channel. Aside from this groundwater seepage, the channel downstream from the pond is intermittent and is dry during the summer months.

The lack of some form of energy dissipation at the pond's spillway outfall has resulted in significant local scour. Similar local bed scour and adjacent bank instability was observed at other culvert outlets in Subarea 7.

Perhaps the most significant ponding area in Subarea 7 is the broad plateau downslope from and north of the Zone 7 water treatment facility. This area is mantled by the Positas gravely loam.[17] The representative profile of this soil contains a very plastic and firm clay at depths of 11 to 29 inches. The clay layer impedes the infiltration of rainfall and accumulated runoff, fostering local ponding during the wet season. The location and extent of this ponding and the associated wetland indicator plant zone are delineated in Exhibit 4.3-5.

Erosion

Of the soils identified in the SLVSPA subareas, seven units have characteristics representing severe to very severe erosion hazards, attributable to the significant 20 to 75 percent slopes of upper hillsides where they are present (Exhibit 4.3-6).[18] Due to the upland locations of these soil types on very steep slopes, their runoff potential is estimated to be rapid to very rapid. The combined influence of steep slopes and erodible soils is evident in Subarea 7, particularly along the west fork of Drainage 7B above the stock pond. Elsewhere in Subarea 7, there is evidence of channel / gully incision in soils generally identified by the *Soil Survey* as having slight to moderate erosion potential. The east fork of Drainage 7C is an example of this potential. A discontinuous gullying process has been triggered on this drainage which is most severe just upstream of the west fork confluence. Grade knickpoints of five to eight feet characterize the channel which is incising into the Positas series terrace deposits. By contrast, the west

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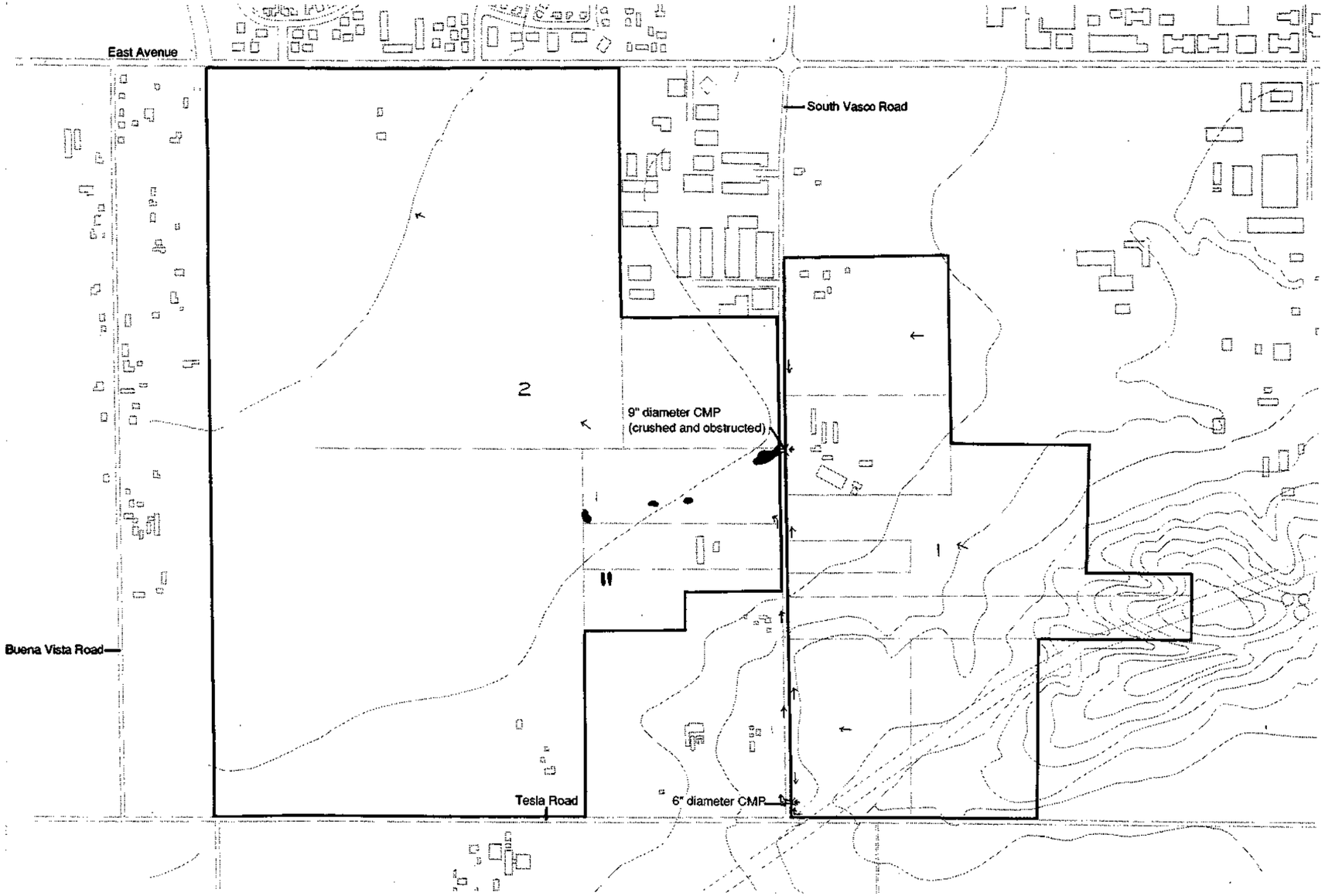
17 Soil unit type PtB2, *Soil Survey of Alameda Area*, U.S. Soil Conservation Service, 1966.

18 *Ibid.*

Exhibit 4.3-2
Subareas 1-2 Local Hydrology

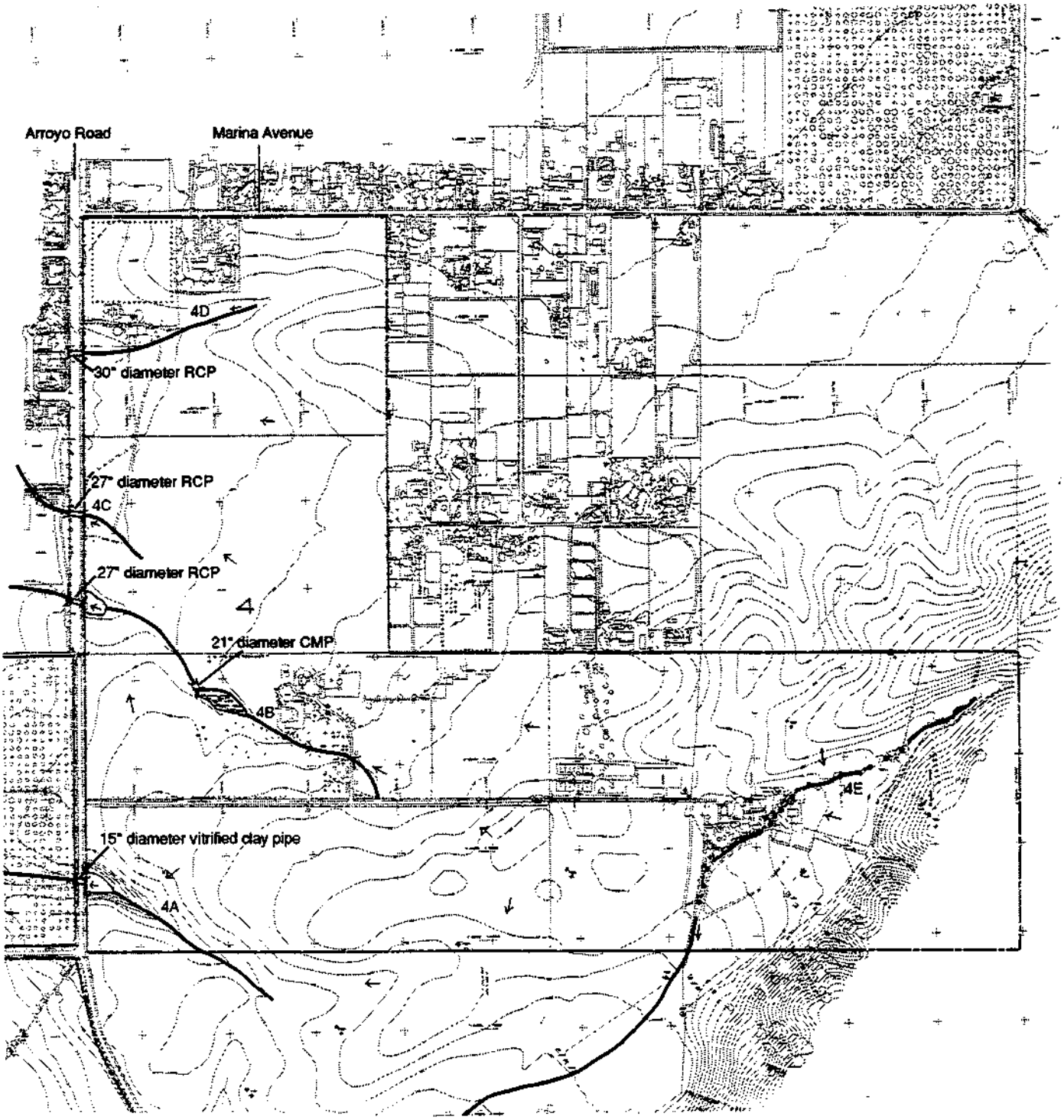


Legend:

- ↖ Flow/runoff Direction
- Potential Seasonal Wetland
- Culvert
- CMP Corrugated Metal Pipe

Source: Clearwater Hydrology

Exhibit 4.3-3
Subarea 4 Local Hydrology

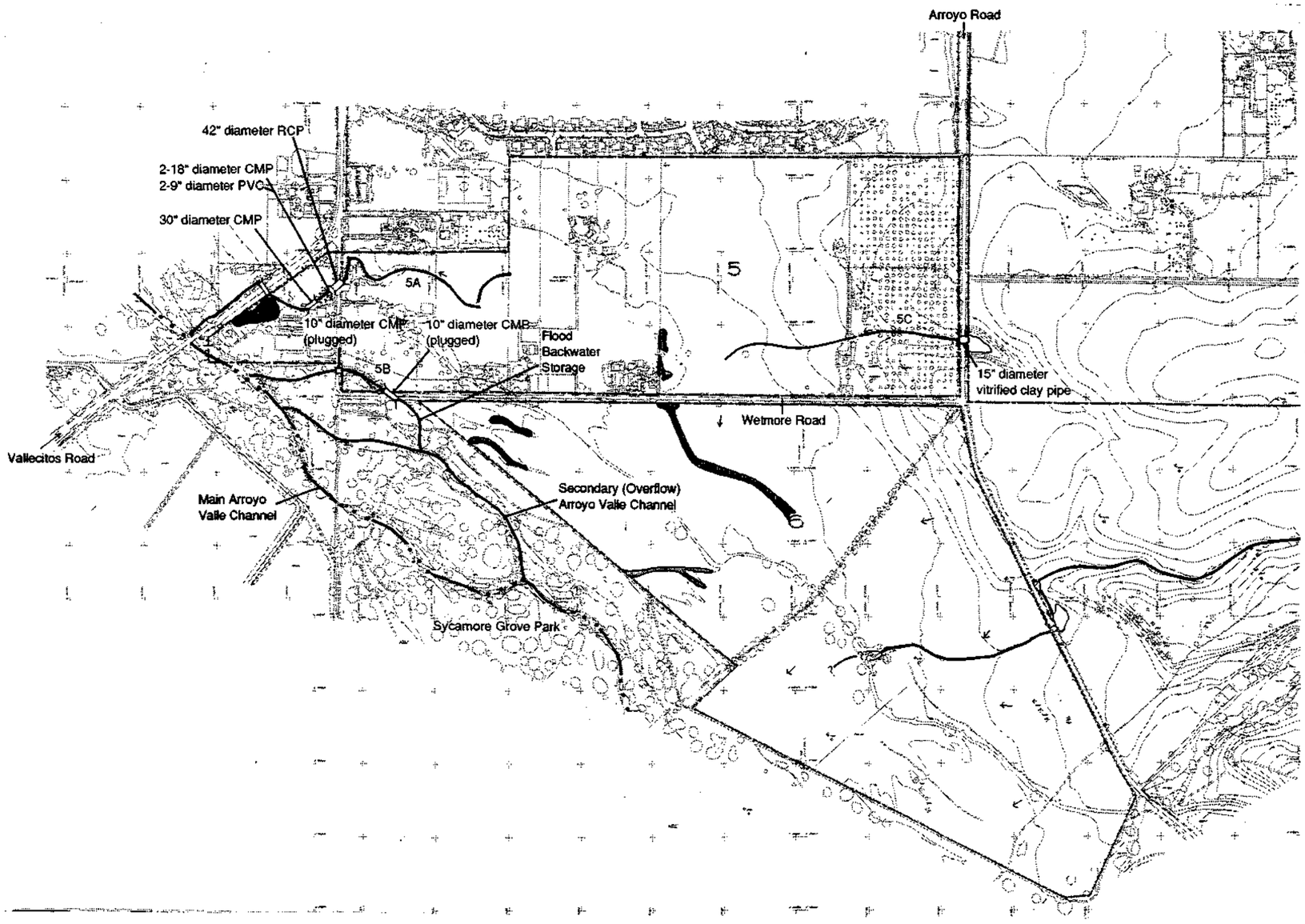


Legend:

USGS Blue-line Stream
Intermittent Drainage
Flow/runoff Direction
Seasonal or Perrenial Pond
Culvert
RCP Reinforced Concrete Pipe
CMP Corrugated Metal Pipe

Source: Clearwater Hydrology

Exhibit 4.3-4
Subareas 5-6 Local Hydrology

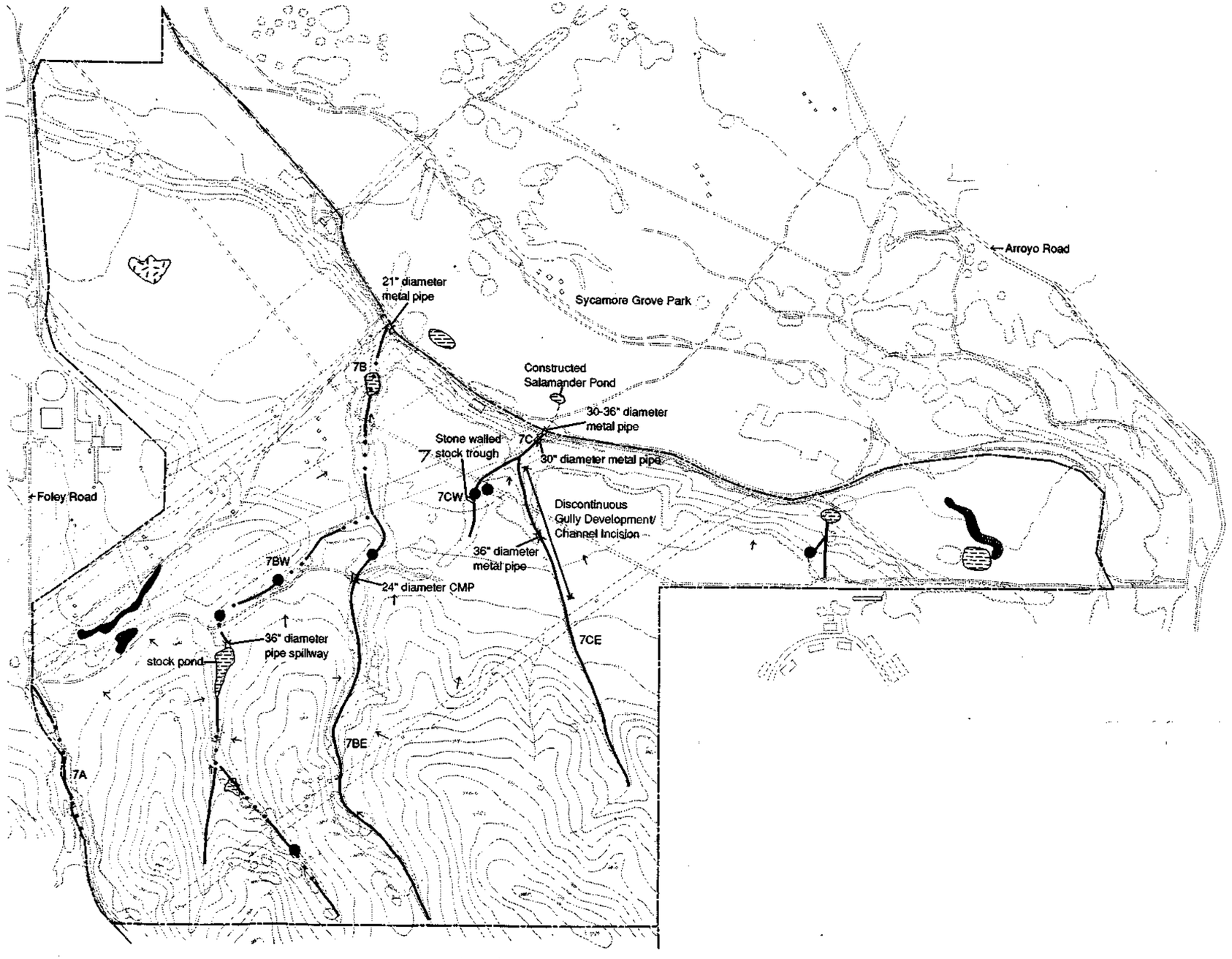


Legend:

- USGS Blue-line Stream
- Intermittent Drainage
- Flow/runoff Direction
- Potential Seasonal Wetland
- Culvert
- CMP Corrugated Metal Pipe
- RCP Reinforced Concrete Pipe
- PVC Poly-vinyl Chloride

Source: Clearwater Hydrology

Exhibit 4.3-5
Subarea 7 Local Hydrology



Legend:

- USGS Blue-line Stream
- Intermittent Drainage
- Flow/runoff Direction
- Potential Seasonal Wetland
- Potential Vernal Pool
- Freshwater Seep or Spring
- Culvert
- CMP Corrugated Metal Pipe.
- Seasonal or Perrenial Pond

Source: Clearwater Hydrology

Exhibit 4.3-6
Soil Characteristics

Soil Type	Sub Area	Runoff Potential	Erosion Hazard	Shrink / Swell Potential
Azule clay loan, 3-30 percent slopes	7	Slow-Medium	Slight-Moderate [a]	High
Clear Lake clay, drained, 3-7	7	Slow	Not a Problem	NC [b]
Danville silty clay loam, 0-30	7	Slow	Slight	Moderate
Diablo clay, 15-30	7	Medium	Moderate	High
Diablo clay, 30-45	7	Medium-Rapid	Severe	Moderate
Linne clay loam, 30-45	7	Medium-Rapid	Severe	Low
Linne clay loam, shallow, 45-75	7	Very Rapid	Very Severe	Low
Livermore gravely loam	7	NC	NC	Low
Livermore very gravely coarse sandy loam	2-3, 5-7	Slow-Very Slow	Slight [a]	Low
Millsholm silt loam, 30-45, eroded	7	Rapid	Severe	Moderate
Pleasanton gravely loam, 0-3	2, 5-6	Slow	Slight [a]	Low
Pleasanton gravely loam, 3-12	1-2, 6	Slow-Medium	Slight-Moderate	Moderate
Positas gravely loam, 2-20, eroded	1, 4-7	Slow-Medium	Slight-Moderate	Low
Positas gravely loam, 20-40, eroded	1, 4, 7	Rapid	Severe	High
Positas gravely loam, 40-60, eroded	4, 7	Rapid-Very Rapid	Very Severe	Moderate
Positas gravely loam, thick surface, 2-10, eroded	4-7	Slow-Medium	Slight-Moderate	Low
Rincon loam 0-3	1-2	Slow	Slight	Moderate
Riverwash	3, 5	NC	NC	Low
Shedd silt loam, 45-75, severely eroded	7	Very Rapid	Very Severe	Low
Zamora silt loam 0-4-	3,5	NC	NC	Moderate-High
Zamora silty clay loam 0-3	1-2	Slow	Slight [a]	Moderate

Source: *Soil Survey of Alameda Area*, Soil Conservation Service, U. S. Department of Agriculture, 1966.

a If cultivated / when cultivated
b NC Not Classified

fork of the drainage is stable and unaffected by channel incision. The threshold for gully development depends on a number of variables, including peak flow rates, sediment influx, watershed vegetation cover and land use.

Flooding

The ACFCWCD, Zone 7, provides flood protection in the City of Livermore and surrounding unincorporated area. FEMA and the ACFCWCD have estimated areas subject to flooding by Arroyo

Valle, Arroyo Mocho, and Arroyo Seco. [19] FEMA's Flood Insurance Rate Maps distinguish between the boundaries of the 100- and 500-year floods -- Zone A shows the area subject to flooding by a 100-year storm, and Zone B shows the extent of the 500-year flood. The ACFCWCD's Flood Hazard Map shows the boundaries of the 100-year flood in both incorporated and unincorporated areas and differs somewhat from the FEMA maps in some locations (Exhibit 4.3-7). In order to prevent inundation by floodwaters, habitable floors of development within designated flood hazards areas must be built above 100-year flood elevations.

As defined by FEMA, the 100-year flood boundary of Arroyo Valle encroaches into parts of Subarea 5 (about 500 feet inside the western boundary), Subarea 6 (about 250 inside the southern property line), and Subarea 7 (about 190 feet inside the northeastern corner of the subarea). The ACFCWCD shows no potential inundation of Subareas 5 and 6 from the 100-year event and encroachment of about 300 feet in Subarea 7. Flooding is controlled along the arroyo by the Del Valle Dam which regulates flows, particularly downstream in Niles Canyon where cumulative flows of Alameda Creek must be limited to 5,000 to 6,000 cubic feet per second (cfs) to prevent flooding. [20]

The 100- and 500-year flood boundaries coincide on the south bank of Arroyo Mocho in the vicinity of Subarea 3 (northeast corner) and do not encroach into the subarea. (The mapped floodplain of the 500-year event widens on the north side of the channel opposite Subarea 3 as it also does upstream of this subarea.)

The State Office of Emergency Services (OES) and DWR have identified areas of potential inundation in the event of dam failures throughout California and have estimated when flood waters would arrive at downstream locations after a failure in order to provide information for local jurisdictions to develop evacuation plans for areas below dams. Projected inundation limits are approximate and assume severe hypothetical failures, thus showing all potential flooded areas in the improbable occurrence of failure and resulting flooding. [21] Inundation maps for Del Valle Dam indicate that land up to the approximate 500-foot elevation on both sides of Arroyo Valle could be flooded should Del Valle Dam fail and that floodwaters could arrive at the State Route 84-Holmes Street intersection immediately west of SLVSPA Subarea 5 in five minutes (Exhibit 4.3-7). [22] Parts of Subareas 5, 6, and 7 with elevations below 500 feet could be flooded in that five-minute period, inundating large areas of Subareas 5 and 6 and smaller parts of Subarea 7.

There are no State siting restrictions for lands below dams except for schools, and local government has responsibility for land use downstream of dams. [23] The Emergency Services Act requires cities and

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19 *Flood Insurance Rate Map, Alameda County, California (Unincorporated Areas)*, Federal Emergency Management Agency, Panels 210 (revised 1986) and 220 (effective 1981) of 325, and *Flood Hazard Areas-100 Year Flows*, Alameda County Flood Control and Water Conservation District Zone 7, 1988.

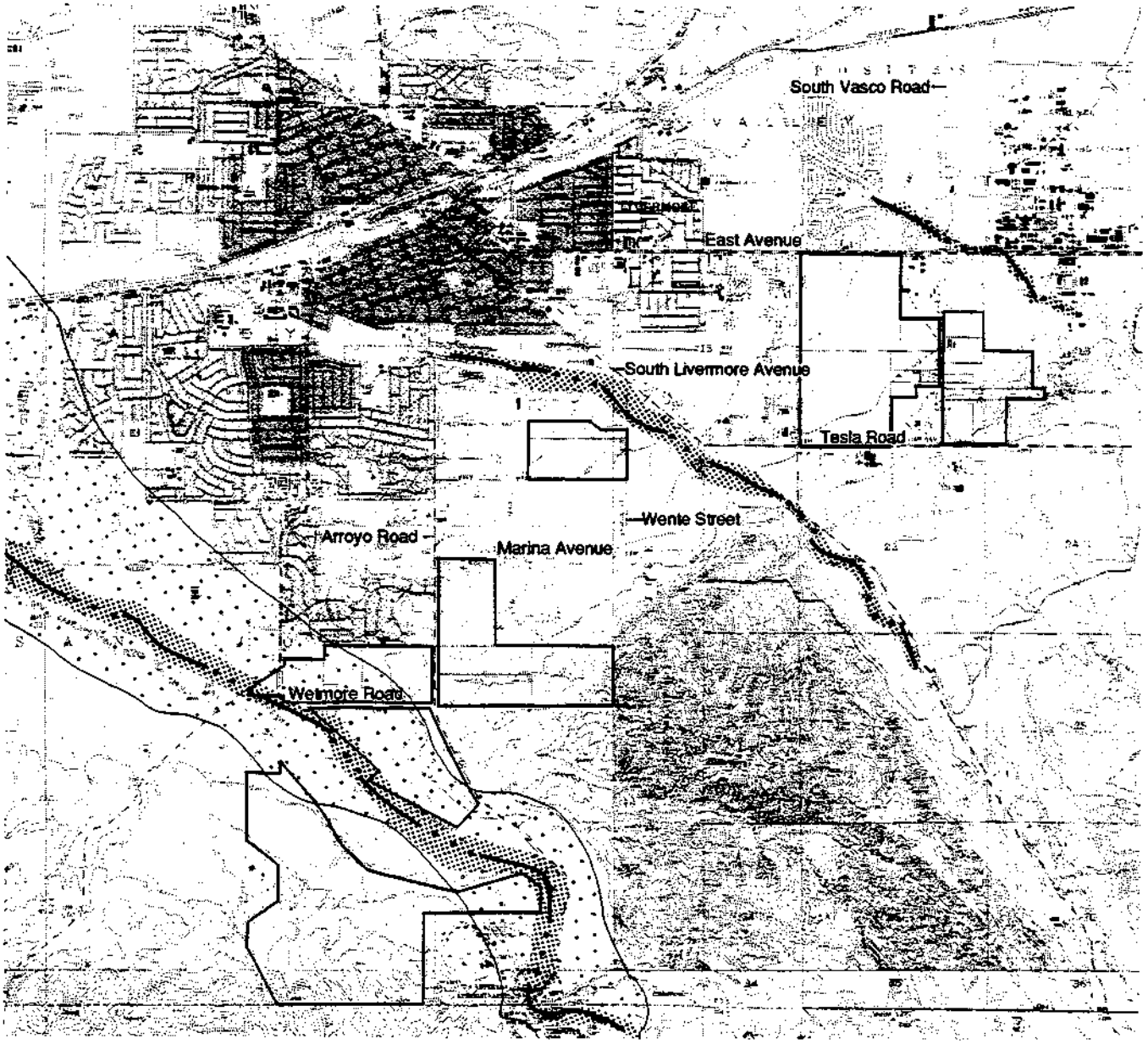
20 Nichols • Berman conversation with Martin Niemi, *op. cit.*

21 *Inundation Map for Del Valle Dam, Livermore California* (one of eight sheets), Department of Water Resources, 1979.

22 *Ibid.*

23 Nichols • Berman conversation with Jerry Kopp, Dam Safety Program, State Office of Emergency Services, May 16, 1995.

Exhibit 4.3-7
Flood Hazard Map



Legend:

Streams

100-year flood zone

Innundated area-De Valle Dam

Source: Department of Water Resources and the Federal Emergency Management Agency

counties to prepare emergency evacuation plans, but Livermore's current plan was last updated in July 1990 and did not anticipate development in any *Draft Plan* subarea.[24] The DWR has no formal positions or land use guidelines for dam inundation areas but informally recommends that critical facilities -- such as convalescent hospitals, residential care facilities for seniors, etc. (which would be difficult to evacuate on short notice) -- should not be built in inundation areas.[25] Owners of property located in dam inundation areas are not required to buy flood insurance due to the proximity of a dam, although insurance could be needed for other reasons (such as where the inundation areas of a dam and 100-year flood coincide). New development within a dam inundation area could alter the inundation pathway, potentially affecting areas not previously mapped by the OES and DWR. The State presently has no plans to periodically update the OES and DWR's dam inundation maps in the future to reflect changes resulting from development.[26]

Localized Flooding

The gently sloping terrain which characterizes much of the SLVSPA currently devoted to agriculture also favors localized ponding of accumulated stormwater runoff. This is especially true of Subareas 2 and 5. In Subarea 2, the bulk of Subarea 1 stormwater runoff is discharged onto the eastern edge of Subarea 2 via shallow sheet flooding across South Vasco Road. This primarily is due to the degraded condition of the nine-inch culvert which formerly conveyed this runoff under the roadway. Because the culvert is crushed and obstructed by sediment, nuisance roadway flooding occurs during prolonged or intense rainstorms.

In Subarea 5, stormwater runoff from the eastern part of the subarea and at least a portion of the runoff from Subarea 4 Drainages 4A and 4B drain west across the Alameda County parcel and then south toward Wetmore Road. When soils are in a wet antecedent condition and rainfall is prolonged or intense, some shallow roadway flooding appears to occur across Wetmore Road (see wetland / seasonal ponding areas in Exhibit 4.3-4). Similarly induced roadway flooding likely occurs farther west at the southeast corner of the Nelson parcel.

Intermittent ponding of stormwater runoff also occurs on Drainage 5B due to the nearly complete obstruction of Wetmore Road and Holmes Avenue culverts. This minor drainageway links a remnant arm of a secondary channel of Arroyo Valle. The secondary channel is an abandoned meander which carries arroyo overflow during severe flood events. When the secondary channel is functioning, local runoff and backwater ponds in Drainage 5B.[27]

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[24] *Ibid.* The Office of Emergency Services advises communities to update their plans (and their General Plan Safety Elements) regularly to account for changed circumstances. Plans prepared in the 1970s are no longer adequate.

[25] Nichols • Berman conversation with Ruth Dudley, Floodplain Management Division, Department of Water Resources, May 16, 1995.

[26] Nichols • Berman conversation with Jerry Kopp, *op. cit.*, May 1995 and October 1996. Senate Bill X1-8, mentioned in the Constraints Analysis, would have required a property seller to disclose to a potential buyer that land is located in a dam inundation area. The measure was not enacted, however, and failed in the Appropriations Committee.

[27] Clearwater Hydrology conversation with Mike Nickleson, Livermore Parks and Recreation District, 1996.

As mentioned above (in the preceding section on ***Local Hydrology***), the wide claypan plateau in Subarea 7 also is subject to stormwater ponding during the wet season. This is a function of the generally flat terrain and an underlying clayey substrate which impedes infiltration.

Groundwater

Groundwater in the Livermore Valley occurs in a multi-layered 12-subbasin system [29], with a combined storage capacity of more than 250,000 acre-feet and an annual yield of about 13,000 acre-feet [30], composed of an unconfined upper aquifer situated over a sequence of leaky or semi-confined aquifers. Horizontal movement between layers is restricted by faults and variations in thickness and permeability of aquifer materials, and vertical movement is restricted by separations between the upper and lower water-bearing units. Hydraulic continuity only occurs where the Livermore Formation is in direct contact with overlying stream deposits of Arroyo Valle and Arroyo Mocho. These principal streams and other smaller water courses drain the two subbasins -- the Amador and Mocho (Mocho I and Mocho II) Subbasins -- which underlie the SLVSPA.

The approximately 18,360-acre Amador Subbasin consists of about 10,790 acres on the valley floor and another ± 7,570 acres of upland area and is drained by Arroyo Valle, downstream reaches of Arroyo Mocho, Arroyo Seco, and smaller Livermore Valley streams. Groundwater occurs in unconfined conditions (near-surface zones principally near the Arroyo Valle channel and upper aquifer in the central part of the subbasin) and confined conditions (elsewhere in the subbasin).

The approximately 23,130-acre Mocho Subbasin is located east of the Amador Subbasin and consists of about 9,180 acres on the valley floor (± 2,935 acres in Mocho I and ± 6,245 acres in Mocho II) and about 13,950 acres of contiguous uplands. Arroyo Seco and Arroyo Mocho drain the subbasin, as do smaller streams. Groundwater ranges from unconfined in near-surface zones to confined in deeper zones.

Faults bound the subbasins and inhibit hydraulic continuity between subbasins. The Amador Subbasin is bounded by the middle zone of the feature formerly referred to as the Livermore "fault" (east) [31] which blocks inflow from the Mocho Subbasin and the Pleasanton Fault (west) where some flow occurs west into the adjacent Bernal Subbasin. The northern boundary of the Amador Subbasin consists of a permeability barrier, and the southern boundary coincides with the overall Livermore Basin, neither of which allows groundwater flow into the subbasin.

The Mocho Subbasin is bounded by the Tesla fault (east), Livermore "fault" feature (west), the Tassajara Subbasin (north), and the contact of the Livermore Formation (south). The Tesla fault does not block inflow within 50 feet of the surface but does block inflow deeper than 50 feet from the surface

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29 *Evaluation of Ground Water Resources in Livermore-Sunol Valleys, op. cit.*

30 *Groundwater Monitoring Program Annual Report 1994 Water Year*, Alameda County Flood Control and Water Conservation District Zone 7, April 1995. Of that yield, the California Department of Water Resources (DWR) estimates that 5,500 acre-feet of groundwater are extracted annually. *California Water Plan Update, op. cit.*

31 The DWR's *Evaluation of Groundwater Resources in the Livermore-Sunol Valleys* predates the EIR geologist's review of the Livermore "fault" (1974 and 1995, respectively), and DWR has not updated the earlier report. *Preliminary Evaluation of the Available Data Regarding the Locations and State-of-Activity of the Las Positas and Livermore Faults*, Rogers / Pacific, August 1995.

while the Livermore "fault" feature is described as restricting subsurface flow from the Mocho to Amador Subbasins. No surface water flows in from the north because of lack of hydraulic continuity between the Mocho-Tassajara Subbasins and in from the south because of the Livermore Formation contact with non-water-bearing marine rocks.

Groundwater recharge occurs throughout the Livermore Basin with downward movement of surface water through surface deposits (infiltration). Surface water sources include runoff from rainfall (natural recharge) and releases of water stored in dams (such as the Del Valle dam and reservoir) or imported to the valley (via the South Bay Aqueduct)(artificial recharge). Artificial recharge programs of Zone 7 and elsewhere in the South Bay hydrologic subregion have resulted in a general rise in near-historic high groundwater levels. [32] The DWR has classified the infiltration characteristics of local soils in five groups ranging from very permeable gravel (more than ten inches per hour) to very impermeable plastic clay (less than 0.05 inch per hour):

Exhibit 4.3-8
Infiltration Characteristics

Infiltration Characteristics	Permeability Rate *inches / hour*	General Soil Texture
Very Rapid	5.0 to >10.0	Coarse sandy gravel to sandy loam
Rapid	2.5 to 5.0	Sandy loam to fine sandy loam
Moderate	0.8 to 2.5	Fine sandy loam to clay loam
Slow	0.2 to 0.8	Clay loam to clay
Very Slow	<0.05-0.2	Heavy clay soil or claypan subsoil

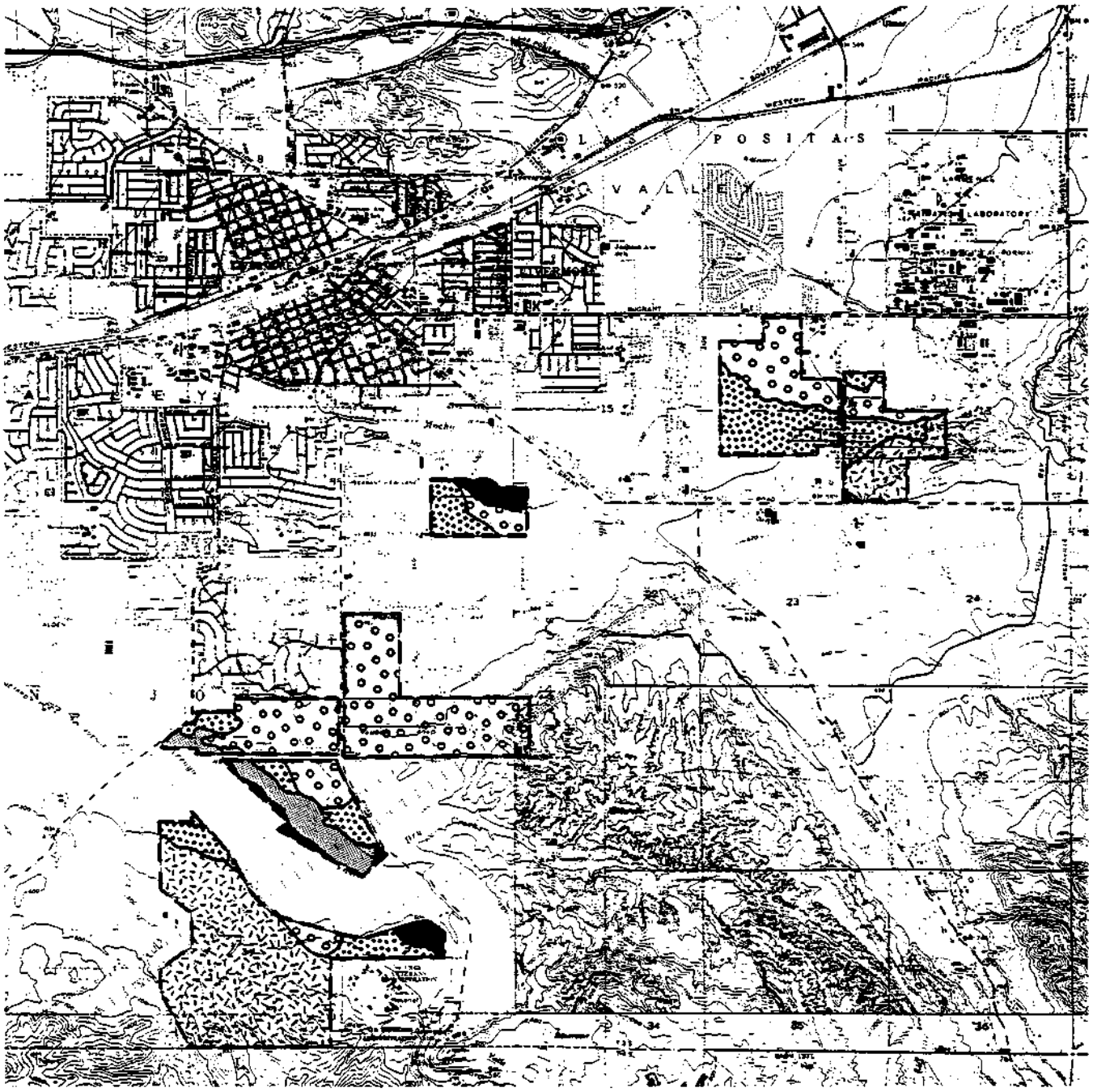
Source: *Evaluation of Ground Water Resources in Livermore-Sunol Valleys*, California Department of Water Resources, DWR Bulletin 118-2, 1974.

Stream courses tend to be the most permeable because bed agitation during periods of heavy flow removes fine sediments from between coarser grains, leaving sand and gravel behind. Thus, the infiltration characteristics of Arroyo Valle and Arroyo Mocho are classified as very rapid and adjacent soils are classified as rapid. According to the *City of Livermore Community General Plan*, Cenozoic deposits, also known as riverwash, which consist mainly of loose well-sorted sand, gravel, and boulders have a Unified Soil Classification of "GP" and a permeability of 75 gallons per day per square foot. The *Community General Plan* states that such recharge areas are of State, regional, and local significance, that effective control is extremely important, and that regulation of recharge areas should focus on preventing:

- Construction of impervious surfaces over the recharge area
- Pollution of the recharge area by development
- Pollution or clogging of the recharge area during sand and gravel extraction operations

[32] *California Water Plan Update, op. cit.* The South Bay Aqueduct is an approximately 40-mile water supply delivery facility which conveys State Water Project (SWP) flows from the South Bay Pumping Plant on Bethany Reservoir (northeast) to the Santa Clara Terminal (southwest) via Subareas 4 and 7. It provides water to Zone 7 and other agencies. *Ibid.*

Exhibit 4.3-9
Groundwater Recharge Areas



Legend:

- Very Rapid
- Rapid
- Moderate
- Slow
- Very Slow

Source: Department of Water Resources

Parts of Subareas 3, 5, 6, and 7 nearest to these arroyos represent optimum recharge areas with the fastest infiltration rates while infiltration occurs more slowly in parts of subareas farther distant from those principal recharge zones (Exhibit 4.3-9). This is especially the case in hilly areas where runoff potential of soils is rapid to very rapid and permeability is correspondingly slow to very slow.

The significance of groundwater and groundwater recharge in the Livermore Valley relates to water supply and quality. Groundwater is used for agricultural irrigation. Wells also supply domestic use in the unincorporated area where urban water facilities have not been extended whereas water is imported via the South Bay Aqueduct to meet urban water demands. Construction of buildings and coverage of recharge zones with paved roads, driveways, and other impervious surfaces can interfere with natural infiltration and affect groundwater availability.

Local manifestations of shallow groundwater in the SLVSPA are present primarily in Subarea 7. All of the springs and freshwater seep zones in this subarea are described above (***Local Hydrology***) and shown in Exhibit 4.3-5. While some of the occurrences are caused by local soil and bedrock conditions, other wet sites also may have been affected by installation of the South Bay Aqueduct. The extent to which this mechanism has worked to actually create wetland conditions where none had existed previously cannot be determined without extensive field investigation.

Water Quality

No surface water quality data are available for the principal streams which drain the SLVSPA. This lack of data is typical of urban communities throughout the U.S. Data on stormwater quality has been limited to point source analyses conducted for mixed industrial effluents or to programmatic non-point source analyses by the U.S. Environmental Protection Agency (USEPA). In the case of the USEPA's data collection efforts, representative urban areas have been targeted only for brief periods of time. Due to the low density of existing development in the subareas, typical stormwater contaminant concentrations probably are much lower than those measured in areas dominated by urban land uses. Moreover, given the intensive groundwater pumping for irrigated agriculture and the losing condition (the streambed seepage to the groundwater system rather than groundwater discharge to the streams) of streams in the area, the bulk of agricultural contaminants entering the groundwater system reach the surface water system much farther downstream.

A general DWR assessment of groundwater resources in the Livermore and Sunol Valleys found that the overall quality of South Livermore Valley groundwater corresponded to the quality of surface water entering the major recharge zones in and along Arroyo Mocho and Arroyo Valle and was deemed excellent. [33] Groundwater quality in the northeast part of the SLVSPA was determined to be good, although some contaminant sources on the Lawrence Livermore National Laboratory (LLNL) site could influence quality downgradient of the facility. [34]

Discussions with California Regional Water Quality Control Board (RWQCB) personnel confirmed

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[33] *Evaluation of Ground Water Resources in Livermore-Sunol Valleys, op. cit.* This report has not been updated, but the data remain relevant, including information on water quality because water quality in the area is influenced primarily by geology (such as the constituent minerals of local rock types).

[34] LLNL has not investigated conditions upgradient from that site, thus not southwest toward the SLVSPA. Clearwater Hydrology conversation with Hank Kahn, Lawrence Livermore National Laboratory, October 1996.

that no significant hazardous waste sites or water quality problems occur in the SLVSPA. [35] Identified groundwater contaminant sites occur at the LLNL and at some commercial sites in the downtown Livermore area.

The rural nature of present SLVSPA land uses reduces the likelihood of significant stormwater contaminant concentrations in area runoff. Locally elevated concentrations of nitrates and ammonia, as well as deworming agents, could be present in runoff from commercial horse stabling facilities in Subareas 1, 4, and 5. Even at isolated sites where oils, greases, and solvents could be spilled, the limited number of partly unimproved roads and the gentle topography within the SLVSPA present maximum opportunities for local adsorption to surface soils and / or volatilization of hydrocarbons. Urban stormwater contaminant loading to area streams for the existing and proposed SLVSPA land uses are estimated in the impacts analysis (below).

4.3 HYDROLOGY, DRAINAGE, AND WATER QUALITY -- IMPACTS AND MITIGATION MEASURES

The land uses envisaged for the SLVSPA by the *South Livermore Valley Specific Plan (Draft Plan)* would involve the conversion of varying proportions of existing grassland to residential, commercial, and agricultural (vineyards) uses. The most intense urbanization would occur in Subareas 2, 3, and 5. Lower density development would occur in Subareas 1, 4, 6 and 7, with vineyard cultivation (and one commercial site) the dominant land use in Subarea 6. Residential and commercial development would increase impervious surface area in the watershed and require construction of storm drain systems. These combined effects would reduce the volume of rainfall infiltration and increase runoff volumes and peak stormwater flow rates.

In some instances, conversion of grassland to vineyard cultivation may cause minor increases in peak flow rates, although the most significant potential impact would be an increased erosion hazard during high intensity rainstorms. Given the importance of SLVSPA stream channels in Zone 7's groundwater recharge program, any increase in the delivery of fine-grained watershed sediments to such streamcourses could be detrimental.

Peak Flow and Water Quality Assessments

Two independent assessments of development envisaged by the *Draft Plan* were performed for this EIR for use in the impact analysis presented below.

One assessment estimated peak flow rates for the ten- and 100-year design rainstorms under pre-(existing) and post-development land use conditions using a version of the Rational Method published by the U.S. Geological Survey. [36] Watershed areas, topographic characteristics, and land use types / areas were derived from scaled measurements of topographic maps prepared for the *Draft Plan*. Exhibit 4.3-10 lists the peak discharges computed for the design rainstorms for all SLVSPA subareas.

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[35] Clearwater Hydrology conversations with Kevin Graves and Sam Arigala, California Regional Water Quality Control Board (RWQCB), 1996.

[36] *Mean Annual Precipitation Depth-Duration Frequency Data for the San Francisco Bay Region, California*, S. E. Rantz, U.S. Geological Survey Open-File Report, 1971.

Maximum post-development increases in peak flow rates for the seven subareas would range from 460 percent to approximately 350 percent for the ten- and 100-year rainstorms. The higher rates of increase for the lower recurrence interval rainstorm are typical of developing areas where the differences in pre- and post-development runoff factors decrease as recurrence interval increases. (As watershed soil moisture deficit is satisfied, as it is with severe runoff events, the differences in infiltration rates over natural and paved surfaces is greatly reduced.) For both of the design storms investigated, Subarea 2

Exhibit 4.3-10
Peak Flow Rates for Design Ten- and 100-Year Rainstorms
Existing and Post-Development Conditions in the SLVSPA

Subarea	Drainage Area[a]	Ten- and 100-Year Peak Discharge[b]			
		Existing		Post-Project	
		10-Year	*100-Year*	*10-Year*	*100-Year*
1	170	29.0	91.3	94.0	207.0
2	401	49.0	151.9	224.1	526.3
3	97	11.8	35.5	31.7	95.2
4	301	35.1	110.0	64.4	155.0
5	155	20.9	64.5	75.0	190.0
6	185	23.0	70.4	41.9	114.0
7	578	107.0	317.0	145.0	332.0
Totals	1,887	275.8	840.6	676.1	1,619.5

a acres
b Cubic feet per second (cfs)

registered the greatest relative increases in peak flow rates.

As noted in the description of existing conditions (*Setting*, above), Zone 7 sets standards for storm drain and flood control channel improvements within its maintenance jurisdiction. Such standards must be met if developers implement improvements in Zone 7 Special Drainage Areas (SDAs) and expect to be reimbursed for the work. In addition to Zone 7 standards, the design and construction of subdivision improvements must conform to the City of Livermore *Storm Drainage Master Plan*[37] and the associated *Drainage Facilities Planning Guidelines.*[38]

The EIR's second comparative assessment was made to clarify the significance of development impacts on the quality of area stormwater discharge. The assessment applied contaminant loading rates cited in the USEPA's National Urban Runoff Program (NURP) studies, adjusted to reflect SLVSPA departures from the baseline mean annual precipitation used in normalizing EPA study sites. Surface water loading rates were computed for five urban stormwater constituents typically associated with urbanization assuming both existing and post-development land uses.

For purposes of the areawide assessment, all subareas were combined into a single unit with

37 *Storm Drainage Master Plan for the City of Livermore, California*, Camp Dresser & McKee, 1995.

38 *Drainage Facilities Planning Guidelines for the City of Livermore, California*, Camp Dresser & McKee, 1995.

proportioned development characteristics (such as residential versus commercial areas). Therefore, the resulting loading rates for the assessed constituents represent bulk trends rather than estimates of loading rates to specific drainages. It is clear from the land use summary presented in Exhibit 2.2-6 that localized subarea loading rates would be higher in subareas where the percentages of residential and commercial areas would be greatest. Commercial use loading rates typically are two to three times residential rates.

Exhibit 4.3-11 lists the loading rates computed for the SLVSPA under existing and post-development land uses. The exhibit also shows threshold values for the assessed water quality indicators, known as maximum contaminant levels (MCLs).[39] In both cases, contaminant concentrations are calculated to be significantly less than the threshold MCLs for urban stormwater. Because of the relatively large area designated for open space and vineyard cultivation, the cumulative water quality impact of SLVSPA buildout also would be minor (see ***Impact 4.3-4***).

Exhibit 4.3-11
Annual Contaminant Loading to SLVSPA Drainages from Subareas [a]

Contaminant	Loading Rate		Criteria	
	Existing Conditions [b]	*Post-Project Conditions* [b]	*mg / l* [c]	*mg / l* [d]
NO 3-N	663	3,725	2.2	96.0
Total Cu	222	1,426	0.9	12.0
Total Pb	135	755	0.4	3.2
Total Zn	157	886	0.5	4.7
Oil and Grease	0.3 mg /l		1.74	5.3

a Assumptions:
1) Representative rainfall year = 1984-1985 (14.59 inches)
2) Number of storms in 1984-1985 = 20
3) Average storm rainfall depth = 0.70 inches
4) Loading rates for residential and commercial land uses based on Table 6-25 "Annual Urban Runoff Loads", *Results of the Nationwide Urban Runoff Program*, U.S. EPA, December 1983.

b Pounds per acre per year (lb / ac / yr)

c Milligrams per liter (mg / l) = parts per million (ppm)

d Toxicity thresholds for selected contaminants from *Quality Criteria for Water*, U.S. EPA, May 1986, and *Oil and Grease in Urban Stormwaters*, Michael Stenstrom *et al*, ASCE Journal of Environmental Engineering, February 1984.

The water quality assessment quantitatively analyzed no agriculturally-based water quality contaminants (such as fertilizers, herbicides, or pesticides). Agricultural technologies currently used in irrigated vineyard cultivation include drip irrigation regulates water and fertilizer applications to crops. This form of land treatment maximizes the efficiency of water application and reduces the impact of fertilizer-based contaminants on the groundwater system. In addition, the precision of the irrigation process enables viticulturalists to apply the necessary systemic inhibitors to control mildew. The powdered sulfur compound used to control grape mildew is typical of herbicides and pesticides used in the industry. Most of the commonly used chemical agents have been designed to adsorb to the surface of the fruit and are not water soluble. Thus, the likelihood that potential contaminants would enter the

39 *Quality Criteria for Water*, U.S. Environmental Protection Agency, May 1986.

groundwater is minimized. [40]

Methyl bromide, a toxic soil fumigant used to control phylloxera infestations, is an exception. Where it is applied, it can have highly detrimental effects on groundwater quality. However, it only is used in situations of severe infestation, and newly planted crops would not be subject to such infestations. [41]

One potential source of surface water contamination associated with vineyard cultivation is the use of smudge pots to deter frost development. [42] There have been instances (such as during severe storm events) when smudge pots have fallen to the ground and emptied their oil onto the ground surface. Surface runoff then conveyed the oils to local ponding areas and eventually to streams. Local vintners currently are neglecting frost protection practices altogether. Where any measures are taken, the preferred techniques include spraying of water on plants and / or use of wind machines. Wind machines circulate the air, thus inducing a slight elevation in local air temperature. [43]

Significance Criteria

Hydrologic conditions of significance include those which would:

- Substantially alter site drainage patterns
- Increase the potential for substantial flood damage
- Substantially affect groundwater recharge
- Result in a substantial degradation of surface or groundwater quality
- Cause a detrimental increase in site erosion and / or downstream sedimentation
- Place a significant number of people in a downstream dam inundation zone at risk, due to an insufficient opportunity to evacuate (such as an emergency flood warning of less than 30 minutes)

Impacts and Mitigation Measures

Impact 4.3-1 Subarea Drainage Patterns

SLVSPA buildout would have significant on-site impacts in sub-watershed 2. Upstream development in Subarea 4 could divert runoff away from the Corbett pond, and Subarea 4 commercial development could obstruct drainage under Arroyo Road. S

The *Draft Plan* envisages residential development upstream of the Corbett property in Subarea 4. Grading, road construction, and storm drain installation could alter hillslope runoff patterns in Drainage 4B. Normal storm drain design would align this system along subarea roads with outlets at Arroyo Road. Directing stormwater runoff to the roadway outlet, including natural watershed runoff originating farther upstream from the development area, would divert flows from the private ornamental pond or basin on the Corbett property. This diversion would affect potential uses of this water supply if

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[40] Clearwater Hydrology conversation with James Gianopolis, Central Valley Regional Water Quality Control Board, 1996.

[41] Clearwater Hydrology conversation with Brad Job, San Francisco Bay Regional Water Quality Control Board, 1996.

[42] *Ibid.*

[43] Clearwater Hydrology conversation with Mike Gatzman, Wente Brothers Winery, October 1996.

other than ornamental. The owner plans to expand the pond and use it to store water for irrigation of vineyards and an olive tree orchard. [44]

If stormwater flows from the upper reaches of Subarea 4 were diverted along Hansen Road and routed west to Arroyo Road, flows likely would be discharged into the Arroyo Road culvert on Drainage 4A. Such a diversion would constitute an interbasin transfer from Drainage 4A to 4B. With the increased flows conveyed by Drainage 4A, the roadway culvert on 4A could be under-sized and / or the broad downstream swale which accepts the culvert discharge could begin to incise. Shallow flooding across Wetmore Road also could occur as a secondary effect of the diversion.

Finally, the existing culvert which conveys Drainage 4B runoff under Arroyo Road has a stilling basin inlet at one of the potential commercial sites illustrated by the *Draft Plan* (the site east of Ravenswood Park). Development of the site would need to accommodate the existing drainage outlet, so that local drainage could continue unimpeded. (Also, see ***Impact*** and ***Mitigation Measure 4.3-4*** for related water quality concerns.)

Policies 8-19 through 8-22 of the *Draft Plan*, cited below, would mitigate the potential impacts of development within the SLVSPA on-site drainage patterns.

- ***Policy 8-19*** A detailed drainage design plan will be prepared for each development area and submitted as part of each tentative subdivision map application. The drainage plan must document pre- and post- development flows in the critical channel reaches within the project watershed and the available flow capacity in any off-site drainage systems proposed for discharge from planning area development.

- ***Policy 8-20*** Peak period discharge rates shall not increase off-site flood hazards or exceed the design capacity of any off-site drainage facility. Before designing and building any drainage improvements, sponsors of individual projects should consult the City of Livermore's Master Drainage Plan and the supplemental Drainage Facilities Planning Guidelines. All improvements should adhere to those City requirements and guidelines. In addition, hydraulic structures (such as storm drains and culverts) should be over-sized to accommodate sediment and debris conveyed in stormwater runoff.

- ***Policy 8-21*** Consistent with the rural image of the planning area, encourage the use of permeable surface drainage and runoff detention systems both inside and outside the development areas. The use of grass-lined swales and detention basins is encouraged wherever feasible as a means of: 1) minimizing the increase in the rate and volume of stormwater runoff associated with new urban development, 2) maximizing the potential for groundwater recharge, and 3) filtering the urban pollutants that get carried into the major drainage channels.

- ***Policy 8-22*** Require proposed development to provide drainage facilities which minimize impact upon existing streams and arroyos.

Mitigation Measure 4.3-1 In addition to the *Draft Plan* policies listed above, implementation of the following mitigation measure would mitigate impacts from SLVSPA development on stormwater drainage patterns:

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[44] Clearwater Hydrology conversation with Rick Corbett, landowner, October 1996.

- Coordinate installation of the Drainage 4B storm drain system upstream of Hansen Road with the physical expansion of the existing Corbett pond. No storm drain installation should occur until improvements to the Corbett pond are complete. Such improvements should include replacement of the Hansen Road culvert, enlargement and stabilization of the pond entrance channel, pond excavation, and upgrading (if necessary) of the pond's pipe spillway.

No additional measures would be required elsewhere in Subarea 4 or in the other SLVSPA subareas to mitigate the potential impacts to area drainage patterns which would accrue from adoption and implementation of the *Draft Plan*.

Significance after Mitigation Implementation of the appropriate *Draft Plan* policies on stormwater drainage along with Mitigation Measure 4.3-1 would reduce on-site drainage pattern impacts to less-than-significant levels.

Responsibility for Mitigation Monitoring The City of Livermore would be responsible for review and site inspection of all storm drain and related engineering drainage improvements in the subareas to ensure compliance with the relevant policies cited in the *Draft Plan*. Subarea developers would be responsible for maintenance of all improvements during the City's designated warranty period for subdivision improvements. Thereafter, the City would be responsible for maintenance of such improvements.

Impact 4.3-2 Site Peak Flow Rates and Localized Flooding

Grading, construction of impervious surfaces, and installation of a storm drain system would substantially increase peak flow rates from SLVSPA subareas. Such increases could exceed the capacities of downstream culverts and induce shallow localized flooding of properties and roadways. LTS

SLVSPA development would increase peak flow rates at local subarea drainage outlets by 1.4 to 4.5 times existing rates during a ten-year design rainstorm. For the 100-year design rainstorm, the differential increases would range from inconsequential (Subarea 7) to 3.5 times existing peak flow rates. Particular drainages within subareas could experience even more substantial rates of increase. Such increases in subarea peak flows could overwhelm existing downstream culvert capacities and produce localized flooding. Zone 7 does not require on-site detention storage to mitigate increases in peak flow rates. (Related downstream erosion and sedimentation impacts resulting from increased peak flows are addressed separately in ***Impact 4.3-3***, below.)

An undetermined number of culverts in and downstream of the subareas would require replacement before development could proceed. Culverts which appeared under-sized or in poor condition during the September 1996 field inspection conducted for this EIR included:

- The crushed nine-inch diameter corrugated metal pipe (CMP) under South Vasco Road, connecting Subareas 1 and 2
- The totally obstructed ten-inch diameter CMP on Drainage 5B crossing under Wetmore Road

The latter culvert connects parts of the Arroyo Valle secondary overflow channel south of Subarea 5, adjacent to the existing Sycamore Grove Park parking lot. Since it stores local runoff and backwater from the overflow channel, it may not be critical to the local drainage network.

Policies 8-19 through 8-22 of the *Draft Plan*, cited above under ***Impact 4.3-1***, would serve to mitigate

the potential peak flow impacts of proposed development within the SLVSPA to a less-than-significant level.

Mitigation Measure 4.3-2 Implementation of the *Draft Plan* policies listed above would mitigate potentially adverse project impacts on site peak flows and localized downstream flooding to a less-than-significant level. No additional measures would be required to mitigate impacts on peak flow rates and localized flooding which would result from the adoption and implementing the *Draft Plan.*

Significance After Mitigation Implementation of the above *Draft Plan* policies as part of all SLVSPA development projects would ensure that impacts to peak flow rates and flooding would be reduced to a less-than-significant level from the standpoint of downstream floodwater conveyance alone. However, Mitigation Measure 4.3-2 would not decrease downstream erosion and sedimentation impacts related to increased peak flows to a level of insignificance (see ***Impact 4.3-3.***)

Responsibility for Mitigation Monitoring Hydraulic design and construction of subarea storm drain system components and replacement of existing culverts would be subject to review and approval by the City of Livermore's City Engineer for compliance with pertinent *Draft Plan* policies. City Engineering staff would also inspect structure construction / installation. Maintenance of the storm drains and culverts would be the responsibility of each of the project developers within the subareas during the warranty period for subdivision improvements. Thereafter, the City would be responsible for maintaining storm drains within their subdivisions.

Impact 4.3-3 ***Erosion and Downstream Sedimentation***
Hillslope grading for SLVSPA development and conversion of large areas of existing grassland to vineyard cultivation would expose large areas to erosion by rainfall and hillslope runoff and would remove natural vegetation filters which would result in significant adverse erosion and sedimentation impacts within and downstream of all subareas. LTS

Hillslope grading activities associated with the construction of residential and commercial structures, roadways, and driveways could result in large areas of bare soils subject to erosion by rainfall and hillslope runoff. In addition, conversion of large areas of existing grassland to vineyard or orchard cultivation also could result in significant increases in subarea erosion and sediment yields due to the removal of natural vegetative filters. Short-term erosion generated by grading for residential and commercial facilities and longer-term increases in SLVSPA sediment yields due to agricultural conversion could result in sedimentation and blockage at downstream culvert sites. These short- and longer-term erosion and increased sediment yields could produce minor yet possibly significant reductions in groundwater recharge in channel reaches downstream of the subareas.

Construction grading of development sites exposes the ground surface to increased erosive forces resulting from raindrop impact and overland runoff. Raindrop impact on exposed soils seals the soil surface, reduces infiltration capacity, and enhances production of surface runoff. Soil particles entrained in runoff move downslope toward local drainage outlets, roadway culverts, and intermittent drainage channels. Uncontrolled surface runoff from such areas can result in serious soil loss and in rill and gully erosion.

The cumulative effect of this increased sediment yield can partly or fully block downstream culverts which, in turn, can contribute to an increased frequency of local flooding at roadway crossings and along other culverted reaches of drainagecourses. Furthermore, increases in the delivery of fine-grained sediments to area channels could impede efficient groundwater recharge operations of Zone 7. Existing

high rates of groundwater recharge are linked to the coarse nature of stream sediments. The principal flood control channels are overly wide and are inefficient conveyers of sediment over all but the higher range of floodflows. Thus, the introduction of finer sediments from upland runoff could reduce recharge rates.

Implementation of an agricultural sediment management plan can effectively reduce the potential erosion and sedimentation impacts which attend the conversion of grassland to intensively cultivated agricultural use. Such a plan can include any of a number of site cropping management and erosion control measures developed for a wide range of crop environments by the Natural Resource Conservation Service (NRCS) and affiliated research centers throughout the country. The NRCS in Livermore is a valuable source of information for local farmers and viticulturalists. The NRCS offers free technical guidance on cultivation practices and erosion control measures to reduce soil loss, erosion, and downstream sedimentation.

Erosion and sedimentation control on newly constructed residential and commercial properties typically is ensured through the preparation and implementation of comprehensive Stormwater Pollution Prevention Plans (SWPPPs). Project sponsors typically prepare SWPPPs before submitting Notices of Intent to the State Water Resources Control Board to conduct site grading operations. General Construction Activity Stormwater Permits would be required from the Regional Water Quality Control Board for any development which would disturb more than five acres of land. RWQCB approval of a General Construction Activity Stormwater Permits would depend on the acceptability of measures proposed to minimize potentially significant water quality impacts outlined in the Notice of Intent.

SWPPPs normally include *in-situ* protection (protection in the natural or original condition), seeding and mulching of bare ground, planting of trees and shrubbery in both disturbed upland and riparian areas, and installation of other forms of biotechnical slope stabilization (such as appropriately staked straw bale perimeters, silt fences, or staked plant wattles on the slope contour).

Subarea 7 exhibits evidence of a high erosion and gully development potential. Downstream of development, peak flows conveyed by the subarea's intermittent channels would increase. This would be particularly true for more frequent rainstorms. If unmitigated, storm drain systems would route flashier flows directly into drainageways, and a clear water scour condition would occur for some distance downstream of the storm drain outlets. Such a condition would greatly enhance erosion potential within streambeds and banks. If unimpeded, any channel incision produced in this manner then could extend upstream and destabilize channel reaches otherwise unaffected by development-related increases in runoff volumes and peak flows.

Site runoff controls (such as detention basins) should be designed and built to mitigate the increase in peak flows attributable to development. Implementation of peak flow controls would negate the need for significant stabilization of most subarea channels. One exception would be the east fork of Drainage 7E where the gullying process is advanced and threatens to expand its influence farther upstream. Some level of channel / gully stabilization work should be implemented on this drainage.

Channel or gully stabilization should not employ conventional construction techniques (such as use of loose rock check dams within drainageways). This form of mitigation is strongly discouraged because it traps sediment naturally conveyed from the upstream watershed and reproduces a clear water scour condition downstream of the structure. If such structures fail during a severe storm, downstream erosion can be extreme. Instead, less intrusive forms of stabilization should be designed. Strategically-placed bed armoring and drop structures can be constructed which will stabilize the channel bed against

incision while allowing for the natural conveyance of watershed runoff and sediment.

Stream stabilization would require California Department of Fish and Game (CDFG) approval of 1603 Stream Alteration Agreements. Agreements identify site-specific erosion control measures required in addition to provisions of projects' SWPPPs. In addition, if wetland impacts or impacts to waters of the United States are involved, a project sponsor also must obtain a Permit to Fill from the U.S. Army Corps of Engineers (Corps) and a Water Quality Certificate from the RWQCB. Corps permits cover the discharge of fill into waters of the United States, and RWQCB certification addresses water quality and wetland implications of proposed activities.

Implementation of Policies 8-23 through 8-27 of the *Draft Plan*, listed below, would reduce the impact of proposed development within the SLVSPA to a less-than-significant level.

- ***Policy 8-23*** For all agricultural mitigation land required by *Specific Plan* development, require preparation of an agricultural sediment management plan for each parcel of grassland converted to vineyard cultivation within the proposed City limits. Such plans should describe appropriate erosion control measures and schedules to operate and maintain related facilities (such as detention / sediment basins). Each plan should reflect consultation with and input of the Natural Resource Conservation Service (NRCS) in Livermore and should implement NRCS recommendations. Sufficient optional measures are available to enable each property owner flexibility to satisfy the requirements for erosion and sedimentation control for the particular parcel without significant loss of arable land.

- ***Policy 8-24*** Prepare and implement a comprehensive Stormwater Pollution Prevention Plan (SWPPP) for each residential development project and / or commercial facility built in the SLVSPA. The SWPPP must accompany any application to the Regional Water Quality Control Board for General Construction Activity Stormwater Permit (required for any development which would disturb more than five acres of land) The SWPPP should be submitted to the City of Livermore Engineering Department for review and approval before construction begins. No grading should occur during the winter season, and, therefore, grading activities should be restricted to the period between April 1 and October 15.

- ***Policy 8-25*** Install adequate energy dissipation at all culvert outlets to deter local channel incision and erosion.

- ***Policy 8-26*** For all earthen (defined) channel reaches within new or established drainageways, install geosynthetic stabilization or targeted natural stabilization to deter erosion and channel incision. Full lining of earthen channels with concrete or rock rip rap shall be prohibited in favor of vegetated channels. The vegetated channels can be stabilized with occasional rock grade checks and / or biodegradable or geosynthetic elements (such as long-life erosion control blanket or geoweb).

- ***Policy 8-27*** For development in Subarea 7, institute on-site peak flow controls and / or channel and gully erosion stabilization measures downstream of proposed residential development. These measures would be in addition to the general policy of SWPPP preparation and channel stabilization measures described above.

Mitigation Measure 4.3-3 Implementation of the *Draft Plan* policies listed above would mitigate the potentially adverse impacts of SLVSPA development on erosion and downstream sedimentation. No

additional measures would be required to mitigate potential impacts which would result from buildout according to the *Draft Plan*.

Significance after Mitigation Implementation of these *Draft Plan* policies as part of all SLVSPA development projects would reduce site erosion and downstream sedimentation impacts to less-than-significant levels.

Responsibility and Monitoring The City of Livermore Department of Engineering would be responsible for supervising site preparation, hydraulic design review, new culvert / roadway construction, and the implementation of revegetation and erosion control measures in all disturbed areas associated with new development within the SLVSPA in conformance with relevant policies contained in the *Draft Plan*. Monitoring of site erosion control measures and debris removal during and after flooding events would be the responsibility of the City of Livermore except that maintenance of the measures and any required corrective action would be the responsibility of the applicant during the specified warranty period for project improvements.

Impact 4.3-4 Water Quality

Conversion from grassland to residential use in SLVSPA subareas could result in a degradation of the water quality in area creeks and drainageways. Water quality degradation could have an especially critical impact on the California tiger salamander breeding ponds in Sycamore Park. Also, any loss of existing wetlands would reduce the ability of the landscape to naturally filter stormwater contaminants that would otherwise be discharged to the arroyos. LTS

Exhibit 4.3-11 indicates that oil and grease concentrations in post-development stormwater could increase by nearly 500 percent. Similar increases in heavy metal concentrations would also follow the proposed levels of development. While the corresponding rates are lower than the maximum contaminant levels (MCLs) currently listed by the USEPA for urban stormwater, such increases have the potential to degrade the cumulative, regional water quality in area streams and San Francisco Bay.

Two salamander breeding ponds have been established within Sycamore Grove Park, just north and downstream of drainage outlets 7B and 7C. Both of these contributing watersheds would be partly developed for residential use. Untreated stormwater runoff from such development likely would enter storm drain systems and be delivered directly to the drainageways. Oils, greases, and heavy metals could be conveyed downstream into the breeding ponds and degrade the aquatic habitat.

Implementation of *Draft Plan* Policies 8-21 (see ***Impact 4.3-1***) and 8-22 through 8-27 (see ***Impact 4.3-3***) would mitigate the potential impacts of SLVSPA development on local and regional water quality to a less-than-significant level.

Mitigation Measure 4.3-4 Implementation of the *Draft Plan* policies listed above would reduce the potential water quality impact of development in the SLVSPA to a less-than-significant level. No additional mitigation would be required to mitigate impacts on water quality which would result from adopting and implementing the *Draft Plan*.

Significance after Mitigation Implementation of the *Draft Plan* policies listed above as part of all SLVSPA planned development projects would reduce impacts on both local and regional water quality and on the salamander breeding ponds downstream of outlets to drainageways 7B and 7C, to a less-than-significant level.

Responsibility and Monitoring The *Draft Plan* would require individual development projects to comply with all relevant sediment and water quality management policies and would require their implementation as conditions of project approval. The City of Livermore Department of Engineering would be responsible for overseeing and / or approving the design and installation of related measures. Such measures should be included in the Stormwater Pollution Prevention Plan (SWPPP) which must be developed as part of the preparation for acquisition of a General Construction Activity Stormwater Permit from the Regional Water Quality Control Board in Oakland. Maintenance of the measures and any corrective action would be the responsibility of individual developers during the specified warranty period for project improvements.

Impact 4.3-5 *Inundation from Del Valle Dam Failure*

SLVSPA development could subject existing and furture residents within the downstream inundation zone to a life-threatening flood hazard. SU

Development which occurs within the mapped inundation area of Del Valle Dam could interfere with and redirect flood flows in the event of a catastrophic failure of the dam. Such obstructions to previously mapped flows could alter the inundation pathway and change the area exposed to potential flooding from the area identified by the State Office of Emergency Services. More importantly, structures and properties in the mapped inundation area of Subareas 5, 6, and 7 could be flooded with little or no warning due to the projected rapid progression of the resulting flood wave (five minutes from failure), thus posing a hazard to public safety and property. While the risk of such a failure is small -- less than the probability of a 100-year flood -- the severe consequences attending its occurrence override the risk assessment alone.

The State's only siting restriction below dams currently prohibits development of schools in inundation areas. The SLVSPA combined elementary / middle school site would be located in Subarea 3, outside the mapped inundation area of Del Valle Dam and, thus, in compliance with State policy.

Policies 8-17 and 8-18 of the *Draft Plan*, listed below, would serve to partially mitigate the potentially life-threatening flood hazard posed by a low probability dam failure at Del Valle Dam.

- ***Policy 8-17*** The City of Livermore should review and update its emergency evacuation plan for the city as a whole, including future South Livermore Valley areas proposed for annexation, and incorporate appropriate provisions needed to reduce the likelihood of loss of life during a potential inundation from failure of Del Valle Dam.

- ***Policy 8-18*** Sellers of property within and adjacent to the mapped inundation area of Del Valle Dam shall be required to record a notice on each property deed which informs potential purchasers about the possible exposure to flooding from a failure of the dam.

Mitigation Measure 4.3-5 Implementation of the *Draft Plan* policies listed above would partly mitigate potentially significant dam failure impacts. No additional measures short of full avoidance within the potential dam failure inundation zone would reduce the risk of loss-of-life to a less-than-significant level. Since the overall likelihood of the failure event is very small, full avoidance is not likely to be mandated by the City.

Significance after Mitigation Implementation of *Draft Plan* Policies 8-17 and 8-18 would minimize, to the extent possible, risk to life and properties in the SLVSPA due to a low probability failure at Del Valle Dam. Unless full avoidance of development within the verified floodwater inundation zone were

to be adopted as a specific *Draft Plan* policy, this impact would remain significant and unmitigable.

Responsibility and Monitoring The City of Livermore would be responsible for securing the compliance of developers, landowners and real estate agents with the *Draft Plan* policies cited above.

4.4 BIOLOGICAL RESOURCES -- THE SETTING

Introduction and Methodology

Biotic resources in the planning area were identified primarily through a review and compilation of existing information, including vegetation and wildlife information prepared in 1995 for the *South Livermore Valley Specific Plan (Draft Plan).* [1] The review provided information on general resources in the area, the extent of sensitive natural communities, wetlands mapped as part of the National Wetland Inventory (NWI), and the distribution and habitat requirements of special-status species which have been recorded or are suspected to occur in the Livermore area. The 1995 constraints analysis described vegetation and wildlife resources, the potential for occurrence of special-status species, and made preliminary planning recommendations for consideration in formulating the *Draft Plan.*

Preparation of the EIR by the EIR biologist involved a peer review of the constraints analysis, independent field verification of potentially sensitive resources in the South Livermore Valley Specific Plan Area (SLVSPA), a more detailed analysis of anticipated impacts, and identification of appropriate measures to mitigate adverse impacts of development envisaged by the *Draft Plan.* The EIR biologist also compiled and reviewed additional information, including the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* [2] and other references on California Flora [3], the *Guide to California Wildlife Habitat Relationship System* and *Volumes I, II,* and *III* of *California's Wildlife* [4], the Notice of Review for Federally-listed and candidate animals [5], the California Department of Fish and Game's (CDFG) list of special animals and plants [6], and a record search conducted by the California Natural Diversity Data Base (CNDDB) of information on file with the CDFG. [7] The CNDDB record search provided an inventory of the known

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1 "Vegetation and Wildlife", Dr. Samuel McGinnis, *Environmental Setting and Planning Considerations* (Constraints Analysis), Nichols • Berman, June 30, 1995.

2 *Inventory of Rare and Endangered Vascular Plants of California*, Special Publication No. 1 (5th Edition), California Native Plant Society, 1994.

3 *A California Flora and Supplement*, P. Munz and D. Keck, 1973.

4 *Guide to California Wildlife Habitat Relationship Systems*, California Department of Fish and Game, prepared by Jones & Stokes Associates, 1988, and *Volume I Amphibians and Reptiles*, 1988, *Volume II Birds*, 1990, and *Volume III Mammals*, 1990.

5 "Endangered and Threatened Wildlife and Plants", Animal Notice of Review, U.S. Fish and Wildlife Service, *Federal Register*, 50 CFR Part 17, 1995.

6 *Special Plants and Animals Lists*, California Natural Diversity Data Base, California Department of Fish and Game, 1995.

7 Record search of the U.S. Geological Survey (USGS) Livermore and Altamont 7.5-minute quadrangles, Natural Diversity Data Base, California Department of Fish and Game, September 1996.

distribution of special-status species and sensitive natural communities for the U.S. Geologic Survey (USGS) quadrangles for Livermore and the vicinity.

The EIR biologist conducted field reconnaissance surveys of each SLVSPA subarea on August 28 and September 5, 1996. The field reconnaissance surveys served to confirm the 1995 field investigations regarding plant cover, wildlife species which may occur in or frequent the area, and the presence or potential for populations of special-status species. The reconnaissance surveys were conducted primarily by automobile from roads, with spot checking by foot of sensitive features (such as creek corridors, woodlands and ponds). Plant community types were mapped using the natural community classification system [8], and associated wildlife species observed in the field were noted. No detailed surveys were conducted as part of the EIR analysis. The EIR biologist also met in the field with CDFG biologists and others (City staff, affected landowners, etc.) to consider specific biological resource issues and appropriate mitigative approaches. [9] The EIR analysis identified type, location, and timing of additional detailed field mapping and pre-construction surveys which will be required on a project-by-project basis to confirm the presence or absence of sensitive resources before the City could approve plans for individual development projects. Policies in the *Draft Plan* call for avoidance of sensitive resources, where feasible, and appropriate mitigation where complete avoidance is not possible. The *Draft Plan* incorporates these recommendations, as noted in the subsection on ***Impacts and Mitigation Measures***.

Vegetation and Wildlife

The seven subareas vary in vegetative cover, ssociated wildlife species, and presence of sensitive biological resources. Subareas 2 and 3 primarily support intensively managed agricultural crops and are bordered by suburban development. Subareas 1, 4, 5, 6, and 7 also reflect an agricultural history, including livestock grazing, dry land farming, orchards, and viticulture. Subareas 1, 4, and 5 are located at the fringe of expanding development in Livermore and form a transition to undeveloped grazing lands south and southeast of the SLVSPA. Most of the vineyards and orchards in Subareas 1, 4, and 5 are no longer actively managed. Several ranchettes and equestrian facilities also are scattered throughout these three subareas, and grazing is now the predominant use.

In contrast to the others, Subareas 6 and 7 currently are used almost exclusively for grazing, although most of Subarea 6 and parts of the lower elevations of Subarea 7 were once used for more intensive agricultural production, including dry land farming and production of orchard crops (such as almonds and olives). The presence of Sycamore Grove Park contiguous to Subareas 6, 7, and the southwest corner of Subarea 5 contributes to both the wildlife habitat value of the Arroyo Valle corridor and the sensitivity of the subareas. The arroyo supports a complex of native sycamore woodland, willow scrub, and non-native grassland of regional significance. In addition, Subarea 7 currently forms part of a continuous band of undeveloped grazing land between Sycamore Grove Park and the rangeland located south of the SLVSPA.

The various plant cover types and common wildlife species found in each of the subareas are described below. Exhibits 4.4-1 through 4.4-5 show existing plant cover types in the subareas.

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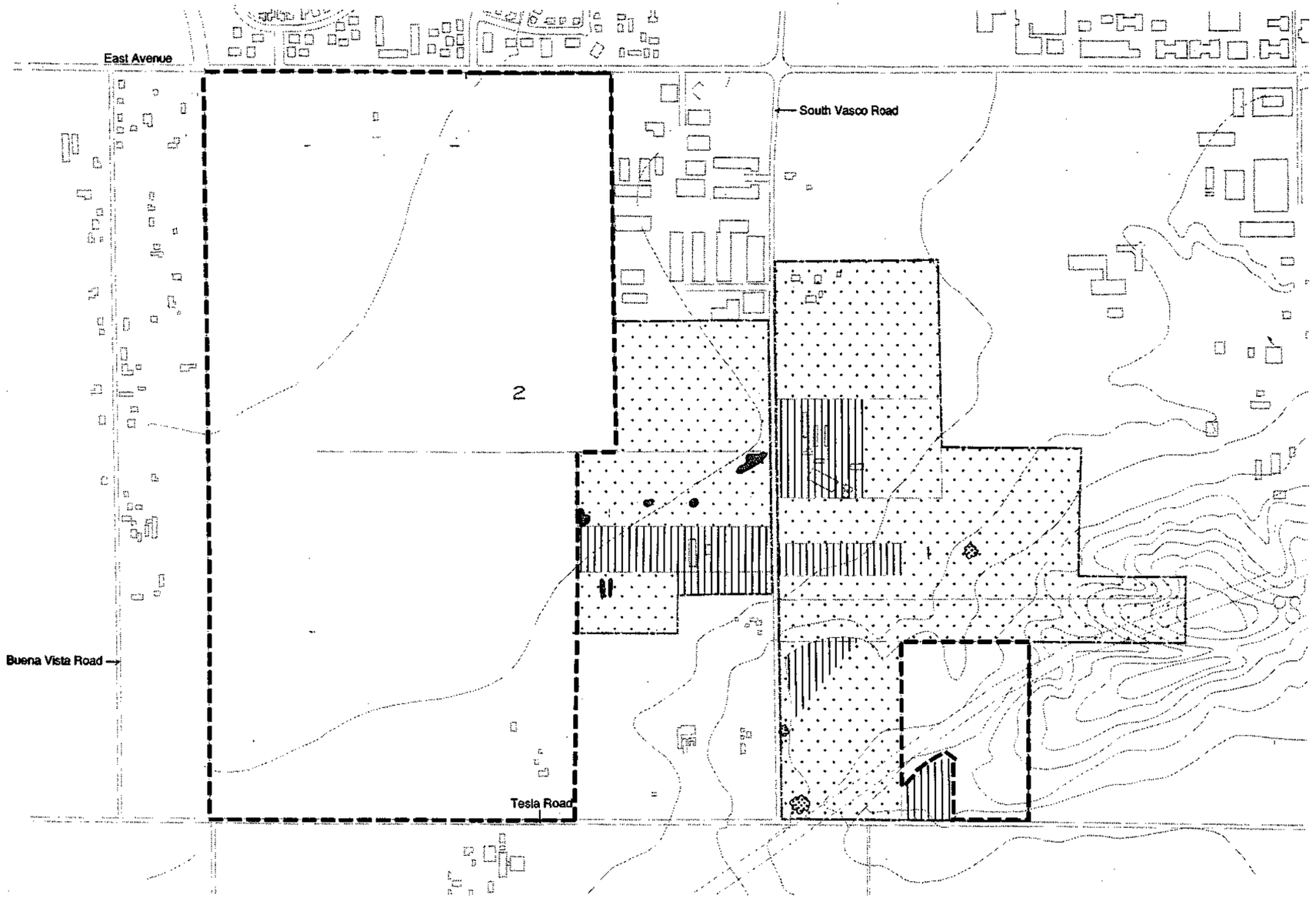
8 *Preliminary Descriptions of the Terrestrial Natural Communities of California*, R.F. Holland, California Department of Fish and Game, October 1986.

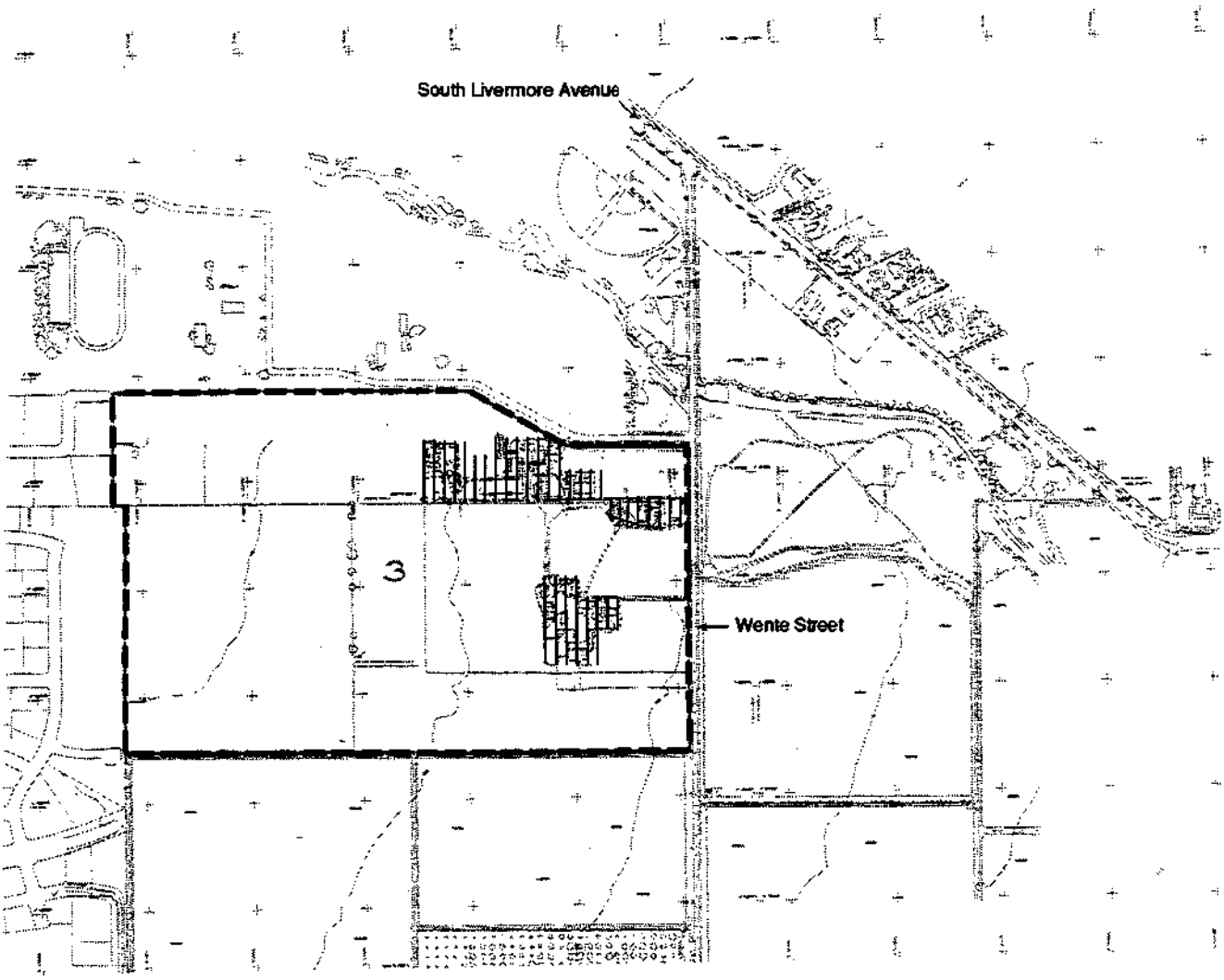
9 Environmental Collaborative (EIR biologist) meeting with Marc Roberts, City of Livermore Planning Department, and John Brode and Kevin Hunting, California Department of Fish and Game, October 2, 1996.

Exhibit 4.4-1
Subareas 1-2 Habitat Map



Source: Samuel McGinnis, 1995; Environmental Collaborative, 1996

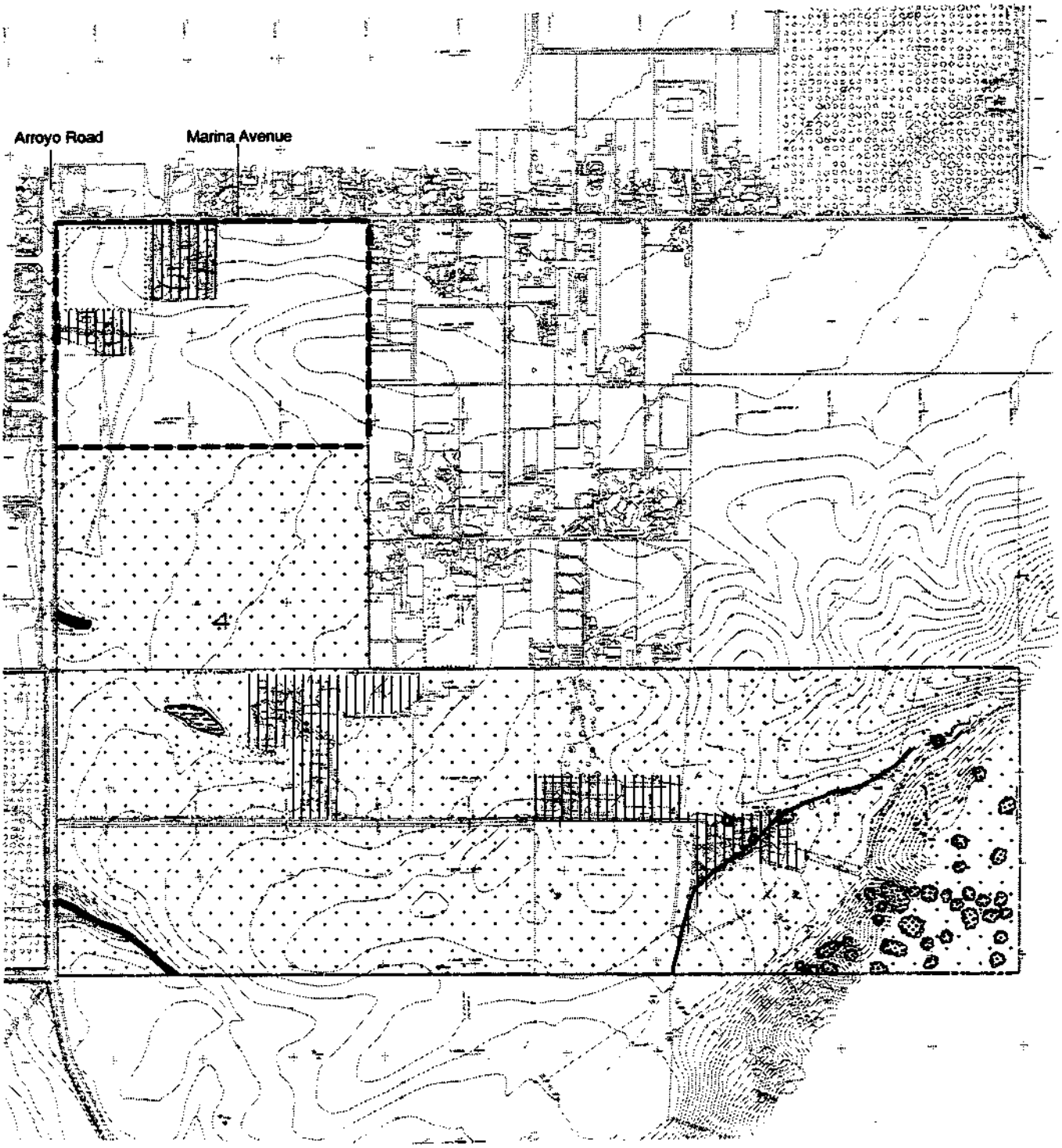
Exhibit 4.4-2
Subarea 3 Habitat Map



Legend:
Intensive Agriculture
Developed Area

Source: Samuel McGinnis,1995;Environmental Collaborative,1996

Exhibit 4.4-3
Subarea 4 Habitat Map

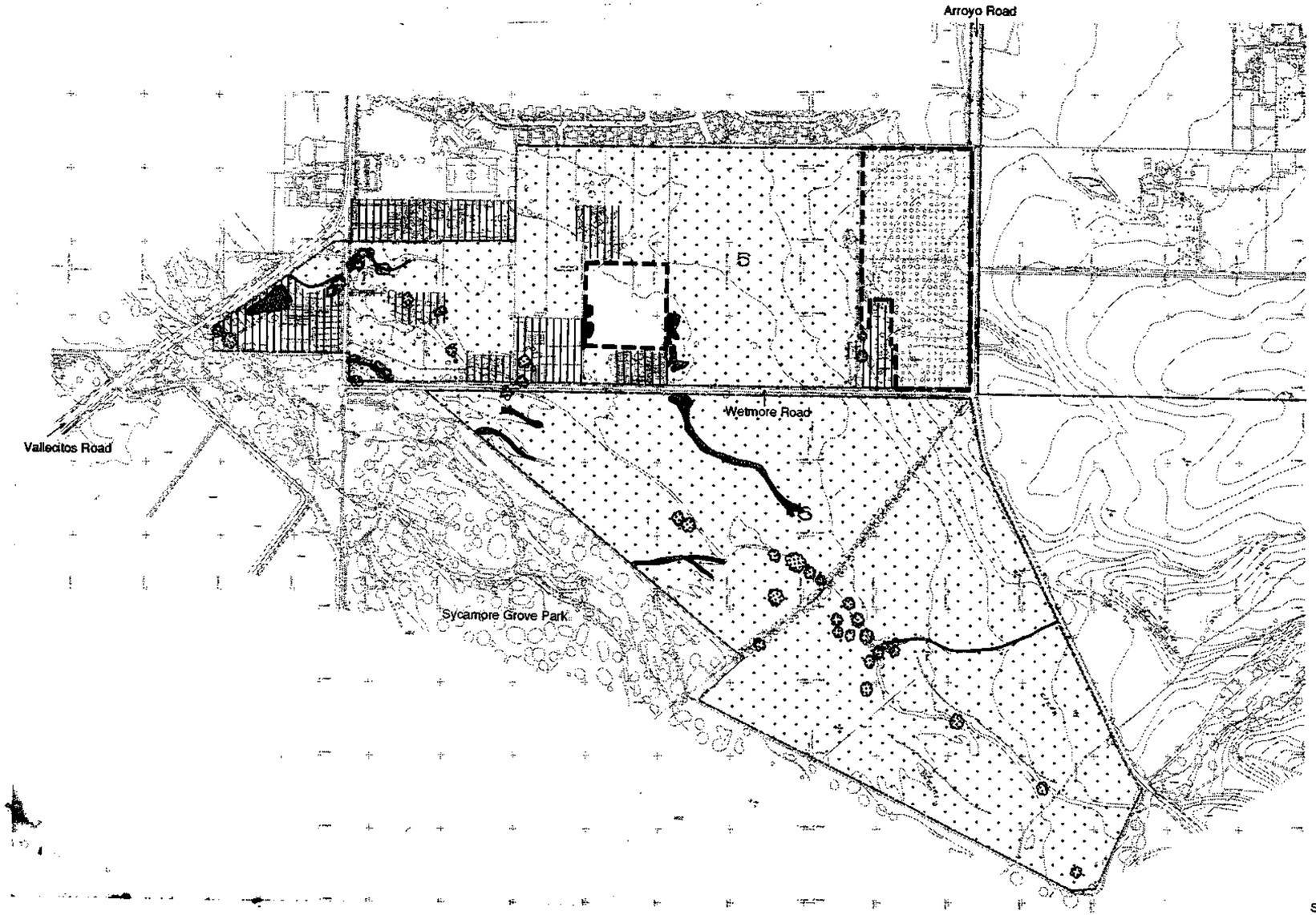


Legend:

- Grassland
- Seasonal or Perrenial Pond
- Developed Area
- Potential Seasonal Wetland
- Woodland/Native Oak Tree
- Intensive Agriculture
- Intermittent Drainage

Source: Samuel McGinnis, 1995; Environmental Collaborative, 1996

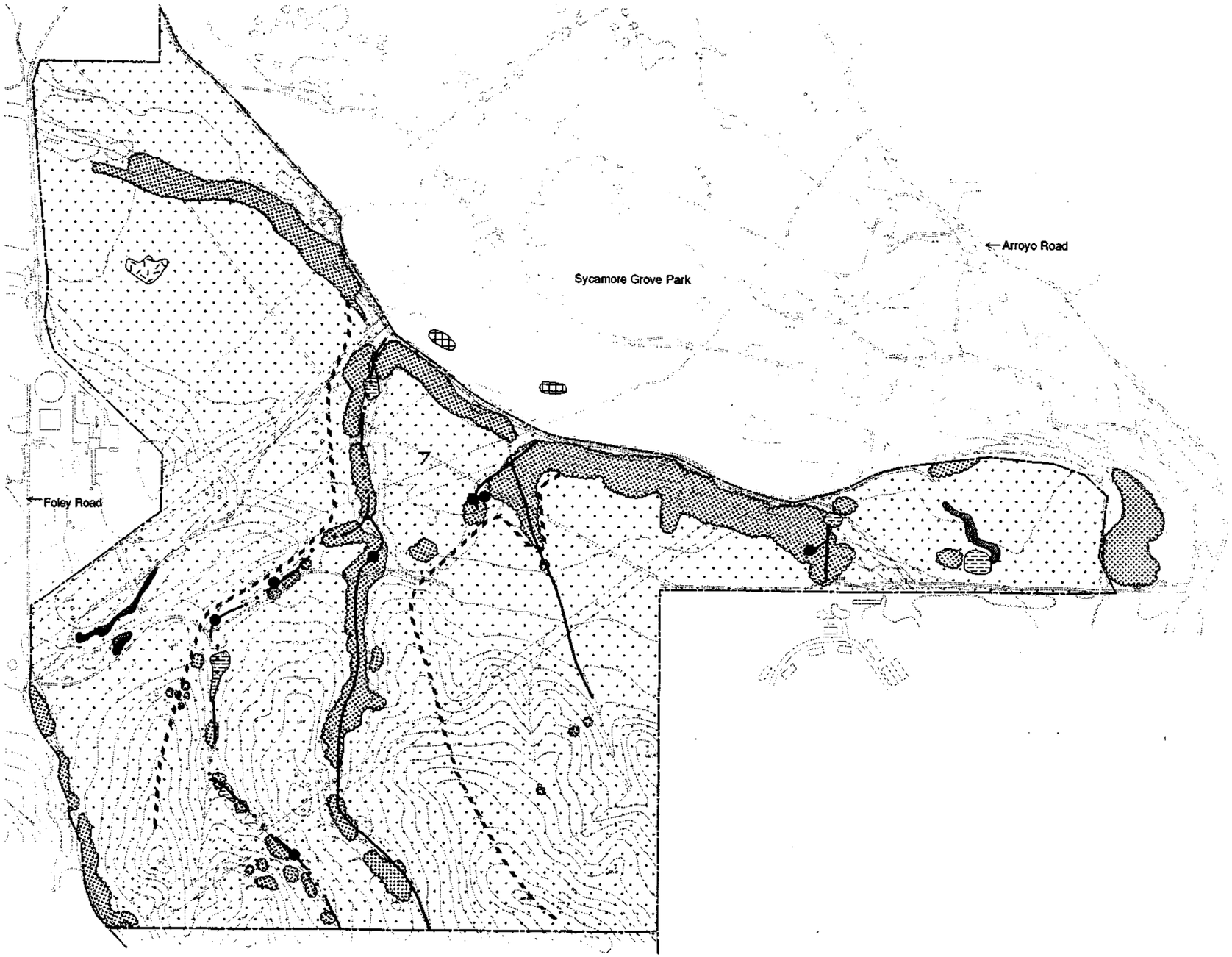
Exhibit 4.4-4
Subareas 5-6 Habitat Map



Legend:
- Intermittent Drainage
- Potential Seasonal Wetland
- Woodland/Native Oak or Sycamore Tree
- Grassland
- Intensive Agriculture
- Developed Area

Source: Samuel McGinnis, 1995; Environmental Collaborative, 1996

Exhibit 4.4-5
Subarea 7 Habitat Map



Legend:

- USGS Blue-line Stream
- Intermittent Drainage
- Potential Seasonal Wetland
- Seasonal or Perrenial Pond
- Vernal Pool
- Freshwater Seep or Spring
- Woodland/Native Oak Tree
- Grassland
- California Tiger Salamander Breeding Pool
- Recommended Wildlife Movement Corridor

Source: Samuel McGinnis,1995;Environmental Collaborative,1996

woodlands, but no evidence of
Dead limbs and cavities in older
seed crops are an important foo
and other wildlife species. Due
isolated shrubs and thickets pro
black-tailed deer.

Agricultural Crops and Rural

Agricultural and rural residenti
orchard trees, and ornamental l
and 5. Large parts of Subareas
vineyards, are routinely disced.
generally is low due to frequen
currently producing field crop in
is a perennial which remains in
populations of rodent prey speci
excellent foraging opportunities
an abandoned orchard with a de
southern part of Subarea 5. T
support wildlife associated with

Vegetative cover in developed p
as where intensive grazing and t
and 4) to ornamental landscap
structures and ornamental landsc
areas (such as American robin,
Blue gum eucalyptus (*Eucalyptu*
7 where construction of the O
plantings generally have low
ornamental trees provide impor
tailed hawk and great horned ow

Riparian, Fresh Water Marsh,

Riparian plant communities ar
along the Arroyo Valle is bou
SLVSPA drainages is indistingu
passes along the base of the hill
absent along this feature. Two
several native trees, including
Several major Subarea 7 ravin
spicata) -- with stands of oak w
along the creek channel in the
latifolia) and individual willow
appear to limit establishment of
the southwest boundary of Su
vegetation and is part of contin
grazing lands farther south.

Grassland

Grassland vegetation in most of the subareas is composed primarily of introduced annual grasses and forbs which form non-native grassland. Intensive grazing in and around the SLVSPA and throughout California has dramatically altered the composition of grassland communities during the past 100 years, eventually replacing most of the native perennial bunchgrasses with non-native annuals. Grazing and agricultural development, including discing and tilling associated with dry land farming and other production activities, also may have diminished the extent of other sensitive natural communities found in the Livermore area, including valley sink scrub, alkali meadow, alkali grassland, and northern vernal pool.

Species common in the grasslands of Subareas 1, 4, 5, 6, and 7 include wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), wild barley (*Hordeum leporinum*), annual rye grass (*Lolium multiflorum*), field bindweed (*Convolvulus arvensis*), tarweed (*Hemizonia sp.*), and fillaree (*Erodium circutarium*). Intensive grazing has eliminated most of the identifiable grassland cover on large parts of Subareas 1 and 4 used for equestrian facilities and pasture. Weedy or ruderal species form the predominant cover where recent grading or tilling has occurred or where grazing and trampling by cattle has been particularly severe. Common ruderal species include yellow star thistle (*Centaurea soltitialis*), bristly ox-tongue (*Picris echioides*), bull thistle (*Cirsium vulgare*), black mustard (*Brassica nigra*), and sweet fennel (*Feoniculum vulgare*).

Remnants of native valley wildrye grasslands remain on the upper elevations of Subarea 7, generally above an elevation of approximately 650 feet. These native grasslands are characterized by dense to open stands of creeping wildrye (*Elymus triticoiedes*) with other native and non-native species. Due to the rarity of the remaining native grasslands in the State, the CNDDB gives this natural community a high inventory priority. Other native species -- such as blue-eyed grass (*Sisyrinchium bellum*), wild-hyacinth (*Dichelostemma capitatum*), California poppy (*Eschscholzia californica*), and soap plant (*Chlorogalum pomeridianum*) -- were observed in the stands of native grassland, but identification of most species was not possible due to the timing of the EIR field survey effort in late summer. [10] Smaller stands of native grasslands occur along the major Subarea 7 ravine below 650 feet, but most lower elevations support a cover dominated by non-native species. Evidence of native grasslands was absent in the other subareas.

The value of grasslands to wildlife depends on the availability of cover, food, and water and the connectivity between this habitat type. Grazing continues to influence the value of grasslands in most of the subareas and surrounding lands. Grasslands not used for grazing or dry land farming tend to have a denser cover and a higher species diversity of both plant and associated wildlife species. Areas of heavy overgrazing and trampling by cattle have limited plant cover of primarily ruderal species and tend to have little habitat value. Where cover is present, grasslands support numerous insects, small mammals, and birds and provide important foraging habitat for predatory mammals and birds. Many species use the grassland for only part of their habitat requirements -- foraging in the grassland and seeking cover in adjacent woodlands or riparian corridors. Mammal and reptile species which forage and breed in the grasslands include California ground squirrel, California vole, Botta pocket gopher, black-tailed jackrabbit, common garter snake, western fence lizard, northern alligator lizard, and gopher snake. Grassland vegetation provides food, nesting material, and nesting substrate for

10 The EIR biologist's work took place between mid-August and October 1996, after the normal season for spring and early summer surveys.

numerous species of birds, includin
meadowlark. The smaller mamma
raptors and predatory mammals whi
horned owl, American kestrel, turke

The expanse of grasslands in Subar
to the importance of this habitat typ
to forage in the grasslands becau
dispersing through partly develope
incised channels and protective c
important link for these larger mam
lands to the south.

Woodlands

The woodland communities in the S
upland locations and sycamore allu
The sycamore woodland generally
although a narrow band of sycamo
stream terraces in Subarea 6. The
major ravines of Subarea 7 which d
open oak savannah occupies the so
locations in Subareas 1, 5, and 6. B
the dominate tree species in most c
lobata) grow at lower elevations. N
little regeneration observed in the u
olive, walnut, and almond trees gro

Most of the woodland and savai
Herbaceous species and scatterec
diversilobum), wood rose (*Rosa gy*
sometimes occur in the understory,
slope along the northeast boundary

Woodland and savanna communitie
of concern because of their long m
roosting, and cover for wildlife. Th
as sensitive natural communities w
sensitive natural communities cons
Livermore Code on "Ancestral Tre
and non-native trees designated by
community because of age, size, lo
conditions require preparation of a
construction requirements, vegetatio
significant trees and shrubs as a stan

Woodlands provide important co
understory vegetation provides for
grasslands. The oak woodlands and
substrate for numerous bird speci

Freshwater marsh vegetation grows around the fringes of six man-made stock ponds in Subareas 4 and 7 which were created by damming reaches of intermittent streams and drainages. Five of the ponds are located in Subarea 7 and contribute to the habitat value of the creek corridors south of Sycamore Grove Park. Three of these ponds occur along the main creek through the center of Subarea 7, and the other two are fed by springs and runoff from the Veterans Medical Center grounds in the eastern part of the subarea. Except for the northernmost pond on the main creek, all appear to contain water year-round and are fringed by a dense growth of cattail. The dam of the northernmost pond on the main creek was breached during a severe storm in March 1995. Because the dam has not been replaced, this pond only holds shallow water through the wet season and does not support emergent vegetation. The pond in Subarea 4 was created recently along a drainage swale in the central part of the subarea. It is relatively shallow and supports a dense thicket of cattail.

Factors affecting the wildlife value of riparian habitat include the extent of protective cover, complexity of vegetation, availability of surface water, the proximity of existing development, and potential for disturbance by automobile traffic, humans, and their pets. Trees and shrubs in Sycamore Grove Park and to a lesser extent along the corridors in Subarea 7 provide important nesting and foraging habitat for numerous species of birds (such as warbling vireo, ruby-crowned kinglet, dark-eyed junco, and California quail). Arroyo Valle and tributary drainages in Subarea 7 serve as important movement corridors for larger wildlife species (such as black-tailed deer and raccoon), particularly where dense growth provides protective cover on the valley floor. The stock ponds in Subarea 7 are an attractive feature to wildlife and contribute to the value of the intermittent streams. Sycamore Grove Park supports or is frequented by many predatory mammals, including long-tailed weasel, bobcat, coyote, and, occasionally, mountain lion. [11] Subarea 7 forms an essential link for these larger species between the park and undeveloped grazing lands farther south.

Seasonal wetlands occur in a number of locations in the SLVSPA. They support a cover of primarily annual wetland species and are bordered by non-native grassland. Seasonal wetland indicators were observed during the August 1996 reconnaissance of Subareas 2, 5, 6, and 7, as shown in Exhibits 4.4-1, 4.4-4, and 4.4-5. Heavy grazing and trampling by livestock made it impossible to determine the vegetative cover in these wetlands, but they probably support a number of annual facultative wetland plant species. Most of these seasonal wetlands appear to be vernal swales, but at least one on the large terrace in the western part of Subarea 7 appears to be a vernal pool. The terrace is underlain by a claypan, forming an impenetrable barrier for runoff and creating a pool near its center, as shown in Exhibit 4.4-5. While severely degraded by cattle, this feature is a jurisdictional wetland and most likely can best be characterized as a northern claypan vernal pool -- a sensitive natural community with a high CNDDB inventory priority.

Aquatic habitat throughout the SLVSPA area includes perennial and intermittent creeks, stock ponds, seeps, and seasonal wetlands. The perennial and seasonal waters and associated wetlands provide important habitat for numerous species of invertebrates, reptiles, and amphibians, possibly including special-status species (such as California tiger salamander which has been reported in a number of locations near the SLVSPA). Stock ponds created to hold drinking water for livestock now contribute to the wildlife habitat diversity of the surrounding area by providing breeding habitat for amphibians, foraging habitat for herons, killdeer, and other birds, and a source of drinking water for larger native mammals. Non-native bullfrogs are abundant on all four of the year-round ponds in Subarea 7,

11 Environmental Collaborative conversation with Mike Nickleson, Ranger, Livermore Area Recreation and Park District (LARPD), September 1996.

creating excellent foraging opportunities for predators (such as the great blue heron, black-crowned night heron, and raccoon). The large insect populations associated with the ponds also make them attractive to insectivorous bats and birds (such as black phoebe, Brewer's blackbird, barn swallow, and cliff swallow).

Wetlands and Watercourses

Although definitions vary to some degree, wetlands generally are considered to be areas which are periodically or permanently inundated by surface or ground water and which support vegetation adapted to life in saturated soil. Wetlands are recognized as important features in a regional and national context due to their high inherent value to fish and wildlife, use as storage areas for storm and flood waters, and water recharge, filtration, and purification functions. The U.S. Army Corps of Engineers (Corps) and the U.S. Fish and Wildlife Service (USFWS) have developed technical standards for delineating wetlands which generally define wetlands according to three criteria -- hydrology, soils, and vegetation. [12]

Wetlands mapped as part of the National Wetland Inventory (NWI) provide a preliminary indication of wetland resources in the SLVSPA subareas. [13] No detailed wetland delineation has been conducted for any of the subareas, but the general presence of possible wetland indicators was reviewed during the August 1996 field reconnaissance. The timing of the reconnaissance effort in late summer greatly

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12 The CDFG and Corps have jurisdiction over modifications to stream channels, river banks, lakes, and other wetland features. The provisions of §404 of the Clean Water Act establish Corps jurisdiction and prohibit the discharge of dredged or fill material into "waters" of the United States without a permit, including wetlands and unvegetated "other waters of the U.S.". The Corps uses three mandatory technical criteria (hydrophytic vegetation, hydric soils, and wetland hydrology) to determine whether an area is a jurisdictional wetland. All three of the identified technical criteria must be met for an area to be identified as a wetland under Corps jurisdiction, unless the area has been modified by human activity. Aggregate wetland impacts (defined as direct fill or indirect effects of fill) of less than one acre do not require an Individual 404 permit. Certain activities in wetlands or "waters" are authorized automatically or granted a General Permit which allows the filling of wetlands where impacts would not exceed one acre. The Corps assumes discretionary approval over proposed projects which may impact one to ten acres, issuing either a Nationwide or an Individual Permit. An Individual Permit would be required automatically where ten or more acres would be affected by a project.

The USFWS classification system is used by the CDFG to determine wetlands. This classification system is generally more encompassing then that used by the Corps, requiring that only one of the criteria be met for an area to be considered wetlands, rather than all three as required by the Corps. Jurisdictional authority of the CDFG over wetland areas is established under §1601-1606 of the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. The Fish and Game Code stipulates that it is "unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake" without notifying the Department, incorporating necessary mitigation, and obtaining a Streambed Alteration agreement. The Wetlands Resources Policy of the CDFG states that the Fish and Game Commission will "strongly discourage development in or conversion of wetlands...unless, at a minimum, project mitigation assures there will be no net loss of either wetland habitat values or acreage". The Department is also responsible for commenting on projects requiring Corps permits under the Fish and Wildlife Coordination Act of 1958.

13 In 1977 the USFWS began a systematic effort to classify and map remaining wetlands in the country, now known as the National Wetlands Inventory Program (NWI). The wetland mapping effort uses USGS topographic maps as bases and provides a general inventory of wetlands according to the USFWS classification system. Maps have been prepared by interpreting aerial photographs and only limited ground confirmation which means that a more thorough ground and historical analysis may result in a revision to the wetland boundaries in a specific location. The wetland classification system also varies from that used by the Corps, and the inventory is not an attempt to define the limits of proprietary jurisdiction of any Federal, state, or local agency.

limited the feasibility of determining even the vegetative characteristics of wetlands or seasonal wetlands due to intensive grazing and removal of identifiable cover.

Exhibits 4.4-1 through 4.4-5 provide an initial indication of wetlands in the subareas based on NWI maps and distinguishable vegetation characteristics observed during the reconnaissance. Additional detailed wetland delineations will be necessary to accurately determine the extent of wetlands in each subarea. Discing and other agricultural practices in most of Subarea 2 and all of Subarea 3 generally preclude the presence of wetlands in these parts of the SLVSPA. According to the preliminary assessment performed as part of this EIR, wetlands include:

- The stock ponds in Subareas 4 and 7
- Small scattered seasonal wetlands in parts of a vacant parcel just west of South Vasco Road in Subarea 2
- An intermittent drainage at the base of the hills and seasonal drainages in the western part of Subarea 4
- Seasonal wetlands in the central and western parts of Subarea 5
- Seasonal wetlands in the central and lower terrace area of Subarea 6
- The vernal pool, a seasonal drainage near the easternmost stock pond, and channel bottoms of the intermittent and perennial drainages in Subarea 7

Although not mapped in Exhibit 4.4-4, much of the lower terrace of Subarea 6 and parts of the claypan terrace where the vernal pool occurs in Subarea 7 may also meet the Corps definition as jurisdictional seasonal wetlands. The terrace in Subarea 6 appears to have been part of the historic riparian corridor of Arroyo Valle, and the sycamore woodlands may have been eliminated by agricultural production. The claypan where the vernal pool occurs in Subarea 7 also may create suitable conditions for seasonal wetlands in the surrounding level terrace.

A large man-made above ground agricultural pond in Subarea 2 mapped by the NWI and addressed in the 1995 constraints analysis has been eliminated as previously planned. [14]

Again, a thorough wetland delineation conducted in spring months would be necessary to accurately identify the extent of seasonal wetlands and other jurisdictional features in each subarea.

Endangered, Threatened, and Other Special-Status Species

A record search conducted by the CNDDB[15] and examination of the information referenced above indicate that historical occurrences of several plant and animal species with special-status have been

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[14] The water stored in this impoundment was used for frost control in the subarea's vineyards. Water remaining later in the year was used for irrigation. When Wente Brothers converted to a different frost control method, the pond was no longer needed and was eliminated. Mike Gatzman, Wente Brothers, July 12, 1995.

[15] Natural Diversity Data Base, *op. cit.*

recorded in or are suspected in the Livermore area. Special-status species [16] are plants and animals legally protected under the State and / or Federal Endangered Species Acts [17] or other regulations, as well as other species which the scientific community and trustee agencies have identified as rare enough to warrant special consideration, particularly with regard to protection of isolated populations, nesting or denning locations, communal roosts, and other essential habitat. Species protected by the Endangered Species Acts often represent a major constraint to development, particularly when they are wide ranging or highly sensitive to habitat disturbance and where proposed development would result in a "take"[18] of these species.

The 1995 constraints analysis prepared for the *Draft Plan* provides an overview of the potential for occurrence of special-status species in the vicinity of the SLVSPA. According to CNDDB records, no special-status plant or animal species have been reported in any of the subareas, although suitable habitat for numerous species of concern occurs in or near the SLVSPA. The CNDDB does not have complete occurrence information on all species and for all areas due to the lack of detailed survey work to detect existing populations and because the CNDDB does not closely monitor species of concern without legal status. Detailed field surveys generally are necessary to conclusively determine the presence or absence of species of concern.

Information on plant and animal species of concern which were suspected to have a reasonable likelihood of occurrence in the SLVSPA is summarized in Exhibits 4.4-6 and 4.4-7, respectively. These exhibits identify the common and scientific name of each species, its current status, preferred habitat, and other life history or distribution information. Exhibit 4.4-8 shows the reported

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16 Special-status species include:

- Officially designated (rare, threatened, or endangered) and candidate species for listing by the CDFG.
- Officially designated (threatened or endangered) and candidate species for listing by the USFWS.
- Species considered to be rare or endangered under the conditions of Section 15380 of the California Environmental Quality Act (CEQA) Guidelines, such as those identified on lists 1A, 1B, and 2 in the CNPS Inventory.
- And possibly other species which are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included on list 3 in the CNPS Inventory or identified as animal "Species of Special Concern" by the CDFG. Species of Special Concern have no legal protective status under the state Endangered Species Act but are of concern to the CDFG because of severe decline in breeding populations in California.

17 The Federal Endangered Species Act (FESA) of 1973 declares that all Federal departments and agencies shall use their authority to conserve endangered and threatened plant and animal taxa. The California Endangered Species Act (CESA) of 1984 parallels FESA policies and pertains to native California taxa.

18 The FESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a threatened or endangered species. The USFWS further defines "harm" to include the killing or harming of wildlife due to significant obstruction of essential behavior patterns (that is, breeding, feeding, or sheltering) through significant habitat modification or degradation. The CDFG also considers the loss of listed species habitat as "take", although this policy lacks statutory authority and case law support under the CESA.

Two sections of the FESA contain provisions which allow or permit "incidental take". Section 10(a) provides a method by which a state or private action which may result in "take" may be permitted. An applicant must provide the USFWS with an acceptable conservation plan and publish notification for a permit in the *Federal Register*. Section 7 pertains to a Federal agency which proposes to conduct an action that may result in "take", requiring consultation with USFWS and possible issuance of a jeopardy decision. Under the CESA, "take" can be permitted under Section 2081 of the Fish and Game Code. An applicant must enter into a habitat management agreement with the CDFG which defines the permitted activities and provides adequate mitigation.

occurrenceof special-status species in the SLVSPA vicinity according to records maintained by the CNDDB and other information sources.

Plant Species of Concern

Based on the recorded geographic range and presence of suitable habitat, a potential 31 plant species with special-status were considered to possibly occur in the SLVSPA vicinity. Other species reported or suspected to occur in the surrounding area of Alameda, Contra Costa, and San Joaquin Counties were eliminated from further consideration due to the absence of suitable habitat (such as chaparral vegetation) or specific soil characteristics (such as serpentine derived soils) in SLVSPA subareas. Species eliminated from further consideration included Mt. Diablo manzanita (*Arctostaphylos auriculata*), Contra Costa manzanita (*A. pungens* ssp. *laevigata*), chaparral harebell (*Campanula exigua*), Mt. Hamilton harebell (*Campanula sharsmithiae*), Mt. Hamilton thistle (*Cirsium fontinale* var. *campylon*), northcoast bird's-beak (*Cordylanthus maritimus* ssp. *palustris*), Contra Costa wallflower (*Erysimum capitatum* var. *angustatum*), tallus fritillary (*Fritillaria falcata*), Hall's bush mallow (*Malacothamnus hallii*), and Mt. Diablo phacelia (*Phacelia phacelioides*).

Exhibit 4.4-6 provides information on the status, distribution, geographical range, and flowering period of the 31 plant species of concern known or initially suspected to possibly occur in the vicinity of the SLVSPA. The previous constraints analysis was based on surveys conducted in April and May 1995 and focused on the potential occurrence of nine plant species of concern. Except for valley oak, no other taxa of concern were encountered during the 1995 surveys. While black walnut trees (*Juglans hindsii*) were observed in several subareas during the August 1996 field reconnaissance, none was considered part of a native population, and they are not considered to be of special-status.

Valley oak occurs in woodlands, savanna, and as scattered individuals in the SLVSPA. This species was included on List 4 of the CNPS *Inventory* until revised in 1994. List 4 plants are considered to be of limited distribution in California, and their vulnerability or susceptibility to threat appear low at this time. The previous edition of the *Inventory* noted that, although this species of oak is widespread and relatively abundant, it is threatened by loss of habitat from urbanization and agricultural development in the Central Valley and that regeneration needs monitoring in many areas. It was removed from the most recent edition and has no legal protective status under the provisions of CEQA or the State or Federal Endangered Species Acts. However, mature specimen trees of this and other native tree species may be afforded some degree of protection by the City's Ancestral Tree Ordinance.

Northern California black walnut (*Juglans hindsii*) was reported historically in riparian woodlands but currently is believed to occur naturally in only two or three remaining stands in Contra Costa and Napa Counties. The black walnut was developed and still is used in grafting with the less tolerant English walnut. Black walnut trees grow sporadically along the old Olivina Winery estate entrance road in Subareas 6 and 7, as the bases of walnut trees in Subarea 5 orchards, and near a number of existing residences. Trees observed in the subareas are presumed to be from an agricultural and ornamental seed source and, therefore, are not considered to be of special-status.

Due to the extent of historical disturbance from past agricultural practices, the likelihood of occurrence of any sensitive plant populations in Subareas 1, 2, 3, 5, and 6 is so remote that further detailed surveys do not appear warranted. However, the extent of native grasslands on parts of Subarea 7 and the oak savanna habitat in the upper elevations of Subarea 4 suggest that native plant populations, possibly including one or more special-status species, could occur on at least parts of these two subareas. Because the 1995 rare plant survey was of a limited scope and duration, it does not definitively confirm the absence of plant species of concern in these two subareas. Species with a

Exhibit 4.4-6
Potential Special Status Plant Species Occurrence in SLVSPA

Species Name[a]	Status[b]	Habitat Characteristics	Distribution	Flowers
	Fed/State/CNPS		(Presumed Extirpated)	
Amsinckia grandiflora Large-flowered fiddleneck	FE/SE/1B	Open grassy slopes below 1,200 feet	Alameda, Contra Costa, San Joaquin	April-May
Amsinckia lunaris Bent-flowered fiddleneck	-/-/4	Valley grassland	Contra Costa, Lake, Marin, Santa Cruz, Shasta, Siskiyou, Sonoma	March-June
Atriplex cordulata Heartscale	*/-/1B	Akali scrub and grassland	Alameda, Fresno, Glenn, Madera, Merced, Solano, Tulare (Contra Costa, San Joaquin, Stanislaus)	May-October
Atriplex joaquiniana San Joaquin spearscale	*/-/1B	Akali meadows and scrub	Alameda, Colusa, Contra Costa, Merced, Napa, Sacramento, San Benito, Solano, Yolo (Santa Clara, San Joaquin, Tulare)	April-September
Balsamorhiza macrolepis var. *m.*, Balsamroot	-/-/1B	Fields and rocky hillsides, up to 2,000 feet	Alameda, Butte, Mariposa, Napa, Placer, Santa Clara, Tehama	March-June
Calochortus pulchellus Mt. Diablo fairy lantern	-/-/1B	Wooded and brushy slopes	Contra Costa, Solano	April-June
Chorizanthe robusta var. *r.*, Robust spineflower	FE/-/1B	Dry sandy places, below 1,000 feet	Monterey, Santa Cruz (Alameda, Santa Clara, San Mateo)	May-September
Cordylanthus mollis ssp. *hispidus* Hispid bird's-beak	*/-/1B	Alkaline meadows	Alameda, Kern, Merced, Placer, Solano	June-September
Cordylanthus palmatus Palmate-bracted bird's-beak	FE/SE/1B	Alkali scrub and grassland	Alameda, Colusa, Fresno, Yolo (Madera, San Joaquin)	May-October
Cryptantha hooveri Hoover's cryptantha	-/-/4	Bedrock outcrops, dry rocky areas	Alameda, Contra Cost, Madera, Merced, San Joaquin, Stanislaus	April-May
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	*/-/1B	Wet places, foothill woodland	Alameda, Contra Costa, Santa Clara, San Joaquin, San Luis Obispo	April-June
Delphinium recurvatum Recurved larkspur	*/-/1B	Subalkaline soil of brushy or open places	Alameda, Contra Costa, Colusa, Fresno, King, Kern, San Luis Obispo, Solano, Tulare	March-May
Eriogonum truncatum Mt. Diablo buckwheat	-/-/1A	Dry slopes, 1,000 to 1,500 feet, edge of chaparral	(Alameda, Contra Costa, Solano)	April-September
Eschscholzia rhombipetala Diamond-petaled California poppy	*/-/1A	Open dry areas in grassland or rocky areas	(Alameda, Contra Costa, Colusa, San Luis Obispo, Stanislaus)	March-April
Fritillaria agrestis Stinkbells	-/-/4	Heavy clay soils in low-lying areas	Alameda, Contra Costa, Fresno, Kern, Mendocino, Monterey, San Benito, Solano	March-April
Fritillaria liliacea Fragrant fritillary	*/-/1B	Coastal scrub and grassland often on ultramafic soils	Alameda, Contra Costa, Monterey, Marin, San Benito, Santa Clara, San Francisco, San Mateo, Solano, Sonoma	February-April
Helianthella castanea Diablo helianthella	*/-/1B	Fringe of woodland, chaparral and scrub	Alameda, Contra Costa (Marin, San Francisco, San Mateo)	April-June
Hemizonia parryi ssp. *congdonii* Congdon's tarplant	C/-/1B	Alkaline grasslands	Monterey, San Luis Obispo (Alameda, Contra Costa, Santa Clara, Santa Cruz, Solano)	June-November

a *Scientific name*, common name.

b Status designations on following page.

Exhibit 4.4-6 – Continued
Potential Special-Status Plant Species Occurrence in SLVSPA

Species Name[a]	Status[b]	Habitat Characteristics	Distribution	Flowers
	Federal/State/CNPS		(Presumed Extirpated)	
Hesperolinon breweri Brewer dwarf flax	*/-/1B	Grassy or brushy slopes, partly shaded, often on serpentine	Contra Costa, Napa, Solano	May-July
Horkelia cuneata ssp. *sericea* Wedge-leaved horkelia	*/-/1B	Sandy and gravelly places	Monterey, Santa Barbara, Santa Cruz, San Luis Obispo, San Mateo (Alameda, Marin, San Francisco)	April-September
Juglans hindsii Northern California black walnut	*/-/1B	Riparian forests and woodlands	Contra Costa, Napa, (Sacramento, Solano, Yolo)	April-May
Lasthenia conjugens Contra Costa goldfield	PT/-/1B	Low flats and borders of vernal pools	Napa, Solano, (Alameda, Contra Costa, Mendocino, Santa Barbara, Santa Clara)	March-June
Madia radiata Showy madia	-/-/1B	Grassy slopes, up to 2,500 feet	Contra Costa, Fresno, Kings, Kern, Monterey, San Benito, San Joaquin, San Luis Obispo	March-May
Micropus amphibola Mt. Diablo cottonweed	-/-/4	Shallow soil in rocky places	Alameda, Contra Costa, Lake, Marin, Monterey, Napa, Santa Clara, Sonoma	April-May
Plagiobothrys glaber Hairless popcorn-flower	-/-/1A	Salt marshes and alkaline meadows	(Alameda, Marin, Merced, San Benito, Santa Clara)	April-May
Quercus lobata Valley oak	-/-/-	Rich loam, valleys and slopes	Widespread	March-May
Ranunculus lobbii Lobb aquatic buttercup	-/-/4	Shallow vernal pools, low elevations	Alameda, Contra Costa, Marin, Napa, Santa Clara, Solano, Sonoma	March-May
Streptanthus albidus ssp. *albidus* Metcalf Canyon jewelflower	FE/-/1B	Valley grassland, often on ultramafic soils	Santa Clara	April-July
Streptanthus hispidus Mt. Diablo jewelflower	*/-/1B	Talus or rocky slopes	Contra Costa	March-June
Trifolium amoenum Showy Indian clover	PE/-/1B	Low rich fields, swales	Sonoma (Alameda, Mendocino, Marin, Napa, Santa Clara, Solano)	April-June
Tropidocarpum capparideum Caper-fruited tropidocarpum	*/-/1A	Grassy alkaline slopes below 500 feet, last observed in 1957	(Alameda, Contra Costa, Glenn, Monterey, San Joaquin, Santa Clara)	March-April

a *Scientific name*, common name.

b Status Designations:

Federal:

FE Listed as "endangered" under the federal Endangered Species Act.

PE Proposed for listing as "endangered".

C A candidate species under review for federal listing. Includes species for which the USFWS currently has sufficient biological information to support listing as endangered or threatened species.

* These species were considered to be category 2 candidate species for federal listing until 28 February 1996 when the USFWS revised their status classification system. These species no longer have any candidate designation, but are unofficially classified as species of concern and could be added to the candidate list if information demonstrates they warrant listing.

State:

SE An "endangered" species. Serious danger of becoming extinct throughout all or significant portion of range due to varying factors.

CNPS:

1A Plants of highest priority; plants presumed extinct in California.

1B Plants of highest priority; plants rare and endangered in California and elsewhere.

3 Plants requiring additional information; a review list.

4 Plants of limited distribution; a watch list.

Exhibit 4.4-7
Potential Special-Status Animal Species Occurrence in SLVSPA

Species Name[a]	Status[b]	Habitat Characteristics
	Federal / State	*(Occurrence within Vicinity of Planning Area)*
Invertebrates		
Branchinecta longiantenna Longhorn fairy shrimp	PE/-	Grassland vernal pools (marginal habitat in Subarea 7)
Branchinecta lynchi Vernal pool fairy shrimp	FT/-	Vernal pools (marginal habitat in Subarea 7)
Linderiella occidentalis California linderiella	PE/-	Vernal pools (marginal habitat in Subarea 7)
Amphibians / Reptiles		
Ambystoma tigrinum californiense California tiger salamander	C/CSC	Grassland and open woodlands with temporary or permanent water (suitable habitat in several subareas but not detected in 1995. Numerous occurrences in SLVSPA vicinity)
Clemmys marmorata Western pond turtle	*/CSC	Ponds, marshes, rivers, and streams (suitable habitat in Subareas 4 and 7 but not detected in 1995)
Masticophis lateralis euryxanthus Alameda whipsnake	PE/ST	Scrub / chaparral habitat, adjacent grasslands, open woodlands, and riparian corridors (suitable habitat absent)
Rana aurora draytoni California red-legged frog	FT/CSC	Permanent ponds, pools, and streams (suitable habitat in Subareas 4 and 7 but not detected in 1995)
Rana boylii Foothill yellow-legged frog	*/CSC	Rocky perennial streams (marginal habitat along Arroyo Valle in Sycamore Grove Park but habitat absent in SLVSPA)
Scaphiopus hammondi hammondi Western spadefoot toad	*/CSC	Permanent wet areas and adjacent grasslands (suitable habitat present but not recorded from vicinity)
Birds		
Accipiter cooperi Cooper's hawk	-/CSC	Nests and forages in dense woodlands (suitable nesting and foraging habitat in Sycamore Grove Park and fringe of Subareas 6 and 7 but no nests detected)
Accipiter striatus *Sharp-shinned hawk*	-/CSC	Nests and forages in extensive woodlands (marginal nesting and foraging habitat in Sycamore Grove Park and woodlands of Subarea 7 but no nests detected)
Agelaius tricolor Tricolored blackbird	*/CSC	Waterways and adjacent grassland and agricultural fields (suitable habitat in Subareas 4 and 7 with reported occurrences in SLVSPA vicinity)
Aquila chrysaetos Golden eagle	-/CSC, CP	Open mountains, foothills, and canyons (suitable foraging habitat in Subareas 1, 4, 6, and 7 but no known nest locations)
Athene cunicularia Burrowing owl	-/CSC	Open grassland and fields, farms, and ruderal areas (suitable habitat present in Subareas 1, 2, 4, 5, 6, and 7 but no individuals observed)
Buteo regalis Ferruginous hawk	*/CSC	Forages in variety of habitats but not known to breed in California (suitable foraging habitat for wintering individuals in Subareas 1, 2, 4, 5, 6, and 7)
Circus cyaneus Northern harrier	-/CSC	Marshes, fields, and grassland (suitable habitat present in Subareas 1, 2, 3, 4, 5, 6, and 7 but no individuals observed)
Dendroica petechia Yellow warbler	-/CSC	Riparian habitat (suitable habitat in Sycamore Grove Park but no individuals observed)
Elanus caeruleus White-tailed kite	-/CP	Open foothills, marshes, and grassland (suitable habitat present in all subareas but no nests detected)
Eremophila alpestris actia California horned lark	*/CSC	Open habitat with sparse cover (suitable habitat in Subareas 4, 6, and 7 but no nests detected)

a *Scientific name*, common name.
b Status designations on following page.

Exhibit 4.4-7 -- Continued
Potential Special-Status Animal Species Occurrence in SLVSPA

Species Name [a]	Status [b]	Habitat Characteristics
	Federal / State	*(Occurrence within Vicinity of Planning Area)*
Falco columbarius Merlin	-/CSC	Forages in variety of habitats, but not known to breed in California (suitable foraging habitat for wintering individuals in Subareas 1, 2, 4, 5, 6, and 7)
Falco mexicanus Prairie falcon	-/CSC	Canyons, mountains, open grassland (suitable foraging habitat in Subareas 1, 2, 4, 5, 6, and 7 but nesting habitat absent)
Falco peregrinus Peregrine falcon	FE/SE, CP	Canyons, mountains, open grassland (suitable foraging habitat in Subareas 1, 2, 4, 5, 6, and 7 but nesting habitat absent)
Haliaeetus leucocephalus Bald eagle	FE/SE, CP	Coast, lakes, and rivers (nesting, foraging, and resting habitat absent in subareas, reported from Lake Del Valle)
Lanius ludovicianus Loggerhead shrike	*/CSC	Open habitat with scattered trees, shrubs, and other perches (suitable habitat present in all subareas but no nests detected)
Mammals		
Antrozous pallidus Pallid bat	-/CSC	Roosts in caves, crevices, unused structures (old winery buildings in Subarea 7 may provide maternity roost)
Eumops perotis californicus California mastiff bat	*/CSC	Caves and crevices in arid areas with high cliffs (old winery buildings in Subarea 7 may provide maternaty roost)
Plecotus townsendi townsendi Townsend western big-eared bat	*/CSC	Cave, mines, and abandoned buildings (old winery buildings in Subarea 7 may provide maternaty roost)
Taxidea taxus American badger	-/CSC	Grassland, oak savanna, and woodland (suitable foraging habitat in Subareas 1, 4, 6, and 7 but no signs observed)
Vulpes macrotis mutica San Joaquin kit fox	FE/ST	Alkali sink, saltbrush scrub, grassland, and oak savanna (suitable habitat present in Subareas 1, 4, 6, and 7 but not beleived to occur in SLVSPA vicnity)

a *Scientific name*, common name

b Status designations:

Federal:

FE Listed as "endangered" under the federal Endangered Species Act.

FT Listed as "threatened" under the federal Endangered Species Act.

PE Proposed for federal listing as "endangered".

PT Proposed for federal listing as "threatened".

C A candidate species under review for federal listing. Includes species for which the USFWS currently has sufficient biological information to support listing as endangered or threatened species.

* These species were considered to be category 2 candidate species for federal listing until February 28, 1996 when the USFWS revised its status classification system. These species no longer have any candidate designation but are classified unofficially as species of concern and could be added to the candidate list if information demonstrates they warrant listing.

State:

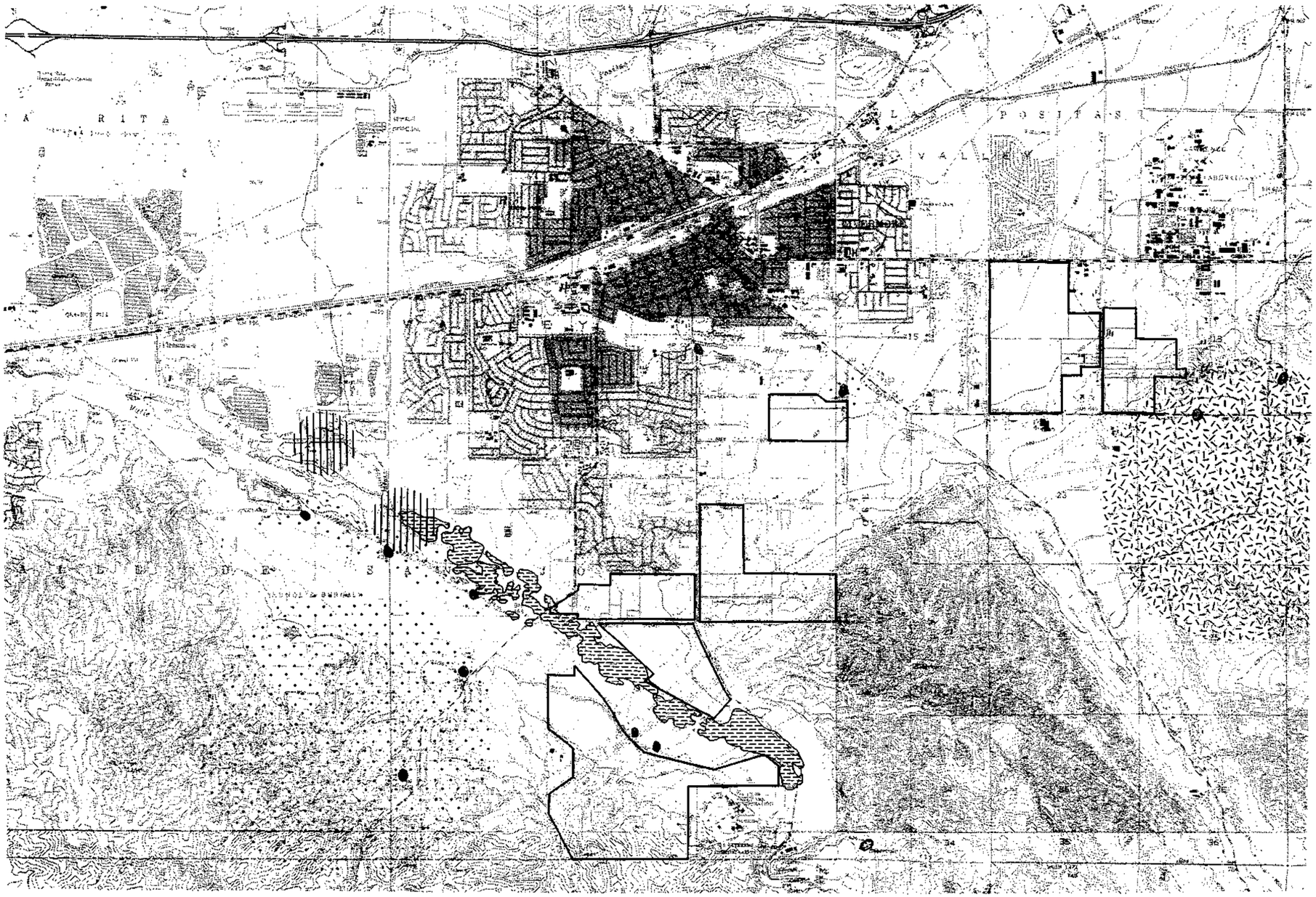
SE An "endangered" species under the California Endangered Species Act.

ST A "threatened" species under the California Endangered Species Act.

CP California fully protected species; individual may not be possessed or taken at any time.

CSC Considered a species of special concern by the California Department of Fish and Game; taxa have no formal legal protection but nest sites and communal roosts are generally recognized as significant biotic features.

Exhibit 4.4-8
Sightings of Special Status Species in Vicinity



Legend:

- Specific Occurence Location- California Tiger Salamander
- General Occurence Location- California Tiger Salamander
- General Occurence Location- Tricolored Blackbird
- Specific Occurence Location- California Red-legged Frog
- General Occurence Location- Burrowing Owl
- Sycamore Woodland

Source:
Samuel McGinnis, 1995;
Environmental Collaborative, 1996;
Californial Department of Fish and Game, 1996

particularly high likelihood of occurrence in these subareas include fragrant fritillary (*Fritillaria liliacea*), Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*), and Brewer's dwarf flax (*Hesperolinon breweri*). The vernal pool in the claypan area also may support endemic species -- such as Contra Costa goldfield (*Lasthenia conjugens*) -- which may have been undetectable by April. Systematic surveys during the appropriate flowering period would be required to confirm the presence or absence of any plant species of concern in Subarea 7 and upper elevations of Subarea 4.

Animal Species of Concern

A number of animal taxa recognized as "special animals" by the CNDDB have been recorded in or are suspected to occur in the vicinity of Livermore. "Special animals" is a broad term which refers to animal species with legal status or those considered significant because of restricted distribution, declining habitat, and other factors. Exhibit 4.4-7 lists special animals known or suspected to possibly occur in the SLVSPA vicinity and provides information on their status and preferred habitat characteristics.

Of the 26 animal species listed in Exhibit 4.4-7, the CNDDB has recorded individuals or distinct evidence of only four species in South Livermore area. They are the California tiger salamander, California red-legged frog, tricolored blackbird, and burrowing owl. Several other birds and mammals occur in the SLVSPA (such as loggerhead shrike, California horned lark, northern harrier, black-shouldered kite, golden eagle, and American badger), but most of these have no legal protective status and are not monitored as closely by the CNDDB. The following discussion summarizes the status and conclusions on the potential occurrence of species of concern in or near the SLVSPA.

California Tiger Salamander Distribution of the California tiger salamander has declined due to conversion of valley and foothill grassland habitat to agricultural and urban uses. For much of the year adult salamanders occupy burrows made by California ground squirrel and other rodents and then migrate to water sources to breed after the first hard rains in the fall. This subspecies breeds in temporary pools and permanent water, usually associated with grassland and open woodlands, where the water source lasts at least through late spring to permit development of larval young. Adults have been observed a considerable distance from possible breeding locations during fall migration, indicating the importance of surrounding upland habitat.

Exhibit 4.4-8 shows the numerous occurrences of California tiger salamander reported in the vicinity of the SLVSPA. These include several breeding locations in the Ruby Hill project site west of Subarea 7, scattered records of migrating adults during the winter rain storms along East Vineyard Avenue, Arroyo Road at Arroyo Mocho, and Marina Avenue at Arroyo Mocho, and the presence of larval young at two recently constructed seasonal breeding ponds in Sycamore Grove Park immediately north of the central ravine in Subarea 7. The two breeding ponds adjacent to Subarea 7 are of particular importance because adult salamanders used these ponds for breeding the first season following their construction, without relocation of individuals or other intervention. It appears that salamanders may use burrows on adjacent Subarea 7 for summer aestivation. Seasonal pools along the intermittent streams and the vernal pool in the claypan terrace in this subarea also may be used for breeding. No adult or larval young were observed in the stock ponds in Subarea 7 during the spring surveys conducted in 1995, but the seasonal pools apparently were not sampled. Without detailed trapping and telemetry studies, an accurate understanding of salamander use of Subarea 7 is not possible. Subarea 7 provides the most suitable breeding habitat for California tiger salamander in the SLVSPA, although undeveloped uplands in other subareas may be used for aestivation, with breeding locations outside the SLVSPA.

California Red-Legged Frog The USFWS recently listed this frog as a threatened species. This frog's preferred habitat consists of permanent ponds with lush shoreline cover where bullfrog and predatory fish are absent. CNDDB records indicate a single occurrence in a stock pond east of Lake Del Valle, although individual California red-legged and foothill yellow-legged frogs (also a species of special concern) have been observed in the past along Arroyo Valle in Sycamore Grove Park. [19]

The stock ponds in Subareas 4 and 7 provide suitable breeding habitat for red-legged frog, but the presence of large bullfrog populations may be preventing use of the ponds for breeding. No adult or larval young were detected in any of the ponds during spring surveys conducted in 1995. Although bullfrog may severely limit the ponds' suitability as breeding habitat, a potential remains that larger adult frogs may spend summer in the permanent ponds and breed in pools along the intermittent streams where bullfrogs are absent.

Western Pond Turtle This species occurs in permanent freshwater ponds, lakes, marshes, and creeks where basking and retreat habitat is present. The pond turtle is aquatic but basks along shorelines and partly submerged logs or rocks. This turtle has been observed in pools along Arroyo Valle in Sycamore Grove Park but was not detected in the stock ponds in Subareas 4 and 7 during the spring surveys conducted in 1995. These ponds provide marginally suitable breeding habitat, particularly four of the ponds in Subarea 7, but the intermittent nature of the drainage connections with the Arroyo Valle may have prevented colonization in some of these ponds. Turtles have been observed in the easternmost stock pond by the property owner [20] and presumably are the native western pond turtle.

San Joaquin Kit Fox It appears that kit fox historically inhabited most of the alkali sink community of the San Joaquin Valley and adjacent valley systems. Kit fox also occupied the lower reaches of many of the surrounding foothill grasslands, extending into western San Joaquin and eastern Alameda and Contra Costa Counties. However, intensive agricultural development, livestock grazing, and use of poison for ground squirrel eradication have greatly reduced the extent of suitable habitat for this subspecies during the past half century. Other factors which may affect kit fox populations include illegal shooting and trapping, road kills, lack of adequate denning sites, and interspecific competition with and predation by coyote and red fox. Kit fox currently occur in remaining alkali scrub and grassland habitat and sporadically occur in savanna, woodland, and suitable agricultural habitat.

The 1995 constraints analysis summarized reported kit fox occurrences and studies to determine its presence or absence in the Livermore vicinity. All of the SLVSPA subareas are located outside the kit fox range mapped by the USFWS in 1990. No evidence of kit fox activity was encountered during systematic surveys for sites west and east of the SLVSPA. The 1995 constraints analysis concluded that kit fox are absent from the subareas and that expanding residential and commercial development in east Livermore makes any future colonization of the SLVSPA highly unlikely.

American Badger This large mammal occurs in grassland and savanna habitat with an abundant supply of prey. Badgers excavate burrows for denning and to extract ground squirrels, gophers, and other prey. This species has declined or been eliminated from large areas of the state due to agriculture and urban development and has been designated a species of special concern by the CDFG. The open grasslands and savanna habitat in Subareas 6 and 7 and the eastern parts of Subareas 1 and 4 provide

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19 Environmental Collaborative conversation with Mike Nickleson, *op. cit.*

20 Environmental Collaborative conversation with Charles Crohare, October 2, 1996.

suitable foraging habitat for badger where ground squirrels are abundant, although no badger diggings or dens were observed during field reconnaissance surveys. The SLVSPA could be used for denning in the future, particularly Subarea 7 where human disturbance is minimal.

Golden Eagle This raptor requires extensive areas of open grasslands as territory for feeding and nesting. Nests are built on cliffs or in trees, preferably overlooking grasslands. Some nesting pairs use the same nest each year while others move between alternative nest locations within their territory. Golden eagles are sensitive to disturbance, particularly at nest locations. This species has been designated as a species of special concern by the CDFG because of habitat loss, harassment and sensitivity to disturbance by humans, and declines in prey species abundance.

Adult golden eagles were observed foraging over the southern part of Subarea 7 during the August 1996 field reconnaissance survey. No nests have been reported in the vicinity of the SLVSPA, and no evidence of any nesting activity was detected during the field reconnaissance. The open grasslands of Subareas 1, 4, 6, and 7 provide good to moderate quality foraging habitat, limited in some areas by small ground squirrel populations.

Burrowing Owl This owl has no legal status under the Federal or State Endangered Species Acts but is protected under the provisions of the Migratory Bird Treaty Act [21] and is recognized as a Species of special concern by the CDFG, as are many of the raptors known to occur in the vicinity. Destruction of California ground squirrel colonies, conversion of pasture land to agricultural and urban development, poisoning, and human disturbance are major reasons for the decline of this species. No known colonies or breeding pairs have been reported in the subareas, although a CNDDB general occurrence record extends just southeast of Subarea 1. Suitable habitat occurs throughout most of the subareas and could be used in the future.

Other Bird Species of Concern Suitable breeding and foraging habitat for several other bird species of concern exists in the vicinity of the SLVSPA, most of which have no legal protective status under the State or Federal Endangered Species Acts but are designated special-concern species by the CDFG. These include numerous raptors, tricolored blackbird, loggerhead shrike, California horned lark, and yellow warbler.

In addition to golden eagle and burrowing owl, the SLVSPA vicinity provides foraging habitat for a number of other raptors, including northern harrier, white-tailed kite, ferruginous hawk, Cooper's hawk, sharp-shinned hawk, merlin, prairie falcon, peregrine falcon, and bald eagle. Active nests of raptors are protected under the Migratory Bird Treaty Act and Section 3503.5 of the State Fish and Game Code. Suitable breeding and nesting habitat for northern harrier and white-tailed kite occurs throughout all of the subareas, but no active nests were observed in 1995 or encountered during the field surveys in 1996. Suitable nesting habitat for resident prairie falcon and peregrine falcon is absent from the subareas. Ferruginous hawk, merlin, and bald eagle are most likely winter migrants and uncommon aerial transients which may forage and roost in the SLVSPA, but essential habitat for these species is absent from the subareas. The lack of extensive brush and dense forest in the subareas most likely accounts for the absence of Cooper's hawk and sharp-shined hawk. An abundance of good foraging habitat for these two raptors exists in the woodlands of Sycamore Grove Park, and individuals potentially could forage over parts of Subareas 6 and 7.

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21 The Migratory Bird Treaty Act does not provide protection for habitat of migratory birds but does prohibit the destruction or possession of individual birds, eggs, or nests in active use without a permit from the USFWS.

The freshwater marsh vegetation along the fringes of the stock ponds in Subareas 4 and 7 provide suitable breeding habitat for the colonial nesting tricolored blackbird. Nesting colonies have been recorded in the gravel quarries southwest of Livermore, including one along Arroyo Valle near the Isabel Avenue crossing. No nesting activity or individuals were observed in 1995 or during the 1996 field reconnaissance surveys, but this does not preclude use of suitable habitat in the future.

Most of the subareas provide suitable foraging habitat for loggerhead shrike and California horned lark, although no nesting activity was noted in 1995 or observed in 1996. California horned lark tend to prefer lightly grazed grassland along ridgelines and open hillsides (such as found in the upper elevations of Subareas 4 and 7). Loggerhead shrike use open grasslands and agricultural fields for foraging and nest in isolated shrubs and small trees.

The sycamore woodland and willow riparian habitat along Arroyo Valle provides suitable breeding habitat for yellow warbler. Warblers occur in other wooded habitat during migration and winter months but are more common in riparian habitat. No detailed surveys for yellow warbler or other songbirds were conducted in 1995, although small numbers potentially could forage in wooded habitats of Subarea 7 during spring and fall migration and, possibly, as an uncommon breeding species as well.

Invertebrates All three of the special-status freshwater shrimp species require vernal pool and swale habitat where the drought resistant eggs from the previous year's generation remain in the bottom substrate and hatch when the pools refill the following spring. The vernal pool in the claypan terrace of Subarea 7 and possibly the vernal depressions and potential seasonal wetlands in Subareas 2, 5, and 6 provide marginally suitable habitat for these invertebrates. Past agricultural activities and intensive trampling by livestock have severely degraded the habitat conditions of these features. No shrimp-like crustaceans were found during extensive dip net sampling of the stock ponds in 1995, but sampling of the vernal pool and seasonal depressions was not performed as part of that survey effort. Detailed surveys by a qualified invertebrate biologist would be necessary to conclusively determine the presence or absence of these species in the subareas. According to survey protocol of the USFWS, the surveys typically must extend through two wet seasons to provide a conclusive determination on presence of absence in a study area.

Bats The 1995 constraints analysis reported observations of both large and small bats foraging near the eastern pond in Subarea 7 and a small Myotis-size bat in the area of the abandoned Olivina Winery buildings. Due to the relative remoteness and current restricted access of these structures, they may be used for roosting by one or more sensitive bat species. No detailed surveys were conducted to determine possible use of the structures by bats. Both pallid bat and California mastiff bat were observed in old winery-related structures on the Ruby Hill project site west of Subarea 7. Structures in the other subareas are frequented too often by humans to be used as maternal roosts for the bat species of concern.

4.4 BIOLOGICAL RESOURCES -- IMPACTS AND MITIGATION MEASURES

Scope of Topics Addressed

The biological resources analysis addresses the overall effects of adopting and implementing the *South Livermore Valley Specific Plan (Draft Plan)* but also focuses on specific concerns raised during the City's public scoping process which was used to further define the contents of this EIR. Most of these concerns were raised in a detailed response to the NOP by representatives of the CDFG. They include:

- Loss and fragmentation of grassland habitat
- Impacts on wetland features (such as creeks, swales, seasonal depressions and pools, and ponds)
- Removal of mature oaks and other native vegetation
- Effects on special-status species, particularly California tiger salamander, California red-legged frog, and burrowing owl

Significance Criteria

The *State CEQA Guidelines (Guidelines)* identify potentially significant environmental effects on biological resources to include:

- Impacts on a population or essential habitat of special-status plant or animal species
- Substantial interference with the movement of any resident or migratory fish or wildlife species
- A substantial reduction in habitat for fish, wildlife, or plants

Although not specifically identified in the *Guidelines* as a potentially significant impact, modifications to wetlands are of great concern to jurisdictional agencies due to the regional and national importance of these features. The cumulative adverse effect of seemingly minor changes to wetlands often can result in major damage to these resources through numerous individual alterations. Therefore, this EIR also considers the loss or substantial modification to existing wetlands to constitute a potentially significant effect.

All impacts identified below are considered significant adverse impacts before mitigation, but all are capable of being reduced to less-than-significant levels through mitigation. As indicated below, the *Draft Plan* contains policies derived from the EIR's biological resources analysis and recommended by the EIR biologist to mitigate impacts. This EIR identifies additional measures which also would be required to augment *Draft Plan* policies. Both types of mitigation (*Plan* policies and EIR requirements) are listed below.

Impacts and Mitigation Measures

Impact 4.4-1 Loss of Non-Native Grassland and Agricultural Cover

Grading for development and cultivation of new subarea vineyards would eliminate much of the non-native grassland plant community and parts of existing agricultural cover, raising concerns about the appropriateness of landscape planting, need for long-term monitoring, and control of open space lands. LTS

Existing vegetative cover would be removed throughout the SLVSPA to accommodate development and other subarea alterations envisaged by the *Draft Plan*. Vegetation would be removed in areas devoted to future residential and commercial development, newly planted agricultural lands, and roadway improvements. Small areas of grassland cover also could be affected by construction of regional trail improvements in Subareas 4 and 7. A total of up to 312 acres would be retained as undeveloped open space or low intensity agricultural land, primarily in the upper elevations of Subareas 4 and 7. Regional open space land in Subarea 4 would encompass 32 acres of grasslands and oak savanna in the southeast part of that subarea. Regional open space in Subarea 7 would include approximately 80 acres of woodland along the northern boundary and a corridor along the central and western drainages which would be dedicated to Sycamore Grove Park. Of the 361 acres of potential agricultural land in Subarea 7, approximately 200 acres of grasslands and scattered woodlands in the southern part of the subarea have been identified as inappropriate for intensive cultivation and suitable as potential grazing land.

Most of the affected vegetation would consist of non-native grassland, dry land crops, and agricultural cover. Only limited disturbance to riparian vegetation, oak woodlands, and mature oaks would occur in the subareas, as discussed in ***Impact 4.4-2***. Existing grassland cover is composed primarily of introduced annual grasses and forbs, commonly found elsewhere in Alameda County and other areas in the state, and direct loss of portions of this plant community would not be considered significant. The effect of this loss of grassland and agricultural cover on the wildlife habitat of the area is discussed under ***Impact 4.4-3***.

After grading in the subareas to implement individual development projects envisaged by the *Draft Plan*, disturbed areas would be developed with roadways, structures, landscaping, or agricultural crops, with the fringe assumed to be reseeded to control erosion and re-establish grassland cover. Ornamental landscaping planted throughout developed areas likely would be composed of both non-native and native species, including a variety of trees, shrubs, and groundcovers. Non-native ornamentals may compete with native species in open space areas, particularly if highly aggressive species (such as eucalyptus and acacia) are planted near the interface with undeveloped hillsides and along riparian corridors. Revegetating graded slopes with a mixture of compatible native and non-native perennial and annual species (rather than a seed mix limited to one or two highly invasive non-native annuals) would enhance the diversity of restored grasslands. Policies 6-14 through 6-16 of the *Draft Plan*, listed below, would serve to mitigate the potential impacts of landscape compatibility and revegetation to a less-than-significant level.

- ***Policy 6-14*** Landscaping and revegetation shall emphasize the use of native drought resistant plant species along the fringe of future development projects in all of the subareas. Landscape design and maintenance shall recognize the ultimate condition of a specific location and provide appropriate plants which can survive and regenerate naturally. Landscape improvements shall be monitored for a minimum of five years until defined plant establishment criteria are achieved. Suitable native plant species for possible use in landscaping plans in or adjacent to open space and rangeland areas include valley oak (*Quercus lobata*), blue oak (*Q. douglasii*), live oak (*Q. agrifolia*), California buckeye (*Aesculus californica*), toyon (*Heteromeles arbutifolia*), California rose (*Rosa californica*), creeping wildrye (*Elymus triticoides*), and purple needlegrass (*Nassella pulchra*).

- ***Policy 6-15*** Non-native ornamental species used in landscape plantings shall be restricted to the immediate vicinity of future residential and commercial uses. Landscaping plans shall not include use of non-native invasive species which may spread into adjacent undeveloped areas. Unsuitable species include blue gum eucalyptus (*Eucalyptus globulus*), acacia (*Acacia* spp.), pampas grass (*Cortaderia selloana*), broom (*Cytisus* spp.), gorse (*Ulex europaeus*), bamboo (*Bambusa* spp.), giant reed (*Arundo donax*), English ivy (*Hedera helix*), German ivy (*Senecio milanioides*), and periwinkle (*Vinca* sp.).

- ***Policy 6-16*** Graded slopes which are to remain undeveloped and without landscape improvements shall be reseeded with a mixture of compatible native and non-native perennial and annual species to increase the diversity of the grassland cover. Highly invasive annuals typically used just for erosion control shall not be used.

Improved access to the hillsides of Subareas 1, 4, and 7 could result in off-road vehicle activity through undeveloped land and designated open space, particularly during construction of specific development projects when obstacles to access have been removed but before introduction of a permanent population which would discourage access is present in the subareas. Off-road vehicle activity could further

damage grassland and other vegetative cover, disturbance to sensitive wildlife features, and contribute to erosion of hillside areas and sedimentation in creeks unless adequate measures are taken to prevent unauthorized vehicle access. Policy 6-9 of the *Draft Plan*, listed below, would serve to mitigate the potential impacts of off-road vehicle activity on undeveloped open space to a less-than-significant level.

- ***Policy 6-13*** In order to prevent further disturbance to grassland cover and other vegetation, vehicles and motorcycles shall not be allowed to travel off designated roadways. Barriers should be provided where vehicle access to open space areas might be possible.

Mitigation Measure 4.4-1 Implementation of Policies 6-13, 6-14, 6-15, and 6-16 contained in the *Draft Plan's* Conservation and Resource Management Element the would mitigate general impacts on vegetation resources and both landscape compatibility and management impacts. No additional measures would be required to mitigate impacts on non-native grassland and agricultural cover which would result from adopting and implementing the *Draft Plan.*

Significance After Mitigation Implementation of these policies as part of all SLVSPA planned development projects would ensure successful re-establishment of vegetative cover and landscape improvements and would provide for replacement and enhancement with native species, thus reducing impacts on general vegetation resources to less-than-significant levels.

Responsibility and Monitoring The *South Livermore Valley Specific Plan* would require sponsors of individual development projects to comply with the relevant policies as conditions of each project's approval. The City shall require all project sponsors to incorporate the policies as mitigation measures when preparing their landscaping and revegetation plans and to provide monitoring as part of long-term management (such as through individual projects' codes, covenants, and restrictions).

Impact 4.4-2 ***Disturbance to Sensitive Natural Communities and Loss of Native Trees***
Development as envisaged by the Draft Plan *would remove mature oaks and other native trees in areas of oak woodland and savanna communities and could disturb remnant native grasslands. S*

The *Draft Plan's* subarea development concepts generally avoid direct removal of most mature native trees by locating urban and agricultural uses away from areas with dense woodland. No sensitive natural communities or mature native trees would be affected in Subareas 2, 3, or 4. The few mature oaks in Subarea 4 would be located in proposed open space well above the planned extent of development. One mature oak in Subarea 1 is located in the vicinity of future residential development. Some tree removal still could occur to accommodate roadways, creek crossings, and development in parts of the remaining subareas. Several isolated trees along road rights-of-way could be affected by roadway improvements if South Vasco Road and Wetmore Road require widening to accommodate increased traffic volumes.

Based on a review of *Draft Plan* development concepts for Subareas 5, 6, and 7, development either would remove or possibly would affect an estimated 87 native oaks and sycamore tress. These include:

- Approximately 44 oaks in the central part of Subarea 7 growing along the proposed roadway and on residential lots

- Five oaks along an intermittent drainage in the northwest part of Subarea 5

- Possibly two oaks near the potential commercial site in the southeast corner of Subarea 5

- All 36 sycamores and oaks between the two Subarea 6 terraces which the *Draft Plan* designates for intensive agricultural use

Most of these trees could be preserved through minor adjustments to roadway alignments or lot lines or through the use of sensitive construction practices. Adherence to the City's Vegetation Preservation Conditions would serve to identify significant trees and shrubs and provide for appropriate preservation and restoration.

Site-specific refinement of grading and other plans designed during preparation of individual development projects for Subareas 5, 6, and 7 would provide opportunities to preserve specific trees to the maximum extent possible. Development setbacks would be necessary to minimize damage to trees to be preserved. This is because trees not removed directly by grading or other development activities could be damaged or affected adversely during construction or as a result of long-term changes to drainage patterns, irrigation and other factors. Mature oaks and other trees are sensitive to changes in drainage patterns, soil compaction, trenching, landscape irrigation, and other modifications within the root zone. Changes in subsurface water and oxygen availability due to agricultural irrigation practices could affect the long-term health of mature trees (such as the mature trees in Subarea 6), but contemporary drip irrigation would serve to minimize this potential impact. Considerable care is necessary to protect trees in the vicinity of grading, building and roadway construction, and landscape improvements. Wounding of trunks and major roots during construction is a common problem which can result in the invasion of harmful organisms and can contribute to structural decay of the trees. Root loss and a reduction in potential rooting area often contributes to long-term tree decline. In general, any disturbance within the dripline should be avoided to prevent adverse changes which may affect the long-term health and condition of trees to be preserved. Policies 6-17 through 6-19 of the *Draft Plan's* Conservation and Resource Management Element, listed below, would serve to partly mitigate potential impacts on native trees. However, further refinement if the proposed development concepts for Subareas 5, 6, and 7 also would be required to fully mitigate impacts on tree resources, as indicated below in ***Mitigation Measure 4.4-2.***

- ***Policy 6-17*** Oaks and other native trees shall be preserved and protected to the maximum extent possible, with adequate replacement provided where tree removal is unavoidable. Sponsors of individual development projects proposed in Subareas 1, 4, 5, 6, and 7 shall design their projects to refine the *Plan's* development concepts in order to protect mature native trees. Surveys shall be performed to identify trees with trunk diameters of four inches or greater (measured at a height of four feet above grade) before submitting tentative maps for individual development projects, and project plans shall map trunk locations within 50 feet of the anticipated limits of grading. Individual native trees shall be preserved by adjusting proposed site alterations, using retaining walls, creating short over-steepened slopes, and other methods.

- ***Policy 6-18*** Individual development projects shall comply with the City's Vegetation Preservation Conditions and appropriate tree protection guidelines to minimize the potential for damage to significant vegetation. The following tree preservation guidelines shall be implemented to minimize the potential for damage from proposed development and construction activities:

    - Avoid grade changes within 1.5 times the width of the tree dripline and prohibit any encroachment closer than 15 feet of the trunk. Restrictions on the limits of grading, adjustments to the final grade of cut and fill slopes, and use of retaining walls shall all be used to protect individual trees worthy of preservation.

- Before any land alterations or construction begin, install temporary fencing along the outermost edge of the dripline of each tree or group of trees to be retained in the vicinity of grading in order to avoid compacting the root zone and mechanical damage to trunks and limbs.

- Prohibit or stringently minimize paving within the tree dripline by using porous materials such as gravel, loose boulders, cobbles, wood chips, or bark mulch where placement of hardscape in the vicinity of trees would be necessary for access.

- Prohibit trenching within the tree dripline and install any utility line required to be located within the dripline by boring or drilling through the soil.

- Minimize the amount of landscape irrigation within the tree dripline by prohibiting turf or any landscaping with high water requirements and by limiting permanent irrigation improvements to bubbler, drip, or subterranean systems.

- Prohibit storage of construction equipment, materials, and stockpiled soils within the tree dripline.

- ***Policy 6-19*** Where removal of native trees is unavoidable, each project sponsor shall prepare a tree replacement program to provide for replacement of native trees with trunk diameters exceeding four (4) inches future development would remove. The tree replacement program shall be incorporated as a component in each project's Landscape Plan and implemented as part of site revegetation and landscaping. Provisions of the tree replacement program shall include the following:

  - Replace oaks at a ratio of 5:1 (ratio of replacement trees to number of trees removed) unless salvaged from the site or grown from a locally-collected seed source (as specified below)

  - Replace all other tree species at a ratio of 3:1

  - Select plant species composition for the tree replacement program consistent with the percentage of each tree species removed

  - Salvage and transplant young trees and saplings (with trunk diameters of less than 12 inches) from within the limits of anticipated grading to use as replacement plantings as part of a project's revegetation program. Use of on-site salvage trees for replacement plantings would preserve younger trees and protect the genetic integrity of the native species. Trees from a local source, particularly seedlings, typically have a higher success rate for re-establishment than nursery stock due to their adaptation to local conditions. Due to the benefits of using local plant material, salvage of young oaks is required where young trees are available on-site. The required replacement ratio is reduced from 5:1 to 3:1 where on-site oaks are used as replacement plantings.

  - Consider collecting on-site seed and growing seedlings for use in the tree replacement program. Seeds should be collected on-site in the fall months, planted in temporary containers, and maintained for a period of one or more years until seedlings are ready for planting. As with salvage plantings, oak seedlings grown from an on-site seed source would be preferable to off-site nursery stock. This program will be encouraged by reducing the required replacement ratio from 5:1 to 3:1 where seedlings from on-site collection are used as replacement plantings.

- Monitor tree replacement plantings for a minimum of five years. If mature salvaged trees die within this time period, replacement plantings shall be made at the respective 5:1 or 3:1 ratios. Any on-site salvage, locally-collected and grown seedlings, or nursery stock plantings lost within this monitoring period shall be replaced at a 1:1 ratio on an annual basis.

In addition to the potential effects on woodland communities and individual native trees, future development also could affect native grasslands in the upper elevations of Subarea 7. The *Draft Plan's* development concept indicates agricultural use could extend up the steep hillsides above planned residential use. In addition, proposed regional trails would pass through the two main ravines in the upper elevations of the subarea. Intensive agricultural use and modifications to accommodate regional trail alignments could affect stands of native grasslands and further reduce the extent of this sensitive natural community type. Policies 6-11 and 6-12 of the *Draft Plan*, listed below, would serve to mitigate the potential impacts of intensive agricultural use and possible open space trail improvements on the sensitive grassland resources of Subarea 7 to a less-than-significant level.

- ***Policy 6-11*** In order to protect native and non-native grasslands and reduce erosion potential, residential development and intensive agricultural use is prohibited on hillside slopes in the southern part of Subarea 7 above an elevation of 650 feet.

- ***Policy 6-12*** Regional trails in the proposed regional park open space area above an elevation of 650 feet in Subarea 7 should use the existing fire trails or be sited to minimize disturbance to native grasslands. If the trail corridor is to deviate from the existing fire trail, further detailed assessment and mapping of grassland cover along the trail corridor shall be conducted by a qualified plant ecologist, and the proposed alignment shall be adjusted before construction of any trail improvements in order to protect stands of native grassland.

Mitigation Measure 4.4-2 Policies 6-11, 6-12, and 6-17 through 6-19 of the *Draft Plan* would need to be augmented by additional measures to fully mitigate adverse impacts on tree resources to a less-than-significant level. The development concept for Subareas 5, 6, and 7 should be refined to protect mature native trees. At a minimum, this should include:

- Adjust the proposed alignment of the roadway crossings of the main creek in the center of Subarea 7 to avoid approximately ten (10) oak trees. All of these trees would be preserved by eliminating the cross-site roadway, as recommended by Mitigation Measure 4.4-3. Relocating the cross-site roadway approximately 300 feet to the north and moving the proposed access to the southwestern development cluster away from the creek and toward the transmission line would serve to protect most of these oaks and minimize disturbance to the channel.

- Adjust the proposed siting of residential lots and, as necessary, eliminate proposed development to protect oaks in Subarea 7. These include approximately nine (9) oaks in the vicinity of the active spring and former fish pond northeast of the unbuilt Olivina Winery estate homesite and 23 trees in the cluster of native and ornamental trees surrounding the homesite.

- Adjust the proposed alignment of roadways and siting of two (2) residential lots in the vicinity of the intermittent drainage to protect the five (5) oaks in the northwest part of Subarea 5.

- Preserve the band of sycamore and oak trees by prohibiting intensive agricultural development on the slope between the two terraces in Subarea 6.

Significance After Mitigation Implementation of the above policies as part of all SLVSPA planned development projects and refinement by sponsors of individual development projects in Subareas 5, 6, and 7 would serve to minimize removal of existing trees, provide replacement plantings where tree removal is unavoidable, and protect native grasslands, reducing potential impacts on trees and sensitive natural communities to less-than-significant levels.

Responsibility and Monitoring The *South Livermore Valley Specific Plan* would require individual development projects to comply with the relevant policies as conditions of approval by the City. Under review and approval by the City, sponsors of individual development projects should adjust the *Plan's* development concepts, as recommended, and should formulate site-specific grading plans to protect existing trees and other significant vegetation when designing their projects. Sponsors of specific development projects proposed in Subareas 5, 6, and 7 should incorporate tree preservation and replacement provisions into their landscape plans, and City conditions of approval for such projects should require sponsors to follow the specified preservation methods during grading and construction. Project sponsors should plant replacement trees when making landscape improvements, and sponsors or their agents (homeowners' associations, commercial site operators) should conduct monitoring as specified in the individual landscape and restoration plans.

Impact 4.4-3 Loss and Fragmentation of Wildlife Habitat

Urban development would alter and fragment wildlife habitat and disrupt wildlife use. S

Future residential, commercial, and agricultural development would alter the existing patterns of wildlife use by replacing substantial areas, primarily of grassland habitat, and possibly disrupting movement patterns of larger terrestrial species. Smaller resident mammals, amphibians, and reptiles would be eliminated from areas devoted to development, and birds and larger mammals would be displaced to adjacent areas, at least temporarily, as individual development projects are built. Species highly sensitive to human activity and disturbance, particularly predatory mammals and birds, may be eliminated from all or large parts of their current range.

Following construction of buildings and installation of landscaping, developed areas eventually would be frequented by wildlife common to suburban areas (such as raccoon, opossum, Norway rat, house sparrow, and house finch), particularly as landscaping matures and provides protective cover and nesting substrate. Deer would be expected to continue foraging along the fringes of developed areas in Subareas 6 and 7 and eventually may become a nuisance to future residents by damaging ornamental landscaping and young native plantings.

Development in each subarea would result in an incremental loss of existing habitat for wildlife as the extent of suburban development expands from central Livermore. In Subareas 1-5, this would not obstruct important movement corridors or links between permanent open space areas. However, development envisaged in Subarea 7 would substantially limit upland access to Sycamore Grove Park for terrestrial wildlife species. The *Draft Plan's* development concept for Subarea 7 includes a band of open space along the northern boundary and approximately 200 acres of open space in the southern part of the subarea. The central ravine would be retained as an open space corridor, but would be immediately bordered by residential development and crossed by the major subarea access road. Residential development would extend along most of the undeveloped northern edge of the subarea, the eastern edge of the main creek through the center of the subarea, and several pockets at the base of the hills. Due to the extent of development, it is highly unlikely that the proposed corridor along the main creek would be used for movement by larger terrestrial species, particularly predatory mammals (such as long-tailed weasel, coyote, and bobcat). Movement of terrestrial species between Sycamore

Grove Park and the undeveloped lands to the south would be diminished substantially and possibly eliminated for species sensitive to human activity, thus affecting the habitat value not only of the site but eventually the parklands as well. Policies 6-20 and 6-21 of the Draft Plan, listed below, would serve to partly mitigate potential impacts of development on wildlife habitat. However, further refinement of the proposed development concept for Subarea 7 also would be required to fully mitigate impacts on wildlife resources, as indicated below in ***Mitigation Measure 4.4-3.***

- ***Policy 6-20*** In order to minimize disturbance to important wildlife habitat, new development shall protect and restore native vegetation and sensitive habitat features (such as creek corridors and wetlands). Development and intensive agricultural uses shall be set back a minimum of 100 feet from the centerline of intermittent and perennial streams which support woodland and riparian vegetation or serve as important wildlife movement corridors. Development shall be set back a minimum of 50 feet from smaller drainages and seasonal wetlands to be retained in the vicinity of proposed development. Where stream crossings are required, bridges or oversized culverts shall be used to minimize disturbance to wildlife movement.

- ***Policy 6-21*** Due to the sensitivity of Subarea 7 and its critical function as a habitat link between Sycamore Grove Park and undeveloped grazing lands to the south, a creek restoration plan shall be prepared and implemented to enhance the wildlife habitat value of the lower elevations of the main creek and smaller intermittent stream east of the old winery buildings on the site. The plan shall be prepared as a component of the overall Landscape Plan for Subarea 7, with plantings restricted to native species associated with riparian and woodland habitat of the Livermore area. The plan shall be prepared by a qualified habitat restoration specialist and provide for a mosaic of native woodland, scrub, and grassland cover within these two creek corridors. It shall include provisions to control human access to these sensitive habitat features and for long-term maintenance and establishment of protective cover to improve the function of the creeks as movement corridors for wildlife as the surrounding lands are developed with residential and agricultural uses.

No additional policy measures would be required of future development in Subareas 1-6 to mitigate the wildlife resource effects discussed above. However, the following measure would be required to mitigate impacts on wildlife resources with implementation of the Advisory Committee's development concept in Subarea 7. The measure was not incorporated into Subalternative 1 (Advisory Committee's 304 Units) analyzed in the main text of the EIR but is reflected in Subalternatives 4 (226 Units), 5 (205 Units), and 6 (159 Units). Subalternatives 4, 5, and 6 were formulated after the EIR biologist analyzed the Advisory Committee's recommended concept. All Subarea 7 Subalternatives are assessed in ***Chapter 5.0 Alternatives.*** Policies 6-20 and 6-21 would need to be augmented by this additional measure in order to mitigate significant adverse impacts expected with development of Subalternative 1 (Advisory Committee's 304 Units).

Mitigation Measure 4.4-3 All development concepts for Subarea 7 should be revised to maintain (or, if provided, should retain) an upland link for terrestrial wildlife movement between Sycamore Grove Park and the undeveloped grazing lands to the south. This should include the following modifications and development restrictions:

- Restrict residential development to outside the central part of the subarea -- the area which extends from the transmission lines (west) to the smaller intermittent stream which enters Sycamore Grove Park approximately 400 feet east of the old winery buildings (east)

- Set intensively managed agricultural uses away from sensitive features to preserve grassland cover

and allow for restoration of native riparian vegetation. Provide agricultural setbacks of:

- A minimum of 100 feet from the top of the bank of the smaller intermittent stream and around the active spring at the eastern edge of the recommended residential development restriction area

- A minimum of 100 feet from the eastern top of bank and a minimum of 300 feet from the western top of bank to the main creek channel through the center of the site

Also restrict agricultural and residential use from the upland habitat between the two branches of the main creek south from their confluence at an elevation of approximately 560 feet in order to provide a broad uninterrupted band of grassland habitat into the proposed open space lands in the southern part of the site.

- Control access to the main creek through the center of Subarea 7 to minimize disturbance to wildlife and improve habitat value of the corridor. Limit human access within the creek channel by establishing an improved trail on only one side of the creek and its upper tributaries. Locate the trail alignment outside the deeply incised channel banks and avoid areas of dense shrubs of mature trees. If grazing is to continue on the site, restrict cattle from the main creek channel by installing three-strand barbed wire fencing along the top of bank.

- Provide access to residential development in the western half of Subarea 7 from Foley Road as envisaged by the Subalternative 1 development concept but provide access to residential development in the eastern half of Subarea 7 from Arroyo Road at the existing in-channel crossing of Arroyo Valle. This would require construction of a bridge across Arroyo Valle which could have secondary impacts on riparian vegetation and essential habitat for California tiger salamander, California red-legged frog, and western pond turtle, as discussed below.

Significance After Mitigation Implementation of the above policies as part of all SLVSPA planned development projects and refinement by the sponsor(s) of individual development project(s) in Subarea 7 would serve to reduce impacts on wildlife resources to less-than-significant levels but would result in secondary impacts which, in turn, could require additional mitigation.

One secondary effect (noted above) would be the impact on sensitive riparian habitat and special-status species from building a bridge across Arroyo Valle. Because providing a permanent bridge crossing at this location would eliminate vehicular activity from within the creek channel, it eventually might improve the quality of aquatic habitat at this location after the initial period of disturbance. While the permanent benefits potentially could off-set temporary impacts, neither the short- nor long-term effects could be identified precisely and accurately quantified in the absence of a detailed bridge design.

Another secondary impact would be to split the continuous band of parkland along Arroyo Valle east of Subarea 7 which extends from Sycamore Grove Park to Veterans Park. While access to the eastern part of Subarea 7 presently bisects this otherwise undisturbed corridor, residential development in the subarea would change the current occasional use to regular daily use by subarea residents (see the ***Chapter 5.0*** analysis of Subalternatives 4, 5, and 6).

Other secondary impacts of this mitigation measure would be to reduce both the residential development and agricultural land use potential of Subarea 7. The measure's expanded open space corridor in the central part of the subarea would provide visual open space but not open space for active recreational

use in order to prevent disturbance and protect habitat values.

Without implementation of Mitigation Measures 4.4-3, the impact on wildlife resources from Subarea 7 development according to Subalternative 1 would remain significant and unavoidable.

Responsibility and Monitoring The *South Livermore Valley Specific Plan* would require individual development projects to comply with the relevant policies as conditions of approval by the City. The City should adopt a development concept for Subarea 7 which reflects the recommendations in Mitigation Measure 4.4-3 before approving the *Final Plan* and should require implementation of this measure as a condition of future Subarea 7 development. The sponsor(s) of Subarea 7 development should design future projects to refine and adjust the *Plan's* development concept consistent with the relevant policies and Mitigation Measure 4.4-3.

Impact 4.4-4 Disturbance to Wetlands and Other Waters
Planned development would eliminate scattered areas of seasonal wetlands and affect a limited area of unvegetated other waters. LTS

Potential impacts on wetlands would include the loss of scattered seasonal wetlands within the limits of grading, direct modifications to creek channels to accommodate crossings, and indirect changes associated with the increased potential for erosion and water quality degradation. Potential erosion and degradation of the wetland and riparian habitat may result from increased urban runoff volumes and degraded water quality associated with proposed development. Without implementation of adequate erosion control measures, soils exposed during grading and construction would contribute to increased sediment loads in creek and drainages. Increased urban pollutants (such as petroleum products from automobiles and fertilizers, herbicides, and pesticides associated with landscape maintenance and expanded agricultural production) may contribute to long-term degradation of water quality.

Anticipated grading to accommodate residential, commercial, and agricultural development would affect possible seasonal wetlands in Subareas 2, 4, 5, 6, and 7. A detailed wetland delineation would be required to accurately determine the extent of seasonal wetlands affected by development. At a minimum, a delineation would address the possible wetland features indicated in Exhibits 4.4-1, 4.4-3, 4.4-4, and 4.4-5. These include:

- The scattered seasonal wetlands in Subarea 2
- The intermittent drainage and two large seasonal wetland areas in Subarea 5
- The swale and drainage channel in the mid-elevations and possibly much of the lower Subarea 6 terrace
- The vernal pool and drainages in Subarea 7

Internal access in Subarea 7 would cross the central drainage in three locations and would affect wetlands and other waters associated with the intermittent creek. Policies 6-23 and 6-24 of the *Draft Plan's* Conservation and Resource Management Element, listed below, together with agency coordination required by Policy 6-22, would serve to fully mitigate potential impacts of development on wetland resources to a less-than significant level.

- ***Policy 6-23*** Wetlands shall be accurately identified and avoided by proposed development to the extent feasible. Where possible, this shall include redesign of site-specific infrastructure improvements and through relocation of elimination of lots in individual development projects.

Development and intensive agriculture shall be set back at least 100 feet from all wetlands to be preserved or created. A detailed wetland delineation shall be conducted by a qualified wetland specialist for each subarea to accurately determine the extent of wetlands and other waters. Wetland delineations shall be conducted, and verification with the Corps required by Policy 6-22 completed prior to submittal of a Tentative Subdivision Map.

Where disturbance and loss of wetlands cannot be completely avoided, a detailed wetland protection, replacement, and restoration plan shall be prepared by a qualified wetland specialist which meets with the approval of jurisdictional agencies and the City. Some loss of degraded, isolated seasonal wetlands with poor habitat value is anticipated as part of implementation of the *Plan*. Each wetland mitigation plan shall clearly identify the total wetlands and other jurisdictional areas affected by individual development projects and agricultural expansion in the affected subarea and provide for re-establishment, enhancement, and / or replacment of wetland habitat. Each wetland mitigation plan shall include the following details:

- Identify the location(s) of mitigation areas. Mitigation for loss of existing wetlands shall be provided at a minimum replacement ratio of 3:1 and shall create or restore wetlands with a higher habitat value. Wetland replacement habitat shall be created on-site or, alternatively, in Sycamore Grove Park as part of a consolidated areawide wetland mitigation and enhancement program. Replacement wetlands shall be consolidated to the degree possible thereby improving the value of the currently scattered wetlands.

- Specify performance criteria, maintenance, and long-term management responsibilities, monitoring requirements, contingency measures, and funding. Monitoring shall be provided for a minimum of five years and continue until the performance criteria are met.

- Define site preparation and revegetation procedures, an implementation schedule, and funding sources to ensure long-term management of the overall wetland mitigation plan.

- ***Policy 6-24*** A detailed erosion and sedimentation control plan shall be submitted with any application for tentative subdivision map approval. The plan shall include measures to control erosion of stockpiled earth and exposed soil, provide for revegetation of graded slopes before the first rainy season following construction, and specify procedures for monitoring of the plan's effectiveness. The plan shall be reviewed for adequacy by the Engineering Division, and plan compliance shall be made a condition of approval for the tentative map and all individual development projects within the area covered by the plan.

Modifications to drainage channels would be subject to jurisdictional review and approval by the CDFG, and the elimination or "filling" of the scattered seasonal wetlands and other waters associated with drainages would require approval by the Corps. Further review by representatives of these agencies would focus on the adequacy of avoidance, replacement, and enhancement efforts to mitigate disturbance to existing wetlands and also provision of new wetlands and native plantings to replace any native vegetation removed to make improvements. The objective of these agencies is to ensure no net loss of either habitat acreage or value. Depending on the extent of disturbance and quality of affected habitat, required mitigation could vary from simple in-kind replacement to a wetland replacement ratio as high as 3:1. Policy 6-22 of the *Draft Plan*, listed below, would require coordination with jurisdictional agencies and, together with Policies 6-23 and 6-24, would serve to fully mitigate potential impacts on wetland resources.

- ***Policy 6-22*** All modifications to potential wetlands and other waters, including filling of drainage swales, seasonal wetlands, and creek crossings, shall be coordinated with representatives of the CDFG and Corps, as required by State and Federal law, to ensure that all mitigation requirements and any design modifications are incorporated into individual development projects during the initial stages of project review.

Mitigation Measure 4.4-4 Implementation of the above policies contained in the *Draft Plan* would mitigate impacts on jurisdictional waters to less-than-significant levels. No additional measures would be required to mitigate impacts on wetland resources.

Significance after Mitigation Implementation of these policies as part of all SLVSPA planned development projects would reduce potential impacts on wetland and surface water resources to less-than-significant levels. In order for these policies to be effective in subareas with multiple ownerships, landowners / prospective developers would need to phase their projects to cooperate with other subarea owners / developers to conduct wetland and jurisdictional delineations before formulating their own plans.

Responsibility and Monitoring The *South Livermore Valley Specific Plan* would require individual development projects to comply with the relevant policies as a condition of approval by the City. Prospective developers should design their projects to refine the *Plan's* development concept and should formulate site-specific grading plans to protect existing wetlands. Wetland preservation and replacement provisions should be incorporated into individual development plans, with monitoring provided as specified in the wetland plans. Coordination and approval by jurisdictional agencies must be completed prior to any disturbance which would affect jurisdictional waters in each subarea.

Impact 4.4-5 Modification and Elimination of Habitat for Special-Status Species

Future development would affect habitat suitable for a number of special-status species, including California tiger salamander, burrowing owl, and numerous raptors. LTS

Future development in the subareas would reduce the available habitat for a number of special-status species and could affect essential habitat features (such as breeding sites). Of particular concern is the effect of development on suitable habitat for California tiger salamander and burrowing owl. Grading activities could eliminate breeding pools and burrow habitat used for summer aestivation by California tiger salamander and nesting by burrowing owl. While no known burrowing owl colonies have been reported in any of the subareas, suitable habitat occurs in Subareas 1, 2, 4, 5, 6, and 7, and development would eliminate both foraging habitat and possibly nesting locations. Detailed surveys typically are required to confirm use by burrowing owl, and owls possibly could use new locations for nesting in the future.

Potential effects on California tiger salamander could include direct loss of breeding and summer aestivation habitat and creation of barriers to migrate to winter breeding locations. The presence of larvae in the newly constructed breeding pools in Sycamore Grove Park provides an indication that parts of Subarea 7 may be used for breeding and aestivation. Detailed surveys would be necessary to determine conclusively whether salamanders use Subarea 7 and suitable habitat in other subareas and to determine the affects of development on breeding habitat, aestivation sites, and movement corridors. Recreational use along creeks and adjacent uplands (such as the proposed regional trail through the lower elevations of Subarea 7) may contribute to the likelihood of an unauthorized "take" of individual salamanders. Harassment by children and predation by pets could become a serious problem, particularly where essential habitat borders residential development and improved parks.

Suitable habitat for a number of other special-status species could be affected by development in Subareas 7, including California red-legged frog, western pond turtle, tricolored blackbird, fairy shrimp, and bat species of concern. The intermittent creek through the central part of the subarea and the perennial creek along the western boundary could be used for dispersal by California red-legged frog and western pond turtle. As with the California tiger salamander, individuals of these two species could be affected by grading in the immediate vicinity of the creeks and ponds, harassment from children, or predation from pets. The vernal pool may support one or more of the fairy shrimp species, and disturbance to the pool could result in a take of this endangered species. Similarly, the potential seasonal wetlands in Subarea 7 and Subareas 2, 5, and 6 provide marginal habitat for the fairy shrimp species of concern, and modifications or elimination of these features also could result in "take", if the invertebrate species of concern are present. The development concept envisaged by Subalternative 1 would retain all of the subarea's existing stock ponds, thus preserving the potential breeding habitat for tricolored blackbird. Residential development generally would be located a sufficient distance from each of these ponds to minimize the potential for direct disturbance to these features. No direct impacts to the two abandoned winery buildings are anticipated, and they could continue to provide suitable rooting habitat for bat species of concern. It is possible that one or both of these structures could be restored by the LARPD in the future, but no specific plans have been proposed. Policy 6-25 of the *Draft Plan*, listed below, which requires supplemental surveys for special-status species and preservation of essential habitat, would serve to mitigate the potential impacts of development on these special-status species of concern to a less-than-significant level.

- ***Policy 6-25*** Essential habitat for special-status species shall be accurately identified and avoided by proposed development to the extent feasible. Where possible this shall include redesign of site-specific infrastructure improvements and through relocation and / or the elimination of lots within designated development areas. Confirmation surveys shall be performed to determine whether special status plant and animal species occur within certain subareas where absence has not been confirmed. This shall include:

  - Systematic rare plant surveys for all plant species of concern in Subarea 7
  - Surveys of suitable vernal pool and swale habitat in Subareas 2, 4, 5, 6, and 7 for the fairy shrimp species of concern
  - A survey of the vernal pool in Subarea 7 to determine if this feature is used for breeding by California tiger salamander

  If any special status species are encountered, disturbance to essential habitat shall be avoided to the extent feasible. Where disturbance and loss of essential habitat cannot be avoided completely, a detailed habitat protection, replacement, and restoration plan shall be prepared and implemented by a qualified biological specialist which meets with the approval of jurisdictional agencies and the City.

The value of the subareas and adjacent undeveloped lands to a number of other special-status species would be reduced due to the conversion of suitable foraging habitat and an increase in human activity and disturbance. This would include suitable habitat for American badger, black-shouldered kite, northern harrier, loggerhead shrike, horned lark, prairie flacon, peregrine falcon, ferruginous hawk, and merlin. However, no known nests or essential denning habitat would be eliminated. Although no direct evidence of San Joaquin kit fox use was encountered during surveys, a remote possibility remains that dispersing individuals could be at risk from construction activities as development proceeds in the subareas, particularly at the fringe of the SLVSPA. It also is possible that new nests

or dens could be established within areas planned for development during the 15- to 25-year buildout period. Pre-construction surveys would be required to confirm the presence or absence of species of concern and to define appropriate development restrictions at that time, if additional essential habitat is encountered. Policy 6-26 of the *Draft Plan*, listed below, would serve to mitigate the potential impacts of development on possible raptor nesting activity to a less-than-significant level.

- ***Policy 6-26*** Pre-construction raptor surveys shall be conducted by a qualified wildlife biologist in the respective subarea before initiation of any development project in order to determine the presence or absence of active raptor nests which could be disturbed or lost with project implementation. The required pre-construction nesting surveys and construction restrictions shall include the following elements:

    - Conduct each survey 30 days before any grading or other habitat modifications. Confirmation surveys on presence or absence of burrowing owl ground nesting colonies shall be required on all subareas at any time during the year to ensure absence of any resident owls. Due to the presence of trees and possible use by tree-nesting raptors, surveys in Subareas 5, 6, and 7 shall also determine whether any nests occur in trees within 300 feet of proposed development if grading or other habitat modifications are proposed during the breeding season of tree nesting raptors (from March 1 through August 15).

    - If an active raptor nest is encountered, establish an appropriate buffer with a minimum distance of 300 feet around the nest location, as determined in consultation with representatives of the CDFG and USFWS to ensure compliance with the provisions of the State Fish and Game Code and the Migratory Bird Treaty Act. The perimeter of the buffer zone shall be flagged in the field at 50-foot intervals, and all construction activities, including grading, tree removal, equipment storage, and stockpiling of soils, shall be prohibited within this buffer zone.

    - Prohibit construction activities within the designated buffer zone until the wildlife biologist determines that breeding was unsuccessful, that the young have fledged from the nest, or that a CDFG-approved relocation plan has been implemented successfully

    - Prohibit construction activities within the designated buffer zone, including removal of any nest tree or burrow, until the wildlife biologist submits written confirmation on the status of nesting activity to the City Planning Department

No special-status plant species were encountered during the 1995 field surveys, and, due to the extent of past disturbance, no populations of species of concern are suspected to occur in Subareas 1, 2, 3, 5, and 6. The upper elevations of Subarea 4 and much of Subarea 7 appear to be less disturbed, and a possibility remains that populations of one or more species of concern could be adversely affected by development. Residential and agricultural development in Subarea 4 would be confined to an elevation below 650 feet and would not affect potential habitat for special-status plant species. While most development in Subarea 7 would be located in areas which appear highly disturbed, some areas continue to support native species which could include special-status species (such as the roadway crossing of the intermittent creek in the central ravine and native grasslands above an elevation of 650 feet in elevation). The vernal pool in the western claypan terrace also could support plant species of concern.

Several of the trees which might be removed to accommodate development are mature valley oak, a species previously included on List 4 of the CNPS *Inventory*. Although valley oak has no legal protective status, these and other mature trees should be preserved to the degree possible. The black

walnut trees in the SLVSPA are of agricultural and ornamental origin and, therefore, are not considered of special-status. Assuming that *Draft Plan* policies on minimizing the loss of mature trees and providing for the re-establishment of native vegetation with locally available plant materials are implemented successfully, removal of individual valley oak trees would not be considered a significant adverse impact.

Mitigation Measure 4.4-5 Implementation of the above policies contained in the *Draft Plan* would mitigate impacts on special-status species to less-than-significant levels. No additional measures would be required to mitigate impacts on special-status species.

Significance after Mitigation Implementation of these policies as part or all SLVSPA planned development projects would ensure potential impacts on special-status species are reduced to less-than-significant levels.

Responsibility and Monitoring The *South Livermore Valley Specific Plan* would require individual development projects to comply with the relevant policies as a condition of approval by the City. Supplemental surveys for special-status species in Subarea 7 and pre-construction surveys for raptor nests in all other subareas would serve to confirm presence or absence of essential habitat. Project sponsors should coordinate with and obtain approval from jurisdictional agencies in order to ensure the adequacy of any detailed mitigation plans and construction restrictions.

4.5 TRANSPORTATION AND CIRCULATION -- THE SETTING

Introduction

The section of the EIR presents an assessment of impacts from buildout according to the *South Livermore Valley Specific Plan (Draft Plan)* in relation to conditions projected for the year 2010. The year 2010 was selected for the buildout analysis because the tool used to project future traffic conditions -- the Tri-Valley Traffic Model -- has been developed for that year. The City of Livermore and other member jurisdictions of the Tri-Valley Transportation Council (TVTC) have authorized this model for use in long-range transportation planning and traffic impact analysis. Because the *Draft Plan* is expected to build out over a 15- to 25-year period (by about year 2020), this analysis is conservative in projecting that impacts would result earlier than they are likely to occur.

In addition to the intersection and local roadway impact analysis, this section provides an assessment of the Alameda County Congestion Management Agency's CMP network which consists of freeways and State Routes in the vicinity of the South Livermore Valley Specific Plan area (SLVSPA). This analysis was performed for both year 2000, as required by the CMA, and year 2010. The CMA requires the year 2000 analysis because it corresponds to the CMA's seven-year Capital Improvement Plan (presently scheduled through the year 2002) and because the CMA's traffic model currently projects traffic for the year 2000. The year 2000 analysis assumes that the SLVSPA would be 20 percent built out which corresponds to the reasonably foreseeable level of building that could occur by the year 2002. The 2010 CMA analysis was performed with the Tri-Valley Traffic Model which is approved for use by the CMA.

The subsection on ***Impacts and Mitigation Measures*** first presents the year 2010 analyses followed by the more limited CMA year 2000 analysis.

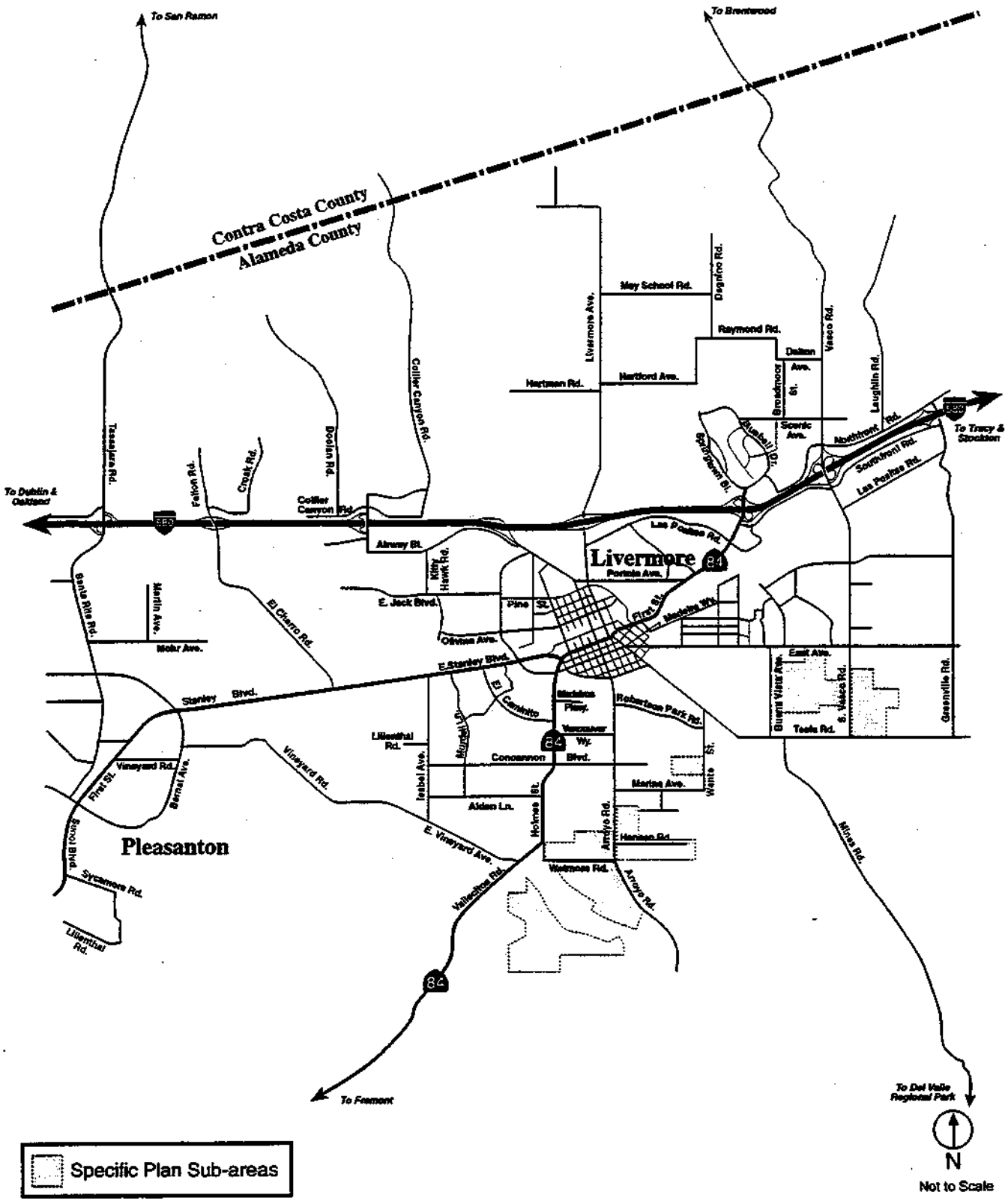
The traffic study area for the year 2010 analysis is bounded by the roadways and intersections selected for quantitative analysis shown in Exhibit 5.4-3. The locations for quantitative analysis were chosen to ensure that impacts on both local and key regional facilities were identified. The study area boundaries include First Street at North Mines Road (north), Arroyo Road at Wetmore Road (south), South Vasco Road at East Avenue (east), and Vallecitos Road at Vineyard Avenue (west).

The traffic study area for the CMA year 2000 analysis includes Interstate 580 (I-580) between Vasco Road (east) and Interstate 680 (I-680)(west), I-680 immediately north and south of I-580, and State Route 84 (SR 84) between I-580 and I-680.

The following subsections describe the existing transportation system in the study area, improvements planned to the transportation system (exclusive of proposed *Draft Plan* improvements), and projected future conditions without SLVSPA development. The discussion covers all modes of transportation -- automobile, public transit, bicycle, pedestrian, and equestrian.

Exhibit 4.5-1 shows the SLVSPA in relation to the regional and local roadway network.

Exhibit 4.5-1
SLVSPA Location



Existing Roadway Network

The following existing major roadways serve the study area. (Improvements planned to several roadways are described under ***Future Roadway Network*** farther below.)

Regional Roadways

Interstate 580 (I-580) provides for east-west travel between Livermore and the San Francisco Bay Area (west) and the San Joaquin Valley (east) via the Altamont Pass. I-580 has eight travel lanes in the Livermore area. I-580 serves as a major commuter route between the Central Valley and the San Francisco Bay Area and provides connections to I-680 in Pleasanton (west) and Interstate 5 (I-5) in Tracy (east). I-680 is a major north-south facility serving travel through Alameda, Contra Costa, and Santa Clara counties, and I-5 serves north-south travel throughout California. In addition to these interstate facilities, I-580 provides access to State Route 84 (SR 84) in Livermore at the First Street / Springtown interchange.

The peak directions along I-580 are westbound during the morning peak period and eastbound during the evening. In the Livermore area, traffic congestion is not significant enough to cause excessive delays. However, west of Dougherty Road and at the I-580 / I-680 interchange, traffic congestion is significant during both morning and evening commute hours.

North of the I-580 / I-680 interchange, I-680 is an eight-lane freeway consisting of three mixed-flow lanes and an high occupancy vehicle (HOV) lane in each direction. South of the interchange, there are three travel lanes in each direction.

SR 84 crosses the Livermore area in a southwest-northeast direction and provides a connection between I-680 and I-580 via interchanges in Sunol and Livermore. In southern Livermore, SR 84 follows Holmes Street and is a major north-south roadway consisting of two to four travel lanes. South of the City boundary, SR 84 runs along Vallecitos Road and is a two-lane rural roadway which traverses hilly terrain. The posted speed limit is 50 miles per hour (mph) south of East Vineyard Avenue. With SR 84 serving as major regional travel route between I-580 in Livermore and San Jose, in addition to serving local Livermore traffic, daily volumes along SR 84 currently are at or near the ultimate traffic carrying capacity for this two-lane roadway.

Local Roadways

Most local roadways in the study area have two travel lanes of eleven to twelve feet wide and three- to six-foot gravel or paved shoulders. Exceptions are East Avenue and Holmes Street north of Concannon Boulevard which each provide four travel lanes. Exhibit 4.5-2 shows the SLVSPA subareas in relation to the local roadway network. Exhibit 4.5-3 shows the lane configurations at the study intersections along the local roadways. The key area roadways are described in more detail below.

North-South Roadways

Isabel Avenue is a two-lane roadway which connects East Stanley Boulevard to East Vineyard Avenue. Travel lanes are ten feet wide with one-foot shoulders. Side streets along Isabel are controlled with stop signs, and there are stop signs on Isabel at its northern terminus (Stanley Boulevard) and southern terminus (East Vineyard Avenue). There is no posted speed limit on Isabel Avenue.

Exhibit 4.5-2
SLVSPA Subareas

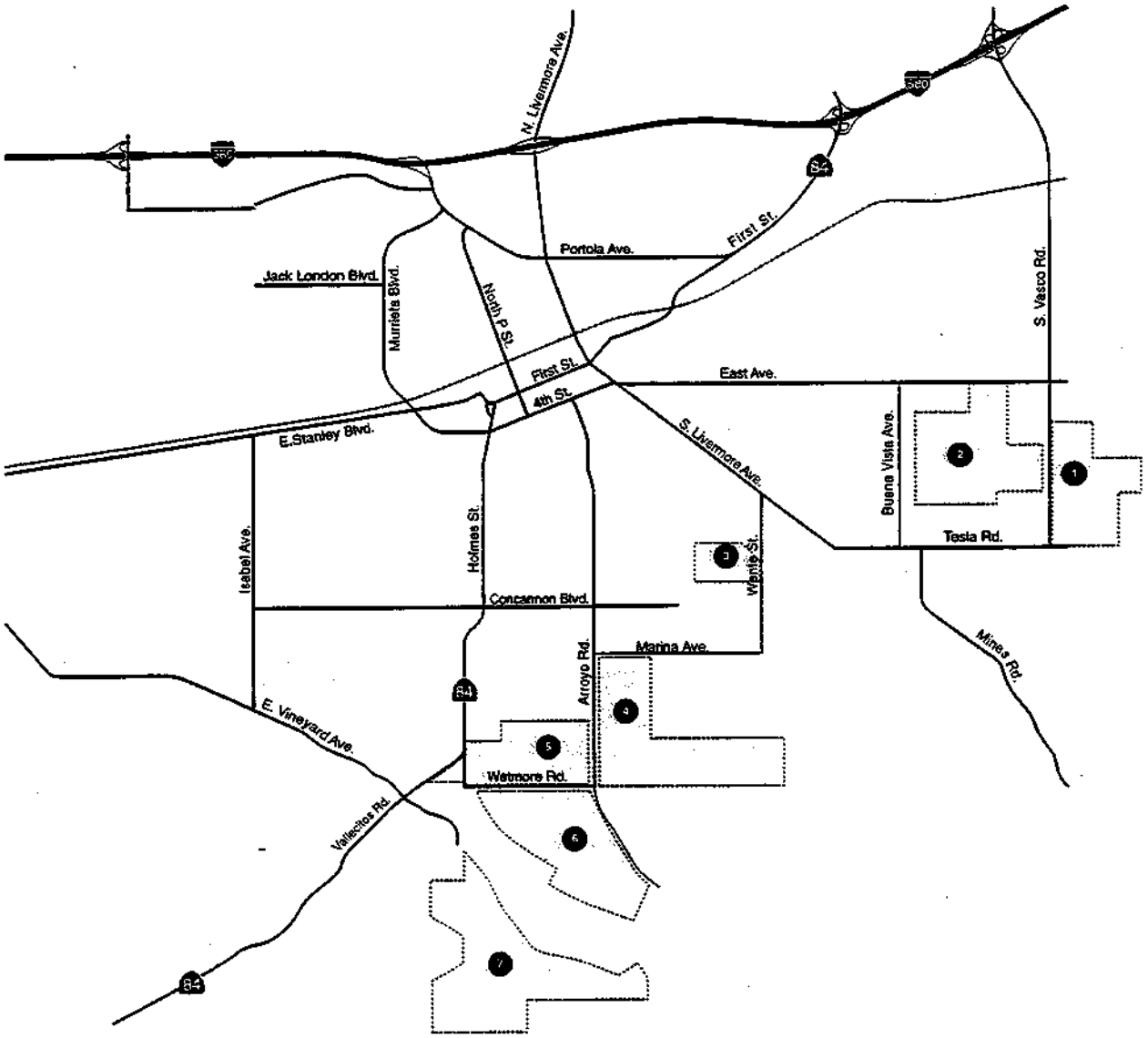
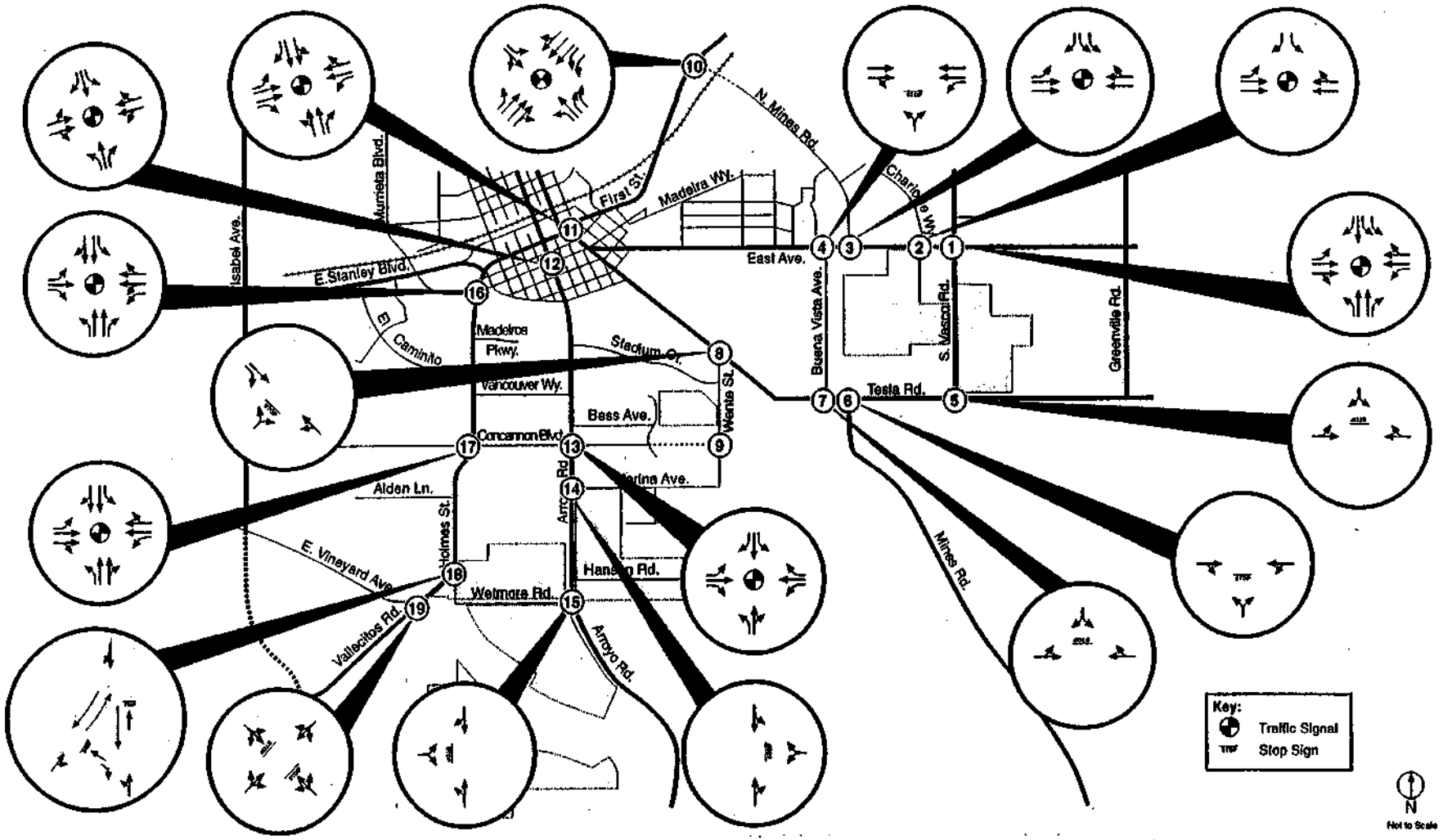


Exhibit 4.5-3
Existing Intersection Configuration and Control



Vallecitos Road runs from I-680 to Holmes Street and is designated SR 84. (The description of SR 84, above, discusses Vallecitos Road further.)

Holmes Street runs from the western part of downtown Livermore south to Vallecitos Road and continues for a short distance farther south to an "L" intersection with Wetmore Road. Holmes Street is designated as SR 84 from Vallecitos Road to First Street. North of Alden Lane, Holmes Street is a four lane divided arterial. South of Alden Lane, Holmes Street narrows to two lanes with a painted median for left-turn lanes. Travel lanes are twelve feet wide in the study area. Traffic signals are located at the intersections of Concannon Boulevard, Vancouver Way / El Caminito, Murrieta Boulevard, and Catalina Drive. The Holmes Street / Vallecitos Road intersection has an oblique "T" configuration with northbound Holmes Street movements to Holmes (northbound) and Vallecitos (southbound) controlled by stop signs. The posted speed limit is 40 mph north of Alden Lane, 45 mph between Alden Lane and Vallecitos Road, and 30 mph between Vallecitos Road and Wetmore Road. Holmes runs through the western end of SLVSPA Subarea 5.

Foley Road is a private road which runs between Vallecitos Road and the Foley ranch, providing access to SLVSPA Subarea 7. The roadway has an approximately 20-foot paved cross section to the Foley Ranch gate and also provides access to the Alameda County Flood Control and Water Conservation District's Zone 7 Del Valle Water Treatment Plant just north of the ranch gate.

Arroyo Road runs from central Livermore south to Del Valle Dam. The roadway runs between SLVSPA Subareas 4 and 5 and forms the eastern boundary of Subarea 6. The roadway has two twelve-foot travel lanes with a striped median north of Concannon Boulevard and south to Marina Avenue. The west side of Arroyo Road is developed with a curb and gutter between Marina Avenue and the northern edge of Subarea 5, and a curb and gutter are provided along the east side of Arroyo Road north of Latour. Bike lanes are provided as far south as Superior Drive. South of these improvements, Arroyo Road consists of two twelve-foot travel lanes and two- to four-foot paved shoulders. The posted speed limit on Arroyo is 35 mph in the vicinity of Concannon and Marina and 50 mph south of Superior Drive.

Wente Street connects South Livermore Avenue and Arroyo Road via Marina Avenue. Wente Street has two ten-foot travel lanes and six-foot gravel shoulders. Wente Street connects South Livermore Avenue with a "T" intersection where the northbound Wente Street movements are controlled by a stop sign. At the Marina Avenue "L" intersection, there are no stop-controlled movements. There is no posted speed limit on Wente Street, but at the curved "L" connection to Marina Avenue the presumed speed limit is 35 mph (the posted speed limit on Marina).

Buena Vista Avenue is a two-lane rural County roadway with fronting residences. Travel lanes are approximately ten to eleven feet wide with one-foot shoulders. It extends from East Avenue to Tesla Road with one-way stop-controlled "T" intersections at both ends. The posted speed limit on Buena Vista Avenue is 25 mph.

South Vasco Road is a two-lane rural roadway between Tesla Road and East Avenue. Travel lanes are approximately eleven feet wide with six- to eight-foot gravel shoulders. South Vasco Road connects Tesla Road with a one-way stop "T" intersection and East Avenue with a signal. North of East Avenue, South Vasco Road widens to four lanes and provides access to I-580 farther north. South Vasco runs between SLVSPA Subareas 1 (east) and 2 (west). The posted speed limit is 45 mph at the northern end which provides access to the Shaheen Industrial Park and 35 mph along the rest of the length between East Avenue and Tesla Road.

Mines Road / North Mines Road runs between Mount Hamilton to the south and First Street in central Livermore. There is a gap in the roadway between Tesla Road and East Avenue. South of Tesla, Mines Road is a rural roadway with two 12-foot travel lanes and two-foot shoulders and is posted for a 45 mph speed limit. North of East Avenue, North Mines Road is a four-lane arterial roadway through a residential area and has a 35 mph posted speed limit.

East-West Roadways

East Avenue is a four-lane arterial connecting South Livermore Avenue to Greenville Road. Travel lanes are twelve feet wide, and a painted median strip provides room for left turns. In the study area, left-turn lanes are provided at the intersection with Buena Vista Avenue with stop sign control on Buena Vista. Signalized intersections are located at North Mines Road, Charlotte Way, and South Vasco Road. East Avenue forms the northern border of SLVSPA Subarea 2.

South Livermore Avenue runs from downtown Livermore to Tesla Road. In the study area, South Livermore Avenue is a two-lane rural roadway with twelve-foot lanes and approximately ten-foot paved shoulders. South Livermore Avenue intersects Wente Street with stop sign control on Wente Street. The posted speed limit is 25 mph north of Wente Street and 45 mph south of Wente Street.

Tesla Road extends from South Livermore Road to the eastern edge of the City eventually connecting to I-580 near the City of Tracy. In the study area, Tesla Road is a two-lane rural roadway with twelve-foot lanes and approximately ten-foot paved shoulders. Intersections at Buena Vista Avenue and South Vasco Road have stop signs at the cross streets but no left-turn lanes on Tesla Road. The posted speed limit is 45 mph. Tesla Road forms the southern border of SLVSPA Subareas 1 and 2.

Concannon Boulevard connects Isabel Avenue to Arroyo Road where it extends east beyond Arroyo to the southwest corner of SLVSPA Subarea 3. Between Holmes Street and Arroyo Road, Concannon Boulevard varies from two to four travel lanes. In the four-lane sections, travel lanes are twelve feet wide, and in the two-lane section travel lanes are eleven feet wide. Sidewalks are provided along most of the four-lane sections. East of Arroyo, there are two 14-foot travel lanes and six-foot shoulders. Traffic signals are provided at Holmes Street and Arroyo Road. The posted speed limit is 35 mph.

Marina Avenue is a two-lane rural roadway which extends from Arroyo Road to Wente Street. Travel lanes are approximately ten feet wide with six-foot gravel shoulders. Marina Avenue connects to Arroyo Road with a one-way stop-controlled "T" intersection (stop control on Marina) and forms a curved "L" intersection with Wente Street. The posted speed limit on Marina is 35 mph. Marina Avenue forms the northern border of SLVSPA Subarea 4. Rural residences front Marina Avenue, as well as Edwards Avenue (which extends south of Marina Avenue) and Reed Avenue (which connects to Edwards Avenue).

Hansen Road is an unstriped private roadway which provides access from Arroyo Road to existing residences in SLVSPA Subarea 4. The paved roadway is about 17n feet wide and provides for two-way travel. The intersection of Hansen and Arroyo Roads is controlled by a stop sign on Hansen Road.

Wetmore Road is a two-lane rural roadway which extends between Holmes Street and Arroyo Road. Travel lanes are twelve feet wide with approximately two-foot shoulders. Wetmore Road connects Arroyo Road with a one-way stop-controlled "T" intersection (stop control on Wetmore). At Holmes

Street, the curved "L" intersection is not controlled. The posted speed limit is 30 mph. Wetmore Road runs between SLVSPA Subareas 5 (north) and 6 (south).

East Vineyard Avenue extends from downtown Pleasanton to Vallecitos Road just south of the Arroyo del Valle. The east end of this roadway near the SLVSPA is a two-lane rural roadway with approximately 11-foot travel lanes and one-foot shoulders. The posted speed limit on East Vineyard is 45 mph between Isabel Avenue and Vallecitos Road and 25 mph on two reverse curves near Vallecitos Road. The intersection with Vallecitos Road has stop sign controls on East Vineyard Avenue and Foley Road which is located opposite East Vineyard. The "T" intersection at Isabel Avenue is controlled with a stop sign on Isabel.

Traffic Volumes and Levels of Service

Methodology for Calculating Levels of Service

Traffic carrying capacity and relative congestion can be measured for both roadway sections and intersections. For both types of congestion measurement, the actual traffic volume using a facility is compared to its ultimate volume-carrying capacity, resulting in a volume-to-capacity ratio (V / C). The higher the V / C, the worse the level-of-service (LOS) to drivers. The process used to calculate roadway and intersection V / C and LOS is described below.

Roadway capacity is a measure of the maximum traffic volume which can be accommodated on a roadway section beyond the influence of intersection controls (such as stop signs and signals). Traffic congestion on uninterrupted segments of roadway longer than one-half mile generally can be described in terms of the roadway volume-to-capacity (V / C) ratio and associated level-of-service (LOS). The V / C ratio is produced by calculating hourly capacity (the total number of vehicles which can be served in one hour) and comparing peak hour volume to that capacity. The V/ C ratio corresponds directly to LOSs A (free-flow conditions) through F (jammed stop-and-go conditions). Exhibit 4.5.4 presents the level-of-service criteria based on V / C ratios for roadways. With intersection spacings of less than one-half mile, intersection delays tend to override the LOS achieved on the roadway between intersections.

Intersection capacity and relative congestion also is described in terms of LOS A (uncongested operation and minimal vehicle delays) to F (congested conditions and long delays). For signalized intersections, LOS is related directly to V / C ratio. The ratio consists of the peak hour traffic volume for critical movements on all approaches to the intersection divided by the maximum per lane capacity for those movements on an hourly basis. Critical movements are the highest combination of conflicting movements on opposite approaches -- for example, the southbound through movement and northbound left-turn or the westbound through movement and eastbound left-turn. Signalized intersection analysis for Livermore area intersections uses the TVTC-approved methodology (the Contra Costa County Transportation Authority's LOS program). This methodology is similar to the Transportation Research Board's *Circular 212* methodology.

For side-street stop-sign-controlled intersections, LOS is related to the average delay experienced by side street movements into and out of the major street traffic stream. The delay is calculated based on the side street volumes, the volume(s) turning left into the side street(s), and the number of "gaps" in the major street traffic flow available for these movements. The methodology used to calculate stop-controlled LOS is the Transportation Research Board's 1994 *Highway Capacity Manual.*

Exhibit 4.5.4 presents intersection LOS criteria for signalized and stop-controlled intersections.

Exhibit 4.5-4
Intersection Level of Service Criteria

Signalized Intersections [a]	
Level of Service	*Volume-to-Capacity Ratio*
A	0.00 - 0.60
B	0.61 - 0.70
C	0.71 - 0.80
D	0.81 - 0.90
E	0.91-1.00
F	1.00 +
Stop-Controlled Intersections [b]	
Level of Service	*Average Stopped Delay Per Vehicle [c]*
A	0 - 5.0
B	5.1 - 10.0
C	10.1 - 20.0
D	20.1 - 30.0
E	30.1 - 45.0
F	45.0 +

Source: Fehr & Peers Associates, Inc.

a *Circular 212, Interim Materials on Highway Capacity*, Transportation Research Board.
b *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 1994.
c In seconds.

Roadway and Intersection Volumes

Exhibits 4.5-5 and 4.5-6 show study area roadway segment and intersection volumes, respectively. Sources for the roadway volumes include Alameda County, the City of Livermore, Caltrans, and the EIR traffic consultant. Sources for the intersection traffic volumes include: the EIR traffic consultant (October 1996 counts), the *Isabel Avenue Extension Revised Draft EIR*, the *South Livermore Valley Area Plan Draft EIR*, and the City of Livermore traffic volume files. Exhibits 4.5-5 and 4.5-6 label counts obtained by the EIR traffic consultant "F" and all other counts "L" for the City of Livermore.

Roadway and intersection traffic congestion resulting from these volumes are discussed below.

Roadway Segment Analysis

The hourly capacities for roadways are set by the Tri Valley Transportation Model (TVTM) and range from 600 vehicles per hour per lane for a collector street to 2,200 vehicles per hour per lane for a freeway. The peak hour / peak direction volume of a roadway segment is compared to its designated capacity to derive a V / C ratio. Thus, the V / C ratio reflects the worst condition at that segment for the day.

All but three study segments currently operate with a V / C ratio lower than 0.65 (less than 65 percent of capacity used or LOS B). The three segments operating at higher levels of congestion are:

- ***L Street*** south of Fourth Street in downtown Livermore has a V / C ratio of 0.95 in the PM peak hour for the peak northbound direction.

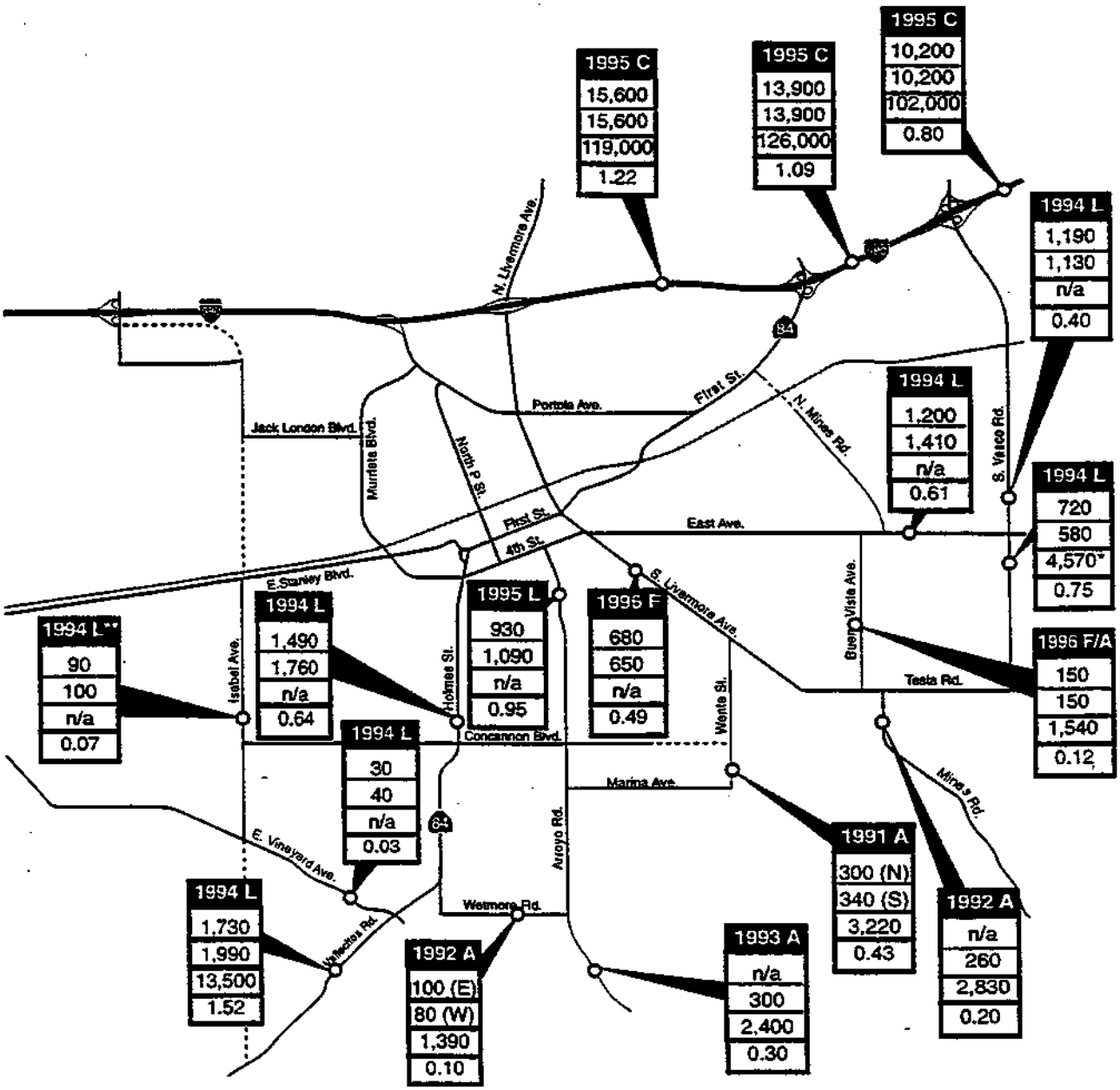
- ***Vallecitos Road*** south of East Vineyard Avenue has a V / C ratio of 1.52 (greater than 150 percent of the calculated capacity) in the PM peak hour for the peak northbound direction. This route carries regional traffic between I-580 in Livermore and the inner Bay Area in addition to local Livermore traffic. The fact that observed volumes currently are exceeding the calculated capacity of this segment illustrates that theoretical capacities are not always accurate and that roadways often can accommodate higher volumes than the capacities would indicate. Factors which can change the calculated capacity of a roadway include driver behavior (such as driving faster at closer headways or passing slow-moving vehicles with less distance from on-coming traffic), terrain, and the percentage of trucks / heavy vehicles in total traffic volume. Observations of this section of Vallecitos Road during the PM peak hour indicate that it is operating close to its ultimate capacity.

- The ***I-580 corridor*** between the North Livermore Avenue and South Vasco Road interchanges currently has a V / C ratio of 1.09 (between South Vasco and First Street) and 1.22 (between First Street and North Livermore Avenue). These V / C ratios are based on the PM peak hour peak direction volume and the Tri-Valley Traffic Model's per-lane capacity of 2,200 vehicles per lane. The over-capacity calculation indicates that the facility probably is operating at or near its ultimate capacity.

Intersection Level of Service Analysis

Exhibit 4.5-6 summarizes intersection levels-of-service for the 19 study intersections. The LOSs were calculated using the most recent traffic counts from the sources noted above. As shown in Exhibit 4.5-6, existing volumes for three intersections along Arroyo Road and the Holmes Street / Vallecitos Road intersection are not available. These intersections were not counted because the existing LOSs can be estimated based on field observations and information from the City of Livermore's Traffic

Exhibit 4.5-5
Existing Segment Volumes and Volume / Capacity Ratios



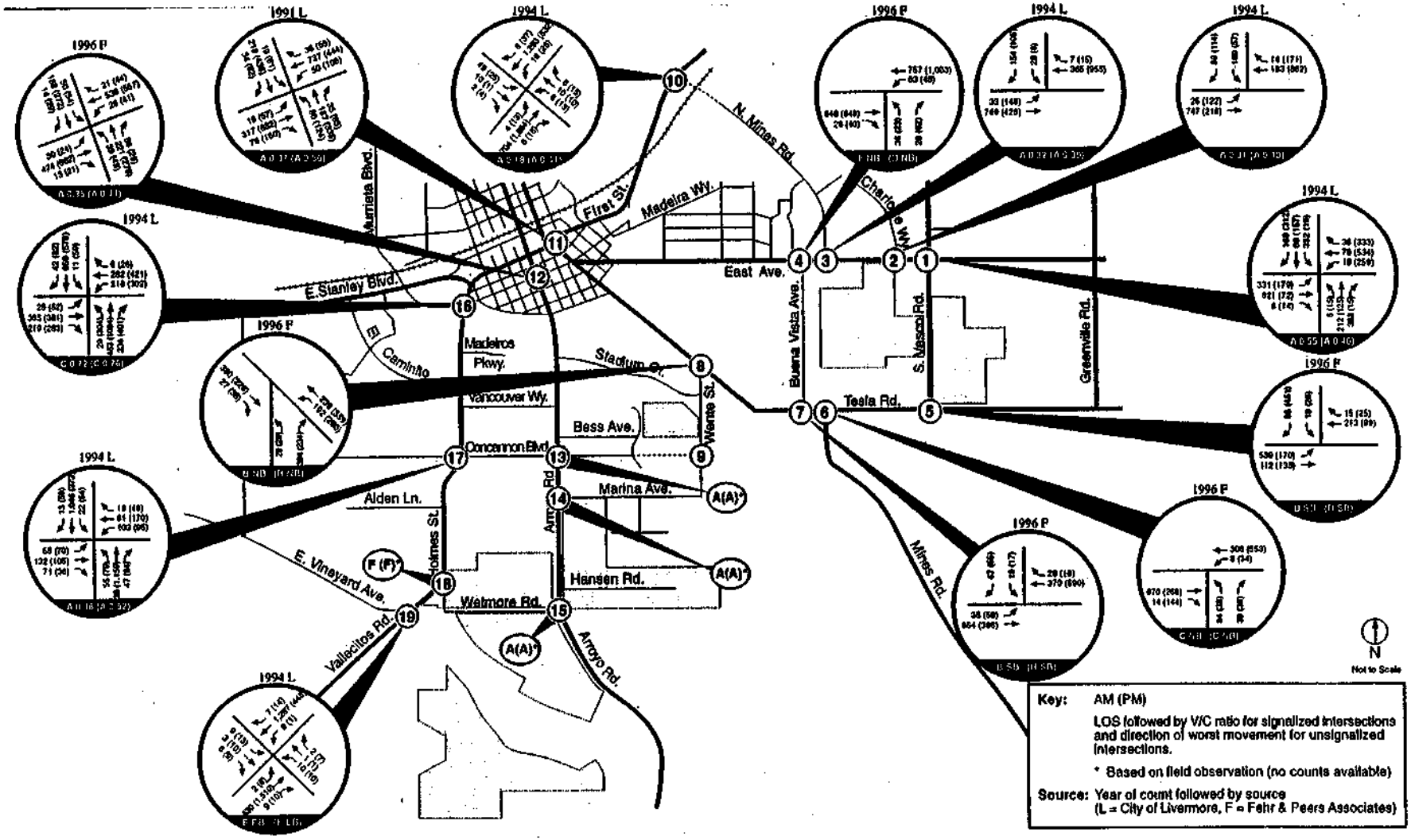
Year of Count and Source (A=Alameda County, C= Caltrans, F=Fehr & Peers, L=Livermore)
AM Peak Hour Traffic
PM Peak Hour Traffic
Average Daily Traffic
Peak Hour / Peak Direction Volume-to-Capacity Ratio
(Capacities are taken from the Tri-Valley Traffic Model, and are included in the Technical Appendix.)

Note: If volume is for a single direction, the direction is noted in (parentheses).

* 1992 count, Alameda County **Counts taken prior to Concannon extension to Isabel

N
Not to Scale

Exhibit 4.5-6
Existing Intersection Volumes and Levels of Service



Engineering Department. The 19 study intersections are:

- East Avenue / South Vasco Road
- East Avenue / Charlotte Way
- East Avenue / North Mines Road
- East Avenue / Buena Vista Avenue
- Tesla Road / South Vasco Road
- Tesla Road / Mines Road
- Tesla Road / Buena Vista Avenue
- South Livermore Avenue / Wente Street
- Concannon Boulevard / Wente Street
- First Street / North Mines Road
- First Street / Livermore Avenue
- Fourth Street / L Street
- Concannon Boulevard / Arroyo Road
- Marina Avenue / Arroyo Road
- Wetmore Road / Arroyo Road
- Murrieta Boulevard / Holmes Street
- Concannon Boulevard / Holmes Street
- Vallecitos Road / Holmes Street
- East Vineyard Avenue / Vallecitos Road

The intersections generally operate at LOS B or better. The exceptions are:

- Holmes Street / Vallecitos Road (LOS F in both AM and PM peak hours) where left-turns from Holmes Street onto Vallecitos Road experience long delays waiting for gaps in the Vallecitos Road traffic stream

- Vallecitos Road / East Vineyard Avenue (LOS E in the AM and LOS F in the PM peak hour) where left turns out of East Vineyard Avenue and Foley Road experience long delays also waiting for gaps in the Vallecitos Road traffic stream

- Buena Vista Avenue / East Avenue (LOS F in the AM and LOS D in the PM peak hour) where left turns out of Buena Vista Avenue experience long delays waiting for gaps in the East Avenue traffic stream

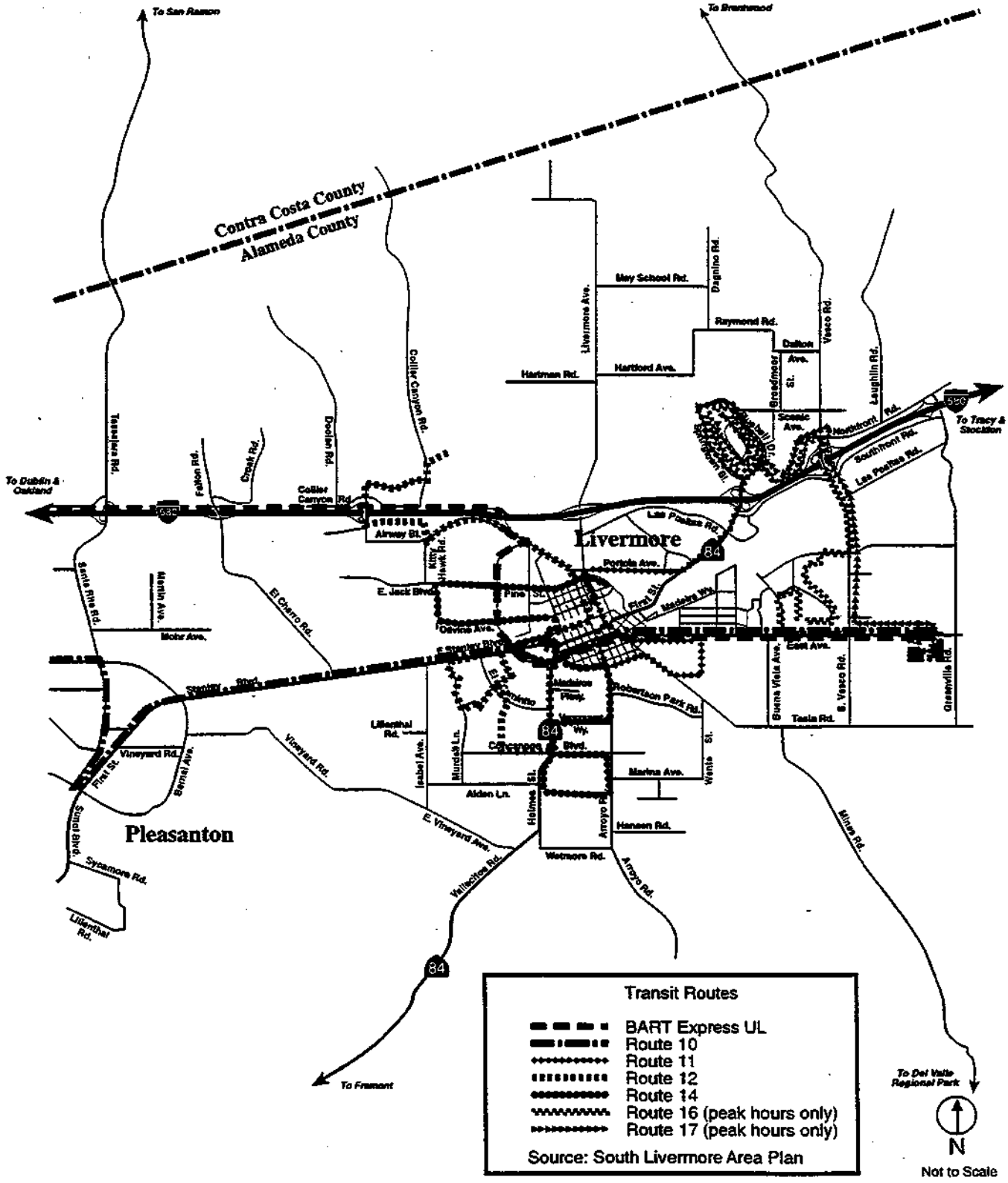
Transit Service

The Livermore-Amador Valley Transit Authority (LAVTA) provides transit service in Livermore through the "Wheels" fixed route and dial-a-ride services. The LAVTA currently operates several direct transit lines to the vicinity of the SLVSPA along Holmes Street, Arroyo Road, and East Avenue. Exhibit 4.5-7 shows existing transit routes in the Livermore area. The fixed route service operates from 5:30 AM to 7:00 PM Monday through Friday and from 9:00 AM to 6:00 PM on Saturday. Headways generally are 30 minutes during peak periods and 60 minutes during off-peak periods. The dial-a-ride service currently is available in Livermore from 6:00 AM to 1:00 AM Monday through Saturday and from 8:00 AM to midnight on Sundays and holidays. The fare is $1.00 a ride.

For intercity travel between Livermore, Dublin, and Pleasanton, the "Wheels" fixed route service operates from 5:00 AM to 1:00 AM Monday through Friday, 6:30 AM to 1:00 AM on Saturdays, and 8:00 AM to 12:30 AM on Sundays and holidays.

In addition to the "Wheels" system, the Bay Area Rapid Transit District (BART) and San Joaquin Regional Transit District (SMART) operate buses which connect Livermore to regional destinations in the San Francisco Bay Area and Central Valley. BART currently is operating express buses which connect the Lawrence Livermore National Laboratory (LLNL) and Livermore Park and Ride to BART stations in Hayward and San Leandro (Bayfair Station). SMART operates several routes from the San Joaquin Valley to LLNL.

Exhibit 4.5-7
Existing Transit Routes



Pedestrian, Bicycle, Equestrian Trail System

The City's *Bicycle / Pedestrian Plan* and *Equestrian Study* were updated in June 1996 and formally adopted and incorporated in the *City of Livermore Community General Plan's* Circulation Element in September 1996. The updated plans document existing bicycle / pedestrian conditions in the City. Conditions in the study area are summarized below.

Pedestrian and Bicycle Facilities

Exhibit 4.5-8 shows the existing network of trails and bikeways in Livermore. The existing bicycle system consists mainly of on-street facilities which include Class II bike lanes or striped shoulders three feet or more wide. The existing system in the Livermore area provides limited direct access to the SLVSPA subareas. The overall system lacks good connections between local and regional destinations, as shown by system gaps downtown, to regional parks, and to the SVLSPA subareas. The following roadways bordering or near the SLVSPA subareas currently provide bicycle facilities:

Roadway	Facility	Roadway	Facility
• Robertson Park Road	Bike Path	• Superior Drive	Bike Lane
• East Avenue	Bike Lane	• Arroyo Road (north of Superior Drive)	Bike Lane
• Vancouver Way	Bike Lane	• Concannon Boulevard	Bike Lane
• Lexington Way	Bike Lane	• Mines Road	Bike Lane

The pedestrian system in Livermore consists primarily of on-street sidewalks. The City also has trails along stream / creek channels. All developed areas generally provide pedestrian facilities in the form of sidewalks and crosswalks. However, in the more rural setting of the SLVSPA, pedestrian facilities consist primarily of three- to six-foot gravel or paved shoulders along many area roadways and the multi-use trails in Robertson Park and Sycamore Grove Regional Park. Shoulders do not provide the safety and visibility of developed sidewalks. The trails near the SLVSPA subareas are the Robertson Park trail, Sycamore Grove Regional Park trail, and the trail between Superior Drive and Ravenswood Neighborhood Park (see Exhibit 4.5-8).

Equestrian Trails

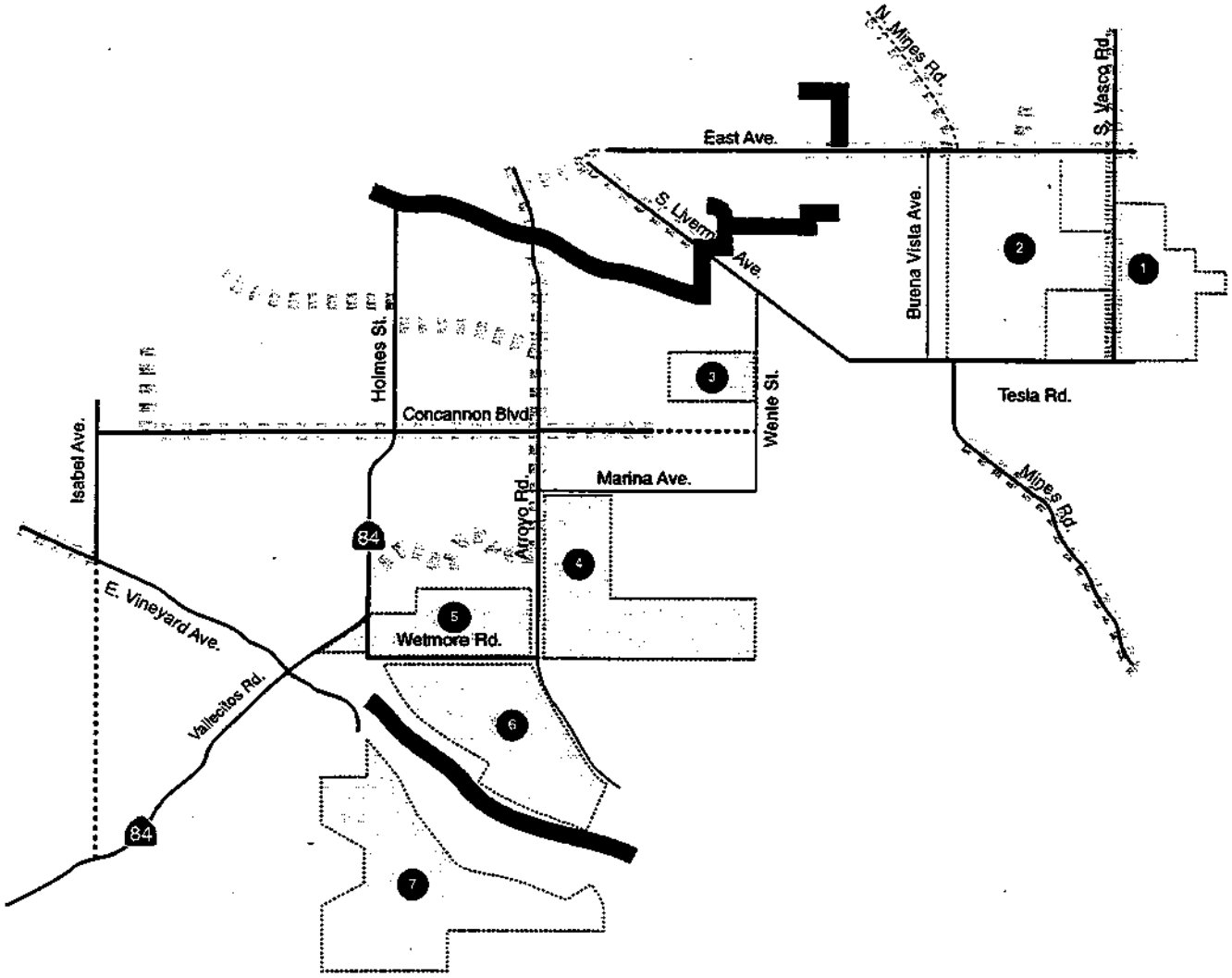
Several loop trails in Robertson and Sycamore Grove Parks provide local opportunities for horseback riding near the SLVSPA. Robertson Park has one show arena, one practice arena, and a trail around the park. The arenas are well-used by both local and regional equestrians for practice riding and special events. For a more scenic experience, there are equestrian trails at Sycamore Grove Park.

Dirt or gravel shoulders along many area roadways, including Tesla Road, Marina Avenue, and Mines Road, once provided opportunities for equestrian use. However, over the years, City and County agencies have eliminated many of these dirt or gravel shoulders by widening the paved portion of roadways or modifying the grade of dirt shoulders. These physical changes combined with generally increased traffic and speeds on these roads have curtailed equestrian riding along most rural roads in the area.

Future Conditions (No Project)

The following discussion focuses on future transportation conditions expected without SLVSPA development or related improvements and uses the year 2010 (the year for which transportation impacts of *Draft Plan* buildout are analyzed). Immediately following the year 2010 discussion below,

Exhibit 4.5-8
Existing Bicycle, Pedestrian and Equestrian Trail Facilities



Legend:

- Multi-Use Trail
- Bike Lanes
- Bike Routes

Source: Livermore Bicycle/Pedestrian Plan Update and Equestrian Trails Study Policy Document, June 1996

N

Not to Scale

expected year 2000 conditions without *Draft Plan* development are discussed in order to provide background for the CMP-mandated year 2000 impact assessment. The year 2000 discussion covers only the CMP network, defined as the freeways and state routes in the project vicinity (I-580, I-680, and SR 84).

Future Roadway Network -- Year 2010

The goals and objectives of the *City of Livermore Community General Plan's* Circulation Element define the City's vision for providing a transportation infrastructure to meet expected growth in the South Livermore Valley. In order to accommodate anticipated traffic growth in Livermore and better serve circulation needs, the City and / or Alameda County currently are planning or implementing the following projects (shown on Exhibit 4.5-9).

Isabel Avenue Extension As part of the Measure B State Route 84 realignment project, the City, in conjunction with the Alameda County Transportation Authority (ACTA), currently is designing the improvement and extension of Isabel Avenue north from Stanley Boulevard to Jack London Boulevard. The project also involves associated operational improvements at the I-580 / Airway Boulevard interchange. The Isabel Avenue Extension project will provide an underpass at Stanley Boulevard and two signalized intersections at Concannon Boulevard and Jack London Boulevard. The project will improve local traffic circulation and access in the western part of Livermore, improve traffic operations and safety, and support local circulation plans. This project is scheduled to begin construction in the spring of 1998.

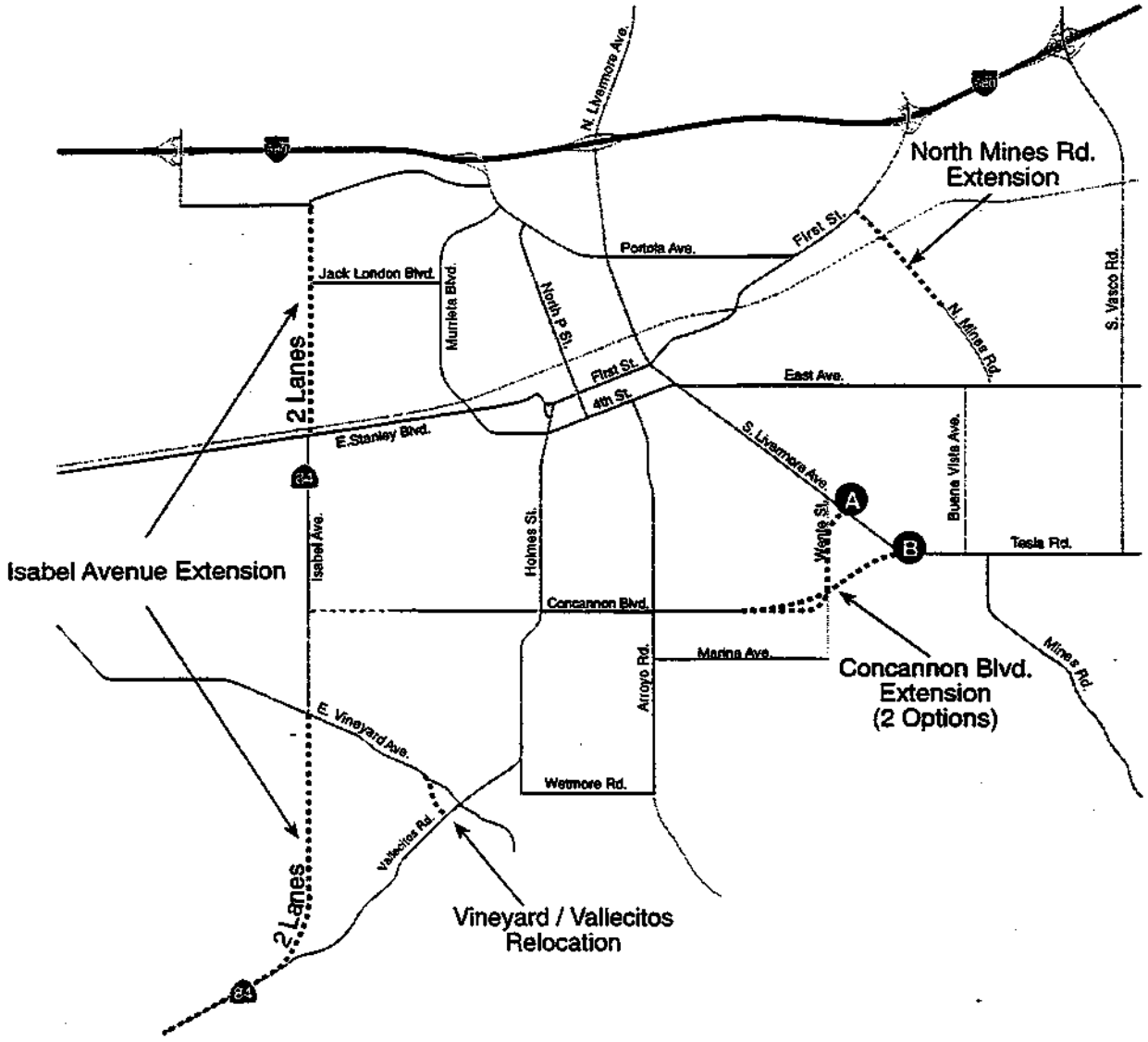
The initial phase for realigning SR 84 to Isabel Avenue involves building a two-lane roadway within a six-lane right-of-way. The City's *Community General Plan* ultimately envisages provision of six travel lanes between Vineyard Avenue and I-580 (with a new interchange) and four lanes between Vineyard Avenue and I-680. The City anticipates the initial phase to be completed by year 2001. Completion of the ultimate four- to six-lane facility and new interchange depends on funding availability. Because funding has not been set aside yet for the four- to six-lane widening, this EIR analysis assumes that only a two-lane facility is in place by the year 2010.

In addition to the northern extension of Isabel Avenue, a condition of approval for the Ruby Hill project was to extend Isabel Avenue south from East Vineyard to Vallecitos Road as a two-lane roadway. Completion of this segment is tied to occupancy of Ruby Hill development and is expected by the year 2000.

Concannon Boulevard Extensions The City proposes to extend Concannon Boulevard easterly to create an additional east-west connector in southern Livermore. The proposed improvements will extend Concannon Boulevard easterly from its current terminus near Normandy Way (and Subarea 3) to South Livermore Avenue or Tesla Road. The extension will provide improved east-west circulation in the southern part of the City. It is anticipated that a through connection between Holmes Street and Tesla Road will improve the flow of commute traffic between State Route 84 and the Lawrence Livermore and Sandia National Laboratories. Due to the absence of a direct connection, this traffic currently filters through local streets, including *Draft Plan* area streets such as Wetmore Road, Arroyo Road, Marina Avenue, and Wente Street.

It is anticipated that construction of the easterly extension of Concannon Boulevard will begin with the development of Subarea 3. The *City of Livermore Community General Plan* (*General Plan*) indicates that preservation of the rural quality of the City's designated vineyard lands shall be the overriding consideration in the design of the easterly extension, and that a two-lane rural design

Exhibit 4.5-9
Year 2010 Roadway Network with Planned Improvements



standard shall be maintained, with separate left-turn lanes to facilitate access to Subarea 3 and Wente Street. Two alternate alignments for the easterly extension are described in the *Draft Plan* for consideration by the City.

The alternative alignments for the Concannon Boulevard extension are illustrated in Exhibits 2.2-7 and 4.5-9. The western section of the extension is the same in both alternatives, with the road alignment extending east from the Tapestry subdivision, through the northwest corner of the Norman property and then skirting the southern boundary of Subarea 3. The difference between the two alternatives occurs in the eastern portion of the extension. In Alternative A, the alignment of Concannon turns northward in a sweeping curve to follow the existing Wente Street corridor for approximately 1,800 feet. Just north of the Arroyo Mocho, the alignment curves to the northeast in order to create a 90 degree, "T" intersection with South Livermore Avenue, replacing the existing oblique intersection of Wente Street with South Livermore Avenue. The new intersection would be located approximately 150-200 feet southeast of the existing intersection. At the intersection with South Livermore Avenue, Concannon Boulevard would have a left-turn and right-turn lane in the northbound direction, and a through lane and acceleration lane in the southbound direction. The intersection would be stop sign controlled for northbound traffic on Concannon Boulevard. Under Alternative A, Wente Street south of Concannon would be re-aligned to form a 90-degree, "T" intersection with the extension.

In Alternative B, the alignment of the extension continues to the east, rather than turning north at Wente Street. The Concannon extension connects directly to Tesla Road at the current intersection of South Livermore Avenue and Tesla Road, providing a continuous, through connection between Concannon and Tesla. The southeast end of South Livermore Avenue would be realigned to create a 90-degree, "T" intersection with the new Concannon/Tesla corridor. The new intersection would be located approximately 150-200 feet west of the existing intersection. At the intersection with the Concannon Boulevard/Tesla Road corridor, South Livermore Avenue would have a left-turn and right-turn lane in the eastbound direction, and a through lane and acceleration lane in the westbound direction. The intersection would be stop sign controlled on South Livermore Avenue, with free flow along the Concannon/Tesla corridor. Under Alternative B, Wente Street would be re-aligned to create a four-way intersection with the Concannon extension, but would remain as it is north and south of the extension, retaining its rural character.

Given the City's desire to provide improved east-west access that will relieve the commute traffic that currently filters through the local street system, a primary purpose of evaluating the two alignments is to assess which provides the best operational characteristics and thus provides the most relief for local neighborhoods.

- ***Right-of-Way*** The *General Plan* calls for a 100-foot right-of-way for Concannon Boulevard. Alternative A would require acquisition of approximately 9.5 acres of right-of-way, compared to 11.6 acres for Alternative B. The difference in acreage between the two results from the 1,800 feet of Wente Street right-of-way which already exists. While practically all of the land to be acquired in both alternatives is actively farmed, Alternative B would displace approximately 4.5 acres more of existing vineyards (in the area east of Wente Street) than would Alternative A. Because the current Wente Street right-of-way is bordered on the east by a hedgerow of Lombardy poplars, the additional 50 feet of right-of-way that is needed would probably be taken along the west side of the roadway (unless the trees are to be removed), from Subarea 3, the City's Corporation Yard, and Robertson Park.

- ***Improvements*** The *General Plan* calls for the Concannon extension to have a 44-foot wide

paved cross-section. Alternative A will require approximately 5,050 linear feet of roadway, compared to approximately 5,150 feet for Alternative B. Additional widening will be needed under both alternatives to accommodate left- and right-turn lanes at key intersections. Both alternatives will also require a bridge over the Arroyo Mocho. Total cost of improvements for Alternative A is projected to be approximately $1.12 million (excluding right-of-way). The cost for Alternative B is projected to be approximately $1.13 million.

- ***Level of Service*** Traffic modeling indicates that the major use of the Tesla/South Livermore/Concannon route will be to carry east-west traffic across town, particularly between Highway 84 and points west to the Labs and points east. In 2010, with buildout of the *Draft Plan*, only about 11-13% of traffic is projected to use the Wente Street/South Livermore Avenue connection to move to and from the center of town. The rest of the traffic is moving east-west. During the AM peak hour, 84% of the traffic on Wente Street (468 vehicles) and 81% of the traffic on South Livermore (176 vehicles) is projected to move to the east (i.e., toward Tesla). In the PM peak, the pattern reverses, with the predominant travel direction being east to west.

  Alternative B provides a more direct east-west route that spans the width of the City with fewer turns and/or stops than required in Alternative A. With a through connnection of Concannon Boulevard to Tesla Road (i.e., no stop sign or intersection requiring a stop where the two roads meet), Alternative B would provide more efficient flow for the majority of the morning and afternoon commute traffic. For example, in 2010 under Alternative A, 75% of the westbound PM peak hour traffic on South Livermore (458 vehicles) would have to make a left turn across traffic to access the Concannon extension. Whereas, no left turns would be required of the same westbound traffic under Alternative B. Level of service analysis of the Concannon/South Livermore intersection under Alternative A shows the intersection operating at LOS C during the AM and PM peak hours at year 2010 with buildout of the project. Even though Alternative B would provide much less constrained flow for the majority of the peak hour trips, because level of service analysis is based on the worst turning movement in an intersection, Alternative B would also result in LOS C at the intersection of South Livermore and Concannon/Tesla (based on left turn movements from South Livermore Avenue to Tesla Road).

As part of its deliberations on the *Draft Plan* and EIR, the City Council will determine which alignment it prefers for the extension of Concannon Boulevard.

North Mines Road Extension The North Mines Road Extension currently is under construction and is expected to be completed in 1998. The North Mines Road Extension will bridge the gap between North Mines Road north of the Union Pacific Railroad (UPRR) tracks and North Mines Road south of the tracks. The extension will provide an overpass crossing at the UPRR tracks. The project will improve north-south circulation in east Livermore and improve access to the freeway for neighborhoods in the East Avenue / North Mines Road area.

Vallecitos Road / East Vineyard Avenue Intersection Relocation The City currently is planning to relocate and reconfigure the intersection of Vallecitos Road and East Vineyard Avenue. The planned improvement would relocate the existing intersection approximately 300 feet south and realign Vineyard Avenue to form a straight "T" intersection with Vallecitos Road. This realignment would eliminate the awkward 15-mph curves present on the current East Vineyard approach to Vallecitos Road. The project also includes widening the northbound and southbound approaches on Vallecitos Road to provide left-turn bays. Relocation of this intersection will require an extension of Foley Road to align with the new intersection. Foley Road provides access to SLVSPA Subarea 7, the Zone 7 water treatment facility, and new Sycamore Grove Park parking area. The City's Capital

Improvement Budget lists this project in the current fiscal year for planning and design and in the years 1998-2003 for construction ($750,000 estimated cost). This project does not include signalization of the intersection.

I-580 High-Occupancy Vehicle Lanes The July 1995 Tri-Valley Transportation Plan calls for an additional high-occupancy vehicle (HOV) lane in each direction on I-580 between Tassajara Road and North Livermore Avenue. However, a funding source has not been identified for this improvement project. The TVTC has been discussing eliminating the HOV lane project from the Tri-Valley Transportation Plan due to lack of identified funding. Because the improvement is not yet funded, this study does not assume it to be in place.

Traffic Projection Methodology -- Year 2010

The forecast of future background conditions establishes a baseline for gauging the impacts of *Draft Plan* development in the year 2010. The travel demand forecasting tool used for this study is the Tri-Valley Transportation Model (TVTM), approved for use in transportation planning and traffic impact analysis by the TVTC and City of Livermore. The TVTM accounts for projected population and employment growth at local and regional levels. Factors which influence the model include demographics, land use, roadway type and size, and travel mode choice. The model's assumptions regarding future demographics and land uses are based on the Association of Bay Area Governments' (ABAG) *Projections 94*. For this EIR, the model's baseline land use assumptions were adjusted to match Alameda County's *South Livermore Valley Area Plan* uses within the Area Plan boundaries.

The TVTM was originally run for this study in October 1996 when the "Financially Constrained" version of the model was not yet complete. The Financially Constrained version omits unfunded roadway improvements which in the Livermore area include the I-580 HOV lanes and the widening of Vallecitos Road and Isabel Avenue to four to six lanes. Before publication of this EIR, the Financially Constrained model was completed, and the EIR was revised to reflect the new model runs. Only one aspect of the EIR analysis was based on the earlier runs. It was the discussion of the relative contribution of individual subarea land uses to intersection congestion and was provided for information only in ***Impact 4.5-2***. This analysis was updated manually to better reflect the Financially Constrained model conditions but is not derived directly from Financially Constrained model runs. The manual process used is described further in the discussion of ***Impact 4.5-2***.

Except for the I-580 HOV lanes and the Vallecitos Road / Isabel Avenue widening, the 2010 model runs include the roadway improvements outlined above.

For the roadway analysis, the TVTM link volumes are taken directly from the model output. For the intersection analysis, the turning movement volumes output by the model are put through a calibration process called "furnessing". This process adjusts model-forecast volumes according to the variation between the model's estimated "existing" volumes and actual existing traffic counts. The purpose of this procedure is to account for the model's original calibration error in interpreting its future forecast turn-movement results. It is necessary to apply this step to the model output at the turning movement level in order to obtain intersection volumes which are as realistic as possible. However, the resulting intersection volumes are still approximations limited by the model's assumptions about trip linkage between residential and employment land uses, automobile usage, and drivers' route selection. As such, the volumes and resulting service levels should be understood to be estimates of future conditions.

Regional Roadway Traffic -- CMA Facilities (Freeways and State Routes)

The Alameda County Congestion Management Agency (CMA) has designated a Congestion Management Program (CMP) roadway system in order to monitor performance in relation to established level of service standards. The CMA requires:

- Analysis of all general plan amendments (GPAs) which would generate 100 or more PM peak hour trips to determine if the amendment would cause a CMP facility to fall below CMA standards

- Disclosure of any GPA-related traffic volume increase of one percent or more if the facility is already below-standard without the amendment

If a GPA would cause a facility to decline from acceptable operation to below-standard operation or if it would add one percent or more to the future traffic volume on a below-standard facility, the EIR must identify the impacts and appropriate mitigation measures.

The *Draft Plan* and accompanying GPA would meet the 100-trip threshold requiring CMA analysis.

The CMA currently only requires analysis for the year 2002 -- to be consistent with its seven-year Capital Improvement Plan which is developed through the year 2002. However, because this EIR also analyzes year 2010 project impacts, it assesses CMA facilities for year 2010 as well. Year 2010 "no project" traffic volumes on CMA facilities (without SLVSPA development) is discussed immediately below. (The year 2002 analysis is presented at the end of this ***Transportation and Circulation Setting*** because it is the only part of the transportation analysis which discusses conditions for a year other than 2010.)

The designated CMP system includes two interstate freeways (I-680 and I-580) and one state highway (SR 84) in the study area. The volumes are divided by the appropriate capacities for the given facility type to produce V / C ratios which correspond to service levels -- 0.90-0.99 = LOS E, 0.80-0.89 = D, 0.70-0.79 = C, etc. [1] The LOS standard for Alameda County CMP roadways is LOS E, except where LOS F conditions already existed when originally measured by the CMA. The LOS standard for all of the CMP facility segments in the study area is LOS E (V / C ratio of 0.99 or better).

Exhibits 4.5-10 and 4.5-11 show year 2010 No Project traffic volumes on CMA facilities. These volumes are generated by the Tri-Valley Traffic Model (Financially Constrained Network), and show that the CMA LOS standards are projected to be violated on several segments of the CMP system by the year 2010. In particular:

- I-580 between South Vasco Road and I-680 exceeds LOS E capacity (2,000 vehicles per lane) in the westbound direction in the morning and the eastbound direction in the evening
- SR 84 between Holmes Street and I-680 exceeds LOS E capacity (1,000 vehicles per lane) in the westbound direction in the morning and the eastbound and westbound directions in the evening

[1] The CMA capacities are 2,000 vehicles per lane for I-580 and I-680 and 600-1,600 vehicles per lane for SR 84, varying by section. Capacity is affected by the urban or rural nature of the surrounding area, lane width, speed limit, and number of signals, all of which vary along the length of SR 84.

Exhibit 4.5-10

Year 2010 AM Peak Hour Volumes -- No Project -- Alameda County CMA Roadways

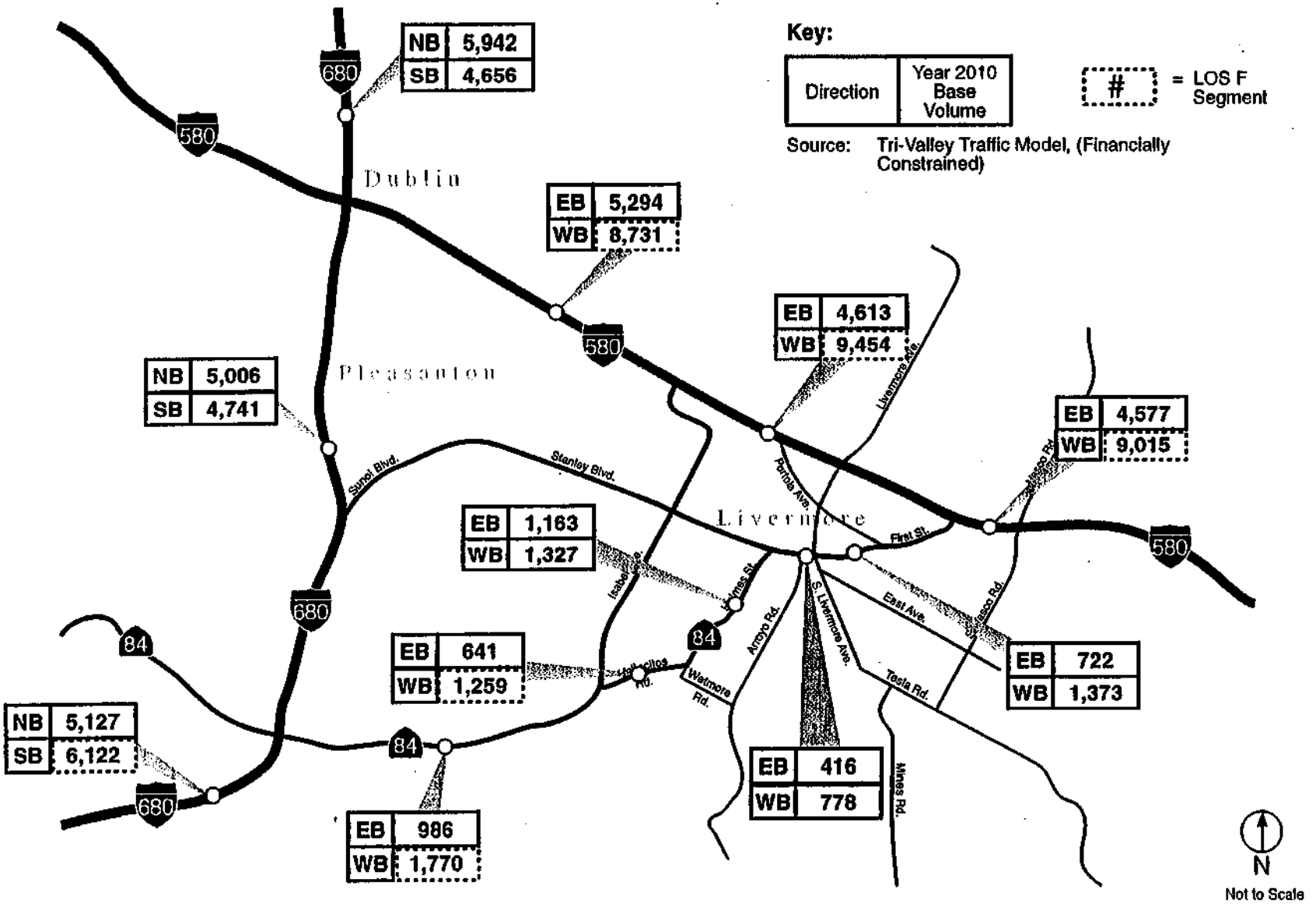
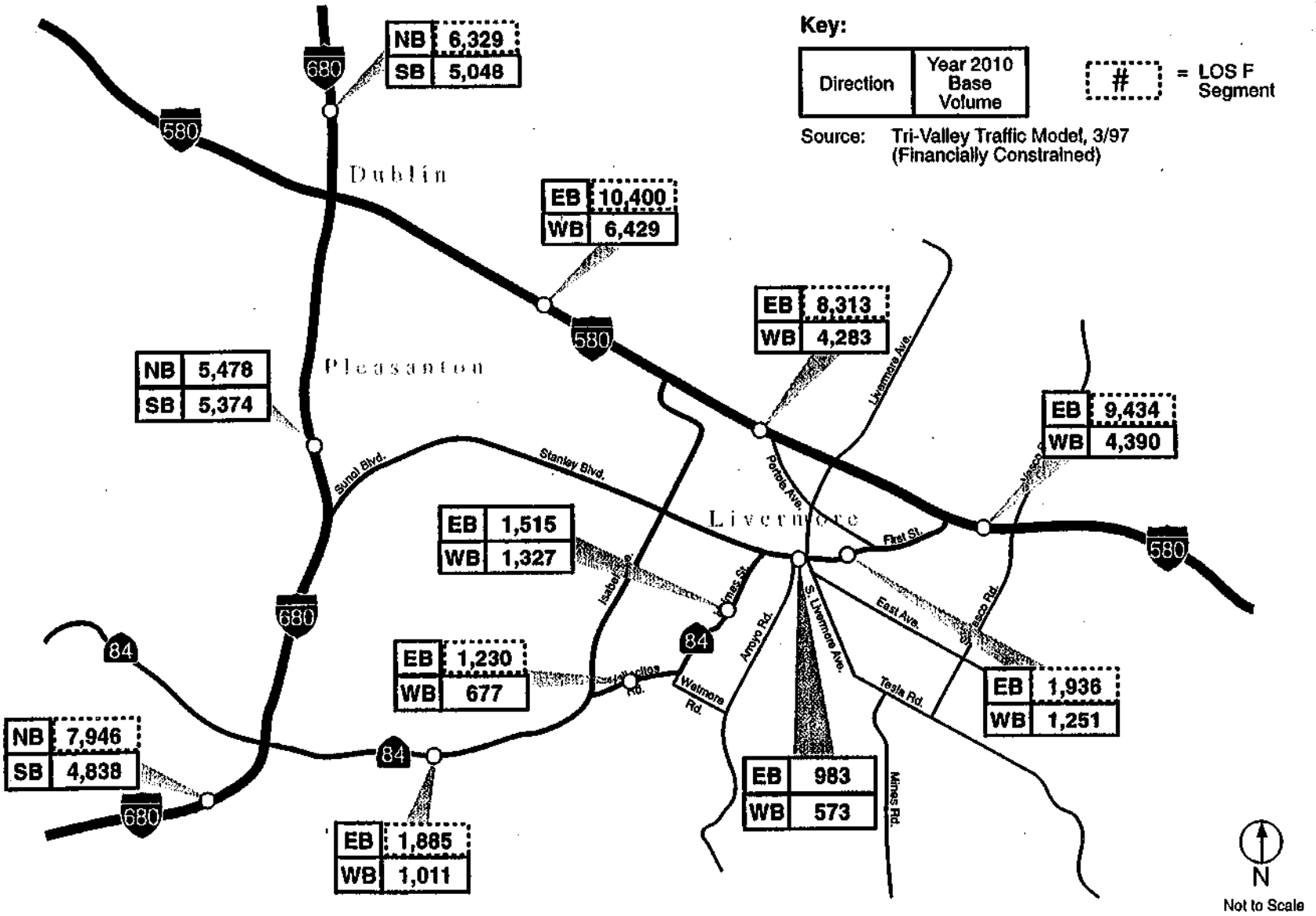


Exhibit 4.5-11

Year 2010 PM Peak Hour Volumes -- No Project -- Alameda County CMA Roadways



- SR 84 between South Livermore Avenue and Portola Avenue exceeds LOS E capacity (1,000 vehicles per lane) in the eastbound direction in the evening

- I-680 south of SR 84 exceeds LOS E capacity (2,000 vehicles per lane) in the southbound direction in the morning and the northbound direction in the evening

- I-680 north of I-580 exceeds the LOS E capacity (2,000 vehicles per lane) in the northbound direction in the evening

Local Roadway Traffic

The following discussion addresses volumes and capacities of roadways not part of the CMP designated network. The volumes and capacities for these roadway segments are taken from the Tri-Valley Traffic Model. [2]

Exhibit 4.5-12 shows local roadway volumes for year 2010 "no project" conditions (future "background" conditions without SLVSPA development). The local roadway segments in the study area are projected to have sufficient capacities to accommodate peak hour demands except for Isabel Avenue north of Concannon Boulevard. Isabel Avenue currently carries primarily local traffic and a peak hour volume of 110 vehicles. In the year 2010 with completion of the two-lane extensions to Vallecitos and Airway Boulevard, total PM peak hour volume (in both directions) is projected to increase to 1,880 vehicles between Concannon Boulevard and Stanley Boulevard and to 2,621 vehicles north of Stanley Boulevard. The TVTM capacity for these segments is 900 vehicles per lane. The V / C ratios are calculated at 1.12 between Concannon and Stanley and 1.54 between Stanley and Airway. This predicted congestion indicates the travel demand for the planned (but not yet funded) additional lanes on Isabel Avenue. With the Isabel Avenue connection between Vallecitos Road to Airway (and I-580), travel demand is projected to grow beyond the two-lane capacity by the year 2010.

Intersection Traffic

Exhibit 4.5-13 shows year 2010 "no project" peak hour volumes and service levels at the 19 study intersections. No significant deterioration in service level is projected for the year 2010, although two intersections (Vineyard Avenue / Vallecitos Road and Holmes Street / Vallecitos Road) would continue to operate at LOS F with long delays for left turns to and from Vallecitos Road. Due to the model's projection of minor traffic reductions and changes in traffic patterns, service levels are projected to improve slightly at intersections along East Avenue and Tesla Road, as well as at the South Livermore Avenue / Wente Street and Concannon Bouelvard / Holmes Street intersections. All of the study intersections except Vallecitos / Holmes and Vallecitos / Vineyard are projected to operate at LOS C or better in the year 2010.

At Holmes Street / Vallecitos Road, left turns from northbound Holmes Street to westbound Vallecitos Road are projected to be delayed longer than five minutes in the AM peak hour and two minutes in the PM peak hour. The analysis assumes that the intersection will remain unsignalized in year 2010. If signalized , the intersection would operate at LOS A in both the AM and the PM peak hours. However, a signal is not warranted for 2010 "no project" conditions due to the relatively low

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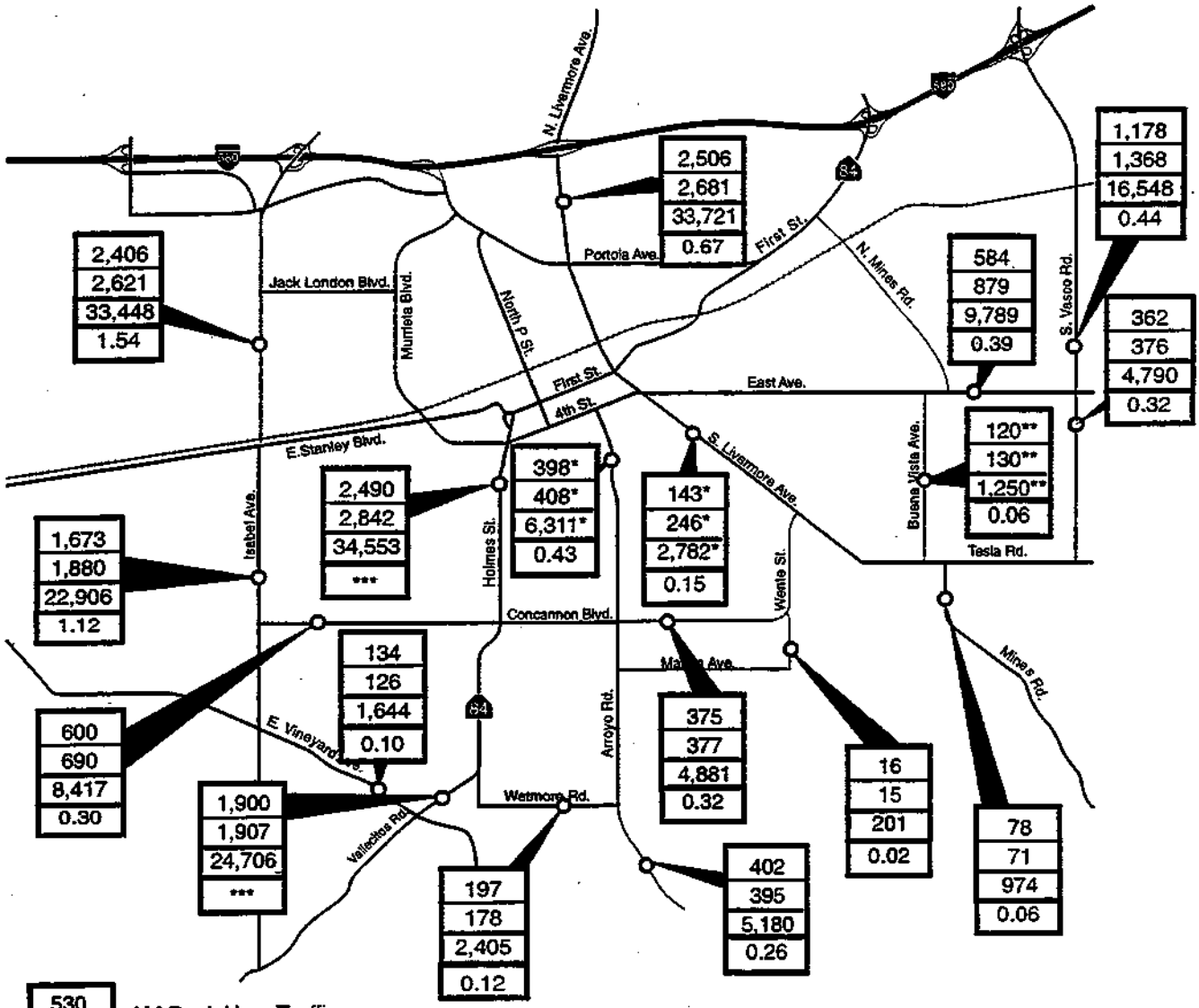
[2] TVTM capacities range from 600 to 900 vehicles per lane for the local roadways in the Livermore area.

Exhibit 4.5-12

Year 2010 Segment Volumes and Volume / Capacity Ratios– No Project -- Local Roadways



530
690
8,417
0.30

AM Peak Hour Traffic
PM Peak Hour Traffic
Average Daily Traffic
Peak / Hour Peak Direction Volume-to-Capacity Ratio

Source: Tri-Valley Transportation Model, Financially Constrained Version.

* Model project volumes which are substantially lower than existing counts on these facilities. This is due to the effect of the Isabel extension and SR 84 re-routing.

** Derived from adjacent intersection turn volumes.

*** See Exhibit 4.5-10, 4.5-11, and related discussion for analysis of CMA facilities.

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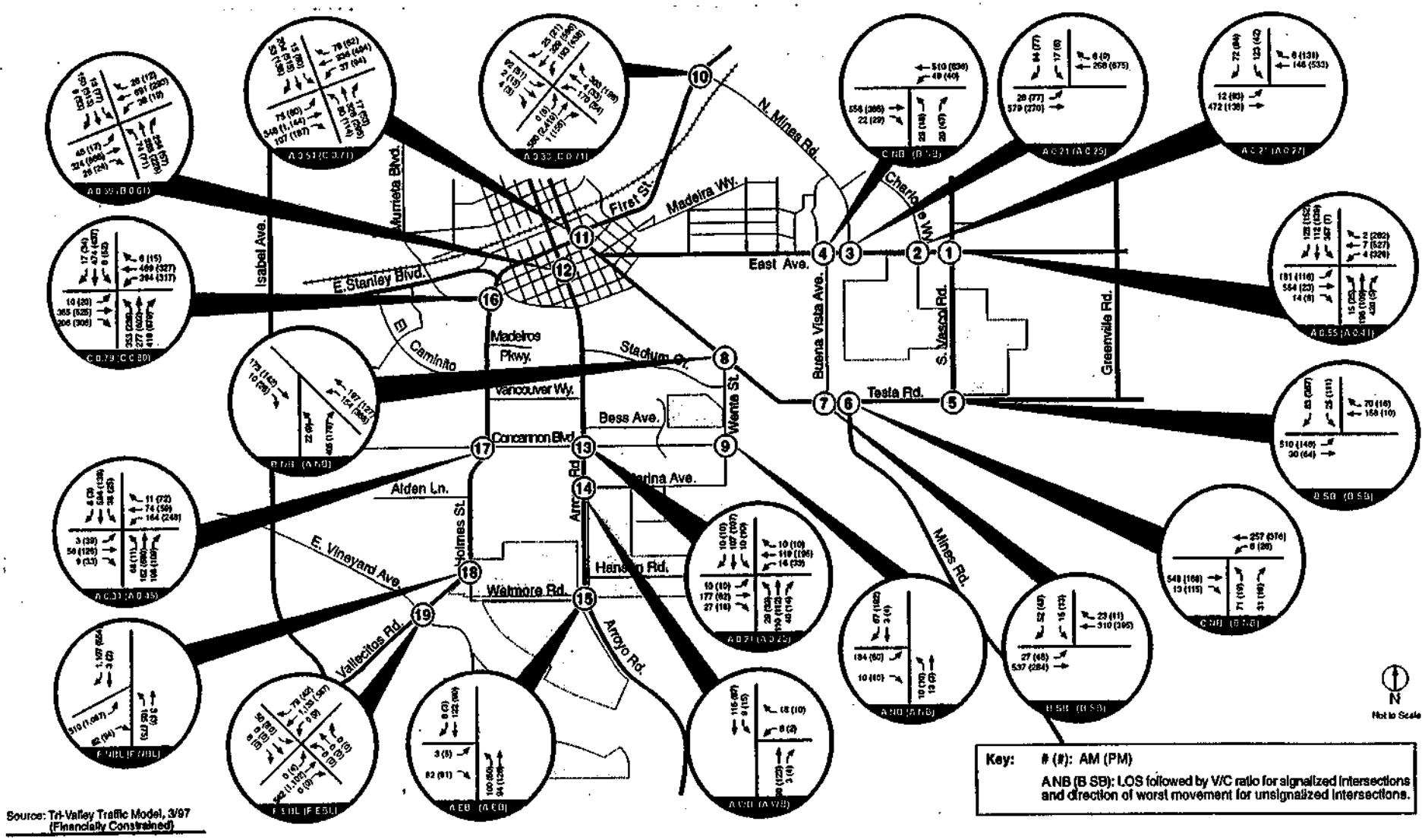
Exhibit 4.5-13

Year 2010 Intersection Volumes and Levels of Service -- No Project



Source: Tri-Valley Traffic Model, 3/97 (Financially Constrained)

volume turning out of northbound Holmes (108 AM peak hour vehicles ans 78 PM peak hour vehicles).

At East Vineyard Avenue / Vallecitos Road, left turns from East Vineyard Avenue to eastbound Vallecitos Road are projected to be delayed by almost an additional minute in the AM peak hour and by two and a half minutes in the evening peak hour. A signal is not warranted for 2010 "no project" conditions due to the relatively low volume turning out of East Vineyard Avenue (56 AM peak hour vehicles and 80 PM peak hour vehicles). If signalized, the intersection would operate at LOS A in both peak hours.

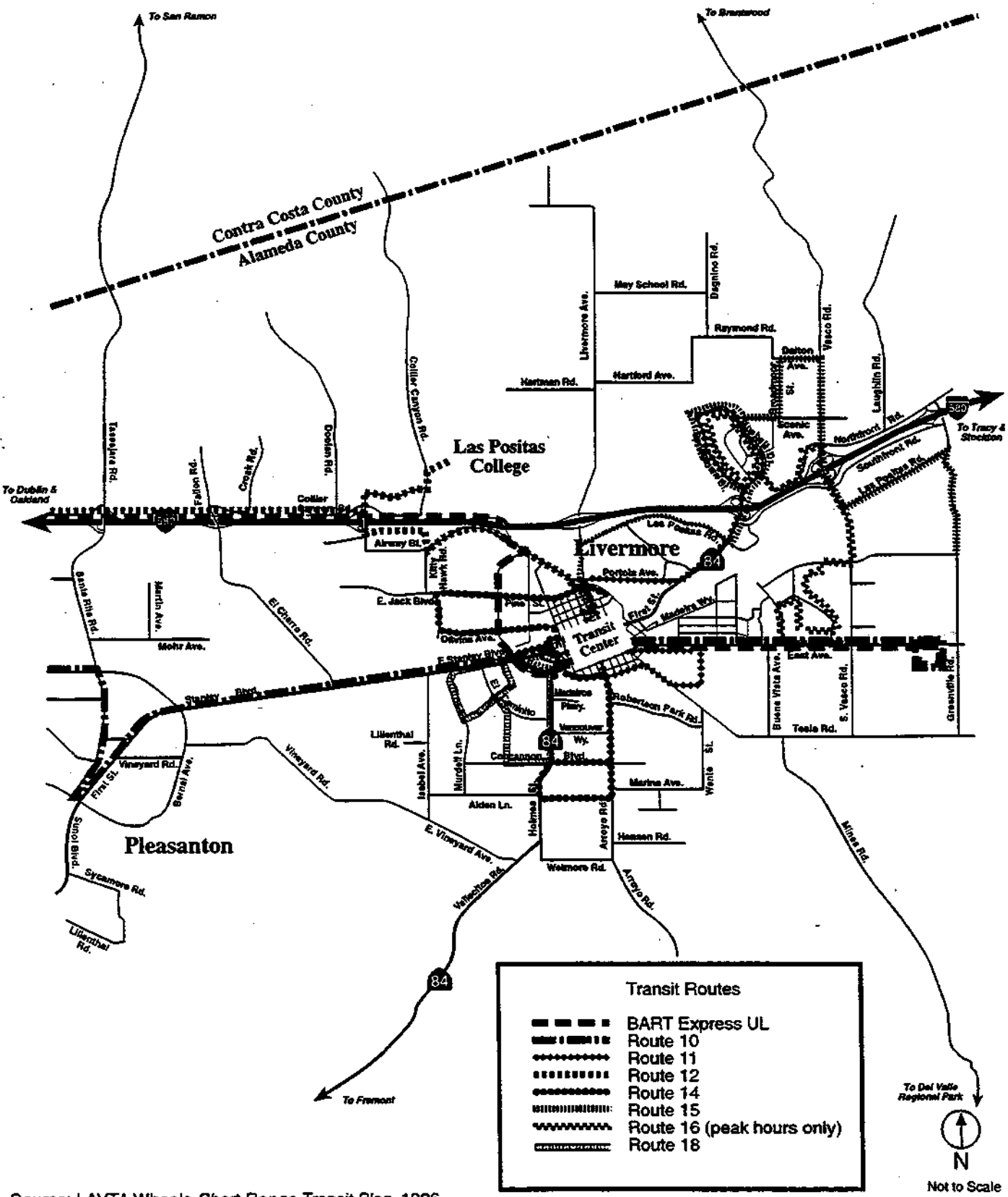
Future Transit Service

Planned Bus Service Improvements The LAVTA has a Short Range Transit Plan which outlines existing service and future service improvements. This plan shows that transit routes in some areas will be realigned to provide service more efficiently and that all routes will be realigned to meet at the new Transit Center (Railroad Avenue and Old First Street) for timed transfers. The new Transit Center, scheduled to open in April 1997, will replace Valley Memorial Hospital as the primary intermodal / transfer center for LAVTA's Livermore routes. Other planned improvements include the following (Exhibit 4.5-14):

- Add one bus to Route 10 (LLNL to Stoneridge Mall) during peak periods, scheduled to start in January 1997.
- Begin the Altamont Pass Demonstration Passenger Rail Service, scheduled to start in Spring 1997. This service will connect the Central Valley to the San Francisco Bay Area and will pass through Livermore on the Union Pacific Mainline adjacent to the new Transit Center.
- Extend Route 10 along East Avenue later in the evening on weekdays and weekends by June 1997.
- Increase Route 11 (Springtown to Valley Memorial Hospital) service frequency from 60-minute headways to 30-minute headways during peak periods by June 1997.
- Extend Route 12 (Las Positas College to Granada High School) to the Dublin / Pleasant BART Station from Las Positas College, scheduled to start in April 1997.
- Increase Route 14 (Pine Street to Arroyo Road / Superior Drive), which operates during peak periods only, to 30-minute service frequency. The new route will provide service to south Livermore via the Civic Center, College Avenue, and Arroyo Road. The improvements are expected to take place by June 1997.
- Extend Route 15 to the East Vasco Industrial Park and the LLNL Visitors' Center. Divert the route to Christensen Park School during school commute hours. The improvements are expected to take place by June 1997.
- Replace the southern portion of existing Route 12. Increase service frequency to 30-minute headways during peak periods and 60-minute headways during non-peak periods by June 1997.

LAVTA Short Range Transit Plan projects an increase in ridership of approximately 77 percent from 989,390 to 1,748,347 during the ten years from 1995 / 1996 to 2005 / 2006. This is based on a

Exhibit 4.5-14
Future Transit Routes



Source: LAVTA Wheels *Short Range Transit Plan*, 1996

projected yearly growth rate of five percent per year for most routes and an extra single-year increase of 15 percent for routes to be linked to the new Dublin BART station when it opens.

Planned BART Extensions BART plans to open its Dublin / Pleasant station in 1997. Longer-range plans include an eventual extension to Livermore. Although preliminary plans have been made for route alignment and station / terminal location(s) in Livermore, financial constraints most likely will prevent the implementation of these plans by year 2010. (They are not included in the Metropolitan Transportation Commission's 1994 *Regional Transportation Plan.*) Until the Livermore BART Station is built and in operation, LAVTA plans to route buses to the Dublin / Pleasant BART Station from Livermore.

Bicycle, Pedestrian and Equestrian Circulation

The June 1996 *Bicycle / Pedestrian Plan Update* and *Equestrian Trail Study* identify existing deficiencies in the City's non-motorized transportation system and identify improvements needed to correct deficiencies and provide a safe and continuous non-motorized circulation system throughout the Livermore Valley. The bicycle / pedestrian and equestrian trails recommended by these studies are shown in Exhibit 4.5-15. The plans call for the following new facilities in the study area:

Bike Lanes on:

- South Vasco Road between East Avenue and Tesla Road
- Tesla Road between Wente Street and Greenville Road
- Mines Road between Tesla Road and existing bike lanes
- Concannon Boulevard between current eastern terminus and South Livermore Avenue
- Holmes Sreet between First Street and Wetmore Road
- Alden Lane between Holmes Street and Murdell
- East Vineyard Avenue between Vallecitos Road and Isabel Avenue

Multi-Use Trails at the following locations:

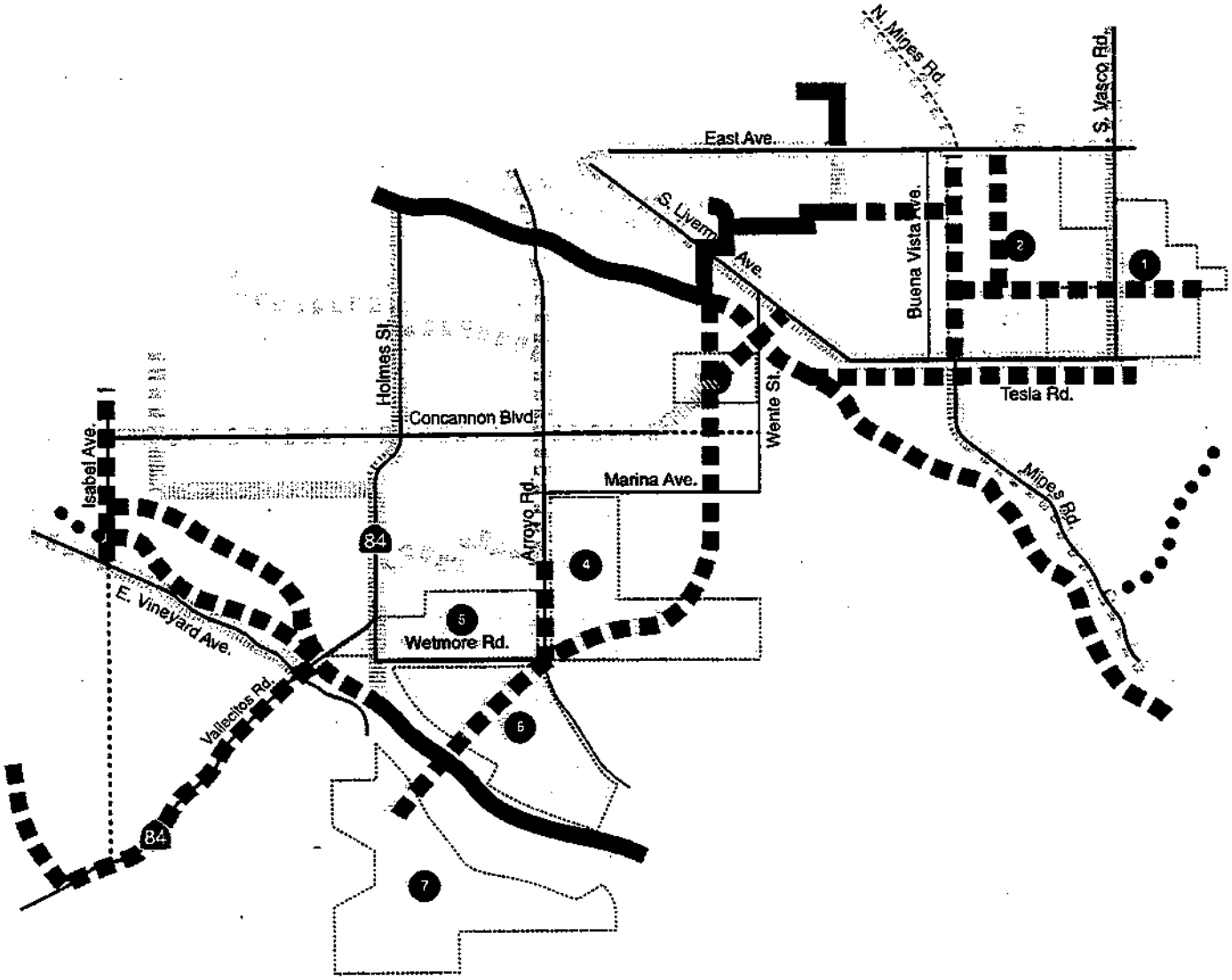
- South Vacso Road between Tesla Road and SLVSPA Subarea 1 / 2 trail connection
- Tesla Road between Greenville Road and Arroyo Mocho
- Arroyo Mocho / Mines Road from Robertson Park south
- Robertson Park / Sycamore Grove Park connection
- Arroyo Road between Superior Drive and Wetmore Road
- Through Ravenswood Park
- East Vineyard Avenue between Vallecitos Road and Isabel Avenue
- Vallecitos Road between East Vineyard Avenue and Vineyard Avenue

Highway / State Route Traffic Volumes -- Year 2000 No Project -- Congestion Management Program Analysis

This section describes year 2000 "no project" volumes on the Alameda County CMA's designated roadway system. ***Regional Roadway Traffic -- CMA Facilities*** (above) describes the CMA analysis requirements and procedure.

Methodology

The CMA Traffic Model was used to show year 2000 conditions in the study area without SLVSPA development. The year 2000 is used because it is the CMA model's calibration year and serves as the



Legend:

Existing		Proposed
▬▬	Multi-Use Trail	■ ■ ■
▨▨	Bike Lanes	▨▨
·····	Bike Routes	
●●●●	Multi-Use Trail (Long Term)	
●	Staging Areas	▲ Trail Heads

Source: Livermore Bicycle/Pedestrian Plan Update and Equestrian Trails Study

N
Not to Scale

CMA's analysis basis for the year 2002. As noted above in the Year 2010 CMA roadway discussion, the LOS standard for all CMP facility segments in the study area is LOS E (V / C of 0.99 or better).

AM Peak Hour Conditions Exhibit 4.5-16 presents year 2000 AM peak hour volumes for the CMP facility segments in the study area. The volumes indicate that, east of Airway Boulevard, both directions of I-580 will continue to operate at acceptable service levels with V / C ratios of 0.66 or better. For the I-580 segment between Airway Boulevard and the I-680 / I-580 interchange, the westbound direction will operate at LOS F (V / C OF1.05) in the AM peak hour. (The capacity set by the CMA for I-580 and I-680 is 2,000 vehicles per lane per hour.)

I-680 is projected to operate at acceptable service levels just north and south of the I-580 interchange with V / C ratios of 0.81 or better north of the interchange and V / C ratios of 0.98 or better south of the interchange. The southbound direction on both of these I-680 segments has higher traffic volumes in the AM peak hour.

SR 84 is projected to operate at acceptable service levels between I-680 and South Livermore Avenue, with V / C ratios of 0.97 or better. Between South Livermore Avenue and Portola Avenue, the LOS is F (V / C of 1.11) for the eastbound direction. The capacity of this segment is set by the CMA at 1,600 vehicles per hour.

PM Peak Hour Conditions Exhibit 4.5-17 presents year 2000 PM peak hour volumes for the CMP segments in the study area. For the I-580 segment east of Airway Boulevard, both directions of I-580 operate at acceptable service levels with V / C ratios of 0.83 or better. For the segment of I-580 between Airway Boulevard and the I-680 / I-580 interchange, the eastbound direction will operate at LOS F with a V / C ratio of 1.11.

I-680 is projected to operate at acceptable service levels just north and south of the I-580 interchange with V / C ratios of 0.81 or better north of the interchange and V / C ratios of 0.99 or better south of the interchange. The northbound direction for both of these segments of I-680 has higher traffic volumes in the PM peak hour.

SR 84 is projected to operate at an acceptable level LOS E (V / C OF0.99 or better) between I-680 and I-580 in the PM peak hour, except for the following segments:

- Between I-680 and the Isabel Avenue extension in the eastbound direction where the service level is projected to be LOS F (V / C 1.29)
- Between Holmes Street and Arroyo Road where the service level is projected to be LOS F in both directions (V / C 1.25 in the eastbound direction and V/ C/ 1.36 in the westbound direction)

The capacity of these two segments is set at 1,000 vehicles per hour and 1,100 vehicles per hour, respectively.

4.5. TRANSPORTATION AND CIRCULATION -- IMPACTS AND MITIGATION MEASURES

Project Description

The *Draft Plan* provides for development of 1,494 single-family housing units, a 900-student school, and up to 13 commercial sites, most of which would be low trip-generating uses (such as small

Exhibit 4.5-16

Year 2000 AM Peak Hour Volumes -- No Project -- Alameda County CMA Roadways

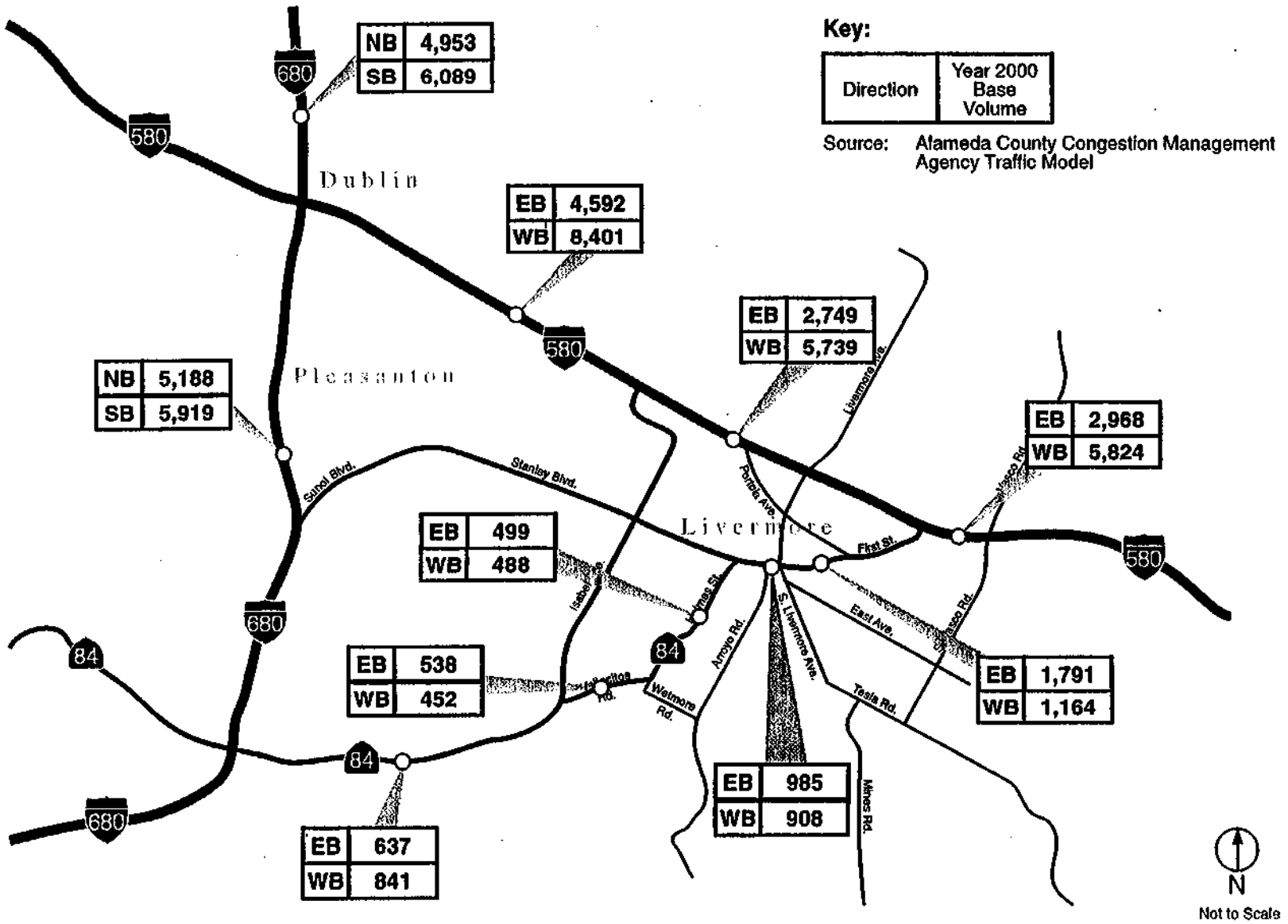
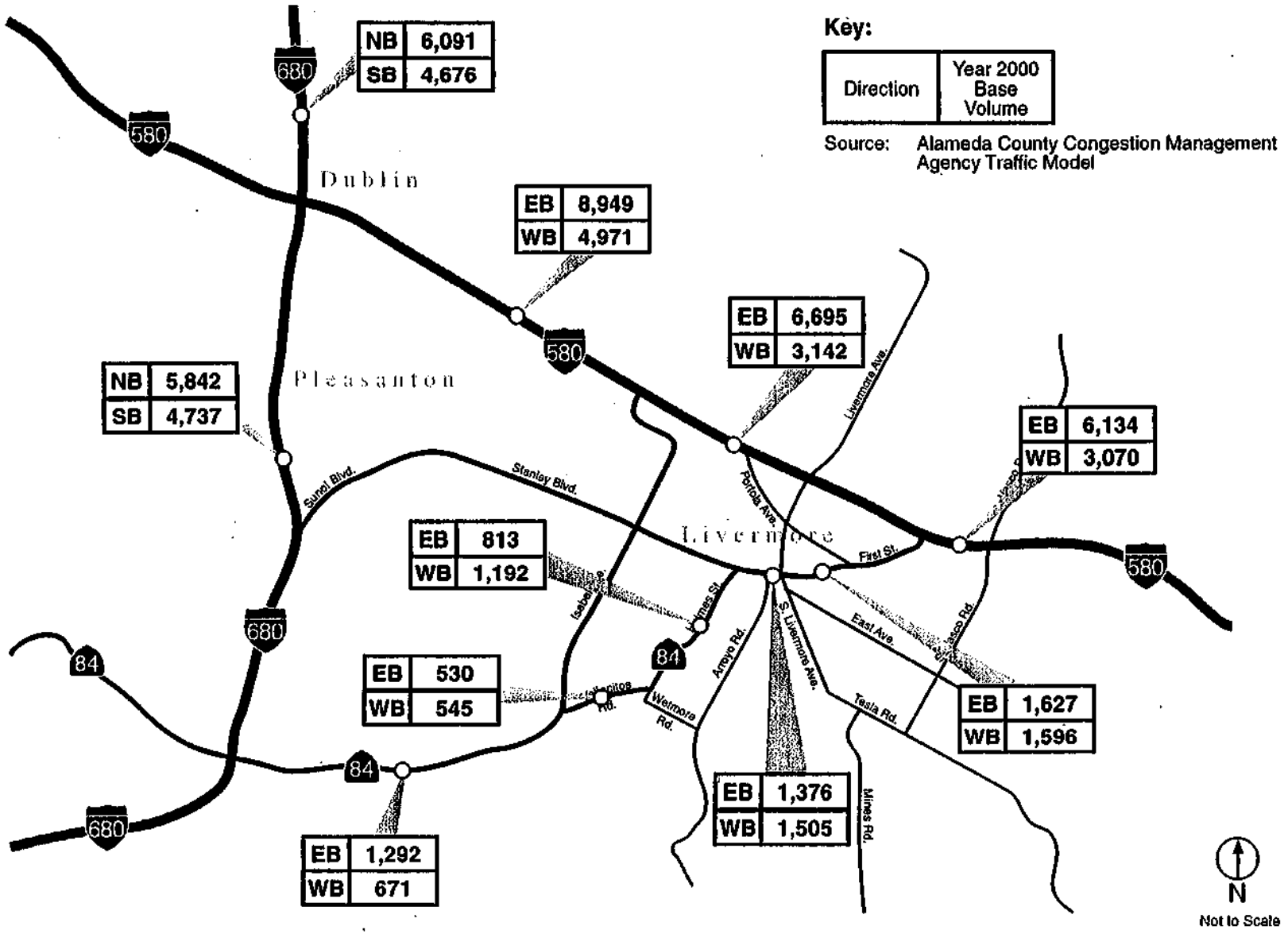


Exhibit 4.5-17

Year 2000 PM Peak Hour Volumes -- No Project -- Alameda County CMA Roadways



wineries, small restaurants, or bed and breakfast inns). Three of the potential commercial sites would be larger trip generators, including a 25,000-square foot wine country commercial center and two medium-sized wineries. Exhibit 4.5-18 shows the distribution of these uses among the seven SLVSPA subareas.

No new arterial or major roadways are proposed to serve SLVSPA subareas other than the Concannon Boulevard Extension which is in the City's *Community General Plan* Circulation Element and would be built concurrently with development of Subarea 3. All other new roadways needed to serve *Draft Plan* uses are located within the subareas and consist of residential collectors and local streets. The following description summarizes each subarea, *Draft Plan* land uses, access points, and turn lane requirements at the access points. Exhibits 2.2.1 through 2.2.5 illustrate the subareas and show access point locations and internal collector-local street configurations (refer to *Draft Plan's* Circulation Element for a description of roadway standards).

Subarea 1 would contain 133 housing units and no commercial sites. It is located east of South Vasco Road, and three access roadways would serve 45, 68, and 16 units, respectively (see Exhibit 2.2-1). The northern two access roadways would be divided entry roadways, and the southernmost access roadway (to 16 units) would be an undivided entry roadway. The middle access point is aligned with the southernmost access point to Subarea 2 which is located west across South Vasco Road from Subarea 1.

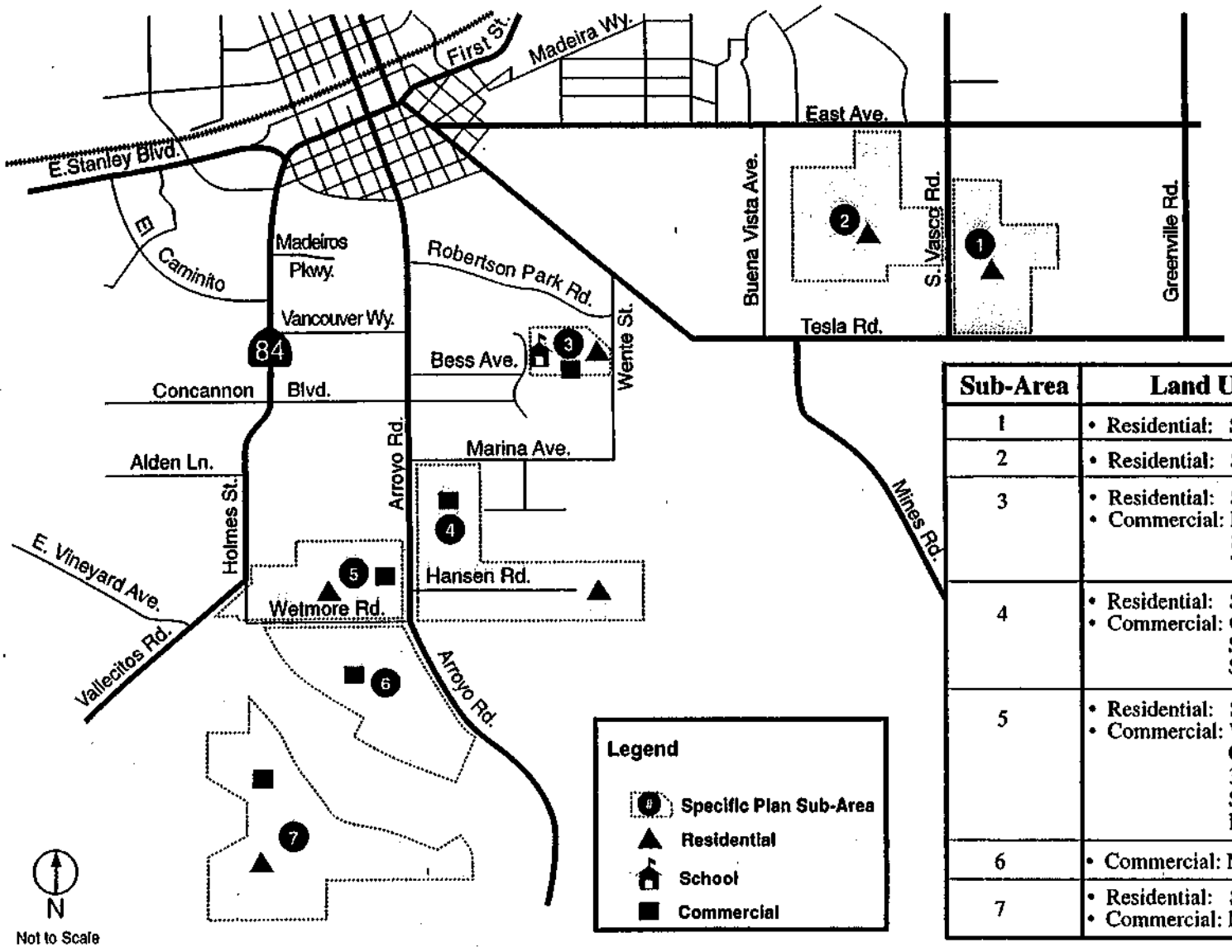
Left-turn lanes and right-turn deceleration lanes would be provided on South Vasco Road at the two northern-most entrances to Subarea 1, and a left-turn lane would be optional at the southern entrance, due to small number of units served.

Subarea 2 would contains 574 units and no commercial sites. It is located west of South Vasco Road (where two access points would be provided) and south of East Avenue (where one access point would be provided opposite Charlotte Way)(see Exhibit 2.2-1). The southernmost South Vasco access would be aligned with the middle Subarea 1 access. Subarea 2 would be served by a central spine collector which would connect the East Avenue entrance to the southernmost South Vasco Road entrance. This roadway is planned as a divided entry road.

Left-turn lanes and right-turn deceleration lanes would be provided on South Vasco Road at both entrances. Left-turn and right-turn lanes would be provided on East Avenue at the signalized intersection at the East Avenue / Charlotte Way / Subarea 2 entrance.

Subarea 3 would contain 177 units, school, and two potential commercial sites -- a small winery or bed and breakfast and a small restaurant or tasting room. Subarea 3 is located west of Wente Street and north of the planned Concannon Boulevard Extension (see Exhibit 2.2-2). Two access points would be provided -- one on Concannon Bouelvard and one on Wente Street (which the Concannon Bouelvard Extension Option A alignment would use). The southern access roadway from Concannon Boulevard would be a divided entry road, and the access roadway from Wente Street would be an undivided entry roadway. Access to the Caldeira parcel commercial site on Wente Street would be via the existing driveway, and access to the commercial site at the southwest corner of Concannon Bouelvard and Wente Street can be from either street.

Left-turn lanes and right-turn deceleration lanes would be provided along Concannon Bouelvard and Wente Street at both residential entrances to Subarea 3.



Sub-Area	Land Use
1	• Residential: Single Family
2	• Residential: Single Family
3	• Residential: Single Family • Commercial: B&B/Small Winery; Small Restaurant/ Tasting Room
4	• Residential: Single Family • Commercial: Olive Press Facilities; Small Restaurant/Winery; Small Wineries
5	• Residential: Single Family • Commercial: Wine Country Commercial Center; 30-room Inn/Restaurant; Small Winery; B&B
6	• Commercial: Medium Winery
7	• Residential: Single Family • Commercial: Medium Winery

Subarea 4 would contain 130 units and four potential commercial sites -- two small wineries, a small winery or restaurant, and an olive press. The subarea is located east of Arroyo Road, between Wetmore Road and Marina Avenue (see Exhibit 2.2-3). Two access points to residential uses would be provided, both from Arroyo Road. The northern entrance would be aligned with Ravenswood Park, and the southern entrance would use Hansen Road. The northern entrance is planned as a divided entry road, and the Hansen Road entrance can be designed to either undivided or divided standards. The four potential commercial sites would have access from Arroyo Road via individual driveways, although the southernmost commercial site may require alternative access from Hansen Road if topographic constraints make Arroyo Road access infeasible.

Left-turn lanes and right-turn deceleration lanes would be provided on Arroyo Road at both residential entrances.

Subarea 5 would contain 176 units and five potential commercial sites -- a wine country commercial center (a small shopping center), two small wineries, a 30-room inn and restaurant, and a bed and breakfast inn. Subarea 5 is located northwest of Wetmore Road / Arroyo Road and extends to Holmes Avenue / Vallecitos Road (see Exhibit 2.2-4). Access points would be located on Arroyo Road (opposite Hansen Road), on Wetmore Road, and on Vallecitos Road. The Vallecitos Road access would be created by the proposed realignment of Wetmore Road to intersect at a right-angle "T" intersection with Vallecitos Road. With this realignment, the segment of Holmes Street between Wetmore Road and Vallecitos Road would be closed to vehicular traffic but retained as an open space corridor. A fourth subarea access, located on Wetmore Road east of the primary Wetmore access, is included as an option in the *Draft Plan's* Circulation Element. The Arroyo Road and Wetmore Road access roadways woudl be divided entry roads. The realigned Wetmore access roadway would be designed to Wetmore Road standards. Left-turn and right-turn deceleration lanes would be required at the Arroyo Road and Vallecitos Road access points to Subarea 5. The commercial sites would have direct access from Arroyo and Wetmore Roads.

Left- and right-turn lanes would be provided on Arroyo and Vallecitos Roads at the two respective residential entrances. No turn lanes would be needed at the entrance(s) proposed on Wetmore Road due to very low projected traffic volumes using these entrances. (Also see ***Impact 4.5-2(a)*** regarding signalization of the Vallecitos Road / Wetmore Road intersection.)

Subarea 6, located southwest of the Wetmore Road / Arroyo Road intersection and north of Sycamore Grove Park, would contain one medium-sized winery site (see Exhibit 2.2-5). Access to this site would be via a new connection to Olivina Ranch Road which currently connects to the Wetmore Road / Arroyo Road intersection at a roughly 45-degree angle. The new access point would be located at least 300 feet south of the intersection to provide better access for visitors and trucks.

No turn lanes would be required on Arroyo at the entrance to the potential winery site which would be located at least 300 feet south of the Wetmore / Arroyo intersection.

Subarea 7 would contain 304 units and one medium-sized winery site. It is located off Foley Road which connects to Vallecitos Road at the East Vineyard Avenue intersection (see Exhibit 2.2-5). Foley Road is a private road which would need to be acquired and dedicated before development of Subarea 7. It would provides the only access to Subarea 7, and two collectors would provide direct access to residential uses from Foley Road. One collector would be located north of the Zone 7 water treatment facility and is planned as a divided entry road. The other collector would be located south of the facility and is planned as an undivided entry road. The northern collector would serve 141 units, and the southern collector would serve 163 units.

Left-turn and right-turn deceleration lanes would be provided on Foley Road at both subarea entrances.

The provision of left- and right-turn lanes from existing roadways into the subareas is based on the projected level of turn volume in relation to through-traffic flow on the major (existing) street and the speed limit on that street. Protected left-turn lanes generally are needed when the turning volume is between 15 and 30 vehicles per hour, and protected right-turn lanes generally are needed when the turning volume is 15 to 45 vehicles.[3] The turn-lane provisions identified above were developed in response to the volumes projected to use the various subarea entrances.

Scope of Topics Addressed

The topics addressed below cover project impacts on all modes of transportation according to year 2010 conditions without adopting the *Draft Plan* and developing the SLVSPA. The year 2010 impact analysis evaluates full SLVSPA buildout and is the focus of the following discussions. In addition to the 2010 analysis, an Alameda County CMA analysis of year 2000 conditions also is presented, in compliance with the Congestion Management Plan's Land Use Analysis Program. The year 2000 and 2010 analyses use separate assumptions -- different planning years, different levels of SLVSPA development, different traffic models, etc. Therefore, the year 2010 is presented first, followed by the year 2000 analysis.

Significance Criteria

Buildout of the SLVSPA according to the *South Livermore Valley Specific Plan (Draft Plan)* would have a significant adverse impact on transportation operations if it:

- Resulted in an intersection V / C ratio exceeding the City of Livermore standard of 0.85 for a minimum period of two hours for intersections within or adjacent to Livermore
- Warranted the need for a system improvement under standard traffic engineering practices
- Resulted in a roadway segment exceeding its capacity as calculated by the Tri-Valley Transportation Model or resulted in a five percent increase in V / C ratio for segments which are already exceeding their calculated capacity
- Created an un-met parking demand
- Contributed substantially to any significant cumulative traffic impact at study intersections or roadways
- Generated transit demands which current and planned transit systems would not be able to accommodate
- Caused bicycle / pedestrian / vehicle conflicts or travel demands that are not served by appropriate facilities

In addition, for the Alameda County Congestion Management Agency year 2000 analysis, the *Draft*

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[3] *City of San Buenaventura Engineering Design Standards.* Volume-speed warrant curves are included in Appendix I.

Plan would have a significant adverse impact on traffic operations if it:

- Degraded the level-of-service below Alameda County CMP LOS standards for designated CMP road segments in the study area or contributed one percent or more to the future projected volume on a CMP facility which would fall below the standard without the *Draft Plan*. (Applies to 20 percent *Draft Plan* build-out of residential uses only for the year 2000 which is the current planning year for the CMA.)

Impacts and Mitigation Measures (Year 2010)

Impact 4.5-1 Roadway and Freeway Traffic

Regional Roadways (CMA Facilities)

- Draft Plan *development would add one percent or more to the peak hour traffic on the following CMA roadways which are projected to operate at LOS F in the year 2010 without the project: SU*
  - *I-580 between Livermore Avenue and I-680 (AM peak hour westbound) and between Airway Boulevard and Livermore Avenue (PM peak hour eastbound)*
  - *SR 84 between I-680 and Isabel Avenue (PM peak hour westbound) and between Isabel Avenue and Holmes Street (PM peak hour eastbound)*
- Draft Plan *development is projected to reduce volumes on the following CMA roadways: B*
  - *I-580 between I-680 and Airway Boulevard and between Livermore Avenue and South Vasco Road (PM peak hour eastbound) and between Airway Boulevard and I-680 (PM peak hour westbound)*
  - *SR 84 between I-580 and I-680 (AM peak hour westbound) and between Concannon Boulevard and I-580 (PM peak hour eastbound)*
  - *I-680 north of I-580, between I-580 and SR 84, and south of SR 84 (AM peak hour southbound) and I-680 north of I-580 and south of SR 84 (PM peak hour northbound)*

Local Roadways

- Draft Plan *development would increase the V / C ratio on Isabel Avenue between Concannon Boulevard and Stanley Boulevard from 1.12 to 1.20 and north of Stanley Boulevard from 1.54 to 1.57 (PM peak hour) SU*

The traffic analysis described below reached the conclusions summarized above. It describes the trip generation of *Draft Plan* development and the resulting Tri-Valley Traffic Model traffic projections on the study area roadways.

Trip Generation

Exhibit 4.5-19 estimates the trip generation of *Draft Plan* land uses. Trip generation is given for weekdays (daily, AM peak hour, and PM peak hour) and weekend days (PM peak hour). The trip generation rates for housing units are taken from the Institute of Transportation Engineers' *Trip Generation, 5th Edition*, a compendium of trip generation studies which is recognized as a national standard. The trip rates for the restaurant, inn, bed and breakfast inn, and shopping center sites also

Exhibit 4.5-19
Trip Generation Estimates

Sub Area	Land Use	Amount	Units	Weekday ADT		Weekday AM Peak Hour		Weekday PM Peak Hour		Weekend PM Peak Hour	
				Trip Rate	*Trips*	*Trip Rate*	*Trips*	*Trip Rate*	*Trips*	*Trip Rate*	*Trips*
1	Single-family residential	133	housing units	9.55	1,270	0.74	98	1.01	134	0.96	128
Total	*Residential*				*1,270*		*98*		*134*		*128*
Total	*Commercial*				*0*		*0*		*0*		*0*
2	Single-family residential	574	housing units	9.55	5,482	0.74	425	1.01	580	0.96	551
Total	*Residential*				*5,482*		*425*		*580*		*551*
Total	*Commercial*				*0*		*0*		*0*		*0*
3	Single-family residential	177	housing units	9.55	1,690	0.74	131	1.01	179	0.96	170
	Bed &breakfast and	10	rooms	7.83	78	0.60	6	0.68	7	0.44	4
	Small winery	50,000	cases / year	3.81E-03	191	1.38E-04	7	2.63E-04	13	7.25E-04	36
	Small restaurant /	40	seats	2.86	114	0.03	1	0.23	9	0.03	1
	Tasting room (no winery) [a]	50,000	cases / year				0			7.25E-04	36
	School	900	students	1.09	981	0.3	270	0.096	86	0	0
Total	*Residential*				*1,690*		*131*		*179*		*170*
Total	*Commercial*				*1,364*		*284*		*116*		*78*
4	Single-family residential	130	housing units	9.55	1,242	0.74	96	1.01	131	0.96	125
	Olive press [b]	50,000	cases / year	3.81E-03	191	1.38E-04	7	2.63E-04	13	7.25E-04	36
	Small restaurant and	40	seats	2.86	114	0.03	1	0.23	9	0.03	1
	Small winery	50,000	cases / year	3.81E-03	191	1.38E-04	7	2.63E-04	13	7.25E-04	36
	Small winery	50,000	cases / year	3.81E-03	191	1.38E-04	7	2.63E-04	13	7.25E-04	36
	Small winery	50,000	cases / year	3.81E-03	191	1.38E-04	7	2.63E-04	13	7.25E-04	36
Total	*Residential*				*1,242*		*96*		*131*		*125*
Total	*Commercial*				*876*		*29*		*62*		*146*
5	Single-family residential	176	housing units	9.55	1,681	0.74	130	1.01	178	0.96	169
	Wine country commercial	25	ksf [c]	118.86	2,972	2.88	72	10.8	270	14.76	369
	30-room inn and	30	rooms	7.83	235	0.60	18	0.68	21	0.44	13
	Large restaurant	100	seats	2.86	286	0.03	3	0.23	23	0.03	3
	Small winery	50,000	cases / year	3.81E-03	191	1.38E-04	7	2.63E-04	13	7.25E-04	36
	Small winery	50,000	cases / year	3.81E-03	191	1.38E-04	7	2.63E-04	13	7.25E-04	36
	Bed &breakfast	10	rooms	7.83	78	0.60	6	0.68	7	0.44	4
Total	*Residential*				*1,681*		*130*		*178*		*169*
Total	*Commercial*				*3,952*		*113*		*347*		*462*
6	Medium winery	100,000	cases / year	3.81E-03	381	1.38E-04	14	2.63E-04	26	7.25E-04	73
Total	*Residential*				*0*		*0*		*0*		*0*
Total	*Commercial*				*381*		*14*		*26*		*73*
7	Single-family residential	304	housing units	9.55	2,903	0.74	225	1.01	307	0.96	292
	Medium winery	100,000	cases / year	3.81E-03	381	1.38E-04	14	2.63E-04	26	7.25E-04	73
Total	*Residential*				*2,903*		*225*		*307*		*292*
Total	*Commercial*				*381*		*14*		*26*		*73*
Totals					**21,222**		**1,559**		**2,086**		**2,265**

Source: Fehr & Peers Associates, Inc.

a Dummy variable. b. Assume same as small winery. c ksf = 1,000 square feet.

were taken from *Trip Generation.* The winery trip generation rates are based on traffic counts at the entrances to Concannon Vineyards and Fenestra Winery, conducted by the EIR traffic consultant, which are summarized in ***Appendix 6.4.*** [4] The counts showed that the average daily trip generation of small- to medium-sized wineries (defined as 50,000 to 100,000 cases per year) is 3.81 trips per 1,000 cases produced. For the PM peak hour, the rate is 0.263 trips per 1,000 cases. These rates translate into 191 daily trips and 13 PM peak hour trips for a small winery and 381 daily and 26 PM peak hour trips for a medium-sized winery.

Exhibit 4.5-19 shows that the total daily trip generation of *Draft Plan* land uses is estimated to be 21,222 trips. Approximately 67 percent of these trips would be generated by residential development, five percent would be generated by the school, and 28 percent would be generated by commercial development. Of the commercial trips, 50 percent would be generated by the wine country commercial center (2,972 daily trips). Medium-sized wineries would contribute six percent each to commercially trip generation, and small wineries would contribute three percent each to commercial trip generation. The other commercial sites would contribute three percent or less to the total of all commercial trips.

Total AM peak hour trip generation would be 1,559 trips, and total PM peak hour trip generation would be 2,086 trips. These hourly trip totals would constitute 7.4 and ten percent of the total daily trip generation, respectively.

Exhibit 4.5-19 also gives the weekend afternoon peak hour trip generation of *Draft Plan* land uses primarily to highlight commercial sites' weekend characteristics. The SLVSPA's weekend afternoon peak hour trip generation is estimated to be 2,265 trips, about nine percent higher than the weekday PM peak hour trip generation. Residential development would contribute 63 percent of the total, and commercial sites would contribute 37 percent. Commercial development would be responsible for the overall higher weekend trip generation. Although the total trip generation for the weekend afternoon peak hour would be higher than the weekday PM peak hour, the weekend afternoon peak hour is not the "worst case" traffic condition because street traffic volumes on the weekend mid-afternoon typically are substantially lower than weekday PM peak hour volumes.

It should be noted that the traffic analysis assumed more intense land uses at three commercial sites than actually envisaged by the *Draft Plan.* In Subarea 3, the bed and breakfast or small winery were both counted when, in fact, only one or the other would be developed. Similarly in Subarea 3, the small restaurant or tasting room were both counted. Finally, in Subarea 4, the small restaurant or winery were both counted. The net result is that Subarea 3 trip generation is about seven PM peak hour trips higher than it should be, and Subarea 4 trip generation is about nine PM peak hour trips higher. These constitute two percent total Subarea 3 traffic and five percent of total Subarea 4 traffic. In relation to the *Draft Plan* as a whole, this represents less than one percent of total trip generation. These differences in trip generation do not have a significant effect on the traffic volume projections at any of the study intersections or roadways.

Regional Roadway Traffic -- 2010 With Project -- CMA Facilities (Freeways and State Routes)

Exhibits 4.5-20 and 4.5-21 give year 2010 "with project" traffic volumes on SR 84, I-580, and I-680.

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4 The traffic appendix has been published as a separate document and is available for public review at the City of Livermore Planning Department, 1052 South Livermore Avenue, during normal business hours.

Exhibit 4.5-20

Year 2010 AM Peak Hour Volumes -- With Project -- Alameda County CMA Roadways

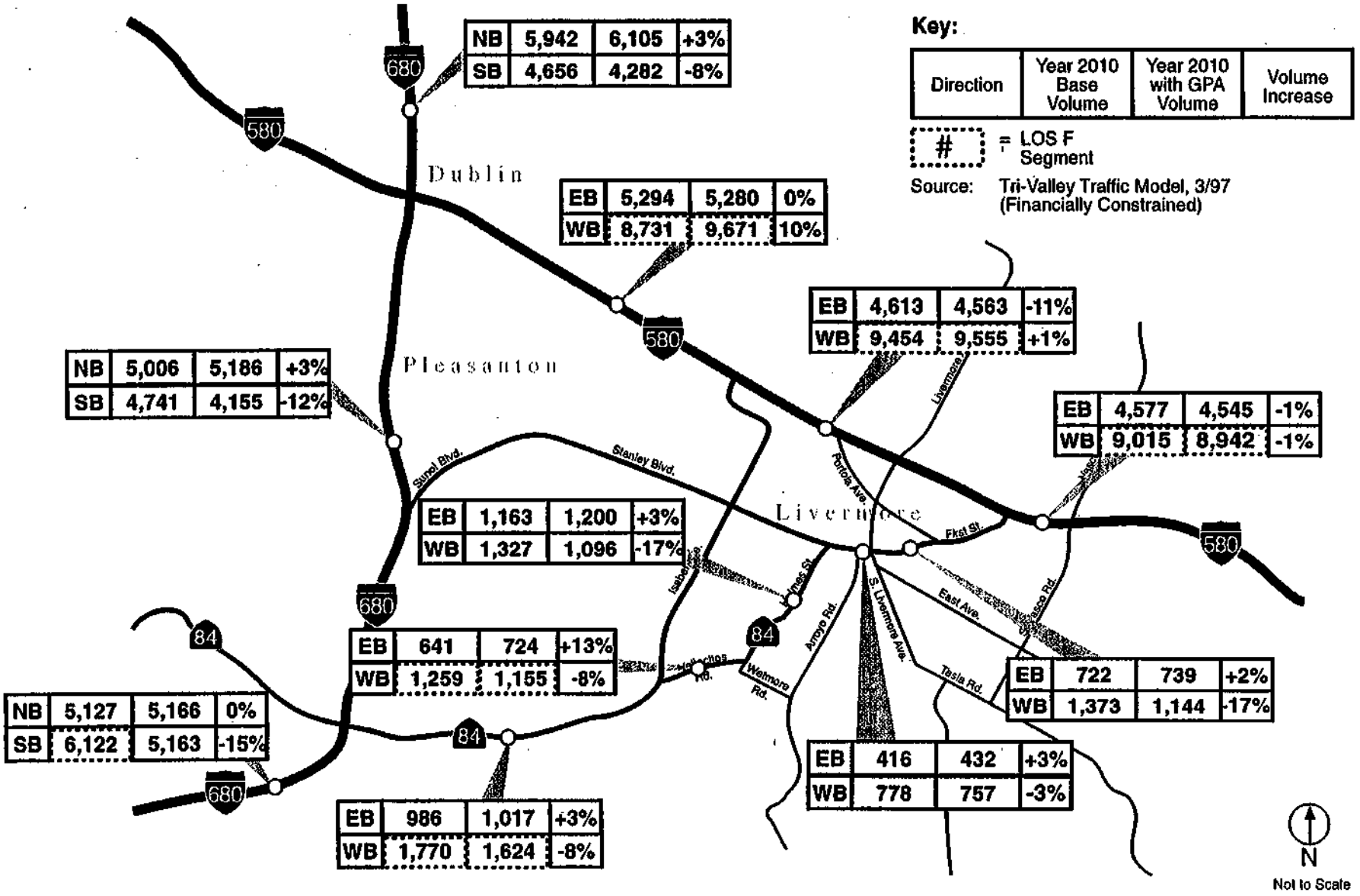
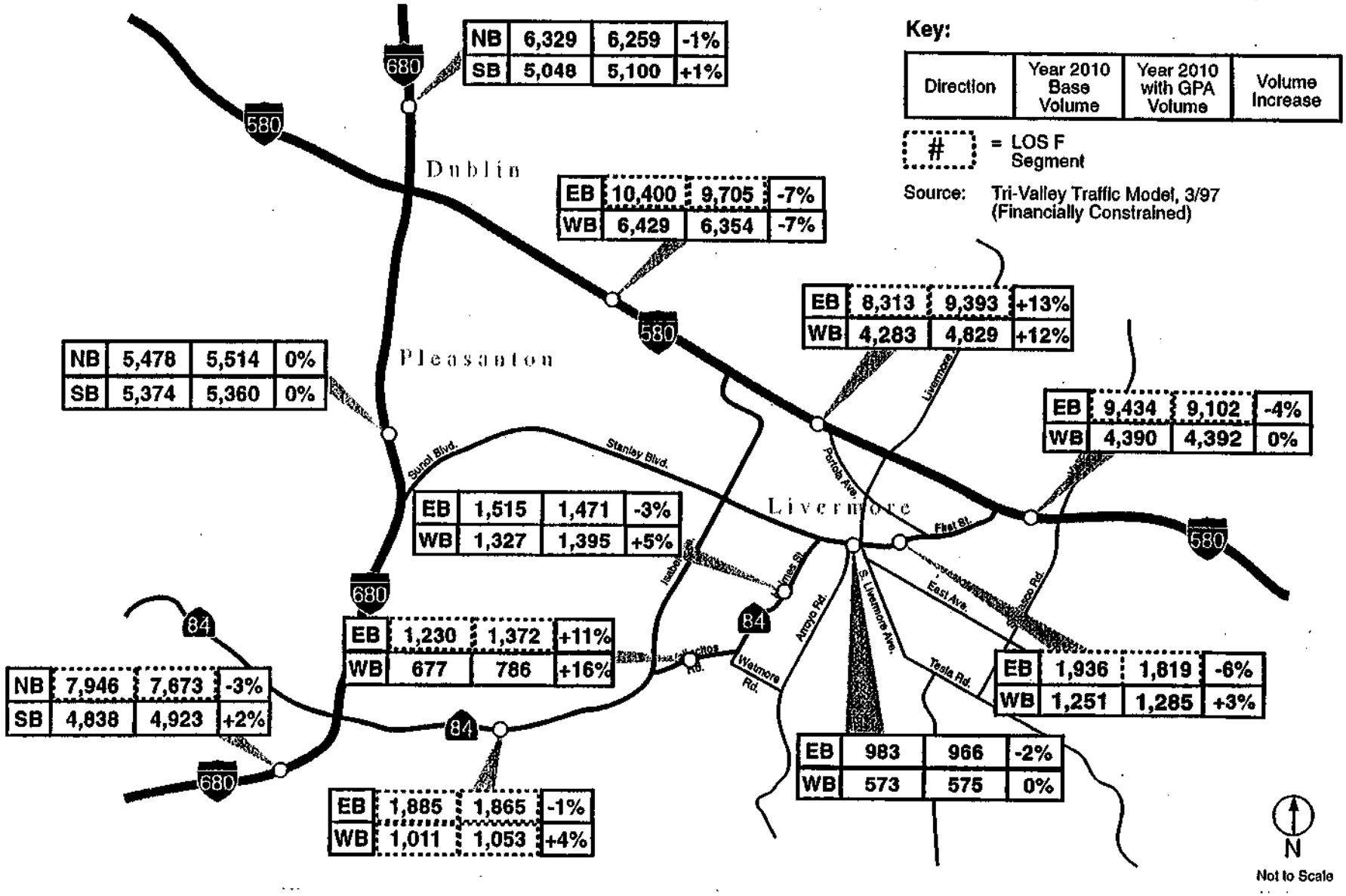


Exhibit 4.5-21

Year 2010 PM Peak Hour Volumes -- With Project -- Alameda County CMA Roadways



The exhibits show that the project would add one percent or more to the peak hour traffic on several segments which are projected to operate at LOS F in the year 2010 without the project, including:

- I-580 between Livermore Avenue and I-680 (AM peak hour westbound) and between Airway Boulevard and Livermore Avenue (PM peak hour eastbound)

- SR 84 between I-680 and Isabel Avenue (PM peak hour westbound) and between Isabel Avenue and Holmes Street (PM peak hour eastbound)

The project would add the most traffic to I-580 between Airway Boulevard and I-680 in the morning (approximately 950 vehicles) and to I-580 between Airway Boulevard and Livermore Avenue in the evening (approximately 1,620 vehicles). On SR 84, the volume increase would be much lower -- approximately 250 additional vehicles in the PM peak hour between Isabel Avenue and Holmes Street and 22 additional vehicles in the PM peak hour between I-680 and Isabel Avenue. It should be emphasized that the over-capacity conditions on these facilities are projected to occur even without *Draft Plan* development and that the addition of project traffic would worsen the congestion already projected to occur in 2010.

The CMA requires mitigation measures to be developed when a project would contribute one percent or more in traffic on facilities projected to operate at substandard LOS. While the 2010 analysis falls beyond the CMA target year of 2000, ***Mitigation Measures 4.5-1(b)*** and ***4.5-1(c)*** were designed to respond to the over-capacity conditions projected above.

The Tri-Valley Traffic Model's traffic distribution with SLVSPA development in place results in lower volumes on the following CMA roadways:

- I-580 between I-680 and Airway Boulevard and between Livermore Avenue and South Vasco Road (PM peak hour eastbound) and between Airway Boulevard and I-680 (PM peak hour westbound)

- SR 84 between I-580 and I-680 (AM peak hour westbound) and between Concannon Boulevard and I-580 (PM peak hour eastbound)

- I-680 north of I-580, between I-580 and SR 84, and south of SR 84 (AM peak hour southbound) and I-680 north of I-580 and south of SR 84 (PM peak hour northbound)

At first glance, this reduction in regional traffic volumes is counter-intuitive, given the project's largely residential trip generation and the large portion of AM and PM peak hour traffic volume which is commute-related. However, the reductions result from the following factors affecting TVTM distribution:

- Whenever a mix of land uses (such as the project) is added to a model, its trip distribution (that is, matching of trips between residential and non-residential uses) is re-analyzed, and this can result in substantial trip destination changes. These changes can affect non-project trips as well as project trips, resulting in a volume decrease on any given roadway.

- The TVTM assigns a large component of the project's trip generation to I-580 in the morning, with most of these trips continuing west of the I-680 interchange while little to no project traffic appears to use SR 84 westbound. This avoidance of SR 84 is related to its low capacity relative to I-580. When both routes are over-capacity, the model assigns more traffic to the higher-

capacity facility (I-580).

- In both the morning and the evening, relatively little to no project traffic uses I-680 either northbound or southbound. This indicates that the portion of project trips which have regional origins or destinations largely choose east-west facilities (I-580 in the AM peak hour and I-580 or SR 84 in the PM peak hour) within the study area.

Despite the model's conclusions regarding AM peak hour regional trip destinations, is not expected that the morning peak hour traffic volume on SR 84 would decrease with the addition of *Draft Plan* uses in the South Livermore Valley.

Local Roadway Traffic -- 2010 With Project

Exhibit 4.5-22 shows traffic volumes on local roadways in the study area for year 2010 conditions with the project. All local roadways would continue to have peak hour volumes substantially lower than their capacities except for Isabel Avenue between Concannon and Airway Boulevards. Without the project, Isabel Avenue between Concannon Boulevard and Stanley Avenue is projected to have a V / C ratio of 1.12 and between Stanley Avenue and Airway Boulevard a V / C ratio of 1.54. These V / C ratios are based on the PM peak hour peak direction volumes. With the project, these ratios would increase to 1.20 and 1.57, respectively.[5] The project would add 75 PM peak hour trips to the segment between Concannon and Stanley and seven trips to the segment between Stanley and Airway.

The ultimate plan for this section of Isabel Avenue calls for six lanes, but the Tri-Valley Traffic Model and this EIR analysis assume that only two lanes would be available due to a lack of funding for the widening. If four lanes were provided, sufficient capacity would be available for the projected traffic volumes, with or without SLVSPA buildout. In the event funding is secured and Isabel Avenue is widened to four (or six) lanes, local regional roadway impacts would be mitigated to a less-than-significant level.

Internal Subarea Traffic

The internal roadway systems designed for the subareas would provide sufficient traffic-carrying capacity for the traffic volumes generated by the subareas. Exhibit 4.5-23 shows the projected daily traffic volumes using the primary access roadways ("collectors") for all of the subareas. These volumes are given for the highest-use sections of the roadways, near the intersections with the existing roadway system. All volumes fall within the range of traditional collector capacity which is up to 4,000 vehicles per day.[6] The local streets connecting to these collectors would provide sufficient access to the collectors and would not produce excessive circuitous travel.

Draft Plan policies 5-44, 5-45, and 5-46 promote transit use, call for the City to encourage bus route extensions and BART extensions, and require SLVSPA developers to provide transit stops:

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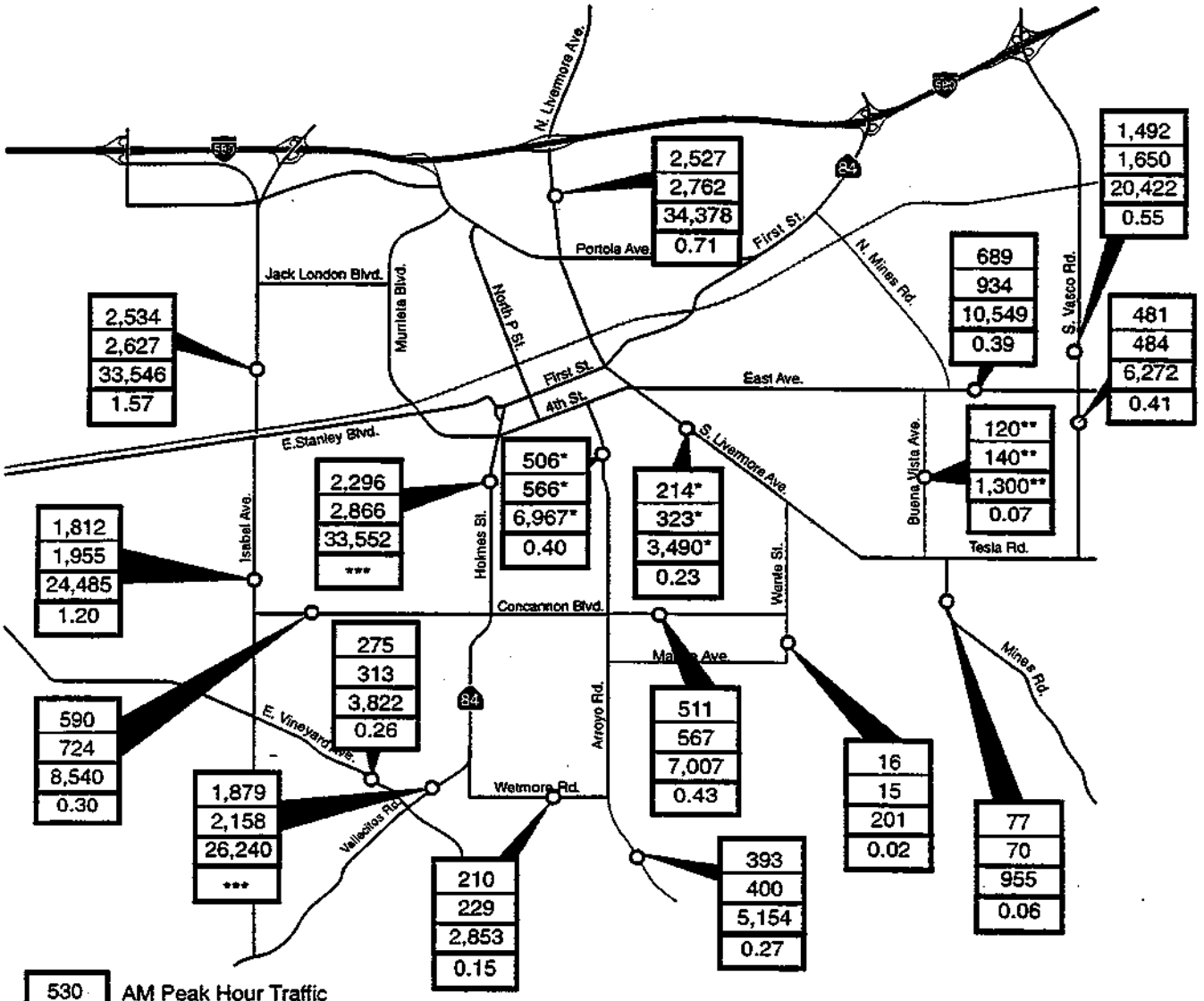
5 The Tri-Valley Traffic Model sets the capacity of this section of Isabel Avenue at 900 vehicles per lane. Exhibit 4.5-22 shows the total two-way volume, and ***Appendix 6.4*** provides the directional volumes in the model plots.

6 *Transportation and Land Development*, Institute of Transportation Engineers, 1988

Exhibit 4.5-22

Year 2010 Segment Volumes and Volume / Capacity Ratios– With Project -- Local Roadways



530 AM Peak Hour Traffic
800 PM Peak Hour Traffic
6,760 Average Daily Traffic
0.45 Peak / Hour Peak Direction Volume-to-Capacity Ratio

Source: Tri-Valley Transportation Model, 3/97 (Financially Constrained)

* Model project volumes which are substantially lower than existing counts on these facilities. This is due to the effect of the Isabel extension and SR 84 re-routing.

** Derived from adjacent intersection turn volumes.

*** See Exhibits 4.5-20 and 4.5-21 and related discussion for analysis of CMA facilities.

N

Not to Scale

Exhibit 4.5-23
Traffic Volumes on Internal Collectors [a]

Subarea	Entrance	Estimated ADT [b]
1	South Vasco - North	400
	South Vasco - Middle	700
	South Vasco - South	200
2	East Avenue	2,100
	South Vasco - North	1,400
	South Vasco - South	2,100
3	Concannon - South	2,000
	Concannon - North (Wente)	1,000
4	Arroyo - North	1,500
	Arroyo - South	500
5	Vallecitos	3,800
	Arroyo	1,900
	Wetmore	very low volume
7	Foley - North	1,500
	Foley - South	1,800

a Residential collector daily capacity is 2,000-4,000 vehicles per day. *Transportation & Land Development*, Institute of Transportation Engineers, 1988.

b Average Daily Traffic (ADT).

- ***Policy 5-44*** The City will require developers to enter into development agreements to provide the necessary roadway improvements to serve the development and mitigate traffic impacts. Development agreements shall be consistent with and coordinated with roadway phasing plans within and between subareas, and will guarantee access to all subarea parcels as needed to allow development.

- ***Policy 5-45*** Circulation improvements necessitated by Specific Plan development (i.e., improvements that would not otherwise be needed) will be funded by Specific Plan developers. Improvements that are required because of cumulative traffic, but to which the Specific Plan contributes, will be placed on the City's TIF project list to be funded by the citywide fee. TIF credits will be available to Specific Plan developers who implement improvements on the TIF list.

- ***Policy 5-46*** The City will update its list of TIF roadways and TIF improvement projects based on the annexation of the South Livermore Valley Specific Plan area into the City. Based on the revised list of TIF projects, the City will adjust its TIF fees.

Transit use by SLVSPA residents, business employees, and patrons would help reduce traffic volumes on study area roadways, including Isabel Avenue, although the effectiveness of transit extensions in reducing *Draft Plan* auto trips can not be predicted. Therefore, transit use alone could not be expected to reduce ***Impact 4.5-1*** to less-than-significant levels, and the following mitigation measures would be required:

Mitigation Measure 4.5-1 (a) The City should advocate the addition of a High-Occupancy Vehicle lane in each direction on I-580 between South Vasco Road and I-680. The extra capacity provided by the lanes is projected to be needed in the year 2010 with or without the project.

Mitigation Measure 4.5-1 (b) The City should work with Caltrans, the Tri-Valley Transportation Council, Alameda County Congestion Management Agency, and the Metropolitan Transportation Commission to add a Vallecitos Road widening project -- four lanes between I-680 and the four-lane segment of Holmes Street) to the Regional Transportation Improvement Plan. Projected traffic volumes for the year 2010 show that four lanes of traffic-carrying capacity will be needed with or without the project.

Mitigation Measure 4.5-1 (c) The City should actively pursue funding for ultimate widening of Isabel Avenue to at least four lanes. Projected traffic volumes for the year 2010 show that four lanes of traffic-carrying capacity will be needed with or without the project.

Significance after Mitigation The eventual success of the City's efforts to bring about the I-580 HOV lanes, Isabel Avenue widening, and Vallecitos Road widening projects is unknown at this time. Because the actions outlined in Mitigation Measure 4.5-1(a) through 4-5-1(c) cannot be assured of reducing the over-capacity conditions on Isabel Avenue and Vallecitos Road, this impact would remain potentially significant after mitigation. However, if Isabel Avenue is widened to four lanes, sufficient capacity would be available for the projected traffic volume with SLVSPA buildout, and the impact would be reduced to a less-than-significant level. In addition, if funding is secured to implement Mitigation Measure 4.5-1(a) and 4.5-1(b), regional roadway impacts would be mitigated to a less-than-significant level.

Responsibility and Monitoring The City of Livermore would be responsible for implementing Mitigation Measures 4.5-1(a), (b), and (c).

Impact 4.5-2 Intersection Impacts

- *Traffic generated by* Draft Plan *development would cause the LOS at the Wetmore Road / Vallecitos Road intersection to deteriorate below LOS D (V / C of 0.85) for both the AM and PM peak hours. LTS*

- *Traffic generated by* Draft Plan *development would cause the LOS at the East Vineyard Avenue / Vallecitos Road intersection to deteriorate below LOS D (V / C of 0.85) for both the AM and PM peak hours. LTS*

- *Traffic generated by* Draft Plan *development would increase turning movements on Tesla Road at South Vasco Road to a level which exceeds that acceptable for non-channeled traffic (that is, through-movements sharing a lane with turning movements). LTS*

Description of Intersection Impacts

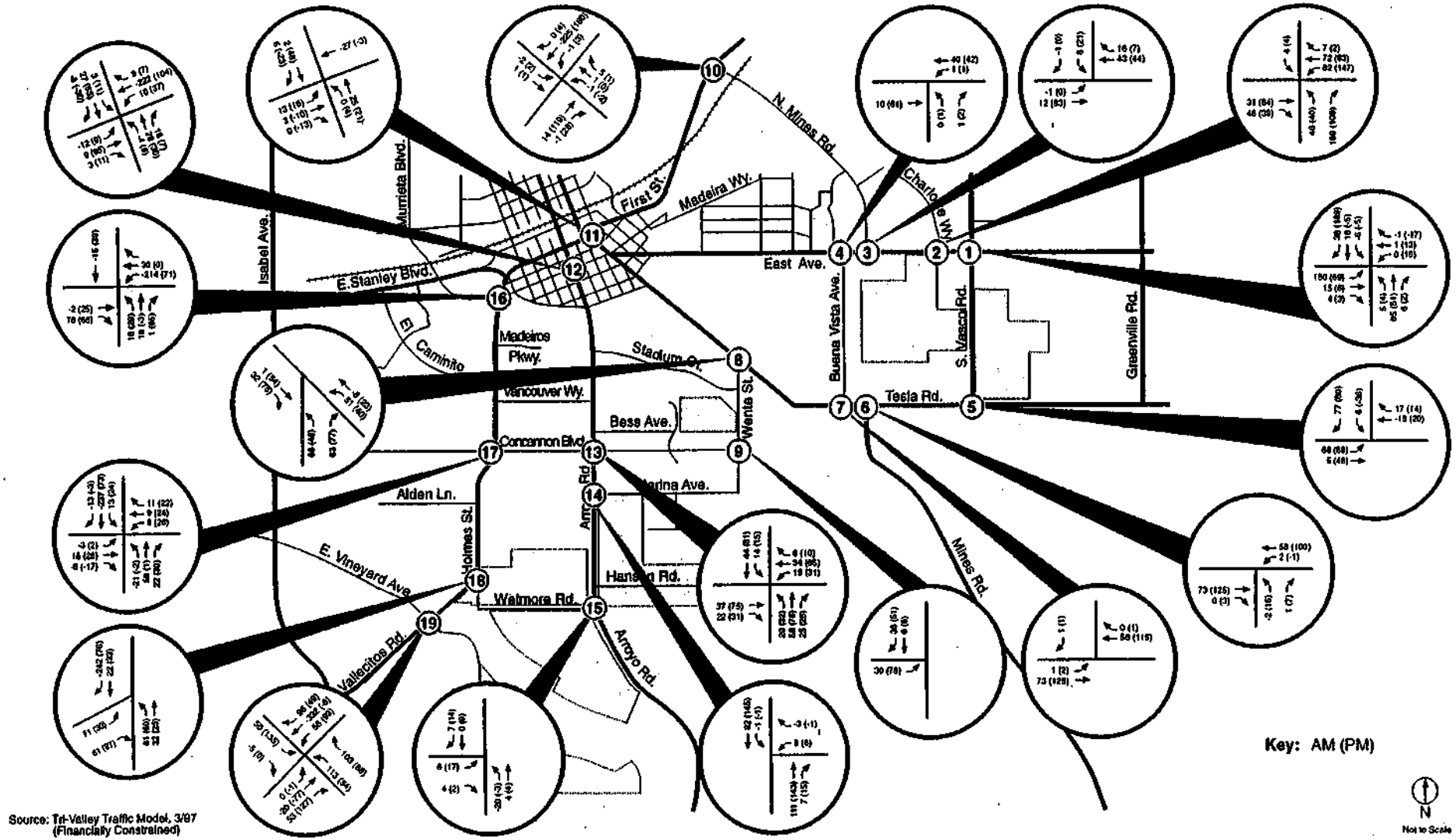
Exhibit 4.5-24 shows *Draft Plan*-generated peak hour volumes at the study intersections. Exhibit 4.5-25 shows the total intersection volumes for the year 2010 with SLVSPA traffic. Exhibit 4.5-26 summarizes intersection service levels for the year 2010 with and without the *Draft Plan*. Two intersections would fall below the City's LOS standard with the addition of *Draft Plan* traffic -- Vallecitos Road / Holmes Street (the future Vallecitos / Wetmore intersection as relocated by the *Plan*) and East Vineyard Avenue / Vallecitos Road. Several other intersections would experience small increases in delay as a result of *Draft Plan* traffic, but none would fall below LOS C. Two intersections are projected to have small decreases in delay with the project, due to the Tri-Valley Traffic Model's redistribution of traffic with the project -- East Avenue / North Mines Road and Fourth Street / L Street.

The future Wetmore Road / Vallecitos Road intersection (the relocated Holmes / Vallecitos intersection) would operate at LOS F in both the AM and PM peak hours with or without *Draft Plan* traffic. *Draft Plan* traffic would increase delay significantly for the worst movement at this intersection -- the left turn from Wetmore to southbound Vallecitos Road. *Draft Plan* development would add 61 left turns from Wetmore to Vallecitos in the AM peak hour and 60 left turns in the PM peak hour. In addition, *Draft Plan* development would add 236 vehicles which would conflict with northbound left-turns in the PM peak hour, although in the AM peak hour *Draft Plan* development would not add net new traffic to these conflicting movements. (Conflicting movements include through movements on Vallecitos Road and turns from Vallecitos Road to Wetmore Road.)

Without *Draft Plan* traffic, the year 2010 peak hour volume warrant for installation of a signal would not be met. With *Draft Plan* traffic, the warrant would be met. If a signal were in place, the intersection would operate at LOS A in the AM peak hour and LOS B in the PM peak hour. These service levels were calculated with the relatively basic CCTA service level methodology. A more detailed operational analysis would indicate that an additional through lane in each direction on Vallecitos Road would be needed to clear vehicle queues and minimize driver delay. Caltrans has indicated that two new through lanes should be provided at any new signal along this section of Vallecitos Road. In addition to widening Vallecitos Road to four total through lanes at the new Wetmore Road signal, left- and right-turn deceleration lanes also should be provided. The vehicle storage length should be approximately 100 feet for these lanes. A review of the distance between the proposed Wetmore Road intersection and the bridge over Arroyo Valle indicates that sufficient distance exists to accommodate the widening without disturbing the bridge structure. Separate left- and right-turn lanes also should be provided on the Wetmore Road approach to the intersection.

The East Vineyard Avenue / Vallecitos Road intersection would operate at LOS F in both the AM and

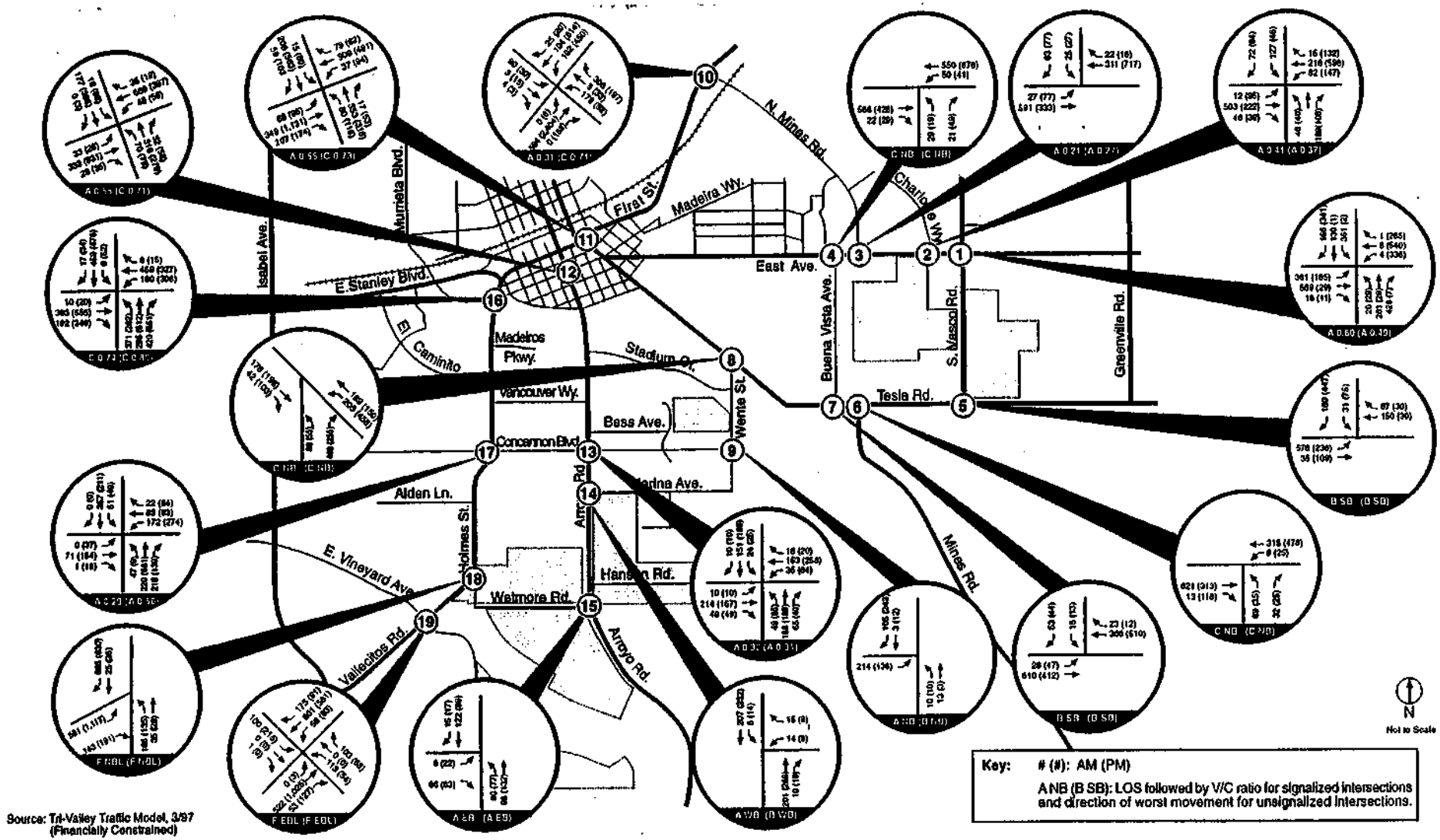
Exhibit 4.5-24
Project-Generated Intersection Volumes



Source: Tri-Valley Traffic Model, 3/97
(Financially Constrained)

Exhibit 4.5-25

Year 2010 Intersection Volumes and Levels of Service -- With Project



Source: Tri-Valley Traffic Model, 3/97
(Financially Constrained)

Exhibit 4.5-26
Level of Service Comparison

Intersection	Existing Conditions				2010 without Project				2010 with Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	*VC / Delay*	*LOS*	*VC / Delay*	*LOS*	*VC / Delay*	*LOS*	*VC / Delay*	*LOS*	*VC / Delay*	*LOS*	*VC / Delay*
East Avenue / South Vasco	A	0.55	A	0.46	A	0.55	A	0.41	A	0.60	A	0.49
East Avenue / Charlotte Way	A	0.31	A	0.40	A	0.21	A	0.27	A	0.41	A	0.37
East Avenue / North Mines	A	0.32	A	0.39	A	0.27	A	0.25	A	0.21	A	0.27
East Avenue / Buena Vista	F(NB)	72	D(NB)	29	C(NB)	17	B(NB)	9	C(NB)	19	C(NB)	10
Tesla Road / South Vasco	B(SB)	9	B(SB)	6	B(SB)	7	B(SB)	6	B(SB)	9	B(SB)	7
Tesla Road / Mines Road	C(NB)	19	C(NB)	10	C(NB)	13	B(NB)	7	C(NB)	16	C(NB)	10
Tesla Road / Buena Vista	B(SB)	8	B(SB)	10	B(SB)	7	B(SB)	6	B(SB)	7	B(SB)	8
South Livermore / Wente	B(NB)	10	B(NB)	8	B(NB)	6	A(NB)	4	C(NB)	13	C(NB)	12
Concannon / Wente	N/A	N/A	N/A	N/A	A(NB)	3	A(NB)	3	A(NB)	3	B(NB)	3
First Street / North Mines	A	0.18	A	0.41	A	0.30	C	0.71	A	0.31	C	0.71
First Street / Livermore Avenue	A	0.37	A	0.56	A	0.54	C	0.71	A	0.55	C	0.73
Fourth Street / L Street	A	0.36	A	0.44	A	0.59	B	0.61	A	0.55	C	0.71
Concannon / Arroyo Road	A	N/A	A	N/A	A	0.21	A	0.20	A	0.30	A	0.31
Marina Avenue / Arroyo Road	A	N/A	A	N/A	A(WB)	3	A(WB)	3	A(WB)	5	B(WB)	5
Wetmore Avenue / Arroyo	A	N/A	A	N/A	A(EB)	3	A(EB)	3	A(EB)	4	A(EB)	4
Murietta / Holmes Street	C	0.72	C	0.76	C	0.79	C	0.80	C	0.74	C	0.80
Concannon / Holmes Street	A	0.48	A	0.52	A	0.34	A	0.45	A	0.29	A	0.50
Vallecitos / Holmes Street	F	N/A	F	N/A	F(NBL)	306	F(NBL)	121	F(NBL)	770	F(NBL)	>999
East Vineyard / Vallecitos	E(EB)	35	F(EB)	52	F(EBL)	85	F(EBL)	208	F(EBL)	403	F(EBL)	>999

Key: LOS = Level of Service. V / C = Volume-to-Capacity Ratio (for signalized intersections). Delay = Average delay, in seconds per vehicle, for worst movement (for unsignalized intersections)

Note: For unsignalized intersections, the LOS and the delay represent the worst movement, shown in parentheses.

Source: *Fehr & Peers, Associates, Inc.*

- For signalized intersections, the LOS calculations were performed with the CCTALOS (Contra Costa Transportation Authority Level of Service) software.
- For unsignalized intersections, the LOS calculations were performed with the HCS94 (Highway Capacity Software) based on the 1994 *Highway Capacity Manual*.

PM peak hours with or without *Draft Plan* traffic. *Draft Plan* traffic would increase delay significantly on the minor street stop-controlled approaches. PM peak hour volumes without *Draft Plan* development would not warrant a traffic signal, but volumes with the project would warrant a signal. If a signal were in place, the intersection would operate at LOS B in the AM peak hour and LOS C in the PM peak hour with *Draft Plan* traffic. As noted above in discussing the Vallecitos / Wetmore intersection, Caltrans advises the provision of additional through lanes at any new signal along Vallecitos Road to help clear through-vehicle queues. A preliminary conceptual design review indicates that sufficient distance exists between the Arroyo Valle bridge and the location of the relocated intersection to widen the roadway without requiring bridge widening. However, further design studies would be needed of this improvement. In addition to two new through lanes (one in each direction) on Vallecitos Road, left-and right-turn deceleration lanes should be provided on Vallecitos.

The left-turning volume from Tesla eastbound to South Vasco northbound is projected to be 578 vehicles in the AM peak hour and 236 vehicles in the PM peak hour in 2010 with *Draft Plan* conditions. While a signal would not be warranted at this intersection, a left-turn lane on Tesla would be needed to physically separate drivers turning left from the through-traffic flow on Tesla eastbound. Without the left-turn lane, eastbound traffic would need to slow down and divert around left-turners, creating an unsafe condition.

Relative Use of Intersection Capacity by Subareas

The relative impact of each of the SLVSPA subareas and commercial sites on intersection congestion is discussed below in order to provide information on the proportionate use of intersection capacity by the commercial sites and housing units by subarea. The traffic analysis included this evaluation to assist the City in determining (1) which commercial sites would be preferable from a traffic impact perspective and (2) what the proportional use of intersection capacity would be for each of the subareas. This second item can be used in assessing traffic impact fees and allocating improvement costs among the subareas.

A note on the methodology used for this analysis: the original (October 1996) TVTM runs, which did not use the financially constrained network, provided the basis for determining relative intersection use by subarea. When the financially constrained network model was run in March 1997, those use numbers were factored up or down in relation to the amount by which (1) the 2010 "no project" turning movements changed and (2) the project (as a whole) volumes changed. The analysis was revised this way rather than generating a completely new set of "select zone" [7] distribution plots with the financially constrained model. This manual method of adjusting the relative subarea contributions was determined to be adequate given the relatively small change in 2010 "no project" volumes and in the project's use of intersection capacity.

Exhibit 4.5-19 shows that *Draft Plan* development is estimated to generate approximately 21,222 daily vehicle trips on a typical weekday, 1,559 trips during the AM peak hour, and 2,086 trips during the PM peak hour. On a PM peak hour basis, residential trips would constitute approximately 72 percent of the total trip generation and commercial trips the remaining 28 percent. Exhibits 4.5-27 and 4.5-28 show the intersection impacts due to traffic from the different subareas, for residential and

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[7] "Select Zone" distributions show the traffic distributed to the network from a single zone, as opposed to the entire set of land uses in the model.

Exhibit 4.5-27

Residential Traffic Contribution to Year 2010 Intersection Volumes

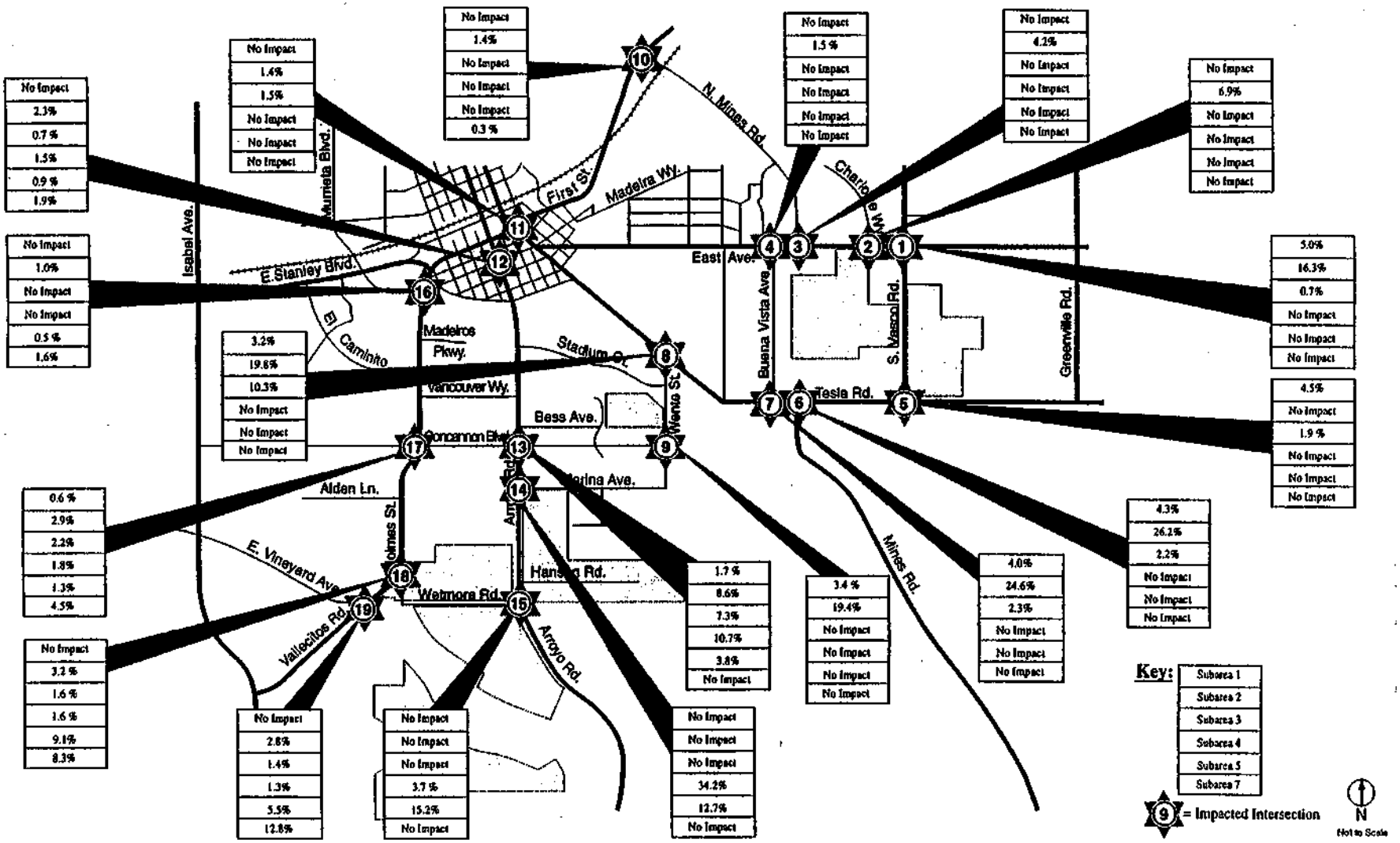
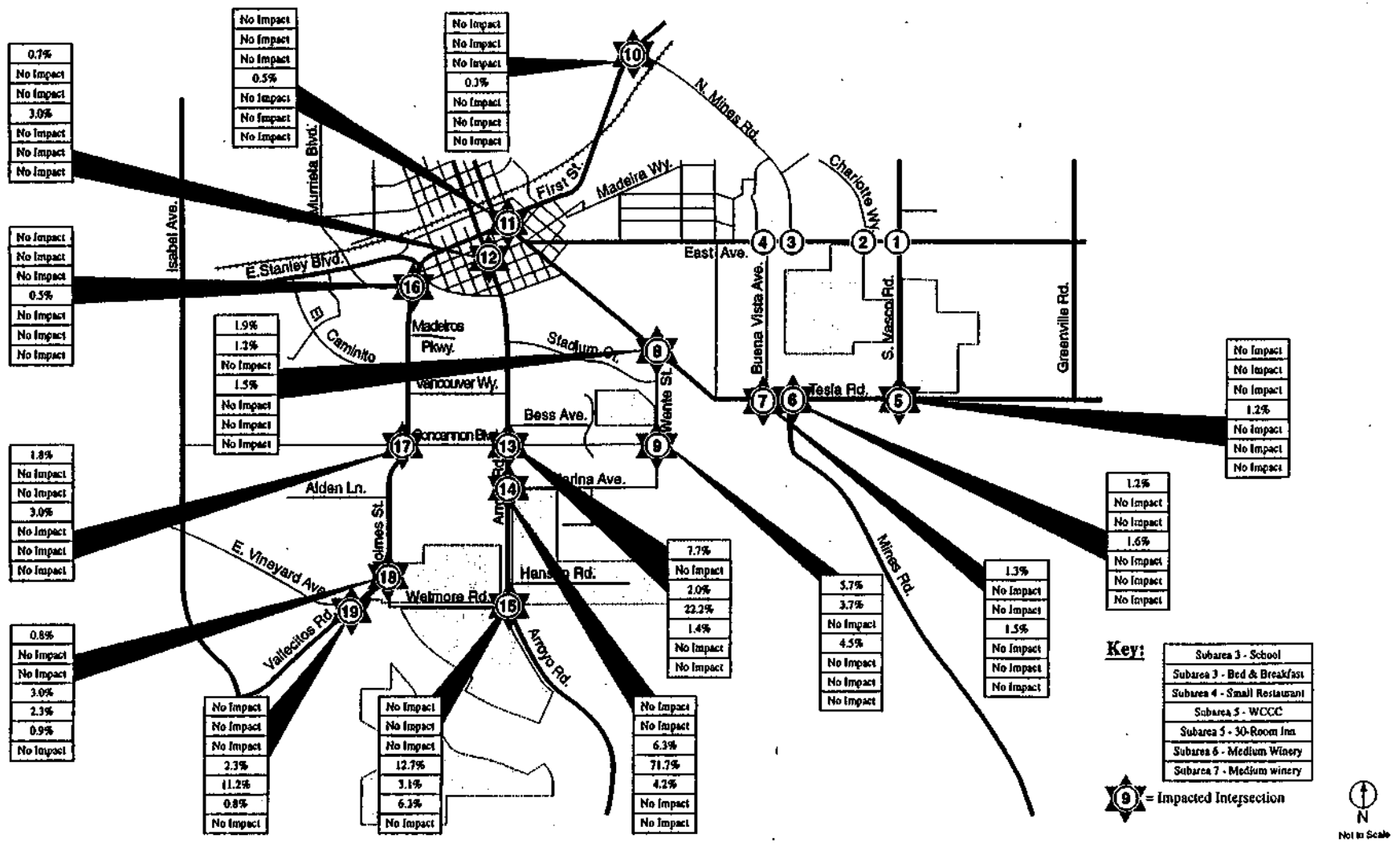


Exhibit 4.5-28
Commercial Traffic Contribution to Year 2010 Intersection Volumes



commercial traffic, respectively.

Residential Traffic Trips generated by residential development in SLVSPA subareas would represent approximately 72 percent of total PM peak hour project trip generation. As Exhibit 4.5-27 indicates, all study intersections would receive residential trips from *Draft Plan* development. SLVSPA traffic would use the highest proportion of intersection capacity at the intersections in close proximity to each respective originating subarea and also at intersections on heavily used facilities (such as Concannon Boulevard).

Commercial Traffic The *Draft Plan* describes 13 potential commercial sites and one school. In total, all 13 sites and the school would generate 28 percent of total PM peak hour trip generation. Of the commercial sites, all but two would be relatively low trip generators in the PM peak hour, accounting for 26 or fewer PM peak hour trips. (For comparison, the lowest trip-generating residential subarea would account for 131 PM peak hour trips). The two commercial sites which would generate higher traffic volumes are the wine country commercial center (270 PM peak hour trips) and 30-room inn / restaurant (44 PM peak hour trips). The school would generate 86 PM peak hour trips. Exhibit 4.5-28 shows the intersections which would be impacted by commercial traffic and the percentage of traffic contribution from each of the five largest commercial sites. The remaining sites would contribute less than ten trips to any intersection and, thus, were determined to have a negligible effect on intersection operations. In summary, the school in Subarea 3 would affect eight study intersections, the wine country commercial center in Subarea 5 would affect 15 study intersections, the 30-room inn in Subarea 5 would affect five study intersections, and the medium-sized winery in Subarea 6 would affect three study intersections.

The *Draft Plan* contains the following policies which would address the post-project conditions discussed above:

- ***Policy 5-32*** A traffic signal will be installed at the Vallecitos Road / Wetmore Road intersection along with appropriate geometric improvements (e.g., left-turn lanes, deceleration lanes, etc.). The signal will be installed when operations at the existing Holmes Street / Vallecitos Road intersection meet signal warrants with the planned Isabel Avenue extension in place. A minimum 550-foot distance will be maintained between the new intersection and the bridge across Arroyo Valle to allow adequate distance for the merging of lanes.

- ***Policy 5-34*** The City will include Vallecitos Road and the Vallecitos Road / Wetmore Road intersection improvements on its TIF list to enable it to use TIF fees to make the required improvements. The TIF fees may also be adjusted accordingly to cover the proposed intersection improvements.

- ***Policy 5-35*** A traffic signal will be installed at the Vallecitos Road / East Vineyard Avenue intersection along with appropriate geometric improvements (e.g., left-turn lanes, deceleration lanes, through lanes, etc.). The signal will be installed when Subarea #7 develops or when signal warrants are met.

- ***Policy 5-36*** The City will include Vallecitos Road and the Vallecitos Road / East Vineyard Avenue intersection improvements on its TIF list to enable it to use TIF fees to make the required improvements. The citywide TIF fees may also be adjusted accordingly to cover the proposed intersection improvements.

- ***Policy 5-40*** Specific Plan developers shall add an eastbound left-turn lane to Tesla Road at

South Vasco Road concurrent with other improvements needed to South Vasco Road.

With implementation of *Draft Plan* Policies 5-32, 5-34, 5-35, 5-36, and 5-40, the City would install signals and / or make the appropriate geometric improvements on the respective street segments at the future Wetmore Road / Vallecitos Road (relocated former Holmes Street / Vallecitos Road), East Vineyard Avenue / Vallecitos Road, and South Vasco Road / Tesla Road intersections, as described above. Thus, implementation of these policies would restore the intersections to acceptable (LOS D or better) operating conditions and would reduce the severity of impact to a less-than-significant level.

Mitigation Measure 4.5-2 No mitigation would be required.

Impact 4.5-3 Potential Traffic-Related Impacts to Marina Avenue
Traffic volumes along Marina Avenue potentially could grow due to this road's proximity to the Wine Trail, the potential for cumulative special events' traffic generated by South Livermore Valley commercial sites, and its potential use as a commute by-pass of Concannon Boulevard. PS

The *Draft Plan* anticipates that Marina Avenue would remain in the County and not be annexed to the City. However, Marina Avenue residents have expressed concerns that the extension of Concannon Boulevard to South Livermore Avenue (or Tesla Road), combined with residential and commercial growth attributable to the *Draft Plan*, would lead to the use of Marina-Wente as a parallel route to by-pass a potentially congested Concannon Boulevard. Special events-related traffic from new commercial sites, especially on weekends, is also a concern. *Draft Plan* Policy 5-4 designates Marina Avenue between Arroyo Road and Wente as the Wine Trail which likely would result in winery-related traffic using the roadway, especially on weekends.

For the weekday peak hours under year 2010 "with project" conditions, the Tri-Valley Traffic Model assignment shows very low volumes using Marina Avenue, of which about ten -to 20 trips would be *Draft Plan* trips. The capacity provided on Concannon Boulevard would be sufficient to handle projected east-west traffic through the area, and the intersections along Concannon Boulevard are projected to operate at good service levels under year 2010 "with project" conditions. Thus, significant "cut-through" traffic on Marina is not anticipated during the weekday AM and PM commute periods.

Because the *Draft Plan* designates the wine trail along Marina Avenue between Arroyo Road and Wente Street, it is likely that some winery-related or special event-related traffic would use Marina Avenue on weekends. However, if volumes exceed the environmental capacity at the roadway, alternative routes exist. The Concannon Boulevard / Arroyo Road intersection and Concannon Boulevard itself have substantial unused capacity which would be available on weekends as well as weekdays. (In general, weekend peak hour volumes usually are lower than weekday peak hour volumes.) For example, the Tri Valley Traffic Model sets the traffic-carrying capacity of Concannon Boulevard at 1,600 vehicles per hour (total of both directions), and the projected weekday traffic volume with *Draft Plan* buildout is 567 PM peak hour vehicles. Because this leaves available capacity for more than 1,000 additional vehicles per hour, Concannon Boulevard would not present a traffic obstacle to recreational and tourism trips.

In addition, *Draft Plan* Policy 5-39 suggests that Alameda County consider placing traffic calming measures along Marina to preserve its rural nature. Such measures can effectively slow traffic and discourage commuter cut-through traffic -- for instance, planting trees close to the roadway, building periodic islands which divert traffic flows with resultant slower speeds, and, if necessary, constructing

speed bumps. Marina Avenue should be considered as a potential traffic calming location by Alameda County, should monitoring of traffic volumes and speeds recommend such measures.

Marina Avenue residents have requested that if, as wineries and other commercial sites in the SLVSPA develop over time, periodic monitoring shows traffic volumes and / or speeds which exceed limits acceptable to the residents, the option of providing a cul-de-sac at the end of Marina Avenue be considered. This would create a mile-plus-long cul-de-sac which is not advisable based on standard transportation planning guidelines. The Institute of Transportation Engineers' *Guidelines for Residential Subdivision Street Design* recommends a maximum cul-de-sac length of 1,500 feet in order to allow for adequate emergency access. If a cul-de-sac were installed at the end of Marina, emergency access could be provided through a break-down barrier between the cul-de-sac and Wente Street. However, less aggressive traffic calming measures would address this problem effectively.

In summary, the traffic modeling performed for the traffic analysis shows that traffic volumes are *not* projected to grow substantially on Marina Avenue with implementation of the *Draft Plan*. While modeling was not performed for weekend conditions, the average weekend traffic generation would not be substantially higher than weekday traffic generation and, thus, would not be expected to cause substantial traffic growth on Marina. Mitigation Measure 4.5-3 provides a mechanism for monitoring and consideration of traffic calming measures on Marina if excessive volumes and / or speeds become a problem, in spite of this analysis' projections.

Mitigation Measure 4.5-3 Implementation of *Draft Plan* Policy 5-39, regarding the City's encouragement of the County's traffic calming program for Marina Avenue, supports the neighborhood's efforts to reduce volumes on Marina Avenue. The following mitigation measure would be required to supplement Policy 5-39:

- The City shall work with the County to continue monitoring traffic patterns on Marina Avenue. Traffic shall be monitored at least once a year until cumulative traffic conditions have stabilized for a period of three years. Stabilized shall be defined as vehicle speed and vehicle volume counts not increasing by more than ten percent for a given three-year period. If trips on Marina Avenue increase to more than 2,000 trips per day (the conservative environmental capacity of the roadway) or if the 85th percentile speed of traffic on the roadway exceeds 40 miles per hour, the City will work cooperatively with the County to implement traffic calming measures to reduce the volume and speed of vehicles to those levels. Traffic calming measures which will be considered include those outlined in the County's adopted traffic calming program, such as the particular following examples:

  - Planting steet trees close to the roadway / Residential Neighborhood Gateways
  - Speed enforcement (Neighborhood Speed Watch Program)
  - Road and speed humps
  - Move the wine trail designation to Concannon Boulevard
  - Turn lane restrictions

  The City will advocate increasingly stringent traffic calming measures until the above-stated standards are met.

Significance after Mitigation Implementation of *Draft Plan* Policy 5-39 and Mitigation Measure 4.5-3 would reduce the potential impact to a less-than-significant level.

Responsibility and Monitoring The City and County would be jointly responsible for implementing

Mitigation Measure 4.5-3 as outlined above. As long as Marina Avenue remains in unincorporated Alameda County, the County would have ultimate jurisdiction and responsibility for the roadway.

Impact 4.5-4 Potential Traffic-Related Impacts to Buena Vista Avenue

- *Project implementation would result in an insignificant amount of additional traffic on Buena Vista Avenue. LTS*

- *Traffic speed surveys show that vehicle speeds on Buena Vista Avenue currently are higher than the posted speed limit, resulting in a traffic safety problem. Therefore, any significant increase in the traffic volumes on Buena Vista Avenue would exacerbate an existing traffic safety problem. Due to the difficulties in predicting individual driver behavior, the EIR assumes there is a possibility of some increase in additional traffic and, therefore, an exacerbation of the traffic speeding problem. This would constitute a potentially significant cumulative impact. PS*

Residents of Buena Vista Avenue have raised the issue that 707 new units in Subareas 1 and 2 would result in increased "cut-through" traffic using Buena Vista Avenue to travel to and from south-central Livermore and SR 84. This travel pattern would occur if competing paths -- primarily South Vasco Road to Tesla Road or East Avenue to Dolores / Pacific / South Livermore Avenue -- were more time-consuming than Buena Vista Avenue to Tesla Road to Wente Street / Concannon Boulevard. Residents of Buena Vista Avenue have expressed the belief that a North Mines Road connection from east Avenue to Tesla Road would provide an alternate route for such travel and preserve the rural residential quality of Buena Vista Avenue.

The following summary describes the analyses performed to assess the potential impact of implementing the *Draft Plan* on Buena Vista Avenue traffic volumes, route preferences, and speeds.

Potential Travel Route Preferences

The Tri-Valley Traffic Model has certain limitations including that the model does not allow prediction to a certainty regarding traffic routing, since individual driver behavior is difficult to predict. Therefore, an analysis of possible travel route preferences based on time of travel was performed to determine the likelihood of an increase in cut-through traffic on Buena Vista as a result of the project. In addition, cut-through traffic from other sources also was considered. The most likely users of such a route would travel from the freeway shopping area at First Street to the southwest parts of the community. Two routes were timed based on the assumption that Alternative A would be selected for the Concannon Boulevard extension alignment. The possible routes analyzed were as follows:

- Concannon Boulevard to South Livermore Avenue to Pacific Avenue to Dolores Street to East Avenue to Mines Road:

- Concannon Boulevard to South Livermore Avenue to Tesla Road to Buena Vista Avenue to East Avenue to Mines Road:

The Buena Vista Avenue route resulted in travel times approximately two minutes faster than the Pacific Avenue / Dolores Street route. The analysis shows that it would be more efficient to use Buena Vista once the Mines Road overpass is completed. However, this route would be likely to attract relatively few additional trips (mainly those to freeway shopping centers at First Street), since freeway travelers would be likely to choose either more easterly or westerly interchanges, depending

on their direction of travel. Generally, only minor increases in traffic using this path could be attributed to *Draft Plan* traffic as a result of the insignificant amount of total traffic generated by the project.

Current Traffic Volumes

Traffic counts and speed surveys have been performed by both Alameda County (in August 1995) and the City of Livermore (in August and October 1996). The County's survey was conducted for seven days and showed an average weekday traffic volume of 1,686 vehicles and an average weekend traffic volume of 1,466 vehicles. The City's surveys showed lower volumes. The average weekday volume was 1,080 in August (one Monday count only) and 1,441 in October (average of three weekdays), and the average weekend volume was 949 in August and 1,235 in October. Averaging the three counts (weighted by the number of days for each count), the average daily volume is 1,537, and the average weekend volume is 1,216.

Peak hour intersection counts conducted by the EIR traffic consultant in October 1996 indicate that the peak hour volume on Buena Vista Avenue is approximately 150 vehicles (AM and PM peak hours). This is consistent with an average daily traffic volume of approximately 1,500 vehicles. (Peak hour volume typically constitutes about ten percent of daily volume.) The peak hour volume is well under the roadway's traffic carrying capacity (estimated by the TVTM at 600 vehicles per hour). The volumes also are well within what is termed the "environmental capacity" for a residential roadway (typically held to be 2,000 to 3,000 vehicles per day and 200 vehicles per hour). Environmental capacity refers to the level of traffic which generally is acceptable to residents living on a local residential roadway -- a roadway which only provides access to fronting uses. The fact that volumes on Buena Vista are lower than generally accepted environmental capacity levels is a good indication that the problem on Buena Vista is related to traffic speeds rather than traffic volumes.

Traffic Speeds

Speed surveys recently conducted by the City of Livermore Department of Public Works show an 85th percentile speed of 41 mph (northbound and southbound), 16 mph higher than the posted speed of 25 mph. Alameda County conducted a speed survey in September 1995 which showed 85th percentile speeds of 45-46 mph. The 85th percentile speed is the California Vehicle Code standard for speed limit setting, in the absence of other indications that a lower speed is necessary (such as higher-than-average accident rates or roadway geometric considerations -- hills or horizontal curvature, for instance, which affect sight distance). The designation of a roadway as a local residential district also can be used to enforce a 25 mph speed limit. Alameda County has authorized radar speed enforcement of the 25 mph limit on Buena Vista since 1994, based on the road's status as a residential district.

Since radar enforcement is authorized for Buena Vista Avenue, increased enforcement would be an effective way to reduce speeds through increased police presence and the use of speed-check trailers. [8] "Traffic calming measures" also can be very effective in slowing traffic and discouraging cut-through traffic. The County is planning a traffic calming pilot program which will employ measures to slow

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[8] It should be noted that, according to County Public Works staff, radar enforcement of substantially down-zoned roadways (that is, from an 85th percentile speed of 45 mph to a speed limit of 25 mph) has been scrutinized by the courts recently and that the provision of defensible engineering studies demonstrating the need for the lower speed is becoming more important to the upholding of radar-enforced citations.

traffic (such as having local residents sign contracts to obey speed limits and, possibly, installing speed humps, signs and other measures). Buena Vista Avenue is one of the roadways included in this program. The program is expected to be approved by the County Board of Supervisors and enter the planning phase in the next few months.

Draft Plan Traffic Assignment to Buena Vista Avenue

The TVTM assigned negligible *Draft Plan* traffic (less than five peak hour trips) to Buena Vista Avenue, an indication that other routes would provide lower travel times for *Draft Plan* traffic (that is, between Subareas 1 and 2 and points south and between the other subareas and points north). A comparison of potential intersection-related delays on the competing routes supports this result. The most likely cut-through travelers would be those in Subarea 2 who either could:

- Enter / exit on East Avenue and travel on Buena Vista to get to / from Tesla / Wente / Concannon / Holmes / SR 84 *or*

- Enter / exit on South Vasco Road and travel to / from the south on Tesla / Wente / Concannon / Holmes / SR 84

The first option would involve at least two traffic signals while the second would involve none. In addition, the segment of South Vasco Road between East Avenue and Tesla Road would be posted at least 35 mph as opposed to the 25 mph posting on Buena Vista. (Currently, South Vasco is posted 35 mph in the northern section near the research park, and 45 mph farther south.) Buena Vista Road has a lower capacity than South Vasco Road, due to its substandard lane widths (approximately ten feet) and shoulder widths (approximately one foot of pavement). The combination of signal delay, posted speeds, and roadway capacity constraints indicates that significant *Draft Plan* cut-through traffic on Buena Vista would not be likely.

The TVTM model predicts no significant increase in Buena Vista traffic in the year 2010 from any source. This may be related in part to the model's assumption of a downsized LLNL (approximately 600 fewer employees than in the 1990 version of the model, based on *ABAG Projections 1994*, the land use source for the TVTM.)

The provision of a Mines Road connection would not guarantee that additional traffic would not seek out Buena Vista. Moreover, it would not provide a solution to the speeding problem which currently is occurring. Therefore, the connection would not mitigate the effects of any project traffic using Buena Vista. For this reason, the Mines Road connection is rejected as a mitigation for Impact 4.5-4. (See ***3.7 Areas of Controversy and Issues To Be Resolved*** for a discussion of a Mines Road extension.) Instead, the *Draft Plan* contains the following policy of the City to encourage the County's traffic calming program for Buena Vista, ensure the City's commitment to mitigating any project-related speeding impact on Buena Vista, and support the neighborhood's efforts to reduce volumes and slow speeds on Buena Vista Avenue:

- ***Policy 5-38*** The County should continue its efforts to find traffic calming devices that will enhance pedestrian safety and maintain the rural character of the Buena Vista Road corridor.

Mitigation Measure 4.5-4 Implementation of *Draft Plan* Policy 5-38, regarding the City's encouragement of the County's traffic calming program for Buena Vista Avenue, supports the neighborhood's efforts to reduce volumes and slow speeds on Buena Vista Avenue. The following mitigation measure would be required to supplement Policy 5-38:

- The City shall work with the County to continue monitoring traffic patterns on Buena Vista Avenue. Traffic shall be monitored at least once a year until cumulative traffic conditions have stabilized for a period of three years. Stabilized shall be defined as vehicle speed and vehicle volume counts not increasing by more than ten percent for a given three-year period. If trips on Buena Vista Avenue increase to more than 2,000 trips per day (the conservative environmental capacity of the roadway) or if the 85th percentile speed of traffic on the roadway exceeds 30 miles per hour, the City will work cooperatively with the County to implement traffic calming measures to reduce the volume and speed of vehicles to those levels. Traffic calming measures which will be considered include those outlined in the County's adopted traffic calming program, such as the particular following examples:

  - Planting steet trees close to the roadway / Residential Neighborhood Gateways
  - Speed enforcement (Neighborhood Speed Watch Program)
  - Road and speed humps
  - Turn lane restrictions

  The City will advocate increasingly stringent traffic calming measures until the above-stated standards are met.

Mitigation Measure 4.5-4 Implementation of *Draft Plan* Policy 5-38 and Mitigation Measure 4.5-4 would reduce the potential impact to a less-than-significant level.

Responsibility and Monitoring The City and County would be responsible as outlined above. As long as Buena Vista Avenue is located in unincorporated Alameda County, the County would have ultimate jurisdiction and responsibility for the roadway.

Impact 4.5-5 Transit Impact

- *Development of SLVSPA subareas would require the extension of existing transit routes to serve the potential new ridership in the subareas. The current* Livermore-Amador Valley Transit Authority Short Range Transit Plan *does not include these extensions, although its ridership growth projections substantially exceed the population and employment growth projected for its service area by* ABAG's Projections 1994. *LTS*

- *Provision of transit service to SLVSPA subareas would require subarea developers to work with the City and LAVTA to locate and design bus pull-outs and provide other bus stop amenities. A preliminary, but not inclusive, list of roadways where transit stops would be required are: LTS*

  - *East Avenue near Subarea 1*
  - *South Vasco Road near Subareas 1 and 2*
  - *The internal collector street in Subarea 2*
  - *Concannon Boulevard near Subarea 3*
  - *Arroyo Road between Subareas 4 and 5*
  - *Wetmore Road between Arroyo and Holmes*
  - *The internal east-west collector in Subarea 5*
  - *Holmes Street near Subarea 5*
  - *Foley Road near the two entrances to Subarea 7*

LAVTA's *Short Range Transit Plan* for Fiscal Year 1995 / 1996 to 2005 / 2006 projects ridership growth of 77 percent by 2005 / 2006, based on a five percent per year growth rate for most routes and a single-year 15 percent growth for routes planned to serve the new Dublin BART station when

complete. To assess whether new SLVSPA residents would constitute additional riders within these projections, the ridership growth was compared to *ABAG's Projections 1994* growth rates in employment and population for the LAVTA service area. For the same period (1995 / 1996 to 2005 / 2006) *Projections 1994* shows employment growth of 45 percent and population growth of 39 percent for the combined Livermore / Dublin / Pleasanton area. LAVTA's ridership projections accommodate these growth rates easily, given that transit use is much lower than 100 percent. Thus, LAVTA's ridership projections appear to accommodate the potential patronage from *Draft Plan* uses. However, the *Short Range Transit Plan* contains no service extensions beyond July 1997 for the Livermore area.

The *Draft Plan* contains a number of policies to encourage the respective transit providers to extend or expand service and to require developers within the SLVSPA to accommodate transit service (such as providing shelters). Policies include the following:

- ***Policy 5-47*** The City will encourage LAVTA to extend or expand service to Specific Plan subareas.

- ***Policy 5-48*** The City should promote the use of regional transit such as BART to reduce regional traffic congestion and reduce regional automobile emissions.

- ***Policy 5-49*** Developers shall be required to provide transit stops along existing and extended or expanded fixed routes within or bordering subareas to serve future ridership from the Specific Plan area. Developers shall coordinate with LAVTA regarding the location and design of transit facilities. Transit stop design and amenities (benches, shelters, etc.) shall be consistent with the rural agricultural setting, while also meeting the functional requirements of LAVTA's design standards. Transit stop locations should be coordinated with the alignment of planned pedestrian trail systems to ensure convenient pedestrian access.

Examples of specific changes the LAVTA could make to serve the SLVSPA in response to Policy 5-47 include:

- Extending Route 14 farther south along Holmes Street and Arroyo Road with an east-west crossing at Wetmore Road or the internal east-west collector in Subarea 5. This extension would provide service to Subareas 4, 5 and 6.

- Expanding and re-aligning Route 10 to serve Subareas 1 and 2 by adding a loop consisting of South Vasco Road and the Subarea 2 collector street.

- Expanding or re-aligning Route 11 or Route 14 to extend transit service to Subarea 3.

The *Draft Plan* Policy 5-49 states that developers shall be required to provide transit stops along existing and extended or expanded fixed routes within or bordering subareas to serve future ridership from the SLVSPA, coordinating with LAVTA regarding the location and design of the facilities.

Mitigation Measure 4.5-5 No mitigation would be required.

Impact 4.5-6 Pedestrian / Bicyclist Safety and Mobility

Implementation of the Draft Plan *would generate bicycle and pedestrian travel demand on roadways adjacent to the SLVSPA, requiring construction of sections of the City's* Bicycle / Pedestrian Plan *facilities on subarea frontages concurrent with individual subarea development. The* Draft Plan *does not include all of the required* Bicycle / Pedestrian Plan *facilities, and it does not explicitly address trail crossing treatments. This could result in inadequate pedestrian and bicyclist circulation and substandard crossing designs. S*

The *Draft Plan* contains a continuous multi-use trail system which both provides for pedestrian and bicycle travel within subareas and connects the subareas to each other and to the Citywide *Bicycle / Pedestrian Plan* and *Equestrian Trails Plan* network. Exhibit 4.5-29 illustrates schematically the subarea trails (dashed line), subarea connection trails (dotted line) and connections to citywide trails contained in the *Bicycle / Pedestrian Plan* and *Equestrian Trails Plan.* Exhibits 2.2-1 through 2.2-5 illustrate the trails within the subareas.

Within the corridor connecting the SLVSPA subareas, the provision of a continuous trail system would minimize the need for and length of bicycle or walking trips on roadways external to the subareas, whether for recreational, commuting, or school trips. For trips which do require use of external roadways due to origins / destinations (such as the LLNL or downtown), the City's *Bicycle / Pedestrian Plan* calls for bike lanes or multi-use trails along key arterials, such as (see Exhibit 4.5-15):

- South Vasco Road south of East Avenue
- Tesla Road east of Wente Street
- Arroyo Road south of Superior Drive
- Vallecitos Road south of East Vineyard Avenue
- East Vineyard Avenue between Isabel Avenue and Vallecitos Road
- Holmes Street from First Street to Wetmore

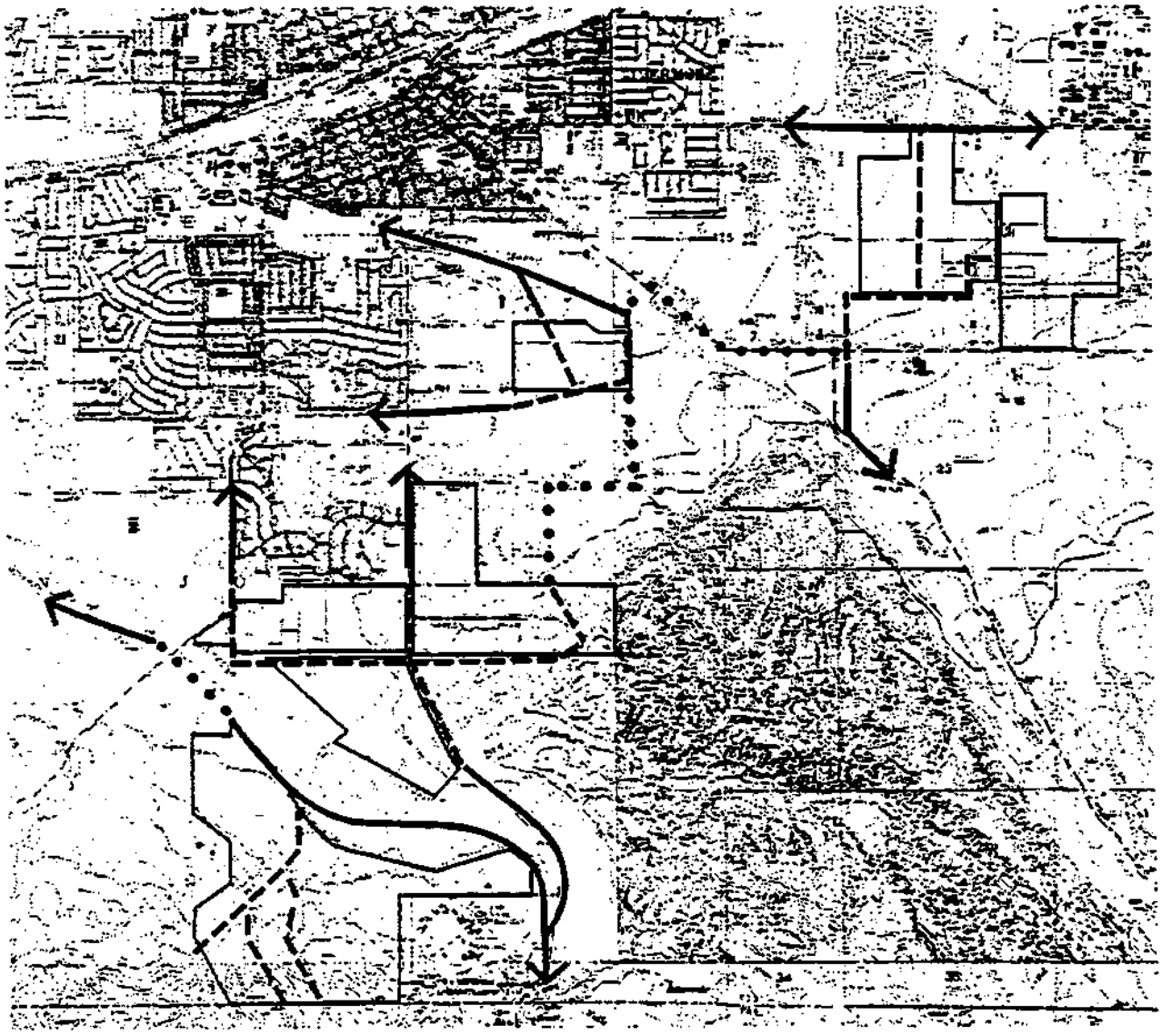
It is anticipated that sections of these facilities located adjacent to SLVSPA subareas would be used most heavily by residents of the adjacent subareas. As a result, subarea developers should be required to build these sections of the Citywide Plan when constructing fronting uses and in conjunction with any other external roadway improvements (such as turn-lane installation).

Within the subareas, pedestrian and bicycle trips would use all of the internal roadways, primarily to access trails. *Draft Plan* site plans provide pedestrian / bicycle paths along all entry and collector roadways separated from the automobile traveled ways by landscaped buffers of at least eight feet. Local residential roadways would provide pedestrian paths separated from the traveled way by landscaped buffers of five feet. Bicycles would share the automobile traveled way on these local residential roadways. These widths are not considered unsafe given the low traffic volumes which would use these roadways and the low speeds resulting from relatively narrow lane widths and short roadway lengths.

Draft Plan Policies 5-52 through 5-54 call for the dedication of subarea trails to the Livermore Area Regional Park District (5-52), for subarea developers to plan for and build trail sections within the subareas (Policy 5-53), and for the LARPD to design and build trail sections between the subareas (5-54), as follows:

- ***Policy 5-52*** All trail corridor rights-of-way and improvements will be dedicated to LARPD for long-term ownership and maintenance.

Exhibit 4.5-29
Existing and Proposed Trail System



Legend:

- Proposed project trail improvements
- Proposed joint project/LARPD trail improvements
- Existing/planned trail connections

N

Not to Scale

- ***Policy 5-53*** Planning area developers are responsible for improving designated regional trail corridors within the planning subareas to Specific Plan standards prior to dedication. The City and LARPD must review and approve trail improvements prior to final map approval to integrate the South Livermore Valley with the remainder of the City and to ensure consistency with this Specific Plan and with LARPD objectives.

- ***Policy 5-54*** Acquisition of right-of-way for sections of the trail corridor that are located between the planning subareas shall be the responsibility of LARPD. LARPD will be responsible for the design and implementation of improvements to these sections of the trail system. The costs of improvements to the sections of trail corridor that are located between the planning subareas shall be divided equally between LARPD and the subarea developers via a Specific Plan fee.

These policies would ensure that the trail sections within the subareas are constructed, that trail sections connecting the subareas to each other are planned and built by the LARPD, and that the LARPD ultimately would manage and maintain the entire system along with other citywide trail sections.

Mitigation Measure 4.5-6 (a) Where trails cross roadways, trail crossings shall be designed to the standards set forth in the *Livermore Bicycle / Pedestrian Plan Update* and *Equestrian Trails Study.* Subarea developers should work with LARPD and the City and County Public Works Departments on crossing design. Trail / roadway crossings are planned at the following locations:

- Subarea 2 midway along the central collector
- Subarea 2 all farm compound access drives
- Tesla Road at southwest edge of Subarea 2
- Concannon Boulevard at Wente Street
- Subarea 3 at southern entry drive
- Subarea 3 at southwest corner of school site
- Arroyo Road / Wetmore Road
- Wetmore Road, near Holmes Street and Sycamore Grove Park entrance
- Subarea 7 three residential roadway crossings

Mitigation Measure 4.5-6 (b) Subarea developers should work with the City Public Works Department and LARPD to plan, design, and construct the segments of the *Bicycle / Pedestrian Plan* facilities which run adjacent to subarea frontage but are not included in the *Draft Plan.* Subarea developers should pay for the improvements along subarea frontage. The facilities include (refer to Exhibit 4.5-15):

- Bicycle lanes on South Vasco Road along Subarea 1 and 2 frontages
- Multi-use trail on South Vasco Road between southern entrance to Subarea 2 and Tesla Road
- Bicycle lanes and multi-use trail on Tesla Road between Subarea 1 southeast corner and north-south trail connection at southwest corner of Subarea 2

Significance after Mitigation Implementation of Mitigation Measures 4.5-6 (a) and 4.5-6 (b) would reduce the impacts to a less-than-significant level.

Responsibility and Monitoring The City, County, subarea developers, and LARPD all would be responsible for implementing Mitigation Measures 4.5-6(b) and 4.5-6(c). The City would be responsible for implementing and enforcing *Specific Plan* and for ensuring that components of the

Bicycle / Pedestrian Plan would be constructed as fronting parcels develop. Subarea developers would be responsible for working with LARPD and the City and County Public Works Departments to design trail crossings to the standards set forth in the *City Bicycle / Pedestrian Plan Update and Equestrian Trails Study*, for planning and designing the trail and bike lane segments to the standards outlined in the *Bicycle / Pedestrian Plan*, and for coordinating these plans with the City and LARPD. LARPD, as the ultimate agency responsible for the citywide trails system, would be responsible for overseeing the design of the trail crossings along with the City and County Departments of Public Works, since the crossings represent components of the ultimate LARPD system.

Impact 4.5-7 Year 2000 CMP Roadway Network Impact

- Draft Plan *development would cause the LOS to fall from E to F in the AM peak hour on two sections of Route 84 -- First Street between Arroyo Road and South Livermore Avenue and Vallecitos Road between I-680 and Isabel Avenue. The CMA model projects volume increases on Route 84 of 196 vehicles (22 percent) and 236 vehicles (27 percent) respectively in year 2000 without* Draft Plan *traffic. SU*

- Draft Plan *development would result in significant impacts in the PM peak hour on two sections of Route 84, adding more than one percent to the projected year 2000 traffic volume on sections which already are projected to be LOS F without* Draft Plan *traffic. The addition of* Draft Plan *traffic would result in a five percent increase (65 vehicles) in eastbound volumes on First Street between Holmes and Arroyo and a three percent increase (40 vehicles) in the eastbound volumes on Vallecitos Road between I-680 and Isabel Avenue. SU*

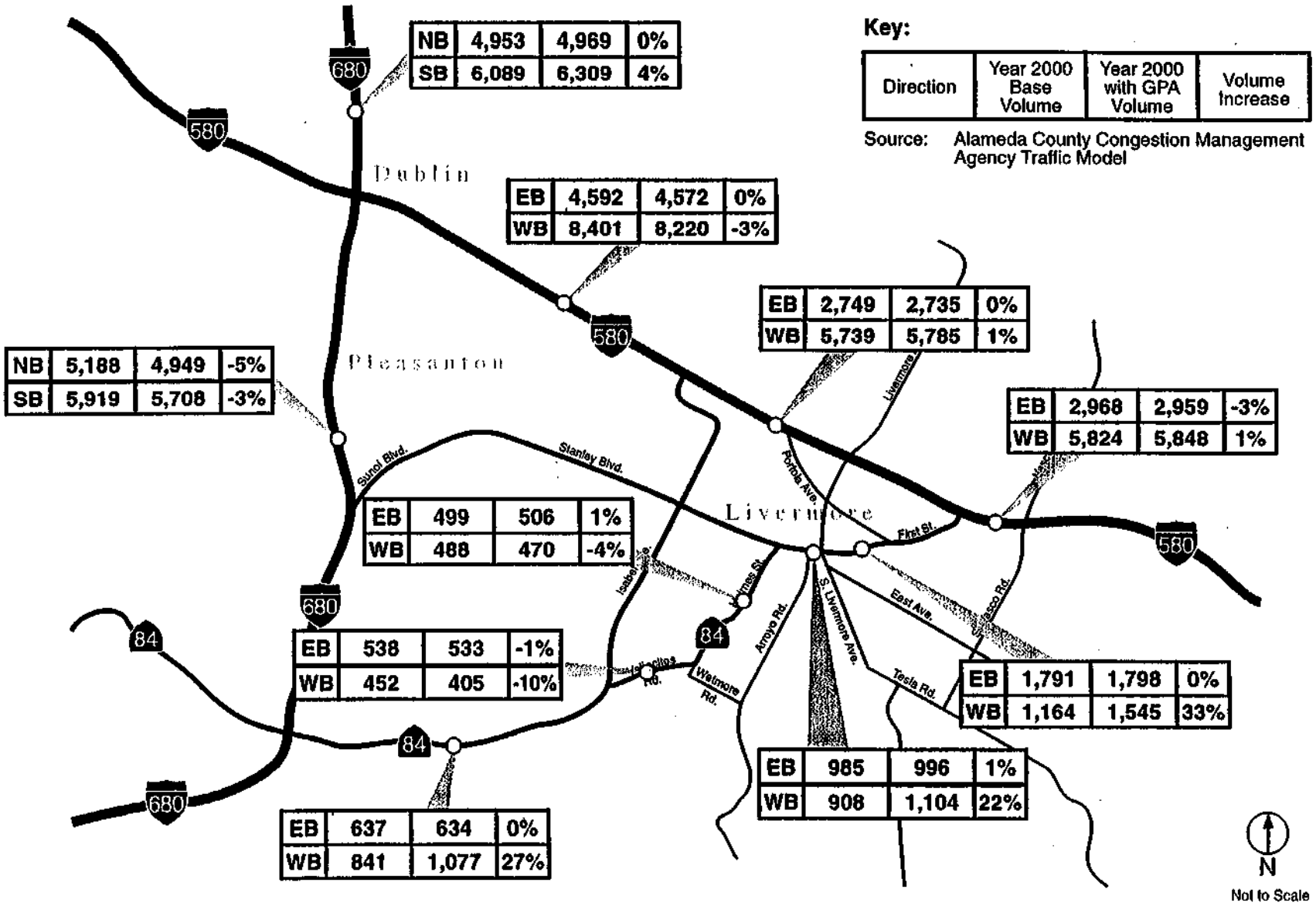
The Alameda County CMA Model was used to determine potential impacts of *Draft Plan* development on the designated CMP roadway system. The *Draft Plan* is assumed to be 20 percent built out (residential uses only) by the year 2000. This is the reasonably foreseeable level of development for the *Draft Plan* by that year. As described in the setting description of ***Regional Roadway Traffic: CMA Facilities*** (above), the LOS standard for all CMP facility segments in the study area is LOS E (V / C ratio of 0.99 or better).

AM Peak Hour Conditions

Exhibit 4.5-30 presents year 2000 AM peak hour volumes for the CMP roadway segments in the study area. Traffic from *Draft Plan* development (20 percent built-out) would cause two segments of the CMP network to fall from acceptable (LOS E) to below-standard (LOS F) conditions -- SR 84 (First Street) between Arroyo Road and South Livermore Avenue and SR 84 (Vallecitos Road) between I-680 and Isabel Avenue.

On the First Street section, AM peak hour westbound traffic is projected to increase in volume from 908 vehicles (V / C of 0.82) to 1,104 vehicles (V / C of 1.00). The CMA defines the capacity of this section of Route 84 as 1,100 vehicles per hour. On the Vallecitos Road section, the AM peak hour westbound traffic is projected to increase in volume from 841 vehicles (V / C of 0.84) to 1,077 vehicles (V / C of 1.07). The CMA defines the capacity of this section of Route 84 as 1,000 vehicles per hour.

Elsewhere, the CMP roadway system is projected to operate at LOS F in the year 2000 without *Draft Plan* traffic. However, the *Draft Plan* would not add one percent or more in traffic to the section. It is I-580 between Airway Boulevard and I-680 (V / C of 1.05 westbound). The *Draft Plan* would result in volume decrease of three percent on the I-580 segment.


Key:
Direction | Year 2000 Base Volume | Year 2000 with GPA Volume | Volume Increase
Source: Alameda County Congestion Management Agency Traffic Model
NB 4,953 4,969 0%
SB 6,089 6,309 4%
EB 4,592 4,572 0%
WB 8,401 8,220 -3%
EB 2,749 2,735 0%
WB 5,739 5,785 1%
EB 2,968 2,959 -3%
WB 5,824 5,848 1%
NB 5,188 4,949 -5%
SB 5,919 5,708 -3%
EB 499 506 1%
WB 488 470 -4%
EB 538 533 -1%
WB 452 405 -10%
EB 637 634 0%
WB 841 1,077 27%
EB 985 996 1%
WB 908 1,104 22%
EB 1,791 1,798 0%
WB 1,164 1,545 33%
Dublin
Pleasanton
Livermore
580
680
84
Sunol Blvd.
Stanley Blvd.
Isabel Ave.
Jack London Blvd.
Portola Ave.
Livermore
First St.
Vasco Rd.
East Ave.
S. Livermore Ave.
Arroyo Rd.
Tesla Rd.
Westmore Rd.
N
Not to Scale

In summary, *Draft Plan* development would have significant impacts in the AM peak hour on two sections of Route 84, causing the LOS to fall from E to F -- First Street between Arroyo Road and South Livermore and Vallecitos Road between I-680 and Isabel Avenue. With the addition of *Draft Plan* traffic, the CMA model projects volume increases on these sections of Route 84 of 196 vehicles (22 percent) and 236 vehicles (27 percent), under year 2000 conditions without *Draft Plan* traffic.

PM Peak Hour Conditions

Exhibit 4.5-31 presents year 2000 PM peak hour volumes for the CMP roadway segments in the study area. Traffic from *Draft Plan* development (20 percent buildout) would not cause any segment to fall from an acceptable to an unacceptable service level. However, the *Draft Plan* would contribute a one percent or greater volume increase to two segments which are projected to operate at unacceptable service levels (LOS F) without *Draft Plan* traffic in the year 2000.

The sections of the CMP roadway system which are projected to operate at LOS F in the year 2000 without *Draft Plan* traffic include:

- SR 84 (First Street) between Holmes and South Livermore (V / C of 1.25 eastbound and V / C of 1.36 westbound)
- SR 84 (Vallecitos Road) between I-680 and Isabel (V / C of 1.29 eastbound)
- I-580 between Airway Boulevard and I-680 (V / C of 1.10 eastbound)

Draft Plan traffic would result in a five percent increase (65 vehicles) in eastbound traffic on First Street between Holmes and South Livermore and a three percent increase (40 vehicles) in eastbound traffic on Vallecitos between I-680 and Isabel Avenue.

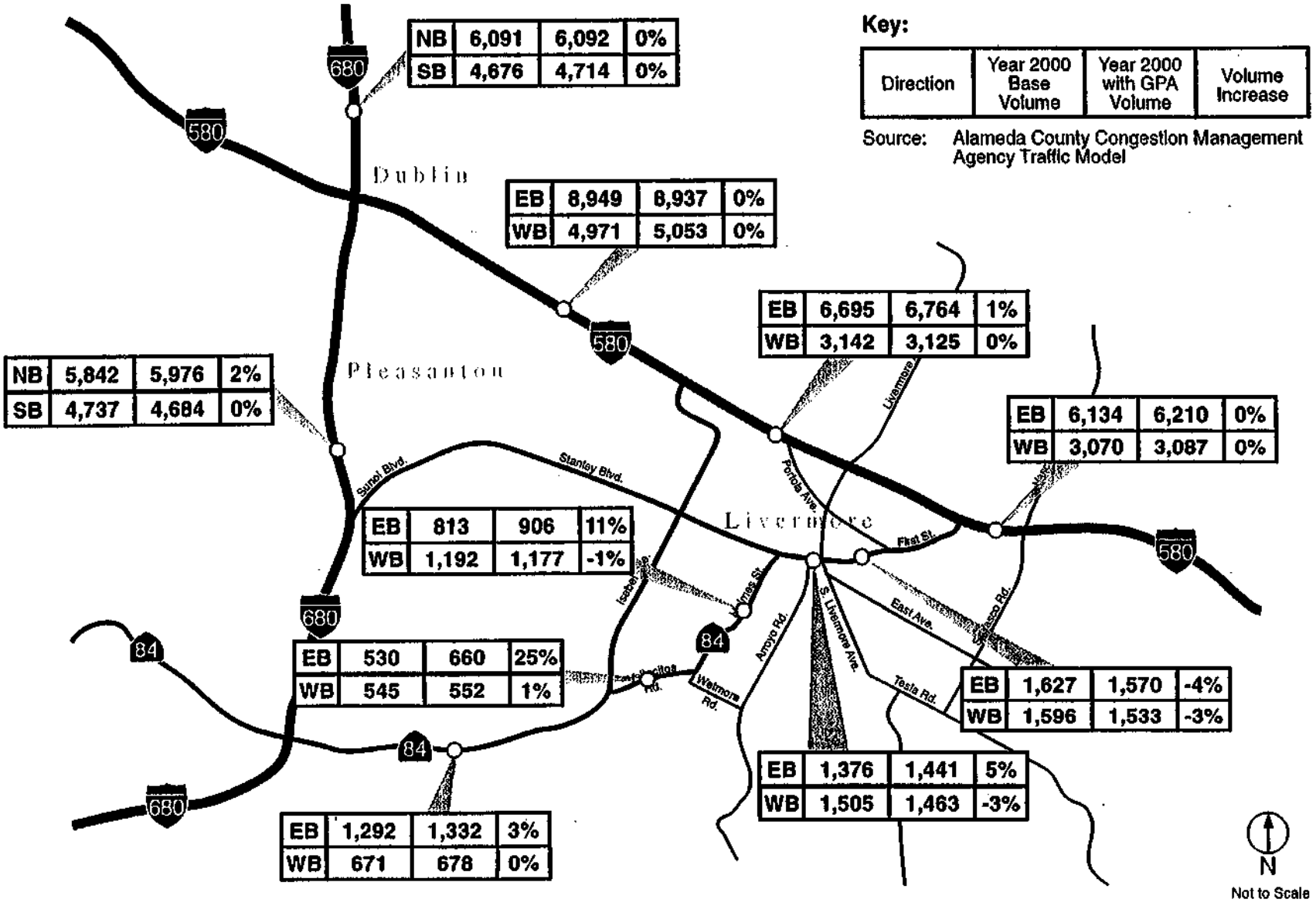
In summary, the *Draft Plan* would have significant impacts in the PM peak hour on two sections of Route 84, adding more than one percent to the projected year 2000 traffic volume. The eastbound section of First Street between Holmes and South Livermore is projected to deteriorate from a V / C of 1.25 to a V / C of 1.31, and the eastbound section of Vallecitos between I-680 and Isabel is projected to deteriorate from a V / C of 1.29 to a V / C of 1.33.

It should be noted that the intersection analysis performed for this study indicates that downtown intersections (First / South Livermore and First / Holmes) are projected to continue to operate at good service levels through the year 2010. This indicates that the State Route capacity may be set at a level which is lower than necessary, since intersections are typically the main source of delay on an arterial such as SR 84 in the downtown area.

Mitigation Measure 4.5-7 (a) The current Tri-Valley Action Plan includes the widening of Vallecitos Road to four lanes between I-680 and Isabel Avenue, although funding is not identified for this improvement. The City should continue to pursue funding for this widening, coordinating with the Tri-Valley Transportation Council, the Alameda County Congestion Management Agency, and the Metropolitan Transportation Commission. Widening of this section of SR 84 would eliminate the impacts identified for the morning and evening peak periods on this section of SR 84.

Mitigation Measure 4.5-7 (b) The City should continue ongoing efforts to optimize traffic flow on SR 84 through the downtown, by monitoring traffic volumes and adjusting signal phasing / timing

Exhibit 4.5-31
Year 2000 PM Peak Hour Volumes -- Alameda County CMA Roadways



and lane configuration as necessary. Geometric improvements (re-striping, etc.) should be considered as traffic patterns may change in the future. The CMA's projections for LOS F conditions on this section of Route 84 are based on generalized arterial capacity calculations, and service levels can be improved through such real-time monitoring of traffic flows and operations.

Significance after Mitigation The mitigation measures identified above have the possibility of fully mitigating the impact 4.5-7. However, because a funding source has not been identified for the Vallecitos widening, and because signal timing and geometric improvements may not fully mitigate the LOS F condition projected for First Street, this impact remains potentially significant after mitigation. If funding is secured and improvements are made (Vallecitos Road widening, First Street signal timing, and First street geometric configurations), the CMP year 2000 roadway network impacts could be reduced to a less-than-significant level.

Responsibility and Monitoring The City is responsible for implementing Mitigation Measures 4.5-7(a) and 4.5-7(b) by working cooperatively with the Tri-Valley Transportation Council, Alameda County CMA, Caltrans, and MTC, and through the City Department of Public Works' efforts to minimize traffic congestion throughout the City of Livermore.

4.6 AIR QUALITY -- THE SETTING

Air Basin Characteristics

The South Livermore Valley Specific Plan Area (SLVSPA) is located in the Livermore-Amador Valley. The valley forms a small subregional air basin distinct from the larger San Francisco Bay Area Air Basin. The basin is surrounded on all sides by high hills or mountains with significant breaks in the hills at Niles Canyon and the San Ramon Valley, the latter which extends north into Contra Costa County.

The terrain of the Livermore-Amador Valley influences both the climate and air pollution potential of the subregional air basin. As a protected inland valley, the area generally has lighter winds and a higher frequency of calm conditions compared to the greater Bay Area.

Episodes of high atmospheric stability, known as inversion conditions, severely limit dispersion of pollutants vertically. Inversions can be found during all seasons in the Bay Area but are particularly prevalent in the summer months when they occur about 90 percent of the time in both morning and afternoon.

The Livermore-Amador subregional air basin generally is located downwind of the greater Bay Area and, therefore, is subject to pollutants transported to the area by prevailing winds. The terrain, meteorological characteristics, and downwind location of the subregional air basin give it a high potential for air pollution, particularly for photochemical pollutants.

Pollutant Characteristics and Air Quality Standards

Both the U. S. Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) have established ambient air quality standards for common pollutants (called "criteria" pollutants). The Federal and State ambient standards were developed to avoid health-related effects and represent safe contaminants levels which avoid specific adverse health effects associated with each pollutant. Exhibit 4.6-1 identifies these "criteria" pollutants, their characteristics, health effects, and typical sources, and Exhibit 4.6-2 summarizes both Federal and State standards.

The Federal and State standards differ in some cases, particularly for ozone and Particulate Matter (PM-10), and the California State standards are more stringent.

The USEPA recently proposed revisions to the Federal standards for ozone and Particulate Matter. The revisions would replace the current one-hour ozone standard with a new lower eight-hour standard and would add a 24-hour and annual standard for Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$). USEPA currently is soliciting comments on the proposed new standards and alternatives, and the final rules are expected by June 1997.

Current Air Quality

The closest air monitoring site to the SLVSPA is located in Livermore. Exhibit 4.6-3 summarizes air

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen). Often called photochemical smog.	• Eye irritation • Respiratory function impairment	The major sources (ozone precursors) are combustion sources (such as factories and automobiles) and evaporation of solvents and fuels
Carbon Monoxide	Carbon monoxide is an odorless colorless gas which is highly toxic and is formed by the incomplete combustion of fuels	• Impairment of oxygen transport in the bloodstream • Aggravation of cardiovascular disease • Fatigue, headache, confusion, dizziness • Can be fatal in the case of very high concentrations	Automobile exhaust, combustion of fuels, combustion of wood in wood stoves and fireplaces
Nitrogen Dioxide	Reddish-brown gas that discolors the air and is formed during combustion	• Increased risk of acute and chronic respiratory disease	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants
Sulfur Dioxide	Sulfur dioxide is a colorless gas with a pungent irritating odor	• Aggravation of chronic obstruction lung disease • Increased risk of acute and chronic respiratory disease	Diesel vehicle exhaust, oil-powered power plants, industrial processes
PM-10	Solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time	• Aggravation of chronic disease and hear / lung disease symptoms	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Exhibit 4.6-2
State and Federal Ambient Air Quality Standards [a]

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8-Hour	9.0 PPM	9.0 PPM
	1-Hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	--
	1-Hour	--	0.25 PPM
Sulfur Dioxide	Annual	0.03 PPM	--
	24-Hour	0.14 PPM	0.05 PPM
	1-Hour	--	0.25 PPM
PM-10	Annual	50 $\mu g / m^3$	30 $\mu g / m^3$
	24-Hour	150 $\mu g / m^3$	50 $\mu g / m^3$
Lead	30-Day Average	--	1.5 $\mu g / m^3$
	Month Average	1.5 $\mu g / m^3$	--

a Legend
PPM = parts per million
$\mu g / m^3$ = micrograms per cubic meter

Exhibit 4.6-3
Air Quality Data for Livermore, 1991-1995 [a]

Pollutant	Standard	Days Exceeding Standard In				
		1991	1992	1993	1994	1995
Ozone	Federal One-Hour	1	0	1	2	7
Ozone	State One-Hour	17	14	7	5	20
Carbon Monoxide	State / Federal Eight-Hour	0	0	0	0	0
PM-10	State 24-Hour	12	5	3	4	1
PM-10	Federal 24-Hour	1	0	0	0	0
Nitrogen Dioxide	State One-Hour	0	0	0	0	0

a *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, Bay Area Air Quality Management District, April 1996.

quality data for this monitoring site for the period 1991-1995. Data are shown for ozone, carbon monoxide, PM-10, and nitrogen dioxide. The number of days exceeding each standard is shown for each year.

No violations of Federal standards have occurred in Livermore except for the Federal ozone standard. Despite the violations recorded in 1993-1995, the region is considered a maintenance area rather than a nonattainment area for this pollutant. The State standards generally are met except for the State standards for ozone and PM-10.

Attainment Status

The Federal Clean Air Act and California Clean Air Act of 1988 require the CARB, based on air quality monitoring data, to designate air basins in California as "nonattainment areas" where the Federal

or State ambient air quality standards are not met. Because of the differences between the Federal and State standards, the designation of "nonattainment areas" also differs. USEPA recently redesignated the San Francisco Bay Air Basin as a "maintenance area" for ozone. "Maintenance area" status requires long-term planning to maintain the ambient air quality standards. The "urbanized area" of the air basin is still considered "nonattainment" for carbon monoxide. However, the Bar Area Air Quality Management District (BAAQMD), Association of Bay Area Governments (ABAG), and the Metropolitan Transportation Commission (MTC) have submitted a joint request for redesignation to "maintenance area" to the USEPA. The San Francisco Bay Air Basin is designated an "attainment area" or is unclassified for all other national ambient air quality standards.

The proposed revisions to the national ambient standards for ozone and Particulate Matter have no immediate effect on nonattainment planning. Existing ozone and Particulate Matter designations will remain in effect until USEPA establishes new designations based on any new ozone or Particulate Matter standard.

Final promulgation of guidelines for developing nonattainment plans for any new ozone or Particulate Matter standard is scheduled for June 1999.

Under the California Clean Air Act, the entire San Francisco Bay Air Basin is a "nonattainment area" for ozone and PM-10. The air basin is either an "attainment area" or is unclassified for other pollutants based on State air quality standards.

4.6 AIR QUALITY -- IMPACTS AND MITIGATION

A project's air quality impacts can be separated into two categories -- short-term impacts due to construction and long-term impacts due to traffic generation and land use changes. This EIR examines impacts due to construction and land use changes qualitatively and examines impacts related to vehicles are quantitatively using the CALINE-4 simulation model and the URBEMIS-5 computer program.

Criteria for Significance

This report identifies an air quality effect as significant if it would:

- Violate any ambient air quality standard
- Contribute substantially to an existing or projected air quality violation
- Expose sensitive receptors to substantial air pollutant concentrations

In addition, the BAAQMD has developed specific measures of significance for air quality impacts of projects. [1] According to the BAAQMD, a project would have a significant effect if:

- Dispersion modeling showed that the project would contribute to a violation of the one- or eight-hour State or Federal standards for carbon monoxide

- Total emissions from project operations exceeded 80 pounds per day or 15 tons per year of

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[1] *BAAQMD CEQA GUIDELINES: Assessing the Air Quality Impacts of Projects and Plans*, Bay Area Air Quality Management District, April 1996.

regional pollutants (Reactive Organic Gases, Nitrogen Oxides, or PM-10)

Impacts and Mitigation Measures

Impact 4.6-1 Construction Period Impacts
During development of housing units, commercial facilities, and infrastructure, areas downwind of construction would be impacted intermittently by construction dust, a potentially significant impact. PS

During construction, the potential for fugitive dust impacts would exist. Fugitive dust can be emitted by the action of equipment and vehicles and from wind erosion over exposed earth surfaces. Clearing, grading, and earthmoving activities comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions.

Construction dust impacts are extremely variable and depend on wind speed, soil type, soil moisture, the type of construction activity, and acreage affected by construction. Effects include increased dustfall and locally elevated levels of PM-10 near the site of construction activity.

The amount of grading in each subarea would provide a primary basis for determining the potential for construction dust impacts. Accordingly:

- Subareas 4 and 7 would have a relatively high potential for construction dust impacts related to grading, since development of both subareas would involve hillside construction
- Subareas 1, 2, 3, 5, and 6 would have a relatively low potential for construction dust impacts related to grading, since these subareas are relatively flat

Mitigation Measure 4.6-1(a) In order to mitigate potentially significant construction dust impacts, the City should require implementation of the BAAQMD's following basic construction dust control measures as conditions of approval for all individual development projects or infrastructure improvement contracts in the SLVSPA:

- Water all active construction areas at least twice daily
- Pave, apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites
- Sweep all paved access roads, parking areas, and staging areas at construction sites daily with water sweepers
- Sweep streets daily with water sweepers, if visible soil material is carried onto adjacent public streets

Mitigation Measure 4.6-1(b) In order to mitigate potentially significant construction dust impacts at construction sites larger than four acres in size, the City should also require implementation of the BAAQMD's enhanced construction dust control measures as conditions of approval for those projects:

- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas (previously graded

areas inactive for ten days or longer)

- Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.)

- Limit traffic speeds on unpaved roads to 15 miles per hour (mph)
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways
- Replant vegetation in disturbed areas as quickly as possible
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph

Significance After Mitigation Implementation of the appropriate measures at each construction site would be expected to reduce construction air quality impacts to a less-than-significant level.

Responsibility and Monitoring Sponsors of individual development projects would be responsible for incorporating these measures in construction contracts and subcontracts, and their contractors and subcontractors ultimately would implement construction dust controls on a day-to-day basis. The City would be responsible for monitoring compliance during the construction period of each project as part of routine site and building inspection activities.

Impact 4.6-2 Carbon Monoxide Impacts
Traffic generated by buildout of the SLVSPA according to the Draft Plan *would contribute to local carbon monoxide concentrations. The incremental increase caused by SLVSPA traffic would not exceed State or Federal ambient air quality standards. LTS*

Carbon monoxide is a localized pollutant whose major source is automobiles. Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections.

The CALINE-4 computer simulation model was applied to five selected intersections to estimate future carbon monoxide levels in the SLVSPA. The CALINE-4 program and the assumptions made in its use are described in ***Appendix 6.5***. The results of the CALINE-4 modeling are shown in Exhibit 4.6-4 on the following page. The CALINE-4 model was run for year 2010 traffic conditions with and without SLVSPA traffic. The one-hour concentrations in Exhibit 4.6-4 should be compared to the State standard of 20 parts per million (PPM) and the Federal standard of 35 PPM. Predicted eight-hour concentrations in Exhibit 4.6-4 should be compared to the State and Federal standard of nine parts per million (9 PPM).

Concentrations in the year 2010 with or without SLVSPA traffic would be lower than State and Federal standards by a wide margin. Therefore, impacts on carbon monoxide from SLVSPA development as a result of the *South Livermore Valley Specific Plan (Draft Plan)* would not be significant.

Mitigation Measure 4.6-2 No mitigation would be required.

Impact 4.6-3 Traffic-Generated Regional Impacts
SLVSPA automobile traffic would incrementally increase air pollutant emissions in the region. These increases would exceed the BAAQMD thresholds of significance and would represent a significant unavoidable impact. SU

SLVSPA development would affect air quality within the entire air basin. The primary impact would

Exhibit 4.6-4
Predicted Worst-Case Carbon Monoxide Concentrations at Selected Intersections[a]

Intersection	2010 No Project		2010 With Project	
	One-Hour	Eight-Hour	One-Hour	Eight-Hour
Buena Vista Avenue / Tesla Road	2.5	1.8	2.7	2.0
Buena Vista Avenue / East Avenue	3.0	2.2	3.1	2.3
East Avenue / South Vasco Road	3.7	2.7	4.0	2.9
Concannon Boulevard / Holmes	4.7	3.4	4.9	3.5
Vallecitos Road / East Vineyard	3.9	2.8	4.2	3.0
Most Stringent Standard	20.0	9.0	20.0	9.0

a In parts per million (PPM).

be due to vehicle trips associated with development. To evaluate the vehicular emissions associated with SLVSPA buildout, the URBEMIS-5 computer program, developed by the CARB, was applied to the SLVSPA traffic generation. The URBEMIS-5 program and the assumed conditions for its use are described in ***Appendix 6.5***.

Emissions associated with auto use are shown in Exhibit 4.6-5 on the following page. The BAAQMD considers emissions of a regional pollutant to be significant if they exceed 80 pounds per day. Based on this criterion, SLVSPA development would have a significant impact on regional air quality.

Mitigation Measure 4.6-3 The *Draft Plan* would provide off-street trail corridors to accommodate separate bicycle / pedestrian and equestrian use. The trail system would be an amenity for SLVSPA residents and visitors. Use would be primarily recreational and, therefore, would have only a minimal effect in reducing vehicle trips from SLVSPA land uses.

The generally low-density, predominantly residential, and semi-rural nature of SLVSPA development under the *Draft Plan* would severely limit available mitigation strategies to reduce trip generation. Therefore, the City should provide information to encourage individual residential development projects in all subareas to:

- Wire each housing unit to allow use of emerging electronic communication technology to encourage home employment
- Provide electrical recharge outlets in residential garages for electric cars

Residences include a number of intermittent air pollutant sources. Therefore, the City also should encourage the following measures for individual residential development projects in all subareas:

- Limit the number of fireplaces in residences to one per household and / or use EPA-certified wood stoves, pellet stoves, or fireplace inserts in housing units. EPA-certified fireplaces and fireplace inserts are 70 to 90 percent effective in reducing emissions from this source. Also encourage the use of natural gas fired fireplaces.
- Provide outdoor electrical outlets at residences to allow use of electrical lawn and landscape maintenance equipment

Exhibit 4.6-5
Project Regional Emissions [a]

Subarea	Source	Reactive Organic Gases	Nitrogen Oxides	PM-10
1	Residential	8.5	11.2	16.2
	Commercial	0.0	0.0	0.0
	Total	8.5	11.2	16.2
2	Residential	36.7	48.2	70.0
	Commercial	0.0	0.0	0.0
	Total	36.7	48.2	70.0
3	Residential	11.3	14.9	21.6
	Commercial	8.0	11.3	14.7
	Total	19.3	26.2	36.3
4	Residential	8.30	10.9	15.9
	Commercial	3.7	6.1	8.8
	Total	12.0	17.0	24.7
5	Residential	11.2	14.8	21.5
	Commercial	16.5	27.6	39.7
	Total	27.7	42.4	61.2
6	Residential	0.0	0.0	0.0
	Commercial	1.6	2.7	3.8
	Total	1.6	2.7	3.8
7	Residential	19.4	25.6	35.5
	Commercial	1.6	2.7	5.4
	Total	21.0	28.3	40.9
SLVSPA	Residential	95.4	125.6	180.5
	Commercial	31.4	31.4	72.4
	Total	126.8	176.0	252.9

a In pounds per day.

- Make natural gas available in residential backyards to allow use of natural gas-fired barbecues

Significance After Mitigation If required as a condition of approval, implementation of Mitigation Measure 4.6-3 would have the potential of reducing projected emissions by an estimated one to two percent. This would not be sufficient to reduce impacts attributable to SLVSPA development to a less-than-significant level. Therefore, impacts on regional air quality would be significant and unavoidable.

Exhibit 4.6-5 shows that emissions attributable to residential buildout of all subareas combined would exceed the BAAQMD's threshold of 80 pounds of regional pollutants per day. However, development in no single subarea alone -- residential only, commercial only, or a subarea's residential and commercial development -- would exceed that standard. The only way available to reduce the significance of this impact appreciably would be to decrease the total amount of development and corresponding trip generation of the respective land uses. Eliminating commercial sites, for instance, would not be sufficient in itself to reduce the significant impacts which still would occur with only residential development of the SLVSPA as currently envisaged by the *Draft Plan*. Scaling back residential development in order to reduce regional air quality impacts to a less-than-significant level

would decrease the contribution the SLVSPA would make to the City's housing supply and agricultural mitigation which could be construed as a secondary impact of such a mitigation approach and in conflict with underlying objectives of the *Draft Plan*.

Responsibility and Monitoring Sponsors of individual development projects would be responsible for implementing Mitigation Measure 4.6-3 as required by conditions of approval. The City would be responsible for monitoring implementation of these measures as part of its routine building inspection activities.

Impact 4.6-4 Potential Air Quality Related Land Use Conflicts
Urbanization adjacent to agricultural and industrial uses would increase the potential for air quality and odor related land use conflicts, a potentially significant impact. PS

Development within all subareas would create potential land use conflicts between agricultural and residential uses. Disking, weeding, or vehicle travel on unpaved roads create dust which would be carried to adjacent properties by the wind. Because the prevailing wind direction in the dry season is westerly, a potential land use conflict would exist whenever residential uses are located east of agricultural lands without a substantial setback.

Development of Subarea 1 would place residences in proximity to percolation ponds located on the Sandia National Laboratories site. These percolation ponds are an intermittent source of odors reportedly generated by decaying vegetation. The intermittent nature of these odors, the minimum 200-foot distance between the ponds and eastern Subarea 1 boundary, and the ponds' location downwind from Subarea 1 suggest that this impact would be less-than-significant.

Mitigation Measure 4.6-4 The *Draft Plan's* site planning standards provide 20-foot rear setbacks for residences. This distance is not expected to be sufficient to avoid dust-related impacts where residential development is located east of agricultural operations. In order to mitigate this air quality-land use conflict, the City should require the following measures as conditions of approval for residential development in Subareas 1, 2, 4, and 7:

- Where residential development would occur east of adjacent active agricultural lands, require developers to provide disclosure statements to prospective buyers warning of possible agricultural nuisances (see ***Mitigation Measure 4.1-5(a)*** related to the City's pending right-to-farm ordinance)

- Implement Mitigation Measure 4.1-5 (to reduce urban-rural conflicts)

Significance After Mitigation Implementation of Mitigation Measure 4.6-4 would be expected to reduce air quality-land-use conflict impacts to a less-than-significant level in all subareas.

Responsibility and Monitoring Sponsors of individual development projects would be responsible for implementing these measures, and the City would monitor compliance during its project approval process.

4.7 NOISE -- SETTING

Fundamental Concepts of Environmental Acoustics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels usually are measured and expressed in decibels (dB) with zero decibels (0 dB) corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in Exhibit 4.7-1.

Most of the sounds heard in the environment do not consist of a single frequency but rather a broad band of frequencies with each frequency differing in sound level. The intensities of each frequency combine to generate a sound. The method commonly used to quantify environmental sounds evaluates and weights all the frequencies of a sound to reflect that human hearing is less sensitive at low and extreme high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter which includes an electrical filter corresponding to the A-weighting curve. Typical A-levels measured in the environment and in industry are shown in Exhibit 4.7-2 for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which creates a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors L_{01}, L_{10}, L_{50}, and L_{90} are commonly used. They are the A-weighted noise levels equaled or exceeded during one, ten, 50, and 90 percent of a stated time period. A single number descriptor called the L_{eq} is also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for people's different responses to daytime and nighttime noise. During the nighttime, exterior background noise generally is lower than the daytime levels. In addition, most household noise also decreases at night, and exterior noise becomes very noticeable. Furthermore, most people sleep at night and are very-sensitive to noise intrusion. In order to account for human sensitivity to nighttime noise levels, the day / night average sound descriptor (L_{dn}) was developed. The L_{dn} divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted ten decibels higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

The effects of noise on people can be listed in three general categories:

Exhibit 4.7-1
Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded one, ten, 50, and 90 percent of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of five decibels in the evening from 7:00 AM to 10:00 PM and after addition of ten decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day / Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of ten decibels to levels measured in the night between 10:00 PM and 7:00 AM.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Illingworth & Rodkin, Inc., Acoustical Engineers

Exhibit 4.7-2
Typical Sound Levels Measured in the Environment and Industry

At a Given Distance from Noise Source	A-Weighted Sound Level	Noise Environments	Subjective Impression
	(in decibels)		
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain threshold
	110	Rock music concert	
Pile Driver (50')	100		Very loud
Ambulance Siren (100')			
	90	Boiler room	
Freight Cars (50')		Printing press plant	
Pneumatic Drill (50')	80	In kitchen with garbage disposal running	
Freeway (100')			
	70		Moderately loud
Vacuum Cleaner (10')	60	Data processing center	
		Department store	
Light Traffic (100')	50	Private business office	
Large Transformer (200')			
	40		Quiet
Soft Whisper (5')	30	Quiet bedroom	
	20	Recording studio	
	10		Threshold of hearing
	0		

Source: Illingworth & Rodkin, Inc., Acoustical Engineers

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, learning
- Physiological effects (such as startling, hearing loss)

In almost every case, the levels associated with environmental noise produce effects only in the first two categories while workers in industrial plants can experience noise in the last category. There currently is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. This primarily is because of the wide variation in individual thresholds of annoyance and habituation to noise due to individuals' different past experiences with noise.

Therefore, an important way of determining a person's subjective reaction to a new noise is to compare it with the existing environment to which one has adapted -- the so-called "ambient". In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged.

Understanding the following relationships in A-weighted noise level increases will be helpful in reading this report.

- A one decibel (1 dB) change cannot be perceived except in carefully controlled laboratory experiments
- A three decibel (3 dB) change is considered a just-perceivable difference outside a laboratory
- At least a five decibel (5 dB) change is required before any noticeable community response would be expected
- A ten decibel (10 dB) change is heard subjectively as approximately a doubling in loudness and almost certainly would cause an adverse community response

Regulatory Background

No Federal regulations govern noise impact assessment. Title 24, Part 2, of the State of California Administrative Code establishes standards which apply to all new multi-family residential developments in California. The standard requires an acoustical analysis for all multi-family units proposed where the L_{dn} exceeds 60 dB. Such units must be designed to achieve interior noise levels no higher than a L_{dn} of 45 dB.

The California Environmental Quality Act (CEQA) includes qualitative guidelines for determining the significance of adverse environmental noise impacts. According to Appendix G of the *State CEQA Guidelines*, a project normally would have a significant effect on the environmental if it conflicted with adopted environmental plans and goals of the community where it is located or substantially increased the noise levels for adjoining areas.

The City of Livermore has adopted noise level guidelines in the *City of Livermore Community General Plan* Noise Element. Residential developments are considered "normally acceptable" where the noise level does not exceed an L_{dn} of 60 dBA, "conditionally acceptable" between 60 and 70 dBA, and "normally unacceptable" between 70 and 75 dBA. In the last two categories, new construction or development should occur only after a detailed analysis of the noise reduction requirements and including the needed noise insulation features in the design. These guidelines provide a basis for determining exterior noise environments acceptable for new residential developments.

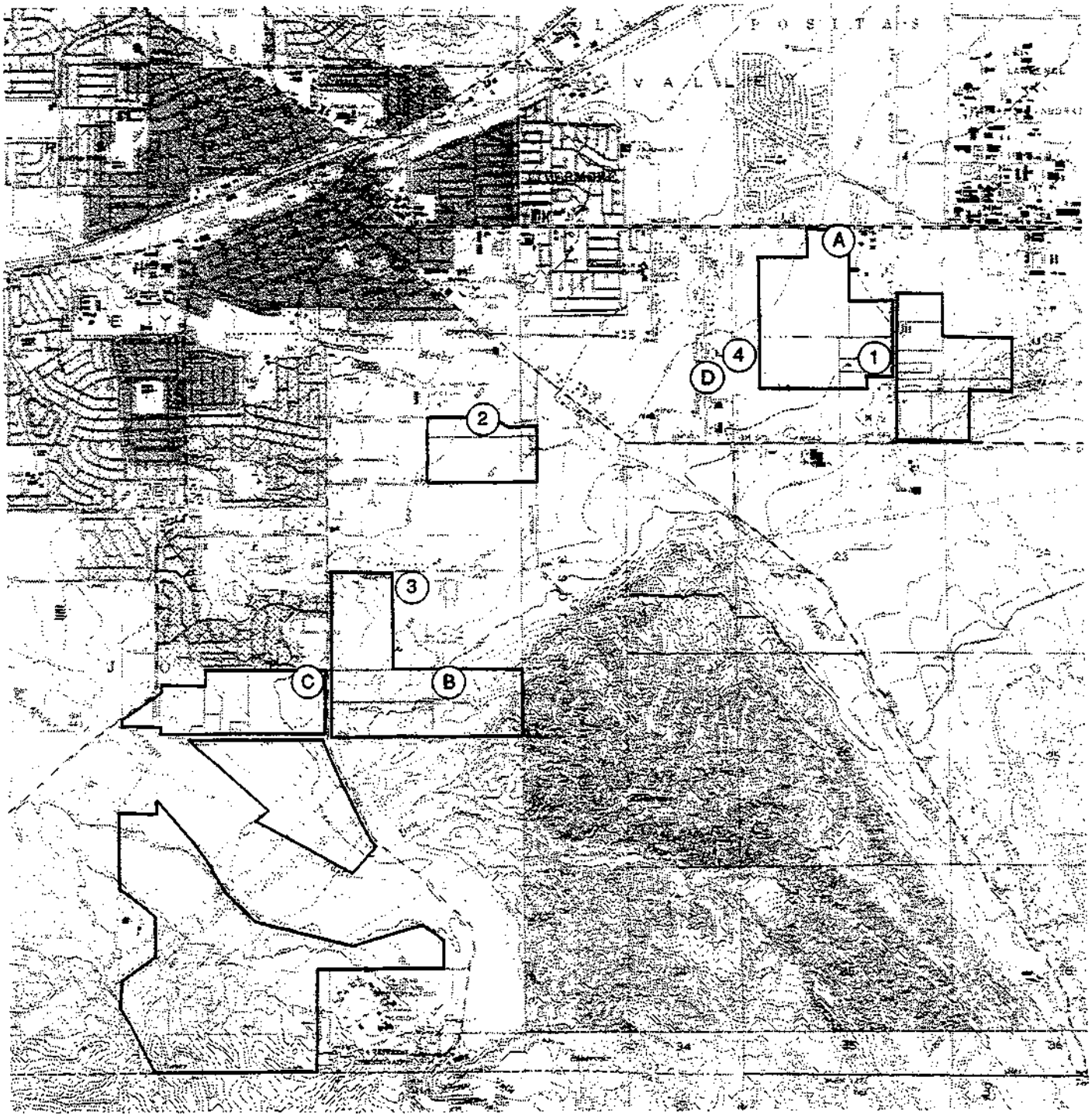
Existing Noise Environment

Motor vehicle traffic is the major source of noise in the South Livermore Valley Specific Plan Area (SLVSPA). Farm machinery also is a source of noise near some subareas, and intermittent noise from training and operations at Sandia National Laboratories (SNL) affects the noise environment of Subarea 1. The noise of distant aircraft occasionally is audible in the SLVSPA but does not contribute significantly to the overall noise environment.

Each subarea is affected by the roadways in the vicinity. East Avenue and South Vasco Road are the most substantial sources of traffic noise in the northern part of the SLVSPA and affect Subareas 1 and 2. Vehicular traffic on Wente Street affects Subarea 3, traffic on Marina Avenue and Arroyo Road affects Subarea 4, and Arroyo Road is the dominant noise source in Subareas 5, 6, and 7.

A noise measurement survey was conducted to quantify existing ambient noise levels. Noise levels were monitored over a continuous 24-hour period at four locations (Locations A through D). The monitoring locations are shown on Exhibit 4.7-3. The data are summarized in Exhibits 4.7-4, 4.7-5, 4.7-6, and 4.7-7. Short-term spot noise measurements were conducted at four additional locations (Locations 1 through 4) to quantify variations in the noise environment, and those data are summarized in Exhibit 4.7-8.

Exhibit 4.7-3
Location of Noise Measurements



Legend:

(A) 24-hour measurements

(1) short-term spot measurement

Source: Illingworth & Rodkin, Inc.

Exhibit 4.7-4
Noise Measurement Site A

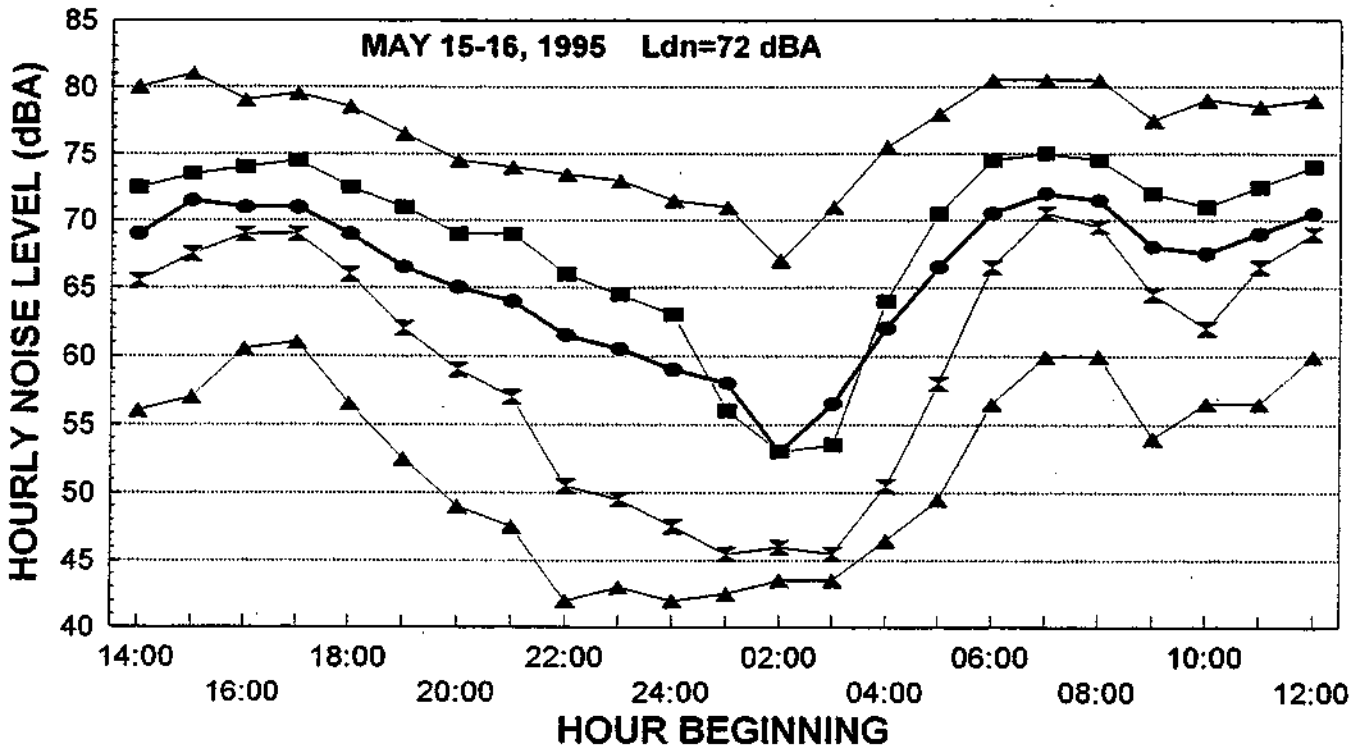
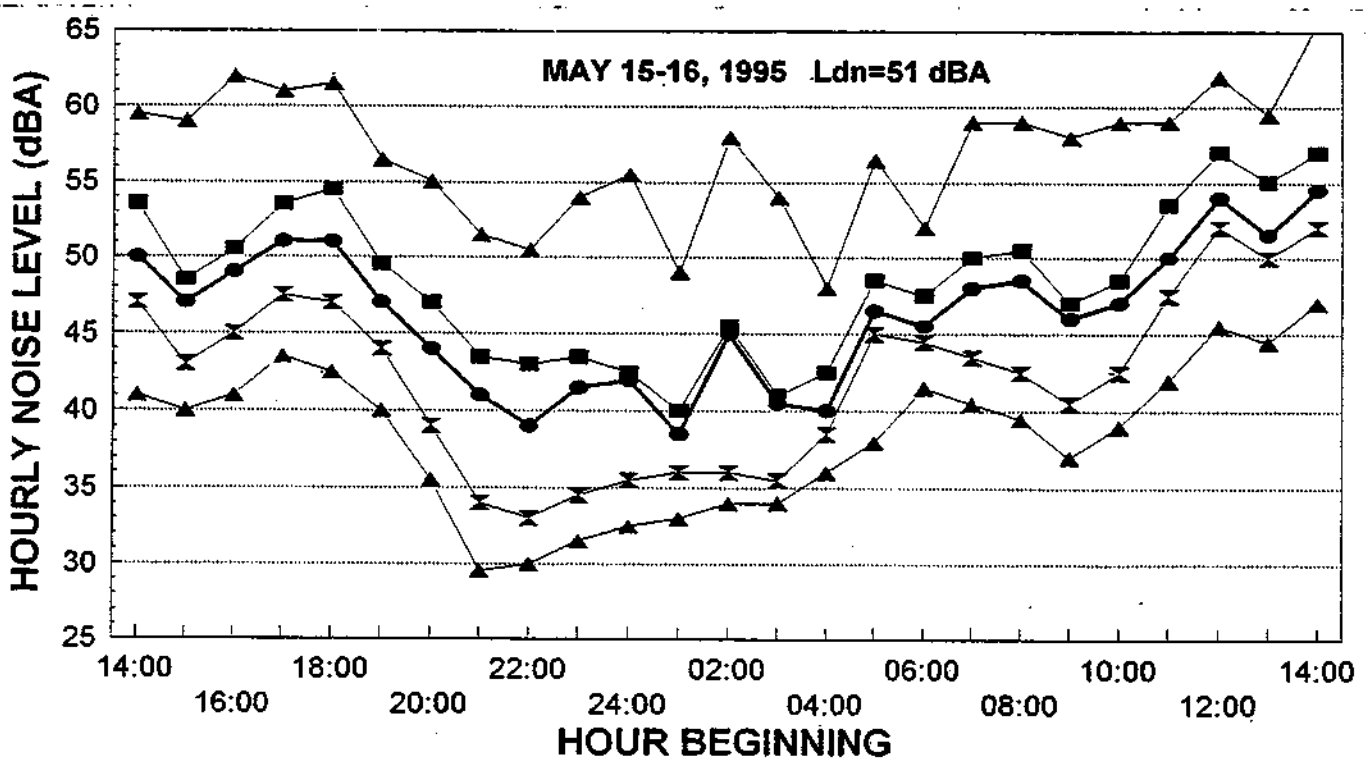


Exhibit 4.7-5
Noise Measurement Site B



Legend:

Leq L01 L10 L50 L90

Source: Illingworth & Rodkin, Inc.

Exhibit 4.7-6
Noise Measurement Site C

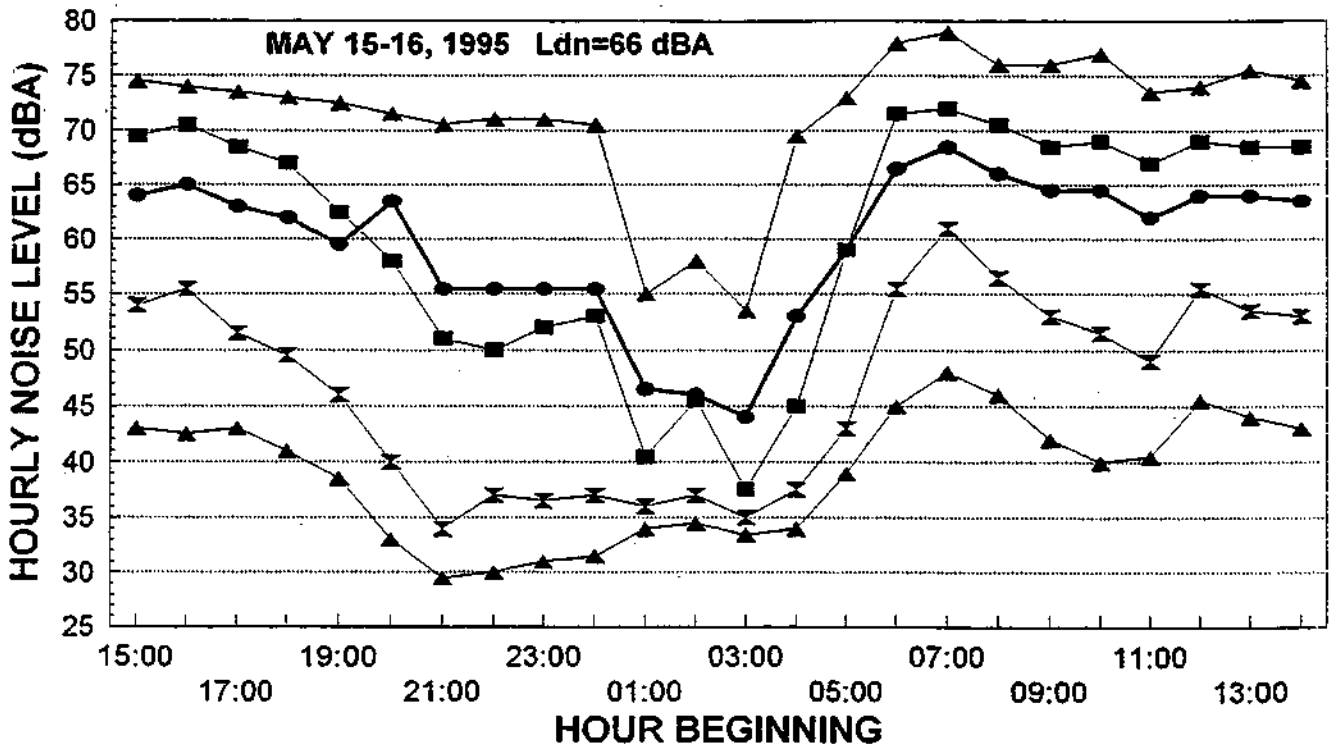
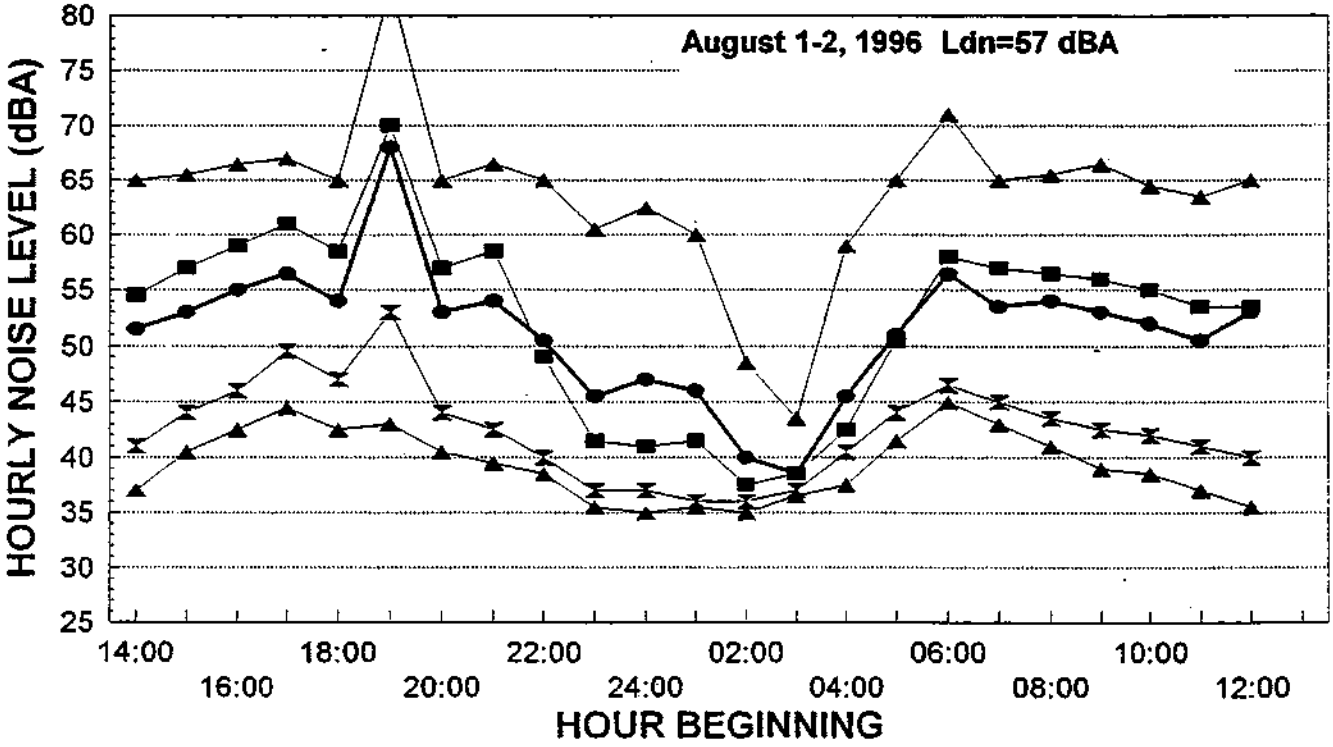


Exhibit 4.7-7
Noise Measurement Site D



Legend:

Leq L01 L10 L50 L90

Source: Illingworth & Rodkin, Inc.

Exhibit 4.7-8
Short-Term Noise Measurements [a]

Location		Time	A-Weighted Noise Level (dBA)				
			L_{eq} [b]	L_{01} [c]	L_{10}	L_{50}	L_{90}
1	South Vasco Road, 50 feet from centerline, south of Research Drive	12:50-1:00 PM	63	71	67	59	51
2	Wente Road, 50 feet from centerline, south of Park	1:20-1:30 PM	62	74	61	45	37
3	Marina Avenue, 50 feet from centerline, at Edwards Avenue	1:55-2:05 PM	59	70	63	50	44
4	In the vineyard east of Buena Vista Road and south of East Avenue	11:30-11:40 AM	45	50	48	43	42

Source: Illingworth & Rodkin, Inc., Acoustical Engineers

a May 15, 1995
b L_{eq} -- The average A-weighted noise level during the measurement period
c L_{01}, L_{10}, L_{50}, L_{90} -- The A-weighted noise levels that are exceeded during the measurement period 01, 10, 50, and 90 percent of the time, respectively.

Measurement Location A was selected to provide hour-by-hour and daily average noise levels along East Avenue where it adjoins Subarea 2. The measured data, shown in Exhibit 4.7-4, are typical of an arterial roadway -- highest noise levels occur during daytime and substantially lower noise levels occur at night.

Measurement Location B, near the intersection of Edwards Avenue and Reed Avenue, provides typical background noise levels for areas away from any significant sources of local traffic. The noise levels measured at Location B are substantially lower than those measured at Location A and reflect a typical rural setting.

Measurement Location C was adjacent to Arroyo Road at Hansen Road. This measurement provides baseline information for noise levels adjacent to Subareas 5, 6, and 7 and also for the noise levels in existing residential areas located along Arroyo Road near Marina Avenue. The data show that this roadway is characteristic of a low volume country road where loud noise levels result from individual vehicle passbys generate loud noise levels and are separated by periods of quiet resulting in a wide range of noise levels.

Measurement Location D was selected in response to concerns expressed by residents of Buena Vista Road about potential traffic noise impacts resulting from SLVSPA development. This location is representative of prevailing noise levels at residences along Buena Vista Road.

Short-term noise measurements were made at Locations 1 through 4.

Measurement Location 1 was located adjacent to South Vasco Road where Subareas 1 and 2 adjoin. The major noise source identified here was vehicular traffic on South Vasco Road. A tractor discing a

field across the street from the measurement location intermittently generated maximum noise levels of 68 dBA.

Measurement Location 2 was along Wente Road. Measured noise levels were similar to those at Location 1.

Measurement Location 3 was along Marina Avenue. Measured noise levels were lower than at Locations 1 and 2 as a result of lower traffic volume on the roadway.

Measurement Location 4 was at a vineyard south of East Road and east of Buena Vista Road. Noise sources at this location were comprised entirely of background sources (such as distant traffic).

The noise environment represented by the measured noise levels does not impose any significant constraints to a wide variety of land uses. Residential use immediately adjacent to major roadways would be exposed to noise levels exceeding those considered "normally acceptable" and likely would require mitigation (such as provision of open space buffer zones, sound barriers, and / or sound retardant building construction). The only other potential noise conflict would be between agricultural operations and residential development. Vineyard cultivation typically involves certain noise generating activities, including wind machines in the winter and spring to minimize freezing, and methods to keep birds away from the grapes during the summer.

4.7 NOISE -- IMPACTS AND MITIGATION

Scope of Topics Addressed

SLVSPA buildout would be expected to change ambient noise levels, mainly due to traffic volume changes. Residents along Buena Vista Road have concerns about increased noise resulting from new SLVSPA traffic using that road. Construction of individual development projects could increase ambient noise levels on a temporary basis at existing sensitive land uses nearby. Development according to the *Draft South Livermore Valley Specific Plan (Draft Plan)* could result in land use and noise conflicts due to the location of new residences close to major roadways, agricultural uses, and / or commercial, industrial, or research facilities.

Significance Criteria

Adoption and implementation of the *Draft Plan* would result in a significant adverse noise impact if:

- The contemplated uses would be inconsistent with *City of Livermore Community General Plan* Noise Element policies or would be exposed to noise levels exceeding State Title 24 noise thresholds
- SLVSPA development would conflict with *Draft Plan* policies due to the need for sound walls to reduce exposure to noise levels in excess of the its standards and those listed below
- SLVSPA development would increase ambient noise levels substantially in adjoining areas -- by at least three decibels (3 dB) -- and cause the ambient level to exceed an L_{dn} of 60 dBA
- SLVSPA development would increase ambient noise levels in adjoining areas by more than five decibels (5 dBA), whether measured for one hour or 24 hours and regardless of the existing ambient level

Impacts and Mitigation Measures

Impact 4.7-1 Traffic Noise Increases

SLVSPA development would not increase traffic noise substantially at any existing sensitive receptors in or around the planning area. LTS

Traffic volumes were reviewed for each of the roadway segments analyzed in section ***4.5 Transportation and Circulation*** of this EIR. Traffic noise level increases were determined by comparing existing traffic volumes on the roadway segments with future traffic volumes for the year 2010 with and without SLVSPA development. On most roadway segments, L_{dn} noise levels would change about one decibel (1 dBA) with or without SLVSPA development. However, noise levels along Wetmore Road are projected to increase by four decibels (4 dBA) with SLVSPA buildout and by two to three decibels (2-3 dBA) without SLVSPA buildout. This difference indicates that most of the increase would result from other development outside the SLVSPA. At the same time, noise levels are projected to decrease noticeably along Arroyo Road and South Livermore Avenue with or without SLVSPA development due to a drop in traffic volumes.

The extension of Concannon Boulevard from its existing eastern terminus to Wente Street would be built whether or not development proceeds in the SLVSPA but is expected to coincide with development of Subarea 3. Noise levels along Concannon Boulevard are predicted to be an L_{dn} of about 59 dBA 50 feet from the roadway centerline under future traffic conditions without SLVSPA development and 62 dBA with SLVSPA buildout. Thus, traffic noise levels along this roadway in the future would not be significantly different with or without SLVSPA traffic. Noise levels would increase substantially at existing residences adjacent to the existing roadway segment as a result of extending Concannon Boulevard with or without development of the SLVSPA.

Ambient noise levels were monitored along Buena Vista Road to establish existing baseline conditions, and existing and future traffic volumes were compared to determine the projected increase in noise levels. According to the analysis presented in ***4.5 Traffic and Circulation***, no additional vehicle trips would be expected along Buena Vista Road by the year 2010 from any source. Therefore, no increase in traffic noise level is projected along Buena Vista Road as a result of SLVSPA development or other development in the area.

Mitigation Measure 4.7-1 No mitigation would be required.

Impact 4.7-2 Noise and Future Land Use Compatibility Issues

Implementation of the Draft Plan *would result in development of noise sensitive residential land uses adjacent to the SLVSPA's road network and near agricultural and industrial / research uses. The* Plan *includes policies to mitigate these potential adverse effects to a less-than-significant level. LTS*

Residential development in all subareas would be exposed to noise from agricultural operations which would have similarities throughout the SLVSPA. Due to the variety of land uses adjacent to the individual subareas, noise exposure to industrial / research and other non-residential activities would differ among the subareas. (Noise implications of commercial development in the SLVSPA are discussed in ***Impact 4.7-3***, below.)

Agricultural Noise One *Draft South Livermore Valley Specific Plan* objective is to design and implement the urban component of the *South Livermore Valley Area Plan*. A companion objective is to preserve the historic wine region and rural valley atmosphere of the SLVSPA. Implementing these objectives would result in residential areas adjacent to and surrounded by active agricultural operations. This would create the potential for the noise from agricultural operations to disturb future residents living adjacent to the agricultural areas.

Viticulture would be the primary agricultural use in the area, supported by winery operations (***Impact 4.7-3***). During most of the year, noise levels associated with the cultivation and maintenance of vineyards is minimal. During the winter and spring, fans sometimes are used to prevent or reduce frost damage. Fans typically are powered by the equivalent of V8 automobile engines which can be heard across long distances. Before harvest, various techniques are used to scare birds away from the grapes, including the firing of blank cartridges. Small tractors and all terrain vehicles (ATVs) are used in the vineyards. During the harvesting and subsequent crushing of the grapes in the fall, farm workers move through the vineyards with trucks, and localized noise levels are generated at the wineries themselves. Noise from these activities would not exceed the *City of Livermore Community General Plan's* noise and land use compatibility guidelines. However, noise levels would exceed ambient background noise levels substantially, would be audible at adjacent residences, and potentially would disturb residents during high activity periods. This is a potentially significant impact. Policies 6-44 and 6-45 included in the Specific Plan mitigate this effect to a less than significant level.

- ***Policy 6-44*** The City of Livermore shall adopt and enforce a right-to-farm ordinance.

- ***Policy 6-45*** All new home-buyers in the Specific Plan area will be notified in their deeds of the potential for noise conflicts associated agricultural activities and the existence of the City's right-to-farm ordinance. The deed declaration will make explicit that noise generated from normal agricultural operations associated with and required to perform agricultural operations is allowable and is not subject to control or regulation in response to complaints from the adjacent residential property owners.

Individual subareas would be exposed to noise generated by a variety of other non-agricultural sources, as discussed below.

Subarea 1 Subarea 1 is located on the east side of South Vasco Road and extends from a point south of East Avenue to Tesla Road. Vehicular traffic on South Vasco Road would be the dominant noise source affecting development in Subarea 1. Based on the future traffic volumes for this roadway, the noise exposure is calculated to be an L_{dn} of 58 dBA 100 feet from the roadway centerline and about 50 dBA at the nearest proposed residential lot. Therefore, future noise levels clearly would be compatible with planned residential development. Inclusion of Policy 6-42 in the *Draft Plan* would adequately mitigate traffic noise.

- ***Policy 6-42*** Maintain agricultural buffers specified in the Plan to ensure adequate mitigation of projected traffic noise on future residents.

Sandia National Laboratories (SNL) owns the contiguous land east of Subarea 1. SNL's security buffer immediately adjoins Subarea 1, is designated as agricultural open space, and is not planned for future

development.[1] SNL's Laboratories Hazardous Test Area is located approximately 950 to 1,500 feet east of Subarea 1. Activities there include high explosive, high pressure, and dynamic testing of materials and components. Impulsive noise levels could be generated occasionally and intermittently from this facility and be audible at the SLVSPA's nearest residences. SNL operates its Livermore Pistol and Rifle Range near the water storage tanks on the southern hills of its site located about 1,200 feet from the nearest SLVSPA residential lots. The range is used periodically for firearms training occurring intermittently between 8:00 AM and 10:00 PM. The range is used approximately every three weeks for a period of one to two weeks to renew and recertify skills and intermittently and occasionally between these training periods.

SNL conducted a sound level survey at its firing range in February 1987.[2] The survey was based on a realistic firing condition for impulse and steady-state sound levels. The maximum firing range peak sound pressure level was approximately 87 dBA at the SNL site's south property line location closest to the nearest existing off-site residence. The steady-state firing range sound pressure level was 65 dBA at the south site boundary location. A review of the SNL site map indicates that this monitoring location was approximately 500 feet south of the firing range. A review of Subarea 1 topography indicates similar conditions to the south and west, although not necessarily identical because the firing range is located near the top of a hill. Assuming that sound propagation characteristics are similar to the west towards Subarea 1 as towards the south where the noise measurement was made and taking the difference in distance into account, the maximum sound pressure level is calculated to be about 80 dBA at the nearest Subarea 1 residential lot and would range from 75 to 85 dBA elsewhere in the planned Subarea 1 residential area. The steady-state pressure level is estimated to be between 55 and 60 dBA in Subarea 1. SNL's EIS / EIR stated that "since the field study was conducted, SNL Livermore has modified the firing range by lowering its elevation and by adding a baffle over the top of the range to reduce noise levels".[3] No such reduction was assumed in this EIR's calculations described above and would need to be verified by field measurement before applying a factor to this analysis. Policy 6-46 contained in the *Draft Plan* would mitigate this effect to a less-than-significant level.

- ***Policy 6-46*** As a condition of final map approval, the owners of all property designated for residential use within Subarea 1 shall grant a noise easement to Sandia National Laboratories, granting the Laboratories the right to generate noise at the existing facility and to be free from complaints or future legal action by the owners or residents of the residentially designated property. Deeds for residential lots shall include a disclosure statement that identifies the potential for noise, the character of the noise, and the terms and conditions of the easement held by the Laboratories.

Subarea 2 Subarea 2 is bounded by East Avenue (north) and South Vasco Road (east). These two roadways are the major sources of environmental noise which potentially could affect residential development in Subarea 2. A light industrial park also is located adjacent to the northeast corner of Subarea 2. The existing noise level monitored along East Avenue was determined to be an L_{dn} of 72 dBA 36 feet from the roadway centerline. In the future, noise levels are projected to decrease about

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1 Letter from Steve Carpenter, Facilities Planning Engineering Department, Sandia National Laboratories, to Marc Roberts, City of Livermore Planning Department, August 28, 1996.

2 *Final Environmental Impact Statement and Environmental Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore, California*, August 1992.

3 *Ibid.*

three decibels (3 dBA) along this roadway. The *Draft Plan's* site plan for Subarea 2 shows that the nearest residences would be located about 250 to 300 feet from the roadway centerline, separated by an agricultural open space buffer. The projected noise level at the nearest residence would be an L_{dn} of about 55 dBA. Therefore, the agricultural open space buffer would mitigate potential traffic noise impacts effectively. The nearest residential lot would be located about 100 feet from South Vasco Road where the projected noise level would be less than 60 dBA at this setback distance.

The Shaheen Industrial Park was visited during the noise monitoring survey. No significant noise sources were identified at that time. The *Draft Plan's* site plan for Subarea 2 shows a 50-foot buffer between the residential lots and the industrial park. It still is possible that existing or future industrial uses could generate noise levels at the property line which would disturb future SLVSPA residents and exceed the significance threshold. As a result of this potential, the *Draft Plan* contains Policy 6-47 to reduce future impacts to a less-than-significant level:

- ***Policy 6-47*** A sound barrier shall be developed in Subarea 2 along the south and west boundaries of the Shaheen Industrial Park in order to eliminate potential noise conflicts between industrial and residential uses. Berming and landscaping should be used to make the sound barrier as inconspicuous as possible from East Avenue, South Vasco Road, and residential development in Subarea 2.

Subarea 3 Subarea 3 is located adjacent to Wente Street and the Concannon Boulevard extension. Vehicular traffic on these existing and future roadways would be the most significant noise source affecting development in Subarea 3 which could include 177 residential units and possibly two commercial sites located in the southeast corner of the subarea. Vehicular traffic on Concannon Boulevard is projected to generate an L_{dn} of 59 dBA 100 feet from the roadway centerline. The *Draft Plan's* site plan shows agricultural open space adjacent to the roadway and the nearest residences located about 150 feet from the roadway centerline. At this distance, the future noise level would be less than an L_{dn} of 60 dBA. Therefore, the noise environment would be compatible for residential development. The future noise level along Wente Boulevard is predicted to be an L_{dn} of about 55 dBA 100 feet from the roadway centerline. The nearest residential lots are envisaged to be about 250 feet from the roadway centerline. Noise levels would be substantially below the 60 L_{dn} goal and, thus, compatible with the future noise environment. The commercial sites include large agricultural open space buffers separating them from the future residential land uses. As a result, no noise and land use compatibility problems are anticipated from development and operation of the commercial sites.

Subarea 3 adjoins Robertson Park. Activities in the park include softball fields, a community horseman's arena, and the Livermore Valley Stadium. These major activity areas are located several hundred feet from the nearest proposed residential lots in Subarea 3. While noise would be expected to be generated intermittently from Robertson Park, it would not be substantial and would not result in a significant impact on proposed residential uses.

Subarea 4 Subarea 4 is located east of Arroyo Road and south of Marina Avenue. Vehicular traffic on these roadways would be the dominant noise source affecting development in Subarea 4. Ambient noise levels measured adjacent to Arroyo Road yielded an existing L_{dn} of 66 dBA 27 feet from the roadway centerline. In the future, noise levels are projected to increase about three decibels (3 dBA), primarily as a result of general growth in the area and, to a lesser extent, development in the SLVSPA. Subarea 4 commercial sites adjacent to Arroyo Road would be located within a normally acceptable noise environment for commercial development. Marina Avenue traffic noise also was monitored. The existing L_{dn} is estimated to be about 60 dBA 50 feet from the roadway centerline. Marina Avenue

traffic noise levels are not projected to increase as a result of SLVSPA development. The *Draft Plan's* site plan shows a large agricultural open space buffer along Arroyo Road and Marina Avenue in Subarea 4. The nearest residences would be located about 500 feet from Arroyo Road and farther away from Marina Avenue. At these distances, future noise levels would be similar to those monitored at the end of Edwards Avenue adjacent to Subarea 4 where the ambient L_{dn} away from local traffic was about 51 dBA. Thus, *Draft Plan* land uses clearly would be compatible with the existing and future noise environment in Subarea 4.

Subarea 5 Subarea 5 is bounded by Arroyo Road (east), a residential neighborhood (north), and Vallecitos Road / Holmes Street (west). Arroyo Road traffic noise levels are discussed above. The commercial sites proposed adjacent to Arroyo Road clearly would be compatible with traffic noise generated on Arroyo Road. The nearest SLVSPA residential lots would be separated from Arroyo Road traffic by a 500-foot wide agricultural open space buffer. Projected noise levels would be compatible with SLVSPA residential development in this part of Subarea 5. The *Draft Plan's* site plan shows residential lots adjacent to Vallecitos Road just south of the existing Holmes Street intersection. In the future, Vallecitos Road traffic is estimated to generate an L_{dn} of 65 dBA 100 feet from the roadway centerline, the approximate distance the nearest SLVSPA residential development would be set back. Therefore, noise levels at the lots immediately adjacent to Vallecitos Road would exceed the normally acceptable level for new residential development in Livermore (60 dBA L_{dn}). *Draft Plan* Policy 6-43 would mitigate this effect to a less-than-significant level.

- ***Policy 6-43*** Design and build a noise barrier in the open space buffer between Vallecitos Road and the proposed development in Subarea 5. The barrier must be sufficient to reduce noise levels on adjacent lots below an L_{dn} of 60 dBA and must be designed to be as inconspicuous as possible from Vallecitos Road. A landscaped earthen berm or combination berm and barrier shall be used to attenuate traffic noise. No sound walls or fences that are visible form the adjacent public thoroughfares shall be permitted.

Subarea 6 Development in Subarea 6 would be limited to a commercial site within the subarea which otherwise would be used for agriculture. There are no noise and land use compatibility issues associated with Subarea 6.

Subarea 7 Subarea 7 is located south of Sycamore Grove Park. There are no existing sources of noise which would affect development in Subarea 7. The U.S. Department of Veterans Affairs Medical Center located adjacent to (southeast of) the subarea was visited and found to be a quiet land use. The future extension of Foley Road proposed to serve Subarea 7 would not be a significant traffic noise source. Noise generated from operation of the Zone 7 Del Valle Water Treatment Plan would not increase noise levels off-site in Subarea 7.

Mitigation Measure 4.7-2 *Draft Plan* Policies 6-38 through 6-43 would reduce potential noise impacts to a less-than-significant level, and no additional mitigation would be required.

Impact 4.7-3 Noise from New Commercial Sites

Noise from one of the new commercial sites potentially could increase noise levels substantially at existing or proposed residential land uses. PS

Subareas 1 and 2 would not contain new commercial sites.

Two commercial sites could be located in the southeast part Subarea 3 on either side of the Concannon

Boulevard extension alignment. A bed and breakfast / small winery would be located north of the roadway, and, depending on Concannon Boulevard extension alignment, a small restaurant / tasting room would be located on the southeast side of the road near the intersection with Wente Street. The *Draft Plan's* site plan provides adequate open space buffers between new commercial sites and the new residential development area. No existing residences would remain in the vicinity which could be affected by noise from operation of these commercial sites. (The existing Caldiera residence is assumed to be converted to the Subarea 3 bed and breakfast inn, and the other housing units present in the subarea area are assumed to be replaced by new residential development.)

Four commercial sites could be built along Arroyo Road in Subarea 4. Each site would be surrounded by an agricultural open space buffer. The olive press shown in the northwest part of Subarea 4 would be located across the roadway from existing residences. These residences currently are shielded from Arroyo Road traffic noise by a sound wall. The olive press site is shown several hundred feet from Arroyo Road. Pressing activities are not expected to increase noise levels at the nearest adjacent residential land uses substantially. Nevertheless, it is recommended that an acoustical consultant should review detailed site development plans for the olive press before the City approves construction and operation of the facility to ensure that no mechanical equipment proposed to be used would disturb the adjacent residents.

Five commercial sites could be built in Subarea 5. These include a wine country commercial center on Arroyo Road adjacent to Ravenswood Park, a 30-room inn and restaurant at Arroyo Road and Hansen Road, a small winery near the Wetmore ruins on Wetmore Road, and a small winery on the Nelson property opposite Sycamore Grove Park. A bed and breakfast possibly could be built in the southeast corner of the Tolentino property. In addition, a medium-sized winery could be built in Subarea 6. Each of these commercial sites would be buffered from existing or proposed residential development by agricultural open space areas. No significant noise impacts on existing or future residents would result from development of these commercial sites as shown on the *Draft Plan* site plans.

In Subarea 7, a medium-sized winery could be built in the northeast corner of the subarea. The winery would be separated from residential land uses by an open space agricultural buffer planted with vineyards. The several hundred-foot buffer would be sufficient to mitigate winery-related noise on residential land uses.

Mitigation Measures 4.7-3 The *Draft Plan's* site plans for SLVSPA subareas incorporate open space buffers around each of the potential commercial sites. The only potential noise-land use conflict could result from the Subarea 4 olive press which would be located directly across Arroyo Road from existing residences. The several hundred-foot setback from Arroyo Road shown for Subarea 4 is expected to be sufficient to mitigate potential noise impacts. However, the following measure is recommended as a condition of approval for development of this commercial site:

- On behalf of the City, an acoustical engineer should review the detailed site plan and equipment layout when designed for the Subarea 4 olive press to determine that no noise sources are proposed which could affect adjacent residences adversely and to identify project-specific measures required to ensure that noise levels at the property lines of existing off-site residences would not exceed the "normally acceptable" L_{dn} of 60 dBA. Measures to achieve these off-site noise levels could include placing all mechanical equipment inside, orienting outdoor activity areas at the olive press to face away from existing off-site housing units, or designing a barrier on the olive press site to attenuate noise.

Significance after Mitigation Implementation of Mitigation Measure 4.7-3 would reduce the potential impact of operating an olive press on Subarea 4 to a less-than-significant level.

Responsibility and Monitoring The City would be responsible for reviewing plans for the olive press to ensure that noise compatibility guidelines would be met at adjacent residences. The project sponsor would be responsible for designing, building, and operating the facility to comply with the noise level thresholds and for funding the independent acoustical review on behalf of the City.

Impact 4.7-4 Construction Period Noise
Construction involved in implementing the Draft Plan *and building out the SLVSPA would temporarily elevate noise levels in surrounding areas. This would constitute a significant short-term impact for which mitigation would not be entirely successful. SU*

Construction noise impacts are localized in nature and would be expected to occur around each individual development project in the SLVSPA. Future development areas in Subareas 1 and 2 are not located adjacent to existing sensitive receptors. Construction in Subarea 2 would be separated from Buena Vista Road residents by an intervening agricultural buffer more than 600 feet wide. This buffer would be sufficient to mitigate any potentially significant construction noise impacts generated in Subarea 2 to a less-than-significant level.

Construction activities in Subarea 3 would adjoin existing residential neighborhoods contiguous on the west. Construction activities associated with residential development include grading, excavation work, pouring of foundations, and framing and finishing of structures. Infrastructure work also would be required to build new roadways and install utilities. Such construction activities typically generate noise levels ranging from 75 to 85 dBA at a distance of 50 feet. Construction-related noise would drop off at the rate of about six decibels (6 dBA) with each doubling of the distance. Therefore, construction noise levels would fluctuate widely during the buildout period and occasionally and intermittently would exceed existing ambient noise levels substantially at adjacent neighbors' homes.

Development in Subarea 4 would not be expected to result in any construction noise impacts because of the widths of buffer areas envisaged. As with Subarea 3, residential development in the northern part of Subarea 5 would occur immediately adjacent to an existing residential neighborhood. Substantial increases in noise would occur during construction of SLVSPA units immediately adjacent to the existing neighbors, as described above. No construction noise impacts would be expected during development in Subareas 6 and 7.

Mitigation Measure 4.7-4 The City should impose the following measures as conditions of approval for individual development projects in Subareas 3 and 5 in order to minimize construction noise during development and to substantially lessen the significance of the impacts:

- ***Construction Scheduling*** Limit noise-generating construction activities, including truck traffic coming to and from the project site for any purpose, to daytime, weekday, non-holiday hours from 7:00 AM to 8:00 PM as specified in Livermore Municipal Code Section 9.36.08

- ***Construction Equipment Mufflers and Maintenance*** Properly muffle and maintain all construction equipment powered by internal combustion engines

- ***Idling Prohibitions*** Prohibit unnecessary idling of internal combustion engines

- ***Equipment Location Shielding*** Locate all stationary noise-generating construction equipment (such as air compressors) as far as practical from existing nearby residences

- ***Quiet Equipment Selection*** Select quiet construction equipment, particularly air compressors, whenever possible

- ***Notification*** Notify neighbors located within 500 feet of the construction site of the construction schedule in writing

- ***Noise Disturbance Coordinator*** Designate a "noise disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (such as starting too early, bad muffler, etc.) and would require implementation of reasonable measures to correct the problem. Conspicuously post the disturbance coordinator's telephone number at the construction site and include it in the notice sent to neighbors providing the construction schedule.

Significance after Mitigation Although these measures would reduce potential noise of conflicts, there still would be times when noise levels would exceed existing ambient levels substantially and possibly interfere with speech and routine residential activities. Therefore, this effect would remain a significant short-term noise impact after mitigation.

Responsibility and Monitoring The City would be responsible for requiring Mitigation Measure 4.7-4 as a condition of approval for individual development projects proposed in Subareas 3 and 5. Project sponsors would be responsible for requiring their contractors to implement the measures by inserting these provisions in contracts and subcontracts. The noise disturbance coordinator ultimately would implement this measure, and, failing that, complaints would be directed to the City of Livermore Police Department.

Impact 4.7-5 Cumulative Noise Impacts

After construction of the Concannon Boulevard extension, traffic generated by SLVSPA development would contribute incrementally to substantially increased noise levels at existing residences along existing segments of this roadway. While increases attributable to SLVSPA development alone would not constitute a significant impact, the combined effect would be significant and potentially unmitigable. SU

The *City of Livermore Community General Plan* recommends extending Concannon Boulevard to connect South Livermore Avenue (east) and Holmes Street (west) This roadway improvement would occur with or without the development of the SLVSPA, although it is assumed to be implemented with development of Subarea 3. Existing residents living adjacent to existing segments of Concannon Boulevard would experience increases of traffic noise up to about ten decibels (10 dBA) as a result of the extensions. The noise level increase would be about eight decibels (8 dBA) without SLVSPA development. Existing sound walls are expected to keep future noise levels in the yards of homes below the City's land use compatibility guidelines. However, there would be a substantial increase in noise and would be a significant cumulative impact attributable to buildout of the *General Plan* and the implementation of this roadway improvement.

No other cumulative noise impacts were found to be significant as a result of SLVSPA development in conjunction with other development expected in the area.

Mitigation Measure 4.7-5 Currently, as each potion of Concannon Boulevard was constructed, adjacent sound walls have been installed to address to ultimate noise impacts of buildout of the General Plan. No additional mitigation would be available.

Significance after Mitigation The extension of Concannon Boulevard to South Livermore Avenue will complete the roadway as planned by the Livermore Community General Plan. This will result in an increase of traffic using the roadway and increased traffic related noise along its entire length. Concannon Boulevard has been constructed incrementally over a long period of time as adjacent residential areas have been developed. As each portion of the roadway was constructed, adjacent sound walls have also been installed to address the ultimate noise impacts of the buildout of the General Plan. However, due to the long delay between the development of the first sections of Concannon Boulevard and the final extension to south Livermore Avenue, and due to the fact that the required mitigation measures were installed prior to the actual noise impact, adjacent residents have experienced a long period of time with noise levels substantially below maximum levels identified by the General Plan as acceptable in residential areas. So, although ultimate noise levels along Concannon Boulevard will remain within acceptable levels due to previous installed sound walls, the increase in noise due to the completion of the roadway will be noticeable to existing residents. The impact of the increase in noise level will be significant and is unavoidable.

4.8 VISUAL AND AESTHETIC QUALITY

VISUAL AND AESTHETIC QUALITY -- THE SETTING

Regional Setting

The City of Livermore is located in the eastern end of the Livermore-Amador Valley, an east-west trending basin surrounded by hills and mountains. These hills and mountains provide a distinctive visual backdrop for the urban area which has developed near the center of the valley on the relatively flat valley floor. The physical character of the hills and their distance from the urban area varies on each side of Livermore, thus creating a different visual character for each part of the city. To the north, the hills are somewhat distant, with the terrain rising gradually in a series of gently rolling grass-covered hills to two distinctive and much taller peaks, Mt. Diablo to the northwest and Brushy Peak to the northeast. To the east, the Altamont Hills are much closer and provide a more regular horizon line consisting of a series of softly rounded grass-covered hilltops. To the south, the hills are steeper and much more rugged in character with substantially more vegetation covering the slopes. Due to their distance from the city, Pleasanton Ridge and the East Bay hills to the west play a much smaller role in Livermore's visual character.

General Planning Area Character

Landscape Elements

The South Livermore Valley Specific Plan Area (SLVSPA) is located along the southern edge of Livermore between the urban area on the north and foothills on the south. The visual character of the area reflects the predominance of natural features and agricultural activities. The scenic quality of the setting is generally quite high. The South Livermore Valley's visual environment consists of three dominant landscape elements -- the flat valley floor, the rolling foothills, and the steep, tree-covered ridges. Although the seven subareas differ in character, they generally represent the first two landscape types, with terrain ranging from relatively flat (Subareas 2 and 3) to gently rolling (Subareas 1, 4, 5, and 6). Subarea 7, the southernmost subarea, is the only exception. It forms a transition between the rolling foothills and steeper tree-covered ridges and has much more rugged and diverse terrain than the other subareas.

The two natural drainages which cross the South Livermore Valley -- Arroyo Mocho and Arroyo Valle -- form a distinctive but secondary landscape element in determining overall visual character. In the vicinity of the SLVSPA subareas, Arroyo Valle is more visually distinctive due to the sycamore trees growing along the drainage. The light gray-tan trunks of the sycamores provide a striking element in a landscape where the natural vegetation consists primarily of grasslands with few trees.

Visual Character

The SLVSPA generally is characterized by very open and expansive views. The valley floor typically forms both the foreground and middleground of most views, and the foothill perimeter provides a distant but distinctive background. Because of the relatively level terrain and the general absence of tall vertical elements in the landscape, the visual character of the landscape is predominantly horizontal in nature. Views from the SLVSPA to the south tend to have high scenic value due to the

distinctiveness of the foothill backdrop and little intervening development, although in isolated instances distinctive views are available to the north.

The development character of the planning area is generally rural with rural residences scattered throughout large areas under cultivation or in open grasslands. The perceived "ruralness" varies from subarea to subarea depending on the age and style of existing development. The presence of suburban and industrial development immediately adjacent to or visible from many of the subareas also tends to compromise the perception of the area as rural. For instance, the Shaheen Industrial Park adjacent to Subarea 2 and the proximity of the Sandia and Lawrence National Laboratories to Subarea 1 significantly alter the perception of these subareas. Rural residential development is scattered without clear patterns throughout the planning area and typically consists of small clusters of structures, including a house, barn, corral or paddocks, windmills or pump houses, and / or other assorted out-buildings. These compounds frequently are demarcated by stands of shade trees which often are the only substantial mature vegetation on the property and are typically the tallest vertical elements in a predominantly horizontal visual environment.

One visual element which clearly detracts from the aesthetic character of the SLVSPA is the presence of electrical power transmission towers and lines. These facilities are predominantly industrial in character and also are out of scale with the rest of the visual environment. In addition to bisecting Subareas 1, 4, 6, and 7, these tall vertical elements are sited along prominent ridgelines and form silhouettes against the sky, thus increasing their visual prominence.

Apart from grazing, agriculture in the SLVSPA consists primarily of vineyards or orchard crops (nuts and olives). From a visual standpoint, the parallel lines of trees and vines created by these crops introduce a formal man-made geometry to the landscape which contrasts with and highlights the less regular character of natural landscape. In addition, the growth cycles of the vineyards and orchards tend to complement those of the natural grasslands. In winter when the grasslands are lush and green, the orchards and vineyards are dormant, without foliage. In the summer, when the grasslands have turned a golden brown, the verdant crops provide a rich contrast.

Views from Roads

In our mobile society, many people form their image or idea of an area solely on what they can see as they travel through it. With the possible exception of Highway 84 which skirts the west end of the planning area, the SLVSPA generally is not located near the region's busiest transportation routes. Instead, the area is viewed primarily from local-serving roadways. This does not mean that only local residents use SLVSPA roadways. The SLVSPA provides a transition for visitors to the Lake Del Valle and Sycamore Grove recreation areas and for visitors to South Livermore Valley wineries. As the wine region continues to expand, the number of tourists also can be expected to increase. Travelers' first and most lasting impression of the South Livermore Valley may be formed by the quality and character of views from the planning area's roadways.

View from Scenic Corridors

Given the high scenic quality of the South Livermore Valley, a number of roadways in the vicinity of the SLVSPA have been designated or proposed as "Scenic Routes" by the City of Livermore and Alameda County. The City's purpose in establishing scenic route corridors is to establish clear policy direction to guide development along the corridors "in a manner that will protect and enhance scenic values ... which are deemed to be of outstanding quality or which provide access to important scenic, recreational, cultural, or historic points". The principal features contributing to the scenic character of

South Livermore Valley corridors are the panoramic views of the rural landscape on the valley floor and the dramatic backdrop formed by the foothills.

The City and County both designate Vallecitos Road, East Vineyard Avenue, Arroyo Road, Mines Road, Tesla Road, South Vasco Road, Greenville Road, and Patterson Pass Road as scenic routes. The City also proposes to designate the extensions of Concannon Boulevard and Isabel Avenue as scenic routes. Scenic Routes are shown in Exhibit 4.8-1.

VISUAL AND AESTHETIC QUALITY -- IMPACTS AND MITIGATION MEASURES

Significance Criteria

According to the *State CEQA Guidelines*, a project normally would have a significant effect on the environment if it: [1]

- Had a substantial demonstrable negative aesthetic effect
- Affected a scenic vista or scenic highway
- Created light and glare
- Conflicted with adopted environmental plans and goals where the community is located

While all projects create some visual change, CEQA provides little guidance about how much change is significant. Most EIRs rely on two methods to determine what change is significant. The first is conformance with adopted plans and policies, and the second is a visual analysis. Both methods are used in this EIR. Section ***4.1 Land Use and Public Plans***, presents the project's conformance with public plans and zoning, and the visual analysis is presented here.

The Visual Analysis Methodology described below established an additional significance criterion. An impact would be significant if:

- The project's *visual dominance* exceeded what is defined as the appropriate *sensitivity level.*

The terms *visual dominance* and *sensitivity level* also are defined below.

Visual Analysis

This EIR visual analysis uses visual simulations to discuss changes to the SLVSPA with implementation and buildout according to the *South Livermore Valley Specific Plan (Draft Plan).* The simulations present views of six subareas (Subareas 1-5 and 7) plus one potential commercial site. For each view, a photograph is presented first showing existing conditions and is followed by the photosimulation of the developed subarea.

To determine the significance of the change in a view, two elements are considered. One element is the *sensitivity* of the view which analyzes the nature of the landscape in relation to plans and policies

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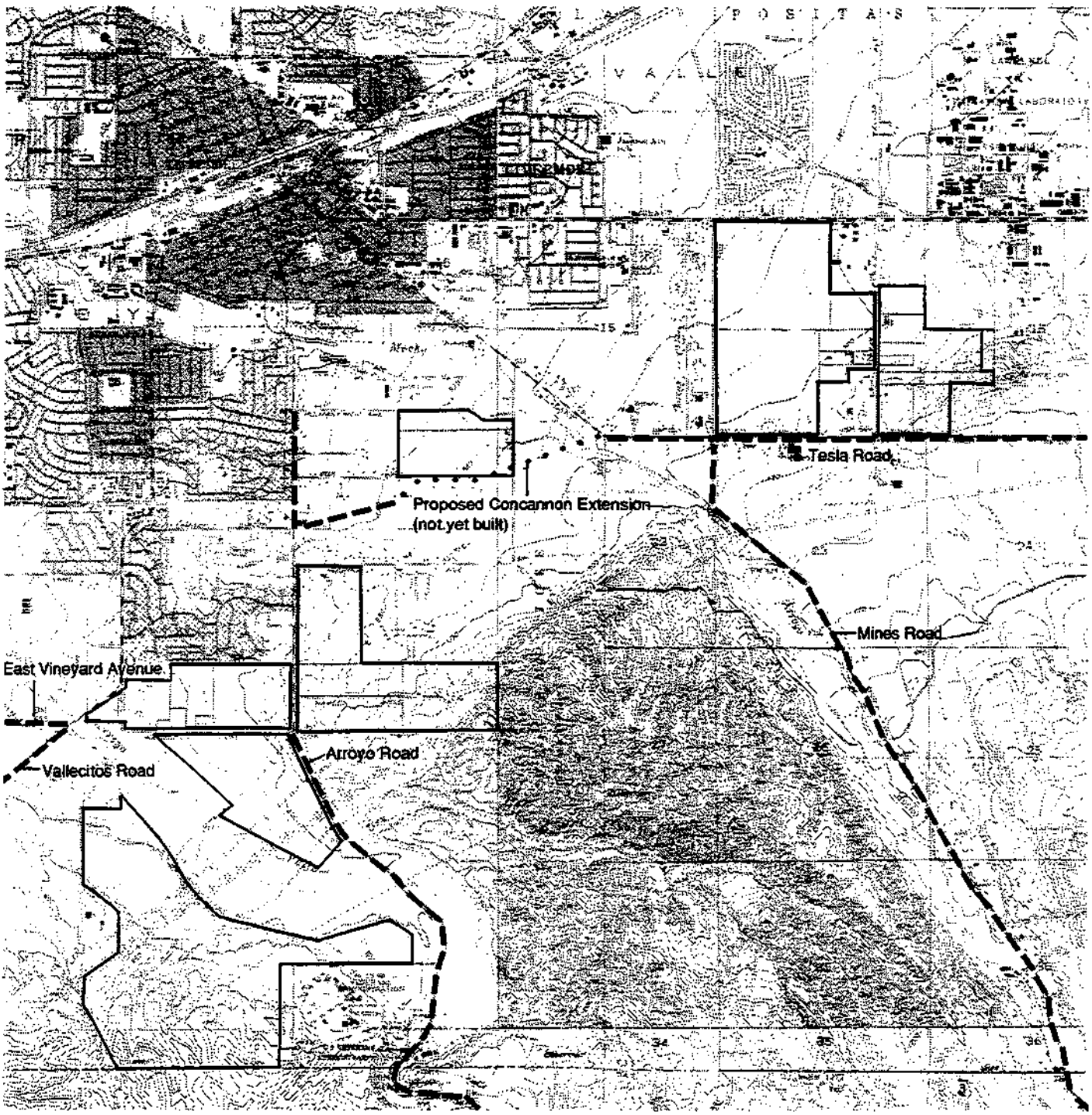
[1] Additional criteria were considered when initiating the EIR studies, mainly those identified in the *City of Livermore Community General Plan* and *Zoning Ordinance*. As described below, ***Impact 4.1-6 Conformance with Plans*** reflects this analysis of ***Aesthetics, Light, and Glare***, as it does the other environmental assessments conducted for this EIR.

Exhibit 4.8-1
Scenic Routes



Legend:
- Existing Scenic Corridors
- Proposed Scenic Corridor (not yet built)

Source: City of Livermore

governing the use of the land. Such plans and policies provide an expectation of development and encourage or discourage certain types of development.

The second element is the *visual dominance* of development. *Visual dominance* is a measure of how the form, line, color, and texture of structures added to a view interact with the natural surroundings where development would occur. The basic philosophy of a visual analysis system encompasses the following ideas: [2]

> The degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The contrast can be measured by comparing the project features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the project.

Those elements are further defined as follows: [3]

Form The shape or structure of something as opposed to the material which composes it. Important subelements of form include *geometry* (the shape of the form), *complexity* (the simplicity of the form), and *orientation.*

Line The path, real or imagined, the eye follows when perceiving abrupt differences in form, color, or texture. The most common line in the landscape is the edge of shapes or masses. Important subelements of line include *boldness* (the strength of the line), *complexity* (the simplicity of the line), and *orientation.*

Color The property of reflecting light. Color is composed of *hue* (the aspect of color we know by name, such as blue or green), *value* (the degree of darkness from black to white), and *chroma* (the degree of color saturation or grayness, ranging from pure (high chroma) to dull (low chroma)).

Texture The visual or tactile surface characteristics of something. Texture consists of *grain* (the relative dimensions of surface variation, from fine to coarse), *density* (the spacing of surface variation), and *regularity* (the amount of evenness and randomness).

These elements are used to describe the relationship between an existing view and of project development. Existing views have variations in form, line, color, and texture. These views are changed by the addition of structures and alterations to the natural site. Whether the structures adopt the existing element variations or create new ones determines the level of *visual dominance* of a project. For example, if the existing view is composed of natural colors or earth tones, a structure could adopt those colors and have a lower visual dominance or could be painted or plastered with a completely different contrasting color and create a high level of visual dominance. This EIR uses four levels of visual dominance -- *dominant, co-dominant, subordinate,* and *inevident* -- with a different maximum level of visual dominance appropriate to each level of view sensitivity, as described below.

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2 *Bureau of Land Management Manual*, Bureau of Land Management (BLM), U.S. Department of Interior, 1986.

3 The elements listed in the text combine and refine, for CEQA EIR purposes, definitions originally identified by the U.S. Forest Service and BLM to assess large-scale resource use and land management programs.

The level of visual significance is determined by placing a view's *sensitivity* in a matrix with the project's *visual dominance*.[4] An impact is considered significant if its visual dominance exceeds what is appropriate for the view's sensitivity level. The resulting matrix is shown below.

Exhibit 4.8-2
Visual Significance Matrix

Sensitivity	Visual Dominance			
	Dominant	*Co-dominant*	*Subordinate*	*Inevident*
Maximum	significant	significant	significant	less-than-significant
High	significant	significant	less-than-significant	less-than-significant
Moderate	significant	less-than-significant	less-than-significant	less-than-significant
Low	less-than-significant	less-than-significant	less-than-significant	less-than-significant

Visual Analysis Methodology

To reduce subjectivity, the following steps were taken to prepare this visual analysis:

Determine viewpoints As discussed above, one viewpoint for each subarea except Subarea 6 was chosen as a representative sample of SLVSPA views. (CEQA does not, and could not, require a visual analysis of the site from "every imaginable" view.) Exhibit 4.8-5 shows the locations of the viewpoints.

Prepare photosimulations Photosimulations were prepared to simulate subarea development at completion as seen from each viewpoint. Simulations used *Draft Plan* design guidelines discussed in ***2.2 Project Description*** and presented below to determine the appearance of development and maturity of landscaping.

Determine sensitivity level of views A change might be significant in one setting and not significant in another. This EIR uses four sensitivity levels -- *low, moderate, high,* and *maximum* -- to determine the level of *visual dominance* appropriate for each view. This is summarized in Exhibit 4.8-3.

[4] A more detailed description of the visual dominance appropriate for each sensitivity level is given in Exhibit 4.8-3.

Exhibit 4.8-3
Sensitivity Level and Appropriate Visual Dominance

Sensitivity Level	Appropriate Visual Dominance	
Low	Dominant	Project dominates the landscape. Project elements are strong -- they stand out against the setting and attract attention away from the surrounding landscape. Form, line, color, and texture can *contrast* with existing elements.
Moderate	Co-Dominant	Project co-dominates. Project elements are moderate -- they are prominent within the setting and attract attention equally with other landscape features. Project generally must *borrow* from naturally established form, line, color, and texture so that visual characteristics are compatible with their surroundings.
High	Subordinate	Project is visibly subordinate. Element contrasts are weak -- they can be seen but do not attract attention. Project generally must *repeat* the form, line, color, and texture of its surroundings.
Maximum	Inevident	Project is generally not visually evident. Element contrasts are not visible or perceived. Project changes in the characteristics of size, amount, intensity, pattern, etc. should not be evident.

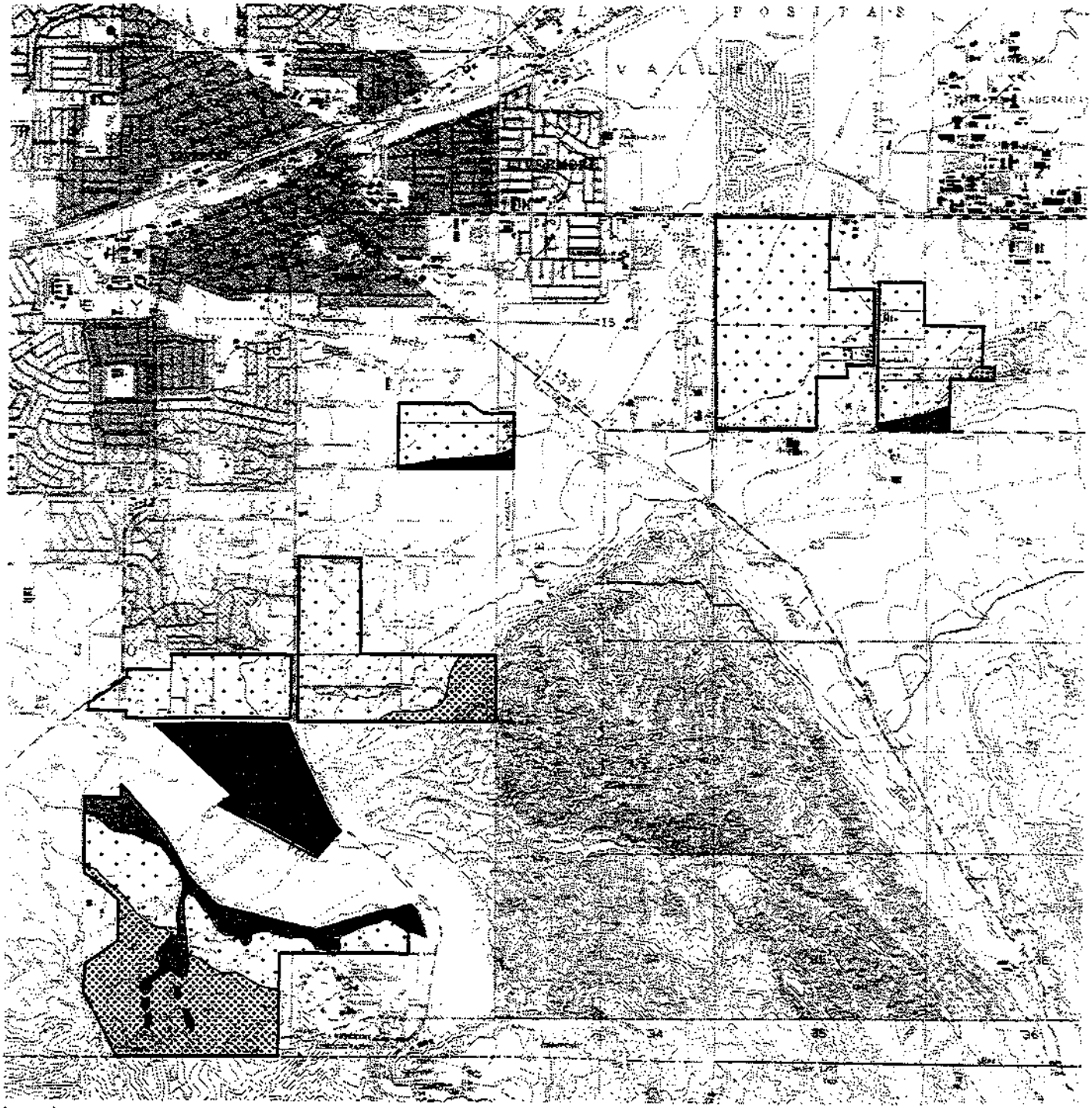
The sensitivity level is determined by adopted plans and policies (including the *Draft Plan*). A complete description of applicable plans and policies is included ***Impact 4.1-6 Conformance with Plans***. Different areas of the SLVSPA have different sensitivity levels, as described below and shown in Exhibit 4.8-4.

- The ridgeline of Subarea 7 is considered to have a ***maximum*** sensitivity level for structures. This means that any structural development should not be visually evident. Other uses (such as agriculture) could be developed. This reflects *City of Livermore Community General Plan* Visual Resources Policy (7)(a) which forbids structural development in hillsides involving ridgelines and Scenic Route Element Policy 3.B which forbids artificial ridgelines.

- The grasslands in the upland area of Subarea 7, the easternmost wedge of Subarea 1, and the southeast part of Subarea 4 are considered to have a ***maximum*** sensitivity level for structures. This follows *City of Livermore Community General Plan* Visual Resources Policy (7)(l) which forbids development in the grassland of upland areas (except agriculture) without effective screening from public viewing areas or scenic corridors. (Note that "upland" is not defined in this policy. For purposes of the EIR, uplands are the steeper slopes above flatter lands which are visually distinct. One example is the steeper area above the flat "plateau" or "terrace" of Subarea 7. As such, they are defined by the topography of the immediate area and not a particular elevation.)

- The forested hills below the ridgeline of Subarea 7 are considered to have a ***high*** sensitivity level. This means that development generally must *repeat* the form, line, color, and texture of its surroundings. This follows *City of Livermore Community General Plan* Visual Resources Policy (7)(c) which states that development in hills should not be intensive, and should be *subordinate* to the natural landforms.

Exhibit 4.8-4
Sensitivity Levels



Legend:

- Maximum sensitivity (structures)
- High sensitivity
- Moderate sensitivity for color and texture, low sensitivity for line and form

Source: City of Livermore

- Subarea 6, the northwest part of Subarea 7, and the northernmost edge of Subarea 7 are considered to have a ***high*** sensitivity level. This follows *City of Livermore Community General Plan* Visual Resources Policy (7)(j) which states that the City shall protect public views within and from arroyos (such as Arroyo Valle flowing through Sycamore Grove Park).

- The southern end of Subarea 1 (visible seen from Tesla Road), the southern end of Subarea 3 (which would be visible from a future Concannon Boulevard extension), and Subarea 6 are considered to have a ***high*** sensitivity level. This follows from Scenic Route Element Policy 3.G which states that development next to scenic route corridors (such as Tesla Road, Concannon Boulevard, and Arroyo Road) should be compatible visually with the natural scenic qualities of the area. (Scenic Routes are shown in Exhibit 4.8-1.)

- Development in the flatlands of SLVSPA Subareas 1 through 6 is considered to have a ***moderate*** sensitivity level in relation to color and texture. This means that development generally must *borrow* from naturally established colors and textures of the surroundings. This follows *City of Livermore Community General Plan* Visual Resources Policy (7)(f) which states that development must employ colors and materials which are in harmony with, rather than contrasting with, the vegetative cover of a site. (A low sensitivity level would allow contrasts.)

  In relation to form and line, the flatland areas are considered to have a ***low*** visual sensitivity. This means that form and line can *contrast* with the surroundings. This follows from the *South Livermore Valley Area Plan (Area Plan*) which expects development of non-agricultural uses in the SLVSPA. The form and line of virtually any structural development in the SLVSPA would contrast with the existing flat line and form of the agricultural land. Only a low sensitivity level can accommodate development with contrasting elements.

Determine the project's visual dominance for each view The visual dominance of SLVSPA buildout was determined using the photosimulations to describe the impacts of the resulting change from existing to developed conditions. The characteristics of form, line, color, and texture were used to describe the change from existing conditions.

Determine significance Most development creates a visual change. The degree and effect of change was determined using the matrix in Exhibit 4.8-2.

Material and Colors Allowed by the Draft Plan

The *Draft Plan's* design guidelines encourage use of materials such as wood, stone, brick, terne-coated metal, and copper, left in their natural color and finish. Processed materials permitted include cast-in-place concrete, cement plaster stucco (smooth or light stipple), asphalt shingles, flat non-reflective roof tile, and galvanized aluminum trim. Artificial imitations of natural materials (such as stamped brick and vinyl siding) are prohibited. The City's Design Review Committee may permit the use of artificial materials (such as horizontal lap siding fabricated from wood by-products or synthetic stone) on a case-by-case basis. Reflective or shiny finished are not allowed (including glazed windows). Roof colors shall range between gray / green and neutral gray, on a spectrum between neutral gray and black.

Impacts and Mitigation Measures

Views from six locations were selected to illustrate in the EIR. Exhibit 4.8-5 shows the viewpoint locations. Exhibits in the impact analysis present photographs of existing views and photomontages simulating post-project conditions as seen from these locations.

Impact 4.8-1 Subarea 1

Development in Subarea 1 would be located in an area of moderate sensitivity for color and texture and low sensitivity for line and form. The visual dominance of development would not exceed what is allowed under these sensitivity levels. Therefore, no significant impacts would result. LTS

View Sensitivity

As shown in Exhibit 4.8-4, the visual sensitivity of most of Subarea 1 is *moderate* for color and texture and *low* for line and form. This means the line and form of new development can contrast with the surroundings but that new development must borrow the color and texture of the surroundings.

The sensitivity of the southern part of the subarea (mainly the area visible from Tesla Road) is considered to be *high* because Tesla Road is a scenic route. This means that new development generally must repeat the form, line, color, and texture of its surroundings.

Policies protecting upland grasslands define the *maximum* sensitivity of the easternmost wedge of the subarea. Development generally should not be evident.

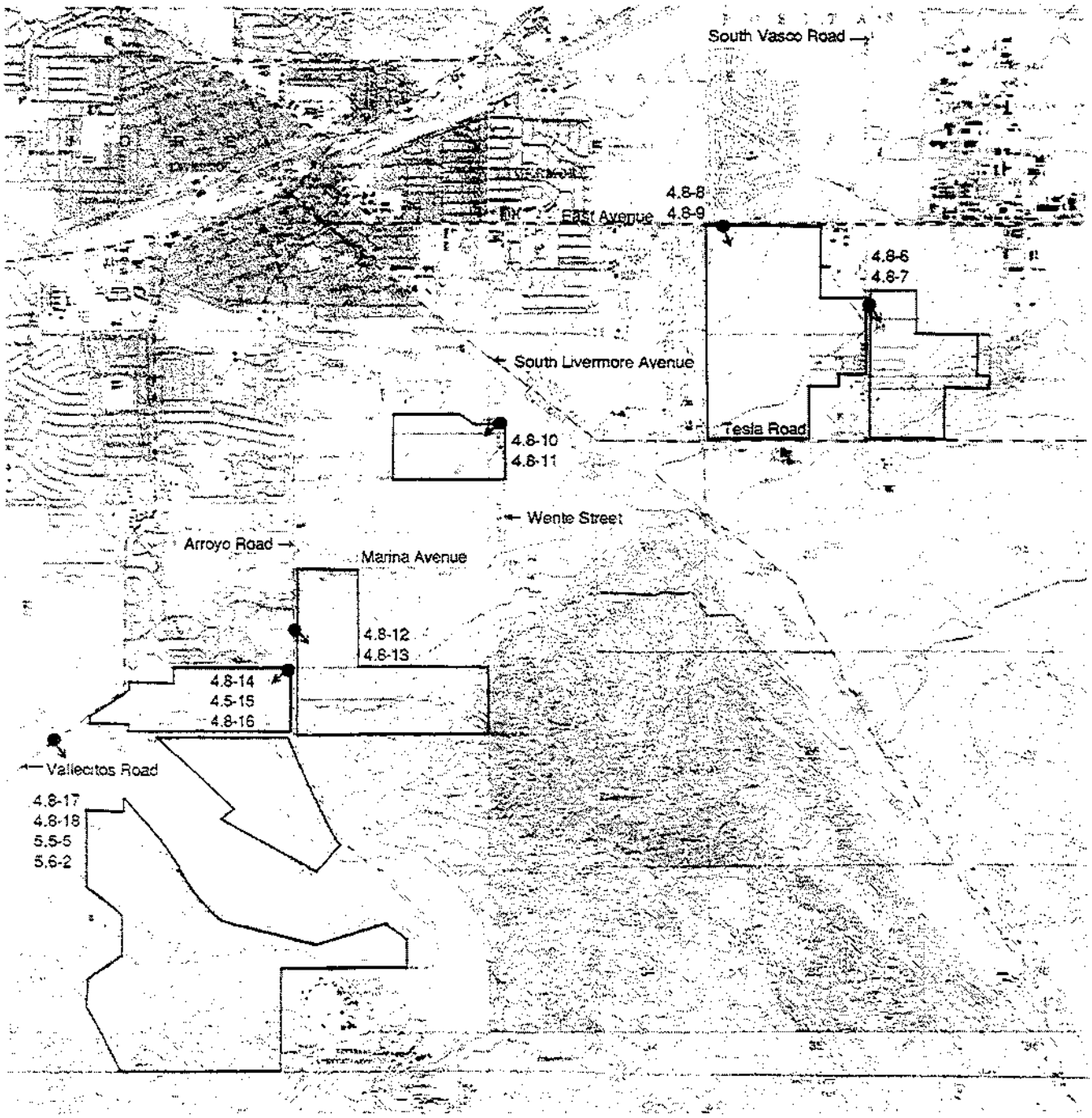
Setting

Parts of Subarea 1 are visible from East Avenue, Vasco Road, and Tesla Road. Due to the ridgeline which occupies the southernmost part of the subarea, views from Tesla Road generally are limited to foreground views of the Rios and Wise parcels developed with rural residences. The Rios parcel is developed with a winery and planted with vineyards. The electrical transmission lines and towers located along the ridgeline are prominent from Tesla Road. The approach to the South Vasco Road intersection provides distant views northwest to Mt. Diablo.

From South Vasco Road, views of the undeveloped interior of Subarea 1 are intermittent, obscured in the south by topography and along the rest of the roadway, at fairly regular intervals, by existing development. The Altamont Hills form the backdrop for many of these views, but the middle ground includes less attractive visual elements, such as the Sandia National Laboratories to the northeast and the electric transmission lines along the ridgetop to the southeast. The absence of development along the south side of East Avenue (east of South Vasco Road) allows for distant views into the eastern part of Subarea 1.

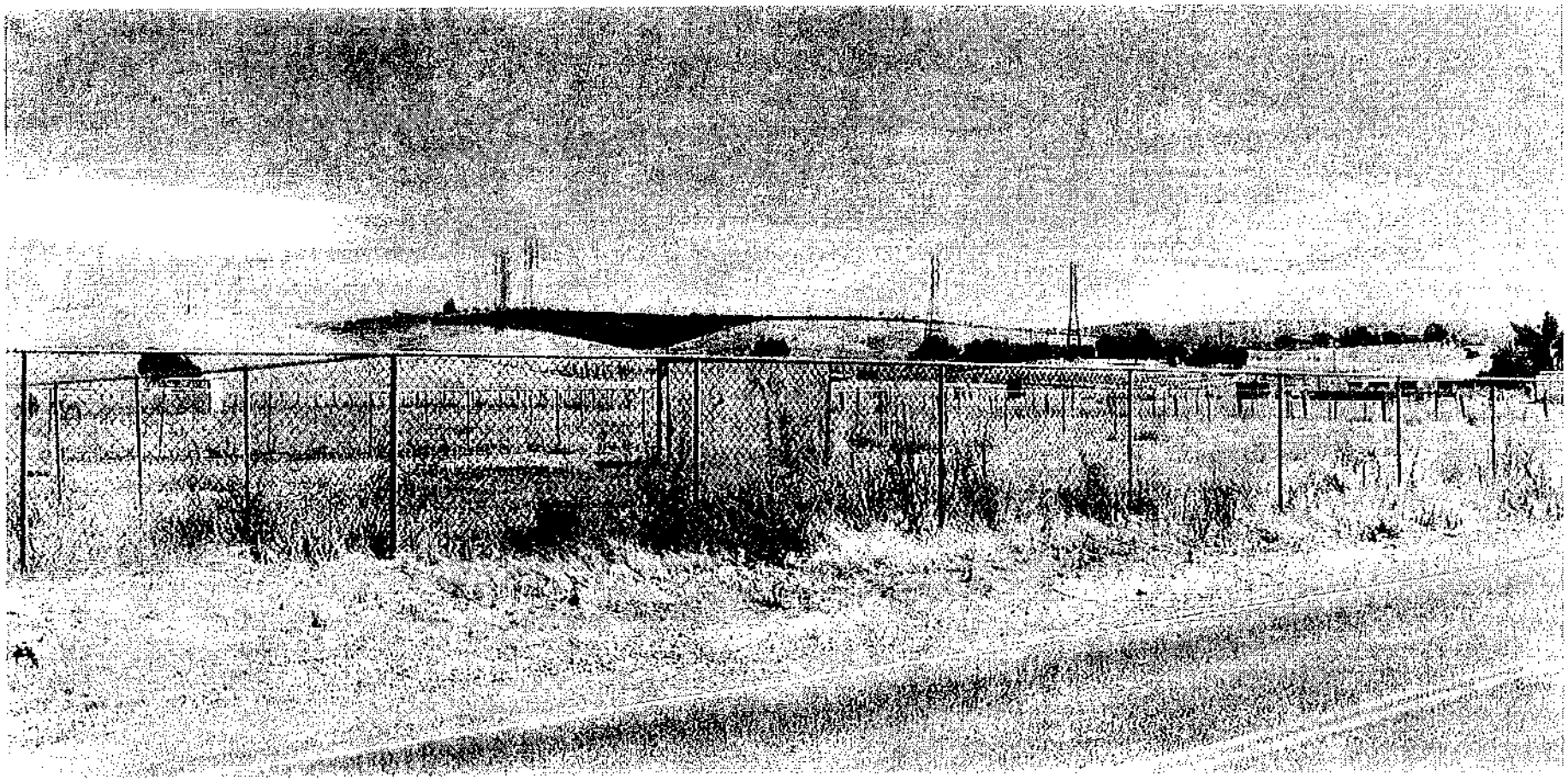
Exhibit 4.8-6 shows Subarea 1 from a viewpoint on South Vasco Road just south of the Shaheen Industrial Park, looking southeast. The existing electrical lines are useful for orientation. The towers to the far left (under the clouds) mark the eastern end of the easternmost wedge of the subarea. The towers left of the white box or shed in the center of Exhibit 4.8-6 are located in the easternmost wedge. The towers right of the box are located roughly between 4M Arabian on the Minaker parcel (the brown building just in front of one tower) and the Rios parcel on Tesla Road (the buildings on the ridgeline right of some trees, silhouetted against the background hills to the south). The buildings on the far right

Exhibit 4.8-5
Viewpoint Locations



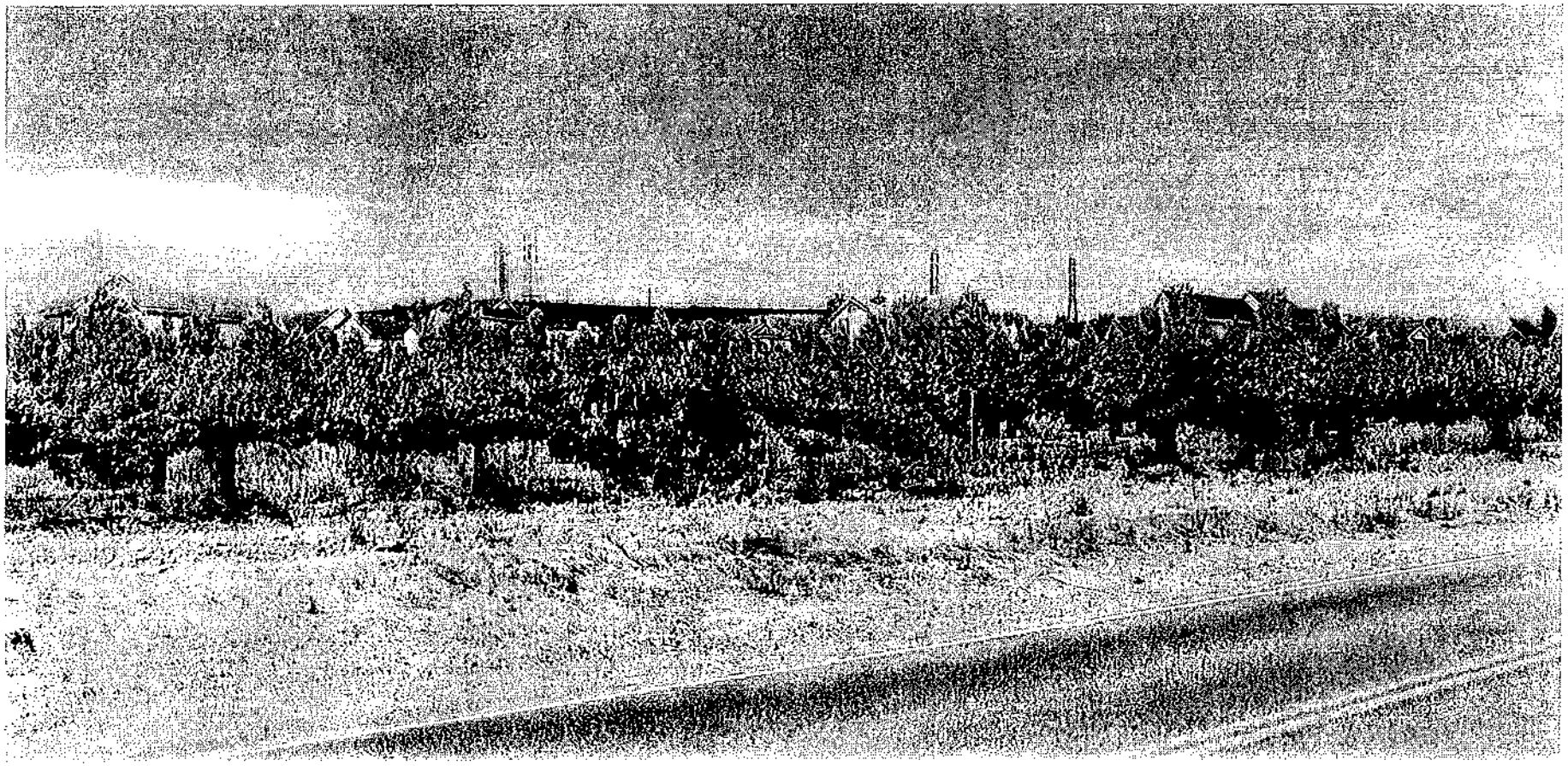
Source: Visual Impact Analysis

Exhibit 4.8-6
Subarea 1 -- Existing View from South Vasco Road



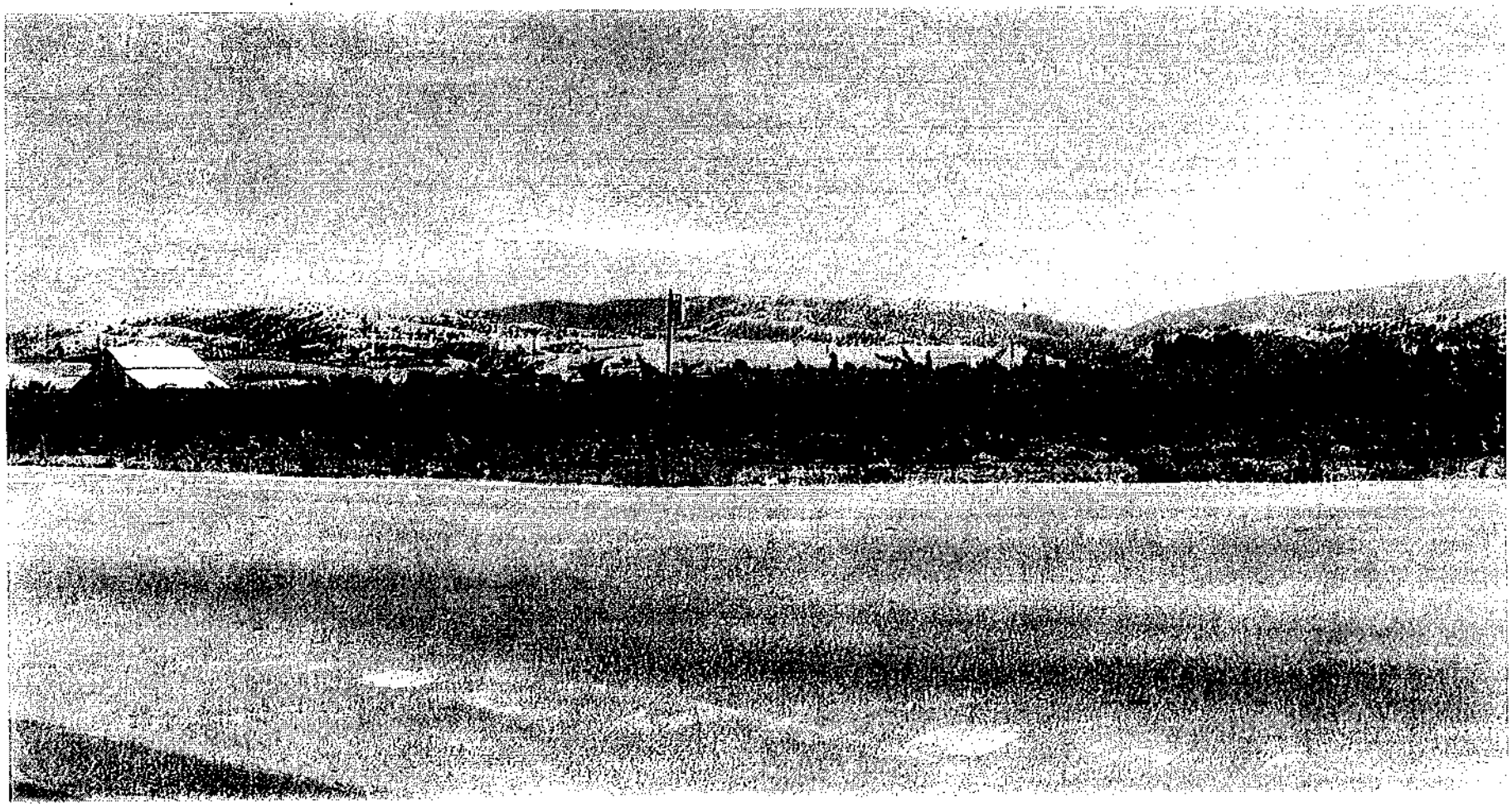
Source: Visual Impact Analysis

Exhibit 4.8-7
Subarea 1 -- View from South Vasco Road after Development



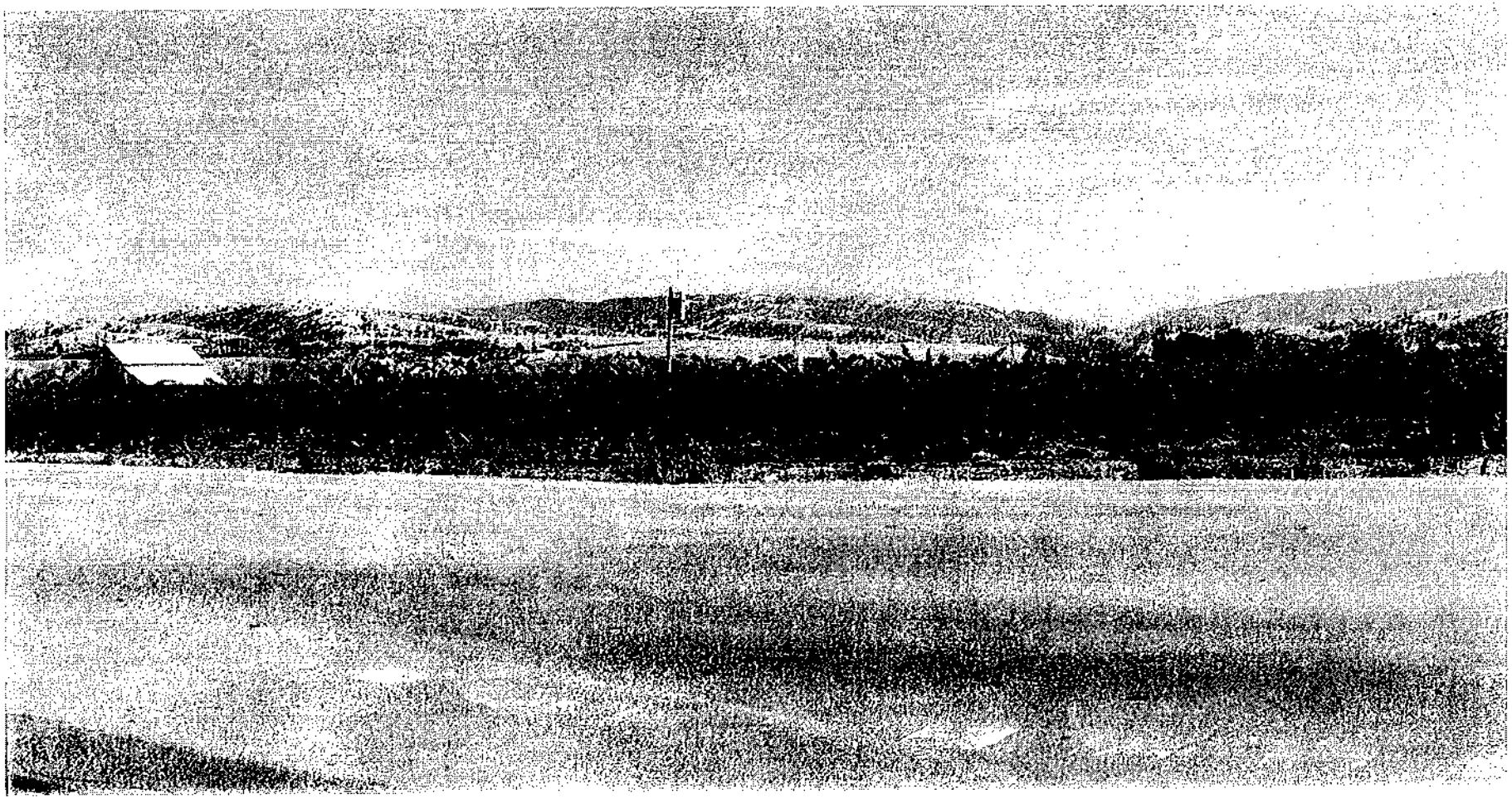
Source: Visual Impact Analysis

Exhibit 4.8-8
Subarea 2 -- Existing View from East Avenue



Source: Visual Impact Analysis

Exhibit 4.8-9
Subarea 2 -- View from East Avenue after Development



Source: Visual Impact Analysis

Exhibit 4.8-10
Subarea 3 – Existing View from Wente Street

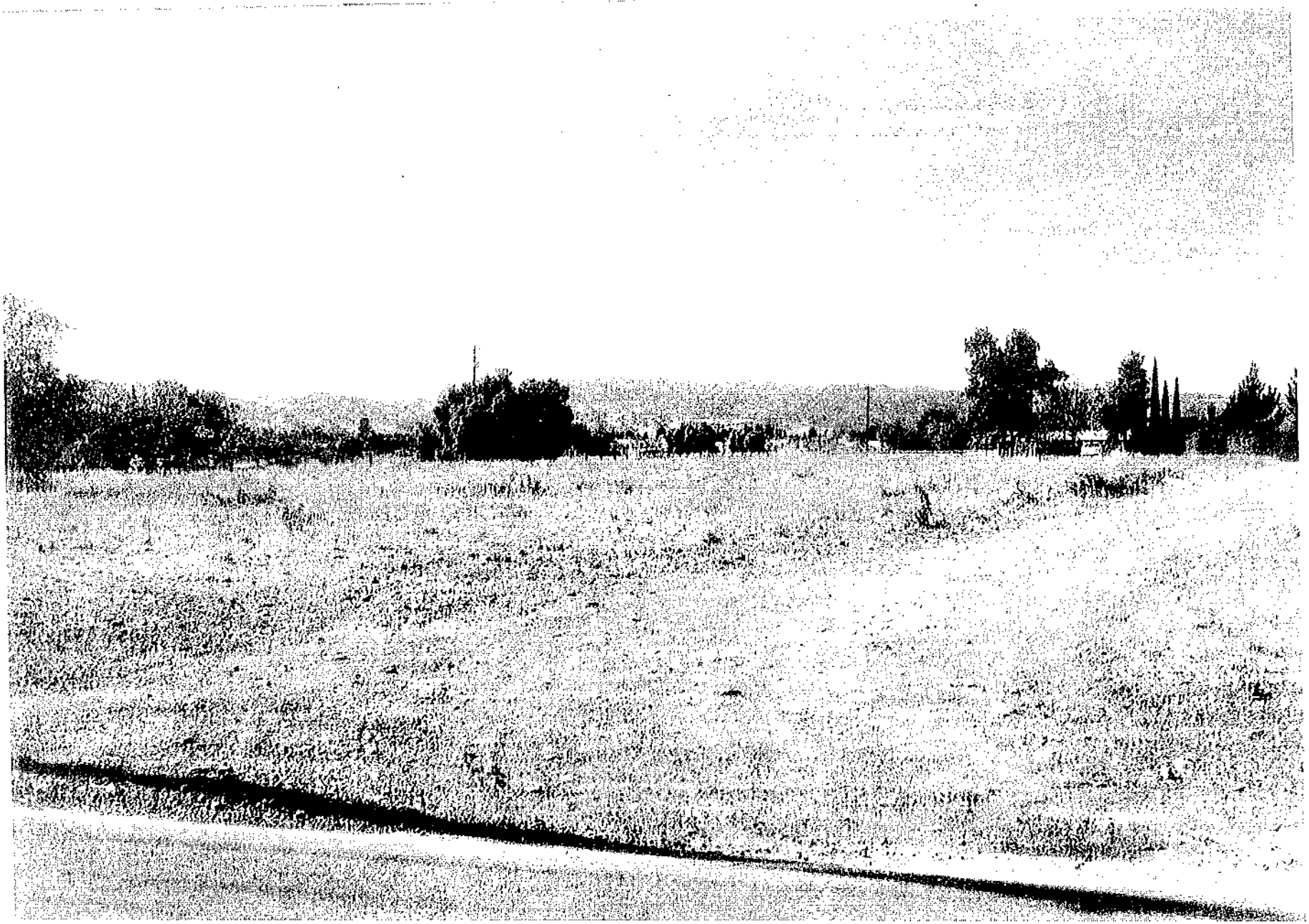
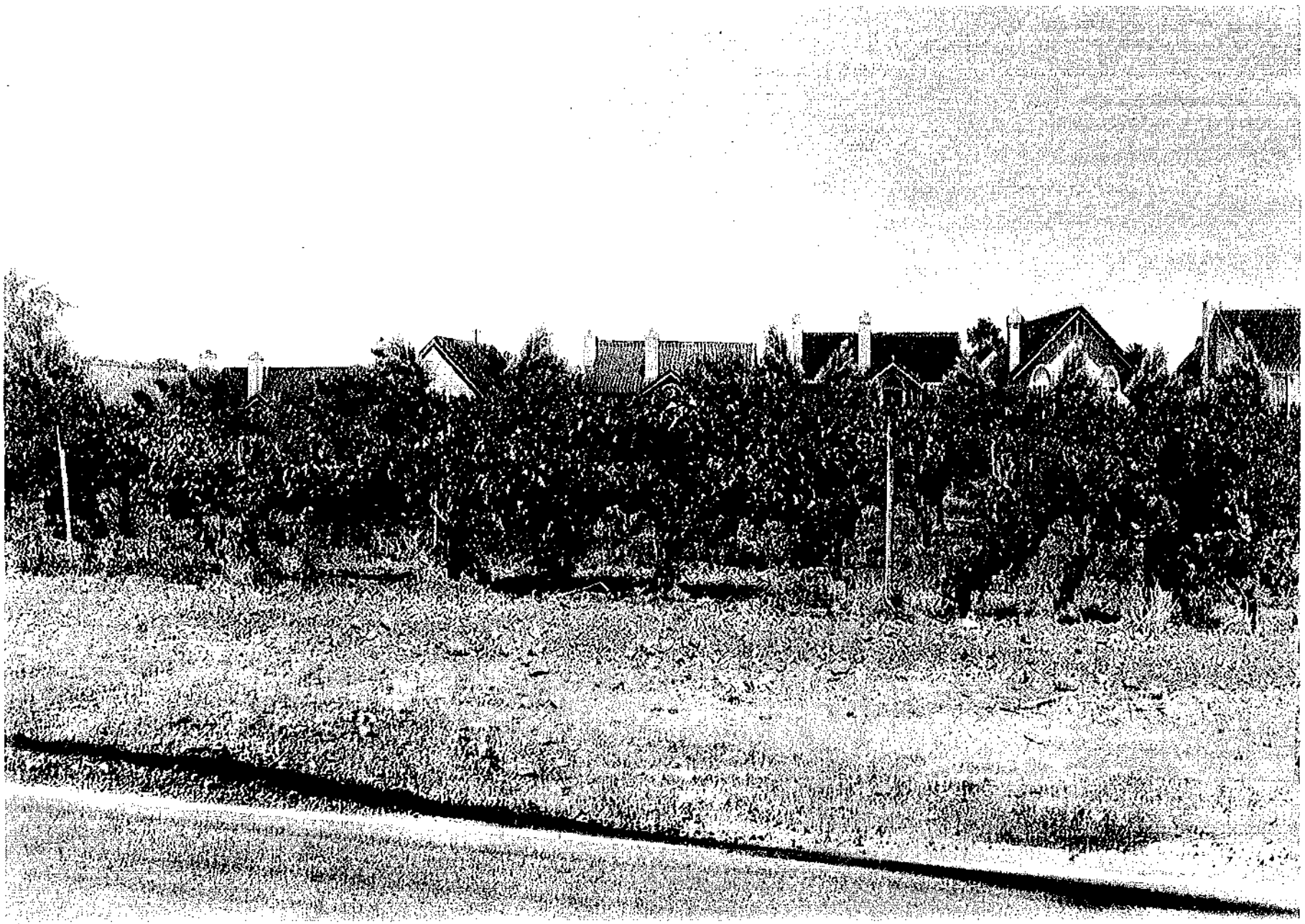
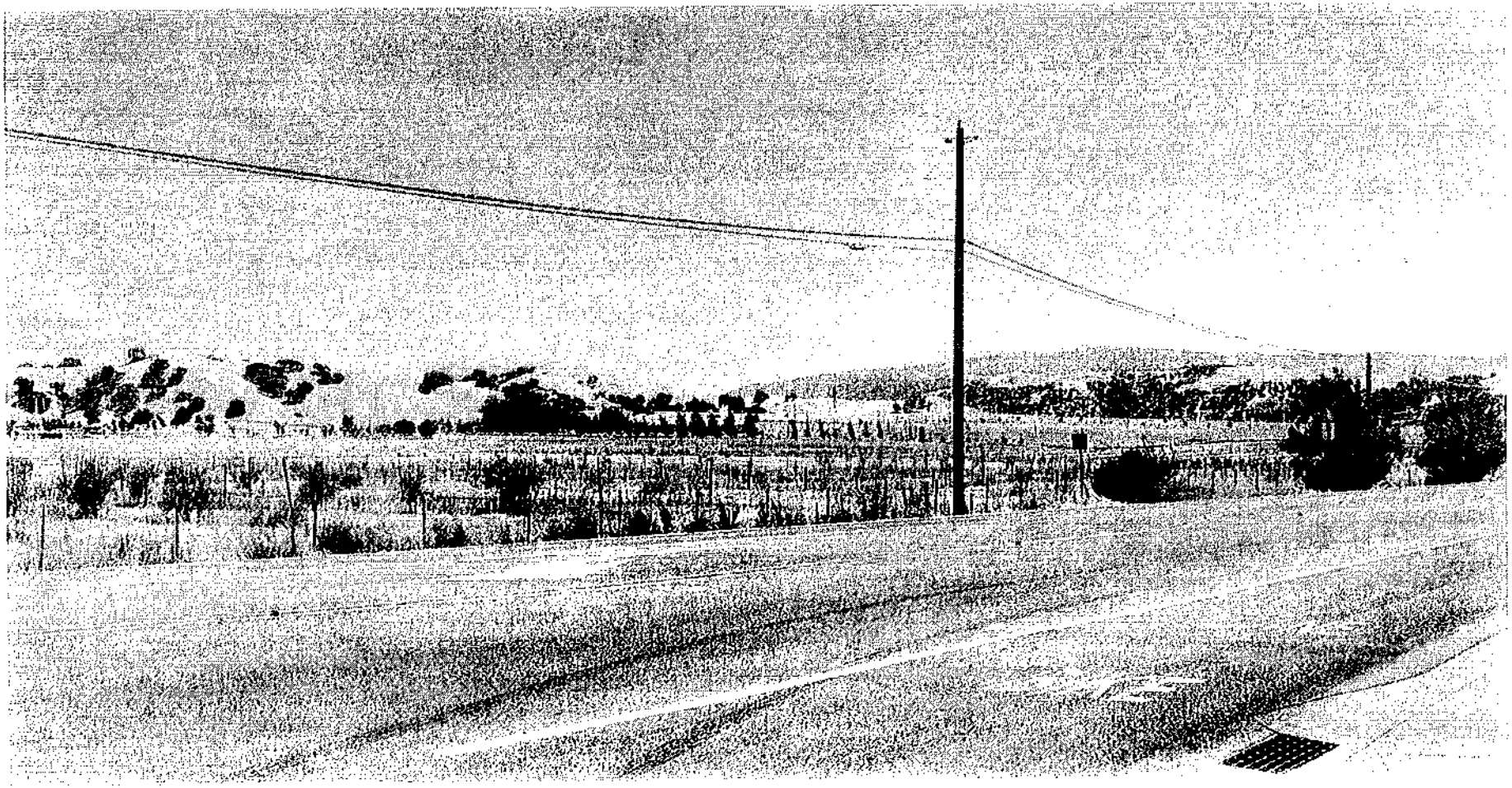


Exhibit 4.8-11
Subarea 3 -- View from Wente Street after Development



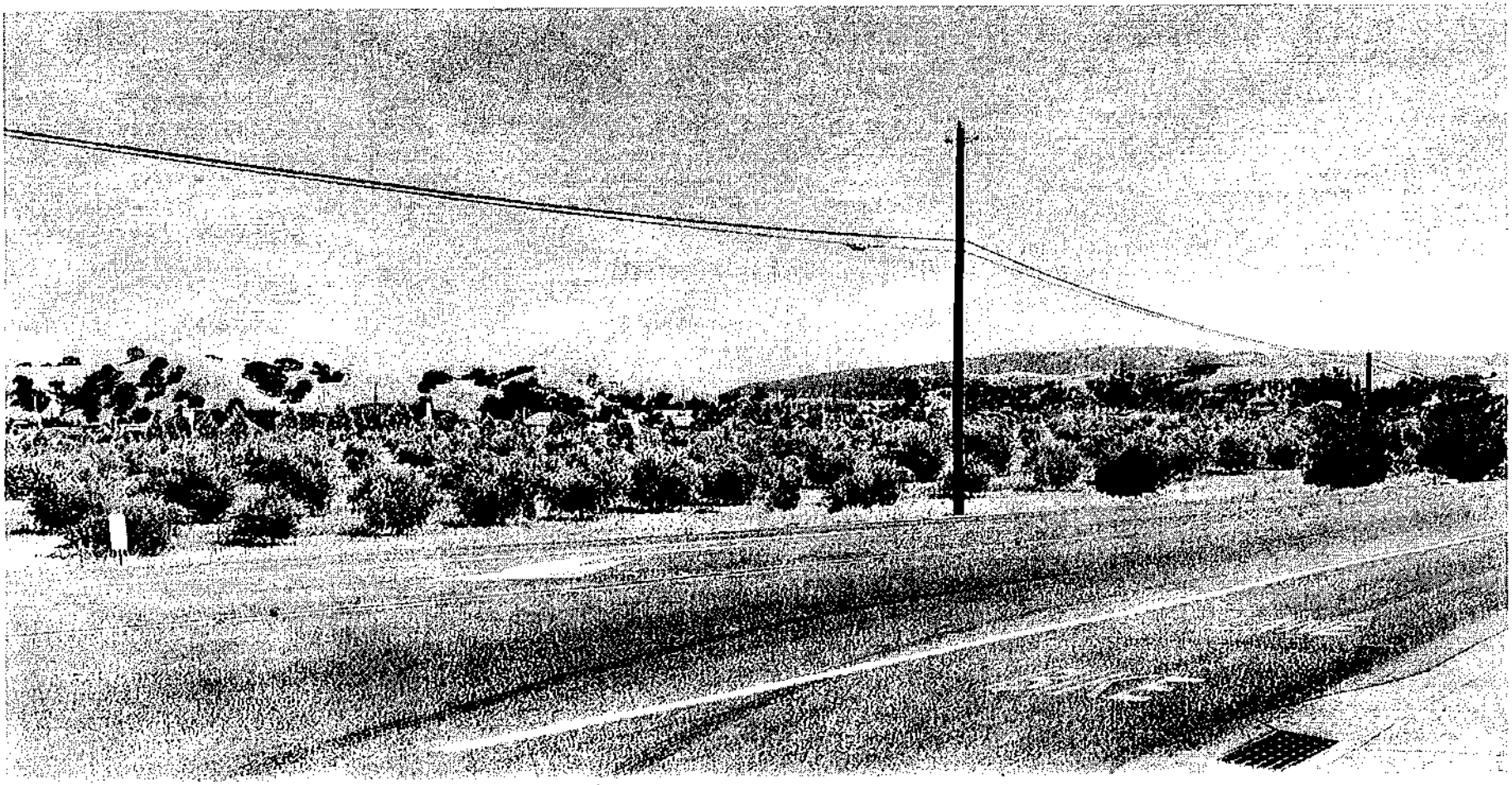
Source: Visual Impact Analysis

Exhibit 4.8-12
Subarea 4 -- Existing View from Arroyo Road



Source: Visual Impact Analysis

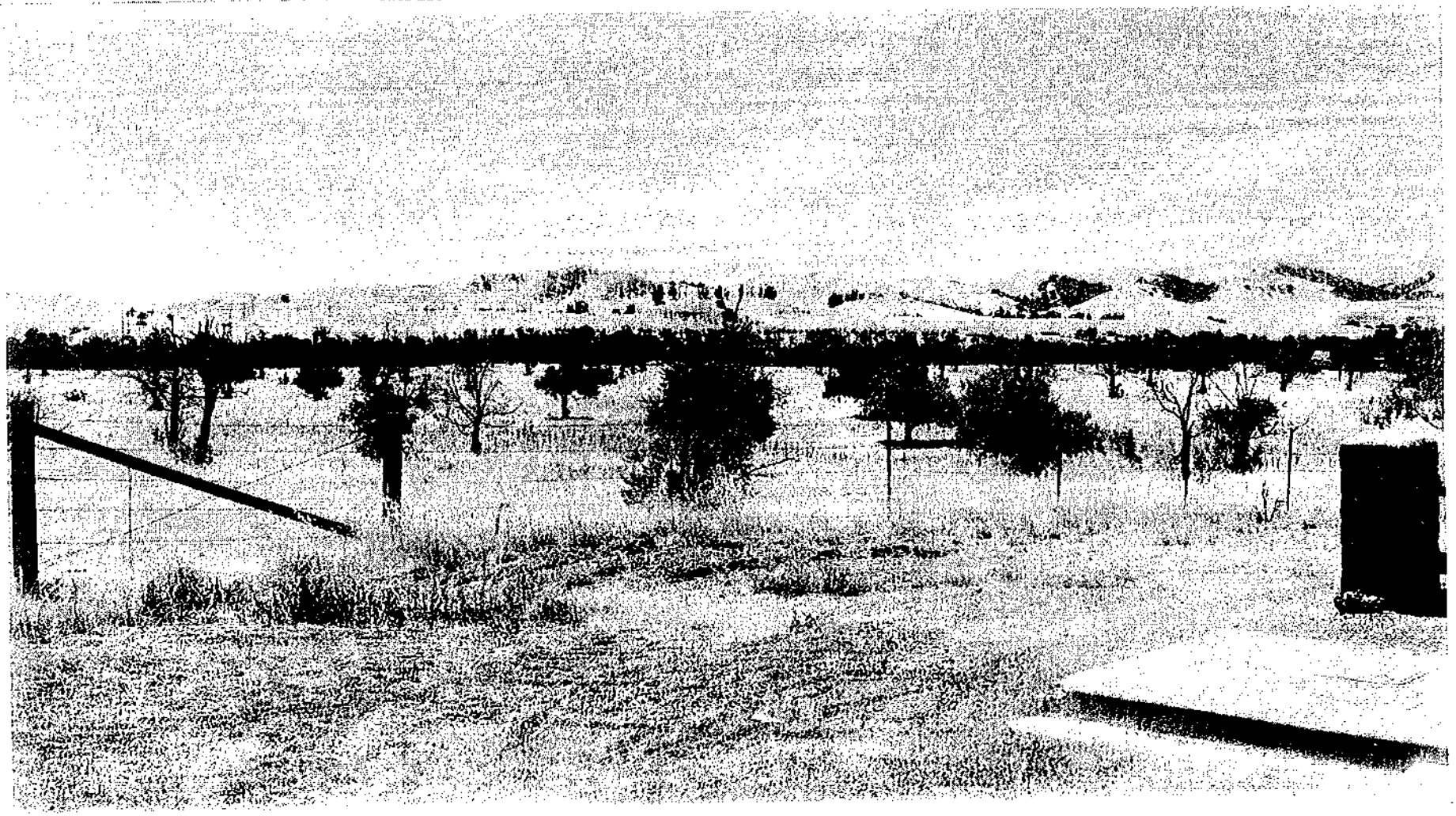
Exhibit 4.8-13
Subarea 4 -- View from Arroyo Road after Development



Source: Visual Impact Analysis

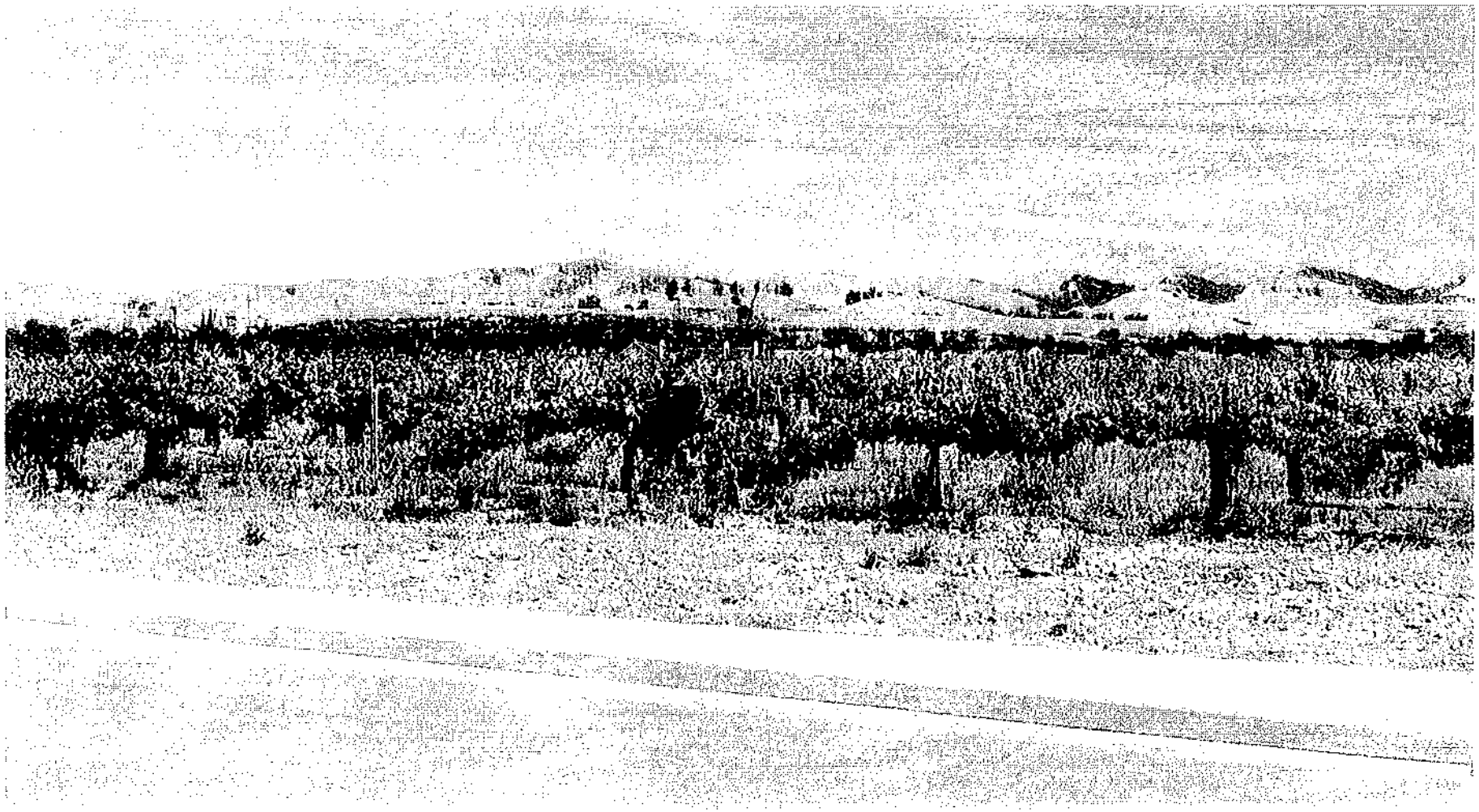
Exhibit 4.8-14

Subarea 5 -- Existing View from Arroyo Road



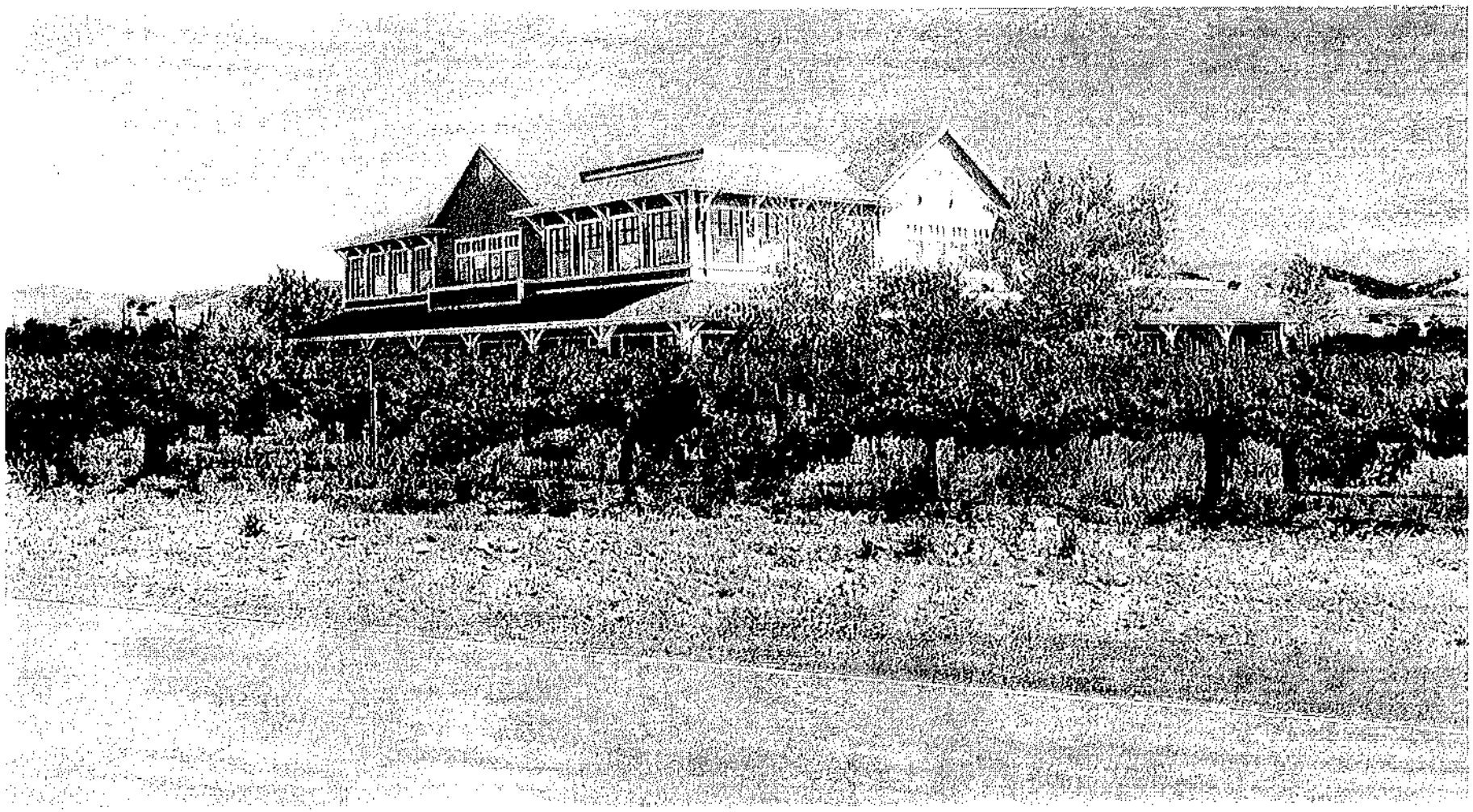
Source: Visual Impact Analysis

Exhibit 4.8-15
Subarea 5 -- View from Arroyo Road after Residential Development



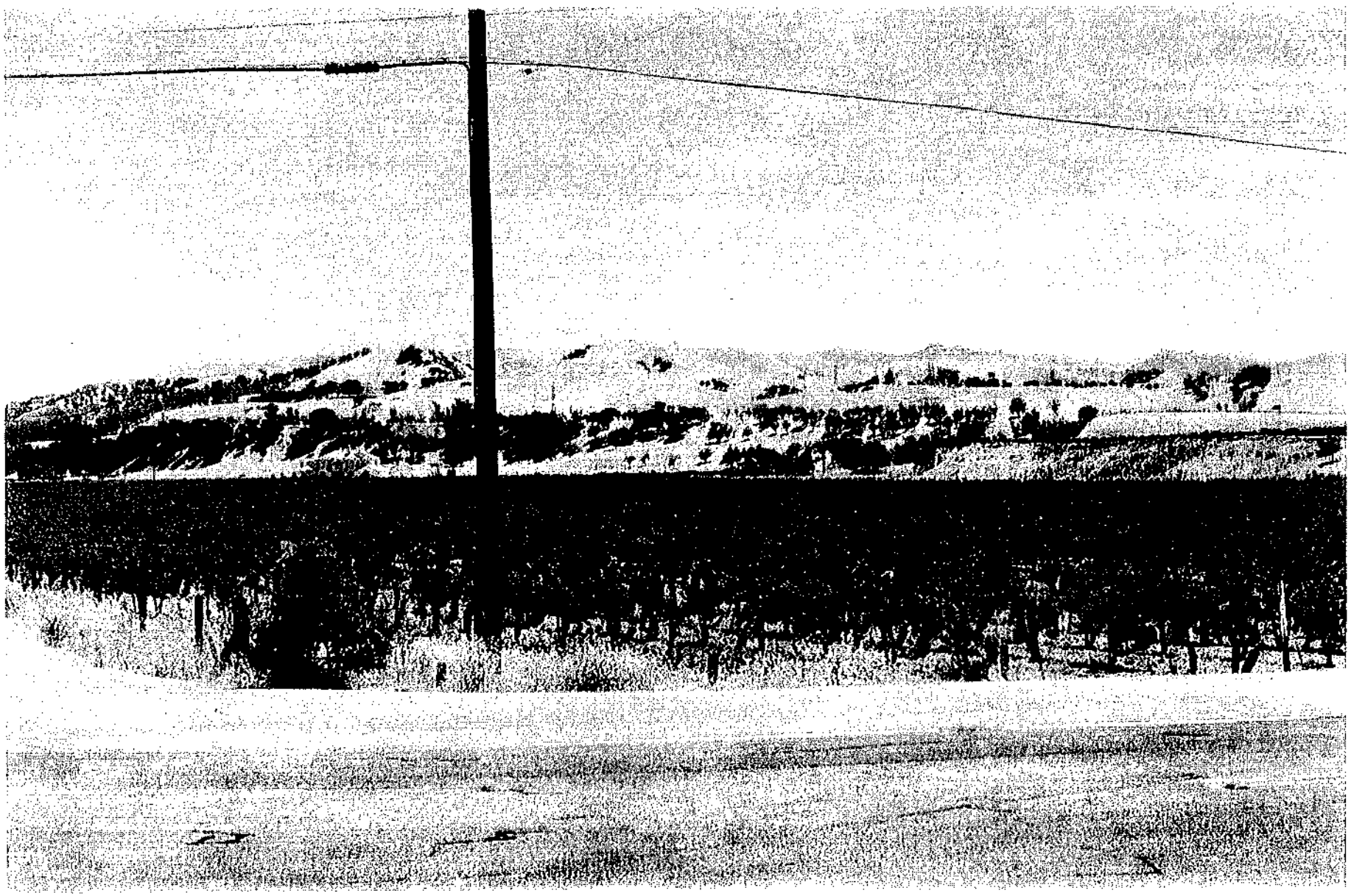
Source: Visual Impact Analysis

Exhibit 4.8-16
Subarea 5 -- View from Arroyo Road with Potential Commercial Development



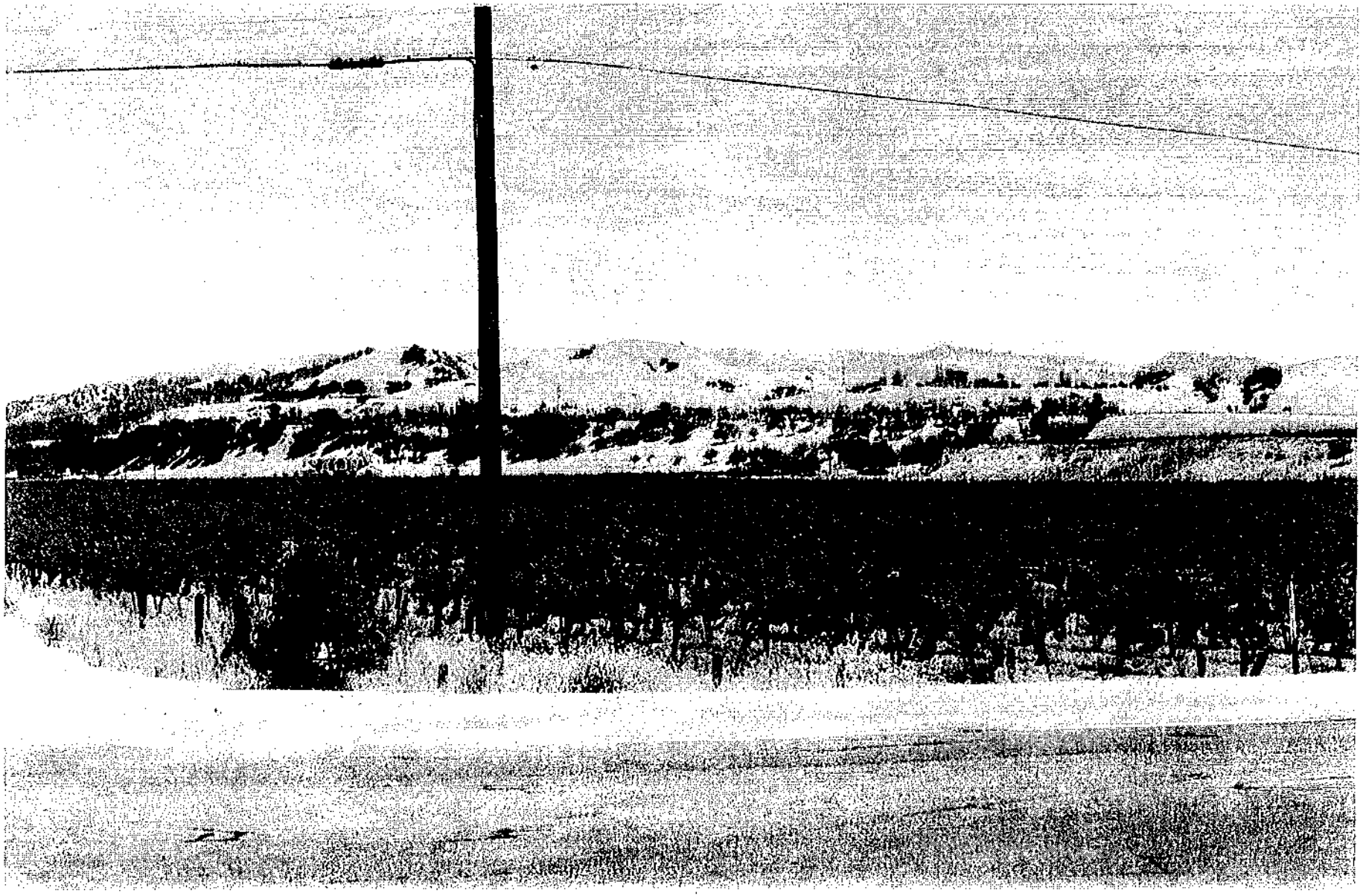
Source: Visual Impact Analysis

Exhibit 4.8-17
Subarea 7 -- Existing View from Vallecitos Road



Source: Visual Impact Analysis

Exhibit 4.8-18
Subarea 7 -- View from Vallecitos Road after Development



Source: Visual Impact Analysis

of Exhibit 4.8-6 (just above the fence along South Vasco Road) are part of Mathews Paint Horses on the Miller parcel.

Because of the relatively flat foreground, this viewpoint is dominated by the form and line of the low rolling hills in the background, along the alignment of the electrical towers. The line of the horizon formed by these hills is simple and bold, adding to the strength of their form.

The towers themselves stand out as sharp vertical lines interrupting the more horizontal lines of the rest of the scene. The regular forms and lines of the fence in the foreground obscures a large part of the scene.

The colors in this scene are low in chroma (dull) and somewhat monotone, ranging from brown to light green. The colors in the spring are brighter and predominately greener shades. Because of the predominance of cool dull colors, bright colors (such as the white shed in the foreground) tend to advance and dominate the other more subtle natural colors in the scene.

The textures in the scene are fine-grained due to the predominance of grassland in the scene, with occasional irregular clumps of coarser trees planted primarily around homesites. These coarser textures of the trees tend to stand out against the finer-grained grasses.

Project and Impacts

Exhibit 4.8-7 shows the viewpoint after development. In this view, the grasslands have been replaced by vines in the foreground and housing units in the near background. Vineyards in this and the other photosimulations are assumed to be approximately ten years old. From this location, the closest units would be about 400 feet away. Due to the flat topography of Subarea 1, other development would be hidden by the nearer homes.

From this view, the hills in the background would be largely hidden, although some of the original horizon could be seen between some structures. The only significant part of the scene that would remain constant would be the sharp vertical lines of the electrical towers. From this viewpoint, the rest of the scene would be completely changed. The forms and lines of the new vines and homes would contrast with the previous surroundings, and, therefore, the visual dominance of development would be *dominate*. As shown in Exhibit 4.8-2, this would be a less-than-significant impact because the sensitivity of the subarea for forms and lines is *low*.

The colors and materials of development would borrow from the natural hues and textures of the landscape (as described above), and, thus, the visual dominance would be *co-dominant*. As shown in Exhibit 4.8-2, this would be a less-than-significant impact because the sensitivity of the subarea for colors and textures is *moderate*.

From other viewpoints of the subarea, these conditions are expected to be similar. No new development is considered for either the high sensitivity area on the southern edge of the subarea or in the area of maximum sensitivity in the easternmost wedge. Therefore, no impacts would occur in these areas.

Mitigation Measure 4.8-1 No mitigation would be required.

Impact 4.8-2 ***Subarea 2***

Development in Subarea 2 would be located in an area of moderate sensitivity for color and texture and low sensitivity for line and form. The visual dominance of development would not exceed what is allowed under these sensitivity levels. Therefore, no significant impacts would result. LTS

View Sensitivity

As shown in Exhibit 4.8-4, the sensitivity of Subarea 2 is *moderate* for color and texture and *low* for line and form. This means the line and form of new development can contrast with the surroundings but that new development must borrow the color and texture of the surroundings.

Setting

Subarea 2 generally is very flat, and much of it currently is obscured by vineyards which previously extended throughout the subarea. Parts of Subarea 2 are visible from East Avenue, Vasco Road, and Tesla Road. Whereas views from South Vasco Road are limited (due to existing development on the west side of the roadway) unobstructed views generally are available from East Avenue and Tesla Road across and beyond the subarea. Not much of the subarea's interior actually is visible from the surrounding roadways. From the lower viewing perspective of an automobile along these roadways, the vineyards tend to obscure all but the tallest on- and off-site visual elements. Isolated elements (such as the Shaheen Industrial Park on South Vasco Road, the pump stations, and the electrical transmission lines along the subarea's western boundary) reduce the overall visual quality and rural character of the site.

From Tesla Road, foreground vineyards and background foothills are the principal visual components. The main difference is that the foothill backdrop viewed from Tesla Road is less visually dramatic, although views of Brushy Peak and Mt. Diablo are distinctive. While the transmission lines affect views at the southeast corner of the subarea, the visual character of Subarea 2 generally is more rural when seen from Tesla Road than from East Avenue.

Exhibit 4.8-8 shows Subarea 2 from East Avenue, looking south-southeast. The subarea is set back from East Avenue by vineyards which are visible in the foreground. A barn is visible on the left of Exhibit 4.8-8. Due to the flatness of this area, the vines in the foreground do not allow a clear view into the subarea. However, some large trees can be seen above the vines near the right side of the exhibit.

This viewpoint is dominated by the form and line of the rolling hills in the far background, similar to other viewpoints. The color of the scene consists of the natural greens and browns of the hills (faded by distance) and the brighter green of the vines in the foreground. The texture is likewise split, with the finer textures of the hills contrasting somewhat with the coarse texture of the vines. A notable feature of the vines is their regularity which contrasts with the more uneven mottled surface of the hills in the background.

Project and Impacts

Exhibit 4.8-9 shows Subarea 2 after development. In this view, the off-site vines remain in the foreground, but the obvious change in the view is the introduction of housing units. The rooflines of homes could be seen just over the vines in the foreground. The pitched roofs, which borrows from the lines of the rolling hills in the background. As both the form and line of the development borrows from the landscape, the visual dominance is co-dominate. As the visual sensitivity of the subarea is low for form and line, this is a less-than-significant impact (as seen in Exhibit 4.8-2).

The colors and materials of development would borrow from the natural hues and textures of the landscape, and, thus, the visual dominance would be *co-dominant*. As shown in Exhibit 4.8-2, this would be a less-than-significant impact because the sensitivity of Subarea 2 for colors and textures is *moderate*.

Other viewpoints of the subarea would be similar.

Mitigation Measure 4.8-2 No mitigation would be required.

Impact 4.8-3 Subarea 3

Most development in Subarea 3 would be located in an area of moderate sensitivity for color and texture and low sensitivity for line and form. The visual dominance of development would not exceed what is allowed under these sensitivity levels. Therefore, no significant impacts would result. LTS

View Sensitivity

As shown in Exhibit 4.8-4, the sensitivity of most of Subarea 3 is *moderate* for color and texture and *low* for line and form. This means the line and form of new development can contrast with the surroundings but that new development must borrow the color and texture of the surroundings.

The sensitivity of the southern part of the subarea is considered to be *high* because the planned Concannon Boulevard extension will be a scenic route. While the purpose of this scenic route designation is to protect the vistas which exist primarily to the south, development on the north side of the Concannon Boulevard extension should not attract attention and, thus, detract from views to the south. This means that new development immediately north of the Concannon Boulevard extension generally must repeat the form, line, color, and texture of the surroundings.

Setting

As with Subarea 2, Subarea 3 is flat topographically, but, unlike Subarea 2, Subarea 3 is not screened by vegetation. The absence of vegetation opens the entire subarea to views from adjoining areas. The only features which interrupt views of the interior are the residences located in the northeast part of the subarea. In particular, the Caldeira residence (a small compound of structures which includes house, barns, water tower, etc.) and a number of large shade trees (centrally located on the east side of the subarea) greatly reduce the parts of the subarea visible at any one time from Wente Street. Wente Street is the only major roadway which provides views of the subarea.

From Robertson Park (adjacent to the north side of the subarea), practically the entire subarea is visible. Given the absence of features, the subarea currently provides a rather non-descript foreground (tilled earth) for a panoramic view of the distant foothills south of the city.

Exhibit 4.8-10 shows Subarea 3 from a viewpoint on Wente Road just south of Robertson Park, looking southwest.

This viewpoint is largely dominated by the form and line of the rolling hills in the far background, similar to other viewpoints. However, the brighter colors, coarser textures, and more complex lines of trees shown in this exhibit make the trees stand out against the hills and provide a focal point.

A number of homes are visible in Exhibit 4.8-10. Those in the center of the exhibit are located in the Tapestry Subdivision west of Subarea 3. Two homes within the subarea can be seen from this viewpoint location. One is on the right of the exhibit and is largely blocked by trees. The second (the Caldeira residence) is outside the left margin of the exhibit.

Project and Impacts

Exhibit 4.8-11 shows Subarea 3 from the Wente Street viewpoint after development. In this view, the scene is dominated by the forms of the vines and new housing units in the foreground which block views beyond. The forms and lines of houses would contrast with previous undeveloped conditions, and, therefore, the visual dominance of development would be *dominant*. As shown in Exhibit 4.8-2, this would be a less-than-significant impact because the sensitivity of the subarea for forms and lines is *low*.

The colors and materials of structures would borrow from the natural hues and textures of the landscape, and, thus, the visual dominance would be *co-dominant*. Exhibit 4.8-2 shows that this would be a less-than-significant impact because the sensitivity of Subarea 3 for colors and textures is *moderate*.

Locations farther south are expected to provide similar views. Due to the topography of the area, the Norman Vineyards would almost completely block views of Subarea 3 from segments of Wente Street south of the subarea. Viewpoints from South Livermore Avenue would be largely blocked by trees growing along Arroyo Mocho. Development would be visible from the backyards of homes located west of the subarea, but new SLVSPA development would look like an extension of this existing development. Subarea 3 development would be visible from Robertson Park to the north. New SLVSPA houses would directly abut Robertson Park.

The proposed Concannon Boulevard extension along the southern edge of the subarea would be classified as a Scenic Route, as described above and shown in Exhibit 4.8-1. Because the sensitivity of lands immediately adjacent to scenic routes is *high*, development near the roadway should be visually subordinate to the landscape. The *Draft Plan* envisages vineyards in this area which would be considered to have a *subordinate* visual dominance, a less-than-significant impact. A tasting room and / or small restaurant could also be developed southwest of the Concannon / Wente intersection. Because such development would borrow from visual elements of other wine-related uses in the area, this would also be considered to have a subordinate visual dominance, a less-than-significant impact.

Mitigation 4.8-3 No mitigation would be required.

Impact 4.8-4 ***View of Subarea 4***

Development in Subarea 4 would largely be located in an area of moderate sensitivity for color and texture and low sensitivity for line and form. The visual dominance of development would not exceed what is allowed under these sensitivity levels. Therefore, no significant impacts would be expected. The eastern part of the subarea is in an area of maximum sensitivity which does not allow visible structural development. Future parkland use of this area would not result in significant impacts. LTS

View Sensitivity

As shown in Exhibit 4.8-4, the sensitivity of most of Subarea 4 is *moderate* for color and texture and *low* for line and form. This means the line and form of new development can contrast with the surroundings but that new development must borrow the color and texture of the surroundings.

The southeast part of Subarea 4 has *maximum* sensitivity, due to policies protecting upland grasslands. Development generally should not be evident.

Setting

Subarea 4 is visible from Marina Avenue (which bounds the north end of the subarea) and Arroyo Road (which bounds the west side of the area). Both roadways provide sweeping views of the subarea and beyond. The segment of Marina Avenue between the Hansen residence and the developed rural residential Edwards / Reed Avenue area provides the most dramatic and scenic views. The roadway is located higher than the subarea in this area, providing an elevated perspective of the valley and enclosing foothills farther south. East of the Edwards / Reed Avenue area, open views are available from Marina Avenue of agricultural land to the south. Only the highest elevations on the south side of Subarea 4 are visible from this section of roadway -- the tops of some trees and some structures on the Zumbach property are barely visible.

Views of Subarea 4 from Arroyo Road differ in character depending on the viewpoint along the road corridor. At the north end, southbound travelers have a long-range view of the foothills which enclose the valley. This panorama includes a view into the heart of the subarea over the tops of olive trees growing on the Hansen property. Views of the westernmost part of the subarea are screened, however, by locust trees which intermittently border the roadway. Along the mid-part of the subarea, views from the roadway are very open and include most of the subarea. However, while these views include an attractive valley foreground and foothill backdrop, they generally are not as visually dramatic as those from Marina Avenue due to their eastward orientation and the lower viewer perspective. At the south subarea boundary where Arroyo Road intersects Wetmore Road, a topographic rise closes off views into Subarea 4 from Wetmore Road. The grass-covered slope creates a very smooth horizon line with only the sky as a backdrop. The view is not particularly distinctive from a scenic standpoint given its lack of depth, breadth, or distinctive features but is quite sensitive to impact due to the simplicity of form and line and the potential for new elements to be silhouetted along the skyline.

Exhibit 4.8-12 shows Subarea 4 from Arroyo Road at Pyramid Street, looking southeast. The scene is dominated by low rolling hills that form the horizon in the right half of the picture and the farther Altamont Hills. The low hills to the right are in the western portion of the subarea. The Hansen home on Hansen Avenue can be barely seen through the row of trees in the center of the picture, while the horse ranch on the Zumbach property can be seen below the hills at the extreme left side of the exhibit. Olive saplings, part of the Corbett property, can be seen next to the roadway in the left foreground of the exhibit.

As with other viewpoints in the SLVSPA, this viewpoint is dominated by the hills in the background. The low hills on the project site, being closer than the Altamont Hills, are more dominant. The vacant/grazing land in the subarea is nondescript, with the natural colors and fine textures common of grassland in the valley.

Project and Impacts

Exhibit 4.8-13 shows the viewpoint after development. The dominate features are mature olive trees which separate new houses farther east from the roadway. The units themselves are nestled at the base of the hills, and little can be seen except roofs over the olive trees. The dark color of the roofs is subordinate to the lighter colors of the hills. The spacing of dark roofs is similar to the random spacing of the dark clusters of trees in the hills, forming a similar texture in the scene. Because the visual

elements of development are weak and generally repeat surrounding elements, the visual dominance of the homes is considered subordinate. Because the visual sensitivity is low for form and line and moderate for color and texture, this is considered a less-than-significant impact.

No housing development is envisaged in the steeper sloping part of Subarea 4 to the east which has a maximum sensitivity level. A regional park is designated in this area. This would result in a less-than-significant impact.

Mitigation Measure 4.8-4 No mitigation would be required.

Impact 4.8-5 ***View of Residential Development in Subarea 5***
Residential development in Subarea 5 would be located in an area of moderate sensitivity for color and texture, and low sensitivity for line and form. The visual dominance of development in these areas would not exceed what is allowed under these sensitivity levels. Therefore, no significant impacts would occur. [5] *LTS*

View Sensitivity

As shown in Exhibit 4.8-4, the sensitivity of Subarea 5 is *moderate* for color and texture and *low* for line and form. This means the line and form of new development can contrast with the surroundings but that new development must borrow the color and texture of the surroundings.

From this viewpoint, Subarea 7 also would be visible. The view sensitivity of Subarea 7 is described in ***Impact 4.8-7***.

Setting

Parts of Subarea 5 are visible from Arroyo Road, Wetmore Road, Holmes Street, and Vallecitos Road. In addition, the western end of the subarea is visible from the parking area and main entrance to Sycamore Grove Park. The visual character of this subarea is distinctively different from each of these roadways. From Vallecitos Road, only the westernmost tip of the subarea (the Tolentino property) is visible. Views of this area are not particularly distinctive. The Tolentino parcel -- developed as an equestrian boarding and exercise facility -- is located in the historic floodplain of Arroyo Valle, generally lower than the roadway, and trees planted along the edge of the roadway partially screen views into the parcel.

Views of the subarea from Holmes Street and the western end of Wetmore Road tend to consist primarily of foreground views. Trees, rural residential development, and topography restrict most views into or beyond the subarea. Near the mid-point of Wetmore Road, the center part of the subarea is visible from roadway. Grasslands in the central part of the subarea create a pleasant rural character, but the view does not have distinctive features, distant views, or a distinctive mountain backdrop.

At the east end of the subarea, Arroyo Road is located at a higher elevation than the adjacent subarea. The subarea's terrain slopes away from the roadway opening up a sweeping panorama of the valley and foothills to the southwest (including Ruby Hills). The scenic quality of this viewshed is very

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[5] ***Impact 4.8-6*** assesses the effects of potential commercial development in Suabrea 5.

high due to the sweep of the panorama, the variation in topography and vegetation, and the absence of significant development.

Exhibit 4.8-14 shows Subarea 5 from Arroyo Road at the northeast corner of the subarea looking southwest. From this viewpoint an abandoned walnut orchard is visible in the foreground. Views from this location are over Subarea 6 (which cannot be seen due to the topography) and into the western part of Subarea 7. Towers for the electrical transmission line which bisect Subarea 7 are visible on the hills in the background and to the left of the exhibit.

Views from this location are dominated by the form and line of the rolling hills in Subarea 7 and adjacent lands. The lower wooded slopes of Subarea 7 are visible as the dark green band between the abandoned orchard (marked by light brown grass) and the background hills.

Project and Impacts

Exhibit 4.8-15 shows Subarea 5 from this viewpoint after development. Note that Exhibit 4.8-15 shows conditions *after* residential and agricultural development but *before* potential commercial development of the subarea. The abandoned orchard has been replaced by vines. Their regular spacing, coarse texture, and bright color "advance" the vines in the scene, making them the dominant visual element from this viewpoint. The rooflines of new houses are visible sandwiched between the vines and the wooded hillside of Subarea 7 in the background. The dark roofs of housing units blend in with the dark hillside beyond. From this viewpoint, new structures would be visually subordinate, a less-than-significant impact. The vines themselves also would be subordinate because they repeat the visual elements of viticulture in the valley.

The location of development in Subarea 7 can be identified largely by the new tree cover just visible over the top of the wooded band of trees in the middle of the exhibit (approximately below the line of electrical towers). From this location, development would be largely inevident, a less-than-significant impact.

Mitigation Measure 4.8-5 No mitigation would be required.

Impact 4.8-6 ***View of Commercial Development in Subarea 5***
Development of the commercial development in Subarea 5 would be located in an area of moderate sensitivity for color and texture and low sensitivity for line and form. The visual dominance of development in these areas would not exceed what is allowed under these sensitivity levels. Therefore, no significant impacts would result. LTS

View Sensitivity

As shown in Exhibit 4.8-4, the sensitivity of Subarea 5 is *moderate* for color and texture and *low* for line and form. This means the line and form of new development can contrast with the surroundings but that new development must borrow the color and texture of the surroundings.

Setting

Exhibit 4.8-14 shows existing views which are described in ***Impact 4.8-5***.

Project and Impacts

Exhibit 4.8-16 shows the views from this location after development. From this location, commercial development would block views of Subarea 5.

The *Draft Plan* indicates that the commercial site at this location could be developed with a 30-room inn on three acres and a large restaurant of no more than 7,500 square feet with no more than 100 seats. The photosimulation is not intended to present a precise representation of this particular commercial development. Rather, it attempts to present how such a commercial development could appear, given the design and architectural guidelines of the *Draft Plan*. [6]

The form and line of development would contrast with surrounding landscape, and, therefore, the visual dominance of this type or scale of commercial development would be considered *dominant*. Because the visual sensitivity of this area is low for form and line, this is considered a less-than-significant impact.

Using the *Draft Plan's* design guidelines for materials and colors, the building's assumed color and texture would borrow from the surrounding environment. Thus, the visual dominance would be considered *co-dominant*. Because the visual sensitivity of the subarea is moderate for color and texture, this is considered a less-than-significant impact.

Mitigation Measure 4.8-6 No mitigation would be required.

Impact 4.8-7 Subarea 6
Development in Subarea 6 would be located in an area of high sensitivity. The only development contemplated in this subarea is a medium-sized winery which would be considered visually subordinate. LTS

View Sensitivity

As shown in Exhibit 4.8-4, the sensitivity of Subarea 6 is considered to be *high* due to policies on views from scenic corridors and Arroyo Valle. This means that development generally must *repeat* the form, line, color, and texture of its surroundings.

No photographs or photosimulations were prepared to illustrate this subarea.

Setting

Subarea 6 is a triangular parcel bordered by Arroyo Road, Wetmore Road, and Arroyo Valle. The terrain generally slopes away from the roadways toward the arroyo with the highest elevation at the intersection of the two roads. The subarea consists primarily of grassland but also includes three features which further enhance the visual character of the area. They are the grove of sycamore trees which lines the arroyo, the remnant alleé of trees which bisects the triangle, and the Olivina gate made of local river rock. Each of these elements is unique in the South Livermore Valley and, thus, contributes to the visual character of this subarea. While the subarea itself is attractive, it also is

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6 The *Draft Plan's* design guidelines were prepared for residential development only but describe a rural character to be achieved in the SLVSPA which can be applied to non-residential uses.

significant because it provides an unobtrusive foreground for panoramic views to the south and west from the two roadways.

Subarea 6 is located in a slight depression, similar to other land around the Arroyo Valle. This makes development particularly visible from surrounding areas, especially from Wetmore and Arroyo Roads.

Project and Impacts

Much of Subarea 6 would be planted with vines. One commercial site, a medium-sized winery, could be established on six to eight acres. Development could involve construction of a 50,000-square foot building (including crushing facilities, lab and office space, tasting room, storage, and, possibly, indoor event space) and a large outdoor event or picnic area.

Development at this commercial site must repeat the visual elements of the surroundings (visually *subordinate*). As numerous wineries already exist in the valley and the proposed winery would repeat some of their visual elements, the development would meet this criterion. Therefore, this is a less-than-significant impact.

Mitigation Measure 4.8-7 No mitigation would be required. However, the following measures could reduce already less-than-significant impacts:

- Consider locating the winery near the edge of the subarea in order to reduce visual intrusiveness and avoid creating a visual focal point and to reduce the amount of roadway constructed in the subarea

Impact 4.8-8 View of Subarea 7

Development in Subarea 7 would be located in areas of low to high sensitivity. While most future housing development would not create visual impacts due to topography and viewing distance, some units would be built within view of Sycamore Grove Park and in an area of high visual sensitivity. This could create significant visual impacts. PS

View Sensitivity

As shown in Exhibit 4.8-4, Subarea 7 has a mix of sensitivity levels. The ridgelines and upland grassland areas are considered to have *maximum* sensitivity which means that development generally should not be evident.

The sensitivity of the forested hills and areas visible from the Arroyo Valle to the north are considered to be *high*. This means that development generally must *repeat* the form, line, color, and texture of its surroundings.

The sensitivity of the rest of the subarea is *moderate* for color and texture and *low* for line and form. This means the line and form of new development can contrast with the surroundings but that new development must borrow the color and texture of the surroundings.

Setting

Unlike the other SLVSPA subareas, Subarea 7 is not as visible from adjoining roadways as other subareas are. However, given its elevation and location within a major scenic viewshed, the subarea is quite visible from more distant viewpoints, including Wetmore Road, Arroyo Road, and Marina

Avenue to the north and East Vineyard Avenue to the west. Views from the roadways to the north tend to include primarily the upper elevations of the subarea. Although visible from these distant viewpoints, Subarea 7 forms a very small percentage of the overall viewshed.

Exhibit 4.8-17 shows Subarea 7 from Vallecitos Road and East Vineyard Avenue. Eastbound travelers on East Vineyard Avenue have a direct view of Subarea 7 from this location. Foley Road, providing access to the Zone 7 Del Valle water treatment plant, is visible just below the ridgeline in the far right of the exhibit. The electrical towers visible in Exhibits 4.8-14 and 4.8-15 appear in the center of the exhibit.

Project and Impacts

Views from Vallecitos Road and East Vineyard Avenue

Exhibit 4.8-18 shows Subarea 7 after development. Most of the development in this subarea is planned on a relatively flat plateau between a steep wooded slope the to north (adjacent to Sycamore Grove Park) and the open hillsides to the south. In the exhibit, this area and the future housing units are visible directly beneath the electrical towers.

Most units in Subarea 7 would not be visible due to the flat topography of the proposed development areas (where the closest homes block the views of those beyond). For the units which are visible, the viewing angle (where the viewer is lower than the development) creates a perspective foreshortening that reduces the apparent size of the structures. The relatively long distance between the viewer and the houses also makes the units appear smaller than they really are.

The form of the homes are indistinct from this distance. The line of the development follows the natural lay of the land and the line formed by the trees at the edge of the plateau. The color from this distance is difficult to determine as colors become paler at this distance, lower in brightness (chroma), and bluer. The density and spacing of the homes forms a medium-grained texture that appears similar to the texture of the trees in the wooded slope to the north.

Due largely to the distance involved, building elements are weak and do not attract attention, giving development a *subordinate* visual dominance. Because the visual sensitivity of the area is low to high, this is a less-than-significant impact as shown in Exhibit 4.8-2.

Views from Sycamore Grove Park

Most other locations with views to Subarea 7 would present similar effects. However, views from Sycamore Grove Park could be affected, due to closer viewing distance. Views from the park generally are limited by the steep tree-covered slope which separates the park from the lowest terrace in the subarea. Given the depth of the terrace, very little is visible beyond the slope bank. In most cases, the top of the slope (edge of the terrace) forms the skyline for views from the park. However, two areas of development could be visible, both within an area of high visual sensitivity.

First, the proposed medium-sized winery in the northwest part of the subarea would be visible from the park. This commercial site could be developed with a 50,000-square foot building (including crushing facilities, lab and office space, tasting room, storage, and, possibly, indoor event space) and a large outdoor event or picnic area. Similar to the medium-sized winery in Subarea 6, also in a high sensitivity area (and discussed in ***Impact 4.8-7***), the Subarea 7 winery would have a subordinate visual dominance

in that it would repeat many of the visual elements of other wineries in the area. Therefore, no significant impact would occur.

Second, some housing units would be visible from Sycamore Grove Park. For example, a limited number of units in the eastern part of the subarea could be seen from park. Because residential development perched on top of the slope would be prominent to viewers in the park, the visual prominence would be *co-dominate*. This would be a potentially significant impact.

Views from Other Areas

A number of housing units are envisaged in the southern part of Subarea 7 in an area of *maximum* visual sensitivity. Structural development in this area should not be evident. Because units in this part of Subarea 7 could be seen from viewpoints located north of the subarea, this would be a significant impact.

Mitigation Measure 4.8-7 Either of the following mitigation measures would reduce impacts resulting from development of houses in an area of *high* visual sensitivity (the six proposed lots in the eastern section of the subarea, immediately north of the VA hospital):

(a) Screen the proposed homesites with trees to eliminate views from Sycamore Grove Park. Exact placement of screening trees will need to be determined later, as they cannot be determined at this level of detail. *OR*
(b) Relocate or eliminate the homesites.

Either of the following mitigation measures would reduce impacts of developing homesites in an area of *maximum* visual sensitivity (the upland part of the subarea, as shown in Exhibit 4.8-4):

(c) Screen the north side of the proposed homesites with trees to eliminate views from other areas *OR*
(d) Relocate or eliminate the homesites

Significance after Mitigation Mitigation Measure 4.8-7 would reduce impacts to a less-than-significant level.

Responsibility and Monitoring The City would be responsible for incorporating these mitigations and/or revising the *Draft Plan*.

4.9 PUBLIC SERVICES

This section presents impact analyses of the following public service and facility topics:

- Water Service
- Wastewater Service
- Fire Protection
- Police Protection
- Parks and Recreation
- Schools

WATER SERVICE [1]

Water Service -- The Setting

The California Water Service Company (Cal Water) and City of Livermore Water Resources Division provide water to the City of Livermore. Both entities receive their water supply from Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7).

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[1] Sources used to prepare this section include:

- *Water Supply Planning Report*, Camp Dresser and Mc Kee, Inc. for Alameda County Flood Control and Water Conservation District, Zone 7, November 1993.
- *Yearly Review of Sustainable Water Supply*, Alameda County Flood Control and Water Conservation District, Zone 7, April 1995, April 1997.
- *Annual Report 1994*, Alameda County Flood Control and Water Conservation District, Zone 7, undated.
- *1995 Annual Report Update*, Alameda County Flood Control and Water Conservation District, Zone 7, undated.
- *Water Connection Charge Program Update*, Alameda County Flood Control and Water Conservation District, Zone 7, February 1994.
- *Proposed Water Connection Charge Increase*, Alameda County Flood Control and Water Conservation District, Zone 7, April 18, 1996.
- *Water Master Plan Final Report*, Camp Dresser & McKee, February 1994.
- *Facilities Planning Guidelines, Final Report*, Camp Dresser & McKee, August 1995.
- *North Livermore General Plan Amendment Draft Environmental Impact Report*, Willdan Associates for the City of Livermore Planning Department, June 1993.
- *South Livermore Valley Area Plan Draft Environmental Impact Report*, Alameda County Planning Department, June 1992.
- *Implementation of the Monterey Agreement Draft EIR*, Central Coast Water Authority, May 1995.
- *Implementation of the Monterey Agreement Final EIR*, Central Coast Water Authority, October 1995.
- *Negative Declaration for the Hopyard Well No. 7 - Demonstration Injection/Extraction Well (Resolution 1717)*, Alameda County Flood Control and Water Conservation District, Zone 7, February 15, 1995.
- *Negative Declaration for Five Year Water Transfer Agreement with Byron-Bethany Irrigation District*, Alameda County Flood Control and Water Conservation District, Zone 7, June 3, 1994.
- *Los Banos Grandes Facilities Draft EIR*, Department of Water Resources, December 1990.
- *City of Livermore Groundwater Recharge Project Mitigated Negative Declaration*, Environmental Science Associates, November 1996.
- *Transfer of Water Entitlements from Berrenda Mesa Water District for use in the Dougherty Valley Area Draft EIR*, Berrenda Mesa Water District, September 1995, and Final EIR, February 1996
- Nolte and Associates interviews with Bill Adams and Laura Johnson, City of Livermore Public Works Department, Water Resources Division, and Sam Polermo, California Water Services Company.
- Nichols • Berman interviews with David Meany, Suzanne Alaska, and Dennis Gambs, Alameda County Flood Control and Water Conservation District, Zone 7, October 1996, Vincent Wong, Zone 7, November 25, 1996, and Michael Gatzman, Wente Bros., October 1996.

The City currently has two existing water storage reservoirs and is in the process of designing a third reservoir. The two existing reservoirs provide a total storage capacity of 5.0 million gallons (MG). The new reservoir (to be located on the west side of the City) will add 4.5 MG of storage capacity. The existing reservoirs are (and the new reservoir will be) at ground level and designed to feed by gravity to the pressure zone each serves. Once water is delivered to the pressure zones, pump stations are used to maintain consistent water pressures.

In March 1995, the City published a Water Master Plan, Final Report (*Water Master Plan*) [2] which identified capacity deficiencies in the existing water system and recommended improvements to correct them. The analysis indicated that there are few deficiencies under existing conditions and that most of the deficiencies found were attributable to future development. The *Water Master Plan* recommended improvements in reservoirs, pump stations, and waterlines to correct these deficiencies.

Water Supply

Zone 7 is the water management agency for the Livermore-Amador Valley. It has a service area of approximately 425 square miles in eastern Alameda County. Zone 7 is responsible for bulk water purchase and treatment, distribution of treated drinking water and untreated agricultural irrigation water, surface water and groundwater management, and flood control. Water for the Zone 7 service area currently comes from four sources:

- ***Local groundwater*** The Livermore-Amador Valley has a large groundwater basin with a storage capacity of more than 240,000 acre-feet. The main basin has abundant well yields and good quality groundwater. It is used to supply municipal wells and to store high quality imported water. The current safe yield of the groundwater basin is 13,400 acre-feet per year. [3] Major water retailers are permitted to pump 7,200 acre-feet annually. The balance of the safe yield is pumped for agriculture and gravel mining.

- ***Local runoff from Arroyo Valle*** Zone 7 holds water rights for flows in the Arroyo Valle. Local runoff from the Arroyo Valle is captured in the Del Valle Reservoir. This runoff is either treated and used directly or is recharged into the groundwater basin for later recovery. Based on records from 1969 to 1990, the long-term yield to Zone 7 is 7,000 acre-feet per year.

- ***Imported surface water from the State Water Project (SWP)*** Imported water from the State Water Project (SWP) currently provides about 70 percent of the water used in the Zone 7 service area. Water is delivered via the Sacramento-San Joaquin Delta and the South Bay Aqueduct. It is treated at the Del Valle and Patterson Pass Water Treatment Plants before delivery. Some imported water also is released into the arroyos for groundwater recharge. Zone 7 has a long-term contract with the SWP for delivery of 46,000 acre-feet of water by 1997. The SWP cannot currently deliver its contracted amounts. Estimates for deliveries range from the SWP range from 28,500 to 35,600 acre-feet a year. In 1994, deliveries from the SWP were 20,500 acre-feet, while in 1995 (a very wet year), deliveries were 30,100 acre-feet.

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2 *City of Livermore Water Master Plan, Final Report*, Camp Dresser & McKee, March 1995.

3 One acre-foot of water is equal to 325,829 gallons of water. This measurement refers to the amount of water which covers one acre (43,560 square feet) to a depth of one foot.

- ***Supplemental water purchases*** Zone 7 purchases other water as needed from the Byron Bethany Irrigation District and State Water Bank, to make up shortfalls from the SWP. These purchases vary greatly. In 1994 supplemental purchases totaled 13,400 acre-feet, while in 1995 supplemental purchases totaled only 700 acre-feet.

The sustainable yield (the long-term average annual yield) of Zone 7's water supplies ranges from 48,900 to 56,000 acre-feet. For planning purposes, a total average annual supply of 52,100 acre-feet is used.

Water Demand

Actual total demand in 1995 was 41,000 acre-feet. Estimated total demand in 1997 is 45,526 acre-feet, which leaves a surplus of 6,574 acre-feet.

Zone 7 estimates that it has an adequate sustainable water supply until the year 2000, at which time it will need to bring other sources of water on-line. Zone 7 has projected an additional 6,680 acre-feet would be required by the year 2005, 14,425 acre-feet by 2010, and 24,910 acre-feet by 2020.[4] Zone 7 allocates its water to five principal types of users: municipal and industrial (M&I), small systems and institutions, rural residential, gravel mining operations, and irrigated agriculture. Untreated water is used for vineyards and golf courses, and water is also used for groundwater recharge. Zone 7's 1995 demand was based on requested deliveries to all users of 40,755 acre-feet. The 1999 demand -- based on projected population and a per person water demand rate of 190 to 210 gallons per day -- is 47,208 acre-feet.

Existing Conditions and Infrastructure in the SLVSPA

Subarea 1

Except for the southeast corner which is located at a higher elevation, Subarea 1 is in the City of Livermore service area, Pressure Zone 3. The subarea was included in the study area of the *Water Master Plan*, but no development was anticipated. This zone serves elevations from 540 feet to 680 feet. The Altamont Reservoir is the storage facility for this Pressure Zone. The City owns a 16-inch water line in Vasco Road which terminates approximately 3,000 feet south of the East Avenue intersection. There also is a 12-inch water line in East Avenue which ends at the Vasco Road intersection.

Subarea 2

Subarea 2 is adjacent to the City of Livermore service area and is within the 540- to 680-foot elevation range of Pressure Zone 3, supplied by the Altamont Reservoir. The subarea was included in the study area of the *Water Master Plan*, but no development was anticipated. The City-owned 16-inch line in Vasco Road and the 12-inch line in East Avenue noted above are also located in the immediate vicinity of Subarea 2.

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4 *Water Charge Connection Charge Program Update, op. cit.*, page 9.

Subarea 3

Subarea 3 is in the service area boundary of the California Water Service Company (Cal Water). Existing six-, eight-, and 12-inch Cal Water lines serving the adjacent subdivision terminate near the western boundary of Subarea 3. There also is an existing 12-inch line in Robertson Park Road to the north. Existing water facilities in Subarea 3 are in good condition and do not need replacing. Cal Water would be able to provide water service to development in Subareas 3-7.[5] Subarea 3 elevations range from 535 to 565 feet. The subarea would be served by Cal Water Pressure Zone 680.

Subarea 4

Parts of Subarea 4 are in the service area boundary of Cal Water. Existing water facilities in Subarea 4 are in good condition and do not need replacing. Cal Water owns an eight-inch line in Marina Avenue and a 12-inch line in Arroyo Road, both of which extend along part of Subarea 4's boundaries. Cal Water Pumping Station 26 is located at the corner of Marina Avenue and Arroyo Road.

Subarea 5

Subarea 5 is outside of the service area boundaries of the City of Livermore and Cal Water, although it is contiguous to the service area boundary of Cal Water. Existing eight-inch water lines in Chatsworth Way and Superior Drive stub out to the subarea. Zone 7's Del Valle Pipeline is located in Holmes Road, in the western part of the subarea.

Subareas 6 and 7

These subareas are located outside the service area boundaries of the City of Livermore and Cal Water. There is no existing water service to these subareas.

Annexations and Financing

Subareas 1 and 2 are within the service area of the City of Livermore, and Subarea 3 is within the service area boundary of Cal Water for which no annexations would be required. Part of Subarea 4 and all of Subareas 5-7 would need to be annexed to either the City of Livermore's or Cal Water's service area. The annexation must be approved by the City of Livermore, the California Public Utilities Commission, and the Alameda County Local Agency Formation Commission (LAFCO).

Developers construct main line extensions for Cal Water. Cal Water refunds part of extension costs to developers at rate of 2.5 percent per year for 40 years. The refundable part of the cost depends on the number of units served and usually is 80 percent of the total cost for main lines serving a typical subdivision. Very low density developments would be refunded at a lower rate. Special facilities (such as pump stations and storage tanks) are designed and built by Cal Water at developers' expense. If other development uses the special facilities in the future, Cal Water sets up a reimbursement agreement between the developers involved. Cal Water charges no connection or facility fees.

Zone 7 finances projects to develop new water sources through water connection charges. This method is in accordance with the Zone 7 Board's policy of not burdening the cost of future water

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5 Nolte and Associates communication with Sam Polermo, District Manager, California Water Service Company.

supplies on existing water users. The connection charge for a basic 5/8-inch domestic water meter connection is $3,580.

Water Service -- Significance Criteria

The following criteria were identified, based on professional practices, and used to determine if adopting and implementing the *South Livermore Valley Specific Plan (Draft Plan)* would result in a significant environmental impact on water service. An impact is considered is significant if the project:

- Uses water wastefully
- Results in a need for new or substantially altered water facilities which would create an adverse physical change in the environment
- Results in substantial depletion of groundwater resources
- Creates a water demand which exceeds the firm water supply of Zone 7

Water Service -- Impacts and Mitigation Measures

Proposed Water System

All in-tract water distribution lines would be eight-inch diameter pipes.

Subarea 1

Development in Subarea 1 would need to connect to the existing 16-inch line in Vasco Road, which would be extended with a 12-inch line approximately 1,200 feet south. In addition, development of this subarea would contribute to the need to expand the Altamont Reservoir which serves this part of the City.

Subarea 2

Development in Subarea 2 would need to connect to the existing 12-inch line in East Avenue and the 16-inch line in Vasco Road. In addition, development of this subarea would contribute to the need to expand the Altamont Reservior which serves this part of the City.

Subarea 3

Development in Subarea 3 would need to connect to the existing 12-inch line in Concannon Boulevard. Development in this subarea (along with Subareas 4 and 5) would also require expansion of the pumping and storage facilities at Pumping Station 26.

Subarea 4

The existing 12-line in Arroyo Road would require extension to the south, for approximately 3,200 feet. Other necessary improvements would be to expand Pumping Station 26 and develop a 500,000 gallon tank at an elevation of approximately 760 feet.

Subarea 5

Development in Subarea 5 would require a connection to Zone 7's Del Valle Pipeline in Holmes Street with a 12-inch line running through the subarea and connecting with the new 12-inch line in

Arroyo Road. Development in this subarea would contribute to the need to expand Pumping Station 26.

Subarea 6

The proposed commercial site in this subarea would need to connect to Subarea 5 with two eight-inch lines and the new 12-inch line in Arroyo Road. Depending on the ultimate location of the commercial site, a connection to Subarea 7 could also be made.

Subarea 7

Development in Subarea 7 would require a connection to the Del Valle Pipeline near the existing Zone 7 plant. In addition, a 500,000 gallon tank would be required at an elevation of 760 feet.

Growth-Inducing Impacts

Note that potential growth-inducing impacts created by new water infrastructure is addressed in Impact 4.1-7 in ***4.1 Land Use and Public Plans***.

Impact 4.9-1 Water Supply

SLVSPA development would increase water demands on Zone 7 water supplies. Development and agricultural mitigation under the Draft Plan *would create an annual demand of 7,735 acre-feet of water. Zone 7 largely has anticipated the level of municipal demand that would be created by* Draft Plan *development but has not anticipated the level of irrigation water demand for agricultural uses. Demand created by the* Draft Plan *would exceed planned water supplies of Zone 7 for this area by 2,911 to 4,711 acre-feet a year. In addition, demand for agricultural irrigation water during peak demand periods would be inadequate. Secondary impacts created by obtaining new water supplies could be significant. SU*

Demand Created by the Draft Plan

Zone 7 estimates future municipal water demand by assuming a demand rate of 200 gallons per person per day (gppd). This figure includes residential, commercial, industrial, and municipal landscaping uses but excludes agricultural uses. Using this figure, the SLVSPA population of 4,160 would create a demand of 932 acre-feet of water annually. However, this method of estimating demand is inappropriate for the *Draft Plan*. First, 200 gppd represents common water use in urban areas. In urban areas, houses are built on smaller lots and traditionally use less water than houses on larger lots. Housing units in the SLVSPA would be expected to have a higher water demand because lots would be larger than in urban areas. Second, this method also fails to account for the large agricultural demand which would be created in the area.

A more accurate estimate of demand can be calculated by determining the water demand for each land use. For residential uses, water use demand in Livermore varies from 1,000 gpd / acre to 3,920 gpd / acre, depending on the number of dwelling units per acre (the density). [6] The densities in the *Draft*

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6 *City of Livermore Water Master Plan, Final Report, op. cit.*, Table 3-3, "Unit Demand Factors for Residential Land Use Categories", page 3-8.

Plan would result in a demand of 1,015 acre-feet of treated water annually. [7] For non-residential uses, the commercial, landscaped (irrigated) open space, and community facilities (the proposed school) would result in a demand for 100 acre-feet annually, some of which presumably would be untreated for landscaping use. [8] Together, this results in an annual municipal water demand of 1,115 acre-feet.

Draft Plan development also would preserve 2,051 acres of agricultural land in permanent agricultural easements as agricultural mitigation (see "Agricultural Mitigation" in Section 2.0, ***Description of the Proposed Project***). This could include the 1,029 acres of agricultural land within the SLVSPA. [9] Agricultural land would require 4,615 acre-feet of untreated water. [10] [11]

Total annual municipal and agricultural water demand would be 5,730 acre-feet.

Zone 7 Estimates of Future Demand

Zone 7 has based its water supply planning on estimates of future demand. Zone 7 has already assumed development in the South Livermore Valley in estimating future water demand and in developing new water supplies. Zone 7 uses projections from planning documents from Alameda County and from the cities of Pleasanton, Livermore, and Dublin. These documents assume that

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7 This assumes 1,200 gpd / acre for the 166.8 acres of Subareas 4 and 5 (at 1.7 - 1.9 units per acre), 1,300 gpd / acre for the 321.1 acres of Subareas 1, 3, and 7 (at 2.3 units per acre), and 1,400 gpd / acre for the 206 acres of Subarea 2, for a total of 905,990 gpd. These demand estimates are from *City of Livermore Water Master Plan, Final Report. Ibid.*

8 This assumes 800 gpd / acre for 38 acres of commercial, 20 acres of school, ten acres of community park, and 44 acres of landscaped open space. These demand estimates are from *City of Livermore Water Master Plan, Final Report, op. cit.*, Table 3-4, "Unit Demand Factors for Non-Residential Land Use Categories", page 3-9.

9 Land to be used for agricultural mitigation currently is primarily used for grazing and is not irrigated. However, land used for agricultural mitigation would be required to plant vines or orchards, which would require irrigation. Note that the *Draft Plan* recommends giving mitigation credit for the permanent preservation of land such as regional trail corridors, arroyo corridors, and steep slopes. Therefore, total demand for agricultural mitigation might be lower.

10 For water demand, the EIR assumes 2.25 acre-feet annually per acre of agricultural land, the average water use for viticulture in the area. Nichols • Berman conversation with Michael Gatzman, Wente Brothers, October 1996. Note that this is more than the current overall agricultural demand in the area (1.6 acre-feet per acre per year). This is due to the presence of other crops, including existing olive orchards, which use less water. In addition, new vines use more water than older, established vines. For these reasons, the EIR used the figure of 2.25 as a "worst case" estimate. Note that the actual amount of water for viticulture uses varies greatly depending on soil, weather, and crop conditions.

11 Agricultural water would not need treatment, and Zone 7 does not have a delivery system for the untreated water it sells to agricultural users. Users generally are located adjacent or near the South Bay Aqueduct (SBA) and draw water via turnout facilities. These facilities are paid for by the user. Users of SWP water at a distance from the SBA have made arrangements for delivery with intervening users. *South Livermore Valley Area Plan Draft Environmental Impact Report, op. cit.*, page K.1-12.

1,625 single-family homes would be developed in the area covered in the SLVSPA [12] which would result in a demand of 1,019 acre-feet annually. As noted earlier, this EIR projects that municipal uses in the SLVSPA would create an estimated annual demand of 1,115 acre-feet. Therefore, municipal demand created by *Draft Plan* development would exceed Zone 7's planned supply by 96 acre-feet annually. Increased water demand for municipal uses also would require treatment at the Del Valle Water Treatment Plant.

Zone 7's estimate of future agricultural water demand would not be sufficient for planned agricultural development attributable to SLVSPA buildout. Currently, Zone 7 serves 2,250 acres of irrigated agriculture, primarily in the South Livermore Valley. Current agricultural demand is about 3,600 acre-feet of water (or 1.6 acre-feet / acre). Zone 7 has estimated that total agricultural demand will increase to about 5,400 acre-feet by the year 2000 and remain constant to 2020, an increase of 1,800 acre-feet over present demand. [13] Agricultural demand created by the *Draft Plan* (4,615 acre-feet a year) by the year 2020 (the estimated time of buildout) would exceed Zone 7's planned supply (a maximum of 1,800 acre-feet a year) by between 2,815 and 4,615 acre-feet a year, depending on how much of the 1,800 feet acre-feet would be available. [14]

In addition to the lack of total yearly supplies for agricultural demand, the "peak demand" availability of agricultural water would be limited. Agricultural uses require large amounts of irrigation water at certain times of the year. Projected supplies of untreated water for agriculture were expected to drop to a low of about 25 acre-feet per day peak demand use by 1995 and were projected to remain at that level through the year 2010. In the absence of new transport facilities to bring water into the South Livermore Valley or storage reservoirs to set aside supplies for summer months, this will become a serious impediment to agricultural activities. There currently is little or no surplus agricultural water available during peak demand periods. Zone 7 has notified current agricultural users of imported water that coordination of irrigation activities among users to prevent simultaneous water turnout could help reduce this peak-demand problem. [15] Agricultural development foreseen by the *Draft Plan* would require a much greater amount of water during peak demand periods than is available from Zone 7.

In summary, demand created by the *Draft Plan* (all sources) would exceed planned water supplies of Zone 7 by 2,911 to 4,711 acre-feet a year – representing 3.8 to 6.1 percent of Zone 7's estimated total

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[12] Specifically, Zone 7 has included development assumptions contained in the *East County Area Plan* (ECAP). The ECAP incorporates the *South Livermore Valley Area Plan*, which assumes 2,510 potential new housing units would be developed in the South Livermore Valley. Of these new units, it was assumed that 1,625 single family homes would be developed adjacent to the City of Livermore, with a population of 4,550 (in calculating the population of East County, the ECAP assumed 2.8 persons per household. *East County Area Plan, op. cit.*, page 45, page revised March 1996). These 1,625 homesites would be located in the SLVSPA. At 200 gppd, this would result in a demand of 1,019 acre-feet.

[13] *Water Connection Charge Program Update*, Zone 7, February 1994, page 6, and *Water Connection Charge Program Update, op. cit.*, page 9.

[14] It is unlikely any surplus agricultural supply would be available. Zone 7 has assumed that most of this increase in agricultural demand would be generated by the Ruby Hill project and not by agricultural development in the SLVSPA. Zone 7 has not projected any new agricultural water demand past the year 2000 when most (if not all) *Draft Plan* development is foreseen.

[15] *South Livermore Valley Area Plan Draft Environmental Impact Report, op. cit.*, pages K.1-12 and K.1-13.

demand for the year 2020 (the estimated time of buildout of the *Draft Plan*). [16] In addition, water supply for agricultural uses during peak demand periods would be inadequate. These are significant impacts.

Secondary Impacts of Developing New Water Supplies and Distribution Facilities

To serve development under the *Draft Plan*, Zone 7 would need to identify and secure additional water supplies and construct distribution and treatment facilities for municipal uses. These could create potential significant secondary impacts, both for the project itself and with cumulative projects. Zone 7 has already identified a number of potential supply and distribution strategies to increase water supply. [17] These strategies most likely would be used to obtain water supplies required by *Draft Plan* implementation. However, each method of water supply could result in secondary environmental impacts. While specific impacts cannot be determined until a water supply strategy is developed, the EIR can discuss the general types of impacts which could be created from obtaining water for development under the *Draft Plan*. [18]

Zone 7's *Water Supply Planning Report* and its most recent *Yearly Review of the Sustainable Water Supply* (April 23, 1997) identify a number of specific projects underway or planned for the future to increase water supplies. Zone 7 can be expected to consider using some or all of the following methods to obtain water supplies for development contemplated by the Draft Plan as well as other reasonably foreseeable development projects within Zone 7's service area:

- ***Water transfers*** represent the largest available source of supply. Water transfers involve purchasing water rights from other water users who no longer wish to make use of their water rights. Zone 7 would make use of acquired rights by increasing its withdrawals from the SWP. Zone 7 estimates there are about 90,000 acre-feet of SWP entitlements available for purchase and that Zone 7 may seek to acquire 20,000 acre-feet or more from that source. In addition, there are non-SWP sources available. For example, Zone 7 is currently pursuing a demonstration project with the Byron-Bethany Irrigation District (BBID) which could lead to regular water transfers of up to 5,000 acre-feet.

  Implementation of a water transfer agreement is estimated to require 2-5 years to identify the seller, negotiate an agreement, and amend the SWP contract in a manner satisfactory to the Department of Water Resources. Water transfers must proceed in accordance with the principles of the 1995 Monterey Agreement which governs the amendment of SWP contracts for water

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16 Zone 7 estimates that total demand in the year 2020 would be 76,810 acre-feet. *Water Connection Charge Program Update, op. cit.*, page 9.

17 *Water Supply Planning Report, op. cit.* Zone 7 provides a yearly update of "projected expansion projects". The latest is contained in the *Proposed Water Connection Charge Increase, op. cit.*

18 The CEQA Guidelines Section 15144 state that "Drafting an EIR . . . necessarily involves some degree of forecasting. While forecasting the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonable can". The City of Livermore must "attempt in good faith to fulfill its obligation under CEQA to provide sufficient meaningful information regarding the types of activity and environmental effects that are reasonably foreseeable" (*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3rd 376 at p.399).

transfers. The Monterey Agreement is currently the subject of litigation which could lead to delays in implementing SWP entitlement transfers.

The environmental effects of water transfers depends to a large extent on the prior use of the water to be transferred as well as the new use of the transferred water. The EIR the Monterey Agreement examined the potential environmental effects of water transfers on a programmatic basis and concluded that negligible impacts would occur to geology and soils, water resources, and air quality. Adverse but less-than-significant effects would occur from idled cropland from those areas in where water is obtained and from the resulting loss of employment opportunities. Water transfers are unlikely to directly affect statewide biological resources but could create secondary biological impacts through increased population growth in areas where water is transferred because biologically important lands could be converted to urban uses. It is unclear what statewide cultural, recreational, and health and safety impacts could be created because water exchanges could result in distributions which are impossible to predict. [19]

Environmental review of the five-year, 5000 acre-feet per year Byron-Bethany Irrigation District Water Transfer determined that no adverse environmental effects would result. [20]

In 1996, the Berrenda Mesa Water District (BMWD) completed environmental review of a program to transfer up to 75,000 acre-feet per year of SWP entitlements to as-yet unspecified customers, as well as the proposed transfer of up to 7,000 acre-feet per year from Kern County for use in the Dougherty Valley area. The EIR concluded the transfer program would affect land use by changing irrigated lands to non-irrigated lands, but that this impact would be less-than-significant. The EIR found that the transfer program would not change water conveyance patterns through the delta, there would be no change in the to surface water, groundwater, ecology, geology/soils, land use, air quality, circulation, recreation, public services, aesthetics, or cultural resources. With respect to the proposed transfer to Dougherty Valley, the EIR found the project could result in potentially significant short-term construction impacts to ecology, geology and soils, air quality, land use, circulation, public services, energy, and cultural resources. [21]

Based on the analyses which have been prepared to date, if water transfers were ultimately used to supply water for SLVSPA development, these environmental documents indicate that the primary effects would be potential land use and employment changes because agricultural land in other parts of the state would have less water available. In addition, there is a potential for a wide range of short-term construction impacts that could occur depending on the nature and extent of facilities needed to implement the water transfer. Other significant environmental impacts are possible, but insufficient information exists at this time to assess their likelihood or to develop effective mitigation measures.

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19 *Implementation of the Monterey Agreement DEIR, op. cit.*, pages ES-3, 3-4, and 3-5. This document is incorporated by reference in this EIR and is available for public review at the City Planning Department.

20 *Negative Declaration for Five Year Water Transfer with Byron-Bethany Irrigation District, op. cit.*

21 *Transfer of Water Entitlements from Berrenda Mesa Water District DEIR and FEIR, op. cit.* These documents are incorporated by reference in this EIR and are available for public review at the City Planning Department.

- ***Water conservation programs*** Programs underway include an Ultra Low Flow Toilet Rebate, Water Conservation, and Awareness Programs. These programs are not expected to result in any secondary environmental impacts if implemented in the SLVSPA.

- ***Recycled Water*** Consistent with City *General Plan* policy for the South Livermore Valley, all *Draft Plan* development will contribute funding to support the expanded use of recycled water in the community. In combination with water conservation efforts required by the *Draft Plan*, the use of recycled water can partially off-set new development's impact on water resources by providing a secondary source of water for irrigation and for groundwater recharge.

  The City of Livermore currently uses recycled (i.e., secondary treated) water during the summer months to irrigate Las Positas Golf Course, the airport landscaping, the Wastewater Treatment Plant landscaping, and a portion of the Caltrans I-580 right-of-way. In addition, the City is nearing completion on the construction of a 750,000 gallons per day demonstration microfiltration/reverse osmosis plant which will improve the quality of treated wastewater to the point where it can be used for groundwater recharge within the Livermore Valley. The City has expanded its original proposal for the demonstration project to include the addition of a groundwater recharge component to the demonstration plant. This proposal will permit up to 750,000 gallons of water to be directly put back into the ground to recharge the valley basin underground aquifer. The reverse osmosis plant is currently scheduled for completion July 1997. The current building houses two reverse osmosis units with room for a third (which would bring the capacity to 1.125 MGD). Ultimately, the demonstration plant will be able to expand its groundwater recharge capacity to 6.0 MGD. By blending the more highly treated water from the reverse osmosis plant with secondary treated water and/or untreated agricultural water, the City can also greatly expand its use of recycled water without adversely affecting the environment.

  The City has conducted preliminary planning studies for a recycled water distribution pipeline in the South Valley, and is continuing to explore pipeline alignment options. One option that is being considered is along the Arroyo Mocho, with connections to public users that could use the water to irrigate large turf and landscape areas. Such users might include Robertson Park, Sunset Park, Granada High School, and the proposed elementary/middle school in Subarea 3. In addition, such a pipeline would allow recycled water to be released in the Arroyo near the City's Maintenance Service Center for the purpose of groundwater recharge.

- ***Groundwater improvements*** Zone 7 is constructing weirs along Arroyo Mocho to create instream ponds and increase recharge, diverting flows from Arroyo Mocho into an artificial lake, and increasing recharge by spreading recycled water on the ground. Zone 7 also is investigating construction of seven additional wells to provide up to 75 percent of maximum daily demand in the event of cutbacks in the SWP allotments during dry years. An investigation well (the Hopyard Injection / Extraction Well #7) is being constructed in Pleasanton. It has been determined that the Hopyard well would not result in any adverse environmental impacts. [22]

  In addition, the City of Livermore is constructing a demonstration plant which will demineralize wastewater through reverse osmosis (RO). Demineralized water (840 acre-feet / year) will be injected into the groundwater basin to replenish supply. The Dublin San Ramon Services District (DSRSD) also is proposing to implement an RO injection system in the same

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[22] *Negative Declaration for Hopyard Well, op. cit.*

groundwater basin. Environmental analysis has indicated that the Livermore RO injection system in conjunction with the DSRSD RO injection system could result in some domestic water wells containing more than 50 percent recycled water which is considered a significant impact. [23] Livermore and the DSRSD currently are discussing mitigation measures which would reduce this impact to a less-than-significant level. [24] These demonstration projects are the first stages of a large-scale valley-wide water recycling project.

- ***State Water Project Improvements*** Planned improvements to the State Water Project (SWP) include a proposed Los Banos Grande Reservoir which would store water in wet years for use in dryer years ("water banking"). Twenty-nine contractors, including Zone 7, would fund the project. Zone 7 would receive 8,400 acre-feet a year from this project. This reservoir would create a number of secondary impacts, primarily the loss of listed and sensitive plant and wildlife species and sycamore riparian habitat. A biological resources mitigation plan would create new replacement habitat. Other impacts would include short-term air quality degradation (due to construction dust) and loss of recreational opportunities (until the new reservoir is constructed). [25]

- ***Conveyance*** Zone 7 also is planning to enlarge 13 miles of the South Bay Aqueduct connecting Zone 7 to Del Valle Reservoir. This would increase the amount of water available in peak times, but would not actually increase water supply in Del Valle Reservoir. This would involve adding pumps on the pipeline section of the aqueduct and enlarging the open channel section of the aqueduct. Generally impacts would be limited to the immediate right-of-way for the channel and would consist of short term construction related impacts. The expansion is in the initial engineering design stage, and no environmental documentation has been prepared.

  In addition, Zone 7 is planning to purchase 22.5 cubic feet of water per second of conveyance capacity from the South Bay Aqueduct that currently is not allocated. This is not expected to result in any secondary environmental impacts because no new construction would occur and no new water supplies would be developed.

Note that other cumulative development in the area could increase water demand impacts, with the exception of the Dougherty Valley project which already has established a firm water supply. However, as the amount of water needed for cumulative projects is not known, this cannot be quantified.

Draft Plan *Policies*

The following policies of the *Draft Plan* would reduce water supply impacts:

- ***Policy 8-1*** Urban development within the Specific Plan area shall be prohibited unless the City determines at the time of tentative subdivision map approval that there exists an adequate and permanent domestic water supply and emergency fire fighting supply sufficient to service the

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[23] The State Health Department has set a maximum limit of 50 percent. *City of Livermore Groundwater Recharge Project Mitigated Negative Declaration, op. cit.*, page iv.

[24] *City of Livermore Groundwater Recharge Project Mitigated Negative Declaration, op. cit.*

[25] *Los Banos Grandes Facilities Draft EIR, op. cit.*

proposed development and that the quality of the domestic water meets all applicable state and local standards. Agricultural development shall be prohibited unless the City can find there exists an adequate and permanent irrigation water supply. Development that requires agricultural mitigation shall be prohibited if adequate and permanent irrigation water is unavailable for the land to be used for agricultural mitigation.

- ***Policy 8-2*** The City shall condition adoption of individual development proposals for the planning area on adequate delineation of the capacity, phasing, and financing of required domestic water system improvements, including the full cost of securing, conveying, and storing new water sources. The City shall work with Zone 7 to determine water supply needs and sources.

- ***Policy 8-3*** Water conservation measures, in addition to those required by State law, shall be incorporated into all development proposals as conditions of approval. Such measures shall include:

  - Use of water conservation devices such as low-flow shower heads, faucets, and toilets.

  - Use of low flow irrigation systems in public rights-of-way, public parks, recreation areas and vineyards.

  - Use of drought resistant plant palettes in all new landscaped areas.

- ***Policy 8-4*** Parks, public open space areas, and agricultural areas shall incorporate water conservation methods and the use of recycled water, to the maximum extent feasible.

- ***Policy 8-5*** All new development in the Specific Plan area shall contribute funds for a recycled water treatment and distribution system. Each unit shall pay an additional 20% of the Zone 7 water connection fee to support the City's use of reclaimed water.

- ***Policy 8-6*** Each application for a tentative subdivision map shall include a report approved by the Community Development Department, demonstrating the adequacy and availability of public facilities and services. Localized improvements to infrastructure as generally described in this Specific Plan may be required as conditions of approval for individual projects within the Plan area. Development within the Specific Plan area shall be contingent upon the adequacy and availability of public facilities and services.

- ***Policy 8-7*** Availability of public services and infrastructures shall be a primary determinant of development phasing.

- ***Policy 8-8*** The appropriate service provider will be determined at the time each subarea is annexed into the City of Livermore.

- ***Policy 8-9*** Specific Plan developers shall coordinate with the appropriate service provider to identify the timing of required improvements, each subarea's proportionate responsibility for necessary improvements, and the provider's approach to funding such improvements (e.g., development fees, up-front financing with reimbursement agreement, etc.). All improvements shall be built to the appropriate system provider's standards.

- ***Policy 8-13*** The City shall investigate alternative methods for municipal sewage treatment and disposal, and give priority to alternatives which utilize water recycling or reclamation, such as the City's demonstration Reverse Osmosis plant.

- ***Policy 8-14*** Encourage and support proposals for irrigation of landscaped and recreation areas in the South Livermore Valley Specific Plan Area with reclaimed water.

Mitigation Measure 4.9-1 The policies above would decrease water demand impacts.

Significance after Mitigation The policies in the *Draft Plan* (especially Policy 8-1) would eliminate any impacts created by a lack of water to the project by eliminating development. However, implementation of Policy 8-1 and other policies requiring an assured water supply prior to development may have significant impacts depending upon the particular method selected by Zone 7 to make an adequate water supply available. The environmental review of various water supply options that has been conducted thus far indicates there is a possibility providing the water supply necessary for the project could have significant unavoidable impacts. Moreover, with respect to the project's direct impact of increasing demand for water, the courts have stated "it is not mitigation of a significant environmental impact on a project to say that if the impact is not addressed then the project will not be built ... the EIR must address the project and assumes the project will be built". [26] Until an adequate and firm water supply is found for demand created by *Draft Plan* development (2,911 to 4,711 acre-feet a year), impacts created by implementing the *Draft Plan* would remain significant and unavoidable.

Responsibility and Monitoring The City would be responsible for implementing the policies of the *Draft Plan*.

Impact 4.9-2 Groundwater Resources

Zone 7 manages the groundwater basin in the Livermore Valley for a long-term safe yield and does not allow long-term overdrafting. LTS

Until the 1960s, residents of the Livermore Valley relied on groundwater as their sole source of water supply. Serious overdrafting of the aquifer and declining water table elevations was a key reason for the creation of Zone 7 in 1957. To redress historic overdraft and to keep within the limits of long-term safe yield, Zone 7 artificially recharges the basin. Current safe yield is 240,000 acre-feet of water annually.

Zone 7 is the major supplier of water within the Livermore Valley. Zone 7 supplies water to municipal water retailers, although those retailers and Zone 7 may supplement the supplies they receive by pumping groundwater. However, the management of the groundwater basin is provided by Zone 7, and pumping of groundwater takes place only upon Zone 7's authorization. Although implementation of the *Draft Plan* would increase demand for water, the main water supplier still would be Zone 7. Zone 7 does not plan to enhance its water supply by permanently depleting the water basin. Therefore, the depletion of groundwater resources is considered both a less-than-significant project and cumulative impact.

Mitigation 4.9-2 No mitigation would be required.

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[26] *Stanislaus Natural Heritage Project v. County of Stanislaus* (48 Cal.App.4th 182, 205-206).

Impact 4.9-3 Construction Impacts of Water Infrastructure
Construction of new water infrastructure could create less-than-significant traffic, noise, and air quality impacts. The visual impacts of water tanks needed in Subareas 4 and 7 could generate potentially significant impacts. PS

As discussed above (***Proposed Water System***), a number improvements to the existing water supply system would be required to serve the SLVSPA, including construction of new water mains and lines, expansion of Pumping Station 26 at the corner of Marina Avenue and Arroyo Road, and expansion of the Altamont Reservoir.

- Installation of new water lines would occur at the same time as the construction of new streets and installation of other utilities. These construction impacts are addressed in other sections of the EIR (***4.6 Air Quality*** and ***4.7 Noise***).

- Construction of water storage tanks in Subareas 4 and 7 could create secondary visual impacts because they would be located at higher elevations than development in these areas. This is a potentially significant impact.

- The existing Pumping Station 26 (housed in an existing building) would be expanded, but because this site is developed already no significant environmental resources would be lost.

- The existing Altamont Reservoir will require an adjacent 4.6 MG tank. This new reservoir will also require additional water mains and pumping stations. Because the pad for this additional tank has been constructed, no environmental resources would be lost. Construction of new water lines for this tank could require temporary road closures, but this would not be considered significant.

A minor amount of construction traffic and associated air and noise impacts could occur in the immediate vicinity of any construction project, but this is considered a less-than-significant impact.

The following policy of the Draft Plan would reduce visual impacts created by new water infrastructure:

- ***Policy 8-10*** New reservoirs shall be designed and sited to minimize visual impacts. Rather than developing multiple reservoirs, it is preferred that facilities in the same general area be combined into a single reservoir as a means of reducing visual impacts and development costs.

Mitigation 4.9-3 The following mitigation would reduce visual impacts of water-tanks needed in Subareas 4 and 7:

- Paint the water tanks a color which blends with the surroundings as much as possible. Tan colored tanks usually are used in grasslands which helps to blend them into the landscape for much of the year.

- Plant trees around the tanks to minimize their bulk.

- Consider building the tanks below grade -- sunken into the landscape -- to minimize their heights above ground level.

- Tank locations should avoid existing trees, if possible, and areas of unstable soils to prevent excessive grading.

Significance After Mitigation Implementation of this mitigation would reduce impacts to a less-than-significant level.

Responsibility and Monitoring The City would be responsible for implementing the policies in the *Draft Plan*.

WASTEWATER SERVICE [27]

Wastewater Service -- The Setting

The City of Livermore Water Resources Division provides sewer service in the City and other areas within its service area boundary. The City maintains the collection system and operates the treatment facilities, including the Livermore Water Reclamation Plant. The City also regulates existing septic systems within the city.

Export of treated wastewater is considered necessary in order to protect groundwater resources in the Livermore-Amador Valley. The Livermore-Amador Valley Waste Management Agency (LAVWMA) transports the City's wastewater part way to San Francisco Bay. The LAVWMA is a joint powers agency consisting of the cities of Livermore and Pleasanton and the Dublin-San Ramon Services District (DSRSD). The Livermore Water Reclamation Plant is the starting point for the LAVWMA interceptor pipeline which carries treated wastewater from that facility and the DSRSD Wastewater Treatment Plant to the LAVWMA Regulating Reservoir and Export Pump Station. The Valley's treated wastewater then is pumped over the Dublin Grade through the LAVWMA Export Pipeline and delivered to the East Bay Dischargers Authority (EBDA) Pipeline where it is released by outfall pipe into San Francisco Bay. The Regulating Reservoir has a 50 million gallon capacity which is used during wet weather periods when infiltration of stormwater into the wastewater system occurs and when the capacity of the Export Pipeline is exceeded.

The LAVWMA Export Pipeline is a 24- to 27-inch steel pipeline. In 1994 it was discovered that the internal liner was missing from a 12-mile section of the pipe, directly exposing the steel casing to wastewater. This will result in corrosion and eventual failure of the line. The Export Pipeline cannot be shut down for more than 36 hours without exceeding the capacity of the Regulating Reservoir. Therefore, the LAVWMA is planning to replace parts of the line and build a new line adjacent to the existing line.

In March 1995, the City published a Sewer Master Plan, Final Report (*Sewer Master Plan*) [28] which identified capacity deficiencies in the existing water system and to recommend improvements to correct them.

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27 This section based upon:
- *North Livermore General Plan Amendment Draft Environmental Impact Report, op. cit.*
- *Sewer Master Plan Final Report*, Camp Dresser & McKee for the City of Livermore, March 1995.
- Nolte and Associates communications with Bill Adams, City of Livermore, Department of Public Works, Water Resources Division, and with Jerry VanEpps, City of Livermore, Engineering Department.
- Nichols • Berman conversations with Bill Adams, *op. cit.*, October 8 and November 21, 1996, and John Heinz, City of Livermore Department of Public Works, December 5, 1996.
- Memorandum from Bill Adams, City of Livermore Department of Public Works, November 22, 1996.

28 *City of Livermore Sewer Master Plan Final Report, op. cit.*

Existing Infrastructure

Subareas 1 and 2

Subareas 1 and 2 are located near an eight-inch line in Research Drive in the Shaheen Industrial Park which also collects sewage flows of a subdivision located north of East Avenue. The *Sewer Master Plan* does not identify any system bottlenecks near Subareas 1 and 2.

Subarea 3

Subarea 3 is located near an existing eight-inch sewer in Robertson Park Road and new eight-inch sewer lines in Normandy Way and Crescent Court. The nearest trunk line is the eight-inch line in Chardonay Way which serves the Tapestry subdivision west of Subarea 3. The sewer system directly west of Subarea 3 is less than ten years old and is in good condition.

Subareas 4 through 7

Subarea 4 is located near an existing eight-inch sewer in Superior Drive which connects to a ten-inch trunk line in the Ravenswood Park Subdivision.

Eight-inch sewer lines stub out to Subarea 5 at Chatsworth Way and Superior Drive. These lines connect to the ten-inch trunk line in the Ravenswood Park Subdivision.

The sewer facilities closest to Subarea 6 are the lines described above.

Subarea 7 has no existing sanitary sewer system available near the boundaries of this subarea. A new sewer trunk main is located approximately 1.5 miles away at the intersection of Isabel Avenue and Vineyard Avenue.

Wastewater Service -- Significance Criteria

The following criteria were identified, based on professional practices, and used to determine if adopting and implementing the *Draft Plan* would result in a significant environmental impact on wastewater service. An impact is considered significant if the project would:

- Contaminated a public water supply
- Substantially degraded or depleted groundwater resources
- Required construction of major facility and infrastructure improvements or expansions to the wastewater system which created an adverse physical change in the environment

Wastewater Service -- Impacts and Mitigation Measures

Proposed Wastewater System

Subarea 1

Subarea 1 can be sewered in one of two ways. It would be sewered most efficiently through Subarea 2, if the phasing of development in the two subareas permits. If Subarea 2 is developed prior to or concurrently with Subarea 1, a new 8-inch line in Vasco Road would connect to the 8-inch in the central spine road in Subarea 2, which, in turn, would connect to the 12-inch line in East Avenue.

Alternatively, Subarea 1 could sewer into a new 8-inch line constructed in Vasco Road which would connect to the existing 8-inch line in Research Drive. In-tract sewer lines will consist of 8-inch lines.

Subarea 2

A new 8-inch sewer will be constructed in the central spine/entry road for Subarea 2. The line will collect the discharge from the different neighborhoods in the subarea and carry it to the 12-inch line in East Avenue. As discussed above, this line could also extend to Vasco Road to collect discharge from Subarea 1, depending on construction phasing between the two subareas. All sewer lines in Subarea 2 will be 8-inch diameter lines. The existing 12-inch line in East Avenue will be extended eastward to provide capacity for Subareas 1 and 2.

Subarea 3

All in-tract lines in Subarea 3 will be 8-inch diameter lines. The in-tract system will connect to the existing 8-inch line in Chardonnay Way, or there is the possibility of sewering Subarea 3 by connecting to the existing 8-inch line in Robertson Park Road.

Subarea 4

Subarea 4 will connect to the City's existing system through the Ravenswood Park subdivision. Approximately 2,300 feet of new 8-inch line will be installed in Arroyo Road from Hansen Road to Superior Drive. All in-tract lines will be 8-inch diameter lines.

Subarea 5

All in-tract lines will be 8-inch diameter lines. An off-tract 8-inch main will be extended from Subarea Five to Isabel Avenue, via East Vineyard Avenue. As described above, the in-tract system for this subarea can be extended to pick up discharge from Subarea 4, if the phasing of the two subareas can be coordinated. In addition, the connection from Subarea 5 to Isabel Avenue can also be used to sewer Subareas 6 and 7.

Subarea 6

As previously discussed, the development of Subarea 5 (and Subarea 7) will trigger the need for an off-site, gravity flow line to Isabel Avenue. With such an improvement, Subarea 6 will then be able to connect at Vallecitos Road.

Subarea 7

The development of Subarea 7 will be served by an in-tract collection system consisting of 8-inch diameter lines which will connect to a main aligned along the common boundary between the subarea and Sycamore Grove Park. This main will extend northerly to a point near the west end of Subarea 5 at which point it will connect to the extension of the system from Isabel Avenue. In addition to providing capacity for Subarea 7, this line could be sized to handle discharge from the VA Hospital.

Growth-Inducing Impacts

Note that potential growth-inducing impacts created by new wastewater infrastructure are addressed in Impact 4.1-7 in ***4.1 Land Use and Public Plans***.

Impact 4.9-4 Treatment Plant and Export Pipeline Capacity
Cumulative development would exceed the capacity of the City's wastewater treatment plant and LAVWMA Export Pipeline. SU

Wastewater Treatment Plant

Development would create demand at the City's wastewater treatment plant. Current demand for dry weather treatment is 5.2 million gallons per day (mgd). [29] Wet weather demand is 5.6 mgd. The U.S. Department of Veterans Affairs Medical Center (VA Hospital) may be served in the future by the treatment plant for which 0.2 mgd of excess capacity is reserved. The *City of Livermore Community General Plan* requires not less than 30 percent and nor more than 35 percent of remaining capacity beyond 5.0 mgd be reserved for non-residential use.

Present Plant Capacity	**Gallons**
Less	8,500,000
• Current Plant Flow	5,200,000
• Ruby Hill	325,000
• VA Hospital Reserve	200,000
Total Unused Plant Capacity	*2,775,000*
Unused Capacity	
• Non-residential portion	970,000
• Residential portion [a]	1,805,000
Residential Portion of Unused Capacity	
Less:	1,805,000
• Remaining Unbuilt Approved Residential Units (2,654 units at 192 gallons / unit) [b]	510,000
Current Uncommitted Residential Capacity	*1,295,000 (6,744 units)*

a 65 percent of total unused capacity.
b 70 gppd at 2.74 persons per household (per 1990 U.S. Census).

The City of Livermore estimates future residential wastewater generation by assigning a rate of 70 gallons per person per day (gppd). Using this figure, the SLVSPA population of 4,160 would generate a 290,000 gallons per day. Commercial and community facilities would generate 260 gallons per day per acre (gpd / acre) (for 18,000 gpd). [30] Total wastewater generation would be approximately 308,000 gallons per day. It is assumed that agricultural uses would not generate wastewater.

Existing excess dry weather capacity at the Treatment Plant is approximately 2,775,000 gpd. SLVSPA development would represent about 11 percent of remaining overall capacity. Current uncommitted residential capacity is 1,805,000 gpd, and current uncommitted non-residential capacity is 970,000 gpd. SLVSPA residential development would use about 16 percent of current remaining

29 Nichols • Berman conversation with Bill Adams, October 8, 1996.

30 This assumes 38 acres of commercial, 20 acres of school, and ten acres of community park. Open space does not generate significant wastewater flows.

uncommitted residential capacity, and commercial development and community facilities would use about 1.9 percent of current remaining uncommitted non-residential capacity. This is a less-than-significant impact.

However, capacity in the future will be more limited. Given current growth rates, the capacity of the Treatment Plant will be reached some time between 2010 and 2015, requiring an expansion. Buildout of the *City of Livermore Community General Plan*, including both the North Livermore General Plan Amendment (NLGPA) area and SLVSPA, will require an estimated capacity of 11.1 mgd, an increase of 2.6 mgd over the present capacity of 8.5 mgd. No expansion plans have been determined. The lack of cumulative capacity in the Treatment Plant and subsequent need for expansion is considered a significant cumulative impact.

Export Pipeline

The Livermore-Amador Valley Waste Management Agency (LAVWMA) Export Pipeline transports treated wastewater from the Treatment Plant to the East Bay Dischargers Authority (EBDA) Pipeline which, in turn, transports the treated wastewater to San Francisco Bay by outfall pipe. The capacity allocated to Livermore in the LAVWMA Export Pipeline is 8.7 mgd which is adequate for the existing maximum capacity of the Treatment Plant (8.5 mgd) but not sufficient for a future expansion of the Treatment Plant. The lack of cumulative capacity in the Export Pipeline and subsequent need for expansion is considered a significant cumulative impact. (However, as the pipeline has adequate capacity to accomodate wastewater generated by this project, the SLVSP will not have a direct significant impact).

The LAVWMA plan for future expansion of the Export Pipeline includes a parallel pipe adjacent to the existing pipeline, except through part of Hayward where a new alignment for a second line would be required. As noted above, the LAVWMA is replacing segments of the existing pipeline without an interior liner. Pipeline segments to be retired under this program could be repaired and used as a new pipeline. LAVWMA's three-member agencies recently endorsed an agreement in principle to pursue engineering, financing, and environmental studies for construction of the parallel pipeline. Although no detailed implementation plan has been developed, environmental impacts could include the loss biological resources, the potential disturbance of hydrological resources, construction impacts such as short-term noise and traffic effects, and potential growth-inducing impacts as the expanded capacity could allow for more development. However, no detailed studies have yet been prepared to document the extent or significance of these impacts.

LAVWMA must increase its allocation in the EBDA Pipeline, of which extra capacity is currently available. No environmental impacts would be expected from an increased allocation. However, the lack of allocated capacity in the EBDA Pipeline for cumulative development in Livermore and the subsequent need to increase the transport allocation is considered a significant cumulative impact.

The following policies of the *Draft Plan* would reduce wastewater service impacts:

- ***Policy 8-11*** Adequate sewage treatment and export capacity to accommodate Specific Plan development shall be reserved at the time of Specific Plan adoption.

- ***Policy 8-12*** The City shall investigate alternative methods for municipal sewage treatment and disposal, and give priority to alternatives which utilize water recycling or reclamation, such as the City's demonstration Reverse Osmosis plant.

- ***Policy 8-13*** Encourage and support proposals for irrigation of landscaped and recreation areas in the South Livermore Valley Specific Plan Area with reclaimed water.

Mitigation Measure 4.9-4 The policies in the *Draft Plan* reduce cumulative impacts created by a lack of sewer capacity. Until adequate capacity is allocated in the Livermore Treatment Plant and the LAVWMA Export Pipeline and until the EBDA Pipeline is developed sufficient to accommodate cumulative development in Livermore, this will remain a significant unavoidable impact.

Responsibility and Monitoring The City would be responsible for implementing the policies in the *Draft Plan.*

Impact 4.9-5 Construction Impacts of Wastewater Infrastructure
Construction of new wastewater infrastructure would create less-than-significant traffic, noise, and air impacts. LTS

As discussed above (***Proposed Wastewater System***), a number of improvements to the existing wastewater systems would be required to serve SLVSPA development, including construction of new wastewater mains and lines, replacement of segments of the East Avenue line, and replacement of part of the El Caminito line to resolve a bottleneck.

- Installation of new wastewater lines would occur at the same time as the construction of new streets and installation of other utilities. These impacts are addressed in other sections of the EIR (as noted above).

Mitigation 4.9-5 No mitigation would be required.

FIRE PROTECTION[31]

Fire Protection -- The Setting

Livermore - Pleasanton Fire Department

The Livermore-Pleasanton Fire Department (LPFD) was formed in January 1997 by consolidating the Livermore and Pleasanton Fire Departments. The LPFD is staffed by a total of 100 fire suppression personnel who are split into ten separate engine companies and based in eight fire stations (two stations have two engine companies each). All fire suppression staff members have emergency medical training (EMT). Based on the current LPFD service area population of approximately 117,000 people, there presently is an average of 0.85 firefighter per 1,000 residents.

Five stations would serve the SLVSPA -- Station 5 located on Vineyard Avenue approximately one-half mile from the entrance to the Ruby Hill development, Station 6 located on the eastern edge of Livermore at East Avenue and Loyola Road, Station 7 located on Rincon at Pine Street which serves the northwest part of Livermore, Station 8 located north of I-580 in Springtown on Bluebell at Lilac,

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[31] Information in this section is from Nichols • Berman conversations with Eric Carlson, Fire Marshall, Livermore-Pleasanton Fire Department, September 16 and October 18, 1996 and January 29, 1997, letter from Eric Carlson to Nichols • Berman, October 16, 1996, and *Final Fire Department Consolidation Study and Recommendations*, staff summary report to the Mayors and City Council Members of Livermore and Pleasanton, November 25, 1996.

and Station 9 located at Concannon Boulevard and Cordoba which serves the southeast part of the District.

The LPFD has an Automatic Aid Agreement with the fire department at Lawrence Livermore National Laboratory (LLNL) (described below). According to Automatic Aid, units automatically respond under certain conditions. The LPFD also is a party to the mutual aid agreement of the Alameda County Mutual Aid Plan under which aid can be requested at any time, including from the California Division of Forestry (its Sunol station), Alameda County Fire Department (described below), and Tracy Rural.

The LPFD's current service standard is for the first engine to arrive at an incident within five minutes of a call. The second engine should arrive within seven minutes, the third within nine minutes, and the fourth within 11 minutes. The average response time generally is within the standard. However, service to the northwest area of Livermore exceeds the five-minute first engine response time. To resolve this problem, the LPFD is planning to construct a new fire station somewhere near the airport. The exact location has not been determined yet.

Lawrence Livermore National Laboratory [32]

In addition to providing fire protection services to its site, the LLNL Emergency Services Department also provides fire protection in the tri-county area. LLNL has seven fire engines, 42 full-time firefighters (including the chief and assistant chief), one ambulance, and 12 paramedics. The LLNL fire station is located at its main campus on East Avenue.

LLNL has an automatic aid agreement with LPFD. In some parts of the South Livermore Valley, an LLNL engine is dispatched as either the first or second engine to the scene.

Alameda County Fire Department

The Alameda County Fire Department (ACFD) was created in July 1993 when the Alameda County Fire Patrol was consolidated with the Castro Valley and Eden Fire Departments. The ACFD currently is staffed by a total of 125 employees, of which 120 are fire suppression personnel. All staff are EMT-D (defibrillation) trained, and a first responder EMT-P (paramedic) is assigned to all engine companies. There currently are six paramedics assigned to engine companies, and a total of 27 paramedics are expected to be assigned in the future.

The ACFD has a contract to provide service to the VA Hospital on Arroyo Road which is served by ACFD Station 8 located on College Avenue in the center of Livermore.

The minimum daily staffing level for the entire eight-station department is 31 firefighters, and Station 8 maintains a minimum of four personnel. The County's fire service standard requires the first engine to respond to an incident within five minutes and the second to respond within ten minutes. ACFD response times in most parts of central Livermore meet or exceed the service standard.

The County currently has a Memorandum of Understanding (MOU) with the California Department of Forestry (CDF) to provide fire prevention services for State Responsibility Areas (SRAs) in the

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[32] Nichols • Berman conversation with Sue Markishtum, Lawrence Livermore National Laboratory Emergency Services, October 17, 1996.

County.[33] The ACFD also enforces County ordinances related to weed abatement, fire sprinkler installation, and fees for prevention services. The ACFD uses the Uniform Fire Code for base fire flow and hydrant spacing requirements and has set the minimum standard of 1,500 gallons per minute (gpm) with 20 pounds per square inch (psi) residual pressure for hydrants in residential developments. The primary sources of funding for the ACFD are property and utility taxes.

Fire Protection -- Significance Criteria

According to the *State CEQA Guidelines* and professional practices, the project would have a significant effect on the environment if it:

- Interfered with emergency response plans or emergency evacuation plans
- Required additional fire staff, facilities, or equipment which would not be available to maintain an acceptable level of service
- Created a hazardous situation beyond the capability of available emergency services
- Created great difficulty or hardship in providing increased service
- Resulted in extension of emergency services response times which could create a hazardous situation
- Resulted in the emergency services being unable to serve development in the subareas
- Greatly increased the risk of fires

Fire Protection -- Impacts and Mitigation Measures

Impact 4.9-6 Fire and Emergency Medical Service Demand Impacts
LPFD response times to the SLVSPA would be acceptable, and personnel and equipment would be adequate for emergency medical and structural fire service. This is a less-than-significant impact. LTS

The LPFD would have primary responsibility of the SLVSPA subareas, although the LLNL Emergency Services Department would provide either a first or second response to some subareas. Likely station responses to the subareas are shown below:

Subarea	First Engine Response	Second Engine Response	Third Engine Response
Subarea 1	LLNL	LPFD Station #6	LPFD Station #9
Subarea 2	LPFD Station #6	LLNL	LPFD Station #9
Subareas 3-6	LPFD Station #9	LPFD Station #6	LPFD Station #7
Subarea 7	LPFD Station #5 or #9	LPFD Station #5, #7, or #9	LPFD Station #5, #6, #7, or #9

Response to Subarea 7 would depend upon the specific location within the subarea and the ultimate road alignment. Given current plans, first response to the eastern half of Subarea 7 probably would be provided by Station #9 (Concannon) while the western half would be served by Station #5 (Ruby Hill). Second and third engine response would vary accordingly.

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[33] A SRA is an area which generally must conform to standards contained in Section 4290 of the Public Resources Code (such as related to roadway design and clearing of flammable structures). In SRA's the State of California ultimately is responsible for wildland fires.

Response Time

The LPFD estimates that the District would meet response time criteria (five minutes for the first engine response, seven minutes for a second engine response, and nine minutes for a third engine response) to SLVSPA calls from Subareas 1-7. The policy below would serve to fully mitigate response time impacts to a less-than-significant level.

- ***Policy 5-31*** Developers for Subarea #7 shall obtain an emergency vehicle access easement from the Veterans Hospital prior to the first Final Map approval, and construct an emergency vehicle access route that provides access to the east end of the subarea.

Staffing and Equipment

The LPFD estimates that development of the SLVSPA should not require additional staff or equipment for structural fires or for emergency medical service. However, current wildland fire equipment would be inadequate. Subarea 7 would be located in a wildland interface area. Development up the central drainage in this subarea could be threatened by wildfires. In addition, fire could spread from new development to open space and threaten other property. Wildland fires are discussed in more detail in Impact 4.9-7.

The primary equipment used for fighting wildland fires are known as a Type 2 and 3 fire engines, which are designed for off-road multi-purpose use. The LPFD currently has one true Type 3 fire engine, located at Fire Station #6 (East Avenue) for the entire Livermore area. Fire Station #5 (Ruby Hill) has a modified Type 3 engine, but it mainly is designed for emergency medical use and does not have off-road capabilities. In an emergency, the LPFD could request aid from the Alameda County Fire Department (ACFD) which has a modified Type 3 engine at its College Avenue station during parts of the year. However, this engine is "floated" to various ACFD stations depending on need, thus not guaranteeing its availability. The policy below would serve to fully mitigation staffing and equipment impacts to a less-than-significant level, due to development in the upland areas of Subarea 7.

- ***Policy 7-7*** In order to improve Fire Department capabilities to fight wildland fires in Subarea #7 where residential development shares an extensive interface with natural grassland areas, Subarea 7 will fund the acquisition of a new Type 2 fire engine that can negotiate the steeper and more rugged terrain in the regional parklands. The Department will need to acquire this engine prior to development in the critical interface areas.

Medical Response

The LPFD and LLNL respond to calls with an EMT-P paramedic. The LPFD provides first response for paramedic services but contracts with the Alameda County American Medical Response (AMR) ambulance to provide transportation to the care facility. A paramedic-staffed AMR ambulance operates out of LPFD Station 7 (Rincon) which would serve the SLVSPA.

Valley Memorial Hospital at 1111 Stanley Blvd. in Livermore is the nearest hospital to the SLVSPA. A second hospital in Pleasanton at Santa Rita Road and Stoneridge Drive has a 24-hour emergency room. Transport could be to either facility, depending on the nature of illness or injury. Travel time from the SLVSPA is approximately 10 minutes to Livermore and 15 minutes to Pleasanton, although travel times from some areas could be somewhat longer, depending on location.

Annexation Scenarios

The various annexation scenarios would have little or no effect on firefighting ability, although they would affect jurisdictional responsibilities. The LPFD would have primary responsibility within City limits, while the ACFD would have primary responsibility outside of City limits. Under the Minimum Annexation Scenario, for example, this would mean that the ACFD would be responsible for a wildfire in Subarea 7 outside of City limits but that the LPFD would be responsible for land inside the City limits (such as housing units). In practice however, the LPFD and ACFD would coordinate during any wildland fire event, and jurisdictional lines would not affect their actions in any meaningful way.

Mitigation Measure 4.9-6 Implementation of the above policies contained in the Draft Plan would mitigate impacts to a less-than-significant level. No additional mitigations would be necessary.

Impact 4.9-7 Wildland-Building Fire Exposure Impacts
The SLVSPA would be exposed to fire hazards under severe weather and wind conditions. In addition, construction activities could result in accidental wildfires. These would be significant impacts. S

Open space fires could spread unchecked to buildings and, under extreme weather conditions, threaten people's safety or lives. In addition, fire could spread from buildings to open space and threaten other property.

Vegetation in the area provides a natural fuel source for fire. The amount of vegetation present is known as the "fuel load". Heavy fuels include woods, trees, timber, and large heavy brush. Small to medium fuels include grass, weeds, brush, shrubs, and small trees. Small (light) fuel loads ignite more easily, burn faster, generate less heat, and are easier to extinguish than heavy fuel loads. Slope affects the rate fire can spread. Fire burns faster uphill than on flat lands because a fire burning upslope can preheat fuels located even farther upslope and cause them to ignite easily.

The eastern lots of Subarea 4 immediately adjacent to the proposed regional park, the southern lots of Subarea 7, and parts of Subarea 6 could be susceptible to wildland fires. The remainder of the development area would be surrounded by irrigated agriculture (which would be very fire resistant) or by man-made firebreaks such as roadways.

- In Subarea 7, the southern edge of development would be immediately adjacent to grassland to the south. Under *Draft Plan* Policy 6-11, intensive agricultural use on hillside slopes in the southern part of Subarea 7 should be prohibited above an elevation of 650 feet to protect native and non-native grasslands. The southern edge of development at about 650 feet would effectively prevent intensive agriculture south of these lots which would serve as a fire resistant buffer. Current grazing of the Subarea greatly reduces the grassland fuel load and, thus, decreases the risk of a wildfire. If grazing is discontinued in Subarea 7, the risk of wildfire would be greatly increased.

- In Subarea 4, the regional park could serve as a fire bridge between the adjacent lots and the grazing areas east and south of the subarea. This area is a much lower fire risk than Subarea 7 because park management would reduce the amount of fuel load available through maintenance practices such as grass cutting, and an equestrian center would also adjacent to homes, which would provide grazed pasture land as a buffer. In addition, the trail through the regional park would serve as a firebreak and provide access to firefighting equipment.

- In Subarea 6, the large expanse of vacant land could be subject to wildfires during construction activities. Conversion of this area to agricultural uses as required by the *Draft Plan* would reduce wildfire.

The following policy of the *Draft Plan* would reduce wildland-building fire exposure impacts in the upland areas of Subarea 7:

- ***Policy 7-7*** In order to improve Fire Department capabilities to fight wildland fires in Subarea #7 where residential development shares an extensive interface with natural grassland areas, Subarea 7 will fund the acquisition of a new Type 2 fire engine that can negotiate the steeper and more rugged terrain in the regional parklands. The Department will need to acquire this engine prior to development in the critical interface areas.

The following policies of the *Draft Plan* would reduce wildland-building fire exposure impacts generally:

- ***Policy 6-11*** In order to protect native and non-native grasslands and reduce erosion potential, residential development and intensive agricultural use is prohibited on hillside slopes in the southern part of Subarea #7 above an elevation of 650 feet.

- ***Policy 7-6*** In order to ensure adequate fire protection services for wildland areas within the incorporated areas, the Livermore Fire Department and Alameda County Fire Department should enter a Simultaneous Response Agreement. Such an agreement would mean that both department's would respond to any and all wildland fires in the Specific Plan area, particularly those in Subareas #4 and #7.

- ***Policy 7-8*** The CC&R's for Specific Plan development shall require new development adjoining natural areas to incorporate a minimum 30-foot wide defensible space between homesites and adjacent grasslands. Landscaping within this buffer zone shall use fire resistant plant species, and avoid the use of highly flammable trees and vegetation. Irrigation will be provided within the buffer zone, and trees shall be planted so their canopies are at least 20 feet apart.

- ***Policy 7-9*** Building elevations directly facing wildland interfaces shall be designed as fire defensible structures (e.g., non-combustible siding, boxed in eaves, triple paned windows, etc.).

- ***Policy 7-10*** Fence materials in areas adjacent to wildland open space (i.e., not intensive agriculture), shall be constructed of predominantly non-combustible materials (e.g., metal or concrete posts, open wire mesh, etc.).

- ***Policy 7-11*** LARPD shall be responsible for ensuring that fuel loads (e.g., tall grass, dense shrubs, etc.) do not build up in parkland areas adjacent to residential development.

- ***Policy 7-12*** LARPD shall integrate fire trails and fire breaks into the open space trail system, and coordinate with the Fire Department regarding standards for access roads in these areas while minimizing environmental impacts.

- ***Policy 7-13*** In Specific Plan areas adjacent to natural areas, developers will be required to implement fire prevention measures during construction in order to minimize the potential for wildland fires. Developers can consult with the Livermore-Pleasanton Fire Department regarding

appropriate measures and refer to the Wildland-Urban Interface Manual published by the Western Fire Chiefs Association and the California State Fire Marshall.

Mitigation Measure 4.9-7 The following measure would reduce potential wildland-fire impacts due to construction:

- Sponsors of individual development projects in Subarea 6, adjacent to the regional park in Subarea 4, and at the southern edge of Subarea 7 should implement fire prevention measures during construction. Prevention measures also should be implemented during all infrastructure development (including road construction) in Subareas 6 and 7. Prevention measures should include but are not limited to the following:

    - Install all project roadway and water requirements before any residential sidewall construction on the site, consistent with Section 10.502 of the *Uniform Fire Code*

    - Clear brush and other potential fire fuel around construction areas

    - Maintain and clearly mark on-site fire response equipment (such as fire extinguishers, fire retardant blankets, shovels, buckets, etc.) at each construction area

    - Ensure that all construction workers are trained in the use of on-site fire response equipment and workplace safety measures

    - Locate and clearly identify a cellular phone or other communication device on-site at all times during construction

Significance After Mitigation Implementation of Mitigation Measure 4.9-7 and the implementation of the policies of the *Draft Plan* would reduce wildland-building fire exposure impacts to less-than-significant levels.

Responsibility and Monitoring Sponsors of individual development projects in Subareas 4, 6, and 7 would be responsible for designing, implementing, and maintaining fire prevention measures. The City and LPFD would be responsible for monitoring their implementation during the normal site construction checks.

Impact 4.9-8 Roadway Impacts

The proposed internal roadway system in the various subareas would provide for adequate emergency access. This is a less-than-significant impact. LTS

New development projects are required to design internal roadway systems which can accommodate traffic and provide access in emergency situations. It is especially important that development in wildland interface areas allow for more than one access point.

The LPFD would require Subarea 7 to have a roadway connecting Foley Road (west)to Arroyo Road (east), thus providing an alternate entrance and escape route. In the event a wildland fire, landslide, or earthquake makes a portion of the internal roadway system impassable, dual access points would allow emergency vehicles to enter and residents and firefighters escape.

The following *Draft Plan* policies would reduce roadway impacts to a less-than-significant level:

- ***Policy 5-31*** Developers for Subarea #7 shall obtain an emergency vehicle access easement from the Veterans Hospital prior to the first Final Map approval, and construct an emergency vehicle access route that provides access to the east end of the subarea.

Mitigation Measure 4.9-8 Implementation of the above policy would reduce impacts to a less-than-significant level.

Impact 4.9-9 Cumulative Fire and Emergency Medical Service Impacts
Project implementation would not result in significant cumulative fire or medical service demands. LTS

Cumulative development projects, especially growth in the NLGPA area, would result a need for additional personnel, equipment, and stations. Planning for the construction of additional fire facilities to meet the expected demand from the cumulative development cannot be completed until the master and specific plans for cumulative development in North Livermore are formulated and approved by the City and County (part of the planning process now underway). Future environmental documentation would be required to determine environmental impacts of fire station construction. While it would be speculative to determine specific impacts at this time, it is likely that new fire station substation construction would result in the general loss of vegetation and potential loss of existing agricultural land (for a substation in North Livermore).

This increased use will be primarily attributable to the direct demand generated by those projects. The effect of this demand is not expected to compound the effects of the demand generated by development occurring in response to the SLVSPA and therefore is not expected to lead to a significant cumulative impact.

Mitigation Measure 4.9-9 No mitigation would be required.

POLICE PROTECTION

Police Protection -- The Setting

Livermore Police Department

The City of Livermore Police Department (LPD) staff consists of 65 sworn officers and 55.5 non-sworn positions for a total of 120.5 positions. Based on the current City population of 63,000 people, there are 1.03 sworn offices per 1,000 residents. The City's goal is to achieve and maintain a level of 1.25 sworn officers and 0.70 non-sworn employees per 1,000 people. The LPD owns 20 marked patrol cars, 16 unmarked cars, and six fleet vehicles (utility vans, animal control vehicle, etc.). At least two dispatchers are on duty 24 hours a day.

The City is served by four basic beats and one roving beat as officers are available. Each police beat has one officer, and there are three shifts a day. The beats are deployed by City quadrant with First Street and South "L" Street serving as the center of the quadrants. A roving beat of three officers and a sergeant is assigned to special operations and can supplement the regular patrols if necessary.

The LPD has one station, a 43,400-square foot facility adjacent to City Hall on South Livermore Avenue. In 1994, the LPD responded to 52,838 calls for service or 839 calls for service per 1,000 residents. Less than one percent of the total calls for service were Priority One calls, about 30 percent

were Priority Two calls, and the remaining calls were Priority Three. Priority One calls are emergencies where a felony is in process and life or property is in immediate danger, Priority Two calls are those where there is potential for danger or a disturbance, and Priority Three are routine calls where there is no immediate danger.

The LPD goal is to respond to all Priority One calls within three minutes and to all Priority Two calls within ten minutes. The average response time citywide from the time the dispatcher receives a call is 5.52 minutes for Priority One calls and 8.82 minutes for Priority Two calls. The LPD currently is operating on a negative patrol index which means that there are more calls for service than staff hours. According to LPD estimates, new commercial development along I-580 and the shopping center at First Street and Los Positas have generated demands for 1,400 hours of extra police time. The Triad Business Park is also an area of concern due to its location in the far northwest corner of Livermore and the longest response time in the City, an 8.5-minute average response for Priority One calls.

The most frequent crimes reported in the City are Part 1 crimes (larceny) and Part 2 crimes (assault). In 1994, there were 4,817 Part 1 crimes and 6,323 Part 2 crimes reported citywide. On average, 9,000 to 10,000 crimes are reported in the City per year.

Police Protection -- Significance Criteria

According to the *State CEQA Guidelines* and professional practices, the project would have a significant effect on the environment if it:

- Interfered with emergency response plans or emergency evacuation plans
- Required additional police staffing, facilities, or equipment which would not be available to maintain acceptable service ratios
- Created a hazardous situation beyond the capability of the LPD
- Resulted in extension of emergency services response times which could create a hazardous situation

Police Protection -- Impacts and Mitigation Measures

Impact 4.9-10 Police Protection Service Impacts

Increased development in accordance with the Draft Plan *would result additional police personnel to provide acceptable service standards. LTS*

Subareas 1 and 2 are located in the southeast quadrant, and Subareas 3, 4, 5, 6, and 7 are located in the southwest quadrant. Based on the factors described above (1.25 sworn officers and 0.7 civilian personnel per 1,000 new residents) and an estimated SLVSPA population of 4,160, *Draft Plan* development could generate a demand for 5.2 additional sworn officers and 2.9 non-sworn positions. Actual demand may vary depending on household size and design of development. According to the Police Chief, the LPD needs a minimum of six new officers to be able to add a new beat to the City with three shifts per day (three officers on duty and three back-up off-duty officers). The following policies would serve to fully mitigate police service impacts:

- ***Policy 7-14*** The City Planning Department will coordinate with the Police Department regarding the timing of annexation and proposed development, so that the Department can adequately plan for the necessary expansion of services to the South Livermore Valley.

- ***Policy 7-15*** The City shall provide additional police personnel and the Department will revise its patrols as needed to establish and maintain City standards for police services in the Specific Plan area.

Mitigation Measure 4.9-10 Implementation of the above policies contained in the *Draft Plan* would mitigate police service impacts to a less-than-significant level. No additional mitigation would be required.

Impact 4.9-11 Cumulative Police Protection Service Impacts
Cumulative development projects would increase police service demands. LTS

New development proposed in the extreme corners of the City includes residential development at the Triad Business Park (northwest corner), factory outlet stores at Greenville Road and I-580 (northeast corner), and residential development on Concannon Boulevard adjacent to the City of Pleasanton (southwest). The LPD is concerned about meeting future demands given this new development. The opening of BART stations may generate additional calls for service. NLGPA area development is expected to generate a demand for an additional 38 police officers, additional supervisory and support personnel, equipment, and potentially a new substation.

It would be necessary to add new beats to the City to serve future development. Development in the SLVSPA would generate demands for police service based on increased population and also potentially could disperse police forces serving the more remote subareas which could affect the entire City. Future police staffing needs would be determined by the City during the annual budget review process. Therefore, cumulative staffing needs would be considered a less-than-significant impact.

Future environmental documentation would be required to determine any environmental impacts from police substation construction. While it would be speculative to determine specific physical impacts at this time, it is likely that new police substation construction would result in the general loss of vegetation and potential loss of existing agricultural land (for a substation in North Livermore). Note that any future substation would not be constructed because of development in the SLVSPA, and any future substation (such as the planned North Livermore substation) would be constructed even if development under the *Draft Plan* did not proceed. Therefore, the *Draft Plan* is not expected to contribute to any significant cumulative police service impacts. [34]

Mitigation Measure 4.9-11 No mitigation would be required.

PARKS AND RECREATION

Parks and Recreation -- The Setting

Livermore Parks and Recreation District

The Livermore Area Recreation and Parks District (LARPD) is responsible for developing and maintaining parks, special use facilities, and the regional trail system within the District's 245-square

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[34] As the project's individual impacts are not "considerable", the cumulative impacts are also less-than-significant (as per *CEQA Guidelines* §15355).

mile boundary which includes the City of Livermore and surrounding unincorporated areas. The LARPD also provides a variety of recreation programs, including after-school recreation, recreational classes, cultural arts, summer youth camp, nature camp, sports, summer aquatics, and senior citizen programs.

The LARPD has 54 full-time employees. Of those, between one-third and one-half are assigned to the Parks Division which maintains the 1,272 acres of city and regional parks. While the City of Livermore owns the parks within City boundaries, the LARPD manages and maintains all parks and special use facilities through a joint powers agreement with the City. The 43 parks the LARPD operates are categorized as follows:

Exhibit 4.9-1
LARPD Parks by Category

Number of Parks	Type	Acres
23	Neighborhood Parks	124
2	Community Parks	42
12	Special Use Facilities	203
3	Regional Parks	903
Total 40		*1,272*

Source: *LARPD Parks-Facilities List*, April 1995

According to the June 1995 *LARPD Master Plan*, the District has the following parkland standards:

Exhibit 4.9-2
LARPD Park Standards

Park Type	Acreage Ratio[a]	Size Range	Travel Distance	Population Served	Comments
Neighborhood Parks	2 acres	6-10 acres	0.75-1.0 mile	3,000 -5,000	Serve population within elementary school zone
Community Parks	2 acres	30+ acres	2 miles	15-20,000	--
Special Use Facilities	3 acres	Varies	Varies	Varies	Provide for special community needs / demands
Regional Parks	15 acres	250+ acres	1 hour's drive	Varies	Unique habitat / geological features

a Per 1,000 residents.

Based on the parkland standards of the *LARPD Master Plan*, the District has sufficient regional and special use parks to serve the current population (assuming a 1995 population of 66,000 [35]) and is almost in balance for neighborhood parks, with only an eight-acre (one-park) neighborhood park deficit. However, the LARPD has a 90-acre (three-park) deficit for community parks.

35 This population estimate was derived from Association of Bay Area Government (ABAG) projections and includes all areas inside the LARPD boundaries -- City of Livermore (approximately 63,000 people) and unincorporated areas (remaining ± 3,000 people).

Future Park Needs and Plans The *LARPD Master Plan* estimates that in order to meet the existing parkland standards by the year 2005 (assuming a Livermore population of 87,000) the District will need five new neighborhood parks (50 acres), four new community parks (132 acres), one to two new regional parks (402 acres), and 58 acres of additional special use parks.

Planned and Proposed Parks The following projects, planned or proposed in the *LARPD Master Plan*, are relevant to the SLVSPA subareas.

- ***Ravenswood Park*** The LARPD intends to further its role in preserving the Valley's agricultural history by assisting Friends of the Vineyard in planning a wine museum at Ravenswood Park.

- ***Chain-of-Lakes*** The Chain-of-Lakes is principally a flood control project which will be dedicated to the Alameda County Flood Control and Water Conservation District (ACFCWCD) Zone 7 for water management. The plan calls for the eventual conversion of a chain of gravel mining pits for scenic and recreational purposes. Lake A, just west of Sycamore Grove Park, would be the first in a series of scenic lakes and would offer fishing opportunities and trails which eventually could link Sycamore Grove Park to Shadow Cliffs, an EBRPD regional recreational area to the west. However, this plan may not be implemented before the year 2045, depending on the regional demand for aggregate.

East Bay Regional Park District

The East Bay Regional Park District (EBRPD) is responsible for 53 regional parks, recreation areas, wildernesses, shorelines, preserves, land bank areas, and 20 regional inter-park trails. Its jurisdiction covers all of Alameda and Contra Costa Counties.

Parklands in and around Livermore historically were the responsibility of the LARPD, and the EBRPD did not have jurisdiction in the area. However, in 1992 the EBRPD boundaries were expanded to include eastern Alameda County, including Livermore. While the LARPD will remain responsible for community parks, it is planned that regional parks, open space, and trails connecting them will be transferred to the EBRPD. The primary exception will be Sycamore Grove park which will remain in LARPD jurisdiction. In addition, new regional parks and trails are planned to be operated by the EBRPD.

When the EBRPD boundaries were expanded, the then-current EBRPD Master Plan did not cover the Livermore area. The current EBRPD Master Plan now includes the South Livermore Valley. The EBRPD currently is working with the LARPD to define regional and trail purposes in the Livermore area.

Community Centers and Recreational Services

The Samuel Bothwell Recreation Center at 8th and H Streets offers a variety of programs with an emphasis on senior activities. The May Nissen Park and Swim Center is a community park at 685 Rincon Avenue developed with pools, basketball and tennis courts, playgrounds, horseshoe pits, group picnic areas, and a small child care facility. Robertson Park is a special use facility with soccer fields, rodeo grounds, and an equestrian facility. Recreation programs are funded in part by user fees.

The LARPD, the Livermore Valley Joint Unified School District, and the Community College occasionally share facilities on an informal basis.

Trails [36]

The existing trail and bikeway system in Livermore consists of *multi-use trails* (for bicycles, pedestrians, and sometimes equestrians) and *bike lanes* (a separate lane for one-way bike travel on a street or highway). Currently, no equestrian trails exist in the City of Livermore except for a trail in LARPD's Robertson Park. Existing multi-use trails in the City do not include equestrian trails, are too short, or are too far from equestrian facilities to be used by equestrians. [37] The routes in and nearby the SLVSPA are shown in Exhibit 4.9-1.

Three separate trails plans relate to the SLVSPA:

- ***Livermore Bicycle / Pedestrian Plan Update and Equestrian Trail Study Policy Document*** The City recently completed an update of its *Master Plan for Trails and Equestrian Ways* in conjunction with the LARPD, EBRPD, and other interested agencies and individuals. The resulting *Livermore Bicycle / Pedestrian Plan Update and Equestrian Trail Study Policy Document* (*Livermore Trails Plan*) is intended to replace the existing bikeway and pedestrian section of the *City of Livermore Community General Plan* and represents the official trail policy of the City. Exhibit 4.9-3 shows the multi-use trails proposed in this document. Priorities of this plan include:
    - A connection between Robertson Park and Sycamore Grove Park. This alignment is proposed through the Olivina Gate in Subarea 6 and connect to the Olivina Winery in Subarea 7. The trail alignment in this plan is conceptual, and is not intended to show a specific route.
    - A connection on Mines Road between Tesla Road and Del Valle park.
- ***LARPD Regional Trail Plan*** The LARPD published a trail master plan for the District in 1991. The *LARPD Regional Trail Plan* was formulated to show both proposed specific trail alignments and more general trail corridors. This plan was later adopted by the EBRPD in 1992 when the EBRPD boundaries were expanded to include eastern Alameda County, including Livermore. Exhibit 4.9-1 shows the trails proposed in this document. Priorities of this plan include:
    - A connection between Sycamore Grove Park and Robertson Park. This connection is planned on Arroyo Road and Marina Avenue.
    - A connection between Robertson Park and Brushy Peak. This alignment is planned on Tesla Road from Robertson Park to the South Bay Aqueduct and along the aqueduct north across Interstate 580.

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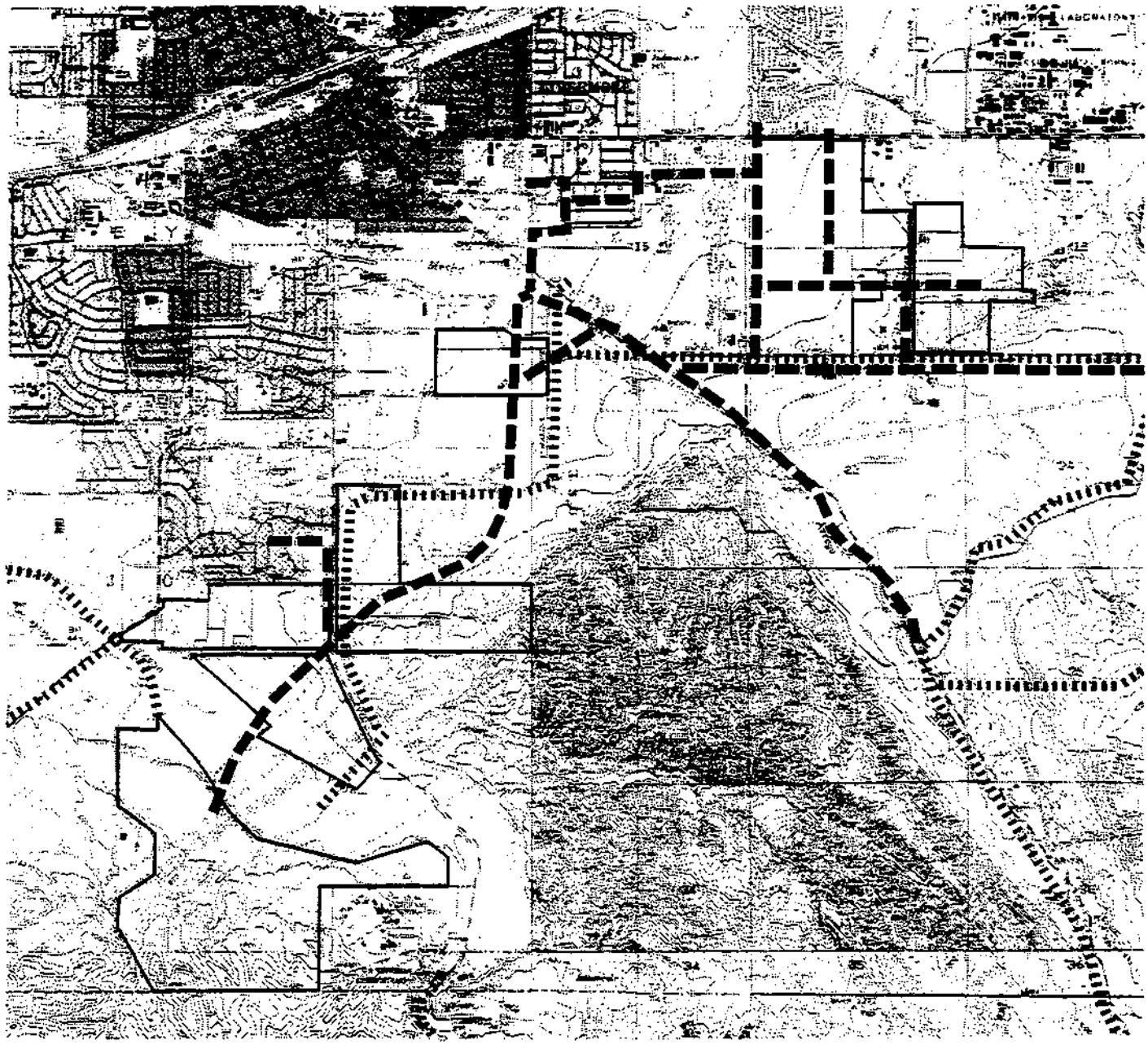
[36] Information in this section is from *Livermore Bicycle / Pedestrian Plan Update and Equestrian Trail Study Policy Document* and *Livermore Bicycle / Pedestrian Plan Update and Equestrian Trail Study Background Report*, Fehr & Peers Associates, June 1996, Nichols • Berman conversations with Jerry Ingledue, LARPD, September 23, 1996 and Martin Vitz, EBRPD, September 20, 1996, letters from Andrea Mackenzie, EBPRD, to Marc Roberts, City of Livermore, June 4, 1996 and to Nichols • Berman, June 18, 1996, *EBRPD Master Plan 1996*, EBRPD, December 17, 1996, and *East Alameda County Planning Area Study Map*, EBRPD and LARPD, November 17, 1994.

[37] *Livermore Bicycle/Pedestrian Plan Update and Equestrian Trail Study Policy Document*, *op. cit.*, page 6.

Exhibit 4.9-3
EBRPD and LARPD Trail Plans



Legend:

1991 LARPD Trail Master Plan

Livermore Bicycle/Pedestrian Plan Update and Equestrian Trails Study

- ***EBRPD Master Plan 1996*** When the EBRPD boundaries were expanded in 1992 to include the Livermore area, the EBRPD adopted the LARPD plan as an interim plan until a new master plan could be prepared. In 1996, the EBRPD released its new Master Plan which shows slightly different trail alignments from those contained in the *LARPD Regional Trail Plan.* The *EBRPD Master Plan 1996* shows general trail alignments throughout the East Bay. [38] Priorities of this plan include:

  - A connection between Del Valle and Shadow Cliffs through Sycamore Grove Park.
  - A connection between Del Valle and Brushy Peak
  - A connection between Sycamore Grove Park and Mines Road (to connect to the Del Valle-Brushy Peak trail)
  - A route from Shadow Cliffs to San Joaquin County through Livermore and connecting to the Del Valle-Brushy Peak trail.

The City has an agreement with Zone 7 which allows the City to use Zone 7 alignments for recreation purposes.

Parks and Recreation -- Significance Criteria

According to Appendix G of the *State CEQA Guidelines*, a project would normally have a significant effect on the environment if it:

- Conflicted with established recreational uses

Based on professional practices, the following criterion was used to determine that adopting and implementing the *Draft Plan* would result in a significant environmental impact on open space / trails if it:

- Conflicted with established goals and standards of the *Livermore Bicycle / Pedestrian Plan Update and Equestrian Trail Study, LARPD Master Plan, LARPD Regional Trail Plan,* or *EBRPD Master Plan 1996*

Parks and Recreation -- Impacts and Mitigation Measures

The *Draft Plan* would provide a 12.5-acre neighborhood park in Subarea 2, acquire 112.3 acres of Regional Park in Subareas 4 and 7, and create trail corridors in Subareas 2-7. Details of the open space and trails contained in the *Draft Plan* are discussed in ***2.2 Proposed Project*** (see the subsection on Open Space).

Exhibit 2.2-8 shows existing and proposed SLVSPA trails corridors. Each corridor would consist of a ten-foot wide paved bike / pedestrian pathway with two-foot gravel shoulder, an eight-foot wide gravel equestrian trail with a two-foot wide gravel shoulder, and a three-foot landscaped buffer between the two trails within a 25-foot wide right-of-way. (Trail segment 2 from South Vasco Road

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[38] The EIR does not include EBRPD trails on Exhibit 4.6-3 due to the large scale of EBRPD trail maps and general nature of the potential trail corridors.

to the west side of Subarea 2 is planned to have a 40-foot right-of-way with additional landscaping to buffer and screen adjacent housing development.)

Impact 4.9-12 LARPD Park Demand
Implementation of the Draft Plan *would meet LARPD acreage standards for neighborhood and community parks. LTS*

The LARPD's greatest needs currently are for new community parks and an expanded multi-use trail system. Large active parks (such as Robertson Park) are very heavily used, and the ball fields are always fully booked.

Development of the SLVSPA with 1,492 units could result in a new population at buildout of approximately 4,160 people. According to existing LARPD standards (Exhibit 4.9-3), this total estimated new population would generate demand for approximately 8.3 acres of neighborhood park (one new park) and 62.4 acres of new regional parks. A new community park would not be required. The *Draft Plan* provides for a 12.5-acre neighborhood park in Subarea 2, four acres of neighborhood park distributed among Subareas 1, 4, and 5, and 112.3 acres of new regional parkland in the eastern hillsides of Subarea 4 (32.3 acres) and along arroyos and drainages in Subarea 7 (80.0 acres).[39] Therefore, LARPD park standards would be met.

Development in the SLVSPA subareas also would be served by existing parks located in the southern and eastern parts of the City -- Robertson, Big Trees, Independence, and Sycamore Grove Parks. Subareas 1 and 2 are closest to Big Trees Park, Subarea 3 is adjacent to Robertson Park, Subarea 4 is opposite Ravenswood Park, Subarea 5 is between Ravenswood and Independence Parks, and Subarea 7 is adjacent to Sycamore Grove Park.

Mitigation 4.9-12 No mitigation would be required.

Impact 4.9-13 Trails Consistency
Trail alignments in the Draft Plan *would be consistent with adopted and proposed trail plans. LTS*

The trail alignments shown in the *Draft Plan* would be consistent with adopted and proposed trail plans. It includes a number of connections contained in the *Livermore Trails Plan.* The *Livermore Trails Plan* states that in South Livermore "final trail alignments will be determined through the master plan and / or specific plan process". The *LARPD Regional Trail Plan* shows a very similar trail plan. These plans include:

- A connection between Sycamore Grove Park and Robertson Park. This would be accomplished by using *Draft Plan* trail segments 5-8, 12, and 14. However, a connection through the Olivina Gate and along the historic Olivina Winery Road in Subarea 6 is not included in the *Draft Plan,* although the main purpose of this connection -- to link Sycamore Grove and Robertson Parks -- would be fulfilled.

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39 A 20-acre school site in Subarea 3 (see below) also may accommodate some non-school recreational opportunities for nearby residents during off-hours.

- A trail along Tesla Road from Robertson Part to areas farther east. *Draft Plan* trail segments 2-4 would fulfill this objective by linking Wente Street to South Vasco Road via South Livermore Avenue and Tesla Road.

The *EBRPD Master Plan 1996* shows two connections relevant the *Draft Plan*:

- A connection between Del Valle and Shadow Cliffs. The *Draft Plan* would create part of this route from the VA hospital to Vallecitas Road with development of trail segment 13. Other trails segments required to connect Del Valle to Shadow Cliffs would be located outside the SLVSPA.

- A connection between Del Valle and Brushy Peak. The *Draft Plan* would provide an uninterrupted trail from the VA hospital to Subarea 1. Other trails segments required to connect Del Valle to Brushy Peak would be located outside the SLVSPA.

- A connection between Sycamore Grove Park and Mines Road. *Draft Plan* trail segments 4-5, 7-8, and 12 would provide this connection.

Mitigation 4.9-13 No mitigation would be required.

Impact 4.9-14 Recreational Use Conflicts with Residents
Recreational and residential uses are not expected to conflict. LTS

Potential for Conflict

A number of complaints can occur at the interface where recreational and residential activities meet. Residents' complaints can include:

- Trespass
- Noise
- Litter
- Maintenance / fire clearing concerns

These concerns are most likely to occur in areas where "fingers" of development extend into open space or where trails and open space are adjacent to residential areas.

More conflicts can occur when recreational areas are created next to existing residential areas where residents are not used to the influx of recreational users. When recreational and residential development is developed concurrently, new residents expect some level of recreational use.

Trail Corridors

Draft Plan implementation would create trail corridors on about 15 acres in Subareas 2-7. Proposed trails are shown in Exhibit 2.2-8. Trails frequently occur nearby proposed residential lots, particularly in Subareas 2, 3, and 7.

Most trails in Subareas 2, 3, and 7 would be located adjacent to roadways where trespass, noise, and litter would be expected to account for fewer problems than roadway nuisances. The only trail planned outside of a roadway (trail segment 2) would have an expanded right-of-way to provide added buffering. Maintenance and fire clearing concerns would not be a concern because these would be urban trails and would not be located through areas where fire hazards would be high.

Regional Parkland

The *Draft Plan* designates 112 acres of new regional parkland in the eastern hillsides of Subarea 4 (32 acres) and along arroyos and drainages of Subarea 7 (80 acres). Regional parkland in Subareas 4 and 7 would be located next to residential lots. Regional parkland in Subarea 4 would be established adjacent to six lots, although trails within this parkland would approach within 100 feet of only three lots. In Subarea 7, regional parkland and trails would be adjacent to numerous lots. It can be expected that trail corridors through Subarea 7 would be heavily used, since they would connect to the existing Sycamore Grove Park. Conflicts between recreational users in regional parkland and residents are not expected to be significant because homes would be purchased with the understanding that trails would be nearby and recreational use would occur on the trails. According to the LARPD, recent residential developments in Livermore which include trails have not generated any complaints from homeowners and, instead, are seen as an amenity for residents rather than a nuisance. [40]

Mitigation 4.9-14 Implementation of the following policy contained in the Draft Plan would mitigate already less-than-significant conflicts between recreational users and residents:

- Potential homeowners in the SLVSPA should be notified of proposed trails and that trails users and occasional noise should be expected.

Note that *Draft Plan* Policy 6-11 directs that trails in the regional parkland in Subarea 7 above an elevation of 650 feet to be sited to minimize disturbance to native grasslands.

SCHOOLS [41]

Schools -- The Setting

Livermore Valley Joint Unified School District

The Livermore Valley Joint Unified School District (LVJUSD) provides public education to the City of Livermore and surrounding areas. The LVJUSD currently operates 11 elementary schools, four middle schools, two high schools, and three alternative / continuation schools. LVJUSD enrollments have been growing in recent years, and many schools are reaching capacity. Total capacity is 13,342, and current enrollment is 12,232 (Exhibit 4.9-4).

The LVJUSD has prepared a *Facilities Master Plan* (*Facilities Plan*) to provide for additional space needs for a total future capacity of 18,255 by the school year 2005-2006. The *Facilities Plan* estimates that the LVJUSD will have an enrollment of 18,557 by this time. The *LVJUSD Facilities Plan* provides for expansion of each existing school campus (except for Arroyo Mocho School) to the maximum capacity given the physical constraints of the site, the use of interim portable classrooms, and the construction of new elementary and high schools. A preliminary new high school location has been selected.

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[40] Nichols • Berman conversation with Jerry Ingledue, LARPD, *op. cit.*

[41] Information in section is based on Nichols • Berman conversations with Kim McNealy, Livermore Valley Joint School District Facilities Planner, July 17, September 16, September 17, and November 14, 1996, memorandum from Kim McNeely, November 13, 1996, and *Livermore Valley Joint Unified School District Facilities Master Plan*, Government Financial Strategies Inc., October 1996.

The LVJUSD has an open enrollment policy which would permit new SLVSPA students to attend any school in the District. Existing schools closest to Subareas 1 and 2 include Arroyo Seco, Jackson, and Almond Avenue elementary schools, East Avenue Middle School, and Livermore High School. Existing schools closest to Subareas 3, 4, 5, 6, and 7 include Smith, Sunset, and Joe Michell elementary schools, Mendenhall Middle School, and Granada High School.

The LVJUSD Board-adopted optimum school capacity is 650 students for an elementary school, 800 students for a middle school, and 1,650 students for a high school. Each campus has an overflow component to allow time for planning, funding, and construction of new facilities as needed.

Exhibit 4.9-4
Current Enrollment and Capacities

School	1996 Capacity	October 1996 Enrollment	Remaining Capacity	Enrollment as Percent of Capacity [a]
Elementary Schools				
Almond	490	486	4	99
Arroyo Seco	630	646	-16	103
Christensen (3-5)	450	447	3	99
Croce (K-2)	612	484	128	79
Jackson	612	595	17	97
Marilyn	574	576	-2	100
Michell	594	475	119	80
Portola	600	567	33	95
Rancho	600	604	-4	101
Smith	504	493	11	98
Sunset	610	623	-13	102
Vineyard Alternative	30	30	0	100
Subtotal	*6,306*	*6,026*	*280*	*96*
Middle Schools				
Christensen (6-8)	470	379	91	81
East Avenue	800	736	64	92
Junction	850	714	136	84
Mendenhall	850	827	23	97
Vineyard Alternative	52	52	0	100
Subtotal	*3,022*	*2,708*	*314*	*90*
High Schools				
Del Valle Continuation	171	138	33	81
Granada	1,925	1,390	535	72
Livermore	1,650	1,730	-80	105
Phoenix Alternative	92	89	3	97
Vineyard Alternative	176	151	25	86
Subtotal	*4,014*	*3,498*	*516*	*87*
Total	*13,342*	*12,232*	*1,110*	*92*

Source: Kim McNeely, Facilities Management, Livermore Valley Joint Unified School District, November 13, 1996

a Percent.

Funds for facilities needed to accommodate students from new development historically have come from AB 2926 developer fees, currently $1.84 per square foot for residential construction and $0.28 per square foot for commercial development. In 1992, the City of Livermore adopted Ordinance 1396 which provides full mitigation for new residential development. Full mitigation requirements are reviewed annually as part of the LVJUSD's *Facilities Plan.* Changes in the amount of funding required are made as necessary, based on the District's facility needs.

Schools -- Significance Criteria

Based on *CEQA Guidelines* and recent court decisions [42], the following criterion was use to assess whether the proposed project would result in a significant environmental impact on schools. A project impact is considered significant if it :

- Resulted in a significant adverse physical change in the environment (such as could occur with expansion of Livermore Valley Joint Unified School District facilities)

Schools -- Impacts and Mitigation Measures

Impact 4.9-15 School Impacts

Buildout under the Draft Plan *would require expansion of the Livermore Valley Joint Unified School District (LVJUSD) facilities to meet increased enrollment. However, this expansion (the construction of a school in Subarea 3) is already a part of the* Draft Plan, *and the physical effects of a new school are analyzed in other sections of the EIR. LTS*

Based on development of approximately 1,494 housing units at buildout, implementation of the *Draft Plan* would add 493 elementary, 239 middle school, and 314 high school students to LVJUSD enrollments (a total of 1,046 students). [43] These new students were not included in the master LVJUSD *Facilities Plan.*

According to the LVJUSD, *Draft Plan* buildout would require a new K-8 facility. The *Draft Plan* designates a 20-acre site in Subarea 3 for the LVJUSD to develop a public school, potentially a 900-student joint elementary / middle school. The high school students expected with *Draft Plan* implementation could be accommodated once the planned new third high school has been constructed.

Construction of a school normally would be considered a significant impact under the criterion listed above. However, construction of the new school and its resulting physical effects have been foreseen by the EIR, and the general physical impacts (such as traffic and noise) have been analyzed in the respective sections of the EIR. (Because the school has not yet been designed, the site-specific physical impacts are unknown.) According to recent court decisions [44], non-physical effects (such as overcrowding) are not considered significant impacts under CEQA unless a physical change would result.

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[42] *Goleta Union School District v. Regent of California* (1995) 37 Cal.App.4th 1025.

[43] The LVJUSD assumes 0.70 student per new single-family housing unit, based on generation rates of 0.33 student per unit for grades K-5, 0.16 student per unit for grades 6-8, and 0.21 student per unit for grades 9-12.

[44] *Goleta Union School District v. Regent of California, op cit.*

Mitigation Measure 4.9-15 No mitigation would be required.

Impact 4.9-16 Cumulative School Impacts
Cumulative development would generate additional students to LVJUSD schools. SU

The LVJUSD's geographical cumulative impact area includes any development within the District's boundaries. The *Facilities Plan* estimates all future development in the District based on current plans except for the unincorporated areas of North Livermore, South Livermore, and east of the City of Dublin.

- South Livermore includes the SLVSPA covered by the *Draft Plan.* Thus, development there is analyzed in ***Impact 4.9-15*** (above).

- Unincorporated North Livermore is undergoing planning for future development. The City's North Livermore General Plan Amendment (NLGPA) identified proposed land uses for which a master and specific planning process is underway to identify details of development. Based on the number of housing units allowed by the NLGPA, the LVJUSD estimates that an additional 6.3 elementary, 2.5 middle, and 1.6 high schools would be required to serve the estimated 8,670 students who could be generated. [45]

- The unincorporated area east of Dublin also is undergoing a planning process. This area is under the jurisdiction of the City of Dublin which is preparing an Eastern Dublin General Plan Amendment (EDGPA). Approximately two-thirds of EDGPA development would occur in the LVJUSD. According to the LVJUSD, EDGPA development would require 1.9 elementary, 0.9 middle, and 0.5 high schools. [46]

Planning for the construction of additional facilities to meet the expected demand from the NLGPA and EDGPA cannot be completed until more specific development plans are formulated. Future environmental documentation would be required to determine environmental impacts from school construction. While it would be speculative to determine specific impacts at this time, it is likely that new school construction would result in the general loss of vegetation, an increase in traffic, and potential loss of existing agricultural land.

K-8 students created by development under the *Draft Plan* would attend the new K-8 school proposed for Subarea 3. Therefore, the *Draft Plan* would not contribute to cumulative impacts for these grade levels.

However, the *Draft Plan* would contribute to the demand for additional high schools (314 students). As the physical impacts of new school construction is unknown until more specific locations are developed, this is considered to be a significant impact.

Mitigation Measure 4.9-16 As specific sites for new high schools have not been determined, no mitigation for the specific environmental impacts can be developed.

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[45] *Livermore Valley Joint Unified School District Facilities Master Plan*, op. cit., page 28.

[46] *Ibid.*, page 27.

Significance after Mitigation As no mitigation can be developed, this is considered a significant and unavoidable impact.

LIBRARY SERVICES[47]

Library Services -- The Setting

City of Livermore libraries are funded entirely by the City's General Fund whereas neighboring cities are served by the County. The 18,000-square foot Main Library is located adjacent to the Civic Center on South Livermore Avenue. The existing Main Library facility is too small to meet the growing demands for library service. Library staff currently are considering how to best meet space needs. One option is to expand the Main Library to 52,000 square feet. Another is to expand the Main Library to 30,000 square feet and build a 12-15,000 square foot branch library in the NLGPA area. The third option would be to construct a new 30-40,000 square foot library in the middle of the City and convert the existing Main Library to another use.

Current library use is very high with an annual circulation rate of 11.12 checkouts per capita in 1995-96. Of the City's total population, 72 percent of residents are considered "active borrowers" or have checked out a book within the last two years. The average Bay Area circulation rate is 7.6. In 1995 the Main Library had 261,410 visitors, and the City spent $30.80 per capita on library services in the same year. The General Fund budget for libraries is approximately $2.0 million annually.

There are two branch libraries, a small 2,400-square foot facility in Springtown and a 4,400-square foot library in May Nissen Park at Rincon and Pine. The branch libraries are heavily used.

Library Services -- Significance Criteria

The following criterion was use to assess whether SLVSPA development would result in a significant environmental impact. A project impact would be considered significant if it:

- Resulted in an significant adverse physical change in the environment (such as an expansion of City of Livermore Library facilities)

Library Services -- Impacts and Mitigation Measures

Impact 4.9-17 Library Impacts
Cumulative development in Livermore would require the expansion of the Library system. However, the project's individual impacts are not considerable. LTS

According to library staff, SLVSPA development should not impact the library significantly. However, cumulative development (especially in the NLGPA area) would require the expansion of the Library system -- with expansion of the current Main Library, construction of a new Main Library, or construction of a branch library in North Livermore.

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[47] Information in this section is based on a Nichols • Berman conversation with Susan Gallagher, City of Livermore Library, December 4, 1996.

Planning for the construction of additional library facilities to meet the expected demand from the cumulative development cannot be completed until more specific development plans are created. Future environmental documentation would be required to determine environmental impacts from library construction. While it would be speculative to determine specific impacts at this time, it is likely that new library construction would result in the general loss of vegetation, an increase in traffic, and potential loss of existing agricultural land (for a branch library in North Livermore). Note that the expansion of the library system would not be constructed because of development in the SLVSPA, and would be constructed even if the SLVSP did not proceed. Therefore, the *Draft Plan* is not expected to contribute to any significant cumulative library service impacts. [48]

Mitigation 4.9-17 No mitigation would be required.

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[48] As the project's individual impacts are not "considerable", the cumulative impacts are also less-than-significant (as per *CEQA Guidelines* §15355).

4.10 CULTURAL RESOURCES -- THE SETTING

Archaeology

Prehistory

Archaeological sites in the Livermore-Amador Valley suggest that inland Alameda County was inhabited as early as 1,000 to 2,500 years before the common era when a large fluctuating freshwater lake or marsh and the streams feeding the lake may have supported prehistoric settlement of the Windmiller cultures. [1] One site may represent 5,000 years of cultural deposition. [2] Beginning about 500 years ago, the Meganos culture, called Coastanoan people [3] , occupied the central California coast as far east as the Diablo-Hamilton range and may have occupied permanent settlements or temporary camps until the Spanish or Mexican historical periods of the late 18th to middle 19th centuries. [4] Coastanoans were among four peoples who inhabited the nine Bay Area Counties. Coastanoan tribes shared similar cultural traits and language and consisted of autonomous groups of 100 to 250 people.[5] Activities in the area included specific seasonal tasks, such as hunting or seed gathering, and those associated with more substantial dwelling sites, such as tool procurement and use. The Livermore-Amador Valley is also archaeologically sensitive because of its geographical location as a widely used aboriginal trade route. [6]

Archaeological Resources

Records of archaeological resources are limited in the Livermore area because detailed surveys generally are conducted only in conjunction with environmental review of proposed development projects. This practice means that little site-specific information exists for the majority of the City and adjacent unincorporated areas. Five archaeological sites have been recorded to date in the general South Livermore Valley area (Ala-28, -29, -394, -413, and -483), two of which (Ala-28 and Ala-29) are

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1 *The Course at Wente Brothers Draft EIR*, Alameda County Planning Department, December 1993, citing information collected by Holman Associates and from the California Archaeological Site Inventory, Northwest Information Center, Sonoma State University.

2 *South Livermore Valley Area Plan Draft EIR*, Alameda County, June 1992, citing Busby *et al* (1990), EIP (1989), Hager-Holson (1988), Peak and Associates (1987), and Wilberg (1988).

3 *City of Livermore Community General Plan 1976-2000*, adopted March 1976. The term Coastanoan is derived from the Spanish word "coastenos" which means "coast people".

4 *Poppy Ridge Golf Course Draft EIR*, Alameda County Planning Department, January 1994, citing information collected by Basin Research Associates and from the California Archaeological Site Inventory, Northwest Information Center, Sonoma State University.

5 *Ibid.*, and *City of Livermore Community General Plan, op. cit.*

6 *City of Livermore Community General Plan, Ibid.*

located along the banks of Arroyo Mocho outside the South Livermore Valley Specific Plan Area (SLVSPA).[7] Prehistoric sites in the Livermore-Amador Valley tend to be concentrated adjacent to stream courses and specific hillside land forms, including terraces and benches along drainages, alluvial plains of arroyos, ridgelines, and saddles between ridges.[8] Extensive agricultural use from the Spanish period to present time may have disturbed evidence of prehistoric activity remaining on the ground surface or buried below the surface of the valley floor. However, while some practices can disrupt or destroy cultural remains, other activities can uncover and reveal archaeological materials, as can excavation for development or trenching to install utilities. Prehistoric resources can include:

- Chert or obsidian flakes, projectile points, mortars, and pestles
- Dark friable soil containing shell and bone debris, heat-affected rock, or human burials

History

The arrival of Spanish explorers and missionaries initiated the historic period in the Livermore-Amador Valley.

Spanish Period

In 1769, Spanish explorers led by Gaspar de Portola discovered San Francisco Bay and dispatched a reconnoitering party led by Sergeant Ortega to the opposite shore -- the "contra costa" comprising present day Alameda County -- to search (unsuccessfully) for a land route to Point Reyes. Subsequent expeditions included those by Pedro Fages (1770), Anza (1776), Pedro Amador (1795), and Father Antonio Danti (also 1795), the latter making preliminary explorations and in 1797 constructing Mission San Jose de Guadelupe 12 miles southwest of the Livermore-Amador Valley.[9] Establishment of Mission San Jose, destined to become one of the most prosperous and populous of the California missions, introduced European explorers and travelers to El Valle de San Jose (the Livermore-Amador Valley) through Mission Pass via El Camino Viejo ("the Old Road").[10] El Valle de San Jose and the surrounding foothills were used to graze Mission cattle. During this period, the missionaries also attempted to transform Coastanoans from hunters and gatherers to agricultural laborers.[11]

Mexican Period

Independence from Spain in 1822 inaugurated the Mexican period in Alta California, during which time the missions were secularized (1833) and large land grants were made in the western part of the Valley,

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7 *South Livermore Valley Area Plan Draft EIR, op. cit.*, and *Poppy Ridge Golf Course Draft EIR, op. cit.* The archaeologist who conducted the cultural resources' analysis for the *South Livermore Valley Area Plan EIR*, David Chavez, reviewed his 1992 report and maps and maps of the seven Specific Plan subareas to confirm that no recorded archaeological sites are located in the subareas. Nichols • Berman conversation with Jan Hupman, David Chavez & Associates, May 16, 1995.

8 *South Livermore Valley Area Plan Draft EIR., Ibid.*

9 *Soil Survey, Alameda Area*, U. S. Soil Conservation Service, 1966.

10 *Ibid.*, and *South Livermore Valley Area Plan EIR, op. cit.*

11 *Poppy Ridge Draft EIR, op. cit.*

while the eastern part of the Valley remained unclaimed common terrain.[12] Grants included former mission grazing land, the 48,436-acre Rancho El Valle de San Jose, to four members of the Bernal family by Governor Juan Alvarado in 1835, and the 8,880-acre Rancho Las Positas to Robert Livermore and Jose Noriega. Uses included cattle grazing, pear and olive orchards, and vineyards.

American Period

With the signing of the Treaty of Guadalupe-Hildago in 1848, California became part of the United States, and the discovery of gold on the American River in 1849 triggered an influx of prospectors and stimulated the settlement of Alameda County and the state as a whole. Beginning in the 1850s, grant lands were divided up following challenges to the validity of Mexican grants, pressures from American squatters, and foreclosures after the 1862-1865 drought. By 1874, the U. S. Geological Survey had surveyed and broken up the range lands east of the original ranchos into square-mile (360-acre) sections, half-sections, and quarter-sections, all of which were sold by 1878.

Agriculture dominated the valley. Construction of the Central Pacific Railroad in 1869 and the invention of refrigerator cars in 1889 provided access to markets for a variety of agricultural crops and commodities and permitted diversification from livestock grazing, beginning with wheat and barley and replaced by almonds, apricots, pears, and dairy products. Charles Wetmore, the Wente family, and the Concannon family were among those who pioneered wine-making in the Livermore-Amador Valley in the 1870s.[13] Cuttings Wetmore imported from France in 1883 flourished and by 1889 were producing internationally award-winning wines. Local vineyards were infected by phylloxera in the 1890s, but by the turn of the century more than 5,000 acres of vineyards were supplying 50 wineries. The wine industry continued to prosper during World War I, but only 12 wineries remained when Prohibition was repealed in 1933. Six wineries and 1,500 acres of vineyards remained by the late 1960s when pressures for urban development intensified in the valley.

Historic Resources

No Spanish or Mexican period historic resources are known to remain in any of the seven subareas, six of which are within the boundaries of the former land grant ranchos -- Subareas 3-7 in Rancho El Valle and Subarea 2 in Rancho Las Positas.[14]

No California Historical Landmarks are located within the SLVSPA, although three 19th century wineries located in the vicinity have State landmark designation -- Cresta Blanca Winery, Wente Bros. Winery, and Concannon Vineyard.

The *City of Livermore Community General Plan* lists a fourth winery, the Olivina Winery, as an historic site[15], although a preliminary field survey conducted in 1991 noted but did not examine the

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12 *South Livermore Valley Area Plan Draft EIR, op. cit.*

13 *South Livermore Valley Area Plan*, Livermore-Amador Valley Planning Unit, Alameda County General Plan, adopted by the Alameda County Board of Supervisors, February 1993.

14 "Heritage Sites and Buildings", *City of Livermore Community General Plan, op. cit.*, Figure IV-1. Subarea 1 is located east of Rancho Las Positas grant lands.

15 *Ibid.*

site.[16] The abandoned former Olivina Winery building is located in Subarea 7, and vestiges of the original Olivina Winery estate remain on both Subareas 6 and 7. They include the entry gate at the Arroyo Road-Wetmore Avenue intersection (Subarea 6), the allée of trees planted on the grounds (Subarea 6), and at the unbuilt Olivina Winery estate homesite (Subarea 7).

The *City of Livermore Community General Plan* does not list any other resources in the SLVSPA. The 1991 survey identified three sites in the SLVSPA as potential historic resources, but the structures do not have any official designation.[17] They are:

5624 Tesla Road This is the site of a turn-of-the-century farmhouse, barn, and outbuildings characterized as exhibiting "fair integrity". These structures are located on the southern Wente parcel in Subarea 2.

2235 Wente Street This is the site of a two-story circa 1890 farmhouse, barn, outbuildings, and tank house described as exhibiting "very good integrity". These structures are located on the Caldeira parcel in Subarea 3.

2927 Hansen Road This is the site of a circa 1920 farmhouse, barn, and outbuildings of "very good integrity". These structures are located on the Zumbach Ranch in Subarea 4.

Additional sites of historic interest not identified above are the Charles Wetmore home (remains of the foundation) and Twin Oaks Farm (the former training facility of world champion boxer Max Baer, destroyed by fire), both located in Subarea 5.

The "integrity" of historic resources is a concept which originally was established by the U. S. Department of Interior to determine the eligibility of resources for inclusion on the National Register of Historic Places.[18] It is now standard practice to use the criteria which define integrity to assess the significance of historic resources regardless of their National Register eligibility. The National Register program defines seven aspects of an historic resource's integrity -- location, design, setting, materials, workmanship, feeling, and association. To retain its historic integrity, a property will always possess several, if not most, of the seven qualities defining integrity. Criteria for evaluating historic resources are presented in Exhibit 4.10-1.

Historic resources are presumed to be historically or culturally significant if they are included in a local register of historic resources, such as officially designated properties listed in a local ordinance.[19] A resource listed in the California Register of Historic Places must be treated as an historic resource, but one not listed is only presumed to be an historic resource. Any resource must be assessed to determine whether it would qualify for listing on either Register. The eligibility for State or Federal designation of the potential resources identified above is not known at this time and would require surveys to

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16 *South Livermore Valley Area Plan Draft EIR, op. cit.*

17 *Ibid.* The EIR listed 21 potential resources identified in the preliminary 1991 survey. The geographic study area of the County's planning effort covered a larger area than the seven subareas selected as candidate City urban development areas, thus eliminating all but three potential resources previously listed.

18 *Secretary of Interior Standards for Rehabilitation and Guidelines*, U. S. Department of Interior, 1990.

19 *Guide to the California Environmental Quality Act (CEQA)*, Remy, Thomas, Moose, and Manley, 1996.

Exhibit 4-10.1
Criteria for Evaluating Historic Properties

The *National Register's* standards for evaluating the significance of properties were developed to recognize the accomplishments of all peoples who have made a contribution to our country's history and heritage. The criteria are designed to guide State and local governments, Federal agencies, and others in evaluating potential entries in the National Register.

Criteria for Evaluation

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

a. that are associated with events that have made a significant contribution to the broad patterns of our history; or

b. that are associated with the lives of persons significant in our past; or

c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

d. that have yielded, or many be likely to yield, information important in prehistory or history.

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

a. a religious property deriving primary significance from architectural or artistic distinction or historic importance; or

b. a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

c. a birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his productive life; or

d. a cemetery that derives its primary significance from the graves of persons or transcendent importance, from age, from distinctive design features, or from association with historic events; or

e. a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

f. a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or

g. a property achieving significance within the past 50 years if it is of exceptional importance.

determine.

The *City of Livermore Community General Plan* contains archaeological and historical resource policies. These include:

- ***Archaeological and Historical Resources Policy 6(b)*** If an archaeological site is discovered during construction, all work in the immediate vicinity shall be suspended pending site investigation by qualified professionals. If, in the opinion of a qualified professional, the site will yield new information or important verification of previous findings, the site shall not be destroyed.

- ***Archaeological and Historical Resources Policy 6(e)*** The City shall encourage and, when possible, require the preservation of places, sites, areas, buildings, structures, and works of man which have cultural, archaeological, or historical significance or other special distinction to the community.

- ***Archaeological and Historical Resources Policy 6(f)*** The City shall make architectural design requirements conditions of approval for use permits for relocating or renovating of historical buildings. Similar restrictions shall be applied to the modification or construction of structures adjacent to historical buildings.

The City of Livermore has established the Cultural Heritage Commission to administer and maintain the City's cultural heritage program which is intended to preserve areas of special historical, cultural, architectural, archaeological, community, or aesthetic value.[20] Adopted City regulations to protect heritage buildings, defined to be more than 50 years old, and to require Commission review of proposals to demolish such buildings. The City also has adopted two historic preservation zoning districts. The HP-L (Landmark) district is used to protect a site's most important historic features and gives the City authority to review any modifications proposed. The HP-H (Heritage) district gives the City authority to review proposed exterior modifications which would be visible for adjacent streets.

The Livermore Area Recreational and Park District's (LARPD) owns and operates Ravenswood Park, an historic site located on Arroyo Road adjacent to Subareas 4 (east) and 5 (south).

Other historic resources may be located in the SLVSPA, including:

- Stone or adobe foundations or walls
- Structures and remains with square nails
- Refuse deposits, often in old wells and privies

4.10 CULTURAL RESOURCES -- IMPACTS AND MITIGATION MEASURES

Significance Criteria

Under the California Environmental Quality Act (CEQA), adoption and implementation of the *South Livermore Valley Specific Plan (Draft Plan)* would have a significant effect on a cultural resource if subsequent public or private development damaged or disturbed significant archaeological or historical

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[20] *Information Sheet 31*, City of Livermore Planning Department, February 1993.

resources or a property of historical or cultural significance to a community or ethnic or social group. A significant resource is a location which meets one of the following criteria of Appendix K of the *State CEQA Guidelines:*

- It is associated with an event or the life of a person of recognized significance in California or American history or recognized scientific importance in prehistory
- It can provide information which is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions
- It has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind
- Is at least 100 years old and possesses substantial stratigraphic integrity
- Involves important research questions which historical research has shown can be answered only with archaeological methods

In Livermore, a building which is more than 50 years old is considered a heritage building by the City.

Impacts and Mitigation Measures

Impact 4.10-1 Archaeological Resources

No recorded archaeological resources are known to be located in the SLVSPA, although the SLVSPA is located in a larger archaeologically sensitive area. Construction activities (to build roads, install utilities, and build new residential and commercial development) and agricultural operations (to install and maintain vineyards and orchards) could uncover and damage or destroy subsurface archaeological resources potentially present in the SLVSPA. LTS

In the absence of records documenting known archaeological sites in the SLVSPA, the potential for the presence of cultural resources is completely unknown. However, the Livermore-Amador Valley may have been occupied for 1,000 years or longer, and recorded sites are located near the SLVSPA -- two on the banks of Arroyo Mocho and additional sites recorded elsewhere in the vicinity. Therefore, activities undertaken to implement the *Draft Plan* which disturb the ground surface could uncover resources, neither the presence nor significance of which is currently known. Such resources could provide information useful in addressing scientifically consequential questions about:

- Prehistoric settlement patterns in the Livermore-Amador Valley
- Subsistence, trade, and economic practices
- Social and cultural customs
- Cultural exchange

In the event that previously unknown cultural deposits are encountered during any SLVSPA development, work would need to be halted in the vicinity of the find, a professional archaeologist consulted, and an appropriate course of action developed which is acceptable to all concerned parties. All such procedures would need to be conducted according to CEQA Appendix K cultural resource management requirements and, as appropriate, in strict compliance with all State laws regarding Native American burials.

Depending on the extent and cultural composition of materials discovered, it also may be advisable to

have subsequent excavation monitored by an archaeologist who would be ready to record, recover, and / or protect significant cultural materials from damage. In the event that human skeletal remains are discovered anywhere on a site, work in the vicinity of the discovery would need to be discontinued and the County Coroner contacted. If skeletal remains are found to be prehistoric, the Coroner would need to call the Native American Heritage Commission in Sacramento which would designate the "Most Likely Descendant" of the remains. The Most Likely Descendant would be responsible for recommending the disposition and treatment of the remains. Although the likelihood of encountering human skeletal remains is not known, it is important to have a procedure for alternative tasks which can be implemented quickly if remains are discovered. This allows construction work to continue elsewhere on a site while the remains are investigated.

The *City of Livermore Community General Plan* already contains Archaeological and Historic Resources Policy 6(b), adherence to which would mitigate the potential impacts on archaeological resources discovered in the SLVSPA. No additional measures would be necessary either to include in the *South Livermore Valley Specific Plan (Draft Plan)* (to supplement adopted *Community General Plan* Policy 6(b)) or to require of individual development projects (as conditions of approval). Nevertheless, the *Draft Plan* contains the following goal to reaffirm existing City policy:

- ***GOAL*** To preserve South Livermore's heritage as embodied in the area's historic structures and cultural resources.

Mitigation Measure 4.10-1 No mitigation would be required.

Significance after Mitigation City's Archaeological and Historic Resources Policy 6(b), combined with the basic goal of the *Draft Plan's* Conservation and Resource Management Element, would ensure that potential impacts on archaeological resources from implementation of the *Draft Plan* would be less-than-significant.

However, compared with the Modified Moderate (assumed by the *Draft Plan*) or Maximum Annexation alternatives, approval of the Minimum or Moderate Annexation alternatives would exclude Subarea 6 from City jurisdiction. Without annexation of Subarea 6 to the City, neither agricultural nor development activities would be subject to existing City Policy 6(b). Nevertheless, the County's *South Livermore Valley Area Plan EIR* contains a mitigation measure equivalent to City Policy 6(b) for activities in the unincorporated area covered by the *Area Plan*. That EIR's Mitigation Measure I-1(c) states:

- If any archaeological sites are found during construction, all work in the immediate vicinity shall be suspended pending site investigation by qualified professionals. If, in the opinion of a qualified professional, the site will yield new information or important verification of previous findings, the site shall not be destroyed.

Therefore, no additional measures would be required to mitigate the impacts in the event that the City adopts the either Minimum or Moderate Annexation alternatives.

Responsibility and Monitoring The City and County would be responsible for requiring implementation of existing City Policy 6(b) and Mitigation Measure I-1(c), respectively, on a project-by project basis as conditions of approval for individual development projects. Landowners / developers would be responsible for including such provisions in contractors' contracts. Archaeologists retained to assess finds and recommend their disposition would be responsible for monitoring to determine

successful compliance.

Impact 4.10-2 Historic Resources
Buildout of the SLVSPA could result in the removal of potential historic resources. LTS

Only one formally designated historic resource is located in the SLVSPA. It is the Olivina Winery building in Subarea 7, listed by the *City of Livermore Community General Plan.* Other existing buildings, former buildings, sites, or features in the SLVSPA are of potential historic interest (and are more than 50 to 100 years old) but currently have no official local, State, or Federal protection.

The *Draft Plan's* site plan for Subarea 7 would retain the former Olivina Winery site as is and designate it and surrounding land for regional park use without converting the building or site to another use. New residential development and a landscape buffer would be located on a higher elevation terrace south of the site. The *Plan* indicates that the winery building would be dedicated to the LARPD as part of implementing the *Plan.* The *Plan* further reports that the LARPD has expressed an interest in restoring the structure for use as an historical interpretive center. It contains the following policies:

- ***Policy 6-27*** As a condition of receiving title to the land on which the Olivina Winery is located, LARPD will be encouraged to restore the Olivina Winery structure as an interpretive center for the public.

The *Draft Plan* also addresses the Olivina Winery entry gate (Subarea 6) and decorative landscaping (Subareas 6 and 7) planted on the former Olivina Winery estate. It calls for preserving both features and states:

- ***Policy 6-28*** The Olivina gate and entry drive shall be preserved as historic features which refer to the South Valley's past. Although the entry drive is not required to be open to public access, the allée of trees along the drive shall be replanted to re-establish the tree-shaded lane that once existed. Replanting shall occur prior to or concurrent with the agricultural planting of Subarea 6.

- ***Policy 6-29*** The double row of almond trees along the northern perimeter of the terrace in Subarea 7 should be replanted and some reference (such as a plaque, vista point, etc.) should be made to the site which was once planned for the Olivina Estate home.

Implementation of the *Draft Plan* would explicitly preserve two of three sites identified in 1991 as potential historic resources but which have no formal designation. They are the Caldeira and Zumbach residences in Subareas 3 and 4, respectively. The *Plan* would retain the existing Caldeira residence and farm compound at 2235 Wente Street for eventual conversion to a bed and breakfast inn if not used as a residence. The *Plan* also would retain the Zumbach residence and equestrian facility at 2927 Hansen Road with no change in use envisaged. The historic architectural integrity of these buildings or building groups has not been determined to date through site-specific surveys or research of historic records, photographs, and other sources. Future alterations, particularly during conversion and renovation of the Caldeira site, potentially could affect the integrity of these resources adversely and / or result in the loss of contributory buildings which define the overall character of the sites. *Draft Plan* policies which address these issues include the following:

- ***Policy 6-30*** New development in the Specific Plan area shall protect Livermore's cultural heritage and historic resources consistent with City policies, including the preservation and / or adaptive reuse of sites, buildings, structures, and other features which are related to or reminiscent of the

South Valley's rural agricultural heritage.

- ***Policy 6-31*** All properties with historic resources which may be impacted by future development shall be subjected to in-depth research to determine the significance of the source prior to any alteration.

- ***Policy 6-32*** Where disruption of historic resources is unavoidable, encourage the adaptive reuse or restoration of historic structures or features (such as farm residences, old barns, and outbuildings) wherever feasible.

The third potential historic resource, the 5624 Tesla Road compound, is located outside the Subarea 2 development area and within potential agricultural land currently planted with vineyards and envisaged to remain in active production with implementation of the *Draft Plan*. The *Plan* would preserve this potential resource implicitly because no additional development would be allowed other than that identified by the *Plan* (in Subarea 2 or any subarea) and because the *Plan* contains the goal "to preserve South Livermore's heritage as embodied in the area's historic structures and cultural resources". While this passive protection could result in deterioration due to normal wear-and-tear or lack of upkeep, Policies 6-30 through 6-32, listed above, would minimize alterations incompatible with the historic features of the potential resource.

The *Draft Plan* identifies a potential small winery site adjacent to the Wetmore House ruins in Subarea 5. Charles Wetmore was among the Livermore-Amador Valley's pioneering vignerons who, in the 19th century, imported cuttings of wine grape vines from France and produced internationally award-winning wines from those valley vines. Therefore, the site itself is significant historically, although buildings from that period do not remain *in tact*. Future winery construction would not displace or damage extant surface features and, in fact, could be considered an appropriate land use to commemorate the historic significance of this site. Resources of potential historic interest dating from Wetmore's period also could be present below the ground surface and could be exposed during excavations to build new foundations, basements, or utility trenches.

Remains of Twin Oaks Farm do not survive, although resources of potential historic interest dating from Max Baer's period could be present below the ground surface. The significance of the Max Baer training site probably would be of less relevance to wine country visitors than to Livermore residents who respect their heritage or sports enthusiasts who have a special interest in boxing. *Draft Plan* Policies 6-30 through 6-32 also would minimize potential impacts on resources, if present. Implementation of Policy 6-33 would specifically acknowledge the Wetmore site:

- ***Policy 6-33*** LARPD, in conjunction with interested groups (such as Friends of the Vineyards and the Livermore Cultural Heritage Commission), should develop a self-guided history tour that identifies important historic sites and features within the Valley and includes exhibits / plaques at each location that explain each site's significance.

Mitigation Measure 4.10-2 No mitigation would be required.

Significance after Mitigation *Draft Plan* Policies 6-27 through 6-33 would ensure that potential impacts on surface and subsurface historic resources from implementing the *Plan* would be less-than-significant.

As discussed under Mitigation Measure 4.10-1, approval of the Minimum or Moderate Annexation

alternatives would exclude Subarea 6 from City jurisdiction. However, the County's *South Livermore Valley Area Plan EIR* contains Mitigation Measure I-4(a) and (b):

- ***Mitigation Measure I-4(a)*** Require that any proposals to remove historic structures in the Plan Area be reviewed by qualified professionals.

- ***Mitigation Measure I-4(b)*** Encourage urban development projects in the Plan Area to preserve historic structures. Appropriate means for preserving an historic structure include renovation or moving it to another location.

A secondary impact of relocation under Mitigation I-4(b) could be to remove a resource from its setting and unalterably change its integrity, such as the Olivina Ranch entry gate. In addition, this measure would not provide feasible mitigation for mature trees which could not survive relocation.

Responsibility and Monitoring The City of Livermore's Cultural Heritage Commission would be responsible for implementing and monitoring *Draft Plan* Policies 6-27 through 6-33 and *General Plan* Archaeological and Historic Resources Policies 6(b), (e), and (f).

5.0 ALTERNATIVES

This chapter of the EIR assesses four alternatives to the *Draft South Livermore Valley Specific Plan (Draft Plan)*, compares the differences in outcome with the effects of implementing the *Draft Plan*, and identifies the "environmentally superior" alternative pursuant to the *State CEQA Guidelines (Guidelines)*. They are the:

- No development variation of the no project alternative
- Existing zoning variation of the no project alternative
- 1,200-unit development alternative
- 1,482-unit consolidated development alternative

The no development and existing zoning variations of the no project alternative are specifically required by the California Environmental Quality Act (CEQA), that statute's implementing *Guidelines*, or case law resulting from judicial decisions. All four are summarized in Exhibit 5.0-1 (below), described and analyzed in ***Sections 5.1*** through ***5.4***, and compared in ***5.6 Environmentally Superior Alternative*** and Exhibit 5.6-1 (at the end of this chapter).

Exhibit 5.0-1
Comparison of Alternatives

Alternative	Subarea[a]							Total
	1	2	3	4	5	6	7	
Draft Plan	133	574	177	130	176	0	304	1,494
No Development Alternative	0	0	0	0	0	0	0	0
Existing General Plan Alternative	7	18	4	13	7	9	28	86
1,200-Unit Development	106	460	142	105	142	0	245	1,200
1,482-Unit Development	7	769	226	13	430	9	28	1,482

a Housing units.

This chapter also addresses several subalternatives for Subarea 7. Although not required by CEQA, these subalternatives were developed in response to public concerns regarding the unique resource characteristics of Subarea 7. The Subarea 7 subalternatives are presented in ***Section 5.5*** and are summarized in Exhibit 5.5-1.

BACKGROUND

EIRs are required to assess a range of alternatives which feasibly could attain the project's objectives and avoid or substantially reduce the significance of the project's impacts. While an EIR potentially could evaluate an infinite number of alternatives, environmental analyses necessarily must focus on a manageable number of alternatives. The purpose is to provide a range of reasonable choices to enable informed decision-making, not to examine every conceivable alternative. The alternatives analyzed in this EIR ultimately were selected because their evaluation and that of the *Draft Plan* would provide readers and public officials with sufficient information to judge the relative advantages or disadvantages of other possible development or non-development variations. This approach also attempts to avoid assessing alternatives which differ too little from each other to provide additional meaningful insights about their environmental effects.

In addition to the alternatives identified above, two types of alternatives also were considered but ultimately were not evaluated as feasible alternatives in the EIR. One type included alternative site plans for the subareas (apart from Subarea 7). The other involved off-site alternatives.

Alternative Site Plans

The City's planning process to prepare the *Draft Plan* was an iterative process which involved the City's planning consultant, Advisory Committee, staff, and public. (Livermore's Planning Commission and City Council also reviewed and commented on the Advisory Committee's preferred plan before directing the planning consultant to complete and the publish the *Draft Plan.*) The process was designed from the outset to consider and refine alternatives which would reflect input and direction from participants.

Environmental input also was integral to the planning process from the outset. The reason for incorporating environmental information was to ensure to the greatest extent possible that development concepts would be environmentally sensitive.

The first step in the planning process involved preparation of an environmental constraints and opportunities analysis. It identified conditions which could affect the location of development within subareas, prerequisites for development (such as infrastructure and access requirements), or other considerations to take into account in formulating plans for the subareas. The purpose of the constraints analysis was to inform the planning process and to ensure that development concepts would avoid, minimize, or mitigate significant effects on the environment. (Additional environmental information subsequently was developed during preparation of this EIR, and the EIR "tests" the extent to which buildout according to the *Draft Plan* would avoid or reduce the magnitude of impacts.)

The next step in the process involved the design of two conceptual development plans for each subarea in order to obtain preliminary input. Based on comments and direction during that and each subsequent step, the alternatives were further refined, eventually narrowed to one plan per subarea, and ultimately developed into the comprehensive site planning concepts presented in the *Plan.*

The preliminary alternatives differed in the approximate number of units per subarea but remained within a generally expected range of 1,200 to 1,600 units which had emerged from the County's *South Livermore Valley Area Plan (Area Plan)* process and the City's original efforts to initiate the *Draft Plan* process beginning in 1993. Other differences involved site planning concepts within the subareas (such as various lot patterns and locations to avoid environmentally sensitive parts of subareas).

Alternatives considered but not pursued were those which failed to obtain consensus among Advisory Committee members, satisfy City goals and objectives for the SLVSPA, meet landowner expectations, or fulfill feasibility tests (such as meeting economic requirements of the agricultural mitigation program, infrastructure costs, and marketability).

For the EIR to revisit these or other alternatives would duplicate the process completed to date and would not add to readers' understanding of the *Draft Plan.*

Off-Site Alternatives

The California Supreme Court has recognized two general classes of potential alternatives to a proposed project for analysis in EIRs. These include alternative uses on the same site where the project is proposed and off-site locations for the proposed uses. The reason for assessing off-site alternatives is to evaluate the extent to which significant impacts attributable to the project as proposed -- SLVSPA

development -- could be alleviated at a different location. Off-site locations selected for analysis should feasibly attain the basic objectives of the project -- in this case, the *Draft Plan.*

No off-site alternatives were analyzed in this EIR. This was for a number of reasons. First, the purpose of the *Draft Plan* is to identify the pattern and density of SLVSPA buildout -- to define what will constitute the southernmost edge of the City and to protect agricultural land in the South Livermore Valley beyond that City's ultimate southern boundary. City adoption and implementation of the *Draft Plan* will finalize the urban component of the County's *Area Plan.* Therefore, development envisaged in the SLVSPA could not occur elsewhere -- at an alternative site outside the SLVSPA -- because the planning area is intended to create the City's permanent boundary in South Livermore Valley. Such development could not be relocated to another site and still accomplish that central aim. In addition, development at a different location could not fulfill the companion aim of preserving agricultural land in the South Livermore Valley by implementing the agricultural mitigation program established by the *Area Plan* and reiterated by the *Draft Plan.*

For instance, development of an equivalent number of housing units, potential commercial sites, and other features of the *Draft Plan* theoretically could be accommodated in North Livermore. North Livermore is largely vacant, and a joint City, County, and landowner planning process currently is under way there to prepare master, urban area, and specific plans for the first development area. According to the City's *North Livermore General Plan Amendment (GPA)*, the GPA area is expected to be developed with approximately 12,040 urban area housing units and 345 rural area units (resulting in a 30,000-person residential population) and with employment-generating uses (accounting for an estimated 11,500 jobs).[1] While this capacity would more than accommodate the magnitude of development envisaged by the *Draft Plan* (1,494 housing units and a potential population of 3,915-4,160 residents), it would not fulfill the area-specific goals and objectives for the SLVSPA sought by the *Draft Plan* for the South Livermore Valley. Relocation of SLVSPA development to North Livermore would not revitalize and provide for the long-term preservation of viticulture in the South Livermore Valley.

Nevertheless, the City's 1993 *North Livermore General Plan Amendment (GPA) Draft EIR* assessed two alternatives which bracket the 3,915- to 4,160-resident SLVSPA *Draft Plan* population. That prior EIR's No Project and Reduced Density Alternatives examined populations of approximately 3,100 to 7,600 people in GPA area (but assessed their relative effects in relation to buildout of the GPA area uses). The prior EIR also assessed an Increased Population Alternative which assumed 45,000 residents in the North Livermore GPA area. This latter level of growth would surpass the addition of 3,915-4,160 SLVSPA residents to GPA area land uses. The *GPA EIR* concluded that impacts from the Increased Population Alternative would be greater than from development according to the *North Livermore General Plan Amendment.*

Second, transferring potential SLVSPA development elsewhere in the City other than in North Livermore would conflict with infill potential in those areas while still failing to accomplish the City's goals and objectives for the SLVSPA.

Furthermore, building the amount of new development envisaged by the *Draft Plan* in the vineyard area

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[1] The County's *East Area Plan* envisages the addition of 23,172 housing units and 7,831 jobs in North Livermore by buildout of that subarea (approximately 65,000 people based on the 2.8 persons per household used in the *East County Area Plan EIR*).

-- the permanent agricultural zone south of the SLVSPA -- would conflict with adopted City and County policies about the location of urban growth contained in the South Livermore Valley Policies of the *City of Livermore's Community General Plan* and the County's *Area Plan.* One of the Advisory Committee's initial tasks was to identify the SLVSPA subareas and preliminarily estimate the approximate development capacity of each. That process focused on including land in close proximity to the existing City boundary where new development could occur without resulting in significant dislocations or impacts on existing land uses. Proximity to the City was a main criterion in order to minimize the costs to extend public facilities to new development and to avoid leap-frog development with its attendant growth inducements. Primary and secondary locational criteria are listed in Exhibit 5.0-2. An analysis of other potential sites in the South Livermore Valley for this EIR would repeat that completed process and the consensus previously reached by the participants in selecting seven subareas analyzed in this EIR.

Exhibit 5.0-2
Locational Criteria for SLVSPA Subareas

Primary Locational Criteria
• Contiguous to City Limits. Generally contiguous to existing urban development. • Forms logical urban edge. Facilitates creation of permanent urban / rural boundary. • Feasible for and facilitates extension of infrastructure and services. • Minimizes impacts on significant viewsheds. • Meets requirements for annexation per LAFCO (contiguity, natural conditions, adequacy of services, orderly expansion, effects on agricultural preserves and open space, conformity to general plan). • Minimizes impacts on existing / potential agricultural land / operations. Avoids environmentally sensitive features and impacts to important public facilities. • Minimizes impacts on rural character. • Facilitates development of circulation system • Promotes development of general benefit to the City regarding provision of public facilities, amenities, schools, parks, etc.
Secondary Locational Criteria
• Minimizes impacts to rural landowners and existing residential development. • Encourages in-fill and compact development. • Uses natural or man-made features to define boundaries. • Protects or incorporates features to enhance wine country entryways.

For these reasons, the EIR analysis did not identify potential alternative sites or investigate the extent to which development of other sites could avoid or alleviate impacts expected in and around the SLVSPA subareas.

The alternatives selected for analysis are presented below.

5.1 NO DEVELOPMENT ALTERNATIVE

CEQA requires every EIR to evaluate a "no project" alternative to provide a baseline for comparing environmental impacts. This EIR assesses two variations of the "no project" alternative. One is the *No Development* variation (this alternative). The other is the *Existing General Plan* variation of the "no

project" alternative (***5.2 Existing General Plan Alternative***).

The *No Development* variation of the "no project" alternative assesses continuation of existing environmental conditions with no development at this time at any location in the SLVSPA. This means that the *Draft Plan* would not be implemented, and existing uses would remain unchanged. This alternative acknowledges that development could occur at a future time, consistent with existing County land use designations and zoning. (Such development is assessed in ***5.2 Existing General Plan Alternative***.) Therefore, it is not an open space alternative. Instead, it provides a basis for understanding the effects of SLVSPA buildout according to the *Draft Plan* and for comparing those effects with impacts expected from the other alternatives, as well as illustrating the effects of maintaining the *status quo* should existing conditions persist unmitigated. With the *No Development Alternative*, other growth in the region would continue to occur, but the SLVSPA would not contribute to this cumulative development.

LAND USE

The *No Development Alternative* would not accomplish the land use goals and objectives of the *Draft Plan* and would not result in any land use changes, including no land use conversions and no loss of prime soils, although it cannot be assumed that agricultural use would be reintroduced on fallow land. Non-renewed Williamson Act contracts will expire with either the *No Development Alternative* or *Draft Plan*. However, with the *No Development Alternative*, non-renewal of these contracts would be expected to presage development without benefit of *Draft Plan* policies to provide both for orderly growth and preservation of other agricultural lands. Maintenance of the *status quo* would create no new land use conflicts between incompatible adjacent uses and would not result in new urban-rural conflicts.

GEOLOGY

Because no development would occur in the SLVSPA with the *No Development Alternative*, people and property would not be exposed to potential geologic hazards. However, the *No Development Alternative* would maintain opportunities to locate and exploit mineral and aggregate resources. (The effects of the *Draft Plan* and other EIR alternatives on mineral or aggregate resources would not differ. Because these effects would not represent significant impacts associated with SLVSPA land use and development, they are not discussed further in relation to the other alternatives.)

HYDROLOGY

The *No Development Alternative* would leave the existing hydrologic system in the SLVSPA intact. This alternative would avoid changes in the stormwater drainage patterns in Subareas 4 and 7, but minor periodic roadway flooding in Subareas 1, 2, and 5 would continue in the absence of roadway culvert upgrading. Erosion and sedimentation hazards would be avoided, and existing levels of stormwater quality and groundwater recharge would be preserved. Because no development would occur in the SLVSPA with the *No Development Alternative*, exposure to potential flooding impacts from a catastrophic failure of Del Valle Dam would not affect new residents or newly built structures. (Because this inundation hazard would be similar for the *Draft Plan* and other alternatives, differing only in the number of future residents potentially affected -- reflecting the density of the respective alternatives -- it is not discussed further in relation to the other alternatives.)

BIOLOGY

No new residential or commercial development would occur under this alternative. However, in the event that intensive agricultural use is expanded in the SLVSPA, it could contribute to a further reduction in non-native grasslands and possibly affect sensitive biological resources (such as seasonal wetlands or essential breeding habitat for wildlife). Conversion of grasslands to vineyards and orchards would eliminate the habitat these areas provide for wildlife. Although a detailed wetland delineation has not been prepared, many of the subareas appear to contain scattered seasonal wetlands which could be eliminated with plowing of fields and grading for intensive agriculture. Essential habitat for a number of special-status species also could be affected, including possible breeding pools for freshwater shrimp and California tiger salamander and nesting habitat for burrowing owl and tree nesting raptors. Supplemental surveys would be required to determine whether any sensitive habitat could be affected by agricultural expansion. however, because existing zoning allows agricultural use, it is unlikely that any supplemental surveys would be conducted. Sensitive resources could be lost without mitigation unless the Corps, USFWS, or CDFG pursued possible violations of State and / or Federal laws pertaining to protection of wetlands and special-status species.

TRAFFIC

With no new SLVSPA development, this alternative would not generate additional traffic or result in any of the traffic impacts expected from implementation of the *Draft Plan*, although cumulative traffic volumes would increase, generated by other development in the study area. With no new SLVSPA development, a signal would not be needed at the Vallecitos / East Vineyard intersection, and neither over-capacity conditions on Isabel Avenue north of Stanley Boulevard nor worsening of already projected over-capacity conditions on Vallecitos Road south of East Vineyard Avenue would occur. (Future conditions without SLVSPA development are discussed in detail in ***4.5 Transportation and Circulation***.)

AIR QUALITY

This alternative would avoid the construction, local, and regional air quality impacts associated with the *Draft Plan*.

NOISE

This alternative assumes no new development whatsoever within the SLVSPA. As a result, no noise impacts would result from the No Development Alternative.

AESTHETICS

No development would result in no visual changes in the SLVSPA, and, therefore, no impacts would result from this alternative.

PUBLIC SERVICES

No development would mean that no extra demand would be placed on service providers, and, therefore,

no impacts would result. While future cumulative conditions would continue to be a problems (such as future water and wastewater capacity), the SLVSPA would not contribute to these future conditions under this alternative.

Because no development would occur, services would not be improved. For example, Subarea 7 would not install improved fire access and water supply infrastructure, and, therefore, wildfire protection would not be improved.

ARCHAEOLOGY

With no trenching, excavating, or site preparation for the *No Development Alternative*, construction activities would not uncover subsurface cultural resources in the SLVSPA. This means that pre-historic or historic artifacts would not be damaged or destroyed but also that there would not be opportunities to recover, examine, and preserve such remains if uncovered. Agricultural activities which affect the subsurface (such as discing) occasionally reveal resources but can be equally responsible for damaging cultural materials. The *No Development Alternative* would not provide added protection for specific historic resources (Caldiera residence, Zumbach ranch complex, or Olivina Ranch features) other than existing County policy, compared with the *Draft Plan*. Because cultural resource impacts generally would be similar for the *Draft Plan* and other alternatives, they are not discussed further in relation to the other alternatives assessed below.

5.2 EXISTING GENERAL PLAN ALTERNATIVE

The *Existing General Plan* variation of the "no project" alternative assumes eventual development permitted by the County's *South Livermore Valley Area Plan (Area Plan)* and Cultivated Agricultural Overlay District. The *Area Plan* and overlay district allow limited but strictly regulated development in exchange for planting and placing easements on agricultural land. Rather than requiring 100-acre minimum parcels, the *Plan* and district offer the option of one unit per 20 acres provided that the home site would not exceed ten percent of site size and that 90 percent of the site would be committed to intensive agricultural cultivation. Based on that density, a total of 86 units theoretically could be built in the SLVSPA without accounting for constraints (such as terrain) which could reduce this number. [2] This maximum estimated number of units was calculated as follows:

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[2] This is the maximum potential number of units estimated on a subarea-by-subarea basis. Actual site topography, parcel shape, and the presence and location of existing development would determine how many 20-acre parcels could be created and units built. It is expected that the actual number of lots / units would be fewer than 86

Exhibit 5.2-1
Existing General Plan Alternative

	Subarea[a]							Total
	1	2	3	4	5	6	7	
Total Area	170.4	400.7	96.6	301.0	154.7	185.4	577.9	1886.7
Existing Uses to Remain	18.5	0.0	0.0	35.2	11.2	0.0	0.0	64.9
Area Available to Subdivide	151.9	400.7	96.6	265.8	143.5	185.4	577.9	1,821.8
Potential Homesite (10 percent)	15.2	40.1	9.7	25.6	14.4	18.5	57.8	181.3
Potential Agricultural Land	136.7	360.6	86.9	240.2	129.1	166.9	520.1	1,640.5
Units (one unit / 20 acres)	7.6	18.0	4.8	13.3	7.2	9.3	28.9	
Total Units *Rounded*	7	18	4	13	7	9	28	86

a All areas in acres.

The *Existing General Plan Alternative* assumes use of on-site septic systems and no extension of public sewers. Domestic water service would be supplied by individual private wells, but Zone 7 would provide untreated irrigation water. At least 90 percent of each 20-acre lot would be cultivated intensively. This alternative assumes no new commercial uses [3], no park in Subarea 2, and no school in Subarea 3.

LAND USE

In the absence of a specific plan for the SLVSPA, the *Existing General Plan Alternative* would not fulfill the policy expectations of either the County's *Area Plan* or *City of Livermore Community General Plan's* South Livermore Valley Policies. Thus, the planning process -- to establish the southernmost boundary of the City's urban area and, through the *Area Plan* and *Draft Plan's* agricultural mitigation program and accompanying policies, to preserve and revitalize viticulture in the SLVSPA -- would be incomplete and unlikely to be pursued for the immediate future.

The *Existing General Plan Alternative* assumes subdivision of land into 20-acre parcels. In the SLVSPA, ten holdings are 40 acres or larger in size, capable of being divided into 20-acre parcels, and potentially could be subdivided into 66 parcels. [4] This process of "parcelization" into smaller properties normally forecloses any future consolidation, thus making permanent a pattern of small 20-acre

[3] While the County's *Area Plan* permits new commercial uses within the Cultivated Agricultural Overlay District -- the district which permits 20-acre parcels -- such commercial uses must be limited to the ten percent of parcel area not dedicated to agriculture. While this could permit a home site, commercial site, or both, this alternative assumes that 86 residential units would preclude commercial use.

[4] The following parcels could be divided (the maximum theoretical number of new parcels is in parenthesis): Coast (2) in Subarea 1, Wente (10) in Subarea 2, Caldiera (3) in Subarea 3, Corbett (2), Hansen (4), McKissick (2), and Zumbach (3) in Subarea 4, Alameda County (3) in Subarea 5, Lonestar (9) in Subarea 6, and Crohare (28) in Subarea 7. It is likely that fewer parcels could be created due to constraints (such as steep topography) in some areas.

holdings. [5] It is possible for commercial agriculturalists to cultivate 20-acre parcels viably for certain types of high value crops. However, 20-acre parcels are equally susceptible to conversion and development primarily for residential uses -- as with large-lot ranchettes or rural estates. In such cases, agricultural land remaining on parcels which surrounds the homesites constitutes "hobby farming" or functions effectively as landscaped open space. [6] Recent experiments in maintaining active agricultural operations on ranchettes or rural estates remain inconclusive, making it impossible to predict the long-term success of agricultural and residential uses coexisting in such close proximity. Until sufficient evidence is available, the underlying concern with subdivision of properties into small parcels, based on a pattern of past experience elsewhere, is that commercial agriculture ultimately would be abandoned, although *Area Plan* proponents contend that the investment required to plant vineyards or orchards would constitute adequate incentive to maintain agricultural productivity. City staff reports that the market for 20-acre parcels is limited and concludes that land near the City would be less likely to be subdivided using the 20-acre option, at least initially.

Therefore, the *Existing General Plan Alternative* ostensibly would preserve the existing supply of agricultural land (and probably would introduce or reintroduce intensive cultivation there, at least for the short-term) and would retain prime soils and prime farmlands. However, the possibility remains that this alternative ultimately would convert land intended for intensive cultivation to large-lot high value residential use and remove it from the local supply of commercially productive agricultural land. The *Existing General Plan Alternative* would not initially change the SLVSPA's land supply and decrease prime farmland appreciably, only incrementally (from about 1,820 acres theoretically available to subdivide under existing conditions to about 1,640 acres of agricultural land and 180 acres in homesites). [7] However, the potential net change with the *Existing General Plan Alternative's* effective conversion of farmland to residential use could be interpreted as transforming the entire 1,887-acre SLVSPA to development. A secondary effect of this alternative would be to plant and place in agricultural easements only about 1,640 acres in the vineyard area compared with approximately 2,050 acres under the *Draft Plan*.

Williamson Act contracts for which notices of non-renewal have been filed will expire, after which time land and improvements would be taxed for their assessed market value. In order to obtain lower taxes based on extended agricultural use, parcel owners would need to enter into new Williamson Act contracts and make a commitment to retain the parcels for agriculture for a minimum of ten years (a

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5 Parcelization tends to prevent people not already in agriculture from entering commercial farming. This is because subdivision of large landholdings at or near the urban-rural interface usually is accompanied by increased land values in anticipation of conversion to low density ranchette development or urban density growth. Parcelization normally means that the resulting subdivided parcels cannot be used for land extensive uses (such as grazing or dry land farming) due to inadequate size (without additional costs and inefficiencies of farming separate or fragmented parcels) and cannot be reassembled (due to the increased cost of subdivided land which reflects its potential development value).

6 "Hobby farming" refers to agricultural or quasi-agricultural activities which do not constitute commercial production, a primary means of support, or primary land use, although hobby farming can include cultivation of agricultural land for one;s own consumption. The rural estate -- where crops are raised, harvested, or processed by another party -- is a relatively recent variation of rural ranchette development. Rural estates continue productive use in some capacity and can retain an area's rural appearance, However, rural estates and ranchettes fundamentally are residential uses first where ancillary uses are secondary.

7 The potential loss of prime soils and prime farmland cannot be quantified. It would depend on where individual homesites would be located on parcels which contain those agricultural resources. Presumably, development could avoid and preserve most prime soils.

shorter period than the generally acknowledged 20-year investment "life" of a vineyard).

Actual agricultural use would not introduce a new or incompatible land use, although vineyards or orchards could differ from existing or even some former products and practices. The *Existing General Plan Alternative* would avert the potential conflict between residential development in Subarea 1 and industrial / research activities on the adjacent Sandia National Laboratories' (SNL) site, compared with implementation of the *Draft Plan*. Intensive cultivation on recently fallow land or parcels previously committed to land extensive uses would result in some urban-rural conflicts (such as for existing non-SLVSPA residents who live next to Subareas 3 or 5).

GEOLOGY

The 20-acre lot size assumed by the *Existing General Plan Alternative* would provide sufficient area on each parcel to avoid geologic hazards in selecting homesites. This flexibility would enable individual lot owners to set homes back from landslides, the Alquist-Priolo Earthquake Fault Zone of the Las Positas fault, areas susceptible to liquefaction, and related site features. Grading could occur in some hilly parts of Subareas 1, 4, and 7 to provide driveway access, build residences, or to prepare land for intensive cultivation, although the *Area Plan* restricts intensive cultivation on land with slopes steeper than 25 percent (but could retain agricultural albeit non-vineyard use, such as grazing, on hilly terrain). Compared with the *Existing General Plan Alternative* and *Area Plan*, the *Draft Plan* would avoid residential development and prohibit agricultural cultivation on the hilliest parts of these subareas (steeper than 25 percent slopes) and would restrict mass grading on slopes of ten to 25 percent slopes. Thus, the *Existing General Plan Alternative* could intensify impacts in areas with ten to 25 percent slopes compared with the *Draft Plan*. While SLVSPA residents would be exposed to the same types of geologic hazards with the *Existing General Plan Alternative* as with the *Draft Plan*, the magnitude of impact under this alternative would be less severe than expected with buildout according to the *Plan* because of the density differences which would result in fewer people and structures in the SLVSPA.

HYDROLOGY

This alternative's heavy emphasis on agricultural land use -- comprising 90 percent or more of the SLVSPA -- would be likely to preserve existing drainage patterns, as long as mass grading did not alter local site topography. Conversion of existing grassland areas to intensive agriculture could result in a somewhat higher erosion and sediment yield potential than the uses envisaged by the *Draft Plan*. Erosion and sedimentation policies similar to those recommended for the *Draft Plan* would be required to minimize associated impacts on culverts throughout the SLVSPA, salamander breeding pond habitat / water quality in Subarea 7, and groundwater recharge in the SLVSPA's primary streams.

Surface water quality could be improved slightly with the *Existing General Plan Alternative* compared with the *Draft Plan* due to the absence of commercial development in the subareas. Contaminant loading rates for commercial uses typically are two to three times those of residential uses. Altogether, the overall reduction in development of any type with the *Existing General Plan Alternative* (no commercial and 86 residential sites) would result in a proportionately smaller increase in pollutant accumulation and degradation of surface water quality compared with the *Draft Plan* (13 potential commercial and 1,494 residential sites). However, groundwater quality could be affected adversely by the increased acreage devoted to intensive agriculture compared with the *Draft Plan* and the reliance on on-site septic systems for wastewater disposal. The extent of the potential degradation would depend

on the nature of the pesticides, herbicides, and other soil treatments and agricultural chemicals used in the SLVSPA.

BIOLOGY

The *Existing General Plan Alternative* would limit residential development significantly, but intensive agricultural uses could result in a substantial reduction in grassland habitat and may affect sensitive biological resources. At least 90 percent of each 20-acre parcel could be cultivated intensively, possibly leading to a loss of seasonal wetlands, essential habitat for special-status species, woodland vegetation, individual oaks, and native grasslands. The extent of intensive agricultural use could expand into areas the *Draft Plan* identifies as open space. Of particular concern are the upper elevations of Subareas 4 and 7 which contain important grassland and woodland habitat. The upper elevations of Subarea 7 contain significant native grasslands and may support populations of special-status plant species. Intensive agricultural use would eliminate the grassland habitat which now provides an important link across Subarea 7 between Sycamore Grove Park and undeveloped grazing land farther south. Supplemental surveys would be required to determine whether any seasonal wetlands, populations of special-status plant species, or habitat essential for species (such as fairy shrimp, California tiger salamander, and raptors) would be affected by future residential development and agricultural expansion. The County's *South Livermore Valley Area Plan* calls for additional surveys for special-status species in the Cultivated Agriculture Overlay District and allows for protection of environmentally sensitive areas (such as wetlands, arroyos, slopes in excess of 25 percent, oak groves, or areas with unique environmental characteristics). The County most likely would consider sensitive resources to include the grasslands on the hillside slopes in the upper elevations of Subareas 4 and 7 where slopes exceed 25 percent, particularly where native cover remains.

TRAFFIC

The *Existing General Plan Alternative* would generate approximately 87 PM peak hour trips, compared with 2,086 trips generated with buildout under the *Draft Plan*, and would not result in the impacts identified for the future with SLVSPA development. As with the *No Project Alternative*, a signal would not be needed at the Vallecitos / East Vineyard intersection. In addition, SLVSPA traffic on Isabel Avenue north of Stanley Boulevard would not exceed capacity, and volumes on Vallecitos Road south of East Vineyard Avenue would not exacerbate projected over-capacity conditions.

AIR QUALITY

Construction impacts associated with the *Existing General Plan Alternative* would be similar to those of the *Draft Plan*, but because less construction would occur, the extent and duration of potential impacts on air quality would be less. Construction impacts would be potentially significant but mitigable.

Traffic associated with this alternative would increase concentrations of carbon monoxide near roadways in the vicinity but would not violate State or Federal ambient air quality standards. Impacts on carbon monoxide concentrations would be less-than-significant.

Exhibit 5.2-2 compares the regional impact of this alternative (and the other EIR alternatives) with of

the *Draft Plan*. Regional emission increases would be substantially below those attributable to *Plan* generated traffic and would not exceed Bay Area Air Quality Management District (BAAQMD) thresholds of significance. The regional impacts of this alternative would be less-than-significant.

Exhibit 5.2-2
Regional Emissions Associated with Alternatives [a]

Alternative	Reactive Organic Gases	Nitrogen Oxides	PM-10
Draft Plan	126.8	176.0	252.9
No Development Alternative	0.0	0.0	0.0
Existing General Plan Alternative	5.2	6.8	9.9
1,200-Unit Development	83.3	110.0	158.0
1,482-Unit Development	101.4	133.9	192.5

a In pounds per day.

Air quality-related conflicts between residential and agricultural lands could occur with the *Existing General Plan Alternative*. Nevertheless, with fewer SLVSPA residences, the potential for conflicts would be substantially less than development according to the *Draft Plan*. Air quality-related land use conflicts would represent a potentially significant impact, as with the *Draft Plan*. While the County has adopted a right-to-farm ordinance, it cannot be assumed that the City would do so with the *Existing General Plan Alternative*. City residents living at the urban-rural interface would be exposed to new, renewed, or continuing agricultural operations, including windblown dust and spray drift.

NOISE

Development under the *Existing General Plan Alternative* would not result in significant noise impacts on existing or future land uses, provided that residences would be set back sufficient distances from existing and new roadways.

AESTHETICS

The *Existing General Plan Alternative* would have fewer aesthetic impacts than the *Draft Plan* because less development would occur overall at much lower intensity. Without making assumptions about the placement of specific lots which has not been determined for this alternative, it is unclear if any significant impacts would result. However, the low density of development would make mitigation (such as vegetative screening) fairly easy to implement.

PUBLIC SERVICES

Because the *Existing General Plan Alternative* assumes that on-site wells would serve new development, this alternative would not increase demand on domestic water supply. However, Zone 7 has not assumed much if any additional water demand from agricultural irrigation of expanded agricultural use in the SLVSPA. Zone 7 has not projected any new agricultural water demand past the year 2000. Therefore, this alternative would contribute to cumulative water demand, a significant and unavoidable impact.

Wastewater impacts would be less-than-significant, since development would be served by on-site septic systems. While cumulative demand resulting in an eventual increase in wastewater treatment plant capacity would still occur, this alternative for the SLVSPA would not contribute to that demand.

Fire, police, parks / trails, and school impacts would be similar to the project for significance, but the overall demand on these services would be much lower than with the *Draft Plan*. Because this alternative would contribute cumulatively to the need to develop new school facilities, the *Existing General Plan Alternative* (and the other build alternatives) would result in significant and unavoidable impacts.

5.3 1,200-UNIT DEVELOPMENT ALTERNATIVE

The *1,200-Unit Development Alternative* was formulated to assess the extent to which reducing the total amount of development throughout the SLVSPA could avert or substantially reduce the magnitude of environmental effects attributable to implementation of the 1,494-unit *Draft Plan*. The amount of development was selected as the minimum extent of urban expansion considered reasonable for SLVSPA buildout during the comprehensive planning process from as early as formulation of the *Area Plan*.[8] Therefore, it was concluded that assuming any fewer than 1,200 units would not fulfill the housing objective component or the mitigation component of the planning process and to do so simply for the purposes of analysis would be unresponsive. Therefore, this alternative assumes construction of 1,200 units distributed among all seven SLVSPA subareas, as follows:

Exhibit 5.3-1
1,200 Unit Development Alternative

	Subarea[a]							Total
	1	2	3	4	5	6	7	
Total Area	170.4	400.7	96.6	301.0	154.7	185.4	577.9	1886.7
Developed Area	45.4	169.2	65.5	62.3	71.2	0	105.5	519.1
Existing Uses to Remain	18.5	0.0	0.0	35.2	11.2	0.0	0.0	64.9
Potential Agricultural Land	106.5	231.5	31.1	203.5	72.3	185.4	472.4	1,302.7
Total Units	106	460	142	105	142	0	245	1,200

a All areas in acres.

All subareas would be annexed and be connected to public water and sewer services. Compared with the *Draft Plan*, 20 percent fewer housing units would result in a corresponding 20 percent reduction in developed land within the subareas and 20 percent increase in land available for agricultural use. This alternative assumes no new commercial sites but does assume provision of a neighborhood park in Subarea 2 and a school site in Subarea 3.

8 This number represents the low end of the range of development generally recalled by planning process participants for SLVSPA buildout (1,200 to 1,600 units). 1200 units would provide an appropriate minimum level of mitigation to allow the overall County Area Plan to accomplish the goal of 5,000 acres of viticulture in the South Livermore Valley. The 1,200 unit minimum was not formally adopted.

LAND USE

The *1,200-Unit Development Alternative* would implement the urban component of the County's *Area Plan* and establish the southern limit of Livermore, as with implementation of the *Draft Plan*. Changes in land supply would differ somewhat from those expected with the *Draft Plan*. Somewhat more land would be devoted to agricultural uses by this alternative (approximately 1,300 acres) than with the *Plan* (1,025 acres), compared with about 1,720 acres of some type of existing or former agricultural use at present, but no land would be converted to commercial use. While substantial residential development would occur with construction of 1,200 units compared with 1,494 units assumed with implementation of the *Draft Plan*, prevailing agricultural uses would continue predominate in the SLVSPA with this alternative (and the *Draft Plan*). The same measures required for the *Draft Plan* would be needed to mitigate the effects of the *1,200-Unit Development Alternative* in expanding non-agricultural land use in the SLVSPA.

Buildout of this alternative potentially would remove proportionately less prime soil and prime farmland than with implementation of the *Draft Plan*, but the effect would remain significant and unmitigable, as with the *Plan*. Similarly, the effect of converting Williamson Act contract lands would be the same for the *1,200-Unit Development Alternative* and *Draft Plan*. While 245 units in Subarea 7 theoretically could be sited west of the parcels which remains under contract, doing so would be expected to have significant secondary biological resource impacts by concentrating this amount of development in the western and central parts of the subarea. In Subarea 1, this alternative would result in construction of 106 new housing units compared with 133 units under the *Draft Plan* (and introduction of approximately 295 and 370 residents, respectively). This difference would not substantially reduce potential land use conflicts between residential and industrial / research uses on the adjacent Sandia National Laboratories (SNL) site. Although the residential population throughout the SLVSPA would be proportionately smaller than expected with *Draft Plan* buildout, the incrementally larger area of agriculture in close proximity to residents could result in similar urban-rural conflicts with both the *1,200-Unit Development Alternative* and *Plan*.

GEOLOGY

Assuming that development would occur in the same parts of subareas as identified by the *Draft Plan* (only compressed somewhat in total area), geologic effects of the *1,200-Unit Development Alternative* and *Draft Plan* would be virtually indistinguishable. The minor differences in area affected, amount of development, or number of residents exposed to potential hazards or requiring measures to mitigate geologic conditions would be insignificant.

HYDROLOGY

The potential stormwater drainage, peak flows and flooding, erosion / sedimentation, and water quality impacts associated with the *1,200-Unit Development Alternative* would be nearly equivalent in all respects to those expected with implementation of the *Draft Plan*. The environmental trade-off involved with 20 percent more agricultural use compared with similarly reduced residential use would not be significant. Localized variations in hydrologic impacts in relation development according to the *Draft Plan* would depend on the geographic distribution of alternative development in the subareas. Thus, *Draft Plan* policies and mitigation measures applicable to the *1,200-Unit Development Alternative* could differ somewhat but not significantly from those required for the *Plan*.

BIOLOGY

Although this alternative would reduce the amount of SLVSPA development slightly, the biological resource effects anticipated from this alternative would be similar to those expected from the *Draft Plan*. To some degree, the effect on sensitive biological resources would depend on the configuration of residential development, particularly in Subarea 7 where 59 fewer units would be built (245 units) compared with the *Draft Plan* (304 units), but approximately 32 more acres would be devoted to residential use (106 acres) compared with the *Plan* (73 acres). The *1,200-Unit Development Alternative* could expand the extent of intensive agricultural use into areas the *Draft Plan* designates as open space, including the upper elevations of Subareas 4 and 7. In addition to significant impacts on native grasslands and possibly special-status plant species, intensive agricultural use in the upper elevations of Subarea 7 also would eliminate grassland habitat which currently provides an important link with Sycamore Grove Park. Supplemental surveys would be required to determine whether future residential development and agricultural expansion under the *1,200-Unit Development Alternative* would affect seasonal wetlands, populations of special-status plant species, or essential habitat for species (such as fairy shrimp, California tiger salamander, and raptors). However, unlike the *No Development Alternative*, thorough surveys for special-status species and wetland resources would be required, and adequate mitigation would be incorporated into development plans for at least the parts of subareas devoted to residential use as conditions of City approval for construction. However, sensitive resource in areas designated for intensive agriculture could be lost without mitigation unless the Corps, USFWS, or CDFG pursued possible violations of State and / or Federal laws related to protection of wetlands and special-status species.

TRAFFIC

The *1,200-Unit Development Alternative* would generate an estimated 1,298 PM peak hour trips, compared with the *Draft Plan's* total of 2,086 trips. The 38 percent fewer peak hour trips than the *Draft Plan* would reflect less residential development and no commercial sites than with the *Plan*. Because housing units would be distributed among SLVSPA subareas in proportion to *Draft Plan* development, trip reductions would affect all study intersections. While a separate traffic model run was not performed for this alternative, the following conclusions can reasonably be made based on the trip generation and distribution of land uses assumed by this alternative.

Compared with the *Draft Plan*, the *1,200-Unit Development Alternative* would reduce traffic on Isabel Avenue north of Stanley Boulevard to below-capacity conditions. The *1,200-Unit Development Alternative* would account for an estimated 390 PM peak hour trips (and a volume-to-capacity (V / C) ratio of 0.97) on this segment of Isabel Avenue compared with 630 PM peak hour trips (and V / C ratio of 1.01) with *Draft Plan* traffic. This is a directional capacity measure reflecting the heavier northbound movement in the PM peak hour. The southbound V / C would be 1.0 for both the *Plan* and this alternative.

The *1,200-Unit Development Alternative* would result in an estimated 149 PM peak hour trips on Vallecitos Road south of Vineyard Avenue, 91 trips fewer than with the *Draft Plan*. These trips would result in a V / C ratio of 1.25 with this alternative compared to a future V / C ratio of 1.14 with no SLVSPA development and V / C ratio of 1.31 with SLVSPA development according to the *Draft Plan*. This directional capacity measure reflects the heavier eastbound movement in the PM peak hour. The westbound movement would remain well below capacity for both the *Plan* and this alternative.

Traffic generated by the *1,200-Unit Development Alternative* would require installation of the two traffic signals also needed to mitigate year 2010 conditions with SLVSPA development. (The fewer trips generated by this alternative would not be sufficient to eliminate the peak hour signal warrant.) At the Vallecitos / East Vineyard intersection, the year 2010 traffic volume on the East Vineyard approach is estimated to decrease by 57 PM peak hour trips for *Draft Plan* conditions to 162 PM peak hour trips for the *1,200-Unit Development Alternative.* At the Holmes / Vallecitos intersection, the year 2010 traffic volume on the Holmes northbound approach is estimated to decrease by 35 PM peak hour trips for *Draft Plan* conditions to 170 PM peak hour trips for the *1,200-Unit Development Alternative.*

AIR QUALITY

Construction impacts associated with the *1,200-Unit Development Alternative* would be similar to those from buildout under the *Draft Plan*, but, because the amount of construction would be less, the extent and duration of potential construction impacts also would be less. Construction impacts still would be potentially significant but mitigable.

Traffic associated with this alternative would increase concentrations of carbon monoxide near roadways in the vicinity, but no violations of the State or Federal ambient air quality standards would occur. Impacts on carbon monoxide concentrations would be less-than-significant.

Exhibit 5.2-2 shows that regional emission increases expected with the *1,200-Unit Development Alternative* would be below those of the *Plan* but would exceed the BAAQMD thresholds of significance, resulting in significant unavoidable regional impacts.

Air quality-related conflicts between residential and agricultural lands could occur under this alternative. The fewer number of residents would reduce the potential for conflicts compared with the *Draft Plan.* The resulting air quality-land use conflicts would represent a potentially significant but mitigable impact.

NOISE

Traffic noise increases were not found to be significant with implementation of the *Draft Plan.* Due to the 20 percent reduction in units under the *1,200 Unit Development Alternative*, it also would be expected to have an associated reduction in traffic. Therefore, no noise impacts would result from the operation of development built under this alternative. Construction noise impacts are assumed to be similar to those identified for buildout according to the *Draft Plan*, although shorter in duration and lower in intensity as a result of the fewer number of units assumed.

AESTHETICS

Visual impact of this alternative would be very similar to that of the *Draft Plan.* The most obvious visual difference between this alternative and the *Draft Plan* would be the absence of new commercial sites. The slightly lower density of residential development under the *1,200-Unit Alternative* compared with the *Draft Plan* would not be noticeable to most viewers, although concentrating development within the subareas surrounded by the additional agricultural land assumed by this alternative would increase underdeveloped areas around the perimeter visible in foreground views and better buffer development from off-site viewing locations. Because the *1,200-Unit Alternative* does not assume the

specific placement of lots, it is not known if any significant impacts would result. This is considered a potential significant impact which could be mitigated by lot placement and vegetative screening, as with the *Draft Plan.*

PUBLIC SERVICES

This alternative would result in almost identical impacts as with the *Draft Plan*, although the slightly reduced (20 percent) intensity of residential development would result in a corresponding decrease in service demand. As with the *Draft Plan*, Zone 7 has assumed for water supply purposes that 1,625 single-family homes would be developed in the area covered in the SLVSPA which would exceed the level of demand for this alternative. However, Zone 7 has not assumed any agricultural irrigation demand which would result in a significant and unavoidable impact.

5.4 1,482-UNIT CONSOLIDATED DEVELOPMENT ALTERNATIVE

The *1,482-Unit Consolidated Development Alternative* assumes annexation of Subareas 2, 3, and 5 (which currently are immediately adjacent to the City's existing urban boundary) and development with 1,425 units but no annexation of Subareas 1, 4, 6, and 7. Those latter four areas would remain unincorporated and conceivably could be divided into 20-acre parcels and developed with up to 57 additional units for a total of 1,482 new units in the SLVSPA, as follows: [9]

Exhibit 5.4-1
1,482-Unit Consolidated Development Alternative

	Subarea							Total
	1	2	3	4	5	6	7	
Total Area [a]	170.4	400.7	96.6	301.0	154.7	185.4	577.9	1,886.7
Developed Area								
• Residential Development	15.2	256.3	75.5	26.6	143.5	18.5	57.8	593.4
• Other Developed Uses [b]		12.5	20.0					32.5
Existing Uses to Remain	18.5	0.0	0.0	35.2	11.2	0.0	0.0	64.9
Potential Agricultural Land	136.7	131.9	1.1	239.2	0.0	166.9	520.1	1,195.9
Units (City Subareas)		769	226		430			1,425
Units (County Subareas)	7			13		9	28	57
Total Units	7	769	226	13	430	9	28	1,482

a All areas in acres.
b Consists of a park in Subarea 2 and school site in Subarea 3.

Urban services would be extended to the 1,425 units in City subareas but not to the 57 units in County subareas.

No commercial development would occur in City subareas (2, 3, or 5), although wine country commercial development potentially could occur in the County subareas (1, 4, 6, and 7). This

9 This alternative would be likely to result in fewer actual lots / parcels and housing units than the potential capacity of 57 units estimated for the reasons given in discussing the *Existing Zoning Alternative*, including parcel topography, shape, and presence and location of existing development.

alternative assumes provision of a ten-acre neighborhood park in Subarea 2 and a school site in Subarea 3 but no agricultural buffers or landscaped areas within City subareas. Ninety percent of lot area of parcels in County subareas would be cultivated intensively.

LAND USE

The *1,482-Unit Consolidated Development Alternative* would intensify urban development in City subareas dramatically. This alternative assumes development of 95 percent of the housing supply envisaged by the *Draft Plan* (1,425 City units compared with 1,494 units) on 30 percent of the land area covered by the *Plan* (475 acres of residential lots in three City subareas with this alternative compared with the 401.1 acres of residential lots in the *Draft Plan's* seven subareas).

This amount of development in the City subareas is expected to result in a dense (three units per acre) development pattern at the southern edge of Livermore, more akin to conventional suburban densities than the lower densities normally considered necessary to make a gradual transition from urban to rural land uses. This confined development pattern would cluster urban more tightly in closer proximity to existing City neighborhoods, compared with the scattering of clusters envisaged by the *Draft Plan's* site plans, especially in Subareas 1 and 7.

The *1,482-Unit Consolidated Development Alternative* primarily would transform City subareas from predominantly agricultural to residential while attempting to preserve smaller but potentially productive parcels in the County. Subareas 2, 3, and 5 would be exclusively residential and residential support (neighborhood park and school). Subareas 1, 4, 6, and 7 would be large-lot rural residential and agricultural. This alternative would result in the permanent loss of prime soils in Subarea 2, 3, and 5, although the extent of loss in Subareas 1 and 7 potentially could be reduced from that expected with buildout under the *Draft Plan.* The loss would be irrevocable nevertheless.

Non-renewal of Williamson Act contracts on parcels in Subareas 2 and 3 would not result in different effects with this alternative or the *Draft Plan,* although creation of 20-acre parcels in Subareas 4 and 7, placement of agricultural easements, and planting with vineyards or orchards is intended to compensate for non-renewal of Williamson Act protections. Owners of parcels without Williamson Act contracts would not benefit from lower assessments based on agricultural value. Land prices for parcels without contracts would reflect market value which would discourage agriculture for most individuals entering farming for the first time or would require a substantial land investment even before establishing a sufficiently high value operation for agriculture to be viable. The approach adopted by the joint City-County planning process for the entire vineyard area assumes that the investment made in establishing intensive agricultural operations on these parcels would ensure long-term agricultural use.

The concentrated urban densities in Subareas 2, 3, and 5 would be adjacent to or near existing neighborhoods of varying residential densities and would be compatible land uses, despite potential density differences. The larger residential populations living in the urban subareas would exacerbate land use conflicts on non-residential uses outside the subareas (such as businesses adjacent to Subarea 2). Twenty-acre parcels in unincorporated subareas would reduce potential impacts between different adjacent land uses (such as between seven additional Subarea 1 units with agricultural buffering and SNL).

Residents of Subareas 2, 3, and 5 would be exposed to similar effects of nearby farming practices generated outside the SLVSPA with implementation of either the *1,482-Unit Consolidated*

Development Alternative or the *Draft Plan.* Impacts on residents of 20-acre parcels also would be similar to those expected with the other development alternatives except that fewer people would be affected due to the smaller residential population of Subareas 1, 4, 6, and 7 compared with the *Draft Plan* and alternatives.

GEOLOGY

The *1,482-Unit Consolidated Development Alternative* would confine urban density development to the City subareas which have the least severe geologic hazards affecting the location or design of development. Such development would have effects similar to those expected with implementation of the *Draft Plan.* Development of 20-acre parcels in the County subareas would result in similar effects as expected with implementation of the *Existing General Plan Alternative.*

HYDROLOGY

The more intense development assumed by this alternative for Subareas 2, 3, and 5 would increase the likelihood of significant adverse impacts on local and downstream storm drain systems. Higher density residential development compared with the *Draft Plan* would increase impervious surface coverage in these subareas. Therefore, surface runoff during rainstorms would be flashier and would produce increased peak flow rates. The resulting local peak flows would affect the capacities of existing downstream culverts and storm drain systems and aggravate any existing roadway flooding. Implementing the *1,482-Unit Consolidated Development Alternative* would be likely to require structure and / or system upgrading. Moreover, the increased flashiness of runoff, particularly for low to moderate intensity rainstorms, could increase channel erosion in non-culverted reaches of local drainageways.

Arroyo Mocho is unstable through a segment of the unrevetted reach west of Wente Street. The amount of development assumed in Subarea 3 (226 units) compared with the *Draft Plan* (177 units) would affect instability through this reach and could result in structural stabilization of the channel with secondary impacts on habitat value.

Agricultural erosion and downstream sedimentation impacts are expected to be similar for this alternative and the *Draft Plan.* Intensive agricultural use of Subarea 6 assumed by both would alter its present function as a grassland buffer for stormwater entering from the north and east and increase field erosion and sedimentation locally, possibly requiring development of an internal surface drainage system. Residential development of Subarea 5 with 430 units could increase peak flow rates through Subarea 6 compared with the *Draft Plan's* 176 units.

Impacts to stormwater quality from the *1,482-Unit Consolidated Development Alternative* also could worsen downstream of Subareas 2, 3, and 5, due to more development than assumed by the *Draft Plan.* The extent to which water quality and salamander habitat impacts in Subarea 7 might be reduced with implementation of this alternative would depend on the actual location and density of lots. Segregation of development to areas not tributary to the salamander breeding ponds in Sycamore Park could reduce or eliminate the impacts associated with the *Draft Plan.*

BIOLOGY

This alternative would concentrate residential development in Subareas 2, 3, and 5, located in proximity to existing suburban neighborhoods in the City. The remaining subareas could be developed with intensive agricultural uses on 20-acre parcels. While concentrating higher density residential use near existing Livermore development would be desirable from a biological perspective, sensitive resources still could be affected in areas designated for residential use or developed with intensively managed agricultural operations. This could result in a loss of seasonal wetlands, essential habitat for special-status species, woodland vegetation, individual oaks, and native grasslands. As with the other alternatives, intensive agricultural use could expand into areas envisaged as open space by the *Draft Plan*, including the upper elevations of Subareas 4 and 7. Intensive agricultural use would eliminate areas of native grasslands in Subarea 7 and the important habitat link with Sycamore Grove Park. Supplemental surveys would be required to determine whether any seasonal wetlands, populations of special-status plant species, or essential habitat for species (such as fairy shrimp, California tiger salamander, and raptors) would be affected by future residential development and agricultural expansion. Thorough surveys for special-status species and wetland resources presumably would be conducted, and adequate mitigation required under this alternative, at least for parts Subareas 2, 3, and 5 where residential use would be concentrated. As with the *Existing General Plan Alternative*, the County's *Area Plan* calls for additional surveys for special-status species in the Cultivated Agriculture Overlay District and allows for protection of environmentally sensitive areas (such as wetlands, arroyos, slopes in excess of 25 percent, oak groves, or areas with unique environmental characteristics).

TRAFFIC

The *1,482-Unit Consolidated Development Alternative* would generate an estimated 1,583 PM peak hour trips, compared with the *Draft Plan's* total of 2,086 trips. The 24 percent fewer peak hour trips than the *Draft Plan* would reflect the slight reduction of residential development and no commercial sites, at least in City subareas, than with the *Plan*. The concentration of housing units in Subareas 2, 3, and 5 would result in 195 more units in Subarea 2 than with the *Draft Plan*, 49 more units in Subarea 3; and 254 more units in Subarea 5. Thus, Subarea 2 would generate approximately 34 percent more residential trips than with the *Draft Plan*, and Subareas 3 and 5 would generate 28 and 144 percent more residential trips, respectively. However, fewer total trips would be generated from Subareas 3 and 5, compared with *Draft Plan* conditions, due to no commercial contribution to traffic volumes. This alternative would load more traffic at the Subarea 2 access points and result in higher traffic volumes on East Avenue and South Vasco Road. Traffic at entrances to Subareas 3 and 5 would decrease compared with volumes under the *Plan*.

While local circulation patterns immediately adjacent to City subareas would change, regional trip distribution patterns would not be expected to change substantially with the *1,482-Unit Consolidated Development Alternative* compared with those analyzed for *Draft Plan* conditions. Use of major facilities (such as I-580, Vasco Road, Vallecitos Road, and Isabel Avenue) would be lower for the *1,482-Unit Consolidated Development Alternative* but proportionate to that with the *Draft Plan*. The following additional conclusions were extrapolated for this alternative from its trip generation and land use assumptions.

Compared with the *Draft Plan*, the *1,482-Unit Consolidated Development Alternative* would reduce traffic on Isabel Avenue north of Stanley Boulevard to below-capacity conditions. This alternative would account for an estimated 470 PM peak hour trips (and a V / C ratio of 0.98) on this segment of

Isabel Avenue compared with 630 PM peak hour trips (and V / C ratio of 1.01) with *Draft Plan* traffic. This is a directional capacity measure reflecting the heavier northbound movement in the PM peak hour. The southbound V / C would be 1.0 for both the *Plan* and this alternative.

The *1,482-Unit Consolidated Development Alternative* would result in an estimated 180 PM peak hour trips on Vallecitos Road south of Vineyard Avenue compared with 240 trips with the *Draft Plan*, 60 trips fewer with this alternative. These trips would result in a V / C ratio of 1.27 with this alternative compared to a future V / C ratio of 1.14 with no SLVSPA development and V / C ratio of 1.31 with SLVSPA development according to the *Draft Plan*. This directional capacity measure reflects the heavier eastbound movement in the PM peak hour. The westbound movement would remain well below capacity for both the *Plan* and this alternative.

Traffic generated by the *1,482-Unit Consolidated Development Alternative* would require installation of the two traffic signals also needed to mitigate year 2010 conditions with SLVSPA development. (The fewer trips generated by this alternative would not be sufficient to eliminate the peak hour signal warrant.) At the Vallecitos / East Vineyard intersection, the year 2010 traffic volume on the East Vineyard approach is estimated to decrease from 219 PM peak hour trips for *Draft Plan* conditions to 181 PM peak hour trips for the *1,482-Unit Consolidated Development Alternative*. At the Holmes / Vallecitos intersection, the year 2010 traffic volume on the Holmes northbound approach is estimated to decrease from 205 PM peak hour trips for *Draft Plan* conditions to 182 PM peak hour trips for the *1,482-Unit Consolidated Development Alternative*.

With the *1,482-Unit Consolidated Development Alternative*, traffic volumes using the entrances to Subarea 2 are not estimated to be high enough to warrant installation of traffic signals. An estimated 193 outbound vehicles are projected to exit via the East Avenue entrance during the AM peak period with this alternative compared with 146 vehicles with the *Draft Plan*. This side-street volume would not warrant a traffic signal based on volume and number of lanes on East Avenue. Similarly, an estimated 245 outbound vehicles are projected to exit via the Subarea 2 entrance on South Vasco Road with this alternative compared with 185 vehicles with the *Draft Plan*. Given the volume on South Vasco Road, this side-street volume would not warrant a traffic signal.

AIR QUALITY

The construction impacts expected from the *1,482-Unit Consolidated Development Alternative* would be similar to those from implementing the *Draft Plan*. However, the amount of concentrated construction in the City would intensify the extent and duration of potential construction impacts on residents of existing Livermore neighborhoods. These construction impacts would be potentially significant but mitigable. Construction on the 20-acre parcels in the County subareas would be sufficiently dispersed and somewhat more distant from urban (but not rural) neighbors that impacts would be proportionately less severe.

Traffic associated with this alternative would increase concentrations of carbon monoxide near roadways in the vicinity but would not violate State or Federal ambient air quality standards. Impacts on carbon monoxide concentrations would be less-than-significant.

As shown in Exhibit 5.2-2, regional emission increases with the *1,482-Unit Consolidated Development Alternative* would be below those generated by *Draft Plan* development but would exceed the BAAQMD thresholds of significance. The regional impacts of this alternative would be significant and

unavoidable.

Air quality-related conflicts between residential and agricultural lands could occur with this alternative. The consolidation of urban density development in Subareas 2, 3, and 5 probably would eliminate the potential for conflicts in these subareas, but conflicts still could occur in Subareas 1, 4, 6, and 7. Air quality-land use conflicts would represent a potentially significant but mitigable impact.

NOISE

This alternative assumes that no agricultural buffers would be provided in Subareas 2, 3, and 5 which could allow noise-land use compatibility conflicts because of the proximity of residential development to major roadways, including exposure to traffic noise generated on East Avenue in Subarea 2, Concannon Boulevard in Subarea 3, and Arroyo Road in Subarea 5. Soundwalls or other physical mitigation measures would be necessary to mitigate noise impacts for residential development built immediately adjacent to these roadways. However, construction of soundwalls would conflict with City policy. Earthen berms could be used as an alternative but would require wider footprint areas to build such buffers. Wine country commercial development could occur in Subareas 1, 4, 6 and 7. Potential noise impacts associated with commercial development would be similar to those expected with implementation of the *Draft Plan.*

AESTHETICS

Concentrated development with this alternative generally would be restricted to low-sensitivity areas located adjacent to already developed urban areas and, therefore, would result in few if any visual impacts. The exception would be if any development occurred in the southern part of Subarea 3 where the visual sensitivity is *high* due to the proximity of a scenic route corridor (Concannon Boulevard). Development in this area would result in significant impacts unless it was visually subordinate to the landscape which is seldom true for residential development. These impacts could be mitigated by adequate setbacks from Concannon Boulevard.

This alternative generally would be far superior to the *Draft Plan* in terms of overall visual impacts because the most sensitive locations of the SLVSPA would be left either undisturbed or developed sparsely.

PUBLIC SERVICES

The demand for water would create significant and unavoidable impacts, similar to the other development alternatives, because new water supplies would need to be found. Development would continue to contribute to cumulative wastewater impacts, a significant and unavoidable impact. Overall, water and wastewater demand would be the same for this alternative and the *Draft Plan* because, while the location of development would change, the demand would remain the same. However, construction impacts to install water and wastewater infrastructure would be less, since lines would not need to be built to the more distant subareas (4, 6, and 7), resulting in less traffic, noise, and air quality disturbances.

The demand for police services could be slightly higher that attributable to the *Draft Plan* because more total development could generate more calls for service. However, police service impacts are expected

to remain less-than-significant.

Park demand would be a significant impact without provision of public parks in Subarea s 4 and 7, resulting in a park demand in excess of LARPD acreage standards. The only mitigation would be to provide public parks.

School and library impacts would remain the same under this alternative as under the *Draft Plan*.

5.5 SUBAREA 7 SUBALTERNATIVES

In response to specific public concerns, this section of the EIR evaluates a range of alternative land use concepts for Subarea 7 (referred to below as "subalternatives"). As noted in the environmental setting discussions in ***Chapter 4***, Subarea 7 differs in several major respects from the other subareas within the SLVSPA. Unlike other subareas addressed by the *Draft Plan*, steep slopes, oak woodlands, and significant habitat areas for special status species are dominant features within Subarea 7. During the process of preparing the *Draft Plan*, concerns were raised about the optimal approach to planning for urban development in the subarea while protecting significant resource values of the area. Accordingly, the following discussion considers several alternatives to the land use concepts presented in ***Section 2.2 Project Description*** and analyzed in the main text of this EIR.

The subalternatives were designed to allow decision-makers to evaluate how changes in the Subarea 7 site plan (Exhibit 2.2-5) would affect anticipated environmental impacts. The subalternatives range from options assuming significantly fewer units than the 304 units analyzed elsewhere in the EIR (the maximum number assumed in Subarea 7) to options assuming other amounts of development in configurations substantially different from the 304-unit EIR plan. All subalternatives are summarized in Exhibit 5.5-1.

Each of these subalternatives would be subject to the standard Conditional Viticulture / Urban Overlay designation analyzed in the EIR (see ***2.2 Project Description***). Exhibit 5.5-1 summarizes the agricultural and open space mitigation requirements of each alternative (also outlined in ***2.2 Project Description***). As applied to Subarea 7, the *Draft Plan's* mitigation program would require dedication of one acre of land -- identified by the City in the *Draft Plan* as significantly contributing either to the protection of the South Livermore Valley's natural resources or to the establishment of regional open space -- for (1) each acre of developed land within the subarea and (2) each housing unit developed within the subarea. If the land to be dedicated would not be suitable for agricultural, residential, or active recreational use (such as due to slopes with grades in excess of 25 percent), the *Draft Plan* requires the dedication of three acres for each acre needed to satisfy the dedication requirement. In addition, all urban development would be required to comply with the provisions of the *Draft Plan* and General Plan Amendment.

SUBALTERNATIVE 1 -- ADVISORY COMMITTEE'S 304 UNITS

This is the 304-unit "project" described in section ***2.2 Project Description*** and examined in the EIR, primarily in the ***Chapter 4*** topical analyses.

	Subalternatives[a]							
	1[b]	2[c]	3	4	5	6	7	8
Housing Units *number*	304	304	260	226	205	159	52	17
Range of Lot Sizes *square feet*	6,000-26,000	6,000-26,000	6,000-26,000	6,000-26,000	8,000-30,000	8,000-871,200[d]	87,120-871,200[d]	871,200-1,263,240[d]
Area in Residential Lots	80.1	80.1	67.0	58.6	64.7	49.2[e]	259.0	395.7
Area in Street Rights-of-Way	32.4	32.4	25.4	21.7	26.0	19.8	23.0	19.0
Landscaped Areas	16.1	16.5	14.5	12.3	17.3	25.1	10.0	0.0
Commercial Development[f]	8.0	8.0	8.0	8.0	8.0	0.0	15.0	0.0
Proposed On-Site Agriculture[g]	139.8	200.0	165.1	165.1	141.1	171.7[g]	0.0[g]	0.0[g]
• Slopes < 25 percent	139.8	139.8[i]	165.1	165.1	141.1	171.7	0.0	0.0
• Slopes > 25 percent	0.0	60.2	0.0	0.0	0.0	0.0	0.0	0.0
Proposed Regional Parkland	80.0[j]	220.0	242.3	260.1	278.5	259.3	269.4	0.0
• Slopes < 25 percent	0.0	38.0	4.7	22.5	58.0	52.0	43.0	0.0
• Slopes > 25 percent	80.0	182	237.6	237.6	220.5	207.3	226.4	0.0
Proposed Open Space[k]	221.2	21.0	55.7	52.2	42.4	36.3	1.6	163.3

Source: Wallace Roberts & Todd

a All numbers in *acres* except *number* of housing units and range of lot size in *square feet*. Large lots of 1-2 to 20-29 acres in size are converted to square feet for comparison with subalternatives with smaller lots.

b Advisory Committee land use program (scenario described in ***Chapter 2***, summarized in ***Chapter 3***, and assessed in ***Chapter 4***).

c Landowner's proposed land use program.

d ***Subalternative 6***: 151 lots of 8,000-14,000 square feet six lots of 43,560-87,120 square feet (one to two acres), and two lots of 871,200 (20 acres); ***Subalternative 7***: 50 lots of 87,120-348,480 square feet (two to eight acres) and two lots of 871,200 square feet (20+ acres); and ***Subalternative 8***: 871,200-1,263,240 square feet (20-29 acres).

e 157 units occupy 45.2 acres and the other two units occupy 4 acres.

f Subalternatives 1-5 assume a medium winery, Subalternative 7 assumes an equestrian facility, and Subalternatives 6 and 8 assume no commercial use.

g Only 20-acre parcels are assumed to support agricultural use (two parcels each in Subalternatives 6 and 7 and all 17 lots in Subalternative 8).

i To achieve 200 acres of agricultural land with Subalternative 2, the lower elevations of the hillsides in the southern part of the subarea would be cultivated.

j The 80 acres of regional parkland consists primarily of trail corridors, lands along the major drainages, and the wooded slope bank facing Sycamore Grove Park.

k Consists of steep hillsides in excess of 25 percent slopes, isolated fragments of land, or heavily vegetated areas located in the northern two-thirds of the subarea, none of which would be suited for development with intensively cultivated agriculture, undeveloped land extensive agriculture (such as grazing), or public recreation. The land use category, "potential agricultural land", presented in Exhibit 2.2-6 for Subalternative 1, includes both the areas identified as "agriculture" *and* "open space" in this discussion of Subarea 7 alternatives. The uplands on the southern third of the subarea are considered potentially suitable for grazing whether publicly or privately owned and designated for regional park or open space.

SUBALTERNATIVE 2 -- LANDOWNER'S 304 UNITS

Land Use / Development Assumptions The landowner's development assumptions are exactly the same as the Advisory Committee's land use program in terms of the amount, pattern, and location of development. The only difference is in the disposition of undeveloped areas. Whereas the Advisory Committee's subalternative would designate 80 acres of regional parkland, 139.8 acres of agriculture and 221.2 acres of open space, this subalternative assumes 220 acres of regional parkland, 200 acres of agriculture, and 21 acres of open space.

Instead of limiting regional parkland to drainage corridors and the slope bank facing Sycamore Grove Park, this subalternative assumes dedication of the entire southernmost part of the subarea to the LARPD in addition to the land assumed by the Advisory Committee's subalternative (see Exhibit 5.5-2). In order to achieve 200 acres of agricultural land, this scenario would extend agriculture much farther south in the subarea onto some of the steeper areas of the site, including approximately 60.2 acres of land with slopes greater than 25 percent. Open space would be limited to relatively small natural areas in the vicinity of proposed development. The largest natural open space area would be in the vicinity of the six units envisaged on the eastern part of the subarea.

Mitigation With 304 housing units and 112.5 acres of developed area, this subalternative would require 416.5 acres of mitigation. Based on a total on-site credit of 346.5 acres, an additional 70 acres of off-site agricultural mitigation would be needed. [10]

SUBALTERNATIVE 3 -- 260 UNITS

Land Use / Development Assumptions This alternative assumes the same residential and commercial development patterns as Subalternatives 1 and 2 except that no development would occur in the west central part of the subarea along the toe of the slopes southeast of the Zone 7 treatment plant (see Exhibit 5.5-3). No development in this area would result in 44 fewer units than assumed by Subalternatives 1 and 2 and reduce the development area from the 129.0 acres assumed by Subalternatives 1 and 2 to 106.9 acres under Subalternative 3. This 22.1-acre difference in residential development area would permit expansion of agricultural area, resulting in an increase from 139.8 acres in Subalternative 1 to 165.1 acres in Subalternative 3. All of this agricultural land would have slopes of less than 25 percent. Subalternative 3 provides for 242.3 acres of regional parkland, including the entire southern part of the subarea. Natural open space areas would comprise 55.7 acres, the two largest areas of which would be located near the six units shown in the eastern part of the subarea and the slope which separates the Zone 7 treatment facility and level terrace to the north.

Mitigation With 260 units and 89.4 acres of developed area, Subalternative 3 would require 352.4 acres of mitigation. Based on a total on-site mitigation credit of 329 acres, an additional 23.4 acres of

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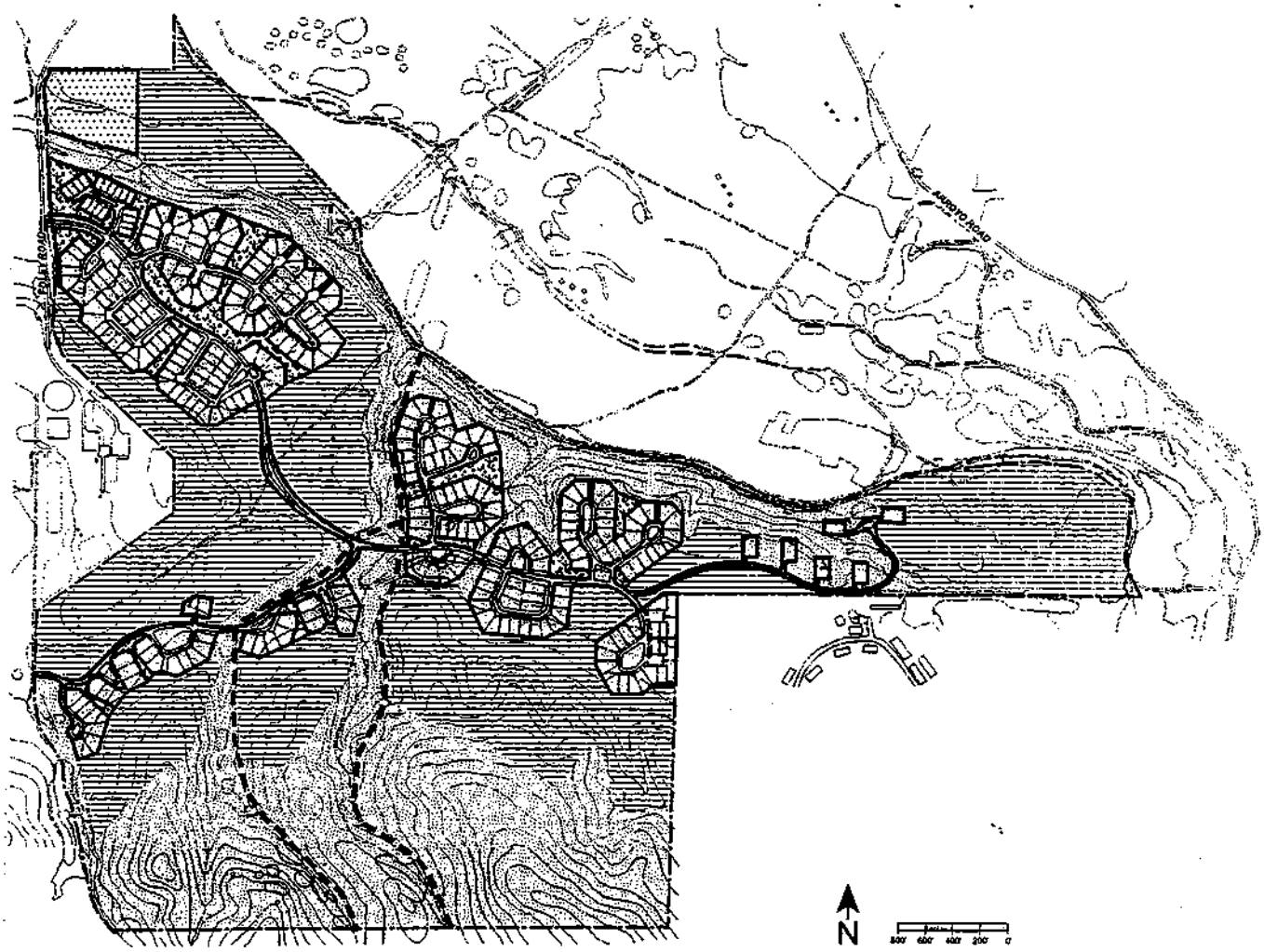
[10] Based on the *Draft Plan's* mitigation formula, Subalterative 2 would receive 1:1 mitigation credit for 139.8 acres of agricultural land and for 80 acres of regional trails / parkland. Consistent with criteria enumerated by *Draft Plan* Policy 6-4, the 80 acres of regional trails / parkland would incorporate stream corridors, steep wooded slopes, and regional trails. Mitigation credit at 3:1 would be given for the 140 acres of regional parkland consisting of predominantly steep slopes and for the 60.1 acres of agricultural land on slopes greater than 25 percent. This would result in a total on-site mitigation credit of 346.5 acres. An additional 70 acres of off-site agricultural mitigation would be required.

Exhibit 5.5-2
Subalternative 2 – Landowner's 304 Units

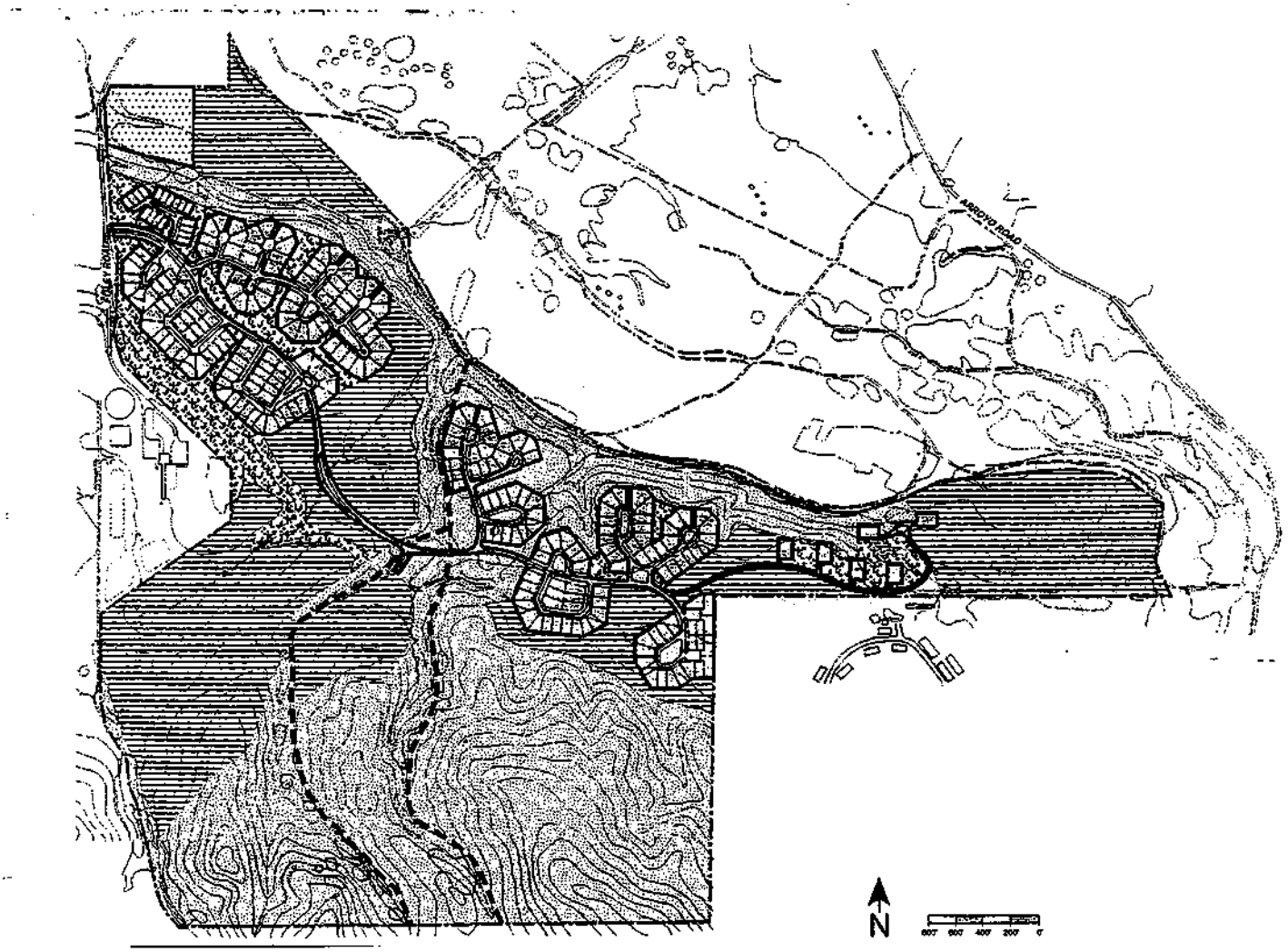


Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

Exhibit 5.5
Subalternative 3 -- 260 Units



Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

off-site agricultural mitigation would be required. [11]

SUBALTERNATIVE 4 -- 226 UNITS

Land Use / Development Assumptions Subalternative 4 assumes 34 fewer units than Subalternative 3 in a similar residential and commercial development pattern except that no units would be developed in the central part of the subarea (Exhibit 5.5-4). This subalternative would commit 92.6 acres development (compared with 106.9 acres under Subalternative 3) and 260.1 acres of regional parkland in the north-central part of the subarea (compared with 242.3 acres under Subalternative 3). The quantity and location of the 165.1 acres of agricultural land would be the same as designated by Subalternative 3, and all agricultural land would have slopes less than 25 percent. Natural open space would comprise 55.7 acres, including areas in the eastern part of the subarea and slope near the Zone 7 treatment facility.

Mitigation This 226 units and 80.3 acres of developed area would require 306.3 acres of mitigation. The total on-site mitigation credit of 346.8 acres would exceed this requirement by 40.5 acres. [12]

SUBALTERNATIVE 5 -- 205 UNITS

Land Use / Development Assumptions While Subalternatives 2, 3, and 4 are all variations on Subalternative 1, Subalternative 5 is based on different assumptions. Although development would be concentrated on the western terrace as with Subalternatives 1-4, Subalternative 5 assumes substantially more units on the eastern part of the subarea compared with those alternatives' limited development there (Exhibit 5.5-5). Concentrating development at the east and west ends of the subarea would preserve the central part of the property. Subalternative 5 also assumes larger lot sizes (ranging from 8,000 to 10,000 square feet in west and 10,000 to 30,000 square feet in the east) and adjacency of more units to open space. In order to accommodate development on the opposite ends of the subarea, Subalternative 5 assumes that access would be provided both from Foley Road and Arroyo Road, the latter via a new bridge. (Subalternatives 1-4 all assume access solely from Foley Road via Vallecitos Road.) Providing access from Arroyo Road would distribute traffic differently off-site and would keep the central part of the subarea free from development, since no connecting road would cross the width of the subarea.

Subalternative 5 designates more parkland (278.5 acres) than the other development alternatives. Parkland would extend the full length and width of the subarea and would maintain a minimum 1,200-foot wide corridor in the central part of the subarea to provide maximum protection for wildlife

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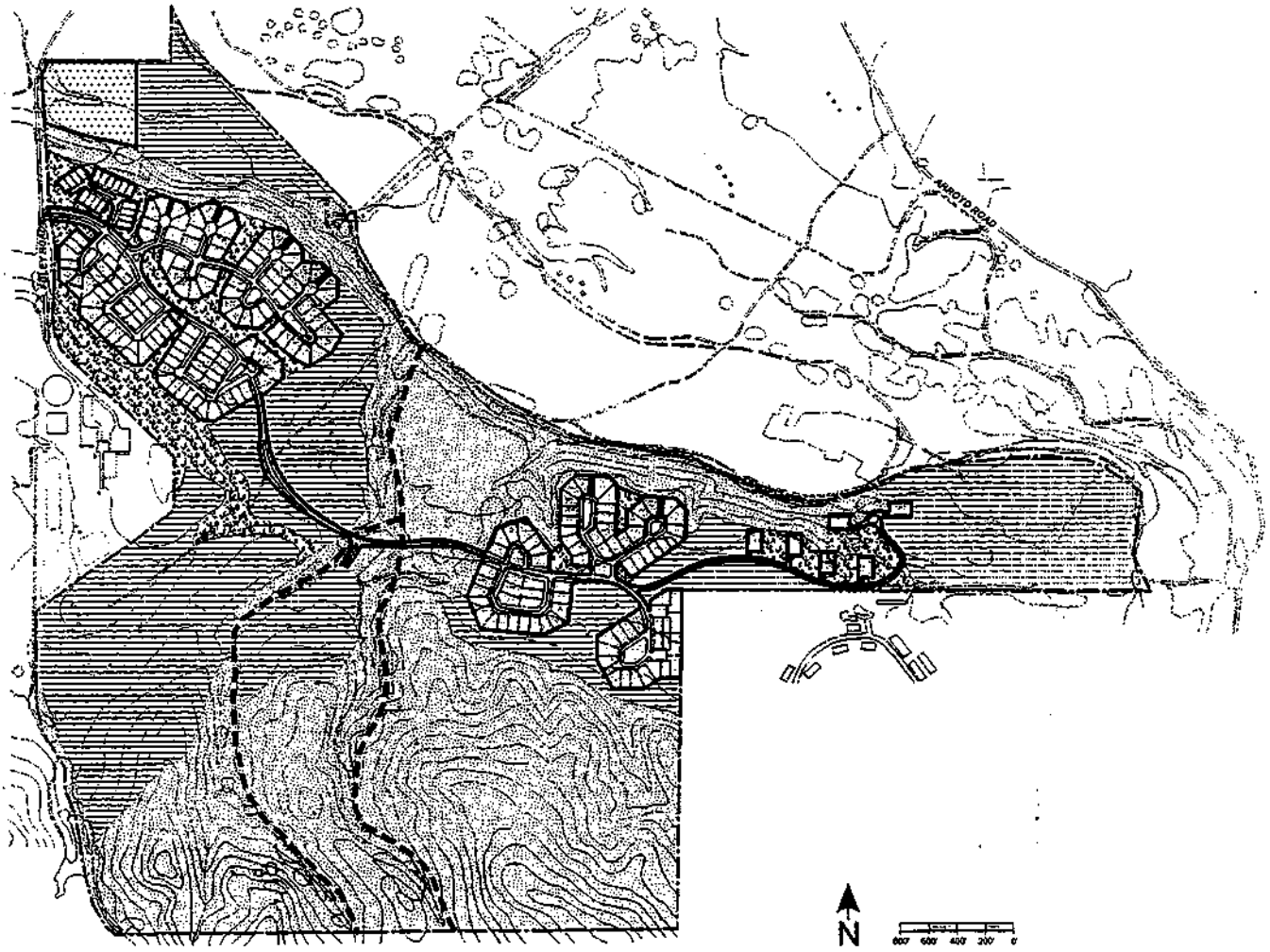
[11] Subalternative 3 would receive 1:1 mitigation credit for 165.1 acres of agricultural land, for 80 acres for regional trails / parkland, and 4.7 acres of regional parkland on slopes less than 25 percent. Mitigation credit at 3:1 would be given for 157.6 acres of regional parkland consisting of predominantly steep slopes over 25 percent. This would result in a total on-site mitigation credit of 329 acres and require an additional 23.4 acres of off-site agricultural mitigation.

[12] Subalterative 4 would receive 1:1 mitigation credit for 165.1 acres of agricultural land, for 80 acres for regional trails/parkland recommended by CAC, and 22.5 acres of regional parkland on slopes less than 25 percent. Mitigation credit at 3:1 would be given for 157.6 acres of regional parkland consisting of predominantly steep slopes over 25 percent. This would result in a total on-site mitigation credit of 346.8 acres, which would exceed by 40.5 acres the amount of suitable agricultural mitigation area needed to mitigate on-site development.

Exhibit 5.5-4
Subalternative 4 – 226 Units

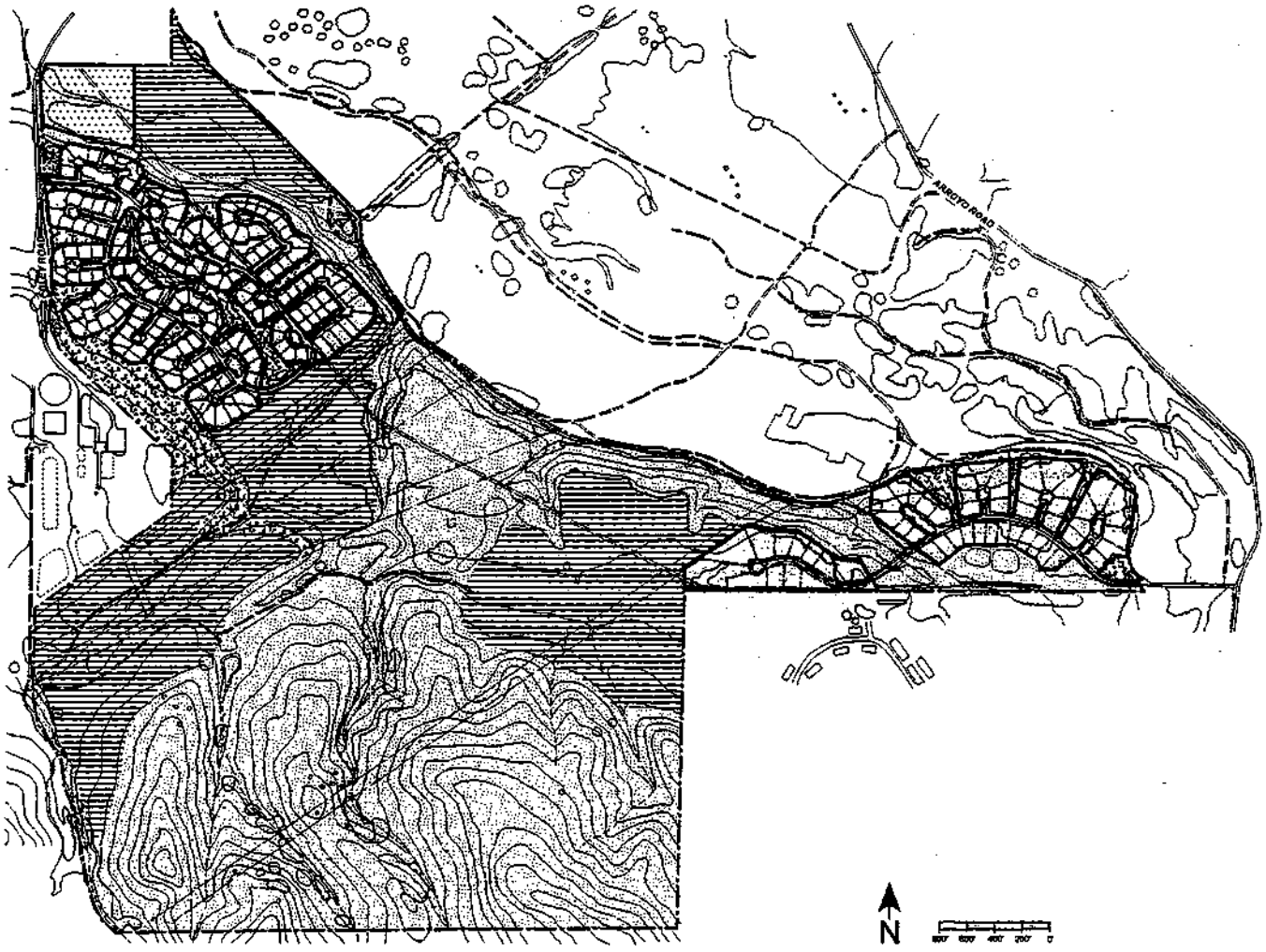


Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

Exhibit 5.5-5
Subalternative 5 – 205 Units



Legend:
- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

movement and habitat values.

Mitigation With 205 dwelling units and 90.7 acres of developed area, this alternative would require 295.7 acres of mitigation. The on-site credit of 325.9 acres would exceed the amount of suitable agricultural mitigation area needed by 38.9 acres. [13]

SUBALTERNATIVE 6 -- 159 UNITS

Land Use / Development Assumptions Subalternative 6 assumes the same residential pattern on the western terrace as Subalternative 5 but only six lots on the eastern part of the subarea (see Exhibit 5.5-6). The six latter lots would be one to two acres in size and accessed from Arroyo Road via a new bridge over Arroyo Valle. Agricultural land is designated east of those six lots. The other difference between Subalternatives 5 and 6 would occur in the northwestern corner of the subarea where Subalternative 5 assumes a winery and agriculture and Subalternative 6 assumes two 20-acre parcels. These 20-acre parcels would include the wooded bank between the upper and lower terraces which Subalternatives 1-5 designate as regional parkland.

Both Subalternatives 5 and 6 designate the same parkland and agricultural land areas in the central part of the subarea. This alternative provides 171.7 acres of agricultural land. This number assumes that approximately 22 acres of active agriculture could occur on the two 20-acre parcels -- that is, available area minus wooded areas, slope banks, and two two-acre development sites. Subalternative 6 provides for 259.3 acres of regional parkland but not the bank between two terraces in the northwest corner or the easternmost extension to the subarea boundary provided by Subalternative 5.

Mitigation With 159 units and 69.0 acres of developed area, Subalternative 6 would require 228.0 acres of mitigation. The total on-site mitigation credit of 346.1 acres would be exceed by 118.1 acres. [14] In addition, planting of the undeveloped parts of the two 20-acre parcels would mitigate the acreage requirements of those units.

SUBALTERNATIVE 7 -- 52 UNITS

Land Use / Development Assumptions This alternative would provide substantially less development than Subalternatives 1-6 while also maintaining the center of the subarea for regional

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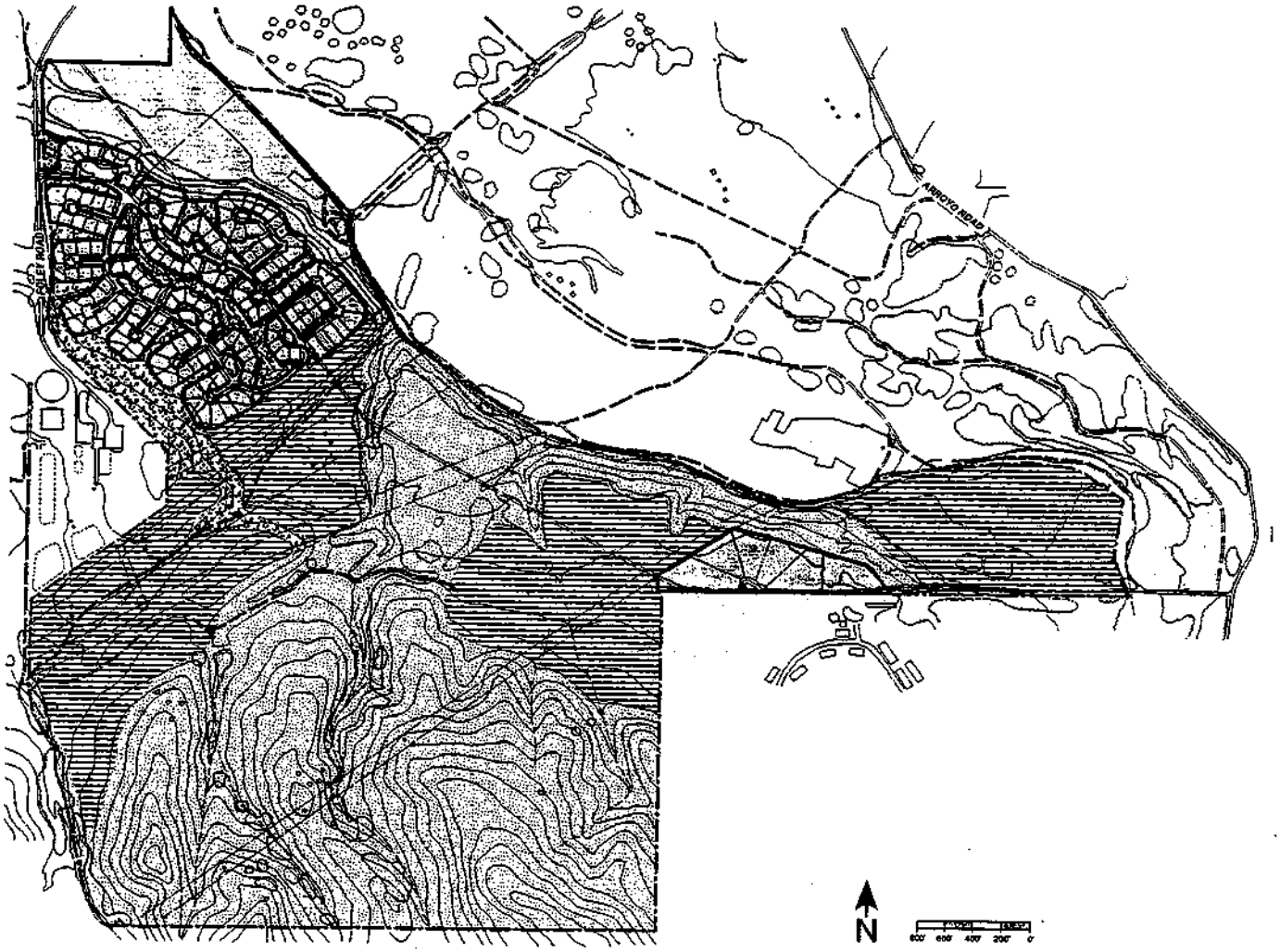
[13] Based on the mitigation formula described in Chapter 6, this alterative would receive 1:1 mitigation credit for 141.1 acres of agricultural land, for 80 acres for regional trails/parkland recommended by the CAC, and 58.0 acres of regional parkland on slopes less than 25 percent. Mitigation credit at 3:1 would be given for 140.5 acres of regional parkland consisting of predominantly steep slopes over 25 percent. This would result in a total on-site mitigation credit of 325.9 acres, which would exceed by 38.9 acres the amount of suitable agricultural mitigation area needed to mitigate on-site development.

[14] Based on the mitigation formula described in Chapter 6, this alterative would receive 1:1 mitigation credit for 171.7 acres of agricultural land, for 80 acres for regional trails/parkland recommended by the CAC, and 52.0 acres of regional parkland on slopes less than 25 percent. Mitigation credit at 3:1 would be given for 127.3 acres of regional parkland consisting of predominantly steep slopes over 25 percent. This would result in a total on-site mitigation credit of 346.1 acres, which would exceed by 118.1 acres the amount of suitable agricultural mitigation area needed to mitigate on-site development. The two 20-acre parcels would self-mitigate by planting out the balance of the undeveloped portions of each parcel.

Exhibit 5.5-6
Subalternative 6 -- 159 Units

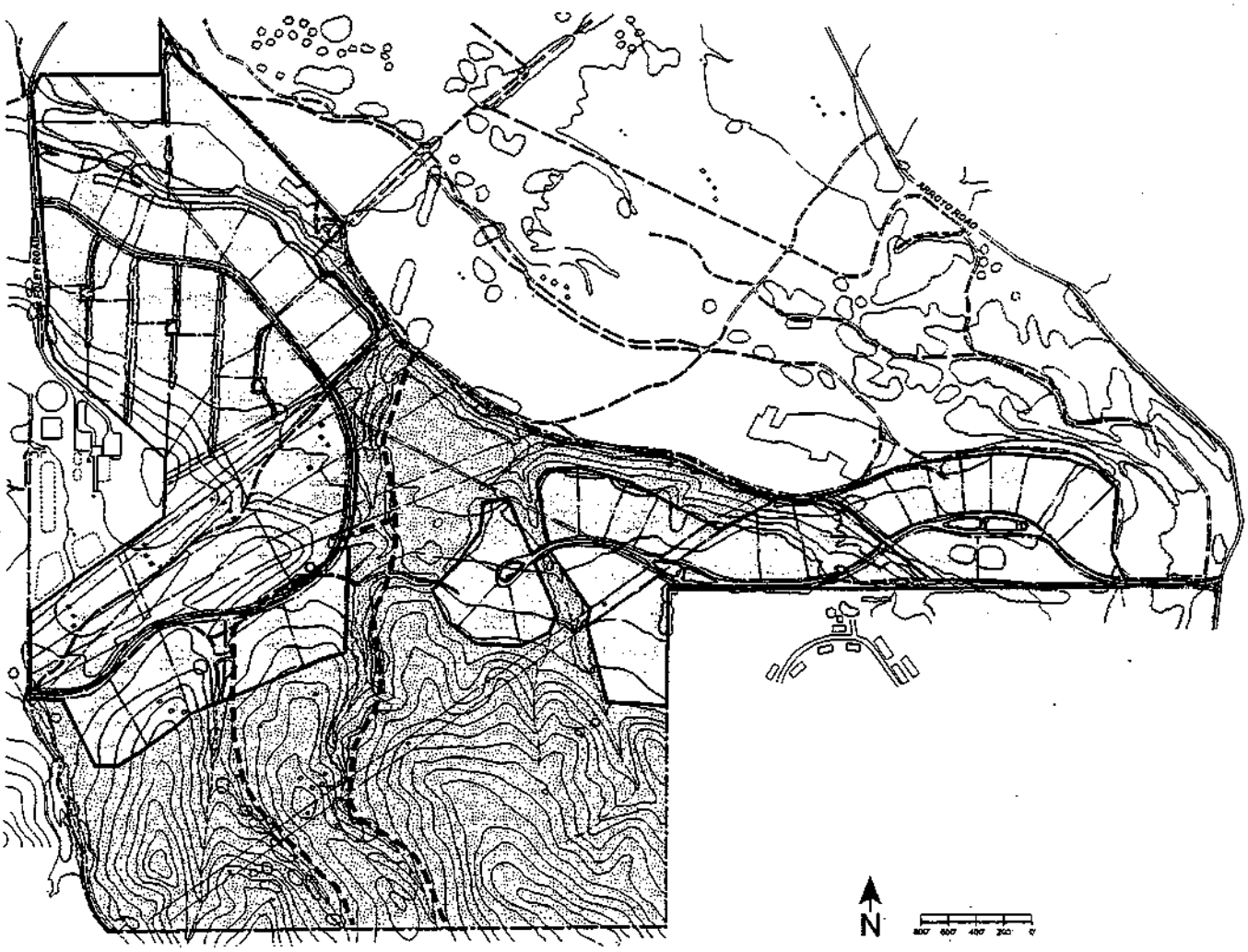


Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

Exhibit 5.5-7
Subalternative 7 – 52 Units



Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

parkland. Lot would range in size from two to eight acres plus an additional two lots of 20 acres or larger (see Exhibit 5.5-7). As with Subalternatives 5 and 6, access would be provided from both Arroyo Road (via a new bridge) and Vallecitos Road (via Foley Road), thus without a roadway across the parkland. Subalternative 7 would provide 269.4 acres of regional parkland, all located in the central part of the subarea. No agriculture is assumed on the two- to eight-acre lots which could not support viable agriculture, although the two 20-acre or larger parcels could support approximately 50 acres of agriculture. A 15-acre equestrian facility is assumed on the lower terrace adjacent to Sycamore Grove Park.

Mitigation The 50 units on lots smaller than 20 acres would occupy 208.0 acres of developed area and require 258.0 acres of agricultural mitigation. Based on a total on-site mitigation credit of 171.8 acres, Subalternative 7 would require an additional 86.2 acres of off-site agricultural mitigation. The two 20-acre or larger lots would be required to provide their own mitigation within their respective parcels, planting and placing all but their two-acre building sites under easement. [15]

SUBALTERNATIVE 8 – 17 UNITS

Land Use / Development Assumptions This alternative illustrates possible retention of the subarea in the County and development under County regulations of minimum 20-acre lots (see Exhibit 5.5-8). Consistent with County regulations, lots would not located in areas where the majority of lot area would be on slopes steeper than 25 percent. Due to the steep slopes in the southern part of the subarea, approximately 163.3 acres would remain in open space suitable for grazing but not for intensive agriculture. No agriculture is assumed outside individual lots. Except for a two-acre building site on each lot, Subalternative 7 landowners would be required to plant appropriate agricultural crops and place all land under permanent easement. Altogether, the 17 lots would occupy approximately 395.7 acres, all but 34 acres of which would be placed under permanent agricultural easement. Subalternative 8 would not provide for any regional parkland or commercial development.

Mitigation Not all of the approximately 361.7 acres placed under agricultural easement with development of 17 20-acre parcels would be suitable for planting due to slopes greater than 25 percent, wooded areas, and riparian areas, although the lots would generally be consistent with County mitigation requirements.

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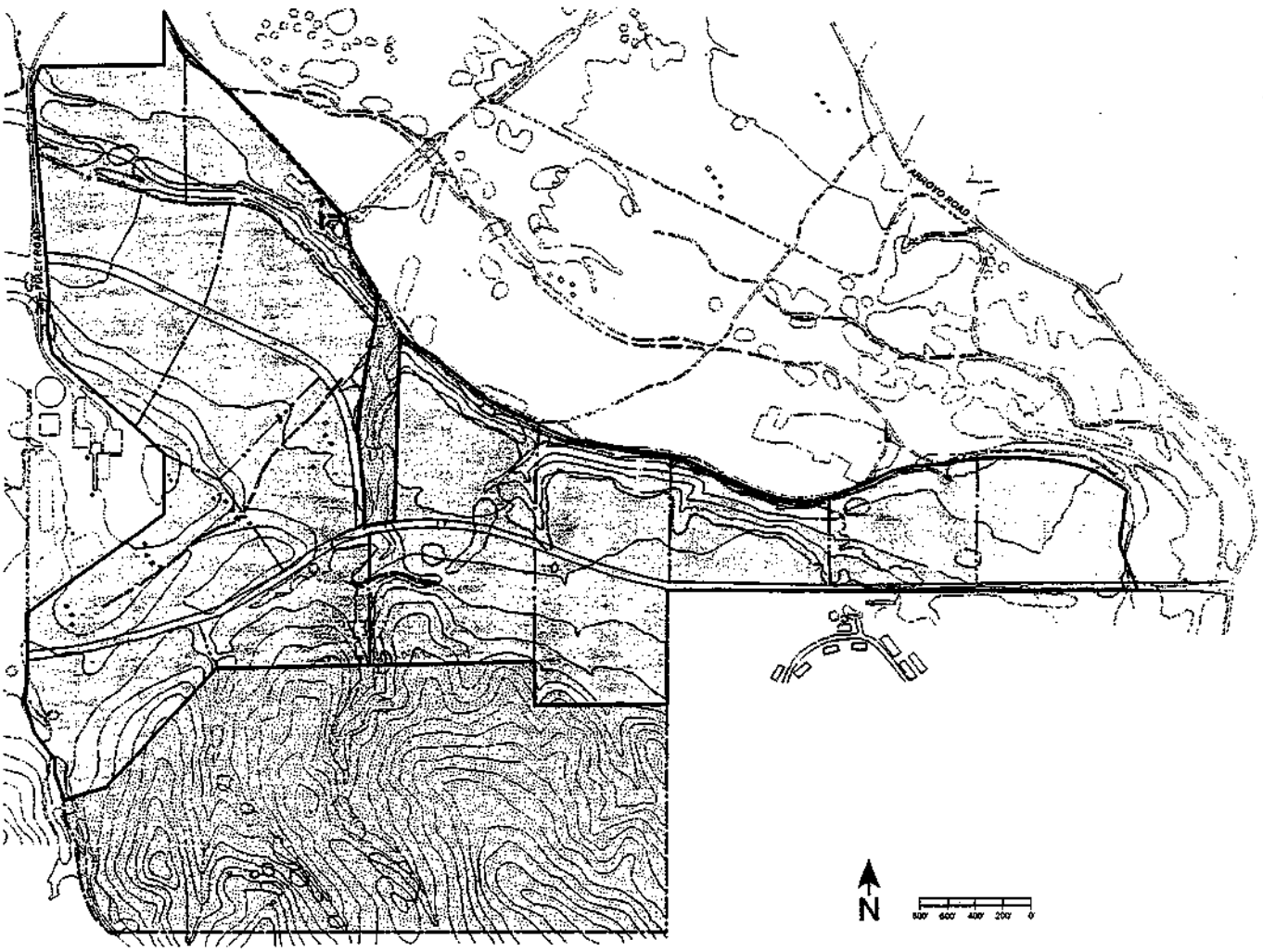
[15] The 50 dwelling units on parcels less than 20 acres would occupy 208.0 acres of developed area. This would require 258.0 acres of agricultural mitigation. Based on the mitigation formula described in Chapter 6, this alterative would receive 1:1 mitigation credit for 80 acres for regional trails/parkland recommended by the CAC, and 43.0 acres of regional parkland on slopes less than 25 percent. Mitigation credit at 3:1 would be given for 146.4 acres of regional parkland consisting of predominantly steep slopes over 25 percent. This would result in a total on-site mitigation credit of 171.8 acres. An additional 86.2 acres of off-site agricultural mitigation would be required. The two parcels that are 20 acres or greater would be required to provide their own mitigation within each parcel, placing all but their two-acre building sites under easement and planted.

Exhibit 5.5-8
Subalternative 8 – 17 Units



Legend:

- Residential
- Commercial
- School
- Agriculture
- Open Space
- Park
- Developed Area Boundary
- Regional Trail Corridor
- Subarea Boundary

Source: Wallace Roberts & Todd

SUBALTERNATIVE 9 -- PERMANENT OPEN SPACE

Background This alternative responds to public concerns about potential development of Subarea 7. Retention of the entire Subarea 7 as open space would require acquisition by the City or other entity (such as the South Livermore Valley Agricultural Land Trust, Park District, or County) from a willing seller. Depending on the ultimate land uses adopted for Subarea 7, parts of the Subarea might be available for purchase by other area landowners to meet their mitigation requirements. Again, this would be subject to the landowner's desire to make easements or fee available for purchase.

This alternative is considered in the EIR to provide decisionmakers with an analysis of the full range of options available including the option of adopting a no project alternative with respect to Subarea 7 in a manner that would protect the resources of the area over the long term. Because this alternative contemplates no development within Subarea 7 it was not included in the *Draft Plan*. If the City elects to proceed with this option, the *Final Specific Plan* would include policies directing the City to work with the property owners and other interested parties to maintain Subarea 7 as open space.

There is a precedent for purchase of some or all of the property for agricultural easements. The South Livermore Valley Agricultural Land Trust is an independent non-profit organization incorporated in September 1994 for the primary purpose of permanently preserving agricultural land through the direct purchase of agricultural conservation easements. The Trust was established as a result of Alameda County's and Livermore's adoption of the *South Livermore Valley Area Plan*. The Trust receives funding from developer fees from the Ruby Hill development and other development projects in the South Livermore area. The Trust will consider properties within or adjacent to the SLVSPA.[16] Acquisition criteria include:

- Proximity to urban development, other agricultural operations, or open space
- Agricultural value
- Historic value
- Preservation of resources and habitats

The Trust currently has no plans to pursue acquisition of land in Subarea 7. However, the Trust is always willing to discuss any property in the South Livermore Valley. After nine months of negotiations, the Land Trust recently acquired a conservation easement on the Concannon Vineyard.

Alameda County will require approximately 100 acres of mitigation planting to mitigate the impacts of development in Subarea 5.[17] The County will be likely to look for one or two large properties to avoid multiple negotiations.

On Subarea 7, such approaches would require the landowner to voluntarily enter into an agreement to sell the property or part of the property to the willing buyer.

Retention of the subarea in open space would avoid many of the significant impacts of the project, most prominently those on biological resources.

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[16] Terrill Watt conversation with Amalia Egre, Executive Director, South Livermore Valley Agricultural Land Trust.

[17] Terrill Watt conversation with Stuart Cook, Planner, Alameda County.

Assumptions This alternative assesses the environmental effects from maintenance and use of the entire Subarea 7 site as open space, assuming purchase for permanent preservation. This alternative assumes no on-site development other than possible provision of limited parking for trails and limited agriculture. The latter is assumed to consist of grazing.

ENVIRONMENTAL ASSESSMENT OF SUBAREA 7 SUBALTERNATIVES

Land Use

The Subarea 7 subalternatives differ in the amount of land devoted to residential lots and access in relation to agricultural or regional parkland use. *Subalternatives 1-6* would commit progressively less land to residential lots and roadways while *Subalternatives 7* and *8* would designate substantial areas for residential lots and the balance of the subarea for park or open space (potential grazing) use. Intensive agriculture would be required on 90 percent of 20-acre lots assumed in the northwest corner by *Subalternatives 6* and *7* and throughout the subarea by *Subalternative 8*.) The land use patterns of all alternatives would concentrate lots in different arrangements on the northern two-thirds of the subarea with park (or grazing) land on the southern third, including on the subarea's steepest slopes. Where alternatives differ most is in the total amount and location of intensive agricultural and regional parkland on the northern part of the subarea (Exhibits 5.5-1 and 5.5-8). While *Subalternative 9* would preserve the entire subarea as public ownership, all or part potentially could have a dual use for grazing.

The commercial site (winery under *Subalternatives 1-5* and equestrian facility under *Subalternative 7*) would be located in one of three parts of the subarea with prime soils. This area of prime soils also encompasses land designated expressly for vineyards by *Subalternatives 1-5* and designated for 20-acre lots (requiring agriculture on 90 percent of the lot area) by *Subalternatives 6-8*. *Subalternatives 1-5 and 6* would retain the second site of prime soils in the eastern part of the subarea as agriculture, but *Subalternatives 5, 7, and 8* would convert most of the prime soils there to residential lots (although agriculture would be required on 90 percent of lots there under *Subalternative 8*). *Subalternative 9* would not convert the prime soils on the northwest and eastern parts of the subarea outright but would be unlikely to take advantage of their value for cultivated agriculture, thus effectively resulting in their productive loss. All or part of the third site of prime soils would be developed with buildout of *Subalternatives 1-4* and *7-8* (although agriculture would be required on 90 percent of lots there under *Subalternative 8*). All subalternatives would result in some unmitigable losses of prime soils, but the magnitude of loss would be less with *Subalternatives 6, 8,* and *9* than with the other subalternatives. The eastern part of Subarea 7 is subject to a Williamson Act contract and could not be developed under *Subalternatives 1-7* unless the contract is not renewed and expires or is canceled.

Subalternatives 1-8 would locate residential lots in similar geographic parts of Subarea 7, primarily lower elevations. Residential use assumed by these subalternatives would be adjacent to the same off-site land uses, although densities within the Subarea 7 residential development areas would differ, thus exposing different numbers of residents to non-residential activities. Subarea 7 development would be exposed to the similar urban-rural conflicts for all subalternatives, differing only in numbers of people involved.

Geology

From a geologic perspective, the *Subalternative 5* and *6* development concepts for Subarea 7 would be environmentally superior to *Subalternatives 1-4* and *7*, among the development alternatives, although

Subalternative 8 potentially could avoid geologic hazards due to the size of large lots assumed. Development of Subarea 7 according to *Subalternatives 5, 6,* and, possibly, *8* would avoid the potential ancient bedrock landslides but would require repair of a small area adjacent to the Zone 7 plant containing 2-3 landslides unless lots were relocated to avoid direct impacts from slope instability or indirect impacts from repairing slides. Neither *Subalternative 7* nor *8* would avoid the subarea's geologic hazards. Lots would be located downslope from landslides. While probably large enough to build housing units in stable parts of lots to avoid on-site landslides, it still would be necessary to repair slides uphill from home sites in order to provide adequate long-term protection from downhill movement of the slides and debris which could be eroded from them. Without repair, there also probably would be short-term day-to-day problems from slides located uphill from residential development (such as from raveling of debris, rocks, and mud flows).

Hydrology

Hydrologic effects of *Subalternatives 2-4* would be similar to those described for *Subalternative 1* in the main text of the EIR, varying in relation to number of housing units. *Subalternatives 5* and *6* could avert changes in stormwater drainage patterns in subwatershed 7b but *Subalternative 5* would be expected to affect patterns in subwatershed 7d somewhat more substantially compared with *Subalternatives 1-4*. Lots would be developed in all subwatersheds with *Subalternatives 7* and *8* and could result in some alterations in the direction and flashiness of local surface drainage. Public park use of the entire subarea with *Subalternative 9* would avert changes in stormwater drainage patterns in all Subarea 7 subwatersheds.

The extent of alterations with *Subalternatives 1-8* would depend on whether storm drain systems installed with development were equipped with multiple outlets mimicking existing drainage patterns or whether systems concentrated stormwater discharge at single points in drainageways. With *Subalternatives 1-4*, concentrated storm drain discharge into the lower reach of drainage 7b could cause local incision and some bank instability. Concentrated storm drain system discharge and increased peak flows of *Subalternatives 5-8* could trigger channel incision and bank instability in drainage 7d. Of those latter four subalternatives, impacts would be expected to be greater with *Subalternatives 5 and 7* than *Subalternatives 6* and *8*, due to relative density. The stormwater alterations likely to attend implementation of *Subalternative 7* also could aggravate the erosive unstable condition in the east fork of Drainage 7c.

Increases in the ten- and 100-year peak flow rates were computed for two representative subalternatives -- *Subalternatives 5* and *7* -- shown below.

Exhibit 5.5-9
Peak Flow Rates for Design Ten- and 100-Year Rainstorms

Subalternative	Ten- / 100-Year Peak Discharge (cfs)			
	Existing		Post-Project [a]	
	Ten-Year	*100-Year*	*Ten-Year*	*100-Year*
Subalternatives 1-2	107	317	145	332
Subalternative 5	107	317	134	307
Subalternative 7	107	317	186	459

a Development was assumed to result in maximum impervious (buildable) areas based on an FAR of 0.35, compared with the maximum coverage allowed by the *Draft Plan's* Design Guidelines (0.38) and the average coverage expected by the *Plan* (0,33). This assumption is conservative, especially for subalternatives with large lots. While this FAR could be applied to the homesite area of 20-acre parcels of *Subalternatives 6-8* (not to exceed two acres), alternatives with one- to eight-acre lots have not been defined to contain equivalent assumptions to restrict homesite area (*Subalternatives 6* and *7*)..

The water quality assessment conducted for *Subalternative 1* in ***4.3 Hydrology*** was expanded to analyze *Subalternatives 5* and *7* to estimate the annual contaminant loading to SLVSPA drainages from the composite planning area (Subareas 1-7) with the representative subalternatives. Exhibit 5.5-10 shows that none of the Subarea 7 alternatives tested would exceed the contaminant criteria.

Exhibit 5.5-10
Annual Contaminant Loading to Subarea 7 Drainages
Subalternatives 1-2, 5, and 7

Contaminant	Loading Rate [a]				
	Existing	Post-Project Condition			
		Subalternative 1-2	*Subalternative 5*	*Subalternative 7*	*Criteria* [b]
NO3-N	0.6	2.2	2.2	2.3	96.0
Total Cu	0.2	0.9	0.8	0.9	12.0
Total Pb	0.1	0.4	0.4	0.5	3.2
Total Zn	0.1	0.5	0.5	0.5	4.7
Oil and Grease	0.3	1.7	1.7	2.2	5.3

Assumptions:

- Representative rainfall year = 1984-1985 (14.59 inches)
- Number of storms in 1984-1985= 20
- Average storm rainfall depth = 0.70 inch
- Loading rates for residential and commercial land uses based on Table 6-25 "Annual Urban Runoff Loads" in *Results of the Nationwide Urban Runoff Program*, USEPA, December 1983.

a mg / l = milligrams per liter = ppm (parts per million).

b Toxicity thresholds for selected contaminants from USEPA's *Quality Criteria for Water*, May 1986, and Stenstrom *et al*, February 1984.

Biology

Impacts associated with *Subalternative 1* are described in detail in ***4.4 Biological Resources***. Potential adverse impacts include: loss of non-native grasslands, native grasslands, and approximately 44 oaks; loss and fragmentation of wildlife habitat, particularly upland access to Sycamore Grove Park for terrestrial wildlife species; filling of vernal pool and possibly other seasonal wetlands in the western

claypan terrace and segments of drainages and possibly other seasonal wetlands in the subarea; and modifications to or elimination of habitat for special-status species (such as California tiger salamander, fairy shrimp, and possibly special-status plant species). Supplemental surveys would be required to definitively determine the extent of sensitive resources which could be affected by development. This includes a wetland delineation and surveys for fairy shrimp, special-status plants, and California tiger salamander. Due to the extent of proposed development, the open space lands assumed as part of this alternative would not provide adequate opportunities to mitigate identified impacts to wildlife habitat, wetlands, and possible occurrence of special-status species, particularly if one of the Federally-listed fairy shrimp species is detected in the vernal pool or other locations. Modifications to the project would be required to fully mitigate adverse impacts identified by the EIR, as recommended by ***Mitigation Measures 4.4-2*** and ***4.4-3***.

Subalternative 2 would have similar impacts on the biological and wetland resources of the subarea because the pattern and location of development is similar to *Subalternative 1*. The one exception would be the extent of land area devoted to agriculture, as opposed to regional park land or other open space use. *Subalternative 2* assumes 200 acres of agriculture and 241 acres of regional park and other open space lands, compared with 139.8 acres of agriculture and 301.2 acres of open space and regional parkland with *Subalternative 1*. The additional 60 acres devoted to agriculture use in this alternative would eliminate additional grassland habitat and could affect sensitive resources (such as native grasslands, seasonal wetlands, and breeding habitat for fairy shrimp or upland aestivation habitat for California tiger salamander. Supplemental surveys would be required to determine the extent of sensitive resources which could be affected by development, including a wetland delineation and surveys for fairy shrimp, special-status plants, and California tiger salamander. As with *Subalternative 1*, the open space lands assumed by *Subalternative 2* would not provide adequate opportunities to mitigate identified impacts, and a reduction in the extent of land devoted to residential development and agricultural use would be required.

While *Subalternative 3* does not assume residential development in a large part of the subarea, compared with *Subalternatives 1* and *2*, its replacement with agricultural use basically would eliminate any benefit to wildlife habitat. *Subalternative 3* assumes approximately 34 more acres of agricultural use than *Subalternatives 1* and *2*. Intensive agriculture and residential use would create a narrow band of open space along the central drainage with a width of less than 300 feet for a distance of more than 800 feet. Vehicular access to the eastern half of the developed area would bisect the central drainage, as with *Subalternatives 1* and *2*, reducing its viability as a major link for terrestrial wildlife between Sycamore Grove Park and the open space lands on the southern part of the subarea. ***Mitigation measure 4.4-3*** includes a provision to eliminate the cross-site road assumed by *Subalternatives 1* and *2* and to create an alternate access to the eastern part of the subarea from Arroyo Road with an improved bridge over Arroyo Valle. The extent of residential and agricultural use also would limit opportunities to mitigate potential impacts on seasonal wetlands and possible breeding habitat for California tiger salamander and freshwater shrimp by creating replacement habitat on-site. As with the other alternatives, supplemental surveys would be required to determine the extent of sensitive resources which could be affected by development, including a wetland delineation, and surveys for fairy shrimp, special-status plants, and California tiger salamander.

Compared with *Subalternatives 1-3*, *Subalternative 4* would provide an improved upland link for terrestrial wildlife between Sycamore Grove Park and the undeveloped lands in the southern part of the subarea by restricting residential development in the center of the subarea and expanding the extent of regional parklands. However, as with *Subalternative 1-3*, *Subalternative 4* would provide access to the eastern development area via a cross-site roadway. As with *Subalternative 3*, *Subalternative 4* assumes

approximately 34 more acres of agricultural use than *Subalternatives 1* and *2* which would be located primarily on grassland habitat (assumed for residential development by *Subalternatives 1* and *2*). Vehicular access across the subarea would limit the effectiveness of the central band of regional parkland as a link to Sycamore Grove Park and would not meet the full intent of ***Mitigation Measure 4.4-3***. As with the other alternatives, supplemental surveys would be required to definitively determine the extent of sensitive resources which could be affected by development, including a wetland delineation, and surveys for fairy shrimp, special-status plants, and California tiger salamander.

From a biological perspective, the *Subalternative 5* development concept would be environmentally superior to *Subalternatives* 1-4, 7, and 8. Intensive development would be concentrated at the eastern and western edges of the subarea, primarily affecting non-native grasslands. Impacts on sensitive resources could include loss of the vernal pool and other seasonal wetlands in the western development area and an improved crossing over Arroyo Valle to provide access to the eastern development area. A large band of open space would separate the development areas in the central part of the subarea and would provide a permanent link for wildlife between Sycamore Grove Park and the undeveloped grazing lands to the south. This would include movement corridors for California tiger salamander known to breed in the adjacent parklands. Open space assumed by this alternative would preserve approximately 320 acres of grassland, woodland, and riparian habitat, and complement the existing habitat of Sycamore Grove Park. This would include the sensitive native grasslands in the upper elevations of the subarea.

Supplemental surveys still would be required to definitively determine the extent of sensitive resources which could be affected by development. This requirement includes a wetland delineation and surveys for fairy shrimp, special-status plants, and California tiger salamander. Unless substantial wetland resources are encountered in the claypan in the western development area, rare plant populations are detected, and / or the vernal pool or other locations are used for breeding by one of the Federally-listed fairy shrimp species, this alternative's open space lands should provide adequate opportunities for mitigation. Such mitigation could include creation of replacement wetland habitat and alternative breeding pools for California tiger salamander, if supplemental surveys indicate that the vernal pool is used for breeding.

As with *Subalternative 5*, *Subalternative 6* would be environmentally superior from a biological perspective to *Subalternative 1* and the other Subarea 7 development alternatives. Although intensively managed vineyards provide little habitat value for wildlife, keeping the eastern part of the subarea free of residential development would provide a substantial buffer along the southeast edge of Sycamore Grove Park. The two 20-acre parcels in the northwest part of the subarea would provide no regional parkland along the floor of the valley similar to with *Subalternative 5*, and it is possible that vegetation of these two parcels could be eliminated by future residents unless a conservation easement is established to ensure protection. As with *Subalternative 5*, *Subalternative 6* would maintain the habitat connectivity between Sycamore Grove Park and the uplands to the south by providing no cross-site vehicular access. Supplemental surveys still would be required to determine the extent of sensitive resources which could be affected by development, but sufficient land area appears available to provide mitigation opportunities if necessary should residential development not avoid these resources completely.

As with *Subalternative 5*, *Subalternative 7* would provide a band of permanent open space connecting Sycamore Grove Park and undeveloped grazing lands south of Subarea 7. Development assumed by the *Subalternative 7* could affect seasonal wetlands, stream corridors, and possibly habitat for special-status species (such as fairy shrimp, California tiger salamander, and rare plants). A wetland

delineation and supplemental surveys still would be required to definitively determine the extent of sensitive resources which could be affected by development. Unless substantial wetland resources are encountered in the claypan in the western development area, rare plant populations are detected, and / or the vernal pool or other locations are used for breeding by one of the Federally-listed fairy shrimp species, open space in the subarea's regional park should provide adequate opportunities for mitigation. Such mitigation would include creation of replacement wetland habitat and alternative breeding pools for California tiger salamander, if supplemental surveys indicate that the vernal pool is used for breeding.

While the total number of units would be substantially reduced from the number envisaged by either *Subalternative 1* or *5*, development would extend over a much greater area, and the open space link would be much narrower than that provided by the *Subalternative 5*. At least two residential lots would be located within the band of grassland habitat at the confluence of the central intermittent stream (recommended for preservation by this EIR's ***Mitigation Measure 4.4-3***). The roadway alignment shown in for the western development area would follow the edge of the riparian corridor and require two crossings of the intermittent stream in the central part of Subarea 7. The western tributary of the central intermittent stream would pass through three private lots rather than a permanent open space corridor, as with *Subalternatives 1 ,5,* and *6* which could result in adverse modifications in the future. Intensive agriculture might be developed on private lots (although not assumed) which could contribute to a further reduction in the extent of grasslands and other habitat on the site. This could include removal of the remaining riparian habitat and oak trees along the fringe of the western tributary of the central intermittent stream and possible loss of sensitive native grasslands on the hillside portion of the five lots in the southwestern portion of the site. Preservation of upland parts of the subarea as a regional park could protect native grasslands whether or not grazing would be maintained as a management practice.

While *Subalternative 8* assumed very low density residential development, the opportunity to maintain an essential habitat link between Sycamore Grove Park and the undeveloped lands to the south would not be possible without restricting residential parcels from the central part of the subarea. Except for two-acre building sites, these 20-acre parcels would be planted with intensively managed crops. Of particular concern is the location of Parcels 10 and 11 which extend into the riparian corridor of the central drainage without any setback. Supplemental surveys would be required to determine the extent of sensitive resources, consistent with policies contained in the County's *Area Plan* for the South Livermore Area. Additional restrictions on agricultural use most likely would be required to fully mitigate impacts on sensitive resources and to maintain a link for terrestrial wildlife between Sycamore Grove Park and the undeveloped lands to the south.

Traffic

Exhibit 5.5-11 compares the estimated PM peak hour traffic generation of Subarea 7 alternatives which reflects the total number of housing units assumed. Thus, subalternatives assuming more units would generate higher traffic volumes than subalternatives with fewer housing units in the subarea, with or without other land uses (such as a winery, equestrian facility, or regional parkland).

Exhibit 5.5-11
Estimated PM Peak Hour Trip Generation of Subarea 7 Subalternatives

				PM Peak Hour	
Sub alternative	**Land Use**	**Amount**	**Access**	**Trip Rate**	**Trips**
1	Residential	304 housing units	Foley Road only	1.01 trips / unit	307
	Commercial	medium winery		Exhibit 4-5-19	26
	Total				*333*
2	Residential	304 housing units	Foley Road only	1.01 trips / unit	307
	Commercial	medium winery		Exhibit 4-5-19	26
	Total				*333*
3	Residential	260 housing units	Foley Road only	1.01 trips / unit	263
	Commercial	medium winery		Exhibit 4-5-19	26
	Total				*289*
4	Residential	226 housing units	Foley Road only	1.01 trips / unit	228
	Commercial	medium winery		Exhibit 4-5-19	26
	Total				*254*
5	Residential	205 housing units	Foley and Arroyo Road	1.01 trips / unit	207
	Commercial	medium winery		Exhibit 4-5-19	26
	Total				*233*
6	Residential	159 housing units	Foley and Arroyo Road	1.01 trips / unit	161
	Commercial			none	0
	Total				*161*
7	Residential	52 housing units	Foley and Arroyo Road	1.01 trips / unit	53
	Commercial	equestrian use		*a*	17
	Total				*70*
8	Residential	17 housing units	Foley and Arroyo Road	1.01 trips / unit	17
	Commercial			none	0
	Total				*17*
9	Park		*b*	0.06 / acre	35
	Total				*35*

a Includes both equestrian and regional park PM peak hour trip generation. Sources, footnoted in text, include East Bay Regional Parks District and *Trip Generation*.

b *Subalternative 9* does not define subarea access. Because Foley Road provides access to Sycamore Grove Park, assuming access to Subarea 7 via Foley Road for this subalternative would be reasonable.

Apart from total estimated trip generation, the main difference among alternatives is access. *Subalternatives 1-4* and *8* assume that access to all uses would be via Foley Road. *Subalternatives 5-7* provide no cross-site roadway and assume separate entrances to the east and west parts of the subarea, as follows:

Subalternative	Units Via Foley Road	Units Via Arroyo Road	Total
1	304	0	304
2	304	0	304
3	260	0	260
4	226	0	226
5	150	55	205
6	153	6	159
7	29	23	52
8	17	0	17

Differences among subalternatives were quantified for two representative subalternatives *(Subalternatives 5* and *7)* to permit comparison with the analysis of *Subalternative 1* presented in ***4.5 Transportation and Circulation*** Compared with *Subalternative 1*, *Subalternatives 5* would generate fewer peak hour trips (25 percent in the AM peak hour and 22 percent in the PM peak hour), and *Subalternative 7* would generate 80 percent fewer AM peak hour and 79 percent fewer PM peak hour than *Subalternative 1*. The PM peak hour trip generation from Subarea 7 would be reduced from 333 trips with *Subalternative 1* to 233 trips under *Subalternative 5* and to 70 trips with *Subalternative 7*. These reductions reflect the fewer number of housing units, different commercial assumptions, and inclusion of different amounts of regional parkland (estimated to generate 0.06 trip per acre in the PM peak hour). [18]

These decreases would reduce traffic at the East Vineyard / Vallecitos Road intersection substantially -- peak hour traffic to and from the Subarea 7 approach would be reduced from 333 trips under *Subalternative 1* to 128 trips under *Subalternative 5* and 47 trips under *Subalternative 7*. The traffic decreases at this intersection would result from the reduction in total trip generation for Subarea 7 *per se* and from the access off Arroyo Road to 55 units with *Subalternative 5* and 23 units with *Subalternative 7*.

Traffic conditions at other study intersections located farther away from Subarea 7 would not change substantially from conditions discussed in relation to *Subalternative 1* because they are less affected by Subarea 7 traffic. Access to Subarea 7 units off Arroyo Road could increase traffic along Arroyo Road by up to 55 trips in the PM peak hour *(Subalternative 5)*. However, the general circulation patterns analyzed for *Subalternative 1* conditions would not be expected to change.

Subalternative 5 would generate enough peak hour traffic to warrant a signal at the East Vineyard / Vallecitos intersection in the year 2010, as with *Subalternative 1*, although *Subalternative 7* would not

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[18] This estimate was based on the following sources:
- *East Bay Regional Park District Master Plan*, 1989 (for total park acreage of 65,000 acres)
- *Draft Transportation Report: East Bay Regional Park District Master Plan*, 1996 (for estimated total daily trip generation of 63,033 trips)
- *Trip generation, 5th Edition* (for peak-to-daily trip generation ratio of 0.06)

generate sufficient peak hour traffic to warrant a signal at this intersection by year 2010. Signalization could result in the following service levels:

Subalternative	AM Peak Hour	PM Peak Hour
1,2	LOS B	LOS D
5	LOS A	LOS C
7	LOS A	LOS B

Air Quality

As with traffic (above), the air quality impacts of the subalternatives reflect the total number of housing units assumed. Thus, subalternatives assuming more units would account for more construction, higher traffic volumes, and a larger residential population exposed to potential land use conflicts whereas subalternatives with fewer units would result in proportionately reduced effects on air quality.

Regional air quality impacts were quantified for *Subalternatives 5* and *7* for consistency with the traffic discussion (above) in order to compare the outcome with *Subalternative 1*. Both *Subalternatives 5* and *7* would reduce total vehicle trip generation for Subarea 7 land uses compared with *Subalternative 1*, thus reducing air quality impacts. The totals would exceed the BAAQMD threshold of significance of 80 pounds per day, as shown on the following page. Thus, the impact of SLVSPA development would be a significant and unavoidable regional air quality impact, regardless of Subarea 7 alternative.

Subalternative		ROG[a]	NO_x[a]	PM-10[a]
1,2	Subarea 7	21.0	28.3	40.9
	Total Subareas 1-7	*126.8*	*176.0*	*252.9*
5	Subarea 7	16.8	23.2	33.5
	Total Subareas 1-7	*122.6*	*170.9*	*245.5*
7	Subarea 7	4.6	6.4	9.3
	Total Subareas 1-7	*110.4*	*154.1*	*221.3*
Threshold of Significance		80.0	80.0	80.0

a Pounds per day.

Noise

Subarea 7 subalternatives would result in noise impacts in proportion to the amount of development (and construction) assumed, concomitant traffic generation due to respective densities and point of access, and the type and size of the on-site population (residential, agricultural work force, recreational). Overall, noise generation of subalternatives would decrease from the less-than-significant levels of *Subalternatives 1* and 2 to varying degrees, depending on development assumptions. For consistency with the traffic and air quality discussions presented above, *Subalternatives 5* and *7* are compared with *Subalternatives 1-2* in general terms.

Subarea 7 would be compatible for residential development under any of the subalternatives, including the proximity of some residential lots to the Zone 7 treatment plant *(Subalternatives 1-2, 5, and 7)* or electrical power transmission lines*(Subalternative 7, as well as Subalternative 8)*. Noise generated by the power lines could be audible to residents of lots crossed by the utility corridor, especially during foggy or inclement weather when popping crackling noises (called corona discharge) may be heard. Exposure to noise from adjacent off-site viticultural and on-site agricultural operations (all

subalternatives), from commercial (winery) sources *(Subalternatives 1-5)*, or from commercial recreation (equestrian) activities *(Subalternative 7)* also would be similar for the subarea development concepts.

Compared with *Subalternative 1*, *Subalternative 5* would reduce less-than-significant off-site traffic noise level increases imperceptibly due to decreased trip generation of fewer housing units. *Subalternative 7* would result in substantially lower off-site traffic noise levels than with *Subalternatives 1* or *5* because fewer housing units would contribute to trip generation, but the effects would be less-than-significant in all cases.

Even with completion of development on the Vineyard Estates site, construction in Subarea 7 under any subalternative would affect fewer adjacent off-site residents than construction in subareas contiguous to built-out City neighborhoods. Implementing *Subalternative 5* could reduce the duration of construction noise impacts somewhat from the period required for *Subalternative 1* development, and implementing *Subalternative 7* could reduce constructionperiod impacts substantially from those expected with *Subalternatives 1* or *5*. Shorter construction periods would reduce impacts on Sycamore Grove Park users whose experience would be affected by exposure to noise generated from development on Subarea 7 whether or not construction activities would be visible from the park.

The number of housing units developed in Subarea 7 under any alternative would not change cumulative noise impacts on Concannon Boulevard residents.

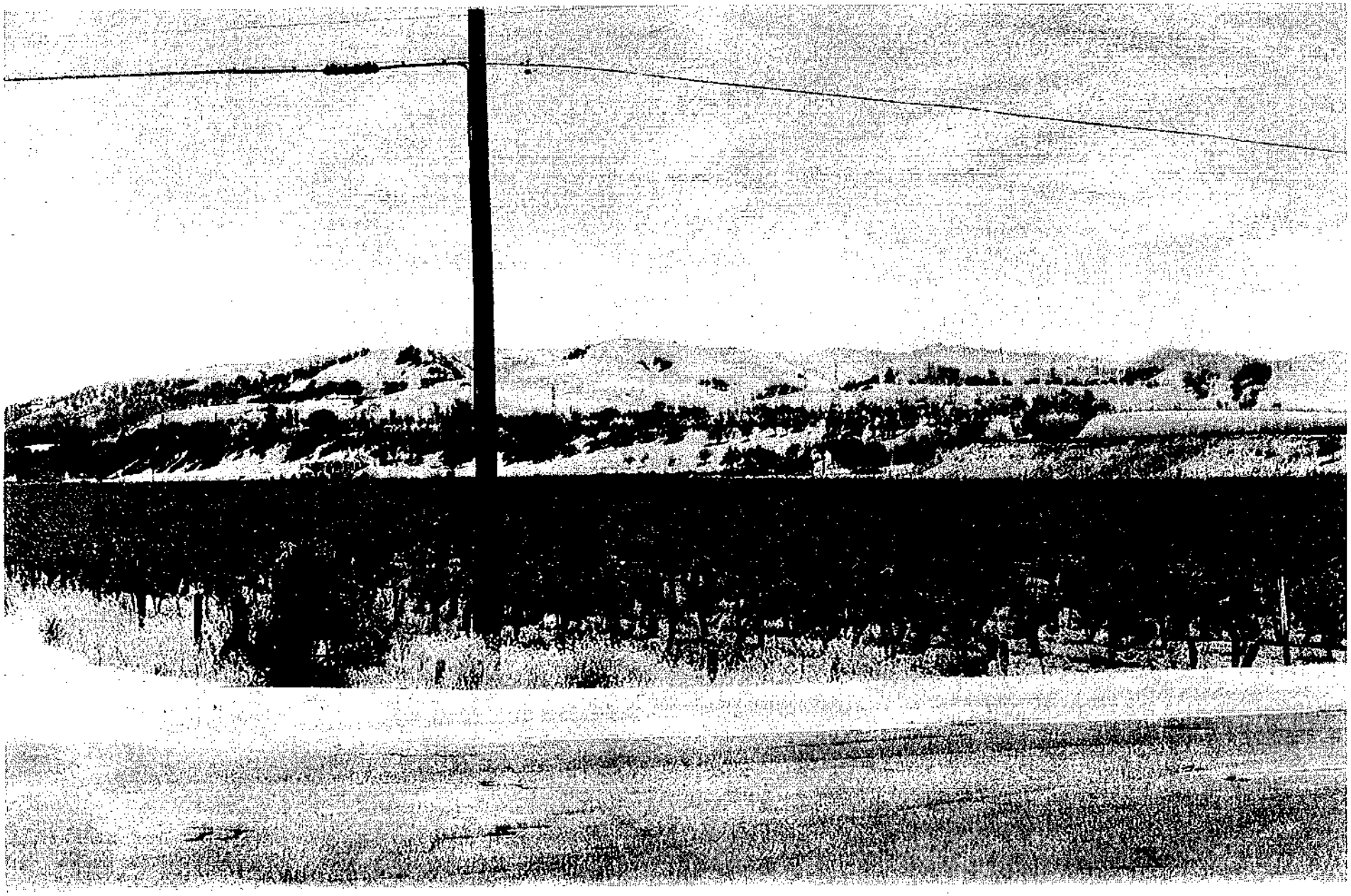
Visual and Aesthetic Quality

Exhibit 4.8-17 (see ***4.8 Visual and Aesthetic Quality***) shows an existing view of *Subalternative 1* from Vallecitos Road and East Vineyard Avenue. *Subalternative 2* would be the same, as no visual changes would occur.

Subalternative 3 would eliminate the uppermost development, but these lots could not be seen from Vallecitos Road and East Vineyard Avenue. These lots could be seen from other (higher) viewpoints in the City, but would not be obvious and therefore a less-than-significant impact due to the distance involved. Due to the topography, the units eliminated along the central drainage in *Subalternative 4* could only be seen from higher viewpoints. Overall, the visual impact from Vallecitos Road and East Vineyard Avenue (the best viewpoint in the City for this subarea) for *Subalternatives 1* to *4* would be roughly the same.

Exhibit 5.5-12 presents a photosimulation of development under *Subalternative 5*. The impact of development from this viewpoint is very similar to that under previous subalternatives. Homes can be seen in a relatively flat plateau, between a relatively steep wooded slope the to north (adjacent to Sycamore Grove Park) and the relatively open hillsides to the south. In the exhibit, this area and the proposed homes can be seen directly beneath the electrical towers. Similar to the previous subalternatives, visual impacts from this location would be less-than-significant. However, this alternative proposes a large amount of residential development in the eastern area of the subarea. These homes would likely be prominent to viewers in the park, and their visual dominance would be *co-dominant*. As this is an area of high visual sensitivity, this is a significant impact. As development in this area is more intensive than the previous subalternatives, greater impacts are expected. This alternative would eliminate development in the upslope areas, which has a maximum visual sensitivity (structural development should not be evident). This would eliminate impacts that would be created by Subalternative 1.

Exhibit 5.5-12
Subalternative 5 -- Photomontage



Source: Visual Impact Analysis

Subalternative 6 would eliminate significant impacts by eliminating development from the upper slopes. Although this subalternative proposes development in the eastern portion, enough open space would be preserved to the north of the lots to provide adequate visual buffering, eliminating any potential visual impacts from the park.

Exhibit 5.5.13 presents a photosimulation of development under *Subalternative 7*. Homes can be seen in a relatively flat plateau, between a relatively steep wooded slope the to north (adjacent to Sycamore Grove Park) and the relatively open hillsides to the south. In the exhibit, this area and the proposed homes can be seen directly beneath the electrical towers. Similar to other subalternatives, visual impacts from this location would be less-than-significant. However, this alternative proposes residential development in the eastern area of the subarea. These homes could be prominent to viewers in the park, and their visual dominance potentially *co-dominant*. As this is an area of high visual sensitivity, this is a significant impact. As development in this area is more intensive than in Subalternatives 1 to 4, greater impacts are expected. Unlike Subalternatives 1 to 4, the greater lot sizes could allow homes to be located in the northern ends of the lots, reducing or eliminating impacts. The large lot sizes would also facilitate the location of screening trees and vegetation. This alternative would reduce development in the upslope area of the site, which has a maximum visual sensitivity (structural development should not be evident). Similar to the lots near Sycamore Park, the large lot sizes would facilitate the location of screening trees and vegetation.

Subalternative 8 could eliminate all visual impacts if homes in Lots 15-17 would provide adequate screening from northern viewpoints.

Subalternative 9 would eliminate all visual impacts.

Public Services

Water impacts (both for the project and cumulative development) would remain significant and unavoidable for all development subalternatives (*Subalternatives 1* to *8*), as no firm water source has been found. Similarly, cumulative wastewater impacts would remain significant and unavoidable, as the secondary impacts of expanding the LAVWMA pipeline are unknown.

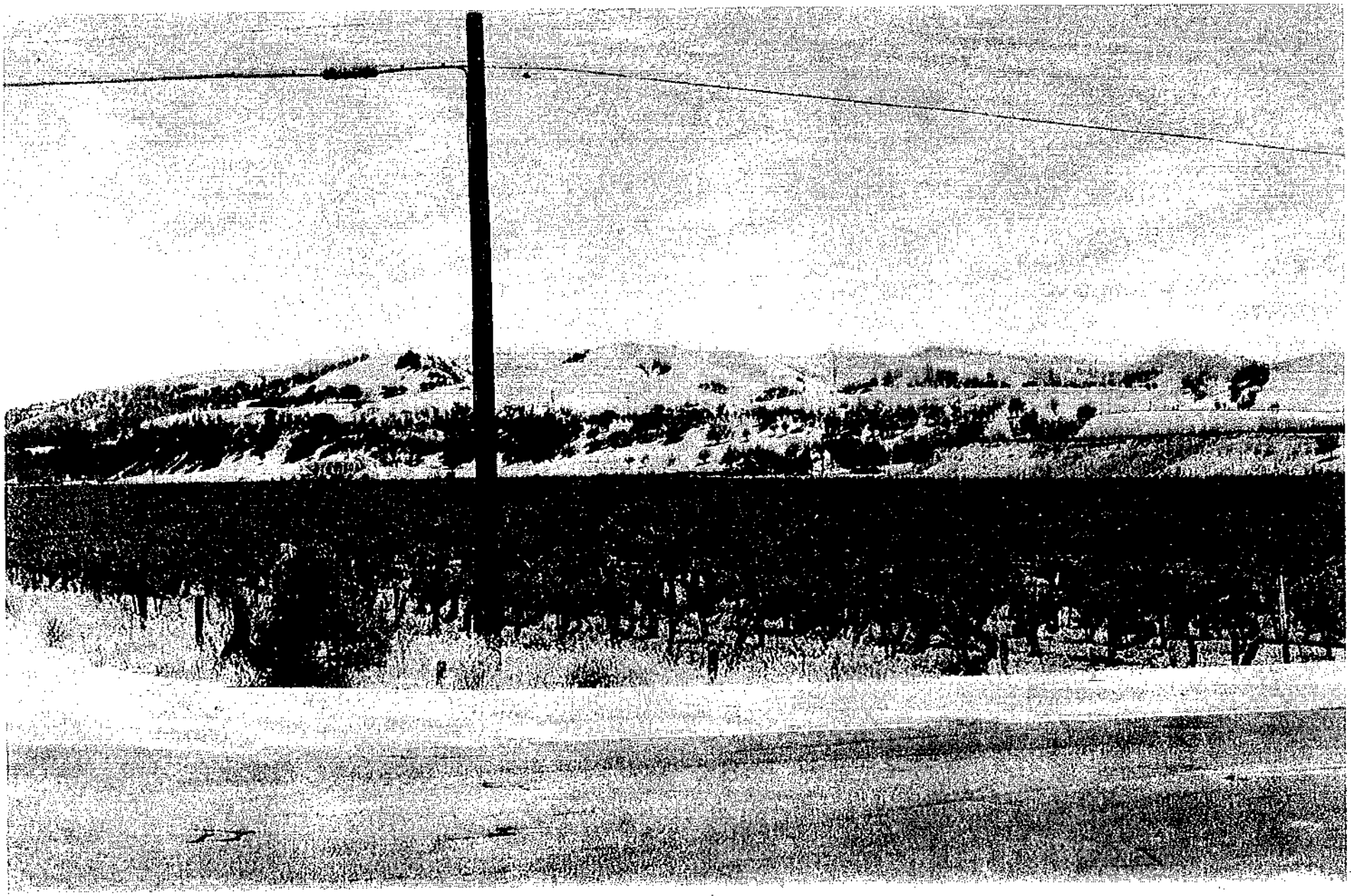
Subalternatives 3, 4, 5, 6, and *9* would not require an additional Type 2 (Wildfire) engine, as no development is proposed on the upper slopes of the property. The wildfire threat would also be greatly reduced for these subalternatives. For the other subalternatives, significant impacts due to the lack of equipment would still occur.

Only *Subalternatives 1* and *2* would have less-than-significant emergency access impacts, as a roadway connection would occur between Foley and Arroyo Roads. For the other subalternative, the lack of a roadway would result in significant access impacts. In addition, response times to the eastern part of the subarea in these alternatives could be inadequate, as fire engines responding from the Ruby Hill station could not easily access this area.

Subalternative 8 would result in significant park and recreation impacts, as the lack of regional open space would result in an overall project park demand that is over LARPD standards (as discussed in Impact 4.9-12).

All development alternatives (*Subalternatives 1* to *8*) would result in significant and unavoidable cumulative school impacts.

Exhibit 5.5-13
Subalternative 7 -- Photomontage



Source: Visual Impact Analysis

The level of significance of other impacts would remain the same.

5.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Based on an analysis of the Proposed Project and alternatives, the EIR finds that the *No Development Alternative* (Alternative 5.1) would be the environmentally superior alternative because it would avoid the environmental impacts expected from construction of the other alternatives. The other "No Project" alternative, the *Existing General Plan Alternative* (Alternative 5.2) would follow.

Section 15126(d) of the *CEQA Guidelines* states that if the environmentally superior alternative is the No Project Alternative, the EIR shall identify an environmentally superior alternative among the other alternatives. Based on a comparison of the significant environmental impacts of all the build alternatives, the *1200-Unit Development Alternative* (Alternative 5.3) would result in the fewest environmental impacts.

The *Permanent Open Space Alternative* (Subalternative 9) would be the environmentally superior Subarea 7 alternative because it would eliminate all impacts of the build alternative. Of the build alternatives, the *159-Unit Alternative* (Subalternative 6) would be environmentally superior to the other Subarea 7 alternatives.

A comparison of the environmental merits of each alternative is provided below.

LAND USE

Although it would not fulfill the City's and County's goals for the South Livermore Valley, the *No Development Alternative* would be the environmentally superior CEQA alternative in the short-term insofar as it would not affect the distribution of land use types, decrease the supply of prime soils and prime farmland, result in land use compatibility impacts, and expose agriculturists or non-agriculturists to new urban-rural conflicts. The *Existing General Plan Alternative* (Alternative 5.2) would follow. The *1,200-Unit Development Alternative* would retain more land for agriculture and convert none to commercial use, preserve somewhat more prime soils (although still resulting in an irrevocable resource loss), and result in proportionately fewer potential land use and urban-rural conflicts than the *Draft Plan* or the other alternatives and would achieve the goals and objectives of the *Draft Plan.*

Subalternative 9 (The Permanent Open Space Alternative) would be the environmental-superior Subarea 7 alternative because it would eliminate all impacts. Of the build alternatives, Subalternative 6 (The 159-Unit Alternative) would be environmentally superior from a land use standpoint.

GEOLOGY

The *No Development Alternative* would be the environmentally superior CEQA alternative because it would result in no changes which would be affected by geologic conditions or would require mitigation to protect people or property. The *Existing General Plan Alternative* (Alternative 5.2) would follow. Of the development alternatives (without considering Subarea 7 alternatives), the *1,200-Unit Development Alternative* would result in slightly fewer impacts than the *Draft Plan* due to somewhat less development than the *Plan.*

Subalternative 9 (the *Permanent Open Space Alternative*) would be the environmentally superior Subarea 7 alternative because it would eliminate all impacts. *Subalternative 6* and then *5* would be superior to other build subalternatives by successfully avoiding most geologic hazards.

HYDROLOGY

The *No Development Alternative* would be environmentally superior hydrologically. The *Existing General Plan Alternative* (Alternative 5.2) would follow. The *1200-Unit Development Alternative* would result in similar effects as the *Draft Plan* but potential dam inundation impacts would result on fewer future residents.

Subalternative 9 (the *Permanent Open Space Alternative*) would be the environmentally superior Subarea 7 alternative because it would eliminate all impacts. *Subalternative 6* and then 5 would be superior to the other build subalternatives.

BIOLOGY

The *No Development Alternative* would be the environmentally superior of the no project and development CEQA alternatives, at least during the short-term when neither new agricultural operations would be introduced or expanded nor development of any density would be built. It would maintain habitat and potential resources intact but would not protect them in the long-term. The *Existing General Plan Alternative* (Alternative 5.2) would follow. Of the development alternatives, the *1,200 Unit Development Alternative* would be superior.

Subalternative 9 (the *Permanent Open Space Alternative*) would be the environmentally superior Subarea 7 alternative because it would eliminate all impacts. *Subalternative 6* would be superior to other build alternatives.

AIR QUALITY

The *No Development Alternative* would result in no air quality impacts whatsoever and, thus, would be environmentally superior to the *Draft Plan* and all other alternatives. The *Existing General Plan Alternative* (Alternative 5.2) would follow. The *1,200-Unit Development Alternative* would be environmentally superior of the development alternatives, including the Subarea 7 alternatives, because fewer housing units would be built, generating fewer vehicle trips, and emitting lower levels of local or regional pollutants.

Subalternative 9 (the *Permanent Open Space Alternative*) would be the environmentally superior Subarea 7 alternative because it would eliminate all impacts. Subalternative 8 (Existing General Plan with 17 twenty-acre parcels) would be superior to the build alternatives. Of the build alternatives, Subalternative 7 (52 five-acre parcels) would be superior.

NOISE

The *No Development Alternative* would be the environmentally superior CEQA alternative by generating no noise and exposing no new receptors to noise. The *Existing General Plan Alternative*

would follow -- responsible for lower off-site traffic noise increases, construction period noise levels (and shorter duration), no commercial operations generating noise, and fewer urban-rural conflicts due to noise attenuation. The *1,200 Unit Development Alternative* would be the superior development alternative because it would generate the lowest off-site traffic noise increases and no commercial noise of the development concepts although still less-than-significant in both cases.

Subalternative 9 (the *Permanent Open Space Alternative*) would be the environmentally superior Subarea 7 alternative because it would eliminate all impacts. Subalternative 8 (Existing General Plan with 17 twenty-acre parcels) would be superior to the build alternatives. Of the build alternatives, Subalternative 7 (52 five-acre parcels) would be superior.

VISUAL AND AESTHETIC QUALITY

The *No Development Alternative* would be the environmentally superior CEQA alternative by generating no visual impacts. The *Existing General Plan Alternative* would follow, and would create few visual impacts.. Of the development alternatives, the *1,482-Unit Consolidated Development Alternative* would limit impacts to the most sensitive visual areas of the SLVSPA.

Subalternative 9 would be the environmentally superior Subarea 7 Alternative because it would eliminate all visual impacts. Of the build alternatives, *Subalternatives 6* and *8* would eliminate all potential visual impacts. *Subalternatives 3* and *4* would follow, but could still create potential impacts due to development in the central portion of the subarea. *Subalternatives 1* and *2* would be worse, in that development in the upper elevations of the site could be seen. *Subalternative 7* would be worse still, as more intensive development would occur in the more sensitive eastern area. The least superior alternative would be *Subalternative 5*, which would create intensive development in the sensitive eastern location of the subarea.

PUBLIC SERVICES

In general, the lower the intensity of development, the less impacts to public services. Therefore, the *No Development Alternative* would be the environmentally superior CEQA alternative as no new service demands would be generated. The *Existing General Plan Alternative* would follow. Of the development alternatives, the *1,482 Unit Development Alternative* would create the fewest impacts, due to the compact development pattern as compared to the *1,200 Unit Development Alternative.*

The superior Subarea 7 alternative would be *Subalternative 9*, which would have no development. Of the build alternatives, in general, greater development results in greater public services impacts. The "superior" build subalternative from a public services point of view would depend upon which service is examined. For example, *Subalternative 7* would result in less public service impacts because of low density (such as reduced police, library, and school impacts), but would result in significant emergency access impacts due to the lack of a connection between Foley and Arroyo Roads.

CULTURAL RESOURCES

The *No Development Alternative* would be environmentally superior to the *Draft Plan* and the CEQA alternatives. Without excavations for development or agricultural activities (such as discing), subsurface resources would not be disturbed or damaged (but also not recovered), and the opportunity

to establish an historic receiver site would be retained in the SLVSPA. However, historic resources would not be protected and, through wear and tear, potentially could age beyond repair. The *Draft Plan* and other EIR alternatives would have generally similar outcomes except for the *1,482-Unit Development Alternative* which would not annex Subarea 4, thus not protect resources there.

6.1 REPORT PREPARATION

This EIR was prepared by the City of Livermore with input from the following independent consultants:

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City of Livermore staff directly involved in preparation of the EIR and Draft Plan inlcude Marc Roberts (Planning Department) as assisted by Richard Taylor (Shute Mihaly & Weinberger) and Terrill Watt (planning consultant to the City Attorney).

Consultants who contributed to other aspects of the South Livermore Valley planning process, including the constraints analysis and specific plan but were not directly involved in conducting analyses for the EIR include:

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6.4 TRAFFIC

Appendix 6.4 is a separate volume not bound into this document. It is available for public review at the City of Livermore Planning Department, 1052 South Livermore Avenue, Livermore, California, 94550. It can be inspected there during normal business hours. It consists of the following data:

- TVTM Link Volume Plots: Existing Conditions (1990)
- Intersection Service Level Calculations: Existing Conditions (1994-1996)
- TVTM Link Volume Plots: Future Conditions - No Project (2010) - TVTM Link Capacity
- Intersection Service Level Calculations: Future Conditions - No Project (2010)
- TVTM Link Volume Plots: Future Conditions - With Project (2010)
- Intersection Service Level Calculations: Future Conditions - With Project (2010)
- Intersection Service Level Calculations: Mitigated Conditions - With Project (2010)
- TVTM Link Volume Plots: Future Conditions - No Project (2010)(see special note in this subsection)
- Turn Lane Warrant Curves

6.5 AIR QUALITY METHODOLOGY AND ASSUMPTIONS

CALINE-4 MODELING

The CALINE-4 model is a fourth-generation line source air quality model which is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. Given source strength, meteorology, site geometry, and site characteristics, the model predicts pollutant concentrations for receptors located within 150 meters of the roadway. The CALINE-4 model allows roadways to be broken into multiple links which can vary in traffic volume, emission rates, height, width, etc.

A screening-level form of the CALINE-4 program was used to predict concentrations.[1] Normalized concentrations for each roadway size (2 lanes, 4 lanes, etc.) are adjusted for the two-way traffic volume and emission factor. Calculations were made for a receptor at a corner of the intersection, 25 feet equidistant from the two roadways.

Emission factors were derived from the California Air Resources Board EMFAC7-F computer program. An average vehicle speed of ten miles per hour (10 mph) was used to represent conditions at an intersection. The calculation was based on PM peak traffic.

The screening form of the CALINE-4 model calculates the local contribution of nearby roads to the total concentration. The other contribution is the background level attributed to more distant traffic. The year 2010 one-hour background level was assumed to be 2.3 parts per million (ppm) while the eight-hour background concentration was taken as 1.7 ppm. These backgrounds were calculated using 1992 estimated background isopleths and correction factors from Bay Area Air Quality Management District (BAAQMD) guidlines.

Eight-hour concentrations were obtained from the one-hour output of the CALINE-4 model using a persistence factor of 0.7.

URBEMIS-5

Estimates of regional emissions generated by project traffic were made using a program called URBEMIS-5.[2] URBEMIS-5 is a program which estimates the emissions that result from various land use development projects. Land use project can include residential uses (such as single-family dwelling units, apartments and condominiums) and nonresidential uses (such as shopping centers, office buildings, and industrial parks). URBEMIS-5 contains default values for much of the information needed to calculate emissions. However, project-specific user-supplied information can also be used when it is available.

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1 *BAAQMD CEQA Guidelines*, Bay Area Air Quality Management District, April 1996.

2 URBEMIS-5 Computer Program Version 5.0 User Guide, California Air Resources Board, July 1995.

Inputs to the URBEMIS-5 program include trip generation rates, vehicle mix, average trip length by trip type, and average speed. Trip generation rates for project land uses and land uses removed by the project were provided by the EIR's transportation consultant. Average trip lengths and vehicle mix for the San Francisco Bay Area Air Basin were used. Average speed for all types of trips was assumed to be 30 mph.

The URBEMIS-5 runs assumed summertime conditions. Default values for cold-start percentages were used. The URBEMIS-5 program provides emission rates for Total Organic Gases (TOG). The TOG emission was multiplied by 0.91 to estimate Reactive Organic Gases (ROG).

PM-10 emissions from road dust are not calculated by the URBEMIS-5 program. Daily Vehicle Miles Traveled (VMT) generated by project traffic was multiplied by a road dust emission factor3 of 0.69 grams per mile, and this emission was added to the URBEMIS-5 estimates of exhaust emissions.

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3 *BAAQMD CEQA Guidelines, op. cit.*