



FINAL ENVIRONMENTAL IMPACT REPORT
**VANDEN MEADOWS SPECIFIC PLAN
AND DEVELOPMENT PROJECT**
VOLUME II - REVISED DRAFT EIR

JANUARY 2013

LEAD AGENCY:

City of Vacaville
Community Development Department
650 Merchant Street
Vacaville, CA 95688



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Appendix O	Traffic Impact Study

SECTION 1.0

INTRODUCTION

1.0 INTRODUCTION

1.1 PURPOSE OF THE ENVIRONMENTAL IMPACT REPORT

The City of Vacaville (City) has prepared this Draft Environmental Impact Report (Draft EIR) to provide the general public and interested public agencies with information about the potential environmental impacts of the Vanden Meadows Specific Plan and Development Project (Proposed Project). This Draft EIR was prepared in compliance with the California Environmental Quality Act (CEQA, California Public Resources Code §§21000-21178), the CEQA *Guidelines* (California Code of Regulations [CCR], Title 14), and the City of Vacaville's rules, regulations, and procedures for the completion of environmental documents, specifically Environmental Impact Reports (City's Municipal Code Chapter 14.03.024).

As described in CEQA *Guidelines* Section 15121(a), an EIR is an informational document that assesses potential environmental impacts of a proposed project, as well as identifies mitigation measures and alternatives to the proposed project that could reduce or avoid adverse environmental impacts. As the CEQA Lead Agency for this project, the City of Vacaville is required to consider the information in the EIR along with any other available information in deciding whether to approve the project. The basic requirements for an EIR include discussions of the environmental setting, environmental impacts, mitigation measures, alternatives, growth inducing impacts, and cumulative impacts. The EIR is an informational document used in the planning and decision-making process. It is not the intent of an EIR to recommend either approval or denial of a project. This EIR is a "Project EIR," pursuant to CEQA *Guidelines* Section 15161. A Project EIR examines the environmental impacts of a specific project. This type of EIR focuses on the changes in the environment that would result from implementation of the project, including construction and operation.

1.2 EIR PROCESS

1.2.1 LEAD AGENCY

In accordance with CEQA *Guidelines* Sections 15050 and 15367, the City of Vacaville has been designated the "Lead Agency," which is defined as the "public agency which has the principal responsibility for carrying out or disapproving a project." The Lead Agency is also responsible for determining the scope of the environmental analysis, preparing the EIR, and responding to comments received on the Draft EIR. Prior to making a decision whether to approve a project, the Lead Agency is required to certify that the EIR has been completed in compliance with CEQA, that the decision-making body reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the Lead Agency.

1.2.2 NOTICE OF PREPARATION AND SCOPING

In accordance with CEQA *Guidelines* Section 15082, a Notice of Preparation (NOP) was circulated to the public, local, state and federal agencies, and other known interested parties for a 30-day public and agency review period on February 2, 2011 (included as **Appendix A**). The purpose of the NOP was to provide notification that an EIR for the Vanden Meadow Specific Plan and Development Project was being prepared and to solicit public input on the scope and content of the document.

Pursuant to CEQA *Guidelines* Section 15082 the Lead Agency held a scoping meeting for the EIR on February 28, 2011, in the Community Development lobby at City Hall. Agencies and members of the public were invited to attend and provide input on the scope of the EIR. Comments from agencies and the public provided at the scoping meeting and in written comments submitted in response to the NOP are included within **Appendix A**. Significant issues raised during the scoping process are summarized in **Section 1.3**.

1.2.3 DRAFT EIR AND PUBLIC REVIEW

This Draft EIR is being circulated for public review and comment for a period of 45 days. During this period, the general public, organizations, and agencies can submit comments to the Lead Agency on the Draft EIR's accuracy and completeness. Release of the Draft EIR marks the beginning of a 45-day public review period pursuant to CEQA *Guidelines* Section 15105. The public can review the Draft EIR at the City's website at:

http://www.cityofvacaville.com/departments/community_development/project_updates/vandenmeadow.php,

or at following address during normal business hours:

City of Vacaville, Planning Division
650 Merchant St.
Vacaville, CA 95688

Comments may be submitted both in written form and/or orally at the public hearing on the Draft EIR. Notice of the time and location of the hearing will be published in local newspapers, mailed to property owners and residents surrounding the project, posted on the City's website, and posted at and adjacent to the site prior to the hearing. All comments or questions regarding the Draft EIR should be addressed to:

City of Vacaville, Planning Division
c/o Fred Buder, City Planner
650 Merchant St.
Vacaville, CA 95688
(707) 449-5140
fbuder@cityofvacaville.com

1.2.4 FINAL EIR AND EIR CERTIFICATION

Upon completion of the public review period, a Final EIR will be prepared that will include written comments on the Draft EIR received during the public review period and the City's responses to those comments. The Final EIR will also include the Mitigation Monitoring and Reporting Plan (MMRP) prepared in accordance with Section 21081.6 of the Public Resource Code. The Final EIR will address any revisions to the Draft EIR made in response to public comments. The Draft EIR and Final EIR together will comprise the EIR for the Proposed Project. Before the City can approve the project, it must first certify that the EIR has been completed in compliance with CEQA, that the City Council has reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the City. The City Council also will be required to adopt Findings of Fact, and for any impacts determined to be significant and unavoidable, adopt a Statement of Overriding Considerations.

1.3 ISSUES AND CONCERNS RAISED DURING SCOPING

Listed below is a summary of concerns raised during the scoping process.

Air Quality

The Yolo-Solano Air Quality Management District (YSAQMD) requested that construction and emissions be adequately quantified in accordance with the YSAQMD's *Handbook for Assessing and Mitigating Air Quality Impacts* guidance document (Handbook) and significant impacts adequately mitigated considering various mitigation measures presented by the YSAQMD. The YSAQMD also requested that the Draft EIR should assess the potential impacts from sources of toxic air contaminants, greenhouse gas emissions, cumulative development within the region, and other potential impacts included within the Handbook. The YSAQMD stated that a number of District Rules and Regulations may apply to the project.

*These comments are addressed in **Section 4.2, Air Quality of the Draft EIR.***

A private citizen commented that the Draft EIR should consider long-term impacts to residences from diesel particulate emissions from railroad traffic. The commenter also requested that the analysis assess the potential for increased usage of the tracks and associated increase in diesel particulate emissions as well as the potential electrification of the rail lines and associated emissions of ozone.

*The air quality impacts associated with the railroad tracks are addressed in **Section 4.2, Air Quality of the Draft EIR.***

Biological Resources

The California Department of Fish and Game (CDFG) requested that the City provide a complete assessment of the habitats, flora and fauna within and adjacent to the project area, including impacts to Swainson's hawk. The CDFG advised that a California Endangered Species Act (CESA) permit be obtained if the project has the potential to result in the take of species of plants or animals listed under

CESA and provided measures to avoid adverse impacts to Swainson's hawk. The CDFG commented that for any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank of a river or stream, or use material from a streambed, CDFG may require a Lake and Streambed Alteration Agreement.

*Impacts associated with biological resources, including impacts associated with the Swainson's Hawk are addressed in **Section 4.4**, Biological Resources of the Draft EIR.*

The United States Army Corps of Engineers requested the preparation of a wetland delineation and that alternatives considered for the project should include those that avoid impacts to wetland features and other waters of the United States.

*A wetland delineation was completed for the Proposed Project and is included as **Appendix G** of the Draft EIR. The alternatives to the proposed project are presented in **Section 5.0**, CEQA Considerations of the Draft EIR, which include reductions to the impacts to wetlands on the project site.*

A citizen at the public scoping meeting expressed concern that the project would result in loss of habitat for numerous wildlife through the removal of the eucalyptus grove in the northern area of the site. The City noted in the meeting that issues associated with biological resources would be addressed within the Draft EIR.

*Impacts associated with biological resources, including impacts associated with removal of the eucalyptus grove habitat, are addressed in **Section 4.4**, Biological Resources of the Draft EIR.*

Noise

A private citizen stated that the EIR should take into account noise impacts associated with long freight trains passing by the project site.

*Impacts to the existing ambient noise environment associated with freight trains are assessed in **Section 4.10**, Noise of the Draft EIR.*

Public Services and Utility Systems

The Solano Local Agency Formation Commission (Solano LAFCO) stated that fiscal impacts to the Vacaville Fire Protection District (VFPD) and Vacaville Cemetery District (VCD), along with impacts to the Solano Irrigation District (SID) should be assessed within the Draft EIR.

*Environmental impacts to public services are assessed in **Section 4.12**; Public Services, Utility Systems, and Recreation of the Draft EIR. Fiscal impacts are outside the scope of an EIR and are not addressed within Section 4.0.*

Transportation/Circulation

Solano LAFCO stated that the EIR should address the County's current effort to establish Countywide Transportation Impact Fees and mitigate impacts to the County transportation system.

*Impacts to the County transportation system and associated mitigation are presented in **Section 4.13, Transportation of the Draft EIR.** The setting discussion with **Section 4.13** addresses the Countywide Transportation Impact Fee.*

A private citizen stated that the EIR should prepare estimates for traffic generation using industry standard values and that the analysis should incorporate various outcomes (such as assessing the community as a transit and non-transit-oriented community).

*Transportation impacts are assessed in **Section 4.13** of the Draft EIR. Impacts are assessed in accordance with industry standard guidelines, which include assumptions regarding the types of vehicle trip generators that would be developed.*

Project Description/Project Objectives

Private citizens stated that the NOP map did not adequately portray the current extent of the Southtown Development, that the City does not need an additional housing development, that the lot sizes are too small in comparison to adjacent developments, and that an additional school is not warranted.

*The project description, including the most recent aerial photograph of the project site and adjacent properties, is provided in **Section 3.0** of the Draft EIR and alternatives to the project are described in **Section 6.0** of the Draft EIR. The project objectives are described in **Section 3.4.1** of the Draft EIR.*

1.4 SCOPE OF THE EIR

In accordance with CEQA *Guidelines* Section 15063, the Initial Study (**Appendix B**), in conjunction with comments received during scoping (**Appendix A**), was used to focus the EIR on effects determined to be potentially significant. The following environmental resources were determined to have the potential to be significantly affected by the Proposed Project and have therefore been addressed in detail in this Draft EIR:

- Aesthetics
- Air Quality and Greenhouse Gas Emissions
- Agriculture and Forestry Resources
- Biological Resources
- Cultural Resources
- Geology, Soils and Mineral Resources
- Hazards and Hazardous Materials

- Hydrology and Water Quality
- Land Use
- Noise and Vibration
- Population and Housing
- Public Services, Utilities, and Recreation, and
- Transportation and Circulation

1.5 TERMINOLOGY USED IN THE EIR

This EIR uses the following terminology to describe environmental effects of the Proposed Project and Alternatives:

- **Significance Criteria:** A set of criteria used by the Lead Agency to determine at what level or “threshold” an impact would be considered significant. Significance criteria used in this Draft EIR include factual or scientific information; regulatory standards of local, state, and federal agencies; and/or guiding and implementing goals and policies identified in local plans.
- **Less Than Significant Impact:** A less than significant impact would cause no substantial change in the environment (no mitigation required).
- **Less Than Significant Level:** The level below which an impact would cause no substantial change in the environment (no mitigation required).
- **Potentially Significant Impact:** A potentially significant impact may cause a substantial change in the environment; however, it is not certain that effects would exceed specified significance criteria. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact. Mitigation measures and/or project alternatives are identified to reduce project effects to the environment.
- **Significant Impact:** A significant impact would cause a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of effects using specified significance criteria. Mitigation measures and/or project alternatives are identified to reduce or avoid project effects to the environment.
- **Significant and Unavoidable Impact:** A significant and unavoidable impact would result in a substantial change in the environment that cannot be avoided or mitigated to a less-than-significant level if the project is implemented.
- **Cumulative Significant Impact:** A cumulative significant impact would result in a substantial change in the environment from effects of the project as well as surrounding projects and reasonably foreseeable development in the surrounding area. To be considered significant a project’s impact must be a cumulatively considerable contribution to a substantial change in the environment.

- **Mitigation:** Mitigation includes measures recommended in the Draft EIR and imposed as condition of approval by the Lead Agency that:
 - avoid the impact altogether by not taking a certain action or parts of an action;
 - minimize impacts by limiting the degree or magnitude of the action and its implementation;
 - rectify the impact by repairing, rehabilitating, or restoring the affected environment;
 - reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action; and
 - compensate for the impact by replacing or providing substitute resources or environments.

1.6 REPORT ORGANIZATION

- **Chapter 1, Introduction** - Provides an introduction and overview of the EIR, describes the intended use of the EIR, and describes the review and certification process.
- **Chapter 2, Executive Summary** - Summarizes the elements of the project and the environmental impacts that could result from implementation of the Proposed Project, and provides a table which lists impacts, describes proposed mitigation measures, and indicates the level of significance of impacts after mitigation.
- **Chapter 3, Project Description** - Provides a detailed description of the Proposed Project, including its location, background information, major objectives, and components.
- **Chapter 4, Environmental Setting, Impacts, and Mitigation Measures** – Describes the baseline environmental setting and provides an assessment of impacts for each issue area presented in **Section 1.4**. Each section is divided into four sub-sections: Introduction, Existing Environmental Setting, Regulatory Background, and Impacts and Mitigation Measures.
- **Chapter 5, CEQA Considerations** - Provides discussions required by CEQA regarding impacts that would result from the Proposed Project, including a summary of cumulative impacts, secondary impacts, including potential impacts resulting from growth inducement, and significant irreversible changes to the environment.
- **Chapter 6, Project Alternatives** – Describes and compares alternatives to the Proposed Project and associated environmental consequences.
- **Chapter 7, EIR Authors and Persons Consulted** - Lists report authors and agencies consulted for technical assistance in the preparation and review of the EIR.

- **Chapter 8, References** - Provides bibliographic information for all references and resources cited.
- **Chapter 9, Acronyms** – Provides a list of definitions for all acronyms used in the EIR.
- **Appendices** – Includes various documents and data directly related to the analysis presented in the Draft EIR.

1.7 LOCAL REGULATORY FRAMEWORK

The Draft EIR relies, in part, on information prepared by the City of Vacaville for areas within the project vicinity. Applicable documents are listed here as source documents for this Draft EIR. All documents are available for public review and inspection at the City of Vacaville, Community Development Department, 650 Merchant Street, Vacaville, CA 95688.

1. City of Vacaville General Plan (Adopted 1991, Updated 2007)
2. Southtown Planned Development and Final EIR (April 2004)
3. Comprehensive Annexation Plan (September 2004)
4. Solano County General Plan (August 2008)
5. Draft Solano Habitat Conservation Plan (February 2007)

These documents were used primarily to identify the environmental setting, applicable County plans or policies, background material, or descriptive technical material. A more detailed discussion is provided within **Section 3.3**.

SECTION 2.0

EXECUTIVE SUMMARY

2.0 EXECUTIVE SUMMARY

2.1 INTRODUCTION

This chapter provides a summary of the Vanden Meadows Specific Plan and Development Project (Proposed Project), environmental impacts that would result from project implementation, a summary of project alternatives, and the potential areas of controversy. This chapter also includes a table summarizing the impacts of the Proposed Project and mitigation measures that have been identified to reduce potentially significant environmental impacts to less than significant levels.

2.2 PROJECT LOCATION

The Vanden Meadows Specific Plan and Development Project (Proposed Project) area is located within the boundaries of a 265-acre site, which encompasses a 28-acre site currently owned by the Travis Unified School District (TUSD), located within unincorporated Solano County adjacent to the southern boundary of the City of Vacaville (City). The Proposed Project is located approximately 2.6 miles southeast of central Vacaville and 25 miles southwest of Sacramento. The Proposed Project is surrounded on the west and north by residential development and on the east and south by agricultural land. Union Pacific Railroad (UPRR) tracks are oriented northeast to southwest, and are adjacent to the Proposed Project site to the east.

2.3 PROJECT UNDER REVIEW

The Proposed Project would result in the development of 939 single-family, clustered and multi-family units within an approximately 265 acre project site located between Leisure Town Road to the east, Nut Tree Road to the West, and the proposed extension of Foxboro Parkway to the South (with 68 of the proposed residential units located south of the proposed extension of Foxboro Parkway, west of the existing detention pond). The Vanden Meadows Project also includes a 28-acre school site, 7-acres of park, connecting pedestrian trails, and a bike station on Leisure Town Road within a 500-foot agricultural buffer along the southeastern boundary of the proposed project site. The required action is approval by the City Council of the pre-zoning for the property and authorization of staff to proceed with the annexation of the project site into the City. The project also requires a Specific Plan, Planned Development, Tentative Map, and Development Agreement approval by the City Council. A detailed description of the Proposed Project is provided in **Section 3.0**, and a site plan showing the existing project site and proposed facilities is presented in **Figure 3-4**.

2.4 ISSUES TO BE RESOLVED AND AREAS OF CONTROVERSY

Notice of Preparation and Scoping

In accordance with CEQA *Guidelines* Section 15082, the City (Lead Agency) circulated a Notice of Preparation (NOP) for this EIR on February 2, 2011. Presented in **Appendix A**, the NOP established a 30-day review period that ended on March 3, 2011. The NOP was circulated through the State Clearinghouse, to the public, local, state and federal agencies, and other known interested parties in an effort to disclose that the Proposed Project could have significant effects on the environment and to solicit written comments concerning the Proposed Project. A noticed public scoping meeting was held on February 28, 2011 to allow a public presentation of the project and provide an opportunity for oral comments to be submitted. The scoping meeting was held in the Community Development lobby of City Hall to offer a convenient location for the surrounding neighbors. One member of the general public attended the meeting. The City received seven comment letters from state and local agencies. These letters are included in **Appendix A**.

Areas of Controversy

The environmental issues below were identified during the scoping process and are discussed in more detail in **Section 1.0**:

- Air Quality
- Biological Resources
- Noise
- Public Service and Utility Systems
- Transportation/ Circulation
- Project Description/Project Objectives

Scope of the EIR

In accordance with CEQA *Guidelines* Section 15063, an Initial Study (**Appendix B**) was prepared and used in conjunction with comments received during scoping to focus the EIR on effects determined to be potentially significant. The following environmental resources were determined to have the potential to be significantly affected by the Proposed Project, and have therefore been addressed in detail in this Draft EIR:

- Aesthetics, Light and Glare
- Air Quality
- Agricultural Resources
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials

- Hydrology and Water Quality
- Land Use
- Noise
- Population and Housing
- Public Utilities, Services and Recreation
- Traffic and Circulation

2.5 SUMMARY TABLE

Table 2-1 presents a summary of project impacts and proposed mitigation measures that would further avoid or minimize potential impacts. In the table, the level of significance of each environmental impact is indicated both before and after the application of the recommended mitigation measure(s). For detailed discussions of all project impacts and mitigation measures, the reader is referred to environmental analysis sections in **Section 4.0**.

Acronyms used within **Table 2-1** to describe levels of significance are explained below:

- NA – Not applicable
- BI – Beneficial impact
- NI – No impact
- LTS – Less than significant
- PS – Potentially significant
- SU – Significant and unavoidable

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.1 Aesthetics			
4.1-1: The Proposed Project could substantially degrade the existing visual character or quality of the site and its surroundings.	LTS	No mitigation is required.	NA
4.1-2: The proposed construction of a housing development at the project site could create a new source of substantial light or glare which could adversely affect day or nighttime views.	PS	4.1-2: Lighting on the project site shall be designed and installed in accordance with the City's Land Use Development Code (City of Vacaville Municipal Code Section 14.09.127.110). Street lighting on the project site shall utilize effective light shielding devices to minimize uplighting and glare to the greatest extent feasible. Light shields shall be installed above and around all street lights, such that no portion of a luminary extends below the base of the light shield. Drop lens luminaries, which are rounded and extend below the lowest portion of the light shield, shall not be used. All street lighting designs, including lens types and shielding devices, shall be approved by the Vacaville Community Development Department prior to installation.	LTS
4.1-3: The Proposed Project in combination with cumulative development surrounding the project site, could significantly impact visual resources and create new sources of light and glare.	LTS	No mitigation is required.	NA
4.2 Air Quality and Greenhouse Gas Emissions			
4.2-1: Construction of the Proposed Project could generate emissions of ROG, NO _x , PM ₁₀ , and PM _{2.5} .	SU	<p>4.2-1a: The Applicant shall ensure through the enforcement of contractual obligations that construction contractors implement a fugitive dust abatement program during construction, which shall include the following elements:</p> <ul style="list-style-type: none"> ▪ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. ▪ Cover all exposed stockpiles. ▪ Water all exposed roadway and construction areas twice a day. 	SU

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<ul style="list-style-type: none"> ▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent streets. ▪ Limit traffic speeds on unpaved roads to 15 miles per hour (mph). ▪ Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. ▪ Any burning of cleared vegetation shall be conducted according to the rules and regulations of the BAAQMD's Regulation 5 (BAAQMD, 2008). Prior notification to BAAQMD shall be made by submitting an Open Burning Prior Notification Form to BAAQMD's office in San Francisco. <p>4.2-1b: The applicant shall ensure through contractual obligations with construction contractors that the following Best Management Practices shall be implemented during all stages of construction:</p> <ul style="list-style-type: none"> ▪ All heavy duty construction equipment be equipped with a diesel oxidation catalyst and use aqueous diesel fuel. <u>Heavy-duty construction equipment shall be the newest and cleanest equipment available. Biodiesel shall be used whenever available.</u> ▪ Only low ROG VOC coatings that conform to the limits specified in YSAQMD Rule 2.14 shall be utilized. Low VOC paints are available through local paint retailers that supply Olympic Premium and Benjamin Moore Aura paints. Only low ROG coatings shall be utilized. ▪ <u>Construction employees and subcontracts shall be informed that Emissions of reactive organic gases, nitrogen oxides, sulfur oxides, and carbon monoxide, and GHGs shall be controlled by requiring all diesel-powered equipment is to be properly maintained and that, in accordance with state law, minimizing idling time must be limited to 5 minutes when construction equipment is not in use, unless per engine manufacturer's specifications or for safety reasons more time is required. Since these construction emissions would be generated primarily by construction equipment, machinery, and</u> 	

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p><u>engines shall be kept in good mechanical condition to minimize exhaust emissions.</u></p> <ul style="list-style-type: none"> ▪ <u>The applicant shall obtain a permit from the YSAPCD prior to operation of any portable diesel fueled equipment greater than 50 horsepower</u> ▪ <u>All stationary equipment, other than internal combustion engines less than 50 horsepower, emitting air pollutants shall obtain an Authority to Construct and Permit to Operate from the YSAPCD prior to the beginning of construction.</u> ▪ Emissions of reactive organic gases, nitrogen oxides, sulfur oxides, and carbon monoxide, and GHGs shall be controlled by requiring all diesel-powered equipment be properly maintained and minimizing idling time to 5 minutes when construction equipment is not in use, unless per engine manufacturer's specifications or for safety reasons more time is required. Since these emissions would be generated primarily by construction equipment, machinery engines shall be kept in good mechanical condition to minimize exhaust emissions. ▪ <u>The project proponent shall employ periodic and unscheduled inspections to accomplish the above mitigation.</u> ▪ <u>Any burning of cleared vegetation shall be conducted according to the rules and regulations of the BAAQMD's Regulation 5 (BAAQMD, 2008) and YSAQMD Rule 2.8. Open Burning, General. Prior notification to BAAQMD shall be made by submitting an Open Burning Prior Notification Form to BAAQMD's office in San Francisco.</u> 	
<p>4.2-2: Construction of the Proposed Project could generate TACs from construction equipment exhaust.</p>	<p>LTS</p>	<p>No mitigation is required.</p>	<p>NA</p>
<p>4.2-3: Construction of the Proposed Project could have the potential to generate objectionable odors.</p>	<p>LTS</p>	<p>No mitigation is required.</p>	<p>NA</p>
<p>4.2-4: Operation of the Proposed Project could generate</p>	<p>SU</p>	<p>4.2-4a: The City shall ensure through conditions of project</p>	<p>SU</p>

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
emissions of ROG, NO _x , PM ₁₀ , and PM _{2.5} .		<p>approval or the specific plan requirements that the following mitigation measures are implemented to reduce project-related operational emissions:</p> <ul style="list-style-type: none"> ▪ The number of parking spaces at the proposed school shall be consistent with the Leadership in Energy and Environmental Design standards. ▪ The following provision along with design standards shall be included within the Vanden Meadows Specific Plan: If the City expands City Coach's Route 8 (or any other route) into Vanden Meadows area, the Applicant shall install bus turnouts and transit stops in location(s) designated by the City. <p><u>4.2-4b: To reduce project-related emissions, the applicant shall incorporate openings and gaps in the sound walls and cul-de-sacs shown on tentative maps and building plans to allow access to adjacent streets and pathways to the extent possible to further maximize connectivity for bicyclist, pedestrians, and direct access to transit stops.</u></p> <p><u>4.2-4c: To reduce project-related emissions, bicycle lanes shall be provided on all arterial and major and minor collector roadways that connect to existing bicycle routes in adjacent developments.</u></p>	
4.2-5: Operation of the Proposed Project has the potential to generate TACs or may be located near TAC sources.	LTS	<u>4.2-5a: The Applicant shall plant trees such as redwood, deodar cedar, live oak or oleander adjacent to the sound wall along Leisure Town Road north of Vanden Road to the northern project boundary. No mitigation is required.</u>	NALTS
4.2-6: Operation of the Proposed Project could generate objectionable odors, or place sensitive receptors in an area subject to objectionable odors.	LTS	No mitigation is required.	NA
4.2-7: Operation of the Proposed Project could generate emissions of ROG, NO _x , PM ₁₀ , and PM _{2.5} , which in combination with past, present, and future criteria	SU	4.2-7: Implement Mitigation Measure 4.2-4.	SU

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
emissions, has the potential to cause and exceedance of the NAAQS and/or the CAAQS.			
<p>4.2-8: Construction and Operation of the Proposed Project could have the potential to contribute cumulatively considerable emissions of GHGs.</p>	PS	<p>4.2-8a: The applicant shall implement the following BAAQMD mitigation measures. <u>Evidence of compliance with these measures shall be submitted to the City prior to the issuance of building permits:-</u></p> <ol style="list-style-type: none"> 1) The applicant shall require through contractual obligation with the contractor(s) that all heating, air conditioning, and ventilation (HVAC) ducts be sealed. This mitigation measure will reduce residential and school electricity-related GHG emissions by 30 percent. 2) The applicant shall require through contractual obligation with the local utility district and contractors that smart meters and programmable thermostats be installed in the school site and all residences. This mitigation measure will reduce residential and school electricity- and natural gas-related GHG emissions by 10 percent. 3) The applicant shall purchase CO₂e emissions reduction credits in the amount of 19,555 MT prior to the start of construction (5,925 MT for mitigation construction emissions and 13,630 for mitigation of operational emissions). The CO₂e emission reduction credits must be permanently retired by the project proponent; thereby reducing annual GHG emissions for the lifetime of the Proposed Project. <u>Evidence of purchase of GHG emission credits must be submitted to the City prior to approval of tentative maps and shall be a condition of the development agreement with the Vanden Meadows developer. The applicant shall purchase carbon emissions reduction credits from the Climate Action Reserve, the Verified Carbon Standard, the American Carbon Registry, or an equivalent carbon emissions reduction credit trading market, which has the same or more stringent standards for carbon sequestration projects which reduce atmospheric GHGs or direct GHG emissions reductions achieved by existing GHG emitters.</u> 	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p><u>4.2-8b: The applicant shall implement the following mitigation measures, which would further reduce project-related GHG emissions. Evidence of compliance with these measures shall be submitted to the City prior to the issuance of building permits:</u></p> <ol style="list-style-type: none"> <u>1) The applicant shall require the project contractors to utilize local and regional building materials in order to reduce energy consumption and vehicle emissions associated with transporting materials over long distances; thus, reducing GHG emissions from material delivery trips.</u> <u>2) The applicant shall construct new bus stops at convenient locations with pedestrian access to the project developments. Pullouts will be designed so that normal traffic flow or arterial roadway would not be impeded when buses are pulled over to serve riders. This mitigation would reduce project-related GHG emissions from idling and commuter vehicles.</u> <u>3) The applicant shall implement Mitigation Measures 4.2-1c and 4.2-1c, which would reduce project-related vehicle GHG emissions.</u> <u>4) The Applicant shall incorporate the use of the following in all development to the extent feasible:</u> <ul style="list-style-type: none"> <u>• Installation of efficient street and parking lot lighting (e.g., high pressure low sodium fixtures);</u> <u>• Installation of reflective window film or awnings on south and west facing windows;</u> <u>• Installation of ceiling and wall insulation; and</u> <u>• Installation of Energy Management Systems to control HVAC systems including operating hours, set points, scheduling of chillers, etc.</u> <p><u>Implementation of the above mitigation would reduce energy use and GHG emissions from its production.</u></p> <u>5) The applicant shall through contractual obligation with the contractor install, in all buildings reflective, EnergyStar™ cool roofs. Cool roofs decrease roofing maintenance and replacement costs, improve building comfort, reduce impact on surrounding air temperatures,</u> 	

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p><u>reduce peak electricity demand, and reduce waste stream of roofing debris. Implementation of the above mitigation would reduce energy use and GHG emissions from its production.</u></p> <p>6) <u>The applicant shall include, in all residential buildings measures to conserve water usage including use of water efficient features such as high efficiency toilets, water conserving dishwashers, hot water demand systems, and electronic timers to control landscape irrigation systems. This mitigation would reduce energy used to transport water and GHG emissions from its production.</u></p> <p>7) <u>The applicant shall prohibit any wood-burning fireplaces, woodstoves, or similar wood-burning devices. Homes may be fitted with UL rated natural gas burning appliances. This prohibition shall be included in any CC&Rs that are established. This mitigation would reduce GHG emissions from the combustion of wood products.</u></p>	
4.3 Agricultural Resources			
<p>4.3-1: The Proposed Project could result in the conversion of Prime Farmland within the project site to non-agricultural uses.</p>	SU	<p>4.3-1: The applicant shall preserve 68.83 acres of active farmland in Solano County with soils similar in productive value to on-site soils through agricultural easement, purchase of development rights, donation of mitigation fees to an agricultural land trust or conservancy, contribution to the State Department of Conservation fund for the preservation of farmland, or by some other feasible method, as determined by the City Council, that achieves the goal of preserving active farmland. Should donation of mitigation fees be the preferred method for mitigating impacts, the fees shall be based on fair market value of a conservation easement over similar quality active farmland as determined by the County Assessor's Office at the time the fee is to be paid.</p>	SU
<p>4.3-2: The Proposed Project could conflict with existing zoning for agricultural use, or a Williamson Act contract.</p>	LTS	No mitigation is required.	NA
<p>4.3-3: Due to the location and nature of proposed land uses, the Proposed Project could result in land use incompatibilities that would result in the conversion of adjacent agricultural land uses.</p>	PS	<p>4.3-3: In order to protect ongoing surrounding agricultural operations from future complaints by future Vanden Meadow residents, a note on the final subdivision maps for the Project shall be included. The note shall require that, prior to recording,</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		residential property titles shall include a deed restriction prohibiting complaints by future residents related to potential inconsistency with ongoing surrounding agricultural operations. The nature of prohibited complaints would include those attributable to nearby ongoing agricultural operations related to generation of noise, odor, dust, and other elements generally associated with agricultural operations and potentially inconsistent with residential development.	
4.3-4: The Proposed Project could contribute to adverse cumulative impacts associated with conversion of agricultural land uses.	SU	4.3-4: Implement Mitigation Measure 4.3-1 .	SU
4.4 Biology			
4.4-1: Implementation of the Proposed Project could result in the placement of fill material into potentially jurisdictional waters of the U.S.	PS	<p>4.4-1a: Prior to commencement of construction activities that would result in discharge of fill material to wetlands and other waters of the U.S., the applicant shall obtain a Section 404 Clean Water Act permit from the USACE and a Section 401 Water Quality Certification from the SWRCB prior to discharge of fill of waters of the state. As a condition of these permits, the applicant shall provide compensatory mitigation for the restoration, enhancement, and/or replacement of wetland habitat on a “no net loss” basis at an acreage and location and by methods agreeable to the USACE and the RWQCB. At minimum, the applicant shall be required to mitigate at a one:one ratio for construction of new wetlands. The creation credits purchased in accordance with Mitigation Measure 4.4-2 for seasonal wetlands and wetland drainage swales located within critical habitat may contribute to a portion of this mitigation requirement. Evidence of the Section 404 and 401 permits shall be submitted to the Community Development Department prior to the issuance of any grading permits or building permits for construction activities that would result in discharge of fill to waters of the U.S. and of the state. All conditions of the permits shall be adhered to.</p> <p>4.4-1b: The applicant shall implement Mitigation Measure 4.8-1 to obtain coverage the SWRCB NPDES General Construction Permit. This shall include preparation of a SWPPP and implementation of the BMPs specified in Mitigation Measure 4.8-</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>1. Evidence of the SWPPP and coverage under the Construction General Permit shall be submitted to the Community Development Department prior to the issuance of any building or grading permits for construction activities within the project site.</p>	
<p>4.4-2: Construction of the Proposed Project could impact potentially occurring federally listed species, including Contra Costa Goldfields, vernal pool fairy shrimp, and vernal pool tadpole shrimp.</p>	<p>PS</p>	<p>4.4-2a: A Biological Assessment, in accordance with USFWS standards, shall be prepared and submitted to the USACE, the federal lead agency for issuance of 404 permits, to support consultation with the USFWS pursuant to Section 7 of the ESA. A Biological Opinion with an incidental take statement for Contra Costa goldfields, vernal pool fairy shrimp, and vernal pool tadpole shrimp shall be obtained from the USFWS prior to construction within designated critical habitat. All mitigation measures in the Biological Opinion and incidental take statement issued by USFWS shall be adhered to. At minimum, these measures shall include:</p> <ul style="list-style-type: none"> ▪ The applicant shall purchase preservation credits at a two:one ratio and creation credits at a one:one ratio for removal of critical habitat at a USFWS-approved mitigation bank prior to commencement of construction activities, including discharge of fill material. Preservation credits are calculated based on the direct impacts of 0.39 acres and the indirect impacts of 6.9 acres (a 250-foot buffer around the seasonal wetlands and wetland drainage swales for land occurring within critical habitat). Creation credits are calculated based on direct impacts to the 0.39 acres. The preservation and creation credits will be a condition of the Biological Opinion with an incidental take statement. Evidence of the purchase of preservation credits shall be submitted to the Community Development Department prior to the issuance of grading or building permits for construction activities within critical habitat. <p>4.4-2b: Prior to construction within the project site, a USFWS-approved biologist who holds a Recovery Permit for vernal pool branchiopods shall conduct protocol level surveys within the 1.16 acres of seasonal wetlands and wetland drainage swales occurring outside of critical habitat, in accordance with the USFWS (1996) <i>Interim Survey Guidelines to Permittees for</i></p>	<p>LTS</p>

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p><i>Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods.</i> The protocol level surveys may be conducted during two wet seasons within five years or two consecutive seasons of one full wet season survey and one dry season survey. The results of the surveys shall be summarized within the Biological Assessment prepared under Mitigation Measure 4.4-2a.</p> <p>4.4-2c: Should it be determined that federally listed species are not present, and the USFWS agrees within its Biological Opinion, then no further mitigation would be required for effects to federally listed species as a result of construction outside of designated critical habitat. Evidence of compliance with the measures and conditions of the Biological Opinion shall be submitted to the Community Development Department prior to the issuance of any grading and building permits within the project site.</p> <p>4.4-2d: Should the protocol level surveys determine presence of federally listed vernal pool branchiopods, this impact shall be addressed within the Biological Opinion with an incidental take statement for vernal pool branchiopods to be obtained from the USFWS, in accordance with Mitigation Measure 4.4-2a. All conditions of the permit required by USFWS shall be implemented. At a minimum, the following conservation measure shall be implemented to minimize impacts to the federally listed species:</p> <ul style="list-style-type: none"> ▪ The applicant shall purchase preservation credits at a two:one ratio and creation credits at a one:one ratio for removal of habitat at a USFWS-approved mitigation bank prior to commencement of construction activities, including discharge of fill material. ▪ Evidence of the incidental take statement and purchase of preservation credits shall be submitted to the Community Development Department prior to the issuance of any grading and building permits within the project site. 	
4.4-3: Construction of the Proposed Project could result	PS	4.4-3a: Prior to construction with the project site, a qualified	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
<p>in the removal of breeding habitat within the seasonal wetlands and upland habitat within the non-native annual grassland habitat for California tiger salamander.</p>		<p>biologist shall prepare and submit a CTS Site Assessment to the USFWS and the DFG, in accordance with the USFWS (2003) Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander (CTS Guidance). The CTS Site Assessment shall be submitted to the USFWS and the DFG to provide recommendations to the appropriateness of the field surveys and guidance of the surveys conducted.</p> <p>4.4-3b: Upon USFWS and DFG’s request, a biologist who holds a USFWS Recovery Permit <u>and a state Scientific Collecting Permit</u> for CTS shall conduct protocol level surveys within the construction site in accordance with the CTS Guidance. <u>A Memorandum of Understanding shall be obtained from the CDFG prior to commencement of protocol level surveys.</u> Results of the surveys shall be summarized within a letter report submitted to DFG and the City, and the Biological Assessment submitted to USACE for consultation with USFWS in accordance with Mitigation Measure 4.4-2a. Should the surveys determine that CTS is not present within the project site, then no further mitigation is necessary.</p> <p>4.4-3c: Should surveys determine presence of CTS, then a Biological Opinion with an incidental take statement shall be obtained from the USFWS and an Incidental Take Permit shall be obtained from the DFG for impacts to CTS prior to construction. All conditions of the permits, including preservation and compensatory measures required by USFWS and by DFG, shall be implemented.</p> <p>4.4-3d: Evidence of the incidental take permits from USFWS and CDFG, or evidence of concurrence by USFWS with a finding of no effect to CTS, shall be submitted to the Community Development Department prior to the issuance of any grading and building permits.</p>	
<p>4.4-4: Construction activities have the potential to impact aquatic habitat for western pond turtle.</p>	<p>PS</p>	<p>4.4-4a: If grading within 300 feet of either of the detention basin or earth-lined canal is scheduled during the active nesting period</p>	<p>LTS</p>

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>(April through November), a pre-construction survey shall be conducted by a qualified biologist prior to commencement of construction activities. The survey shall be conducted no more than 14 days prior to initiation of grading to provide confirmation on presence or absence of active nests in the vicinity. The biologist shall look for adult western pond turtles, in addition to nests containing pond turtle hatchlings and eggs. If a western pond turtle is located in the construction area, the biologist will move the turtle to a suitable aquatic site, outside of the construction area. If an active pond turtle nest containing either pond turtle hatchlings or eggs is found, DFG will be consulted to determine and implement appropriate avoidance measures, which may include a “no-disturbance” buffer around the nest site until the hatchlings have moved to a nearby aquatic site. Evidence, in the form of a letter report documenting the results of the survey (and any consultation with DFG in the event that nesting pond turtles are found) shall be submitted to the Community Development Department prior to the issuance of any grading or building permits for construction activities within 300 feet of either of the detention basin or earth-lined canal between April and November.</p> <p>4.4-4b: A qualified biologist shall conduct an environmental awareness training for construction crew members prior to commencement of construction activities within 300 feet of the earth-lined canal or the detention basin. The training shall consist of a brief presentation by persons knowledgeable in western pond turtle biology to contractors, their employees, and military and agency personnel involved in the project. A fact sheet conveying this information should be prepared for distribution to the above-mentioned people and anyone else who may enter the project site. A letter report shall be submitted to the City within 30 days following the worker awareness training to document the results.</p>	
<p>4.4-5: Grading and construction activities associated with the Proposed Project could result in the removal of potential nesting habitat for burrowing owls.</p>	<p>PS</p>	<p>4.4-5a: A qualified biologist shall conduct a survey during the non-breeding season (September through January 31), prior to the anticipated start of construction. In accordance with the DFG burrowing owl survey protocol, the survey area will extend 500-feet from construction areas (CDFG, 1995) where legally permitted. <u>The non-breeding season survey shall either take place from one hour before to two hours after sunrise or two hours before to one hour after sunset.</u> The biologist will use binoculars</p>	<p>LTS</p>

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		<p>to visually determine whether burrowing owls occur beyond the construction areas if access is denied on adjacent properties. If no burrowing owls or their sign are detected in the vicinity of the project site during the pre-construction survey, a letter report documenting survey methods and findings shall be submitted to the City and the DFG within 30 days following the survey. If unoccupied burrows are detected during the non-breeding season (September 1 through January 31), the City shall be contacted within one day following the pre-construction survey to report the findings. A qualified biologist shall collapse the unoccupied burrows, or otherwise obstruct their entrances to prevent owls from entering and nesting in the burrows.</p> <p><u>4.4-5b: A qualified biologist shall conduct a survey during the peak breeding season (April 15 through July 15), prior to the anticipated start of construction. A minimum of four survey visits shall be conducted. In accordance with the DFG burrowing owl survey protocol, the survey area will extend 500-feet from construction areas (CDFG, 1995) where legally permitted. The breeding season survey shall either take place from one hour before to two hours after sunrise or from two hours before to one hour after sunset. If no burrowing owls or their sign are detected in the vicinity of the project site during the breeding season surveys, a letter report documenting survey methods and findings shall be submitted to the City and the DFG within 15 days following the survey, and no further mitigation is required so long as construction commences within seven days of the breeding season survey.</u></p> <p><u>4.4-5cb: A qualified biologist shall conduct a pre-construction survey within 30 seven (7) days prior to construction activities. In accordance with the DFG burrowing owl survey protocol, the survey area will extend 500-feet from construction areas (CDFG, 1995) where legally permitted. The survey shall either take place from one hour before to two hours after sunrise or from two hours before to one hour after sunset. If no burrowing owls or their sign are detected in the vicinity of the project site during the pre-construction survey, a letter report documenting survey methods and findings shall be submitted to the City and the DFG within 30 five (5) days following the survey, and no further mitigation is required. If more than seven days has lapsed between the survey date and site disturbance, then an additional survey shall be conducted a maximum of seven days prior to construction</u></p>	

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		<p><u>activities. Mitigation Measure 4.4-5a or Mitigation Measure 4.4-5b may meet the requirements of this pre-construction survey mitigation measure, so long as construction commences within seven days of the breeding or non-breeding season surveys.</u></p> <p>4.4-5de: If occupied burrowing owl burrows are detected, impacts on burrows shall be avoided by providing a buffer of 160 feet during the non-breeding season (September 1 through January 31) or 250 feet during the breeding season (February 1 through August 31). The size of the buffer area may be adjusted if a qualified biologist or the DFG determine the burrowing owl would not likely be affected by the Proposed Project. Project activities shall not commence within the buffer area until a qualified biologist confirms that the burrow is no longer occupied. If the burrow is occupied by a nesting pair, a minimum of 7.5 acres of foraging habitat contiguous to the burrow shall be maintained until the breeding season is finished.</p> <p>4.4-5ed: If impacts to occupied burrows are unavoidable, onsite passive relocation techniques approved by the DFG shall be used to encourage burrowing owls to move to alternative burrows outside of the project site. No occupied burrows shall be disturbed during the nesting season unless a qualified biologist verifies through non-invasive methods that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Mitigation for foraging habitat of relocated pairs shall follow the guidelines provided in the California Burrowing Owl Survey Protocol and Mitigation Guidelines (California Burrowing Owl Consortium, 1993). The mitigation for foraging habitat for relocated pairs range from 7.5 to 19.5 acres per pair.</p>	
<p>4.4-6: Construction activities have the potential to result in the disturbance of nesting habitat for Swainson's hawk.</p>	<p>PS</p>	<p>4.4-6a: <u>A qualified biologist shall conduct a minimum of three protocol level preconstruction surveys during each survey period immediately prior to start of construction, in accordance with the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee, 2000).</u> Prior to the commencement of construction activities on the project site during</p>	<p>LTS</p>

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		<p>the nesting season for Swainson's Hawk (between March 1 and September 15), a qualified biologist shall conduct a minimum of two protocol level preconstruction surveys during the recommended survey periods for the nesting season that coincides with the commencement of construction activities, in accordance with the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (Swainson's Hawk Technical Advisory Committee, 2000). The survey methodology shall be submitted to CDFG 15 days prior to survey activities. The qualified biologist shall conduct surveys for nesting Swainson's hawk in the project site and within 0.25 miles of construction activities where legally permitted. The biologist will use binoculars to visually determine whether Swainson's hawk nests occur beyond the 0.25-mile survey area if access is denied on adjacent properties. If no active Swainson's hawk nests are identified on or within 0.25 miles of construction activities within the recommended survey periods, a letter report summarizing the survey results shall be submitted to the City and the DFG within 30 days following the survey, and no further mitigation for nesting habitat is required. Evidence, in the form of a letter report documenting the results of the survey, shall be submitted to the Community Development Department prior to the issuance of any grading or building permits within the project site.</p> <p>4.4-6b: If active Swainson's hawk nests are found within 0.25 miles of construction activities, the biologist shall contact the City and the DFG within one day following the pre-construction survey to report the findings. For purposes of this mitigation requirement, construction activities are defined to include heavy equipment operation associated with construction (use of cranes or draglines, new rock crushing activities) or other project-related activities that could cause nest abandonment or forced fledging within 0.25 miles of a nest site between March 1 and September 15. Should an active nest be present within 0.25 miles of construction areas, then the DFG shall be consulted to establish an appropriate noise buffer, develop take avoidance measures, and implement a monitoring and reporting program prior to any construction activities occurring within 0.25 miles of the nest. The monitoring program would require that a qualified biologist shall monitor all activities that occur within the established buffer zone to ensure that disruption of the nest or forced fledging does not occur.</p>	

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		Should the biologist determine that the construction activities are disturbing the nest, the biologist shall halt construction activities until the DFG is consulted. The construction activities shall not commence until the DFG determines that construction activities would not result in abandonment of the nest site. If the DFG determines that take may occur, the applicant would be required to obtain a CESA take permit. Should the biologist determine that the nest has not been disturbed during construction activities within the buffer zone, then a letter report summarizing the survey results shall be submitted to the City and the DFG and no further mitigation for nesting habitat is required.	
<p>4.4-7: Construction activities for the Proposed Project could result in the removal of Swainson’s hawk foraging habitat.</p>	PS	<p>4.4-7: Mitigation measures for impacts to foraging habitat in areas designated as Irrigated Agriculture Conservation Area in the draft SMHCP may include the preservation and management of like foraging habitat at a ratio of 1:1 (241.32 acres). In accordance with the conservation measures identified within the draft SMHCP, the applicant shall purchase credits for the conversion of 241.32 acres of Swainson’s hawk foraging habitat at a 1:1 ratio.</p> <p>4.4.7b: If determined acceptable by the DFG, the preservation of 68.83 acres of active farmland in Solano County as required by Mitigation Measure 4.3-1 may could count towards their requirement to <u>preserve Swainson’s Hawk foraging habitat at a 1:1 ratio</u>, reducing the additional preservation requirement to 172.49 acres. In order for this land to be considered suitable mitigation, the 68.83 acres of land must be preserved with a conservation easement, include an endowment fund for long-term resource management, and specify it is for the long-term sustainability and management of resources. Incompatible land uses would be prohibited on lands designated for species protection within the conservation easement area. A detailed Mitigation and Monitoring Plan (MMP) shall be prepared, including a site-specific habitat assessment, species occurrence information, effective compensatory mitigation, monitoring methods, performance criteria to ensure mitigation success, adaptive management, and reporting requirements. The MMP would be prepared in consultation with the DFG and submitted to the DFG for review and approval prior to implementation of the project.</p>	LTS
<p>4.4-8: Grading and construction activities have the potential to result in the disturbance of nesting habitat for migratory birds and other birds of prey, including the</p>	PS	<p>4.4-8a: A qualified biologist shall conduct a pre-construction bird survey for nesting within 14 days prior to commencement of construction activities if anticipated to commence during the</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
northern harrier.		<p>nesting season (between March 1 and September 15). The qualified biologist shall document and submit the results of the pre-construction survey in a letter to the DFG and the City within 30 days following the survey. The letter shall include: a description of the methodology including dates of field visits, the names of survey personnel, a list of references cited and persons contacted, and a map showing the location(s) of any bird nests observed on the project site. If no active nests are identified during the pre-construction survey, then no further mitigation is required. Evidence, in the form of a letter report documenting the results of the survey, shall be submitted to the Community Development Department prior to the issuance of any grading or building permits within the project site.</p> <p>4.4-8b: If any active nests are identified during the pre-construction survey within the project site, a buffer zone will be established around the nests. A qualified biologist will monitor nests weekly during construction to evaluate potential nesting disturbance by construction activities. The biologist will delimit the buffer zone with construction tape or pin flags within 250 feet of the active nest and maintain the buffer zone until the end of the breeding season or until the young have fledged. Guidance from the DFG will be requested if establishing a 250-foot buffer zone is impractical. Guidance from the DFG will be requested if the nestlings within the active nest appear disturbed.</p> <p>4.4-8c: Trees anticipated for removal should be removed outside of the nesting season. The nesting season occurs between March 1 and September 15. If trees are anticipated to be removed during the nesting season, a pre-construction survey shall be conducted by a qualified biologist. If the survey shows that there is no evidence of active nests, then the tree shall be removed within ten days following the survey. If active nests are located within trees identified for removal, a 250-foot buffer shall be installed around the tree. Guidance from the DFG will be requested if the 250-foot buffer is infeasible.</p>	
4.4-9: The Proposed Project could interfere with the movement of native resident or migratory fish or wildlife	LTS	No mitigation is required.	NA

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.			
4.4-10: The Proposed Project could conflict with provisions of the SMHCP should it be adopted prior to the approval of the Proposed Project.	PS	4.4-10: Implement of Mitigation Measures 4.4-2a, 4.4-6a through 4.4-6d, 4.4-7a through 4.4-7b, and 4.4-8a.	LTS
4.4-11: Construction of the Proposed Project could remove trees protected within the tree preservation ordinance specified in Chapter 14.09.131 of the City's Zoning Code.	PS	<p>4.4-11: Prior to the issuance of grading permits and removal of any trees, a certified arborist or registered professional forester shall conduct an arborist survey documenting all trees with trunk circumferences of 31 inches or greater and their location. The report shall be submitted to the Community Development Department. The applicant shall not remove any trees without prior approval from the Community Development Department. All recommendations of the arborist report shall be implemented prior to the issuance of building permits for development on the project site. The arborist report shall specify measures including, but not limited to the following:</p> <ul style="list-style-type: none"> ▪ To the extent feasible, trees anticipated for removal shall be removed outside of the nesting season for birds. The nesting season is from March 1 to September 15. ▪ The project proponent shall plant replacement tree species recommended by the City at a 1:1 ratio within the project site. 	LTS
4.4-12: Development of the proposed off-site sewer connection upgrades could impact biological resources.	PS	4.4-12a: A qualified biologist shall conduct a botanical inventory focusing of the nine special status plants with the potential to occur within the ruderal vegetation in the vicinity of Upgrade 2 prior to the trenching activities associated with installing the proposed off-site sewer connection upgrades within Upgrade 2 (Figure 3-8). The botanical survey should be conducted in April, which is within the evident and identifiable blooming period for these species. A Rare Plant Survey Report shall be prepared and submitted to DFG prior to trenching in the vicinity of Upgrade 2. The Rare Plant Survey Report shall recommend measures to avoid impacts to special-status species, if present. If special status species would be impacted by the Proposed Project,	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>recommended measures could include transplanting individual specimens or providing compensatory conservation lands.</p> <p>4.4-12b: A qualified biologist shall conduct a pre-construction survey for nesting birds within 14 days prior to commencement of construction activities if anticipated to commence during the nesting season (between March 1 and September 15). The qualified biologist shall document and submit the results of the pre-construction survey in a letter to the DFG and the City within 30 days following the survey. If no active nests are identified during the pre-construction survey, then no further mitigation is required. Evidence, in the form of a letter report documenting the results of the survey, shall be submitted to the Community Development Department prior to the issuance of any grading or building permits within the project site.</p> <p>4.4-12c: If any active nests are identified during the pre-construction survey within the off-site sewer connection upgrade route, a buffer zone will be established around the nests. A qualified biologist will monitor nests weekly during construction to evaluate potential nesting disturbance by construction activities. The biologist will delimit the buffer zone with construction tape or pin flags within 250 feet of the active nest and maintain the buffer zone until the end of the breeding season or until the young have fledged. Guidance from the DFG will be requested if establishing a 250-foot buffer zone is impractical. Guidance from the DFG will be requested if the nestlings within the active nest appear disturbed.</p>	
<p>4.4-13: Development of the Proposed Project could contribute to the cumulative loss of special-status wildlife species or their habitat in the region.</p>	PS	<p>4.4-13: Implement Mitigation Measures 4.4-1 through 4.4-12.</p>	LTS

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4.5 Cultural Resources			
<p>4.5-1: Construction of the Proposed Project has the potential to cause a substantial adverse change in the significance of a historic resource as defined in PRC 21083.2, CEQA <i>Guidelines</i> Section 15064.5, or 36 CFR 60.4.</p>	LTS	No mitigation is required.	NA
<p>4.5-2: Ground-disturbing work associated with construction of the Proposed Project has the potential to affect previously undocumented archaeological resources and human remains.</p>	PS	<p>4.5-2a: Applicant shall require that, in the event of any inadvertent discovery of archaeological resources, all such finds shall be subject to PRC 21083.2 and CEQA <i>Guidelines</i> 15064.5. Procedures for inadvertent discovery include the following:</p> <ul style="list-style-type: none"> ▪ All work within 50 feet of the find shall be halted until a professional archaeologist, or paleontologist if the find is of a paleontological nature, can evaluate the significance of the find in accordance with NRHP and CRHR criteria. ▪ If any find is determined to be significant by the archaeologist, or paleontologist as appropriate, then representatives of the City shall meet with the archaeologist, or paleontologist, to determine the appropriate course of action. If necessary, the Applicant shall provide a Treatment Plan, prepared by an archeologist (or paleontologist), outlining recovery of the resource, analysis, and reporting of the find. The Treatment Plan shall be submitted to the City for review and approval prior to resuming construction. ▪ All significant cultural or paleontological materials recovered shall be subject to scientific analysis, professional curation, and a report prepared by the professional archaeologist, or paleontologist, according to current professional standards. <p>4.5-2b: If human remains are encountered during construction activities, work shall halt immediately in the vicinity and the Solano County Coroner should be notified in accordance with California Health and Safety Code Section 7050.5. If human remains are of Native American origin, the Coroner must, in accordance with PRC Section 5097, notify NAHC within 24 hours of this identification.</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
<p>4.5-3: Ground-disturbing construction activities may result in cumulatively considerable adverse impacts to previously unidentified subsurface archeological resources or human remains.</p>	PS	<p>4.5-3: Implement Mitigation Measures 4.5-2a and 4.5-2b.</p>	LTS
4.6 Geology and Soils			
<p>4.6-1: Earth-moving activities associated with construction of the Proposed Project have the potential to result in accelerated runoff, erosion and sedimentation.</p>	PS	<p>4.6-1a: Implement Mitigation Measure 4.8-1 (Section 4.8; Hydrology and Water Quality) to identify and implement erosion control BMPs within the SWPPP prepared for construction activities in accordance with the State’s Clean Water Act Nation Pollutant Discharge Elimination System (NPDES) general permit for construction activities. Implementation of these BMPs would ensure that temporary and short-term construction-related erosion impacts under the Proposed Project would be reduced to a less-than-significant level.</p> <p>4.6-1b: The applicant shall obtain a grading permit which includes the requirement of an ESC plan and a PC Plan. These plans shall include sufficient engineering analysis to show that the proposed erosion and sediment control measures during preconstruction, construction, and post-construction are capable of controlling surface runoff and erosion, retaining sediment on the project site, and preventing pollution of site runoff in compliance with the Clean Water Act.</p>	LTS
<p>4.6-2: The Proposed Project has the potential to result in structural damage and injury from seismic activity and related geologic hazards.</p>	PS	<p>4.6-2: Prior to issuance of building permits, the Project applicant shall contract with a certified geologic engineer to perform a soils analysis of the Project site, consistent with requirements of the City of Vacaville. Grading and building designs, including foundation requirements, shall be consistent with the findings of the soils report, the California Code of Regulations, and the Uniform Building Code. The Building Department shall require that foundation design and grading requirements of individual lots and buildings are sufficient to reduce potential liquefaction of soils to a low level.</p>	LTS
<p>4.6-3: Portions of the Proposed Project are located on expansive soils.</p>	PS	<p>4.6-3: Implement Mitigation Measures 4.6-2.</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
<p>4.6-4: Development of the Proposed Project in combination with future projects in the City of Vacaville could result in cumulative effects associated with geology and soils.</p>	PS	<p>4.6-4: Implement Mitigation Measures 4.6-1 through 4.6-3.</p>	LTS
4.7 Hazardous Materials			
<p>4.7-1: Construction of the Proposed Project would include the routine storage and handling of hazardous materials, which could result in a public health or safety hazard from the accidental release of hazardous materials into the environment.</p>	LTS	<p>4.7-1: The Applicant shall ensure through the enforcement of contractual obligations that all contractors transport, store, and handle construction-required hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the City of Vacaville Fire Department and the Solano County Fire Protection District. Recommendations may include, but are not limited to, transporting and storing materials in appropriate and approved containers, maintaining required clearances, and handling materials using approved protocols.</p>	LTS
<p>4.7-2: Construction of the Proposed Project could result in a public health or safety hazard from accidental or upset conditions involving release of hazardous materials into the environment from potential damage to underground utilities or septic systems, or demolition of buildings containing asbestos materials.</p>	PS	<p>4.7-2a: The project applicant shall require through contractual obligations that the construction contractor(s) marks the areas planned to be disturbed in white paint and notify Underground Service Alert (USA) one week prior to the beginning of excavation activities. This will be completed so the entire construction area is properly surveyed in order to minimize the risk of exposing or damaging underground utilities. USA provides a free "Dig Alert" service to all excavators (contractors, homeowners and others), in northern California, and will automatically notify all USA Members (utility service providers) who may have underground facilities at their work site. In response, the USA Members will mark or stake the horizontal path of their underground facilities, provide information about, or give clearance to dig. This service protects excavators from personal injury and underground facilities from being damaged. The utility companies will be responsible for the timely removal or protection of any existing utility facilities located within construction areas.</p> <p>4.7-2b: Septic systems must be removed by a licensed septic system contractor. A permit must first be obtained from the YCPHD, Division of Environmental Health Services. The septic tank must be emptied and the sewage must be disposed by a licensed septic hauler. The septic tank must then be removed</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>and the hole must be back-filled with soil or gravel. On-site wells must be abandoned and capped in accordance with appropriate regulatory requirements.</p> <p>4.7-2c: Prior to issuance of grading permits, the applicant shall hire a Certified Asbestos Consultant (CAC) to perform an asbestos survey on building materials located throughout the existing structures on the project site to determine if ACMs and lead-based paints are present. If the results of the asbestos survey indicate ACMs and/or lead-based paint are present within the structures that will be demolished, then the applicant shall require through contractual obligations that the following mitigation measure will be implemented:</p> <ul style="list-style-type: none"> ▪ All construction activities shall comply with all requirements and regulations promulgated through the YSAQMD Rule 9.9 and Rule 4.3. Rule 9.9 requires special provisions for structures containing ACMs. These provisions focus on limiting the emission of asbestos to the atmosphere and require an appropriate waste disposal procedure. ▪ Construction activities involving the demolition of structures containing lead based paints shall conform to DHS recommendations and OSHA requirements. Recommendations could include construction BMPs such as applying water to the structures before, during, and after demolition. 	
<p>4.7-3: Construction activities conducted during the dry season in and around dry grasses that pose a fire hazard.</p>	<p>PS</p>	<p>4.7-3: The applicant shall ensure through the enforcement of contractual obligations that the following measures are implemented by contractors during project construction:</p> <ul style="list-style-type: none"> ▪ Staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a fire break. 	<p>LTS</p>

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<ul style="list-style-type: none"> ▪ Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws. 	
<p>4.7-4: The Proposed Project is located within the planning area for the Travis Air Force Land Use Base, and therefore could result in potential safety hazards for people residing or working in the project area.</p>	LTS	No mitigation is required.	NA
<p>4.7-5: Potential for increased hazard of wildland fires during operation of the Proposed Project.</p>	PS	<p>4.7-5: The City shall ensure through conditions of project approval or requirements of the adopted Specific Plan, that development south of Foxboro Parkway and west of Vanden Road is in compliance with Chapter 14.20.290 of the Vacaville Municipal Code with respect to residential uses adjacent to open space areas where wildfire is a threat.</p>	LTS
<p>4.7-6: The adjacent railroad line could create a significant health or safety hazard to proposed residential uses on the project site.</p>	LTS	No mitigation is required.	NA
<p>4.7-7: The Proposed Project in combination with future growth and development in the project vicinity could result in cumulative effects associated with hazards and hazardous materials.</p>	PS	<p>4.7-7: Implement Mitigation Measures 4.7-1 through 4.7-3.</p>	LTS
<p>4.8 Hydrology and Water Quality</p>			
<p>4.8-1: Construction activities may substantially degrade surface water and/or groundwater quality.</p>	PS	<p>4.8-1: The Applicant shall comply with the SWRCB NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit). The SWRCB requires that all construction sites have adequate control measures to reduce the discharge of sediment and other pollutants to streams to ensure compliance with Section 303 of the Clean Water Act. To comply with the NPDES permit, the applicant will file a Notice of Intent with the SWRCB and prepare a SWPPP prior to construction, which includes a detailed, site-specific listing of the potential sources of stormwater pollution; pollution prevention measures (erosion and sediment control measures and measures</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>to control non-stormwater discharges and hazardous spills) to include a description of the type and location of erosion and sediment control BMPs to be implemented at the project site, and a BMP monitoring and maintenance schedule to determine the amount of pollutants leaving the Proposed Project site. A copy of the SWPPP must be current and remain on the project site. Control measures are required prior to and throughout the rainy season. Water quality BMPs identified in the SWPPP shall include but are not limited to the following:</p> <ul style="list-style-type: none"> ▪ Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) shall be employed for disturbed areas. No disturbed surfaces will be left without erosion control measures in place during the winter and spring months. ▪ Sediment shall be retained onsite by the detention basin, onsite sediment traps, or other appropriate measures. ▪ A spill prevention and countermeasure plan shall be developed which would identify proper storage, collection, and disposal measures for potential pollutants (such as fuel, fertilizers, pesticides, etc.) used onsite. The plan would also require the proper storage, handling, use, and disposal of petroleum products. ▪ Construction activities shall be scheduled to minimize land disturbance during peak runoff periods and to the immediate area required for construction. Soil conservation practices shall be completed during the fall or late winter to reduce erosion during spring runoff. Existing vegetation will be retained where possible. To the extent feasible, grading activities shall be limited to the immediate area required for construction. ▪ Surface water runoff shall be controlled by directing flowing water away from critical areas and by reducing runoff velocity. Diversion structures such as terraces, dikes, and ditches shall collect and direct runoff water around vulnerable areas to prepared drainage outlets. Surface roughening, berms, check dams, hay bales, or similar devices shall be used to reduce runoff velocity and erosion. ▪ Sediment shall be contained when conditions are too 	

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		<p>extreme for treatment by surface protection. Temporary sediment traps, filter fabric fences, inlet protectors, vegetative filters and buffers, or settling basins shall be used to detain runoff water long enough for sediment particles to settle out. Store, cover, and isolate construction materials, including topsoil and chemicals, to prevent runoff losses and contamination of groundwater.</p> <ul style="list-style-type: none"> ▪ Topsoil removed during construction shall be carefully stored and treated as an important resource. Berms shall be placed around topsoil stockpiles to prevent runoff during storm events. ▪ Establish fuel and vehicle maintenance areas away from all drainage courses and design these areas to control runoff. ▪ Disturbed areas shall be revegetated after completion of construction activities. ▪ All necessary permits and approvals shall be obtained. ▪ Provide sanitary facilities for construction workers. 	
<p>4.8-2: Urban run-off resulting from the development of impervious surfaces and urban land uses on the project site could result in adverse effects to surface water quality.</p>	PS	<p>4.8-2: Infiltration systems shall be designed in accordance with the following procedures outlined in the California Storm Water Best Management Practice Handbooks to reduce runoff and restore natural flows to groundwater:</p> <ul style="list-style-type: none"> ▪ Biofilters and/or vegetative swale drainage systems will be installed at roof downspouts for all buildings on the project site, allowing sediments and particulates to filter and degrade biologically. ▪ Structural source controls, such as covers, impermeable surfaces, secondary containment facilities, runoff diversion berms, sediment and grease traps in parking lots will be included in the project design. ▪ Designated trash storage areas will be covered to protect bins from rainfall. 	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
<p>4.8-3: Development of the Proposed Project may substantially alter the existing drainage patterns and cause flows to exceed the capacity of existing stormwater drainage systems.</p>	PS	<p>4.8-3: The City shall require that the following drainage improvements outlined in the Master Plan and subsequent Addendum (Appendix J) be completed prior to the issuance of building permits for construction of the Proposed Project.</p> <ul style="list-style-type: none"> ▪ The existing SID twin 36-inch CMP culverts located just east of the Railroad shall be replaced with twin 60-inch culverts in order to match capacity or exceed the combined capacity of the current culverts under the Railroad. Alternatively, the culverts under the Railroad shall be extended. ▪ Replace the existing culverts at Meridian Road, Hay Road, and Farm Road (Figure 4.8-3) with the one of the following alternatives: <ul style="list-style-type: none"> ▪ Twin 96-inch RCP culverts with concrete headwalls, or ▪ 16-foot by 8-foot Conspan culverts at Meridian Road and Hay Road, and 16-foot by 10-foot Conspan culverts at Farm Road. ▪ Raise and maintain the top-of-bank elevations along reaches of the Noonan Dam as recommended in the Master Plan and Addendum (Appendix J). 	LTS
<p>4.8-4: Development of the Proposed Project could place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; place within a 100-year flood hazard area structures that would impede or redirect flood flows; or expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam or inundation by seiche, tsunami, or mudflow.</p>	NI	No mitigation is required.	NA
<p>4.8-5: Implementation of the Proposed Project could degrade groundwater quality nor substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net</p>	LTS	No mitigation is required.	NA

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
deficit in aquifer volume or a lowering of the local groundwater table.			
4.8-6: The Proposed Project in combination with future growth and development within the City and project vicinity could result in cumulative impacts to hydrology and water quality.	LTS	No mitigation is required.	NA
4.9 Land Use			
4.9-1: The Proposed Project could result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	No mitigation is required.	NA
4.9-2: The Proposed Project could result in an inconsistency with any applicable habitat conservation plan or natural community conservation plan.	LTS	No mitigation is required.	NA
4.9-3: The Proposed Project could contribute to adverse cumulative impacts associated with land use.	LTS	No mitigation is required.	NA
4.10 Noise			
4.10-1: Project-related construction has the potential to generate a substantial temporary or periodic noise level greater than existing ambient levels in the project vicinity.	SU	<p>4.10-1: The Applicant shall ensure through contractual agreements that the following measures are implemented during construction:</p> <ul style="list-style-type: none"> ▪ Construction activities shall be limited to occur between the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays, Sundays, and Federal Holidays. The intent of this measure is to prevent construction activities during the more sensitive nighttime period. ▪ Stationary equipment and staging areas shall be located as far as practical from noise-sensitive receptors. ▪ All construction vehicles or equipment, fixed or mobile, 	SU

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>shall be equipped with properly operating and maintained mufflers and acoustical shields or shrouds, in accordance with manufacturers' recommendations.</p> <ul style="list-style-type: none"> ▪ To the extent feasible existing barrier features (structures) shall be used to block sound transmission between noise sources and noise sensitive land uses. ▪ Construction activities shall conform to the following standards: (a) there shall be no start-up of machines or equipment, no delivery of materials or equipment, no cleaning of machines or equipment and no servicing of equipment except during the permitted hours of construction; (b) radios played at high volume, loud talking and other forms of communication constituting a nuisance shall not be permitted; and (c) there shall be no construction on Sundays or legal holidays. Exceptions to these time restrictions may be granted by the Community Development Director for one of the following reasons: (1) inclement weather affecting work; (2) emergency work; or (3) other work, if work and equipment will not create noise that may be unreasonably offensive to neighbors so as to constitute a nuisance. The Community Development Director must be notified and must approve the work in advance. ▪ The general contractors for all construction and demolition activities shall provide a contact number for citizen complaints and a methodology for dealing with such complaints such as designating a noise disturbance coordinator. This noise disturbance coordinator shall receive all public complaints about construction-related noise and vibration, shall be responsible for determining the cause of the complaint, and shall implement any feasible measures to be taken to alleviate the problem. All complaints and resolution of complaints shall be reported to the City weekly. 	
<p>4.10-2: The Proposed Project could expose proposed outdoor activity areas for sensitive receptors to traffic noise in excess of the City's noise standards.</p>	<p>PS</p>	<p>4.10-2: Prior to the issuance of building permits for residential units located within 200 feet of Leisure Town Road, Vanden Road South, and the proposed Foxboro Parkway Extension, the applicant shall construct solid noise barriers along these roadway segments as indicated in Figure 4 of the NIA (Appendix K). The noise barrier shall be uniform with a height of 8 feet relative to</p>	<p>LTS</p>

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		backyard elevations to reduce future traffic noise levels to 60 dB Ldn within the outdoor activity areas of the residences proposed adjacent to these roadways.	
4.10-3: The Proposed Project has the potential to expose sensitive receptors to interior noise levels resulting from cumulative traffic conditions in excess of the City's noise standard.	LTS	No mitigation is required.	NA
4.10-4: The Proposed Project has the potential to substantially increase baseline traffic noise levels at existing residences.	LTS	No mitigation is required.	NA
4.10-5: The Proposed Project has the potential to expose proposed sensitive receptors to excessive noise levels resulting from aircraft.	LTS	No mitigation is required.	NA
4.10-6: The Proposed Project has the potential to expose proposed sensitive receptors to excessive noise levels resulting from railroad operations.	PS	4.10-6: The applicant shall construct a solid noise barrier of sufficient height to intercept line of sight between a point 10 feet above the railroad tracks and a backyard receiver five feet in height should be constructed along the north side of Leisure Town Road, from the northern site boundary to Vanden Road South, at the locations shown in Figure 4 of the NIA (Appendix K). Construction of the noise barrier would provide a reduction of 5 dB Ldn. The noise barrier shall be installed prior to the issuance of building permits for residential units within 300 feet of the UPRR rail tracks.	NA
4.10-7: The Proposed Project has the potential to expose proposed residences to railroad vibration or generate excessive groundborne vibration or groundborne noise levels.	LTS	No mitigation is required.	NA
4.10-8: Traffic resulting from the Proposed Project in combination with cumulative development has the potential to increase cumulative traffic noise levels at existing residences in excess of the City's thresholds.	LTS	No mitigation is required.	NA
4.11 Population and Housing			
4.11-1: Construction of the Proposed Project could induce substantial population growth in the area, resulting in adverse environmental consequences.	LTS	No mitigation is required.	NA

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.11-2: Development of the Proposed Project could induce substantial population growth in the area, resulting in adverse environmental consequences.	LTS	No mitigation is required.	NA
4.11-3: Development of the Proposed Project could displace substantial numbers of existing housing and/or people, necessitating the construction of replacement housing elsewhere.	LTS	No mitigation is required.	NA
4.11-4: The Proposed Project could contribute to adverse cumulative impacts associated with population and housing.	LTS	No mitigation is required.	NA
4.12 Public Services, Utilities, and Recreation			
4.12-1: The Proposed Project could <u>would not</u> exceed the City's water supply capacity requiring the acquisition or expansion of entitlements.	LTS	No mitigation is required.	NA
4.12-2: The Proposed Project could exceed the City's water supply capacity requiring the acquisition or expansion of entitlements under potential global climate change conditions.	LTS	No mitigation is required.	NA
4.12-3: The Proposed Project could require expansion of the City's water treatment, storage, and distribution facilities, the construction of which could result in environmental impacts.	SU	No feasible mitigation available.	SU
4.12-4: The Proposed Project could exceed the capacity of the wastewater treatment collection and collection <u>treatment</u> facilities serving the project site.	SU	4.12-4: Prior to the construction of off-site sewer upgrades, the City shall implement Mitigation Measures 4.4-12a-c to conduct pre-construction surveys for rare plants and nesting birds and implement avoidance measures during construction.	SU
4.12-5: The Proposed Project would generate a demand for fire protection services, and could require the	PS	4.12-5: The Vanden Meadows Specific Plan shall require development of the VFD Southtown Fire Station prior to issuance	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
construction of new or expanded facilities to maintain service level standards.		of the first development permit of any project homes that are located outside the City's fire response time limit.	
4.12-6: The Proposed Project would generate a demand for law enforcement services, and could require the construction of new or expanded facilities to maintain service level standards.	LTS	No mitigation is required.	NA
4.12-7: The Proposed Project may require additional capacity or substantially increase demand for telecommunication services that could require the development of new telecommunications infrastructure, the construction of which could result in adverse environmental effects.	LTS	No mitigation is required.	NA
4.12-8: The Proposed Project may require additional capacity, substantially increase demand, or affect energy supplies for electrical and natural gas services that could require the development of new energy transmission infrastructure, the construction of which could result in adverse environmental effects.	LTS	No mitigation is required.	NA
4.12-9: The Proposed Project could generate solid waste beyond the capacity of the landfill and solid waste collectors serving the project area requiring development of new solid waste management facilities, the construction of which could result in adverse environmental effects.	LTS	No mitigation is required.	NA
4.12-10: The Proposed Project would generate a demand for educational services, and could require the construction of new or expanded school facilities to maintain service level standards.	LTS	No mitigation is required.	NA
4.12-11: The Proposed Project may increase the use of City's parks, resulting in physical deterioration of	LTS	No mitigation is required.	NA

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
recreational facilities.			
4.13 Transportation and Circulation			
Existing Conditions			
4.13-1: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on Vacaville and Solano County roadways beyond acceptable capacities under Existing Conditions.	LTS	No mitigation is required.	NA
4.13-2: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on area freeway beyond acceptable capacities under Existing Conditions.	LTS	No mitigation is required.	NA
4.13-3: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic at study intersections beyond acceptable capacities under Existing Conditions.			
<ul style="list-style-type: none"> ▪ Davis Street and Alamo Drive (#11) – AM peak hour 	PS	4.13-3a: The City shall accept LOS D as the standard for the intersection as allowed by City General Plan Policies. The City of Vacaville shall continue to monitor the operation of the AM peak hour intersection operation to maintain an acceptable LOS. Based on the outcome of the monitoring, the City shall optimize signal timing and update transportation portion of Vacaville Development Impact Fee Program to consider funding improvements at this intersection to address cumulative impact.	LTS
<ul style="list-style-type: none"> ▪ Alamo Drive and Merchant Street (#14) – PM peak hour 	PS	4.13-3b: The City shall widen northbound (Alamo Drive) approach to provide a third left turn lane and a free right turn under signal control. With the improvement, the intersection operations would improve to operate within acceptable standards. The Project shall pay transportation portion of the Development Impact Fees that would provide funding towards the implementation of this improvement. Alternatively, should widening be determined unfeasible, the City may accept LOS D as the standard at this intersection as allowed by City General Plan Policies. Upon implementation of the measure, the project impact would be less than significant.	LTS
4.13-4: Implementation of the Proposed Project with	LTS	No mitigation is required.	NA

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
and without the Foxboro Parkway Extension has the potential to affect the bicycle and pedestrian systems under Existing plus Approved Projects conditions.			
4.3-5: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to affect the public transit under Existing plus Approved Projects conditions.	LTS	No mitigation is required.	NA
Existing plus Approved Projects Conditions			
4.13-6: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on Vacaville and Solano County roadways beyond acceptable capacities under Existing plus Approved Projects Conditions.			
<ul style="list-style-type: none"> ▪ Vanden Road north of Foxboro Parkway Extension – PM peak Hour 	PS	4.13-6a: The City shall accept LOS D as the standard for this roadway segment as allowed by the City General Plan Policies.	LTS
<ul style="list-style-type: none"> ▪ Leisure Town Road north of Sequoia – PM peak hour 	SU	No feasible mitigation available.	SU
<ul style="list-style-type: none"> ▪ Peabody Road south of Alamo Drive – PM peak hour 	PS	4.13-6b: The City of Vacaville shall continue to monitor the operation on Peabody Road. The City shall use the results of the monitoring to coordinate the development of the 5 th and 6 th lane of Peabody Road south of Alamo Drive with the next update of the Development Impact Fee Program. The City shall accept LOS D as an acceptable LOS for this segment in the interim until the impact fee program provides for this project. Alternatively, should widening be determined unfeasible, the City may accept LOS D as the standard at this intersection as allowed by City General Plan Policies.	LTS
<ul style="list-style-type: none"> ▪ Peabody Road north of Foxboro Parkway– PM peak hour 	PS	4.13-6c: Implement Mitigation Measure 4.13-6b.	LTS
<ul style="list-style-type: none"> ▪ Peabody Road south of Foxboro Parkway– PM peak hour 	PS	4.13-6d: Implement Mitigation Measure 4.13-6b.	LTS
<ul style="list-style-type: none"> ▪ Peabody Road south of the Vacaville City Limit– PM peak hour 	SU	No feasible mitigation available.	SU
4.13-7: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on area freeway beyond	LTS	No mitigation is required.	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
acceptable capacities under Existing plus Approved Projects Conditions.			
<p>4.13-8: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic at study intersections beyond acceptable capacities under Existing plus Approved Projects Conditions.</p>			
<ul style="list-style-type: none"> ▪ Peabody Road and Alamo Drive (#10) – PM peak hour ▪ Davis Street and Alamo Drive (#11) – PM peak hour ▪ Alamo Drive and Merchant Street (#14) – AM and PM peak hours ▪ Nut Tree Road and Ulatis Road (#17) – PM peak hour ▪ Peabody Road and CSP-Solano (#18) – AM peak hour ▪ Peabody Road and Foxboro Parkway (#19) – PM peak hour ▪ Peabody Road and California Drive (#20) – PM peak hour ▪ Peabody Road and Cliffside Drive (#21) – PM peak hour 	<p>PS</p>	<p>4.13-8a: The City of Vacaville shall accept LOS D as an acceptable LOS at the eight intersections, where the operation would be LOS D with or without the proposed project. The City shall continue to monitor the operations at these intersections, optimize signal timing, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of the Mitigation Measures 4.13-8a through d, the project impacts at the eight intersections would be less than significant.</p> <p>The City shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. Under the Development Impact Fee Program, the following mitigations would be needed to achieve LOS C at these intersections for Existing + Approved Project Conditions:</p> <p><u>Peabody Road and Alamo Drive (#10)</u> - Widen southwest corner to provide an additional third EB thru lane. With improvement, intersection is projected to operate at LOS C in the PM peak hour.</p> <p><u>Davis Street and Alamo Drive (#11)</u> - Widen southwest corner to provide an additional (3rd) EB thru lane. With improvement intersection is projected to operate at LOS C in the PM peak hour.</p> <p><u>Alam Drive and Merchant Street (#14)</u> - Widen northbound (Alamo Drive) approach to provide a third left turn lane and a free right turn under signal control. With improvement intersection is projected to operate at LOS C in the AM peak hour and LOS B in the PM peak hour.</p> <p><u>Nut Tree Road and Ulatis Road (#17)</u> - Widen west side of</p>	<p>LTS</p>

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>Nut Tree to provide a third southbound thru lane. With improvement intersection is projected to operate at LOS C in the PM peak hour.</p> <p><u>Peabody Road and CSP-Solano (#18)</u> - Widen west side of Peabody Road to provide second southbound thru lane. With improvement intersection is projected to operate at LOS A in the AM peak hour.</p> <p><u>Peabody Road and Foxboro Parkway (#19)</u> - Widen Peabody Road to add a third northbound thru lane. With improvement intersection is projected to operate at LOS C in the PM peak hour.</p> <p><u>Peabody Road and California Drive (#20)</u> - Reconfigure three northbound lanes to provide two thru lanes and a shared thru/right turn lane. With improvement intersection is projected to operate at LOS B in the PM peak hour.</p> <p><u>Peabody Road and Cliffside Drive (#21)</u> - Reconfigure three southbound lanes to provide two thru and 3rd thru shared with right turn lane, and provide an eastbound free right turn lane. With improvement intersection is projected to operate at LOS B in the PM peak hour.</p>	
<ul style="list-style-type: none"> ▪ Nut Tree Road and Alamo Drive (#9) – PM peak hour 	PS	<p>4.13-8b: The City shall widen the southwest corner of the intersection to provide a dedicated eastbound right turn lane would improve the intersection operation to LOS C in the PM peak hour. The Project shall be conditioned to provide this improvement as a condition of approval of development with appropriate timing tied to level of project development. Alternatively, the Project could be conditioned to fund the improvement by providing cash deposit to the City. The City would provide this improvement as appropriate through regular monitoring of the intersection to maintain acceptable LOS.</p> <p>The City may alternatively accept LOS D as an acceptable LOS at the Nut Tree Road and Alamo Drive intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing according to the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code.</p>	LTS
<ul style="list-style-type: none"> ▪ Davis Street and Hume Way (#22) – PM peak 	PS	<p>4.13-8c: The City shall complete the City Capital Improvement</p>	

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
hour		Project to the Davis Hume intersection and associated widening of Davis Street. With these improvements this intersection is project to operate at LOS A without and with the Project with or without Foxboro Parkway Extension.	
Cumulative Impacts			
4.13-9: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on Vacaville and Solano County roadways beyond acceptable capacities under Cumulative Conditions.			
<ul style="list-style-type: none"> ▪ Leisure Town Road north of Orange Drive– PM peak hour 	PS	4.13-9a: The City of Vacaville shall accept LOS D as an acceptable LOS. The City shall continue to monitor the operation on Leisure Town Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS.	LTS
<ul style="list-style-type: none"> ▪ Leisure Town Road north of Sequoia Drive – PM peak hour 	PS	4.13-9b: The City of Vacaville shall accept LOS D as an acceptable LOS. The City shall continue to monitor the operation on Leisure Town Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS.	LTS
<ul style="list-style-type: none"> ▪ Peabody Road north of Foxboro Parkway – PM peak hour 	PS	4.13-9c: The City shall continue to monitor the operation on Peabody Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS.	LTS
<ul style="list-style-type: none"> ▪ Peabody Road south of Foxboro Parkway – PM peak hour 	PS	4.13-9d: The City shall continue to monitor the operation on Peabody Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS.	LTS
<ul style="list-style-type: none"> ▪ Peabody Road south of Vacaville City – PM peak hour 	SU	<p>4.13-9e: The City shall continue to monitor the operation of Peabody Road south of City Limits and support regional efforts to provide additional capacity on this segment of Peabody Road through the proposed Regional Transportation Impact Fee Program. City shall continue to participate and support the Regional Transportation Impact Fee.</p> <p>Should Regional Transportation Impact Fee be approved prior to issuance of building permits for the project, the Project shall</p>	SU

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		participate in the Regional Transportation Impact Fee Program. With implementation of Regional Impact Fee Program that includes improves to two lane section of Peabody Road south of Vacaville City Limits, impact would be less than significant. However, since the implementation and timing of the Fee Program is beyond the City's control, this impact remains significant and unavoidable.	
4.13-10: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on area freeway beyond acceptable capacities under cumulative conditions.	LTS	No mitigation is required.	NA
4.13-11: Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic at study intersections beyond acceptable capacities under cumulative conditions.			
<ul style="list-style-type: none"> ▪ Leisure Town Road and I-80 Eastbound Ramps (#2) – PM peak hour ▪ Leisure Town Road and Sequoia Drive (#4) – PM peak hour ▪ Leisure Town Road and Elmira Road (#5) – PM peak hour ▪ Davis Street and Alamo Drive (#11) – AM and PM peak hour ▪ Peabody Road and Foxboro Parkway (#19) – PM peak hour ▪ Peabody Road and Cliffside Drive (#21) – PM peak hour ▪ I-80 Westbound Ramp and Cherry Glen Road (#23) – PM peak hour 	PS	<p>4.13-11a: The City shall accept LOS D as an acceptable LOS at the seven intersections, where the operation would be LOS D with or without the proposed project. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of this measure, the project impacts at the eight intersections would be less than significant.</p> <p>Alternatively, the City shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. Upon implementation of the measure, the project impacts at these locations would be less than significant. Under the Development Impact Fee Program, the following mitigations would be needed to achieve LOS C at these intersections for Cumulative Conditions:</p> <p><u>Leisure Town Road and I-80 Eastbound Ramps (#2)</u> - Widen Leisure Town Road to provide additional (4th) northbound and southbound thru lanes. With this improvement, the intersection operation is projected to be LOS D (V/C=0.85), or better in the PM peak hour.</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p><u>Leisure Town Road and Sequoia Drive (#4)</u> - Reconfigure southbound lanes to provide three thru lanes including a shared through-right turn lane. With this improvement, the intersection is projected to operate at LOS C (V/C=0.72 or 0.73) in the PM peak hour.</p> <p><u>Leisure Town Road and Elmira Road (#5)</u> - Reconfigure southbound lanes to provide three thru lanes including a shared through-right turn lane. With improvement intersection is projected to operate at LOS C (V/C=0.75 or 0.78 in the PM peak hour.</p> <p><u>Davis Street and Alamo Drive (#11)</u> – Implement Mitigation Measure 4.10-8a by widening the southwest corner to provide an additional (3rd) EB thru lane. In addition, widen Alamo Drive to provide an additional (3rd) westbound thru lane. With this improvement intersection is projected to operate at LOS B or C (V/C=0.65 to 0.73) with and without Project in the AM and PM peak hours.</p> <p><u>Peabody Road and Foxboro Parkway (#19)</u> - Implement Mitigation Measure 4.10-8a by widening Peabody Road to add third northbound thru lane. With this improvement, the intersection is projected to operate at LOS C (V/C=0.75 to 0.79) in the PM peak hour.</p> <p><u>Peabody Road and Cliffside Drive (#21)</u> - Implement Mitigation Measure 4.10-8a by reconfiguring three southbound lanes to provide two thru and one thru-right shared lane, and providing an eastbound free right turn lane. With this improvement, the intersection is projected to operate at LOS C (V/C=0.78 or 0.79) in the PM peak hour.</p> <p><u>I-80 Westbound Ramp and Cherry Glen Road (#23)</u> - Reconfigure southbound lanes to provide one through lane and one through-right shared lane, and add a second eastbound left turn lane along with corresponding receiving lane on the north leg. With improvement intersection is projected to operate at LOS b or C (V/C=0.67 to 0.71) in the PM peak hour.</p>	
<ul style="list-style-type: none"> ▪ Nut Tree Road and Alamo Drive (#9) – PM peak hour 	PS	<p>4.13-11b: The City of Vacaville shall accept LOS D for operation at this intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>Impact Mitigation provisions of Land Use and Development Code. Upon implementation of this mitigation, the project impact would be less than significant.</p> <p>Alternatively, implementation of Mitigation Measure 4.13-8b by widening the southwest corner of this intersection to provide a dedicated eastbound right turn lane would improve the operations to LOS C with the project with the Foxboro Parkway Extension but the operations would remain at LOS D if the Foxboro Parkway Extension is not constructed. If the Extension would not be constructed, the City shall approve LOS D as acceptable for this intersection or limit future approvals to maintain an acceptable LOS at this intersection. Upon implementation of this mitigation, the project impact would be less than significant.</p> <p>Alternatively, in addition to Mitigation Measure 4.13-8b, the Project shall be conditioned to also widen Nut Tree Road to provide a dedicated southbound right-turn lane as a condition of approval of development with appropriate timing tied to level of project development if the Foxboro Parkway Extension would not be constructed,. Alternatively, the Project could be conditioned to fund the improvement by providing cash deposit to the City. The City would provide this improvement as it regularly monitors the intersection and would determine the appropriate timing to implement in order to maintain acceptable LOS. With the addition of a southbound right-turn lane, the operation would be LOS C with the project even if the Foxboro Parkway Extension is not constructed; therefore, the project impact would be less than significant.</p>	
<ul style="list-style-type: none"> ▪ Peabody Road and Alamo Drive (#9) – AM peak hour 	PS	<p>4.13-11c: The City of Vacaville shall accept LOS D for operation at this intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of this mitigation, the project impact would be less than significant.</p> <p>Alternatively, implement Mitigation Measure 4.13-8a by widening the southwest corner to provide an additional third EB thru lane.</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		In addition, also widen Alamo Drive to provide an additional (3rd) westbound thru lane. With this improvement, the intersection is projected to operate at LOS C during both AM and PM peak hours.	
<ul style="list-style-type: none"> ▪ Cherry Glen Road and I-80 Eastbound Ramp (#24) – PM peak hour 	PS	<p>4.13-11d: The City of Vacaville shall accept LOS D for operation at this intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of the Mitigation Measure 4.13-11d, the project impact would be less than significant.</p> <p>Alternatively, to achieve LOS C at the Cherry Glen Road and I-80 Eastbound Ramp intersection, the intersection would need to be widened on Cherry Glenn Road to provide an additional southbound lane to provide two left turn lanes and an outside shared through-right lane, and widen eastbound onramp to receive two left turn lanes. The City shall continue to regularly monitor the operation of this intersection, optimize signal timing based on the results of the monitoring, implement Transportation Impact Mitigation provisions of Land Use and Development Code, and update transportation portion of the Development Impact Fee Program to maintain an acceptable LOS at this intersection. Implementing this mitigation would result in acceptable LOS at this intersection and therefore result in a less than significant impact.</p>	LTS
<ul style="list-style-type: none"> ▪ Alamo Drive and Marshall Road (#12) – PM peak hour ▪ Peabody Road and CSP-Solano (#18) – PM peak hour (LOS D in AM peak hour) 	PS	<p>4.13-11e: The City of Vacaville shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. The following mitigations would be developed under the Development Impact Fee to achieve acceptable service levels under Cumulative Conditions:</p> <p><u>Alamo Drive and Marshall Road (#12)</u> - Widen Alamo Drive to provide an additional (3rd) southbound thru lane and reconfigure eastbound lanes on Marshall Road to provide two thru lanes with outside shared with right turns. With this improvement, the operation is projected to be LOS C (V/C=0.78) without Project, LOS D (V/C=0.82) with Project.</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>The City shall accept LOS D for operation of the Alamo Drive and Marshall Road intersection. This improvement would require right-of-way acquisition. Upon implementation of this measure, the project impact would be less than significant.</p> <p><u>Peabody Road and and CSP-Solano (#18)</u> - Implement Mitigation Measure 4.10-8a by widening the west side of Peabody Road to provide a second southbound thru lane. With this improvement, the intersection is projected to operate at LOS A (V/C= 0.489 0r 0.49) in AM peak hour, and LOS C (V//C=0.72) in the PM peak hour. This improvement would require right-of-way acquisition. Upon implementation of this measure, the project impact would be less than significant.</p> <p>The City shall continue to regularly monitor the operation of these is intersections, optimize signal timing, implement Transportation Impact Mitigation provisions of Land Use and Development Code and update transportation portion of Development Impact Fee Program to maintain acceptable LOS.</p>	
<ul style="list-style-type: none"> ▪ Leisure Town Road and Alamo Drive/Fry Road (#6)—PM peak hour ▪ Peabody Road and California Drive (#20) – PM peak hour ▪ Davis Street and Hume Way (#22) – PM peak hour 	PS	<p>4.13-11f: The City of Vacaville shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. The following mitigations would be developed under the Development Impact Fee Program to achieve acceptable service levels under Cumulative Conditions:</p> <p><u>Leisure Town Road and Alamo Drive/Fry Road (#6)</u> - Widen Leisure Town Road to provide additional (3rd) southbound lane, the outside shared with right turn lane. With improvement intersection is projected to operate at LOS C. Consequently, the project impact would be less than significant.</p> <p><u>Peabody Road and California Drive (#20)</u> – Implement Mitigation Measure 4.10-8a by reconfiguring three northbound lanes to provide two thru lanes and one shared thru-right turn lane. With improvement intersection is projected to operate at LOS D with and without the project. In addition, widen Peabody Road to provide an additional (3rd) southbound thru lane and improve geometrics of intersection to allow east-west signal phasing to operate without split phasing. With these improvements, the</p>	LTS

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>intersection is projected to operate at LOS C. Consequently, the project impact would be less than significant.</p> <p><u>Davis Street and Hume Way (#22)</u> - Reconfigure three southbound lanes to provide two thru and 3rd thru shared with right turn lane, and provide an eastbound free right turn lane. With the improvements, the intersection is projected to operate at LOS C. Consequently, the project impact would be less than significant.</p>	
<ul style="list-style-type: none"> ▪ Leisure Town Road and I-80 Westbound Ramps (#1) – PM peak hour (LOS E in the AM peak hour) ▪ Leisure Town Road and Orange Drive (#3) – PM peak hour (LOS D in the AM peak hour) ▪ Alamo Drive and Merchant Street (#14) –PM peak hours (LOS D in the AM peak hour) ▪ Nut Tree Road and Ulatis Drive(#17) – PM peak hour 	<p>PS</p>	<p>4.13-11g. The City of Vacaville shall continue to regularly monitor the operation of these intersections, optimize signal timing, implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain acceptable LOS. The City shall include funding for improvements at these intersections in updates to the transportation portion of the Development Impact Fee Program. The following measures would be developed under the Development Impact Fee Program:</p> <p><u>Leisure Town Road and I-80 Westbound Ramps (#1)</u> - Widen intersection to provide an additional (4th) southbound thru lane, an additional (3rd) northbound thru lane, and an additional (3rd) eastbound left turn lane with corresponding receiving lane on the north leg. With these improvements, the intersection is projected to operate at LOS D. These improvements would require right-of-way acquisition. Additional mitigation was not found that would mitigate to LOS C without significant impact to adjacent private property. The City shall accept LOS D for operation of this intersection. Upon implementation, the project impact would be less than significant.</p> <p><u>Leisure Town Road and Orange Drive (#3)</u> - Widen Leisure Town Road to provide an additional (3rd) southbound thru lane and an additional (2nd) southbound left turn lane, and also provide an additional (3rd) northbound thru and a dedicated northbound right turn lane. With the improvements, the intersection is projected to operation at LOS D. These improvements would require right-of-way acquisition. Additional mitigation was not found that would mitigate to LOS C without significant impact to adjacent private property. The City shall accept LOS D for operation of this intersection. Upon implementation, the project impact</p>	<p>LTS</p>

Environmental Impact	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		<p>would be less than significant.</p> <p><u>Alamo Drive and Merchant Street (#14)</u> – Implement Mitigation Measure 4.10-8a by widening northbound approach to provide a 3rd left turn lane and provide a free right turn under signal control on Alamo Drive. With the improvement, the operation is projected to be LOS C in AM peak; while remaining at LOS F in the PM peak hour. To improve the operation to LOS C or better, allow the northbound right-turn movement to operate free from signal control.</p> <p>With this modification to the northbound right-turn control, the intersection is projected to operation at LOS C in the PM peak hour. These improvements would require right-of-way acquisition. Upon implementation, the project impact would be less than significant.</p> <p><u>Nut Tree Road and Ulatis Drive (#17)</u> – Implement Mitigation Measure 4.10-8a by widening the west side of Nut Tree Road to provide a third southbound thru lane and widening Ulatis Drive to provide a second eastbound thru lane and a dedicated right turn lane. With this improvement, the intersection is projected to operate at LOS D. To achieve LOS C, widen Nut Tree Road to provide two left turn lanes and two thru lanes on the northbound approach and modify signal phasing to remove north-south split phase. With these improvements, the intersection is projected to operate at LOS C in the PM peak hour. These improvements would require right-of-way acquisition. Upon implementation, the project impact would be less than significant.</p>	

SECTION 3.0

PROJECT DESCRIPTION

3.0 PROJECT DESCRIPTION

3.1 INTRODUCTION

The Vanden Meadows Specific Plan and Development Project (Proposed Project) consists of the annexation of approximately 265.6 acres into the City of Vacaville (City) and the approval and implementation of a specific plan for the property that would result in the development of 939 single-family clustered and multi-family units, a 28-acre school site, 7-acres of park, connecting pedestrian trails, and a bike station. The project location, objectives, and components are described in more detail below.

3.2 PROJECT LOCATION

The Proposed Project area consists of an approximately 265.6-acre site (project site), which encompasses a 28-acre site currently owned by the Travis Unified School District (TUSD), located within unincorporated Solano County (Solano) adjacent to the southern boundary of the City. The regional location of the project site is shown in **Figure 3-1** and **Figure 3-2**. The Proposed Project is located approximately 2.6 miles southeast of central Vacaville and halfway between San Francisco and Sacramento. Regional access to the project site is provided by I-80. Vehicular and pedestrian access points to the project site are provided via three major arterial streets: Nut Tree Road, which borders the western edge of the property, Vanden Road, which bisects the western and eastern portions of the property, and Leisure Town Road which runs within the project site along the eastern site boundary.

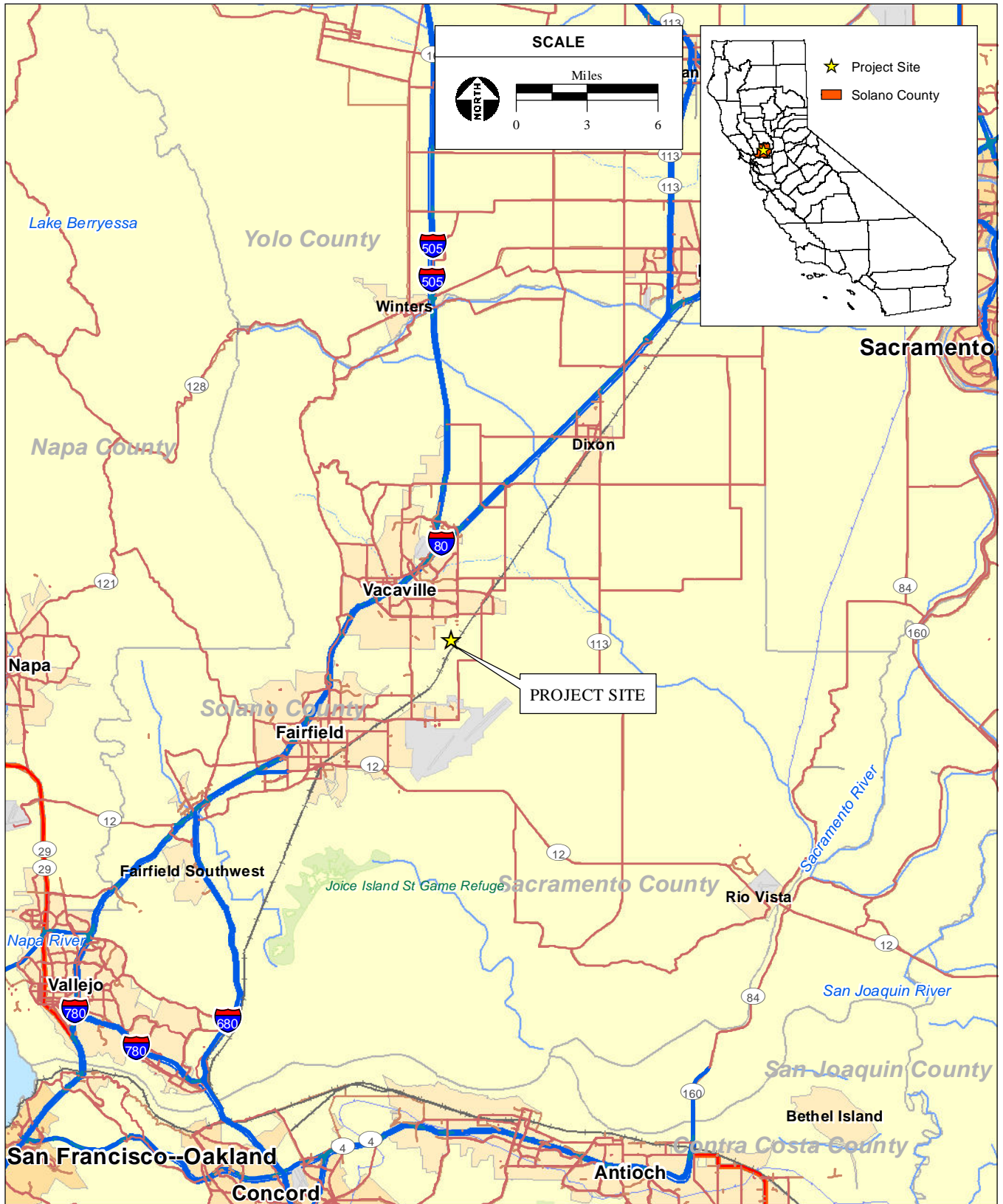
ADJACENT LAND USES

Land uses adjacent to the project site consist of residential housing to the northwest and west within the City limits, and farmland under active agricultural production or grazing to the south, east, and northeast. The Cambridge Elementary School is located approximately 0.6 miles north of the project site. Vaca Valley Hospital is located approximately two miles north of the site on Nut Tree Road. The Union Pacific Railroad (UPRR) runs along the eastern boundary of the project site parallel to Leisure Town Road. The Cypress Lakes Golf Course is located 500 feet directly northeast of the project site on the east side of Leisure Town Road and the railroad tracks.

ENVIRONMENTAL SETTING

The project site is located in northeastern Solano County, an area with flat topography, hot and dry summers, and mild and wet winters. The City is located at the southwestern end of the Sacramento Valley Air Basin, which is bounded by the Coast Range on the west and the Sierra Nevada Mountains on the east. Wind direction tends to be southerly as a result of marine breezes through the Carquinez Strait. Northerly winds occur more often in the winter.

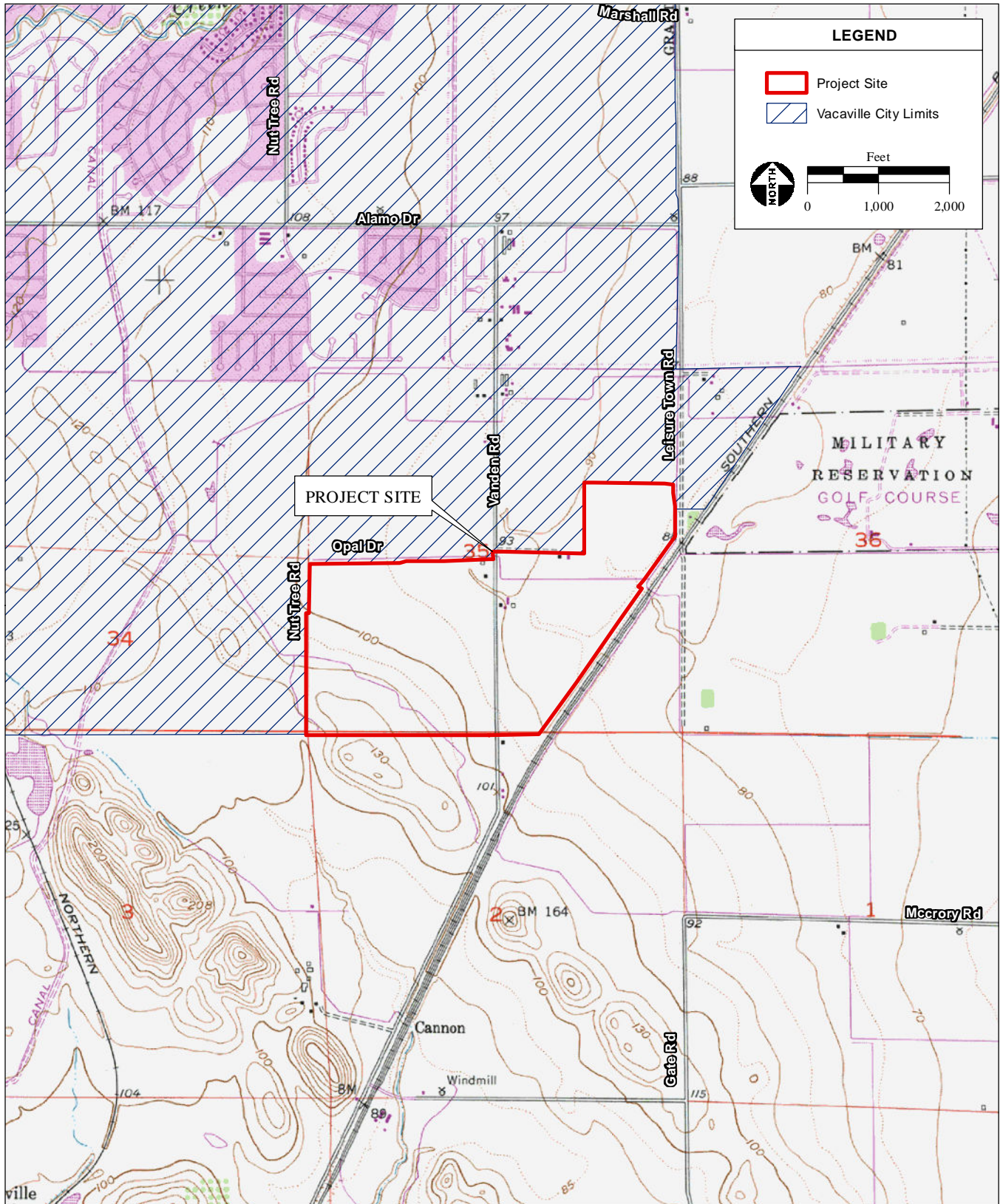
The project site is mostly undeveloped and dominated by non-native vegetation, generally agricultural crops, ruderal grasses, and other low-lying vegetation with the exception of two eucalyptus groves. Trees



SOURCE: StreetMap North America, 2009; AES 2011

Vanden Meadows Specific Plan and Development Project EIR / 210532 ■

Figure 3-1
Regional Location



SOURCE: "Elmira, CA" USGS 7.5 Minute Topographic Quadrangle, T R Section 35, Mt. Diablo Baseline & Meridian; StreetMap World, 2008; AES 2011

Vanden Meadows Specific Plan and Development Project EIR / 210532 ■

Figure 3-2
Site and Vicinity

on the project site are limited and generally found surrounding the three home sites. One home site, located on the west side of Vanden Road in the north central portion of the project site, is abandoned and contains several species of cultivated trees including walnut, eucalyptus, and cypress. The remaining two home sites are located on the east side of Vanden Road and contain dwelling units and accessory structures, with open views in all directions.

There are several canals within the project site. A remnant of the inactive Brazelton Drain runs across the northeastern boundary of the site, and two canals owned and operated by the Solano Irrigation District transect the southwest portion of the project site. An approximately 17-acre detention basin designed to provide stormwater storage for the project site and areas to the north within the City limits is located within the site boundaries between Leisure Town Road and the UPRR rail tracks. There is little variation in topography in the immediate vicinity and the site maintains lengthy views in all directions.

3.3 PROJECT BACKGROUND / PLANNING CONTEXT

The Vanden Meadows project site is located within the Urban Growth Boundary of the City and is identified within the City's Municipal Service Review and Comprehensive Annexation Plan (City of Vacaville, 2004b) as Site K – Vanden South, a designated near-term growth area of the City. This Environmental Impact Report (EIR) addresses the impacts of annexation of the project site into the City and implementation of the specific plan that would result in development of the project site. The following planning and previous environmental review documents provide a regional context and background information for the Proposed Project.

VACAVILLE GENERAL PLAN

The City's current General Plan (GP) was adopted in 1991 with a Technical Update in 1997. This State-mandated document contains nine elements including: Land Use, Transportation, Housing, Open Space, Safety, Conservation, Noise, Parks and Recreation, and Public Facilities, Institutions, and Utilities. Each element contains goals, policies, and programs designed to direct growth and provide guidance through the creation of a framework with which all development must be consistent. Policies in the GP are implemented through actions taken by the City's Planning Commission and City Council and other decision-making bodies. The GP requires that all development be consistent with its goals, policies, and programs as well as be subject to site development and design review. Consistency with the GP is considered where relevant in the various sections of this EIR. The project site is within the City's Sphere of Influence (SOI). The majority of the site is designated within the GP Land Use Map as Residential Low Density (3.1 to 5.0 units per acre), with a portion in the center of the site designated as Junior High School, and the area located east of Leisure Town Road designated as Agricultural Buffer (City of Vacaville, 2007a). Chapter 11 of the General Plan states that within the General Plan Designation of Residential Low Density, a zoning range of Residential Low Density (minimum 8,000 square foot lots) up to Residential High Density would be considered "consistent as part of Planned Development, or a Policy or Specific Plan, to achieve Housing Mix Goals" (City of Vacaville, 2007a). Therefore, proposed residential land uses within the project site would be consistent with the existing General Plan land use designation. While the Proposed Project includes a public school within the project site, the proposed location of the school is not within the area currently designated as Junior High School. If approved, implementation of

the Proposed Project would result in an amendment to the GP Land Use Map to be consistent with proposed educational land uses within the project site.

The City is currently in the process of updating the GP and anticipates adoption of the update will be ~~late 2012~~ in mid-2013. The Notice of Preparation for the programmatic Environmental Impact Report addressing the GP update was released in February of 2011. The City's GP Update will include revisions to the policies and land use map of the existing GP.

SOUTHTOWN PLANNED DEVELOPMENT AND EIR

The Southtown Planned Development area lies directly north of the project site. The Southtown Project is a mixed-use development master plan that includes residential development, neighborhood commercial development, parks and open spaces, a town center/community facility site, and a fire station. This project also required a GP Amendment, annexation into the City, and rezoning. The environmental review process has been completed, the area annexed into the City, and the first phase of construction is currently underway. The majority of the Southtown homes west of Vanden Road have been completed and are currently occupied. The development agreement for the Southtown Project requires that a connection from Nut Tree Road to Vanden Road, known as Foxboro Parkway, must be constructed by the developer during construction of the Southtown Neighborhood Park, which will require closures to Vanden Road. The proposed alignment of Foxboro Parkway would extend through the southeastern area of the Vanden Meadows project site.

Various public infrastructure improvements required under the Southtown Planned Development have been designed to accommodate anticipated growth within the project site (the project site was identified as the "Vanden South" area in the Southtown planning documents). These public infrastructure improvements include installation of adequately sized water and sewer mains to serve development within the Southtown and Vanden Meadows project sites, as well as development of a stormwater detention basin located within the southeast corner of the Vanden Meadows project site sized to accommodate runoff from both sites. Public infrastructure improvements that would serve the Proposed Project are discussed in more detail below, as well as within **Section 4.12 – Public Services, Utility, and Recreation**.

COMPREHENSIVE ANNEXATION PLAN

Pursuant to the Standards and Procedures adopted by the Solano County Local Agency Formation Commission (LAFCO), the City adopted a Comprehensive Annexation Plan (Annexation Plan) in September of 2004. The Annexation Plan is intended to consolidate and summarize development policies of the City and provide an overview of growth within Vacaville over a 10- to 15-year planning period. Required elements within an Annexation Plan include: an urban growth strategy, an infill strategy, and an agricultural preserve strategy. The most recently adopted Annexation Plan for the City covers the planning period between 2001 and 2015.

Pursuant to the requirements of the Solano County LAFCO, areas of proposed annexation must be located within the City's Sphere of Influence (SOI), designated for urban uses in the GP, and outside existing city limits. The project site is identified as Site K – Vanden-South, a Near-Term Annexation Area

in the Annexation Plan, and was anticipated to be annexed between 2004 and 2009. The site is considered a new residential growth area and is required to be developed through a specific plan (or planned development). The Southtown Project to the north, designated as Site J – Vanden-North in the Annexation Plan, was required to be annexed prior to Vanden-South to prevent the creation of an “unincorporated island” within city limits (City of Vacaville, 2004).

SOLANO COUNTY GENERAL PLAN

The Solano County General Plan was adopted by the County Board of Supervisors on August 5, 2008. Parcels included in the project site under Solano County’s jurisdiction are zoned A-40 (agricultural use, 40-acre parcels). Through the annexation process, the project site would have City land use and zoning designations. The Solano County General Plan and EIR were used in preparation of this EIR, providing useful background environmental setting and impact information, as well as land use information for areas adjacent to the project site.

SOLANO HABITAT CONSERVATION PLAN

The Draft Solano Habitat Conservation Plan (HCP) has been prepared to establish a framework for complying with state and federal endangered species regulations while accommodating future urban growth, development of infrastructure, and ongoing operations and maintenance activities associated with flood control, irrigation facilities, and other public infrastructure undertaken by or under the permitting authority/control of the Plan Participants within Solano County over the next 30 years. The Draft Solano HCP is currently an administrative draft, and until it is adopted, the recommendations and requirements are preliminary. The City is one of the six Plan Participants identified within the biological opinion issued in March 1999 for the Solano Project Water Service Contract Renewal between the Bureau of Reclamation and Solano County. The Bureau of Reclamation, Solano County Water Agency (SCWA), and other agencies have agreed to implement conservation measures to ensure the protection of threatened and endangered species and their habitat within the Solano Project contract service area. As such, the agencies have prepared the Draft Solano HCP. The Draft Solano HCP is intended to support the issuance of a Section 10(a)1(B) “incidental take permit” under the Endangered Species Act (ESA) for activities associated with future water use in the Solano Project contract service area.

3.4 DESCRIPTION OF PROPOSED PROJECT

3.4.1 PROJECT OBJECTIVES

The overarching goal of the Proposed Project is the orderly and systematic development of an integrated, community that is compatible with surrounding land uses and master planned communities. In support of this overarching goal, the Applicant has identified the following objectives for the Proposed Project:

- Develop a master planned community that ties into the theme and character of the Southtown Project;
- Establish an attractive community that provides a variety of residential and recreational opportunities;

- Provide for a diverse residential project with densities ranging from low density to high density with individual unique neighborhoods interconnected into a sustainable planned community;
- Provide unique opportunities for walking, running and biking; and
- Provide for a quality project by use of high standards for design of the homes, landscaping, streetscape, and public amenities.

The City identified the following objectives for the Proposed Project:

- Encourage development within the City of Vacaville Sphere of Influence of the 1990 General Plan by utilizing existing General Plan land use designations.
- Encourage development within the City of Vacaville's Urban Service Area as set by and in accordance with the May 1995 City of Vacaville / Solano Irrigation District Master Water Agreement.
- Utilize existing infrastructure; such as detention basins and the urban service area; to encourage economic vitality, accommodate new housing, increase City's revenue base, enhance mobility and economic opportunity, and correct deficiencies.
- Meet planned growth projections within the City's General Plan by providing smart growth through development of a mixture of single-family and multi-family dwellings in close proximity to public schools, public parks, and pedestrian trails;
- Encourage a range of housing types within the City with an emphasis on single family moderate density development while addressing the policies and goals in the City of Vacaville General Plan;
- Develop a comprehensive bikeway/ pedestrian system that connects the park, school(s), and Southtown development, and promote the use of alternative transportation within the City; and
- Incorporate planned public school development within a master planned community.

The alternatives analysis in **Section 4.0** of this EIR utilizes the Project Objectives as criteria for selecting potential alternatives – only alternative projects or alternative sites that fulfill the majority of the Project Objectives are analyzed for environmental impacts.

3.4.2 ANNEXATION AND GENERAL PLAN AMENDMENT

Implementation of the Proposed Project would result in annexation of the 265.6-acre project site into the City, an amendment to the City's General Plan, and pre-zoning the site for a variety of land uses, including residential housing, schools, public parks, and open spaces. The assessor parcel numbers (APNs) for the parcels within the project site are listed in **Table 3-1** and shown on **Figure 3-3**. The land use concept for the Proposed Project is a mix of residential uses complemented by proximity to school(s), parks, and trails. For planning purposes, the project site is divided into 15 subareas with differing land use designations. These sub-areas exclude Leisure Town Road and the unaltered portions of Vanden Road as these will not be developed as a result of the Proposed Project. Proposed General Plan Land Use and zoning designations for the project site are illustrated and defined in **Figure 3-4**. **Table 3-2** provides a breakdown of proposed land uses within the site and a brief description is included below.

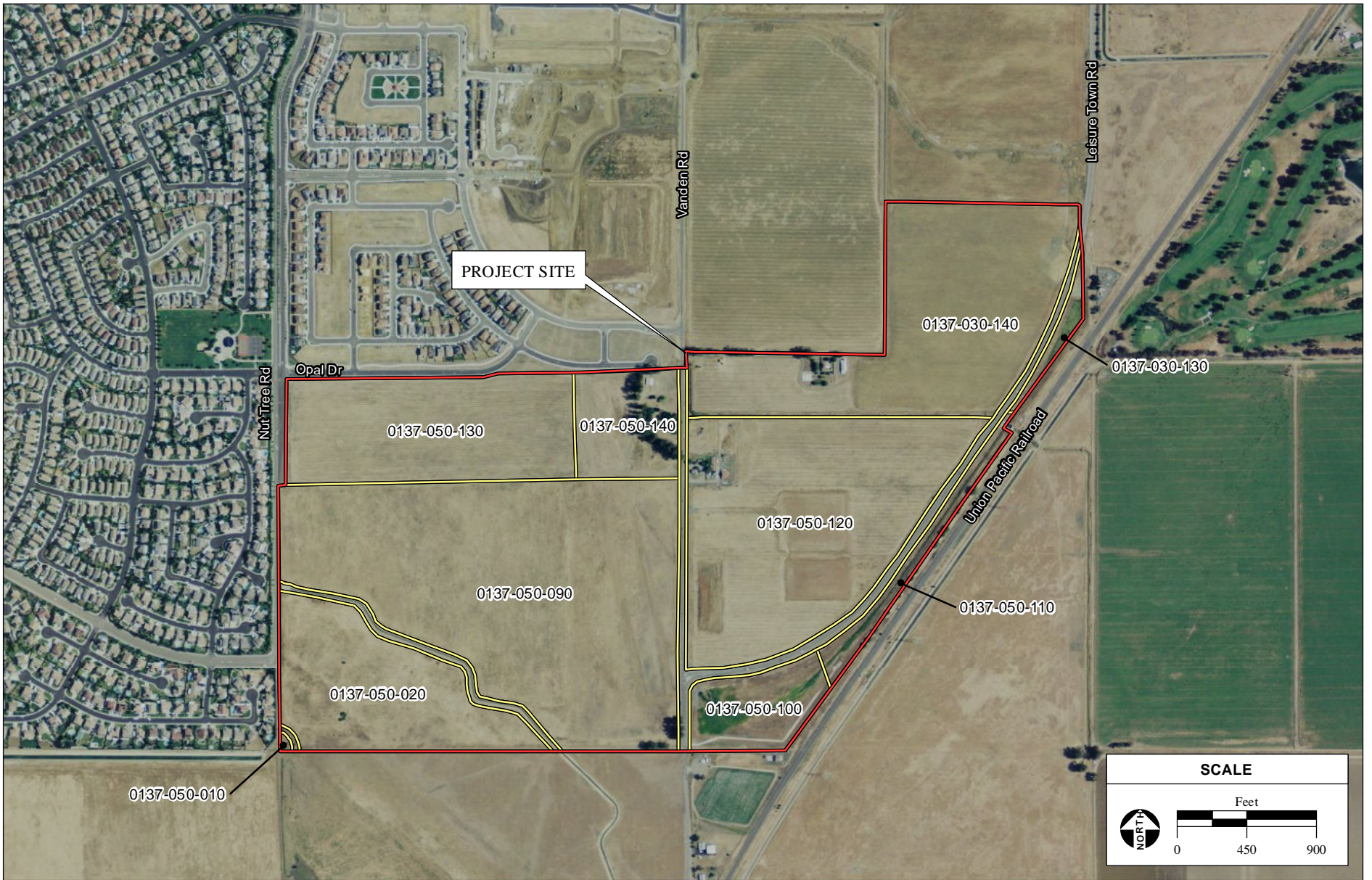


Figure 3-3
Aerial and Parcel Map

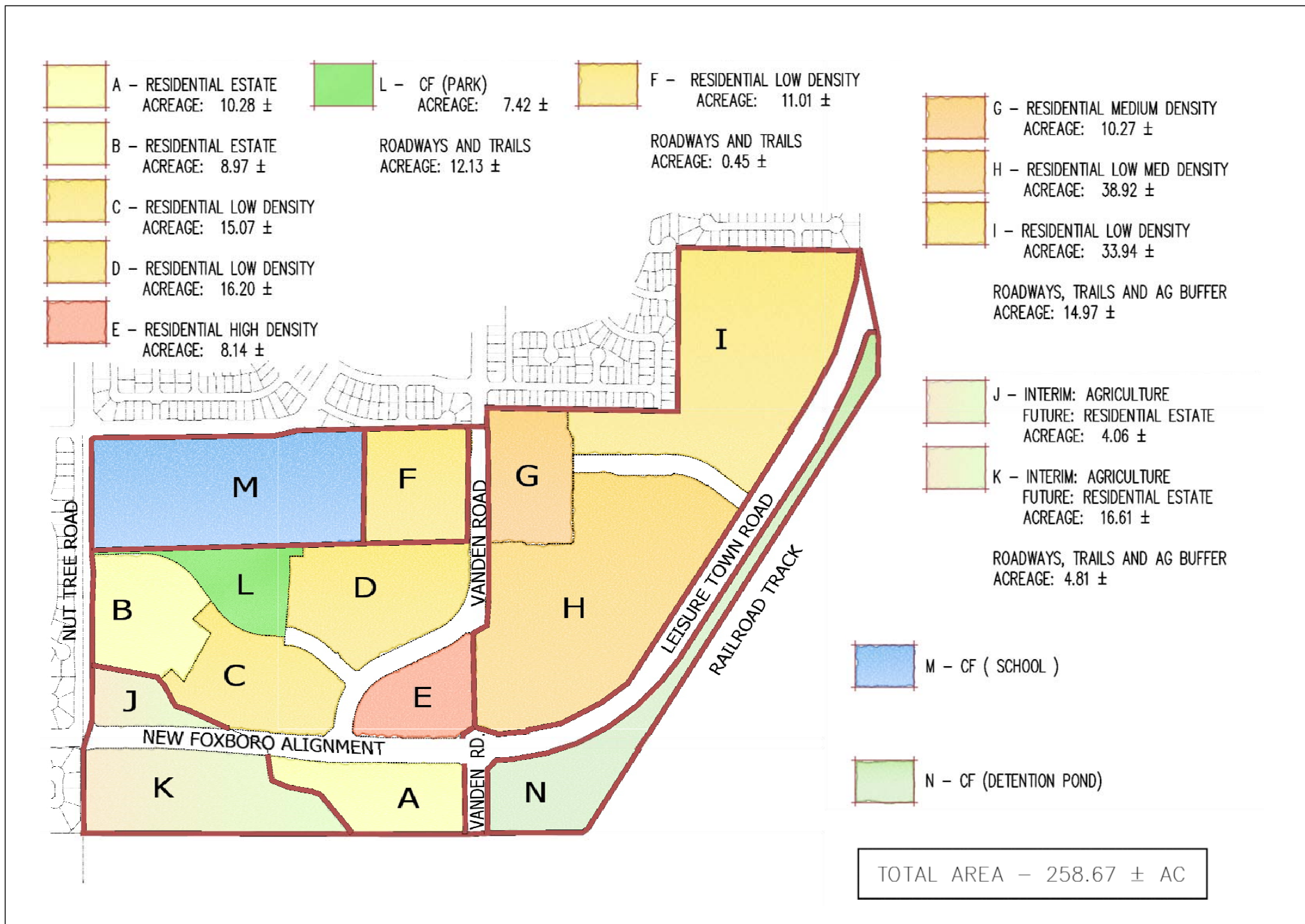


Figure 3-4
Proposed Land Use Designations

TABLE 3-1
PROPOSED PROJECT PARCELS

APN	Owner	Acres
0137-030-130	City of Vacaville (Detention Basin)	1.63
0137-030-140	Park Lane Apartments	44.40
0137-050-010	Solano Irrigation District (SID)	0.12
0137-050-020	Private	25.36
0137-050-090	Private	75.11
0137-050-100	City of Vacaville (Detention Basin)	9.73
0137-050-110	City of Vacaville (Detention Basin)	5.65
0137-050-120	Belmont Homes	53.46
0137-050-130	Travis Unified School District	28.02
0137-050-140	Private	11.46

Source: Philippi Engineering, Inc, 2011a; Solano County, 2011a.

TABLE 3-2
PROPOSED LAND USE PLAN

Sub Area	Proposed Land Use Designation	Proposed Zoning	Approximate Area of Proposed Development (Acres)	Residential Units	Density (Units/ Acre)	Non Residential Uses
A	Residential Estate	RE-10	10.28	26	2.53	n/a
B	Residential Estate	RE-10	8.97	25	2.56	n/a
C	Residential Low Density	RLD-6	15.07	52	3.59	n/a
D	Residential Low Density	RLD-5	16.20	74	4.57	n/a
E	Residential High Density	RH	8.14	192	23.50	n/a
F	Residential Low Density	RLD-6	11.01	50	4.54	n/a
G	Residential Medium Density	RMD	10.27	97	9.44	n/a
H	Residential Low Medium Density	RLMD-4.5	38.92	209	5.37	n/a
I	Residential Low Density	RLD-6	33.94	157	4.62	n/a
J	Residential Estate	RE-10	4.06	11	2.54	n/a
K	Residential Estate	RE-10	16.61	46	2.73	n/a
L	Public Park	CF	7.42	n/a	n/a	Park
M	School	CF	28.41	n/a	n/a	School
N	Public / Institutional	CF	17.01	n/a	n/a	Detention Basin
	Circulation and Public Open Space	CF	39.29	n/a	n/a	Roadways, Trails, & Landscaping ¹
Total			265.60	939	4.56²	

Notes:
1. Includes agricultural buffer (6.96 acres)
2. Total Land Use Density excludes Leisure Town Road , the unaltered portions of Vanden Road, the School Property (28.41 acres), the Detention Basin (17.01 acres), and the agricultural buffer (6.96 acres)
Source: Philippi Engineering, Inc, 2011a.

3.4.3 VANDEN MEADOWS SPECIFIC PLAN – PROPOSED LAND USES

The Vanden Meadows Specific Plan (Specific Plan; **Appendix C**) proposes the development of single-family clustered and multi-family units, a school site, seven acres of park, connecting pedestrian trails, and a bike station within the project site. The environmental analysis within **Section 4.0** of this EIR evaluates environmental impacts resulting from implementation of the Specific Plan such as site preparation, construction, and occupation of each proposed land use, as well as the construction and operation of all supporting infrastructure, utilities, and services. Components of the Specific Plan are summarized in **Table 3-3**, and shown graphically in **Figure 3-5**.

TABLE 3-3
PROPOSED PROJECT SUMMARY

Proposed Land Use	Number of Units/Area/Square Feet
Low Density Housing	441 units/ 116.14 acres
Moderate Density Housing	306 units/ 49.19 acres
High Density Housing	192 units/ 8.14 acres
Total Residential	939 units/ 173.47 acres
School(s)	28.41 acres
Park	7.42 acres
Roadways, Trails, and Landscaping	32.36 acres
Detention Basin (existing)	17.01 acres
Total Proposed Development	258.67 acres
Source: Philippi Engineering, Inc, 2011a; AES, 2011.	

The following provides a summary of the Specific Plan provisions for the development of the Vanden Meadows Project:

Residential Units

The Specific Plan proposes to develop 939 single-family, clustered, and multi-family units. The City's GP policies indicate that a minimum of 25 percent of development in outlying areas must consist of moderate density housing in order to increase the City's existing moderate density housing stock which is currently at approximately 20 percent. Approximately 33 percent (306 units) of the housing proposed within the Specific Plan consists of moderate density housing units, including a cluster/courtyard development and other small lot single family residential units. In addition, approximately 20 percent (192 units) of the housing proposed within the Specific Plan consists of an apartment site of high density housing units.

School Facilities

The TUSD has acquired a 28-acre site in the Vanden Meadows area and identified it as a future site of one or possibly two schools. The TUSD is currently conducting studies to determine if the site will be developed with a middle school and an elementary school, or one K-8 grade school. The TUSD's Master Plan calls for these facilities to be built in 3-5 years (approximately 2012-2014) depending on the rate of build-out of the Specific Plan and the Southtown Project directly to the north, enrollment statistics at the



LEGEND

- Project Site
- Circulation Option 1
- Circulation Option 2

SPECIFIC PLAN ZONING DESIGNATIONS

- CF - Community Facilities
- RE - Residential Estates
- RH - Residential High Density
- RLD - Residential Low Density
- RLMD - Residential Low-Medium Density
- RMD - Residential Medium Density

Feet

NORTH

0
200
400

time of build-out, and available state funding. Based on current conditions, development of the school at the 28-acre site within the Vanden Meadows area may occur later than 2014.

City Park

Development of the Specific Plan would result in the construction of a new 7.42-acre neighborhood park adjacent to the proposed school site. A joint use agreement between the TUSD and the City regarding this neighborhood park may be implemented to increase its usability and functionality. The function of a neighborhood park is primarily to serve the recreation needs of a small portion of the City. The proposed location serves the residential areas within one half-mile of the park. Park facilities are usually oriented towards the recreation needs of children and include multipurpose fields, playgrounds, recreation centers, and tot lots. Existing neighborhood park sites range in size from 2-10 acres. Proposed neighborhood parks are programmed within a 6-9 acre size range, depending upon the neighborhood park needs of the planning sector in which they are located.

Trail System

Approximately four miles of trails would be constructed throughout the project site to provide a pedestrian-friendly connection between the residential areas, park, school(s), and the Southtown Trail System to the north. These trails, along with the park and landscaping, comprise 30.38 acres of dedicated open space and recreational area.

Circulation

The Proposed Project would result in a number of improvements to transportation facilities to facilitate safe and efficient access to the project site in accordance with the City GP Transportation Element.

Foxboro Parkway Extension

Foxboro Parkway currently ends at Nut Tree Road at the western boundary of the project site. The City has recommended an extension of Foxboro Parkway from Nut Tree Road to Vanden Road South as a key four-lane arterial to connect traffic in the Foxboro residential development to the west to Vanden Road South and Leisure Town Road (City of Vacaville, 2007b). Two options for the extension of Foxboro parkway are analyzed within this EIR and are described in further detail below and in **Section 4.13 – Transportation and Circulation**.

Option 1

The proposed four-lane extension of Foxboro Parkway from Nut Tree Road to the existing intersection of Leisure Town Road and Vanden Road South would be developed to provide access to the project site. Construction of the middle two lanes of proposed four-lane Foxboro Parkway extension is the responsibility of the Southtown Project as indicated in the Specific Plan for the Southtown Project, and therefore will be funded by the Southtown developer even if Vanden Meadows is developed first. This alignment of Foxboro Parkway is identified in **Figure 3-4** and **Figure 3-5**.

Option 2

Based on environmental constraints identified during the scoping process of this EIR, an optional extension of Foxboro Parkway is being analyzed in this EIR. Under this Option, Foxboro Parkway would only be constructed to span from the intersection of Leisure Town Road and Vanden Road South to the realigned Vanden Road to the west. To continue west to Nut Tree Road, traffic would head north on the realigned Vanden Road and then west on "Street A". Under Option 2, the proposed segment of Foxboro Parkway between Nut Tree Road and realigned Vanden Road would not be constructed.

Vanden Road Realignment

The Proposed Project would result in the realignment of a portion of Vanden Road within the project site as shown in **Figure 3-4** and **Figure 3-5**. Vanden Road will be maintained open to traffic until the realignment is completed with development on Subareas A, B, C, and D within the project site. Frontage improvements for Vanden Road would be constructed when the adjacent property develops.

Other Roadways

All other internal circulation roads shown within the proposed site plan would be installed by the property owner as shown in **Figure 3-5**. Roadway frontage improvements for arterials within the project site, including Nut Tree Road, Leisure Town Road, and Vanden Road South, would be completed when the property abutting each roadway is developed.

Potable Water Supplies

Water demand generated by the Proposed Project would be approximately ~~624,390~~523,940 gallons per day (gpd) (**Appendix M**). Of this amount, approximately 481,390 gpd would be required to meet the potable water demands of the proposed residences and school(s), and the remaining 143,000 gpd would be required for irrigation of the park, school grounds, trails and landscaping, and the agricultural buffer. Potable water for the Proposed Project would be provided by the City's municipal water system, which is described in detail in **Section 4.12 – Public Services, Utilities, and Recreation**. ~~Only the school's irrigation demand (42,600 gpd) would be supplied by the City, a~~All other irrigation demand, including the school's irrigation demand (42,600 gpd), would be supplied by the Solano Irrigation District (SID). In accordance with City's ordinances, all landscaping would adhere to the requirements for water conservation including the use of drip irrigation where feasible and the planting of drought tolerant plants. The Proposed Project would be developed in accordance with Division 4.3- Water Efficiency and Conservation of the California Green Building Standards Code (2010), including Section 4.303.1 which requires the installation of plumbing fixtures and fittings that will reduce the overall use of potable water by at least 20 percent.

A detailed description and diagram of the on-site water supply utilities and connection to the City's water system is provided within the Technical Memorandum regarding the Vanden Meadows EIR Water Modeling Study (**Appendix M**). In order to meet the potable water and fire flow demands of the Proposed Project, connections to the following existing/future water mains is required: an 18-inch water ~~trunk line~~main in Leisure Town Road, a 12-inch water ~~trunk line~~main in Vanden Road, a 12-inch water ~~trunk line~~main at the intersection of Foxboro Parkway and Nut Tree Road, a 12-inch water ~~trunk line~~main in Nut Tree Road, and to two 8-inch water ~~trunk line~~mains located in Phase 1A and 3 of the Southtown Project,

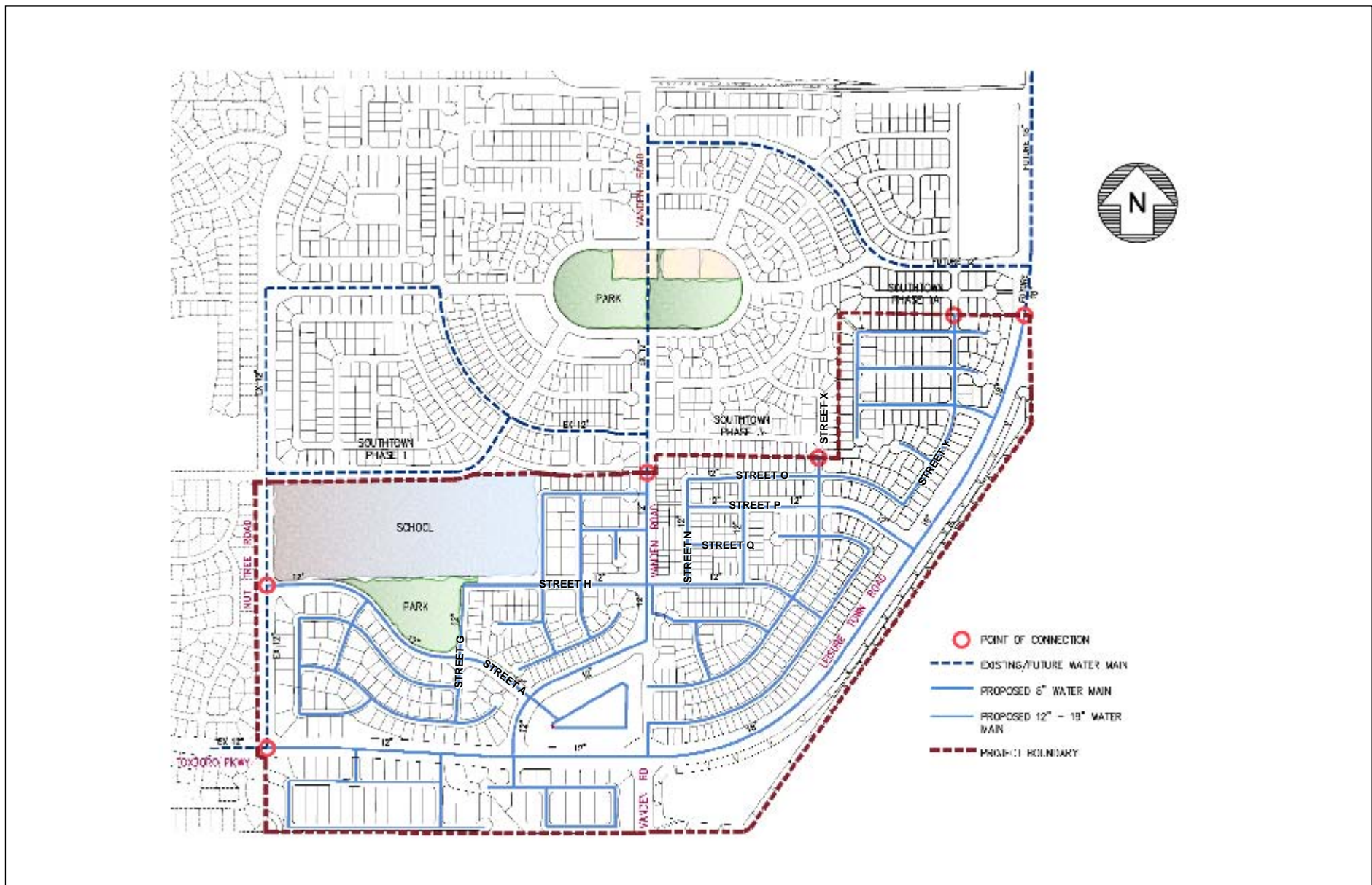


Figure 3-6
On-site Water Supply Utilities

respectively (refer to **Figure 3-6**). As each sub-area of the Proposed Project is developed, a water system analysis would be required to ensure adequate supply and water pressure. A description of various scenarios for potable water system infrastructure development to ensure adequate water pressure for the project site is provided in the Specific Plan (**Appendix C**). Off-site water supply ~~transmission~~ improvements associated with the Southtown development are assumed to be in place prior to the development of the Proposed Project. In the event that the necessary future Southtown water lines are not constructed prior to construction of the Proposed Project, the Vanden Meadows developer would be responsible for installation of the improvements. The cost will be shared by all developers within the Southtown and Vanden Meadows Specific Plan project areas.

Fire Flow Demand

The water supply infrastructure described in **Appendix M** was designed to provide Proposed Project with the fire flow rates required by the City. The required rates are listed in **Table 3-4**.

TABLE 3-4
Required Fire Flow Rates

Proposed Land Use Designation	Required Fire Flow (gallons per minute)
Residential Estate (RE)	1,500
Residential Low Density (RLD)	1,500
Residential Low Medium Density (RLMD)	1,500 ¹
Residential Medium Density	3,000
Residential High Density	4,500
School (CF)	3,000
Note: 1 – The fire flow requirement for RLMD is reduced from 3,000 gpm to 1,500 gpm because dwelling units will be constructed with a minimum eave to eave separation of 6 feet. Source: Nolte Associates Inc., 2011.	

Non-Potable Water

The Specific Plan proposes to use non-potable water and water conservation practices, to the extent reasonably foreseeable, to reduce the Proposed Project’s demand for potable water. In order to provide non-potable water to the Proposed Project, 8-inch water mains shall be located within all on-site arterials and within Vanden Road creating a non-potable looped system with the Southtown Project non-potable system. A detailed description and diagram of the on-site non-potable water supply infrastructure and connection existing non-potable water system is provided within the Specific Plan (**Appendix C**). As described therein, a permanent non-potable water pump station is necessary for the distribution of non-potable water to both the Southtown Project and the Proposed Project. If, at the initiation of the construction of the Proposed Project, the pump station is not constructed, it will be incorporated into the first phase of development. The cost of the non-potable pump station will be shared by all developers within the Southtown and Vanden Meadows Specific Plan project areas (Philippi Engineering, Inc, 2011a). In 2009, TUSD executed and recorded an easement agreement with the SID to place a pump station serving the Southtown and Vanden Meadows development areas on a portion of the District land.

Sewer System

Approximately 0.58-28 million gallons per day (MGD) of wastewater would be generated by the Proposed Project (**Appendix N**). Wastewater would be conveyed to the City's Easterly Wastewater Treatment Plant (EWWTP), located approximately 2.5 miles northeast of the project site, through the City's municipal wastewater collection system, which is described in detail in **Section 4.12 – Public Services, Utilities, and Recreation**. The Proposed Project's sanitary sewer collection system shall be consistent with the most current edition of the City's Sewer Master Plan, the Southtown Area Sewer Plan Evaluation, the CSP-S Trunk Sewer Service Area Master Plan, and the most current edition of the City's Standard Specifications and Drawings.

A detailed description and diagram of the on-site wastewater collection utilities and connection to the City's wastewater collection system is provided within the *City of Vacaville Vanden Meadows Project Sewer Modeling Study* (Phillippi Engineering Inc., 2011c [**Appendix N**]). As detailed therein, the on-site wastewater collection system would connect to the following sewer mains: an existing 24-21-inch sewer main in Vanden Road, an existing 21-inch sewer main at the intersection of Foxboro Parkway and Nut Tree Road, an existing 24-inch sewer main which runs between Nut Tree Road and Vanden Road along the southern border of the proposed school property, and a future trunk sewer line in Leisure Town Road proposed as part of the Southtown Project (refer to **Figure 3-7**). In the event that the future Southtown sewer lines are not constructed prior to construction of the Proposed Project, the Vanden Meadows developer would be responsible for installation of the improvements. The cost will be shared by all developers within the Southtown and Vanden Meadows Specific Plan project areas. A description of specific phasing strategies for the development of the on-site sewer system on each of the parcels is provided in the Specific Plan (**Appendix C**).

In addition to the on-site sewer improvements, three off-site sewer upgrades to the City's wastewater collection pipeline which runs from Leisure Town Road to the EWWTP are required in order to accommodate the increase in flows resulting from the Proposed Project in combination with the Southtown development. Impacts associated with off-site facilities are addressed within this EIR. Depending on the timing for the build out of Southtown and Vanden Meadows, these improvements may be triggered by Southtown before Vanden Meadows acquires any building permits. **Figure 3-8** shows the location of the off-site sewer upgrades and a description of each is provided below:

Upgrade 1

Triggered by issuance of the 770th building permit within the Southeast Vanden area (which includes both Southtown and Vanden Meadows), approximately 8,200 linear feet of existing 27" diameter sewer line that conveys wastewater to the EWWTP would be required to be replaced with 36" diameter sewer line. Depending on timing for build out of Southtown and Vanden Meadows, these improvements may be triggered by Southtown before Vanden Meadows acquires any building permits.

Upgrade 2

Triggered by issuance of the 1,700th-770 building permit within the Southeast Vanden area, approximately 1,800 lineal feet of existing 24" diameter sewer line that conveys wastewater to the EWWTP would be required to be replaced with 27" diameter sewer line.

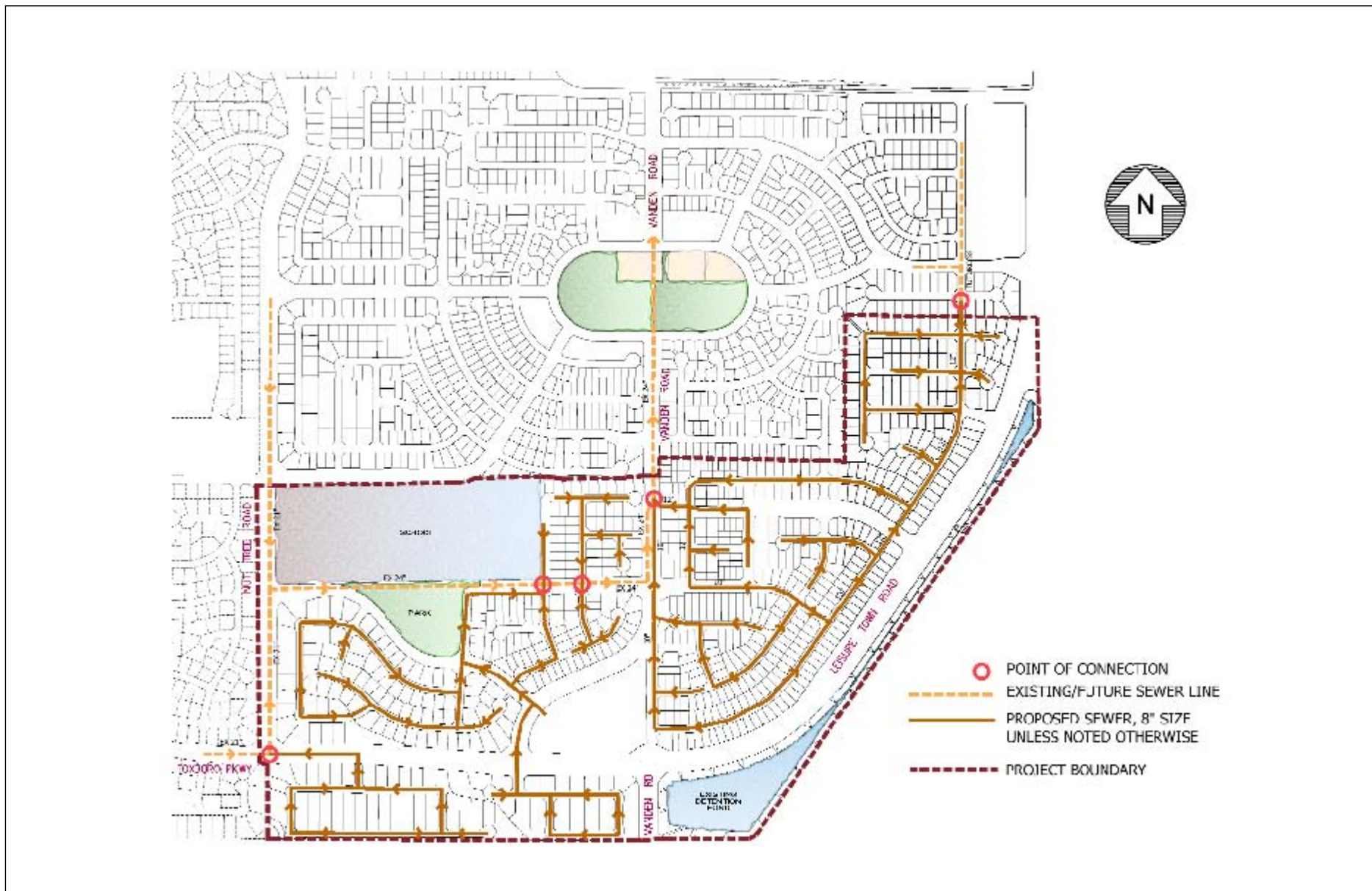
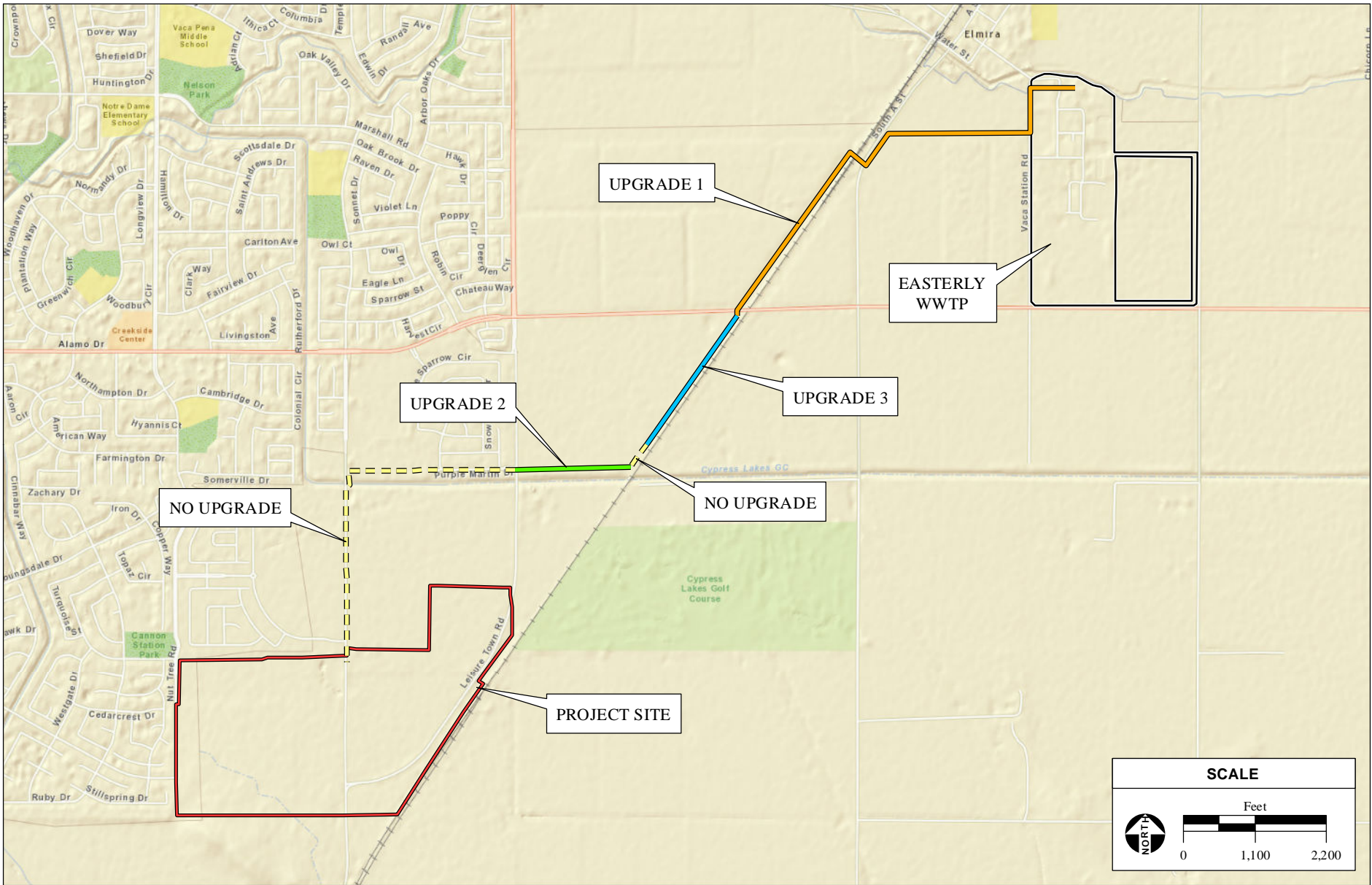


Figure 3-7
On-site Wastewater Collection Utilities



SOURCE: ESRI Server Data, 2011; AES 2011

Vanden Meadows Specific Plan and Development Project EIR / 210532 ■

Figure 3-8
Off-site Sewer Improvement

Upgrade 3

Triggered by issuance of the 2,350th building permit in the Southeast Vanden area, approximately 1,200 900 lineal feet of existing 2724" diameter sewer line would be required to be replaced with 3027" diameter sewer line.

Storm Drain Facilities

Development of impervious surfaces on existing agricultural land would increase stormwater runoff. Stormwater collection and storage facilities for the project site have already been constructed as a component of the Southtown Project. The stormwater facilities currently in place include twin 72" diameter conveyance lines in Vanden Road and a detention basin located within the project site boundaries on the east side of Leisure Town Road.

A detailed description and diagram of the on-site stormwater conveyance lines and connection to the existing stormwater conveyance lines is provided within the Specific Plan (**Appendix C**). As described therein, the eastern half of the property would drain directly into the detention basin on the east side of Leisure Town Road (Sub-area N) and the remaining areas within the project site would drain into the stormwater conveyance facilities adjacent to Vanden Road that would drain to the detention basin.

3.4.4 CONSTRUCTION**Construction Schedule**

It is anticipated that construction would begin in early 2013. Buildout of the facilities is expected to occur over a six year period with an anticipated completion date of 2019. For the purposes of the environmental analysis, it is anticipated that construction would occur continuously over the six year period.

Construction Activities and Equipment

Construction activities would be limited to daytime hours between 7:00 a.m. and 7:00 p.m. The following types of construction activities would occur at different intervals throughout construction:

- Structure Demolition;
- Earthwork – grading, excavation, backfill;
- Concrete – forming, rebar placement, concrete delivery and placement;
- Structural steel work – assembly, welding;
- Masonry construction;
- Electrical/instrumentation work; and
- Installation of mechanical equipment and piping.

Equipment used during construction may include, but is not limited to, the following:

- | | |
|----------------------------|------------------------------|
| ▪ Track mounted excavators | ▪ Flat-bed delivery trucks |
| ▪ Backhoes | ▪ Scrapers |
| ▪ Cranes | ▪ Graders |
| ▪ Compactors | ▪ End and bottom dump trucks |
| ▪ Paving equipment | ▪ Front-end loaders |

- Ten-wheel dump trucks
- Water trucks
- Forklifts
- Concrete trucks
- Compressors/jack hammers
- Dozers

Construction of the Proposed Project would require an average of 20 workers per day; however, this number would vary depending on time of year and construction phase. The site would be balanced such there would be no import or export of earthen materials. Staging areas for the proposed development would be located within the project site. Construction traffic would access the project site by Leisure Town Road, Nut Tree Road, and Vanden Road.

3.5 REGULATORY REQUIREMENTS

Permits and approvals that may be necessary for implementation of the Proposed Project are identified below. This Draft EIR may be used for evaluation of each action described below.

CITY OF VACAVILLE

The City will certify this EIR and adopt the Mitigation Monitoring Plan for the Proposed Project that incorporates the mitigation measures identified in the EIR prior to taking action on the project. Additional actions that must be completed by the City prior to implementation of the Proposed Project include approval of proposed General Plan Amendments and rezoning of the project site, amendments to the Comprehensive Annexation Plan, annexation of the project site, approval of development agreements, approval of tentative and final maps, design review, approval of a reduction to the minimum separation per Implementation Policy 2.5-1 8, and issuance of grading and building permits.

SOLANO LOCAL AGENCY FORMATION COMMISSION (SLAFCO)

Annexation of the project site into the City limits will require approval from the Solano Local Agency Formation Commission (SLAFCO). Annexation approval will be subject to LAFCO's review of the proposed boundary change in light of Solano LAFCO's adopted Standards and Procedures. The annexation must be demonstrated to fully comply with six mandatory standards which relate to general plan consistency, environmental impacts, and sphere of influence issues. The sphere of influence issues include the need to annex the Vanden Meadows site into the Vacaville Elmira Cemetery District and detach the site from the influence of the Vacaville Fire Protection District. The project will also be reviewed in light of several discretionary standards that address issues related to the establishment of logical boundaries, growth inducement, prime agricultural farmland, as well as social and economic impacts. In addition, Solano County would have to approve the immediate termination of the Williamson Act Contract on APN 137-050-020.

OTHER FEDERAL, STATE, AND LOCAL AGENCIES

Additional federal, state, and local agency actions that may be required for implementation of the Proposed Project are listed below:

Solano County Airport Land Use Commission (SCALUC)

- Review of the Proposed Project for consistency with the Travis Airport Land Use Compatibility Plan.

Travis Unified School District (TUSD)

- Development and approval of plans for TUSD facilities to be located within the project site on TUSD owned property.

Solano Irrigation District (SID)

- Approval of amendment to SID boundaries to exclude project site from SID jurisdiction.
- Approval of the abandonment of the two SID easements located on the project site.

California State Department of Fish and Game (DFG)

- Consultation regarding potential impacts to state listed special status species, including Swainson's Hawk and burrowing owl. An incidental take permit must be obtained from the DFG should significant impacts be identified.

U.S. Army Corps of Engineers (Corps)

- Issuance of a Clean Water Act (CWA) Section 404 Permit for filling of wetlands and other waters of the U.S. under the jurisdiction of the Corps.

Central Valley Regional Water Quality Control Board (RWQCB)

- Issuance of CWA Section 401 Water Quality Certification for Section 404 permits from the Corps.
- Approval of the project's coverage under the General Construction Storm Water NPDES Permit for Discharges of Storm Water Runoff Associated with Construction Activity because project construction results in one (1) acre or more of ground disturbance.
- Approval of a Stormwater Pollution Prevention Plan (SWPPP) for construction activities.

State Historic Preservation Officer

- Prior to approval of Section 404 permits, the Corps must consult with the SHPO regarding potential effects to cultural resources in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA).

U.S. Fish and Wildlife Service

- Prior to approval of Section 404 permits, the Corps must consult with the U.S. Fish and Wildlife Service (USFWS) regarding impacts to federally listed special status species and

designated critical habitat in accordance with Section 7 of the federal Endangered Species Act (ESA).

Yolo Solano Air Quality Management District (YSAPCD)

- The applicant shall obtain a permit from the YSAQMD prior to operation of any portable diesel fueled equipment greater than 50 horsepower.
- All stationary equipment, other than internal combustion engines less than 50 horsepower, emitting air pollutants requires an Authority to Construct (ATC) and Permit to Operate (PTO) from the YSAQMD.

SECTION 4.0

ENVIRONMENTAL ANALYSIS

4.0 ENVIRONMENTAL ANALYSIS

ENVIRONMENTAL ANALYSIS

Chapter 4.0 of this Draft EIR contains individual sections that describe the potential environmental impacts of the Proposed Project described in **Chapter 3.0**. Each topical section describes the existing setting and background information necessary to help the reader understand the conditions that would cause an impact to occur. In addition, each section includes a description of how an impact is determined to be significant or not significant. Finally, the individual sections recommend mitigation measures to reduce significant impacts. The following issue area sections are addressed in **Chapter 4.0**:

- Section 4.1 – Aesthetics
- Section 4.2 – Air Quality and Greenhouse Gas Emissions
- Section 4.3 – Agriculture and Forestry Resources
- Section 4.4 – Biological Resources
- Section 4.5 – Cultural Resources
- Section 4.6 – Geology and Soils
- Section 4.7 – Hazards and Hazardous Materials
- Section 4.8 – Hydrology and Water Quality
- Section 4.9 – Land Use
- Section 4.10 – Noise and Vibration
- Section 4.11 – Population and Housing
- Section 4.12 – Public Services, Utilities, and Recreation
- Section 4.13 – Transportation and Circulation

CUMULATIVE IMPACTS

According to the California Environmental Quality Act (CEQA) *Guidelines* Section 15355, “cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” CEQA requires that cumulative impacts be discussed when the project’s incremental effect is cumulatively considerable (*Guidelines* Section 15130(a)). These impacts are discussed when appropriate in the relevant issue area sub-section within **Chapter 4.0** and summarized in **Section 5.2**.

The context for the cumulative impact analysis within this EIR is based on the long term development levels projected in the City General Plan and County General Plan, as well as reasonably foreseeable potential development projects in the vicinity of the Proposed Project. Reasonably foreseeable development projects considered within this Draft EIR consist of the continued implementation of the Southtown Planned Development and the implementation of the proposed Fairfield Train Station Specific Plan (located approximately 1.5 miles south of the project site between Old Canon Road, Vanden Road,

and Peabody Road within the jurisdiction of the City of Fairfield). Refer to **Section 5.2.1** for further discussion of the cumulative context.

4.1 AESTHETICS

4.1.1 INTRODUCTION

This section addresses the potential for the Proposed Project to result in impacts associated with aesthetics and visual resources. Following an overview of the visual resource setting in **Subsection 4.1.2** and the relevant regulatory setting in **Subsection 4.1.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.1.4**.

4.1.2 ENVIRONMENTAL SETTING

Regional Setting

As described in **Section 3.0**, the project area is located within the boundaries of a 265.6-acre site that is currently adjacent to the City of Vacaville city limits and within the jurisdiction of Solano County (County). Approximately 675.4 square miles of the County consists of agricultural/rural land area while the remaining 234 square miles consists of several towns and cities, including the City of Vacaville (City) (Solano County, 2009). The strongest visual features of the City are the Vaca Mountains, Alamo Creek Ridge, and the English Hills along the western borders of the City (City of Vacaville, 2007a). These natural hillsides and ridgelines can be seen from most areas of the City. The project site and vicinity are generally characterized by the flat terrain of the Central Valley and the backdrop of the Vaca Mountains. Non-native vegetation, generally agricultural crops, grasses, and other low-lying plants, are the dominant visual characteristics of the area. As shown in **Figure 4.4-1**, the area surrounding the project site consists of agricultural lands and rural residences associated with farms to the east; agricultural land that is designated as the Vacaville Fairfield-Solano Greenbelt to the south; recreational lands to the northeast; and urban development associated with the City to the north and west. The Southtown Planned Development area is located directly north of the project site and the first phase of construction is currently underway.

Project Site Setting

The visual characteristics of the site are dominated by non-native vegetation, generally agricultural crops, ruderal grasses, and other low-lying vegetation with the exception of two eucalyptus groves (see **Section 4.4**). Three home sites are located on the project site. One home site, located on the west side of Leisure Town Road in the north central portion of the project site, is abandoned while the remaining two home sites are located on the east side of Vanden Road and contain dwelling units and accessory structures. The non-native grassland fields are mowed and disked for fire hazard reduction. Few trees exist on the project site and are generally located near the existing residences. Vanden Road runs through the middle of the site, going north to south, while Leisure Town Road runs along the eastern edge of the site parallel to the train tracks. With little topographical variation, the site maintains lengthy views in all directions. Three viewing corridors have been selected from the viewshed surrounding the project site (**Figure 4.1-1**). These viewpoints were selected based on adjacent sensitive receptors or identified as local areas of high population.

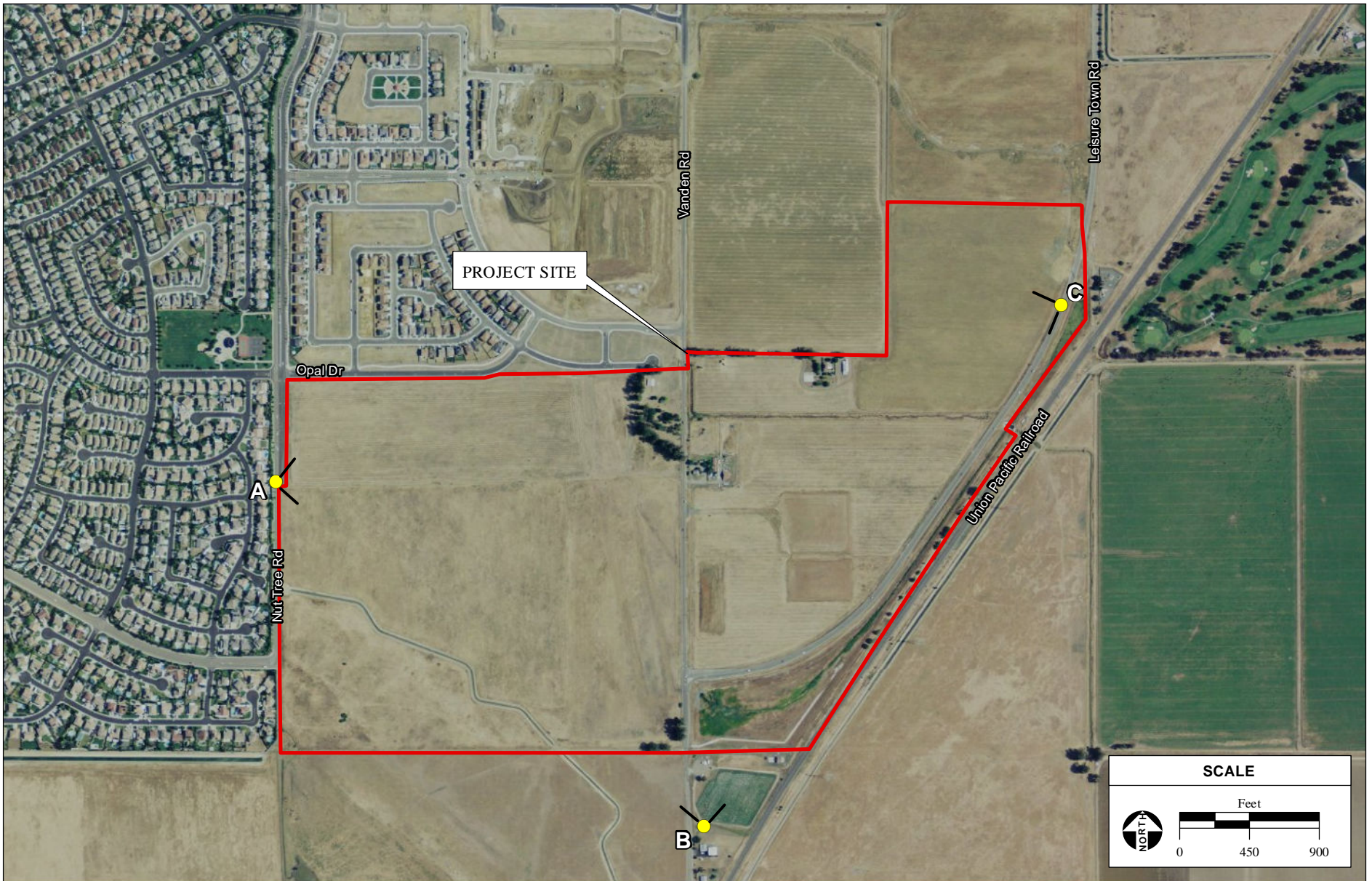


Figure 4.1-1
Viewpoint Locations

Viewshed A – Nut Tree Road

Viewshed A is located within the Foxboro Development along Nut Tree Road, north of the Foxboro Parkway and Nut Tree Road intersection, adjacent to the western boundary of the proposed site (**Figure 4.1-2, Photo A**). This viewpoint is characterized by travelers on Nut Tree Road and the residents of the Foxboro Development. Approximately thirty houses of the Foxboro Development border the site, which have unobstructed views of the proposed site when looking east. Views of the proposed site are dominated by agricultural lands.

Viewshed B – Vanden Road

Viewshed B is located to the south of the project site along Vanden Road (**Figure 4.1-2, Photo B**). This viewshed is characterized by a parcel of land consisting of a crop field and rural residence. The residence does not face the project site, however most of the property and crop field have unobstructed views of the site. Vehicles traveling northbound along Vanden Road also have forward line of sight views of the site, until they reach the Vanden Road/ Opal Way Intersection. Views of the project site consist of a detention pond and open agricultural lands in the foreground and urban development in the background.

Viewshed C – Cypress Lakes Golf Course

Viewshed C is located in the northeastern corner of the project site, near the Cypress Lakes Golf Course (**Figure 4.1-2, Photo C**). Trees line the border of the golf course (out of view of **Photo C** in **Figure 4.1-2**), providing partial screening of the proposed site; however, the project site is visible through the trees. Views of the project site consist of open agricultural lands in the foreground and urban development in the background.

Sensitive Receptors

A sensitive receptor is defined as an individual that is especially sensitive to changes in aesthetic qualities, which could include for example, changes in lighting, shadows, or surrounding visual character. Land uses that serve as sensitive receptors, i.e., residential uses and education centers, are located along the western boundary of the project site, on Nut Tree Road. The residences and school along Nut Tree Road have largely unobstructed views of the project site. The northern boundary of the site consists of a housing development that is currently under construction. Although this development has not been completed, residents that will occupy this area in the future will have unobstructed views of the project site.

Scenic Resources

There is no comprehensive list of specific features that automatically qualify as scenic resources; however, certain characteristics can be identified which contribute to the determination of a scenic resource. The following is a partial list of visual qualities and conditions that if present, may indicate the presence of a scenic resource:

- A tree that displays outstanding features of form or age.



VIEWSHED A



VIEWSHED B



VIEWSHED C

- A landmark tree or a group of distinctive trees accented in a setting as a focus of attention.
- An unusual planting that has historical value.
- A unique, massive rock formation.
- A historic building that is a rare example of its period, style, or design, or which has special architectural features and details of importance.
- A feature specifically identified in applicable planning documents as having a special scenic value.
- A unique focus or a feature integrated with its surroundings or overlapping other scenic elements to form a panorama.
- A vegetative or structural feature that has local, regional, or statewide importance.

The eucalyptus grove in the northern portion of the site is a focus of attention on the project site and, therefore, is considered a scenic resource for the purposes of this analysis (see **Figure 4.1-2, Photos A and C**). The project site is not located within a scenic vista or designated state scenic highway, and no designated scenic resources are located near the project site. The visual characteristics of the project site and vicinity are limited to existing urban development, agricultural fields, rural residences and a eucalyptus grove.

The scenic context for the project area would be described as agricultural /rural. Although not specifically identified by the City or County General Plans as a scenic resource, the agricultural context provides rural character appreciated by locals and travelers passing by.

Light and Glare

The project site currently has no sources of light or glare on the property, with the exception of a few residences. The most notable lighting in the vicinity of the project site is the urban development of the City in the north and west. Nearby urban residences, street lights, cars, and other urban features generate artificial lighting throughout the day, but mainly during evening hours and the night time.

4.1.3 REGULATORY CONTEXT

City of Vacaville General Plan

The following goals and standards are established for visual quality by the City of Vacaville General Plan (2007) (City of Vacaville, 2007a).

Guiding Policies

2.1-G5: Design aesthetically pleasing roadways, including a loop system lined with trees or other appropriate landscaping, that connect the City neighborhoods and serve planned development. Streets alone should not be used to set the outer limits of urbanization.

- 2.1-G9: Preserve scenic features and the feel of a city surrounded by open space, and preserve view corridors to the hills, and other significant natural areas.
- 2.1-G10: Protect the natural environment that the City enjoys and use creeks, hills, utility corridors, viable agricultural lands or other significant natural features wherever appropriate to establish ultimate city boundaries.
- 2.5-G5 Encourage creative site design and architectural quality and variety by a design approval process that provides for a variety of single-family houses and designs and/or multi-family designs.
- 2.6-G7: Ensure that new development is compatible with the character and scale of existing and planned adjoining land uses.
- 5.1-G3: Require buffer landscaping and multiple use, where feasible, of utility sites and rights-of-ways to harmonize with adjoining areas.
- 5.2-G5: Design public buildings to fit into and complement their ultimate surroundings; buffer public buildings from their surroundings so as to shield unsightly areas from public view.
- 5.2-G6: Provide adequate landscaping for all public buildings and installations.

Implementing Policies

- 2.1-11: Continue to implement design guidelines for all development, including residential, commercial, and industrial projects and public facilities
- 2.1-13: Adopt and implement a plan to establish standards and design guidelines for the city's streets, entry ways, and open spaces. Making streets identifiable by their design, marking entrances to the City, finding alternatives to sound walls, and getting the strongest visual lift from existing open spaces are important ingredients of image.

City of Vacaville Municipal Code

The following standards for lighting are established within Chapter 14.09.127.110, Lighting and Glare, of the City of Vacaville Municipal Code (City of Vacaville, 2010a).

- Lighting shall be shielded and directed so as not to create a hazard or nuisance to other properties or impact traffic on adjacent streets.
- Exterior lighting should be installed to identify building entrances and to promote on-site safety or security.
- Parking lot lighting shall comply with the standards of the Off-Street Parking and Loading Design Guidelines, including, but not limited to the following:
 - Exterior lighting shall be a minimum of one foot candle and a maximum of six foot candles;

- A photometric plan demonstrating compliance with these lighting standards and a site plan showing the location and design of exterior lighting shall be required as a condition of project approval;
- Flickering or flashing lights shall not be permitted;
- A reduction in the minimum lighting or an exception to the maximum lighting standard requirement may be granted by the Director if the applicant or developer can demonstrate to the satisfaction of the Director that the minimum lighting is unnecessary or that additional lighting is needed.

Travis Air Force Base Land Use Compatibility Plan

The project site is located within the jurisdiction of the Travis Air Force Base (AFB) Land Use Compatibility Plan (LUCP). As described in more detail in **Section 4.9.3**, the project site is located within Zone D. The LUCP has prohibited land uses within this Zone that are “hazards to flight”, which include physical, visual, and electronic forms of interference with the safety of aircraft operations. Specifically, the LUCP states that “glare or distracting lights that could be mistaken for airport lights” should be avoided. As discussed in **Section 4.1.4** below, lighting from the Proposed Project would be downcast, and thus would not interfere with the safety of aircraft operations (Travis AFB, 2002).

Vacaville-Fairfield-Solano Greenbelt Authority

On September 13, 1994, the City of Vacaville, City of Fairfield and Solano County entered into a joint agreement for the formation of the Vacaville-Fairfield-Solano Greenbelt Authority (VFSGA) and creation of the Vacaville-Fairfield Greenbelt. The goals of the VFSGA are to provide for the preservation and conservation of viable agricultural and open space land, and to provide a permanent separation between the urban areas of Fairfield and Vacaville.

4.1.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

Views within the viewshed are described by expressing the strength of the viewing experience, framed within the analytical criteria listed below. While the viewing experience is personal and subjective in nature, the application of these criteria allows for an objective baseline assessment of the visual environment and subsequent visual impacts of the Proposed Project. The visual experience within each view is comprised of the following constituent elements

1. Clarity in Line of Sight—the overall visibility of the object within the viewshed, influenced by such factors as trees, buildings, topography or any other potential visual obstruction.
2. Duration of Visibility—the amount of time the object is exposed to viewers within the viewshed. For example, a passing commuter will experience a shorter period of viewing time than a resident within the viewshed.
3. Proximity of the Viewer—the effects of foreshortening due to the distance of the viewer from the object will influence the dominance of the object in the perspective of the viewer.
4. Number of Viewers—the number of viewers anticipated to experience the visual character of the object.

The primary views of the project site are experienced by residents along Nut Tree Road, Opal Way, and Vanden Road and viewers traveling along Nut Tree Road, Opal Way, Foxboro Parkway, Vanden Road, and Leisure Town Road. With little topographical variation and minimal obstructing vegetation or structures, all of these viewers have an open view of the site. Views of the project site from the Cypress Lakes Golf Course are partially shielded by an existing landscape buffer.

Significance Criteria

Criteria for determining the significance of impacts to visual resources have been developed based on Appendix G of the California Environmental Quality Act's (CEQA) *Guidelines* and relevant agency thresholds. Impacts associated with aesthetics would be considered significant if the Proposed Project would:

- Result in the substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views.

Effects Found Not to be Significant

As discussed within the Initial Study for the Proposed Project included within **Appendix B**, the Proposed Project would not impact designated scenic vistas or state scenic highways. Therefore, further discussion of these issue areas is not included within this EIR.

Project Specific Impacts

Impact

4.1-1 The Proposed Project could substantially degrade the existing visual character or quality of the site and its surroundings.

The perception of a visual impact is subjective, and what one person may perceive as a negative impact another may not find intrusive. The design of the Proposed Project would be subject to local planning policies and regulations. These policies and regulations are intended to ensure aesthetic compatibility of the project with its surroundings. The Proposed Project is subject to approval by the Planning Commission and each project design phase is subject to Design Review approval to evaluate aesthetic details and impose requirements, including design measures to limit adverse aesthetic impacts.

As discussed in **Section 4.1.2**, the area surrounding the project site can be generally

characterized as primarily agricultural to the east and south and urban residential to the north and west. Although not specifically designated as a scenic resource in the City or County general plans, the rural setting on and surrounding the project site is considered visually appealing by local residents and travelers along local roadways that may be subject to impact by construction of an urban housing development. The Proposed Project would result in a substantial visual change to the project site by converting a 260 acre agricultural lot to an urban housing development. This includes low, medium, and high density residential areas; community facilities; roads; parks and trails; and an agricultural buffer. The structures associated with the Proposed Project will match the existing design theme and character of the surrounding urban uses and will be visually cohesive with agricultural lands to the east and south through designation of agricultural buffers and the location of low density estate housing adjacent to the project boundaries.

A brief discussion of the anticipated changes to each of the viewsheds described in **Section 4.1.2** is provided below:

Viewshed A: The residents along Nut Tree Road are located where the City limit line meets County agricultural land. As shown in **Figure 4.1-2, Photo A**, views of the project site from Viewshed A consist of the open agricultural and grazing fields of Solano County. This viewshed would have a substantial visual change from open rural lands to urban development. The houses located along this portion of Nut Tree Road are not situated facing the project site and most have a fence and trees in the backyard, providing partial screening of the project site. Additionally, the visual appearance of the project site would be consistent with that of the Foxboro development, providing views that are similar to surrounding land uses.

Viewshed B: As shown in **Figure 4.1-2, Photo B**, the project site from Viewshed B consists of existing open fields and agricultural areas in the foreground and residential development in the distance. The Proposed Project would bring residential development closer to Viewpoint B; however, the detention pond and proposed agricultural buffer would continue the open field views in the immediate foreground, as well as partially screen the development in the distance.

Viewshed C: As shown in **Figure 4.1-2, Photo C**, the project site from Viewshed C consists of existing open fields and agricultural lands in the foreground and residential development in the distance. The Proposed Project would bring views of residential development closer to the viewpoint.

The visual change induced by the Proposed Project would not substantially degrade the visual character or visual quality of the project site and its surroundings as the Proposed Project will be consistent with the design of the surrounding urban land. The proposed development would create a significant increase in structures on the project site and would obstruct views of open fields, agricultural lands, and the eucalyptus grove. However, the design plan for the Proposed Project would conform to the existing surrounding housing developments. While the Proposed

Project will result in a significant *change* to the visual character of the site, the General Plan and other regulatory documents have not identified the existing landscape type as a scenic or visual resource to be protected. Consistent with the joint agreement for the creation of the Vacaville-Fairfield Greenbelt, the greenbelt would provide permanent open space areas between the urban areas of Fairfield and Vacaville, preserving the rural visual character of areas adjacent to the City boundaries. A discussion of the Proposed Project's consistency with applicable City General Plan policies related to scenic and visual resources is provided in **Table 4.1-1** below. As stated therein, the project design, including location of land uses, setbacks, landscaping, and other features is consistent with the relevant policies of the General Plan. The Proposed Project will not result in a substantial degradation of the overall character of the community, nor will it violate specific General Plan policies relating to visual resources. Impacts to the visual character and visual quality of the project site would be considered less than significant. **Less than Significant.**

TABLE 4.1-1
CONSISTENCY WITH RELEVANT GENERAL PLAN AESTHETIC POLICIES

Land Use Plan Policy	Consistent	Discussion
Guiding Policies		
2.1-G 5 Design aesthetically pleasing roadways, including a loop street system lined with trees or other appropriate landscaping, that connect Vacaville neighborhoods and serve planned development. Streets alone should not be used to set the outer limits of urbanization.	Yes	The Vanden Meadows Project will provide its residents with a looping street system, extensive pedestrian and bike trails, and extensive landscaping, as required by City standards. The outer limits of the Proposed Project are occupied by residential estates and a detention basin, not a street and, therefore, are consistent with City policy.
2.1-G 9 Preserve scenic features and the feel of a city surrounded by open space, and preserve view corridors to the hills, and other significant natural areas.	Yes	The Proposed Project is located on the edge of the developed city, and is bounded to the south and east by the Vacaville-Fairfield Greenbelt, which is intended to provide permanent open space areas between the urban areas of Fairfield and Vacaville. No view corridors or other significant natural areas would be impaired as a result of the Proposed Project.
2.1-G 10 Protect the natural environment that the City enjoys and use creeks, hills, utility corridors, viable agricultural lands or other significant natural features wherever appropriate to establish ultimate City boundaries.	Yes	The Proposed Project is located on the edge of the developed city, and is bounded to the south and east by the Vacaville-Fairfield Greenbelt, which is intended to provide permanent open space areas between the urban areas of Fairfield and Vacaville. In addition the Proposed Project includes a detention basin located within the project site boundaries on the east side of Leisure Town Road, which would provide additional open space on the boundaries of the City.
2.5-G5 Encourage creative site design and architectural quality and variety by a design approval process that provides for a variety of single-family houses and designs and/or multi-family designs.	Yes	The Proposed Project will provide a variety of housing types throughout the 265-acre site. The types of homes will vary by type, size, and affordability. The Proposed Project is subject to Use Permit approval by the Planning Commission and each project design phase is subject to Design Review approval to evaluate aesthetic details and impose requirements, including mitigation measures, to limit adverse aesthetic impacts.

Land Use Plan Policy	Consistent	Discussion
2.6-G 7 Ensure that new development is compatible with the character and scale of existing and planned adjoining land uses.	Yes	The structures associated with the Proposed Project will match the existing design theme and character of the surrounding urban uses and will be visually cohesive with agricultural lands to the east and south through designation of agricultural buffers and the location of low density estate housing adjacent to the project boundaries.
5.1-G 3 Require buffer landscaping and multiple use, where feasible, of utility sites and rights-of-ways to harmonize with adjoining areas.	Yes	The Vanden Meadows Project will provide its residents with extensive pedestrian and bike trails and landscaping within rights-of-ways.
5.2-G 5 Design public buildings to fit into and complement their ultimate surroundings; buffer public buildings from their surroundings so as to shield unsightly areas from public view.	Yes	The proposed school(s) would meet the design standards of the City and school district. In addition the school grounds and the proposed park would provide a buffer between the school and the surrounding residential area.
5.2-G6 Provide adequate landscaping for all public buildings and installations.	Yes	The proposed school(s) and its grounds would be landscaped in accordance with the design standards of the City and school district.
Implementing Policies		
2.1-I 1 Continue to implement design guidelines for all development, including residential, commercial, and industrial projects and public facilities	Yes	The Proposed Project, which includes residential and public facilities, is subject to Use Permit approval by the Planning Commission and each project design phase is subject to Design Review approval to ensure that applicable design guidelines are met.
2.1-I 3 Adopt and implement a plan to establish standards and design guidelines for the city's streets, entry ways, and open spaces. Making streets identifiable by their design, marking entrances to the City, finding alternatives to sound walls, and getting the strongest visual lift from existing open spaces are important ingredients of image.	Yes	The Vanden Meadows Project Specific Plan will provide standards for the extensive pedestrian and bike trails and landscaping within rights-of-ways, making streets identifiable. Sound walls may be included for noise attenuation, but alternatives are being considered for aesthetic and social improvement.
Source: City of Vacaville General Plan, 2007a.		

Impact

4.1-2 The proposed construction of a housing development at the project site could create a new source of substantial light or glare which could adversely affect day or nighttime views.

Since there are only a few inhabited structures on the project site, there is a marginal amount of light or glare emitted from the property; however, surrounding urban lands provide sources of light in the area. The Proposed Project would introduce new sources of light on the property mainly through streetlights, exterior lighting at residences, and cars driving along residential streets, which are considered common and necessary light sources for residential areas by the City. A photometric plan demonstrating compliance with City lighting standards shall be completed as

part of the development review process in the City and for specific development applications of uses considered in this EIR.

The types of light sources that will be introduced as a result of the Proposed Project are frequent in the neighboring residential developments to the north and west; therefore, the impact of such lighting on these areas would be negligible. The agricultural buffer, detention pond, and railroad tracks would provide enough distance to reduce the visual impact of light on rural properties to the east of the site.

The Vacaville-Fairfield-Solano Greenbelt, located directly south of the project site, is the area with the greatest potential of impact from light spillover. The southern border of the project site will consist of residences with fenced backyards of single-family residences on large lots, which will shield residential light sources from the adjacent agricultural areas. The Vacaville-Fairfield-Solano Greenbelt, defined as grazing lands by the DOC, has historically been used for low intensity agricultural uses, including field crops and livestock grazing.

Glare can result from the use of lighting during the nighttime, which reduces visibility of the sky both at the point of light production and in its surrounding areas. No standards have been adopted by the City related to glare impacts, and there is no commonly accepted method of quantifying glare impacts. While glare will occur from the increase in light sources on the project site, the surrounding urban uses will buffer the overall visual effect. The resulting change in nighttime glare at the project site would not substantially alter views.

As described in detail in **Section 4.9**, the project site is located within Zone D of the Travis Air Force Base Area of Influence, which prohibits uses that are considered “hazards to flight” including physical, visual, and electronic forms of interference with the safety of aircraft operations. The production of light and glare from streetlights could affect aircraft operations at Travis AFB, and is considered a potential impact of the development. Implementation of **Mitigation Measure 4.1-2** would minimize uplighting and glare, reducing the potential impact to the Travis AFB.

Potential impacts to day and nighttime views associated with lighting and glare on the project site would be considered less than significant with mitigation. **Less than Significant with Mitigation.**

Mitigation Measure 4.1-2: Lighting on the project site shall be designed and installed in accordance with the City’s Land Use Development Code (City of Vacaville Municipal Code Section 14.09.127.110). Street lighting on the project site shall utilize effective light shielding devices to minimize uplighting and glare to the greatest extent feasible. Light shields shall be installed above and around all street lights, such that no portion of a luminary extends below the base of the light shield. Drop lens luminaries, which are rounded and extend below the lowest portion of the light shield, shall not be used. All street lighting designs, including lens types and shielding devices, shall be approved by the Vacaville Community Development Department prior to installation.

Cumulative Impacts

The cumulative context for the evaluation of cumulative impacts associated with aesthetics is the surrounding area within the viewshed of the project site.

Impact

4.1-3 The Proposed Project in combination with cumulative development surrounding the project site could significantly impact visual resources and create new sources of light and glare.

The project site and the surrounding unincorporated lands to the east and south are designated for agricultural and rural uses, while the lands to the north and west are within the City and are designated for residential uses. The Proposed Project will annex and develop land that is within the far southeast section of the Municipal Service Area and along the eastern boundary of the City's Sphere of Influence. The Sphere of Influence continues to encompass the agricultural lands to the south of the site. Cumulative impacts in the vicinity of the project site include the development of the Southtown Housing Development to the north and the existing Foxboro Development to the east. The Proposed Project would include exterior and interior lighting that are designed not to infringe on adjacent properties or people traveling on roadways. Although development of the Proposed Project would create new sources of light, it would not negatively affect the ambient light in the project area due to light reduction strategies that will be implemented in accordance with the City's Land Use Development Code (**Mitigation Measure 4.1-2**). Therefore, the Proposed Project's contribution to visual resource impacts and light and glare generation would not be cumulatively considerable. **Less than Significant.**

4.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

4.2.1 INTRODUCTION

This section addresses the potential for the Proposed Project to impact air quality and climate change. Following an overview of the existing air quality and climate change settings in **Subsection 4.2.2** and the relevant regulatory setting in **Subsection 4.2.3**, project-related impacts and recommended mitigation measures, if any, are presented in **Subsection 4.2.4**.

4.2.2 ENVIRONMENTAL SETTING

Local air quality is influenced greatly by regional climate, topography, and pollutant sources. The physical characteristics of the Sacramento Valley Air Basin (SVAB) and the San Francisco Bay Area Air Basin (SFBAAB) provide for the potential for high concentrations of pollutants, which are emitted locally and transported from SFBAAB to the SVAB. The project site straddles the northern boundary of the SFBAAB and the SVAB.

Climate and Topography

Although the project site is located within both air basins, the project site climate exhibits the characteristics of the SVAB because the project site is located east of the coastal mountain range outside the direct influences of the San Francisco bay and near the western edge of the SVAB. Hot dry summers and mild rainy winters characterize the Mediterranean climate of the Sacramento Valley (Valley) region. During the year the temperature may range from 20 to 115 degrees Fahrenheit (°F) with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches with snowfall being very rare. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.

The mountains surrounding the Sacramento Valley create a barrier to airflow, which can trap air pollutants when meteorological conditions are right. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the Valley. The lack of surface wind during these periods and the reduced vertical flow, which is caused by cooler land mass, reduces the influx of outside air and allows air pollutants to become concentrated in the stagnate air above the Valley floor. The surface concentrations of pollutants are highest when these conditions are combined with smoke from agricultural burning or when temperature inversions trap cool air, fog, and pollutants near the ground.

The project area is often subject to strong winds from the southwest, referred to as the “Delta breeze”. Delta breeze winds are caused by an onshore thermal gradient from the mixing of hot Central Valley air with cooler coastal air, typically between the cities of Suisun and Davis that produces not only a marked temperature decrease, but also a wind shift. This phenomenon results in generally southwest to southeast winds at the project site. In the Delta, where the project is located, these winds can gust to

over 30 mph, and can persist throughout the night and into the late morning. Winds in the project area are typically from the SSW for nine months out of the year.

Criteria Air Pollutants

The U.S. Environmental Protection Agency (USEPA) has identified six criteria air pollutants (CAPs) that are both common and detrimental to human health. These CAPs are used as indicators of regional air quality. The six CAPs include: ozone (O₃), carbon monoxide (CO), particulate matter (PM) 10 and 2.5 microns in size (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). The California Environmental Protection Agency (CEPA) identified four additional CAPs: sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles.

CAPs are classified in each air basin, county, or, in some cases, within a specific area. The classification is determined by comparing actual monitoring data with federal and California ambient air quality standards. If a CAP's concentration is lower than the standard or not monitored in an area, the area is classified as attainment or unclassified, unclassified areas are considered attainment areas. If an area exceeds the standard, the area is classified as non-attainment for that CAP.

Existing Air Quality

Table 4.2-1 shows the federal and California Ambient Air Quality Standards and attainment status for the Yolo/Solano Air Quality Management District (YSAQMD) and the Bay Area Air Quality Management District (BAAQMD). As shown in the table eight- and one-hour ozone and PM₁₀ are designated nonattainment under the California standards and eight-hour and PM₁₀ are designated nonattainment under the federal standards. These pollutants are considered pollutants of concern for the SVAB. Although carbon monoxide is designated attainment under federal and California standards, there is a potential for high concentration to accumulate under certain conditions, such as prolonged vehicle idling at intersections that have reached or exceed their capacity.

The health effects associated with the (SVAB) pollutants of concern, including the Toxic Air Contaminant (TAC) diesel particulate matter (DPM), are summarized below:

Ozone

O₃ is created in the presence of sunlight through a photochemical reaction involving reactive organic gas (ROG) and nitrogen oxide (NO_x). ROG and NO_x are a result of incomplete combustion of fossil fuels, which is the largest source of ground-level ozone (O₃). Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. As a photochemical pollutant, O₃ is formed only during daylight hours under appropriate conditions, but is destroyed throughout the day and night. O₃ is considered a regional pollutant, as the reactions forming it take place over time and are often most noticeable downwind from the sources of the emissions.

TABLE 4.2-1
AMBIENT AIR QUALITY STANDARDS AND STATUS

Pollutant	Standard		Status ²	
	California	Federal	California	Federal
Ozone (1-hour)	0.09 ppm	-	NA	Nonattainment
Ozone (8-hour)	0.07 ppm	0.075 ppm	NA	N/A
PM ₁₀ (24-hour)	50 µg/m ³	150 µg/m ³	NA	Unclassified
PM _{2.5}	-	35 µg/m ³	NA	Partial Nonattainment
Carbon Monoxide (8-hour)	9.0 ppm	9.0 ppm	A	Attainment
Nitrogen Dioxide (annual)	0.030 ppm	0.053 ppm	A	Attainment
Nitrogen Dioxide (1-hour) ¹	0.18 ppm	0.100 ppm	A	N/A
Lead (30 day average)	1.5 µg/m ³	-	A	Attainment
Sulfur Dioxide (24-hour)	0.04 ppm	0.14 ppm	A	Attainment
Visibility Reducing Particles	-	N/A	A	N/A
Sulfates	25 µg/m ³	N/A	A	N/A
Vinyl Chloride	0.01 µg/m ³	N/A	A	N/A
Hydrogen Sulfide	0.03 ppm	N/A	U	N/A

Note: PM₁₀ and PM_{2.5} = particulate matter 10 and 2.5 microns in size, respectively; A = Attainment; NA = Nonattainment; U = Unclassified.
N/A = Not applicable
¹ Effective January 22, 2010, attainment/nonattainment areas have not been established under federal standard.
Source: YSAQMD, 2011; BAAQMD, 2011.
² The CAPs NAAQS attainment status designations of the BAAQMD and YSAQMD are identical.

Particulate Matter

PM is a mixture of microscopic solids and liquid droplets suspended in air. PM is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mold spores). Particulate matter is regulated as either PM₁₀ (PM of 10 microns or less in size) or PM_{2.5} (PM of 2.5 microns or less in size), which are the upper limit size restrictions for reaching deep into the lungs PM₁₀ or reaching the bloodstream PM_{2.5}.

Diesel Particulate Matter

DPM is defined as a (TAC), which are substances that are known or suspected to be emitted in California and are classified by the California Air Resources Board (CARB) having potential adverse health effects. Currently, there are 244 TACs listed by CARB. According to CARB, the estimated health risk from TACs can be primarily attributed to relatively few compounds. DPM differs from many other TACs in that it is not a single substance, but rather a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are defined as PM, which includes carbon particles or "soot."

Monitoring

Monitors that collect air quality data are located at monitoring stations throughout Solano County (County), SVAB, SFBAAB, and the State of California. Some monitoring stations collect data on all federal and California CAPs, while others are specialized and only collect data for certain CAPs. **Table**

4.2-2 shows federal and California pollutants of concern data collected at the City of Vacaville's (City's) Ulatis Drive and Tuolumne monitoring stations.

TABLE 4.2-2
EXCEEDANCES OF FEDERAL AND CALIFORNIA AIR POLLUTION STANDARDS

Pollutant	2008	2009	2010
Ozone (1-hour)¹			
Highest (ppm)	0.112	0.106	0.105
Days>0.09 ppm	4	3	2
Ozone (8-hour)¹			
Highest (ppm)	0.095	0.085	0.078
Days>0.07 ppm (California)	7	2	3
Days>0.75 ppm (federal)	4	2	1
PM₁₀²			
Federal Highest (µg/m3)	42.1	*	*
California Highest (µg/m3)	43.6	*	*
Days>50 µg/m3 (California)	0	*	*
Days>150 µg/m3 (federal)	0	*	*
Notes			
* There was insufficient (or no) data available to determine the value.			
¹ Data provided by the Vacaville Ulatis Drive monitoring station.			
² Data provided by the Vacaville Tuolumne monitoring station.			
Source: CARB, 2011.			

Sources

There are many sources of criteria pollutants in the SVAB and SFBAAB. These sources can be divided into three categories; mobile, stationary, and "area" sources. Mobile sources consist of on-road vehicles and off-road recreational vehicles, as well as mobile construction equipment. Stationary sources consist of large industrial or commercial polluters that generally emit via a stack. Stationary sources can also be smaller, as in the case of small emergency generators or boilers. Area source emissions are normally produced by processes and products that are individually small, but are numerous and widely dispersed. Normally, these sources are associated with everyday activities such as landscape maintenance, painting, and the use of fireplaces and barbecues. CARB maintains an emission inventory of air pollutants for California's air basins as well as for the counties inside those air basins. The Proposed Project is located entirely in Solano County. **Table 4.2-3** presents the latest emission inventory of criteria pollutants for Solano County.

Climate Change

Introduction

It is anticipated that the average global temperature could rise 0.6 Celsius (°C) (1.08 °F) to 4.0 °C (7.2 °F) between the years 2000 and 2100 (IPCC, 2007). The extent to which human activities affect global climate change is a subject of considerable scientific debate. While many in the scientific community contend that global climate variation is a normal cyclical process that is not necessarily related to human activities, the International Panel on Climate Change (IPCC) report identifies anthropogenic green house

gases (GHGs) as a contributing factor to changes in the Earth's climate (IPCC, 2007). Preferring to error on the side of caution, the analysis in this Environmental Impact Report (EIR) assumes anthropogenic GHGs are in fact contributing to global climate changes.

TABLE 4.2-3
SOLANO COUNTY EMISSIONS INVENTORY

Source Category	ROG	CO	NOx	SOx	PM ₁₀	PM _{2.5}
	tons per day					
Stationary Sources						
Fuel Combustion	0.35	3.91	6.97	0.29	0.43	0.43
Waste Disposal	2.68	0.04	0.01	0.01	0.00	0.00
Cleaning and Surface Coatings	2.60	0.00	0.01	0.00	0.04	0.04
Petroleum Production and Marketing	1.97	0.06	0.00	17.03	0.30	0.27
Industrial Processes	1.19	0.40	0.63	0.18	0.69	0.50
Area-Wide Sources						
Solvent Evaporation	4.51	-	-	-	-	-
Miscellaneous Processes	1.22	12.01	0.99	0.04	18.51	4.24
Mobile Sources						
On-Road Motor Vehicles	8.26	85.60	25.23	0.08	1.36	1.07
Other Mobile Sources	8.74	33.26	14.32	0.35	0.97	0.85
Total Solano County	31.54	135.28	48.15	17.98	22.29	7.41
Source: CARB, 2009a.						

The U.S. Supreme Court has held that CO₂ (a GHG) falls under the Clean Air Act's (CAA's) definition of an "air pollutant", such that the EPA has statutory authority to regulate the emissions of this gas. Further, *Massachusetts v. Environmental Protection Agency, U.S., 1275 S.Ct. 1438, 1462 (2007)*, concluded that GHG emissions from human activities would result in an additional warming of the Earth's surface. The U.S. Court of Appeals, stated succinctly, that the potential for GHG emissions impacting climate change must be analyzed in National Environmental Policy Act (NEPA) documents, *Center for Biological Diversity v. National Highway Safety Administration, 508 F.3d 508 (9th Cir. 2007)*.

The Greenhouse Effect and Climate Change

Primary sources of GHG emissions in Solano County include vehicles, trucks, airplanes, natural gas dispensing stations, and electricity generation facilities; however, there ~~is~~ are many other sources of GHG emissions in the project's vicinity.

According to the United Nations Intergovernmental Panel on Climate Change (IPCC) and the EPA, temperatures in California could increase by about 5°F in winter and summer and by about 4 ° F in spring and fall over the next 100 years. Precipitation is projected to change little in the spring, summer, and fall and to increase by about 10% in winter. The frequency of extreme hot days in summer is expected to increase along with the general warming trend. A recent study issued by the U.S. Department of Energy predicts similar climatic changes for the region.

Carbon Dioxide Equivalent

Carbon dioxide equivalent (CO₂e) is a method by which GHGs values other than CO₂ are converted to a CO₂-like emissions value based on a heat-capturing ratio. As shown in **Table 4.2-4**, CO₂ is used as the base and is given a value of one.

TABLE 4.2-4
GREENHOUSE GAS CO₂ EQUIVALENT

GHG Gases	CO ₂ e Value
CO ₂	1
CH ₄	21
N ₂ O	310
HFCs/PFCs	140 -23,900
SF ₆	23,900

Source: IPCC, 2007.

CH₄ has the ability to capture 21 times more heat than CO₂; therefore, CH₄ is given a CO₂e value of 21. Emissions are multiplied by the CO₂e value to achieve one GHG emission value. By providing a common measurement, CO₂e provides a means for presenting the relative overall effectiveness of emission reduction measures for various GHGs in reducing project contributions to global climate change.

Odor

The land west, southwest, and northwest of the project site is mainly residential land use, which is not considered an odor source by the BAAQMD or the YSAQMD. The land use east of the project site is mainly agricultural or recreation. Agricultural land use can produce odor; however, these odors are seasonal and generally dissipate rapidly. In the project region, there have been eight odor complaints registered with the YSAQMD over the last 12 years by five people, all of which have been by residence within one half mile of the Easterly Wastewater Treatment Plant (EWWTP). The EWWTP is located approximately 2.1 miles northeast of the project site.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions and odor sources, or duration of exposure to air pollutants or odors. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality related health problems. Residential areas are considered sensitive to poor air quality, because people usually stay home for extended periods of time, with greater associated exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

The land surrounding the project site is agricultural to the east and south and residential to the north and west. The nearest residential sensitive receptors are located west of the project site approximately 100

feet along Nut Tree Road. Approximately 125 feet north of the project site across Opal Way are additional residential units. The nearest schools are Foxboro and Cambridge Elementary Schools, which are located approximately 0.7 miles west and north of the project site, respectively. The nearest medical facility is the California Medical Facility located approximately one mile west of the project site on California Drive.

4.2.3 REGULATORY CONTEXT

Federal

The Federal Clean Air Act (CAA) was enacted for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare, and productivity.

In 1971 the United States Environmental Protection Agency (USEPA) developed primary and secondary National Ambient Air Quality Standards (NAAQS). Six pollutants of primary concern were designated: CO, O₃, suspended PM, sulfur dioxide, NO_x, and lead. The primary NAAQS must "protect the public health with an adequate margin of safety" and the secondary standards must "protect the public welfare from known or anticipated adverse effects (aesthetics, crops, architecture, etc.)". The primary standards were established, with a margin of safety, considering long-term exposures to the most sensitive groups in the general population. The EPA allows states the option to develop different (stricter) standards. California elected this option and adopted standards that are more stringent.

If an air basin is not in federal attainment (e.g. does not meet federal standards) for a particular pollutant, the basin is classified as a marginal, moderate, serious, severe, or extreme nonattainment area.

Nonattainment areas must take steps towards attainment by a specific timeline. These steps include establishing a transportation control program and clean-fuel vehicle program, decreasing the emissions threshold for new stationary sources and major sources, and increasing the stationary source emission offset ratio to at least 1.3:1. The above programs are published in the State Implementation Plan (SIP), which is approved by the EPA.

The SIP is a number of documents that set forth the state's strategies for achieving federal air quality standards. The Code of Federal Regulations (CFR Title 40, Chapter I, Part 52, Subpart F, §52.220) lists all of the items that are included in the California SIP. The SIP is not a single document, but a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, State regulations, and Federal controls. Many of California's SIPs detail control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions from consumer products. Local air districts and other agencies, such as the Bureau of Automotive Repair, prepare SIP elements and submit them to CARB for review and approval. State law makes CARB the lead agency for all purposes related to the SIP.

Climate Change

In 1997 the Council on Environmental Quality (CEQ) circulated an internal draft memorandum on how global climate change should be treated for the purposes of evaluating climate change in environmental

documents (CEQ, 1997a). The CEQ draft memorandum advised federal lead agencies to consider how proposed actions subject to environmental review would affect sources and sinks of GHGs. During the same year, CEQ released guidance on the assessment of cumulative effects in environmental documents (CEQ, 1997b). Consistent with the CEQ draft memorandum, climate change impacts were offered as one example of a cumulative effect.

State

CARB, a part of the California Environmental Protection Agency (CEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB also has primary responsibility for the development of California's SIP, for which it works closely with the Air Quality Management District's (AQMDs) and the USEPA.

California Clean Air Act

The California Clean Air Act (CCAA) of 1988 requires nonattainment areas to achieve and maintain the CAAQS by the earliest practicable date, as well as requiring local air districts to develop plans for attaining the state O₃, CO, sulfur dioxide, and NO_x standards.

Climate Change

California has been a leader among the states in outlining and aggressively implementing a comprehensive climate change strategy that is designed to result in a substantial reduction in total statewide GHG emissions in the future. California's climate change strategy is multifaceted and involves a number of state agencies implementing a variety of state laws and policies. Laws and policies are summarized below:

Assembly Bill 1493

Signed by the Governor in 2002, Assembly Bill (AB) 1493 requires that the CARB adopt regulations requiring a reduction in GHG emissions emitted by cars in the state. EPA granted California's waiver request enabling the state to enforce its greenhouse gas emissions standards for new motor vehicles. With the granting of the waiver on June 30, 2009, it is expected that the regulations will reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016 (CARB, 2009b).

Executive Order S-3-05

Executive Order (EO) S-3-05 was signed by the Governor on June 1, 2005. EO S-3-05 established the following statewide emission reduction targets:

- Reduce GHG emissions to 2000 levels by 2010
- Reduce GHG emissions to 1990 levels by 2020
- Reduce GHG emissions to 80 percent below 1990 levels by 2050

EO S-3-05 created a “Climate Action Team” or “CAT” headed by the CEPA and including several other state jurisdictional agencies. The CAT is tasked by EO S-3-05 with outlining the effects of climate change on California and recommending an adaptation plan. The CAT is also tasked with creating a strategy to meet the target emission reductions. In April 2006 the CAT published an initial report that accomplished these two tasks.

Assembly Bill 32

Signed by the Governor on September 27, 2006, AB 32 codifies a key requirement of EO S-3-05, specifically the requirement to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 tasks CARB with monitoring state sources of GHGs and designing emission reduction measures to comply with the law’s emission reduction requirements. However, AB 32 also continues the CAT’s efforts to meet the requirements of EO S-3-05 and states that the CAT should coordinate overall state climate policy.

In order to accelerate the implementation of emission reduction strategies, AB 32 requires that CARB identify a list of discrete early action measures that can be implemented relatively quickly. In October 2007, CARB published a list of early action measures that could be implemented and would serve to meet about a quarter of the required 2020 emissions reductions (CARB, 2007b). In order to assist CARB in identifying early action measures, the CAT published a report in April 2007 that updated their 2006 report and identified strategies for reducing GHG emissions (CAT, 2007). In the October 2007 report, CARB cited the CAT strategies and other existing strategies that may be utilized in achieving the remainder of the emissions reductions. AB 32 required that CARB prepare a comprehensive “scoping plan” that identifies all strategies necessary to fully achieve the required 2020 emissions reductions. On October 8, 2008 CARB released the Climate Change Scoping Plan, 2008 and on December 12, 2008, CARB approved the Climate Change Scoping Plan (CARB, 2007). CARB provided an update to the December, 2008 Scoping Report in November, 2009. The update provided additional reduction strategies and an overview of methods to further reduce GHG emissions in California; however, no definitive numerical GHG emissions threshold was provided.

Executive Order S-01-07

EO S-01-07 was signed by the Governor on January 18, 2007. It mandates a statewide goal to reduce the carbon intensity of transportation fuels by at least 10 percent by 2020. This target reduction was identified by CARB as one of the AB 32 early action measures identified in their October 2007 report.

CEQA Guidelines

On December 30, 2009 the Natural Resources Agency adopted CEQA Guideline Amendments for the quantification and mitigation of greenhouse gas emissions. The adopted guidelines provide the following direction for consideration of climate change impacts in a CEQA document:

- The determination of significance of GHG emissions calls for a careful judgment by the lead agency.
- The lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a proposed project.
- A model or methodology shall be used to quantify GHG emissions resulting from a CEQA project.
- Significance may rely on qualitative analysis or performance based standards.
- The lead agency may adopt thresholds of significance previously adopted or recommended by other public agencies or recommended by experts.
- The CEQA document shall discuss regional and/or local GHG reduction plans.
- A CEQA document shall analyze GHG emissions if they are cumulatively considerable.
- A description of the effects of climate change on the environment shall be included in CEQA documents.
- A CEQA document shall contain mitigation measures, which feasibly reduce GHG emissions.
- GHG analysis in a CEQA document may be Tiered or Streamlined.

The methodology and basis of calculation for estimating and analyzing GHG emissions resulting from the Proposed Project is based on scientific and factual data and is consistent with the methodology and guidance identified in the CEQA guideline amendments recently adopted by the National Resources Agency.

Senate Bill 375

SB 375 was approved by the Governor on September 30, 2008. SB 375 provides for the creation of a new regional planning document called a “sustainable communities strategy” (SCS). An SCS is a blueprint for regional transportation infrastructure and development that is designed to reduce GHG emission from cars and light trucks to target levels that will be set by CARB for 18 regions throughout California. Each of the various metropolitan planning organizations and the Association of Bay Area Governments (ABAG) must prepare an SCS and include it in that region’s regional transportation plan. The SCS would influence transportation, housing, and land use planning. CARB will determine whether the SCS will achieve the region’s GHG emissions reduction goals. Under SB 375 certain qualifying in-fill residential and mixed-use projects would be eligible for streamlined CEQA review.

Toxic Air Contaminants

TACs are a group of pollutants of concern. Toxic air contaminants are less pervasive in the urban atmosphere than the criteria pollutants, but are linked to short-term (acute) or long-term (chronic) adverse human health effects. There are 244 constituents listed by the State as toxic air contaminants with varying degrees of toxicity. Sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Vehicles release at least forty different toxic air contaminants. Ambient air quality standards have not been set for air toxics. Instead, these pollutants are typically regulated through a technology-based approach for reducing TACs. This approach involves requiring facilities to install Maximum Achievable Control Technology (MACT) on emission sources.

Air Toxics Hot Spots Information and Assessment Act of 1987

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588), California Health and Safety Code Section 44300 et seq., is the primary air contaminant legislation in California, which provides for the regulation of over 200 TACs, including DPM. Under AB 2588, local air districts may request that a facility account for its TAC emissions. Local air districts then prioritize facilities on the basis of emissions, and high priority designated facilities are required to submit a health risk assessment and communicate the results to the affected public.

Assembly Bill 1807

AB 1807, enacted in September 1983, sets forth a procedure for the identification and control of TACs in California. CARB is responsible for the identification and control of TACs, except pesticide use.

Senate Bill 656

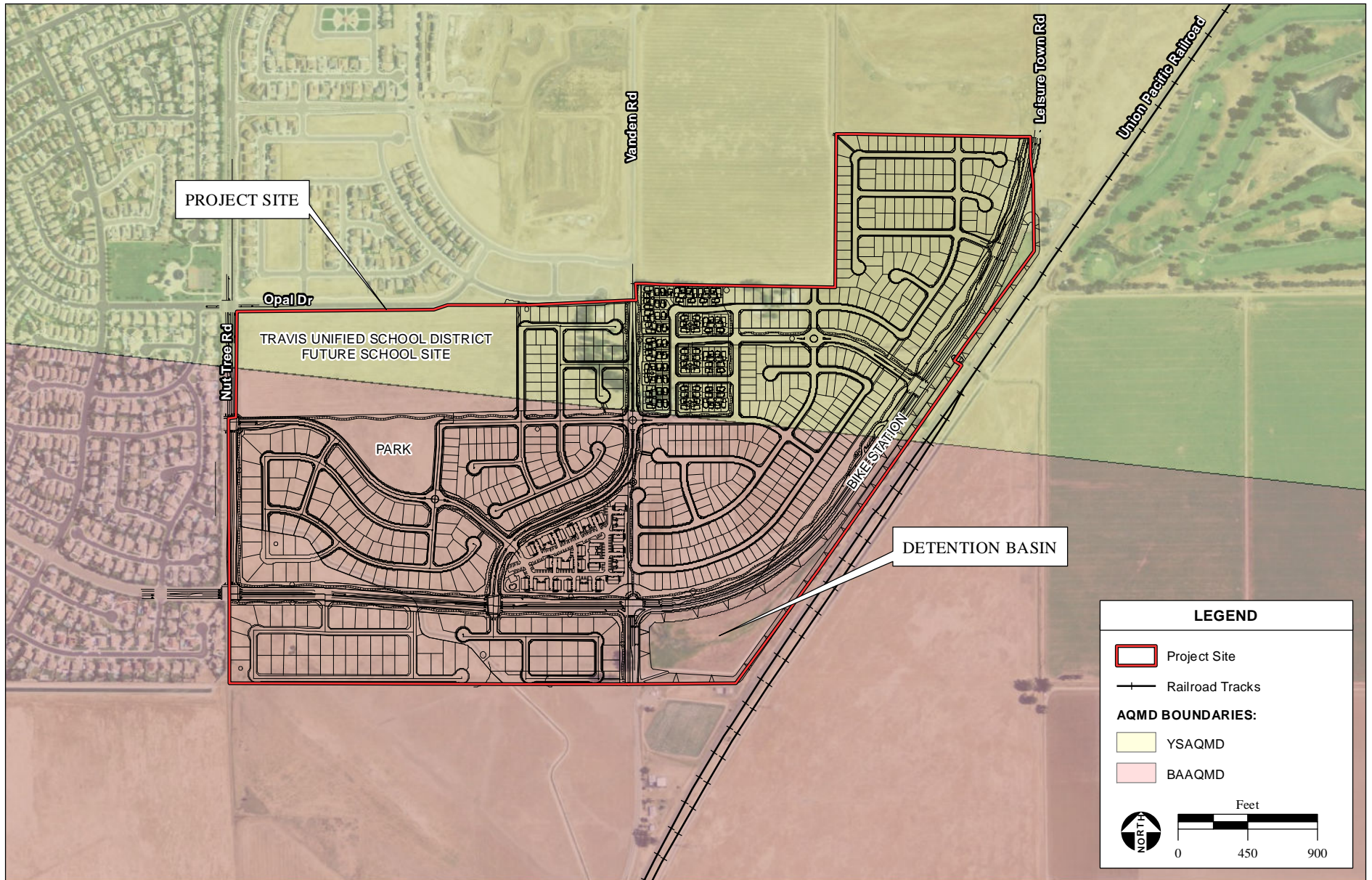
In October 2000, CARB released a report entitled Risk Reduction Plan to Reduce PM Emissions from Diesel-Fueled Engines and Vehicles. This report identifies DPM as the predominant TAC in California and proposes methods for reducing diesel emissions. California propagated Senate Bill 656 in 2003, which was implemented to reduce PM (including DPM) in California. CARB approved a list of the most readily available, feasible, and cost-effective control measures that can be employed by air districts to reduce PM in 2004. The list is based on rules, regulations, and programs existing in California as of January 1, 2004, for stationary, area-wide, and mobile sources. As a second step air districts must adopt implementation schedules for selected measures from the list.

Local

Yolo/Solano and Bay Area Air Quality Management District

As shown in **Figure 4.2-1** the project site is located in both the YSAQMD and the BAAQMD. The YSAQMD and BAAQMD agencies are responsible for planning to meet federal and state ambient air quality standards in the City and YSAQMD also responsible meeting the larger Sacramento Federal Nonattainment Area (SFNA).

In order to demonstrate the area's ability to eventually meet the federal ozone standards, the YSAQMD and BAAQMD, maintain the region's portion of the SIPs for ozone. The Nonattainment Area's part of the SIP is a compilation of regulations that govern how the region and State will comply with the CAA requirements to attain and maintain the federal and state ozone standard. For the YSAQMD, the latest version of the Sacramento Federal Nonattainment Area is contained in a document called the 2011 Reasonable Further Progress Plan (Sacramento Plan). The SIP components for the SFBAB are located in the BAAQMD's 2010 Clean Air Plan (Bay Area Plan). The most recent update of the Sacramento Plan was adopted in 2009 and the BAAQMD adopted its most recent version of in September 2010.



Local Air District Rules

The YSAQMD has several rules that relate to the Proposed Project, which are summarized below:

Rule 3.1 – General Permit Requirements: Requires any project that includes the use of certain equipment capable of releasing emission to the atmosphere as part of project operation to obtain a permit from the YSAQMD prior to operation of the equipment. The applicant, developer, or operator of a project that includes an emergency generator, boiler, or heater should contact the YSAQMD to determine if a permit is required. Portable construction equipment with an internal combustion engine over 50 horsepower are required to have a YSAQMD permit or a CARB portable equipment registration.

Rule 2.11 – Particulate Matter: Sets limit on unpermitted emissions of particulate matter.

Rule 2.14 – Architectural Coatings: Sets volatile organic compound (VOC) limits for coatings that are applied to stationary structures or their appurtenances. The rule also specifies storage and cleanup requirements for these coatings.

Rule 2.3 – Ringelmann Chart: Prohibits individuals from discharging into the atmosphere from any single source of emissions whatsoever any air contaminant whose opacity exceeds certain specified limits.

Rule 2.5 – Nuisance: No person or entity shall emit air pollutant which would cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public

The BAAQMD has several rules that relate to the Proposed Project, which are summarized below:

Regulation 2 – Permits, the Regulation specifies the requirements for authorities to construct and permits

Regulation 6, Rule, 1 – General Requirements, Limits the quantity of particulate matter in the atmosphere by controlling emission rates, concentration, visible emissions and opacity.

Regulation 7 – Odorous Substances, Establishes general limitations on odorous substances and specific emission limitations on certain odorous compounds

Regulation 8, Rule 3 – Architectural Coatings: Sets volatile organic compound (VOC) limits for coatings that are applied to stationary structures or their appurtenances. The rule also specifies storage and cleanup requirements for these coatings.

City of Vacaville General Plan

The City is currently in the process of updating its General Plan and anticipates adoption of the update will occur in the summer/fall of 2012. The City's General Plan Update will include revisions to the policies and land use map of the existing General Plan. Available technical documents developed for the General Plan Update were used, as applicable, in the development of the section. The following guiding and implementing policies under the current General Plan are applicable to the Proposed Project:

Guiding Policy

8.3-G 1 Maintain good air quality in the Vacaville Planning Area.

Implementing Policies

8.3-I 1 Encourage project design that conserves air quality and minimizes direct and indirect emissions of air contaminants.

4.2.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

The analysis in this section focuses on the nature and magnitude of the change in the air quality environment due to construction and operation of the Proposed Project. Emissions resulting from implementation of the Proposed Project are analyzed in two distinct phases, construction and operation. Construction emissions are temporary in nature and do not overlap with operational emissions. During the construction phase, pollutants of concern for the Proposed Project are NO_x, ROG, PM_{2.5}, and PM₁₀. During construction, PM emissions are primarily produced during mass and fine grading activities. NO_x, ROG, PM₁₀, and PM_{2.5} are emitted from earth moving activities, combustion of diesel and gasoline fuels by heavy-duty construction equipment, and employee vehicles.

Criteria Air Pollutants - Construction

URBEMIS 9.2.4 was used to estimate emissions from all construction-related sources. The results of the URBEMIS 9.2.4 modeling are discussed below and output files are provided in **Appendix D**.

URBEMIS 9.2.4 provides default values when site-specific inputs are not available. The default values are provided in **Appendix D**. The following site-specific assumptions were used for the purposes of air quality modeling:

- Construction would occur over a period of 72 months.
- Construction would begin in the year 2013.
- 306 medium density homes would be constructed on 49.19 acres.
- 443 low density homes would be constructed on 116.87 acres.
- 192 high density homes would be constructed on 8.17 acres.
- A 7.42 acres city park would be constructed.
- Proposed Travis Unified School District (TUSD) facilities would accommodate an enrollment of A school sized for 2,000-625 students would be constructed.

Resulting emission estimates associated with construction were compared to applicable YSAQMD, BAAQMD, and/or CEQA thresholds to evaluate the effects of construction activities on regional air quality.

Criteria Air Pollutants - Operation

URBEMIS 9.2.4 was used to estimate emissions associated with operation of the Proposed Project. Input values for the model included URBEMIS defaults and site specific data. The operational effects to air quality were analyzed for both near-term 2019 conditions and cumulative long-term 2030 conditions. Emissions associated with operation are compared to the BAAQMD and YSAQMD CEQA guideline emissions thresholds to evaluate the effects of operational activities on air quality.

Trip Generation Rates

The trip generation rates used in the URBEMIS air quality model are from the Traffic Impact Study (TIS) (**Appendix O**). The trip generation rates for each project component were determined using the Institute of Transportation Engineers, 7th Edition Trip Generation Manual (ITE). Trips generated by single-family residences, which includes 650 homes, was calculated using a trip generation rate of 9.57 (ITE code 210). Trips generated by medium density housing, which includes 97 units, was calculated using a trip generation rate of 9.57 (ITE code 231). Trips generated by high density housing, which includes 192 units, was calculated using a trip generation rate of 9.57 (ITE code 220). The ITE code 522 for schools was used to calculate trips generated by the proposed school. Although the type of school to be developed has not been identified by the school district, the traffic analysis utilized the code for a junior high.

Toxic Air Contaminates

Both construction and operational activities would emit TACs, which includes diesel particulate matter (DPM), but neither the level of project construction activities nor the type of land uses (residential, hotel, retail, and office) proposed would pose significant additional health risk to sensitive receptors on or near the project site. AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act, requires the air quality management district (AQMD) to compile a list of facilities that emit TACs and prioritize them based on the risk they represent. The BAAQMD and the YSAQMD does not consider residential uses as high-risk because they generally do not emit a significant amount of TAC (under CARB guidelines emissions of 10 tons per year of TACs is considered significant). Mobile sources associated with the Proposed Project would generate TACs. However, the Proposed Project would not include truck intensive uses (e.g., large commercial warehouses or distribution centers) that are the most important mobile sources of TACs.

Climate Change

Because the 2007 YSAQMD Handbook for Assessing and Mitigating Air Quality Impacts does not provide a method for calculating project-level GHG emissions or significance thresholds, the 2010 BAAQMD CEQA Guidelines were used. Construction GHG emissions were estimated using URBEMIS 9.2.4. Operational emissions were estimated using URBEMIS 9.2.4 and the BAAQMD GHG Calculator (BAAQMD, 2011b). The GHG calculator estimates a project's direct and indirect GHG emissions by interfacing with the URBEMIS 9.2.4 air quality model.

Odors

Odor is subjective and in most cases not quantifiable. Potential odor impacts were analyzed based on an examination of the existing odor sources, potential odor effects of the project, and a comparison of those effects to the significance criteria listed below. Neither the BAAQMD nor the YSAQMD classify a project such as the Proposed Project as an odor emitter.

Significance Criteria

Criteria for determining the significance of impacts to air quality and climate change have been developed based on Appendix G of the CEQA *Guidelines* and relevant agency thresholds. Impacts to air quality and climate change would be considered significant if the Proposed Project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase in any CAP for which the project region is non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people;
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Based on the above CEQA standards of significance, the City has determined that the following~~the YSAQMD and BAAQMD have provided the following~~ CEQA significance thresholds for pollutants of concern shall be utilized to evaluate project related impacts (YSAQMD, 2007; BAAQMD, 2010). It should be noted that while the BAAQMD CEQA guidelines have been suspended by the courts until an associated CEQA process can be completed, the suspension of the Guidelines does not relieve lead agencies within the District's boundaries from providing a complete air quality and climate change analysis, including quantification of criteria and GHG pollutants, significance analyses, and mitigation. Since the BAAQMD has slightly more stringent criteria pollutant thresholds and provides thresholds for climate change and health risk assessment, the City has determined these are appropriate thresholds for analyzing impacts as a result of the Proposed Project.

- Under the YSAQMD's guidelines, if the project's construction emissions are above 10 tons per year for ROG and/or NOx and/or 80 pounds per day of PM₁₀ emissions, the project is consider to have a significant impact. Under the BAAQMD's guidelines, if during construction the project emits 54 pounds per day of ROG, NOx, or PM_{2.5} and/or 82 pounds per day of PM₁₀, then project emissions would be considered significant. Since the BAAQMD construction thresholds are generally more conservative, for this analysis the BAAQMD construction thresholds were used to determine significance.

- Under the YSAQMD guidelines, if the project's operational emissions are above 10 tons per year for ROG and/or NO_x and/or 80 pounds per day of PM₁₀, then project emissions would be considered significant. Under the BAAQMD if during operation the project emits 54 pounds per day or 10 tons per year of ROG, NO_x, and/or PM_{2.5} and/or 82 pounds per day or 15 tons per year of PM₁₀, then project emissions would be considered significant. Since the BAAQMD operation thresholds are more conservative, for this analysis the BAAQMD operation thresholds were used to determine significance.
- An air quality analysis should address a project's cumulative impact on ozone and localized pollutants. Any proposed project that would individually have a significant air quality impact (see above for project level Thresholds of Significance) would also be considered to have a significant cumulative impact.
- Under the YSAQMD rule 2.5 and the BAAQMD Regulation 7, any project that generates odorous emission in quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public is considered significant.
- Since CARB, YSAQMD, and BAAQMD do not have a significant threshold for construction GHG emissions, for this analysis a 26 percent or greater reduction in construction-related GHG emissions would be considered a less-than-significant impact to global climate change. The 26 percent reduction mirrors the state reduction goal provided in AB 32.
- Since CARB and the YSAQMD do not have a significant threshold for operational GHG emissions, the BAAQMD significance threshold of 1,100 metric tonnes per year was used for this analysis.
- In accordance with the 2010 BAAQMD CEQA Guidelines, locating a project adjacent to a roadway which has greater than 10,000 vehicles per day may result in a significant impact due to diesel particulate matter.

Project Specific Impacts

Construction Effects

Impact

4.2-1 Construction of the Proposed Project could generate emissions of ROG, NO_x, PM₁₀, and PM_{2.5}.

Emissions generated from construction activities associated with demolition, grading, and building resulting from implementation of the Proposed Project would be short-term, intermittent, and temporary in nature. However, these construction emissions have the potential to represent a significant air quality impact. The grading and construction of the Proposed Project would result in the generation of ROG, NO_x, PM₁₀, and PM_{2.5} emissions. PM emissions are generally the direct result of site grading, excavation, road paving, and exhaust associated with construction equipment. PM emissions are largely dependent on the amount of ground disturbance

4.2 Air Quality and Greenhouse Gas Emissions

associated with site preparation activities. Emissions of NO_x and ROG are generally associated with employee vehicle trips, delivery of materials, and construction equipment exhaust.

Table 4.2-5 shows mitigated and unmitigated emissions from construction activities. Construction emissions are compared to the BAAQMD and the YSAQMD thresholds to determine if the construction emissions of the Proposed Project would have a significant impact on regional air quality. As shown in **Table 4.2-5**, without mitigation the Proposed Project would exceed the BAAQMD and YSAQMD threshold for ROG, NO_x, PM₁₀, and PM_{2.5}. This is considered a potentially significant impact. Recommended mitigation measures presented below would minimize the identified significant effect from ROG, NO_x, and PM resulting from construction activities. The reduction in construction emissions resulting from implementation of specific mitigation measures was estimated using URBEMIS; however the reductions from certain mitigation measures are not quantifiable. After implementation of construction mitigation measures, project related emissions during construction would be reduced below significance thresholds for ROG, NO_x, and PM_{2.5}, but would still exceed BAAQMD and YSAQMD thresholds for PM₁₀. Therefore, PM₁₀ emissions from construction are considered to be a significant and unavoidable impact. **Significant and Unavoidable.**

TABLE 4.2-5
MITIGATED (UNMITIGATED) CONSTRUCTION EMISSIONS

Construction Year	Pollutants of Concern			
	ROG	NO _x	PM ₁₀	PM _{2.5}
	tpy	tpy	tpy [lb/day]	tpy
2013	2.73 (6.79)	8.61 <u>9.78</u> (11.22)	17.22 <u>03</u> (103.76) [424 <u>19.96</u> 19.05 (2,569.30)]	3.84 <u>67</u> (22.08)
2014	8.85 (14.89)	5.80 <u>6.39</u> (7.10)	0.37 <u>25</u> (0.53) [3.36 <u>2.17</u> (5.06)]	0.28 <u>17</u> (0.42)
2015	1.91 (6.33)	6.55 <u>7.49</u> (8.59)	15.25 <u>12</u> (92.10) [420 <u>99</u> 18.87(2,568.08)]	3.37 <u>24</u> (19.56)
2016	7.74 (13.84)	4.32 <u>75</u> (5.26)	0.29 <u>22</u> (0.40) [2.25 <u>1.69</u> (3.06)]	0.14 <u>24</u> (0.31)
2017	3.49 (8.65)	5.57 <u>6.38</u> (7.34)	45.10 <u>14.99</u> (91.38) [420 <u>418.43</u> 70 (2,566.97)]	3.31 <u>20</u> (19.36)
2018	4.81 (10.67)	4.00 <u>044</u> (4.96)	2.78 <u>72</u> (15.74) [212 <u>210.06</u> 87 (1,285.80)]	0.71 <u>65</u> (3.49)
2019	7.07 (13.18)	3.70 <u>4.11</u> (4.59)	0.27 <u>20</u> (0.38) [2.40 <u>1.72</u> (3.36)]	0.19 <u>13</u> (0.27)
Highest Emission Year	8.85 (14.89)	8.61<u>9.78</u> (11.22)	17.22<u>03</u> (103.76) [424<u>19.96</u> 19.05 (2,569.30)]	3.84<u>67</u> (22.08)
BAAQMD/YSAQMD Thresholds	10/10	10/10	15/(80)	10/N/A
Exceed Thresholds	No/No	No/No	Yes/(Yes)	No/N/A
Tpy = tons per year; lb/day = pounds per day. Source: URBEMIS 9.2.4, 2007.				

Mitigation Measure 4.2-1a: The Applicant shall ensure through the enforcement of contractual obligations that construction contractors implement a fugitive dust abatement program during construction, which shall include the following elements:

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Cover all exposed stockpiles.
- Water all exposed roadway and construction areas twice a day.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent streets.
- Limit traffic speeds on unpaved roads to 15 miles per hour (mph).
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

Mitigation Measure 4.2-1b: The applicant shall ensure through contractual obligations with construction contractors that the following Best Management Practices shall be implemented during all stages of construction:

- All heavy-duty construction equipment shall be equipped with a diesel oxidation catalyst and diesel particulate filter. Heavy-duty construction equipment shall be the newest and cleanest equipment available. Biodiesel shall be used whenever available.
- Only low ROG-VOC coatings that conform to the limits specified in YSAQMD Rule 2.14 shall be utilized. Low VOC paints are available through local paint retailers that supply Olympic Premium and Benjamin Moore Aura paints.
- Construction employees and subcontracts shall be informed that Emissions of reactive organic gases, nitrogen oxides, sulfur oxides, and carbon monoxide, and GHGs shall be controlled by requiring all diesel-powered equipment is to be properly maintained and that, in accordance with state law, minimizing idling time must be limited to 5 minutes when construction equipment is not in use, unless per engine manufacturer's specifications or for safety reasons more time is required. Since these construction emissions would be generated primarily by construction equipment, machinery, and engines shall be kept in good mechanical condition to minimize exhaust emissions.
- The applicant shall obtain a permit from the YSAPCD prior to operation of any portable diesel fueled equipment greater than 50 horsepower
- All stationary equipment, other than internal combustion engines less than 50 horsepower, emitting air pollutants shall obtain an Authority to Construct and Permit to Operate from the YSAPCD prior to the beginning of construction.
- The project proponent shall employ periodic and unscheduled inspections to accomplish the above mitigation.

- Any burning of cleared vegetation shall be conducted according to the rules and regulations of the BAAQMD's Regulation 5 (BAAQMD, 2008) and YSAQMD Rule 2.8. Open Burning, General. Prior notification to BAAQMD shall be made by submitting an Open Burning Prior Notification Form to BAAQMD's office in San Francisco.

Impact

4.2-2 Construction of the Proposed Project could generate TACs from construction equipment exhaust.

Diesel engines emit a complex mixture of air *pollutants composed of* gaseous and solid material. Many of these air pollutants are designated by the California Environmental Protection Agency as TACs. The TAC of concern during construction is the visible emission known as diesel particulate matter (DPM), which includes carbon particles or "soot." Exposure to DPM is a health hazard, particularly to sensitive receptors, such as children whose lungs are still developing, the elderly, and persons who may have serious health problems. However, only sensitive receptors, which have long-term exposure to DPM, would be considered as individuals who have an increased health risk. Long-term exposure is considered 70 years for a health risk assessment. Construction emissions of DPM are temporary and intermittent and would not create a long-term health risk to sensitive receptors. At this time, neither CARB nor the U.S EPA has a regulatory standard for diesel exhaust emissions. The USEPA took steps to reduce the overall particulate matter in the air by promulgating a new lower PM_{2.5} NAAQS of 35 ug/m³ in December 2006.

Construction activities associated with the Proposed Project could include heavy and stationary equipment that operate on diesel fuel. DPM emissions generated by these uses would be temporary and intermittent, and would be generated primarily at a single location. Idling equipment, including trucks, generators, and stationary equipment would increase DPM levels at the project site. DPM emissions may be blown to nearby sensitive receptors, including nearby residential units constructed at an earlier time in the construction phase of the project. Given the timing of the project (construction would occur over a seven year period) and the distance of the nearest sensitive receptor to the project site (minimum of 100 feet) it is not anticipated that the Proposed Project would substantially increase TACs in the vicinity of the Proposed Project. Construction activities would be temporary and would not result in long-term exposure of sensitive receptors to DPM emissions, construction of the Proposed Project is not anticipated to result in elevated health risks. This is considered a less than significant impact. **Less than Significant.**

Impact

4.2-3 Construction of the Proposed Project could have the potential to generate objectionable odors.

Construction activities have the potential to emit odors from diesel equipment, paints, solvents, fugitive dust, and adhesives. Odors from construction are intermittent and temporary and general do not extend beyond the projects boundary. Construction activities would occur approximately 100 feet from the nearest sensitive odor receptor. Given the distance to the nearest sensitive receptor and the temporary and intermittent nature of construction odors, a less than significant odor impact would occur during the construction phase of the Proposed Project. **Less than Significant.**

Operational Effects

Impact

4.2-4 Operation of the Proposed Project could generate emissions of ROG, NO_x, PM₁₀, and PM_{2.5}.

Once the Proposed Project has been constructed and occupied, operational activities associated with various land uses of the Proposed Project would generate ROG, NO_x, PM₁₀, and PM_{2.5} emissions. ROG, NO_x, PM₁₀, and PM_{2.5} are pollutants of concern due to their role in the formation of ozone and particulate matter. The majority ROG, NO_x, PM₁₀, and PM_{2.5} emissions would be generated by vehicle trips associated with the residences, students and employees of the school, and visitors to recreational facilities on the project site. Consumer products (e.g., cleaning products, aerosol sprays, automotive products) used by residents and employees would also contribute ROG and NO_x emissions. Lesser sources of precursors would include energy use (fuel combustion for heating and cooling of buildings) and the application of architectural coatings.

As shown in **Table 4.2-6**, without mitigation operational ROG, NO_x, and PM₁₀ emissions exceed the BAAQMD and YSAQMD significance thresholds. PM_{2.5} emissions do not exceed the BAAQMD threshold of significance. This is considered a significant impact. Emissions of criteria air pollutants would be reduced through project design features, regulatory requirements, and implementation of mitigation measures. Project design features incorporate sidewalks that connect project areas improving pedestrian circulation while reducing the dependence on motorized vehicle transportation within the project site and a network of landscaped pedestrian/bike corridors that connect key elements of the area, such as the Neighborhood Park, Southtown Park, school site, and arterial streets. Regulatory requirements entail adherence to the Green Building Code standards, which result in decrease energy consumption. In addition, the recommended mitigation measures presented below would minimize the identified significant effect from ROG_s, NO_x, and PM₁₀ resulting from construction activities. The reduction in operational emissions resulting from project design features, regulatory requirements, and implementation of specific mitigation measures was estimated using URBEMIS to the extent possible as various reduction features are not quantifiable. With the incorporation of these measures, project-related emissions during operation would be reduced, but would still exceed BAAQMD and YSAQMD thresholds for NO_x, ROG_s, and PM₁₀. Therefore, this impact is considered to be significant and unavoidable. **Significant and Unavoidable.**

TABLE 4.2-6
MITIGATED (UNMITIGATED) OPERATIONAL EMISSIONS

Emission Type	Pollutants of Concern			
	ROG	NOX	PM10	PM2.5
	tpy	tpy	tpy (lb/day)	tpy
Area	11.34 (11.34)	3.43 (3.43)	0.02 (0.02) [0.13 (0.13)]	0.02 (0.02)
Mobile	9.37 <u>5.4</u> (10.18)	8.87 <u>9.10</u> (9.93)	25.99 <u>6.61</u> (29.08) [145.86 <u>2.37</u> (159.34)]	4.93 <u>5.05</u> (5.51)
Total Emission	20.74 <u>88</u> (21.52)	12.30 <u>53</u> (13.36)	26.04 <u>63</u> (29.10) [142.50 <u>5.99</u> (159.47)]	4.95 <u>5.07</u> (5.53)
BAAQMD/YSAQMD Thresholds	10/10	10/10	15/(80)	10/N/A
Exceed Thresholds	Yes/Yes	Yes/Yes	Yes/Yes	No/N/A

tpy = tons per year; lb/day = pounds per day.
Source: URBEMIS 9.2.4, 2007.

Mitigation Measure 4.2-4a: The City shall ensure through conditions of project approval or the specific plan requirements that the following mitigation measures are implemented to reduce project-related operational emissions:

- ~~The number of parking spaces at the proposed school shall be consistent with the Leadership in Energy and Environmental Design standards.~~
- ~~The following provision along with design standards shall be included within the Vanden Meadows Specific Plan: If the City expands City Coach’s Route 8 (or any other route) into Vanden Meadows area, the Applicant shall install bus turnouts and transit stops in location(s) designated by the City.~~

Mitigation Measure 4.2-4b: To reduce project-related emissions, the applicant shall incorporate openings and gaps in the sound walls and cul-de-sacs shown on tentative maps and building plans to allow access to adjacent streets and pathways to the extent possible to further maximize connectivity for bicyclist, pedestrians, and direct access to transit stops.

Mitigation Measure 4.2-4c: To reduce project-related emissions, bicycle lanes shall be provided on all arterial and major and minor collector roadways that connect to existing bicycle routes in adjacent developments.

Impact

4.2-5 Operation of the Proposed Project has the potential to generate TACs or may be located near TAC sources.

The Proposed Project is not considered a major emitter of TACs under the BAAQMD 2010 CEQA Guidelines or the YSAQMD 2007, Handbook for Assessing and Mitigating Air Quality Impacts. And therefore would not conflict with or obstruct implementation of the applicable air quality plan

or violate any air quality standard or contribute substantially to an existing or projected air quality violation in relation to TAC emissions.

According to CARB's land use guidelines, sensitive receptors should be located greater than 500 feet from major freeways with a capacity of 100,000 cars per day, 1,000 feet from a railroad yard, distribution center, large gas dispensing facilities, chrome plating facilities, refineries, and ports, and 300 to 500 feet from a dry cleaning facility to avoid health risks due to TACs emissions. The closest major freeway is Interstate 80, which is located 3.8 miles northwest of the project site (CARB, 2005). There are no railroad yards, distribution centers, large gas dispensing facilities, chrome plating facilities, refineries, or ports within 1,000 feet of the project site. However, implementation of the Proposed Project would result in the development of residences and a school located within approximately 350 feet and 1,900 feet, respectively of passenger and freight trains traveling along the Union Pacific Railroad (UPRR) tracks, which constitute a minor mobile source of TACs (in the form of diesel particulate matter [DPM]). Trains have the potential to emit significant amounts of DPM when large numbers of trains are idling in rail yards due to the localization of high concentrations of DPM; however, trains moving at moderate to high speeds do not produce high concentrations of DPM at any one location due to the trains' movement. The BAAQMD and the YSAQMD CEQA Guidelines do not identify mobile trains as a source of DPM.

Approximately 50 trains per day pass the project site (Noise Impact Analysis, **Appendix K**). Neither the BAAQMD nor the YSAQMD provides guidance on how to evaluate DPM emissions for trains. However, the BAAQMD 2010 CEQA guidelines provide a health risk screening table to determine if roadways with less than 100,000 vehicles per day emit DPM in concentrations that would require the lead agency to conduct dispersion modeling for DPM. "The results of the screening indicates weather new receptors will be exposed to highway/roadway TAC emissions at concentrations exceeding the threshold of significance (10 in one million) and weather, a more refined modeling analysis may be needed" (BAAQMD, 2010). Therefore, to assess the need for further modeling, train emissions were compared to the BAAQMD screening threshold.

To determine the number of on-road diesel vehicle that would be equivalent to the DPM emissions from one train, the following emission factors for a typical train and diesel vehicle were used (CARB, 2011b and EPA, 2011):

- Union Pacific General Electric C44-9W train with a horsepower rating of 3,200 brake horsepower (bhp) and an emission factor of 0.086 grams per bhp-hour (g/bhp-hr)
- On-road diesel vehicle with an average horsepower rating of 625 bhp with an emission factor of 0.01 g/bhp-hr

As shown in **Equation 4.2-1**, DPM emissions resulting from one train are equivalent to the emissions resulting from 44 on-road diesel vehicles. Because approximately 50 trains pass the project site daily, the associated level of daily DPM emissions from trains passing adjacent to the project site would be equivalent to approximately 2,202 on-road diesel vehicles per day.

Equation 4.2-1: $(0.086 \text{ g-trains./bhp-hr} * 3,200 \text{ bhp}) / (0.01 \text{ g-veh/bhp-hr.} * 625 \text{ bhp}) = 44 \text{ veh. / loc.}$

Note veh. = vehicles

The BAAQMD screening threshold pertains to total vehicles on the roadway, not solely diesel vehicles. To compare the number of diesel vehicle equivalents of the train emissions to the BAAQMD screening threshold, a distribution of diesel vehicles to total roadway vehicles was utilized. Assuming the URBEMIS air quality model default vehicle distribution, 2.3 percent of vehicles on a given roadway are assumed to be diesel vehicles. Therefore, using this distribution, 2,202 diesel vehicles per day would equate to 95,652 total vehicles per day. Using the health risk screening table in the BAAQMD CEQA Guidelines for an east/west roadway in Solano County that carries 100,000 vehicles per day, the cancer health risk for sensitive receptors located between 200-500 feet from the rail tracks would be 7.89 to -3.33 in one million individuals. This health risk is calculated assuming day and night occupancy for 70 years. The screening health risk of 7.89 to -3.33 is below the BAAQMD health risk threshold of 10 in one million; therefore, dispersion modeling and additional analysis would not be warranted according to the BAAQMD CEQA guidelines. The calculated health risk associated with the Proposed Project is highly conservative since DPM emissions would be substantially reduced at the location of sensitive receptors over average conditions used to estimate health risk in the BAAQMD screening tables due to the installation of a sound wall approximately eight to ten feet high, and prevailing easterly winds that would transport DPM emissions away from sensitive receptors (there are no proposed sensitive receptors downwind or east of the tracks).

~~According to CARB, land use guidelines for health risk from TACs would increase only if sensitive receptors were placed within 500 feet of a major freeway (capacity of 100,000 plus cars per day) or 1,000 feet from a railroad yard, distribution center, large gas dispensing facilities, chrome plating facilities, refineries, and ports, or 300 to 500 feet from a dry cleaning facility. The closest major freeway is Interstate 80, which is located 3.8 miles northwest of the project site. There are no railroad yards, distribution centers, large gas dispensing facilities, chrome plating facilities, refineries, or ports within 1,000 feet of the project site. However, implementation of the Proposed Project would result in the development of residences located within approximately 350 feet of passenger and freight trains traveling along the Union Pacific Railroad (UPRR) tracks, a minor mobile source of TACs (in the form of diesel particulate matter [DPM]). Trains have the potential to emit significant amounts of DPM when large numbers are idling in rail yards; however, DPM emissions from trains moving at moderate to high speed do not result in the localization of high concentrations of DPM. The BAAQMD Guideline does not identify mobile trains as a source of DMP.~~

~~Approximately 50 trains per day would pass the project site (Noise Impact Analysis, **Appendix K**). Neither the BAAQMD nor the YSAQMD provides guidance on how to evaluate TAC emissions from trains. However, under the BAAQMD 2010 CEQA guidelines screening process, if a roadway has fewer than 10,000 daily vehicle trips, then dispersion modeling for TAC's is not warranted. It is assumed for this analysis that the TAC emissions from one train (conservatively~~

~~assuming an Union Pacific General Electric C44-9W train with a horsepower rating of 4,400) are the equivalence of approximately 20 on-road light-duty vehicles with an average horsepower rating of 220 (DOE, 2011); therefore, the level of TAC emission from rail traffic along the train tracks adjacent to the project site would be the equivalent to approximately 1,000 vehicles per day. This is less than the BAAQMD screening total of 10,000 vehicles per day; therefore, TAC dispersion modeling and additional analysis is not warranted.~~ The Proposed Project would not place sensitive receptors in an area with high levels of TACs that would be considered a significant human health risk. To further reduce DPM levels at near-by sensitive receptors as a result of train emissions, Mitigation Measure 4.2-5a would result in the planting of conifer trees on the curb side of the proposed sound wall along Leisure Town Road between residential housing and the train tracks. This mitigation is recommended in the BAAQMD CEQA Guidelines and has been shown to reduce DPM levels by 65 to 85 percent. ~~Therefore, this impact is considered a less than significant impact with mitigation (BAAQMD, 2010).~~ **Less than Significant.**

Mitigation Measure 4.2-5a: The Applicant shall plant trees such as redwood, deodar cedar, live oak or oleander adjacent to the sound wall along Leisure Town Road north of Vanden Road to the northern project boundary.

Impact

4.2-6 Operation of the Proposed Project could generate objectionable odors, or place sensitive receptors in an area subject to objectionable odors.

Under the YSAQMD and BAAQMD CEQA Guidelines (YSAQMD, 2007; BAAQMD, 2010) the Proposed Project is not considered an odor generating land use. Additionally, in accordance with YSAQMD Rule 2.5 and BAAQMD Regulation 7, the Proposed Project would be restricted from emitting quantities of pollutants that would cause detriment, nuisance, or annoyance to any persons or to the public. This impact is considered less than significant.

Existing odor sources in the area of the project site are primarily limited to those associated with various agricultural activities and the EWWTP. Proposed sensitive land uses on the project site, including residential housing, could be exposed to offensive odors resulting from adjacent agricultural activities and operation of the EWWTP. It is anticipated that odors resulting from agricultural activities to the east would be reduced through proposed buffers, as described in **Section 4.3** (including associated mitigation). Agricultural activities to the south are low intensity consisting of grain crops and livestock grazing and thus are not likely to emit odors that would be considered a nuisance to the proposed estate housing located along the southern border of the project site. Additionally, the EWWTP is located approximately 2.1 miles northeast of the project site; in 2004, a number of odor control improvement measures were incorporated throughout the treatment process to reduce odor output. This impact is considered less than significant. **Less than Significant.**

Cumulative Impacts

4.2-7 Operation of the Proposed Project could generate emissions of ROG, NO_x, PM₁₀, and PM_{2.5}, which in combination with past, present, and future criteria emissions, has the potential to cause and exceedance of the NAAQS and/or the CAAQS.

Past, present and future development projects contribute to a regions air quality conditions on a cumulative basis; therefore by its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of the NAAQS or CAAQS. If a project's individual emissions contribute toward exceedance of the NAAQS, then the project's cumulative impact on air quality would be significant. In developing attainment designations for criteria pollutants, the EPA considers the regions past, present, and future emission levels. AQMDs determine suitable significance threshold, based on areas designated nonattainment status. These thresholds provide a tool by which the AQMD can achieve attainment for a particular criteria pollutant that is designated as nonattainment. Therefore, the AQMD's significance thresholds consider the regions past, present, and future emissions levels.

Implementation of the Proposed Project combined with the proposed developments within the project area could lead to cumulative impacts to air quality. Operational activities of the Proposed Project in the year 2030 would result in ROG, NO_x, PM₁₀, and PM_{2.5} emissions, which are assumed to be pollutants of concern in the year 2030. The majority of ROG, NO_x, PM₁₀, and PM_{2.5} emissions would be generated by vehicle trips associated with school students and employees, residents, and visitors of the Proposed Project, Southtown Development, and Fairfield Train Station Specific Plan. Consumer products (e.g., cleaning products, aerosol sprays, automotive products) used by residents and employees would also contribute ROG and NO_x emissions. Lesser sources of precursors would include energy use (fuel combustion for heating and cooling of buildings) and the application of architectural coatings.

Table 4.2-7 shows the 2030 operational emissions of ROG, NO_x, PM₁₀, and PM_{2.5}. As shown in **Table 4.2-7** ROG and PM₁₀ would exceed both the BAAQMD's and the YSAQMD's thresholds of significance for operational emissions. Operational emissions from the Proposed Project would result in a cumulative significant and unavoidable impact to the region's air quality in the year 2030. Mitigation provided in **Mitigation Measure 4.2-4** will reduce project emissions; however, not to a less than significant level. **Significant and Unavoidable.**

Mitigation Measure 4.2-7: Implement **Mitigation Measure 4.2-4.**

TABLE 4.2-7
2030 MITIGATED (UNMITIGATED) OPERATIONAL EMISSIONS

Emission Type	Pollutants of Concern			
	ROG	NOX	PM10	PM2.5
	tpy	tpy	tpy [lb/day]	tpy
Area	11.34 (11.34)	3.43 (3.43)	0.02 (0.02)[0.13 (0.13)]	0.02 (0.02)
Mobile	6.33 <u>46</u> (6.91)	5.044 <u>92</u> (5.50)	25.07 <u>6.61</u> (29.07) [142.33 <u>5.80</u> (159.29)]	4.925 <u>04</u> (5.49)
Total Emission	17.67<u>80</u> (18.25)	8.35<u>47</u> (8.93)	25.99<u>26.63</u> (29.09) [142.46<u>5.93</u> (159.42)]	4.945<u>06</u> (5.49)
BAAQMD/YSAQMD Thresholds	10/10	10/10	15/(80)	10/N/A
Exceed Thresholds	Yes/Yes	No/No	Yes/Yes	No/N/A
tpy = tons per year; lb/day = pounds per day. Source: URBEMIS 9.2.4, 2007.				

Impact

4.2-8 Construction and operation of the Proposed Project has the potential to result in cumulatively considerable emissions of GHGs.

Construction

URBEMIS 9.2.4 was used to estimate project-related construction GHG emissions. As shown in **Table 4.2-8** estimated direct construction emissions would be 22,787 metric tons (MT) of CO₂e over the seven year construction period. With the implementation of **Mitigation Measure 4.2-8a(5)**, construction CO₂e emissions from the Proposed Project would be reduced by 26 percent and would not exceed the BAAQMD significance thresholds regarding GHG construction emissions. Therefore, construction of the Proposed Project would not generate GHG emissions, either directly or indirectly, that would have a significant impact on the environment or conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. Construction emissions associated with the Proposed Project would not be cumulatively considerable in relation to global climate change. **Less than Significant with Mitigation.**

Operation

Operation of the Proposed Project would result in direct GHG emissions from vehicles travelling to and from the project site and from residential and school activities such as landscape maintenance. Operation of the Proposed Project would also result in indirect emissions from solid waste disposal, water and wastewater treatment, and electricity and natural gas usage. URBEMIS 9.2.4 and the BAAQMD Greenhouse Gas Model (Beta Version) were used to estimate project-related mobile, solid waste, water and wastewater, electricity, and natural gas GHG emissions. Operational GHG emissions attributable to the Proposed Project are estimated to be 16,681 MT of CO₂e per year. Operation of the Proposed Project would exceed the 1,100 MT significance threshold established in the BAAQMD 2010 CEQA Guidelines.

TABLE 4.2-8
CONSTRUCTION AND OPERATIONAL GHG EMISSIONS

Proposed Project	CO ₂ e Emissions (ST)	Conversion Factor (ST/MT)	GHG Emissions in CO ₂ e (MT per year)
Construction			
Construction	25,022	0.91	22,787
Construction Emission Reductions			
Mitigation 4.2-4e8a (26% reduction in GHG emissions)			-5,925
<i>Subtotal</i>			<i>16,862</i>
Operation			
Transportation			10,920
Area			4
Electricity Usage			2,112
Natural Gas			2,205
Water and Wastewater			168
Solid Waste			1,272
<i>Subtotal</i>			<i>16,681</i>
Operation Emission Reductions			
Adherence to Greed Building Code			-557
Project Design Features			-328
Mitigation 4.2-8a(1)			-634
Mitigation 4.2-8a(2)			-432
Mitigation 4.2-8a(3)			-13,630
<i>Subtotal</i>			<i>-15,581</i>
Total Operation Emissions			1,100
Total Project-Related GHG Emissions			17,962
Notes: ST = short tons; MT = metric tons; CO ₂ e = carbon dioxide equivalent Source: URBEMIS, 2007; LGOP, 2010.			

However, through regulatory requirements, project design features, and the implementation of **Mitigation Measures 4.2-4 and 4.2-8**, project-related GHG emissions would be reduced to 1,100 MT, below the BAAQMD threshold, through energy efficiency and use reduction, transportation availability, and permanently removing GHG emissions from the global inventory through the purchase of emissions reduction credits. Compliance with the Green Building Code standards would reduce residential and school electricity-related GHG emissions by 17 percent and natural gas emissions by 9 percent. Based on project design, the Proposed Project would be considered a transit oriented development and complete streets under the BAAQMD CEQA Guidelines. This design feature reduces mobile source GHG emissions by 3 percent. Implementation of **Mitigation Measure 4.2-8** would result in residential and school electricity-related GHG emissions reductions of 30 percent, residential and school natural gas-related GHG emissions reductions of 10 percent, and would require purchase of credits to off-set emissions. In addition,

as shown in **Table 4.2-9**, development of the Proposed Project would incorporate seven of the State of California Attorney General’s recommended GHG reduction measures. These recommended reductions are not readily quantifiable; however, these project components would further reduce project-related GHG emissions in all sectors of the project’s development and operation.

TABLE 4.2-9
GHG REDUCTION MEASURES

Attorney General’s Recommended GHG Reduction Measures	Implementation Mechanism
Signalized intersections throughout the project area will be coordinated with signalized intersection outside the project area.	Required through the Vacaville General Plan Transportation Element 6.2-16.
Incorporate bicycle lanes into street systems in the development.	Included as Project Component (refer to Section 3.4.3)
Create bicycle lanes and walking paths directed to the location of schools and other logical points of destination and provide adequate bicycle parking.	Included as Project Component (refer to Section 3.4.3)
Require the use of energy efficient appliances.	Required through Green Building Code
Require that the project use energy efficient lighting.	Required through Green Building Code
Develop a park.	Included as Project Component (refer to Section 3.4.3)
Reuse and recycle construction and demolition waste.	Required through Green Building Code
Source: AES, 2011.	

Therefore, operation of the Proposed Project would not generate GHG emissions, either directly or indirectly, that would have a significant impact on the environment or conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. Through mitigation, the project’s reduction in GHG emissions is consistent with the California Climate Action Team’s reduction strategies and States reduction targets established in the CARB’s December 2008 Scoping Plan and AB 32. Therefore, this impact is not cumulatively considerable. **Less than Significant with Mitigation.**

Mitigation Measure 4.2-8a: The applicant shall implement the following BAAQMD mitigation measures. Evidence of compliance with these measures shall be submitted to the City prior to the issuance of building permits:

- 1) The applicant shall require through contractual obligations with the contractor(s) that all heating, air conditioning, and ventilation (HVAC) ducts be sealed. This mitigation measure will reduce residential and school electricity-related GHG emissions by 30 percent.
- 2) The applicant shall require through contractual obligation with the local utility district and contractors that smart meters and programmable thermostats be installed in the school site and all residences. This mitigation measure will reduce residential and school electricity- and natural gas-related GHG emissions by 10 percent.

- 3) The applicant shall purchase CO₂e emissions reduction credits in the amount of 19,555 MT prior to the start of construction (5,925 MT for mitigation of construction emissions and 13,630 for mitigation of operational emissions). The CO₂e emission reduction credits must be permanently retired by the project proponent; thereby reducing annual GHG emissions for the lifetime of the Proposed Project. Evidence of purchase of GHG emission credits must be submitted to the City prior to approval of tentative maps and shall be a condition of the development agreement with the Vanden Meadows developer. The applicant shall purchase carbon emissions reduction credits from the Climate Action Reserve, the Verified Carbon Standard, the American Carbon Registry, or an equivalent carbon emissions reduction credit trading market, which has the same or more stringent standards for carbon sequestration projects which reduce atmospheric GHGs or direct GHG emissions reductions achieved by existing GHG emitters.

Mitigation Measure 4.2-8b: The applicant shall implement the following mitigation measures, which would further reduce project-related GHG emissions. Evidence of compliance with these measures shall be submitted to the City prior to the issuance of building permits:

- 1) The applicant shall require the project contractors to utilize local and regional building materials in order to reduce energy consumption and vehicle emissions associated with transporting materials over long distances; thus, reducing GHG emissions from material delivery trips.
- 2) The applicant shall construct new bus stops at convenient locations with pedestrian access to the project developments. Pullouts will be designed so that normal traffic flow or arterial roadway would not be impeded when buses are pulled over to serve riders. This mitigation would reduce project-related GHG emissions from idling and commuter vehicles.
- 3) The applicant shall implement **Mitigation Measures 4.2-1c and 4.2-1c**, which would reduce project-related vehicle GHG emissions.
- 4) The Applicant shall incorporate the use of the following in all development to the extent feasible:
 - Installation of efficient street and parking lot lighting (e.g., high pressure low sodium fixtures).
 - Installation of reflective window film or awnings on south and west facing windows;
 - Installation of ceiling and wall insulation.
 - Installation of Energy Management Systems to control HVAC systems including operating hours, set points, scheduling of chillers, etc.

Implementation of the above mitigation would reduce energy use and GHG emissions from its production.
- 5) The applicant shall through contractual obligation with the contractor install, in all buildings reflective, EnergyStar™ cool roofs. Cool roofs decrease roofing

4.2 Air Quality and Greenhouse Gas Emissions

maintenance and replacement costs, improve building comfort, reduce impact on surrounding air temperatures, reduce peak electricity demand, and reduce waste stream of roofing debris. Implementation of the above mitigation would reduce energy use and GHG emissions from its production.

- 6) The applicant shall include, in all residential buildings measures to conserve water usage including use of water efficient features such as high efficiency toilets, water conserving dishwashers, hot water demand systems, and electronic timers to control landscape irrigation systems. This mitigation would reduce energy used to transport water and GHG emissions from its production.
- 7) The applicant shall prohibit any wood-burning fireplaces, woodstoves, or similar wood-burning devices. Homes may be fitted with UL rated natural gas burning appliances. This prohibition shall be included in any CC&Rs that are established. This mitigation would reduce GHG emissions from the combustion of wood products.

4.3 AGRICULTURE AND FORESTRY RESOURCES

4.3.1 INTRODUCTION

This section addresses the potential for the Proposed Project to impact the agricultural resources. Following an overview of the environmental setting in Subsection 4.3.2 and the relevant regulatory setting in Subsection 4.3.3, project-related impacts and recommended mitigation measures are presented in Subsection 4.3.4.

4.3.2 ENVIRONMENTAL SETTING

Regional

According to the 2010 Annual Crop Report the value of agricultural production for Solano County (County) was approximately \$259,398,200. The majority of that value was from the cultivation of tomatoes, walnuts, nursery products, and alfalfa crops (Solano County, 2010). The project site is located within the western portion of the Elmira/Main Prairie Agriculture Region, one of ten identified agricultural regions in the County. The Elmira/Maine Prairie Region consists of approximately 75,358 acres of farmland whose major crops include: alfalfa, wheat, corn, pasture, beef cattle, and sheep. The northern area of the region, including the project site and vicinity, is dominated by field crops while the southern area is dominated by grazing land for livestock (UCDAIC, 2007).

Agricultural Lands Classifications within Solano County

The California Department of Conservation (DOC) defines Prime Farmland as “farmland with the best combination of physical and chemical features able to sustain long term production of agricultural crops.” This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. As of 2008, the total acreage of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance in the County was 153,298 acres (approximately 26 percent of the County’s total acreage), including 135,735 acres Prime Farmland. According to the DOC Farmland Mapping and Monitoring Program (FMMP), a net total of 5,835 acres of important farmland in the County was converted to other uses between the years 2008 and 2010 (DOC, 2010a). Since 1984, the average annual conversion of important farmland in the County is 1,288 acres (DOC, 2010b).

Project Site Setting

Figure 4.3-1 illustrates the FMMP designations for the project site and vicinity. It should be noted that land north of the project site has been converted to Urban and Built-up land since the last update of the map in 2008. Approximately there are 56.81 acres of Prime Farmland, 12.02 acres of Farmland of Statewide Importance, and 195.65 acres of Grazing Lands on the project site. Presently, the project site is mostly undeveloped and primarily used for dry farming of field crops. The project site does not contain a working irrigation system, and has not been irrigated within the last 10 years. There are three existing home sites on the project site, one of which is vacant. As shown in **Figure 4.3-2**, approximately 25.48 acres (APNs 0137-050-020 and 0137-050-010) in the southwestern corner of the project site is currently under Williamson Act contracts.

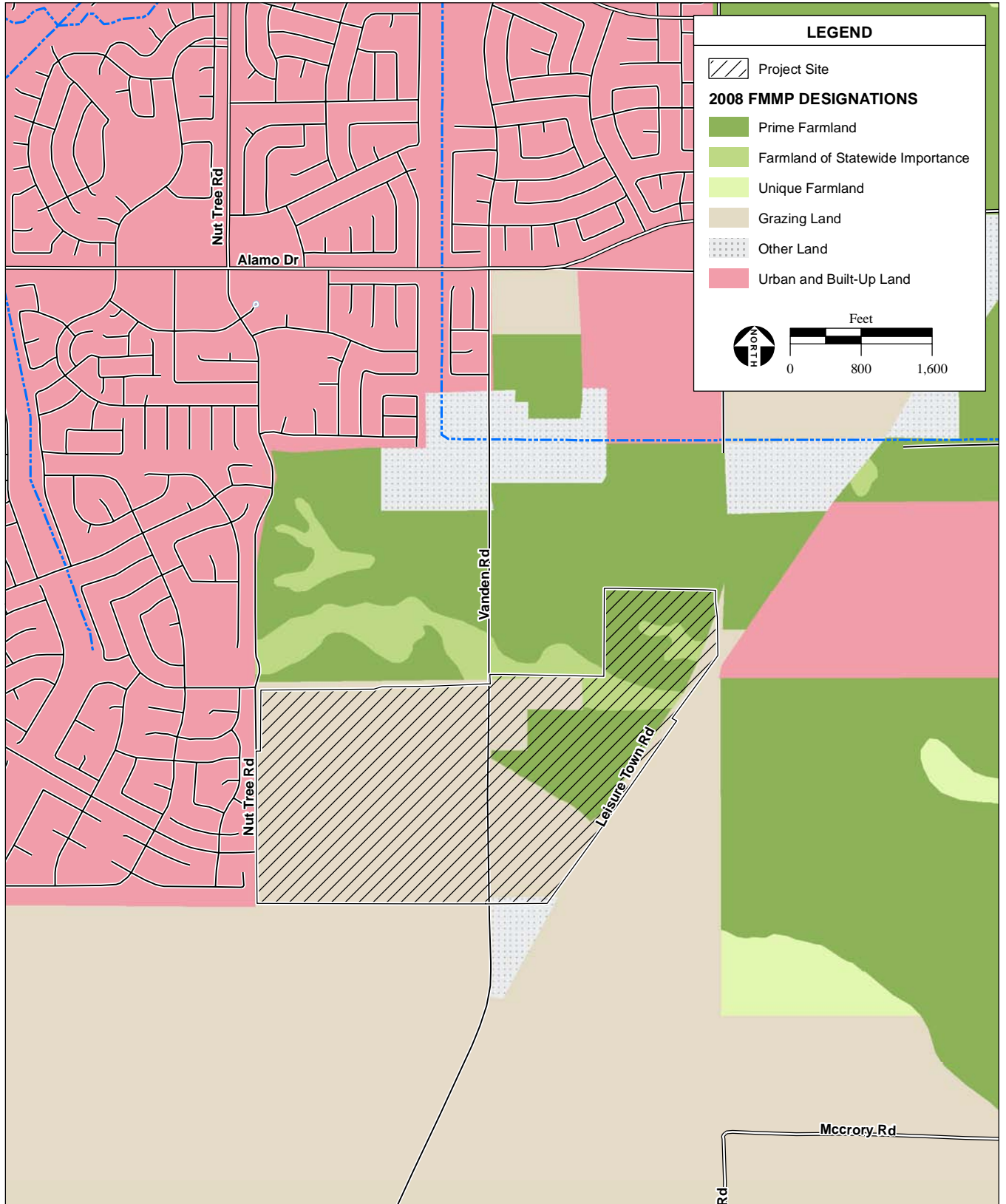


Figure 4.3-1
Farmland Classifications

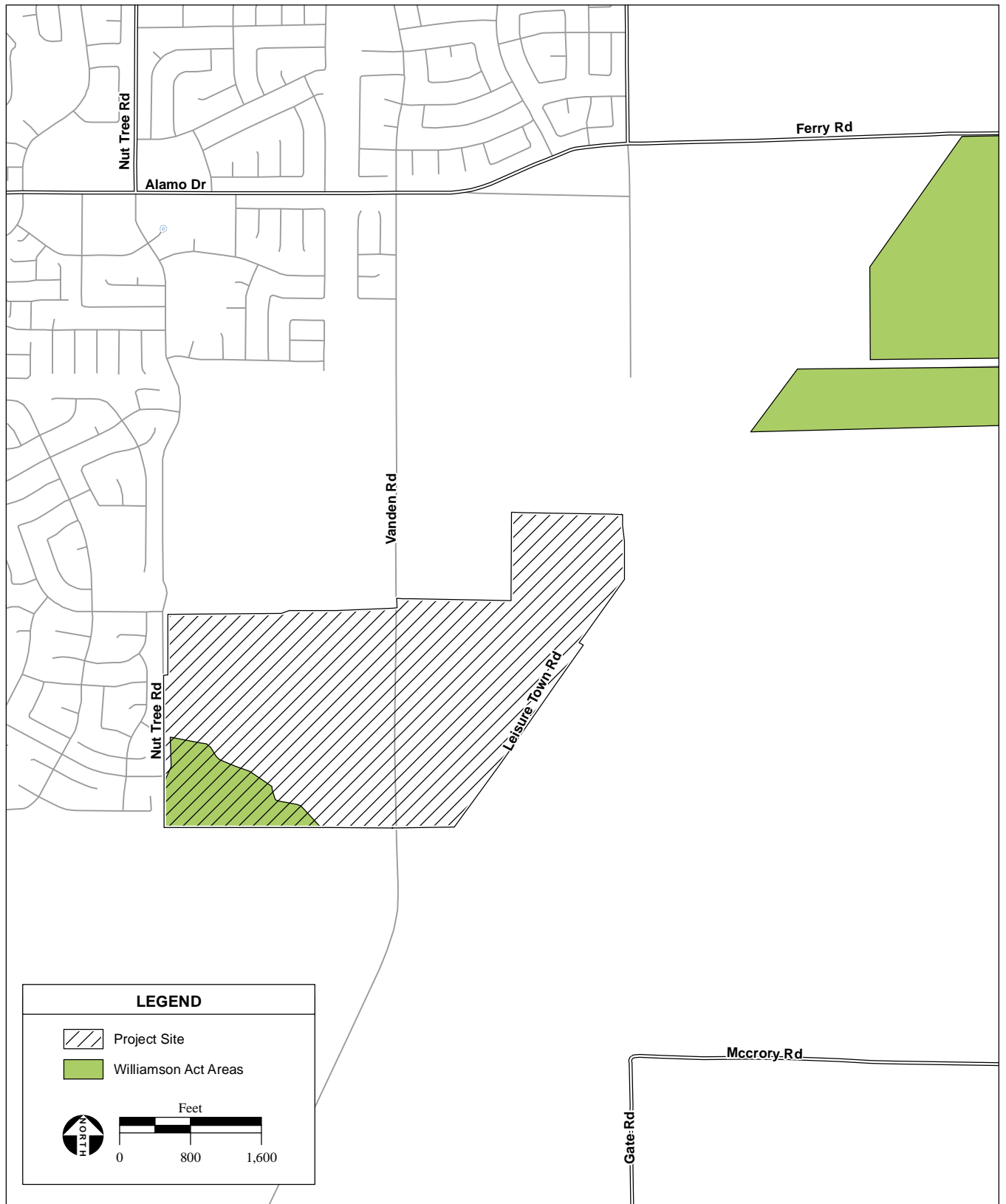


Figure 4.3-2
Williamson Act Parcels - Existing Setting

Project Site Soil

The DOC FMMP has established a “Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance.” Three of the five soils found within the project site, described in **Section 4.6 - Geology and Soils**, are considered Important Farmland Soils (DOC, 2009c).

Table 4.3-1 shows the National Resource Conservation Service (NRCS) land capability classification and California revised Storie Index for soils within the project site. The NRCS Land Capability Classification System is based on the limitations of soils for irrigated field crops, the risk of damage if soils are used for crops, and the way soils respond to management. Land capability classes for irrigated lands are designated by the numbers I through VII, indicating progressively greater limitations and narrower choices for agricultural use. The land capability classes are defined as:

- Class I soils have slight limitations that restrict their use.
- Class II soils have moderate limitations that restrict the crop selection or that require moderate conservation practices.
- Class III soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.
- Class IV soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.
- Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland and/or wildlife habitat.
- Class VI soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.
- Class VII soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, and/or wildlife habitat.

As shown in the table, soils on the project site range from Class II to Class IV, indicating moderate to severe limitations that restrict the choice of crops and require moderate to careful management considerations.

The California revised Storie Index is a soil rating based on four soil characteristics that govern a soil's potential for cultivated agriculture in California (**Table 4.3-1**). These characteristics include: (1) degree of soil profile development, (2) texture of the surface layer, (3) slope, and (4) manageable features including drainage, fertility, acidity, erosion, and salt content. The Storie Index rating is presented as a score ranging from 0 to 100. For simplification, the NRCS combines the Storie Index ratings into six grade classes as follows (NRCS, 2009):

- Grade 1 (excellent) – 100-80;
- Grade 2 (good) – 79-60;
- Grade 3 (fair) – 59-40;
- Grade 4 (poor) – 39-20;
- Grade 5 (very poor) – 19-10; and
- Grade 6 (nonagricultural) – less than 10.

TABLE 4.3-1
PROJECT SITE SOILS LAND CAPABILITY CLASSIFICATION AND STORIE INDEX RATING

Soil Type	Land Capability Classification ^a	Storie Index Rating	Acres of Project Site	Proportion of Project Area	Farmland Classification
Capay Silty Clay Loam (Ca)	Class II	69 - Grade 2	98.62	37.13 %	Prime
Dibble-Los Osos Loams (DbC)	Class III	65 - Grade 2	11.26	4.24 %	Statewide Importance
Millsap Sandy Loam (MkA)	Class IV	38 - Grade 4	1.18	0.45 %	n/a
San Ysidro Sandy Loam (SeA)	Class IV	46 - Grade 3	133.00	50.08 %	n/a
San Ysidro Sandy Loam, Thick Surface (SfA)	Class III	49 - Grade 3	21.35	8.04 %	Statewide Importance
Note: a – Classifications are for irrigated soils. Source: NRCS, Web Soil Survey 2009; DOC, 2009c; Negroni, 2011					

As shown in the table, project site soils range from Grade 2 to Grade 4, indicating good to poor potential for cultivated agriculture.

Surrounding Land Uses

The proposed location is adjacent to the southeastern corner of the City of Vacaville. Surrounding land uses consist primarily of lands classified as Urban and Built-Up Land, Grazing Land, Prime Farmland, and Unique Farmland (**Figure 4.3-1**). The Foxboro Development, which is within the City of Vacaville's city limits, is adjacent to the western boundary of the project site. Land to the north of the site was recently annexed by the City and construction of the Southtown Project has begun which will contain primarily residential uses. The unincorporated land to the south and east is designated in the Solano County General Plan as "Agriculture" with an overlay for the "Vacaville-Fairfield-Solano Greenbelt" (**Figure 4.9-1**) (Solano County, 2008).

4.3.3 REGULATORY CONTEXT

Federal

Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that federal programs are administered in a matter that is compatible with state and local units of government, and private programs and policies to protect farmland (7 U.S.C. § 4201).

The NRCS, responsible for the implementation of the FPPA, categorizes farmland in a number of ways. These categories include: prime farmland, farmland of statewide importance, and unique farmland. Prime farmland is considered to have the best possible features to sustain long-term productivity. Farmland of statewide importance includes farmland similar to prime farmland but with minor shortcomings, such as

greater slopes or less ability to store soil moisture. Unique farmland is characterized by inferior soils and generally needs irrigation depending on climate.

State

California Farmland Mapping and Monitoring Program

The FMMP, which monitors the conversion of the state's farmland to and from agricultural use, was established by the DOC, under the Division of Land Resource Protection. The program maintains an inventory of state agricultural land and updates its "Important Farmland Series Maps" every two years. The FMMP is an informational service only and does not constitute state regulation of local land use decisions.

The four categories of farmland, which include Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance, are considered valuable and any conversion of land within these categories is typically considered to be an adverse impact. The DOC provides the following definitions for the categories of farmland found on the project site:

Prime Farmland: Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance: Farmland with a good combination of physical and chemical features but with minor shortcomings such as greater slopes or with less ability to hold and store moisture.

Grazing land: Land on which the existing vegetation is suited to the grazing of livestock.

A map of the FMMP designations for the project site and surrounding area is provided in **Figure 4.3-1**.

Williamson Act

The Williamson Act is a State program that was implemented to preserve agricultural land. Under the provisions of the Williamson Act (California Land Conservation Act 1965, Section 51200), landowners contract with the county to maintain agricultural or open space use of their lands in return for reduced property tax assessments. The contract is self-renewing; however, the landowner may notify the county at any time of intent to withdraw the land from its preserve status. Withdrawal from a Williamson Act contract involves a gradual tax adjustment to full market value over a ten-year period before protected agricultural/open space land can be converted to urban uses (DOC, 2009). In certain situations, immediate termination is sometimes granted. As shown in **Figure 4.3-2**, the project site includes two parcels of land in the southwestern corner that are currently under Williamson Act contracts.

California Land Evaluation and Site Assessment

The California Land Evaluation and Site Assessment (LESA) is a numeric rating system to evaluate the relative value of agricultural land resources. A LESA rating is composed of two separate sets of factors: Land Evaluation and Site Assessment. Land Evaluation measures the natural quality of the soil in the area in relation to agricultural suitability, while Site Assessment measures social, economic, and geographic attributes in relation to agricultural. These specific factors include soil resource quality, project size, water resource availability, surrounding agricultural lands, and surrounding protected resource lands (DOC 1997).

Local

Solano County Right to Farm Ordinance

The County's Right to Farm Ordinance was adopted to support County policies regarding the conservation and enhancement of agricultural operations in unincorporated County lands. The stated purpose and intent of the Right to Farm Ordinance is to reduce impacts to County agricultural resources by limiting the circumstances under which properly conducted agricultural operations will be deemed a nuisance.

The ordinance promotes a good-neighbor policy by requiring that users of properties adjacent to or near agricultural operations be notified of the inherent potential problems associated with being located near such operations, including noise, odors, dust, operation of machinery, application of fertilizers, soil amendments, seeds and pesticides and other potential effects. Through notification, it is intended that property owners will better understand the potential consequences of being located near agricultural operations. The ordinance states that attendant conditions from properly conducted agricultural operations shall not be considered a nuisance to adjacent property owners and shall be accepted as being a normal and necessary aspect of being located in a rural area (Solano County, 2008).

City of Vacaville General Plan

The following General Plan guiding and implementation policies associated with agricultural resources are applicable to the Proposed Project (City of Vacaville, 2007a).

Guiding Policies

- 2.1-G4: Minimize conflicts between agriculture and urban uses and provide for a transitional area or buffer between agricultural and urban uses.
- 3.5-G5: Maintain a compact urban form and locate growth areas to minimize loss of agricultural resources.
- 3.5-G6: Minimize conflicts between urban and agricultural uses by establishing Agricultural Buffers and community separators.
- 5.1-G3: Require buffer landscaping and multiple use, where feasible, of utility sites and rights-of-way to harmonize with adjoining uses.

Implementing Policies

- 2.1-12: Continue to work through established agreements with the City of Fairfield, City of Dixon, Solano County, and Solano County Irrigation District and negotiate with other public and private agencies to ensure creation of agricultural zones and open space corridors that will serve as community separators between Vacaville and Fairfield and Fairfield and Dixon.
- 2.3-12: In the portion of the Vanden Specific Plan area south of Foxboro Parkway and west of Vanden Road, the minimum lot size shall be 10,000 square feet.
- 2.5-18: Maintain buffers between residential and agricultural areas and between residential areas and industrial parks as required by adopted regulations and Policy Plans. The minimum separation shall be as follows:
 - Between residential and agricultural uses: 500 feet. Standards for walls and landscaping and compatible uses permitted within the buffer area are defined in the Land Use and Development Code and Policy Plans. The Planning Commission may reduce this standard upon review and approval of a Planned Development where design features such as solid masonry walls and appropriate building setbacks are provided. In addition, Disclosure Statements and Right to Farm Deed Restriction may also be required.
- 3.5-11: Maintain agricultural production areas east of Leisure Town Road. In accordance with policies set forth in the 1980 General Plan, maintain agricultural production areas in Upper Lagoon, Bassford Canyon and Vaca Valley.
- 3.5-18: Require a permanent Agricultural Buffer as part of residential developments on the urban edge. Establish appropriate development standards, density transfer provisions, and use regulations for these buffer areas.
- 5.2-15: Implement zoning designations (s) that will clearly delineate major institutions and public facilities and their use.

Land Use and Zoning Designations

The Vanden Meadows project site is currently located outside of the City of Vacaville; however it is located within the Urban Growth Boundary of the City and is identified within the City's Municipal Service Review and Comprehensive Annexation Plan (City of Vacaville, 2004) as Site K – Vanden South of the identified near-term growth areas of the City. The project site is designated in the City's General Plan for Low Density Residential, Estate Residential, Schools, and Public Open Space. The surrounding City lands are zoned as Residential Low Density (RLD-5, RLD-6, RLD-8, and RLD-10), Community Facilities (CF), Residential Estate (RE-10), General Commercial (CG), and Residential Low Medium Density (RLMD-3.6 and RLM-4.5) (see **Section 4.9**). Surrounding land uses to the south and east of the project site are designated within the County General Plan land use map as "Agriculture" with an overlay for the "Vacaville-Fairfield-Solano Greenbelt" (**Figure 4.9-1**) (Solano County, 2008). A detailed description of existing general plan land use and zoning designations is provided in **Section 4.9, Land Use**.

Vacaville-Fairfield-Solano Greenbelt Authority

On September 13, 1994, the City of Vacaville, City of Fairfield and Solano County entered into a joint agreement for the formation of the Vacaville-Fairfield-Solano Greenbelt Authority (VFSGA) and creation of the Vacaville-Fairfield Greenbelt. The goals of the VFSGA are to provide for the preservation and conservation of viable agricultural and open space land, and to provide a permanent separation between

the urban areas of Fairfield and Vacaville. The agreement does not stipulate minimum buffer widths between urban uses and agricultural uses within the greenbelt; however, it does require that “Urban Limit Line Buffers” be established in areas outside of the greenbelt with a minimum width of 500 feet when adjacent to residential uses and a minimum width of 300 feet when adjacent to non-residential uses.

4.3.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

This section identifies any impacts to agricultural resources that could occur from construction, operation, and/or maintenance of the Proposed Project as determined in the Initial Study (**Appendix B**). Impacts to agricultural resources were analyzed based on farmland classification provided by the DOC and NRCS, and comparison of these factors to the significance criteria listed below. If significant impacts are likely to occur, mitigation measures are included to increase the compatibility of the Proposed Project and to reduce impacts to less-than-significant levels.

Significance Criteria

Criteria for determining the significance of impacts to agricultural resources have been developed based on Appendix G of the California Environmental Quality Act’s (CEQA) *Guidelines*. Impacts to agricultural resources would be considered significant if the Proposed Project would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland, to non-agricultural use.
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resource Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)) or result in the loss of forest land or conversion of forest land to non-forest use.

Effects Found Not to be Significant

The Initial Study (**Appendix B**) concluded that the Proposed Project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resource Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)) or result in the loss of forest land or conversion of forest land to non-forest use. These effects are therefore not considered within this EIR.

Project Specific Impacts

Impact

4.3-1 The Proposed Project could result in the conversion of Prime Farmland within the project site to non-agricultural uses.

The Proposed Project would convert approximately 56.81 acres of Prime Farmland, 12.02 acres of Farmland of Statewide Importance, and 195.65 acres of Grazing Lands to urban uses. The DOC recommends using the LESA model to assess the significance of agricultural land conversion resulting from implementation of proposed project. **Table 4.3-2** shows the breakdown of the LESA score for the Proposed Project.

TABLE 4.3-2
PROPOSED PROJECT LAND EVALUATION AND SITE ASSESSMENT SCORE

Factor Name	Factor Rating	Factor Weighting	Score
Land Evaluation			
Land Capability Classification	57.7	0.25	14.4
Storie Index Rating	55.5	0.25	13.9
Subtotal			28.3
Site Assessment			
Project Size	100.0	0.15	15.0
Water Resource Availability	100.0	0.15	15.0
Surrounding Agricultural Lands	20.0	0.15	3.0
Protected Resource Lands	0.0	0.05	0.0
Subtotal			33.0
Total			61.3

The Proposed Project scored a LESA rating of 61.3, which is defined by DOC as “Considered Significant unless either Land Evaluation or Site Assessment is less than 20 points”. Because both the Land Evaluation and Site Assessment subcategories scored above 20 points, the impact is considered potentially significant (DOC, 1997).

The site is located within the Urban Growth Boundary of the City and is identified within the City’s Municipal Service Review and Comprehensive Annexation Plan (City of Vacaville, 2004) as Site K – Vanden South of the identified near-term growth areas of the City. The City has designated this site in the General Plan for Low Density Residential, Estate Residential, Community Facilities, and public open space. Conversion of this agricultural land has been within the City and County’s long-term land use plans for the site. Implementation of Mitigation Measure 4.3-1 would help to off-set impacts through the preservation of active farmland in Solano County with soils similar in productive value to on-site soils. However, the agricultural conservation easements would be acquired on existing farmland, resulting in a net loss of important farmland within Solano County. After mitigation, the loss of prime and important agricultural lands for the

Proposed Project would remain a significant and unavoidable impact. **Significant and Unavoidable.**

Mitigation Measure 4.3-1: The applicant shall preserve 68.83 acres of active farmland in Solano County with soils similar in productive value to on-site soils through agricultural easement, purchase of development rights, donation of mitigation fees to an agricultural land trust or conservancy, contribution to the State Department of Conservation fund for the preservation of farmland, or by some other feasible method, as determined by the City Council, that achieves the goal of preserving active farmland. Should donation of mitigation fees be the preferred method for mitigating impacts, the fees shall be based on fair market value of a conservation easement over similar quality active farmland as determined by the County Assessor's Office at the time the fee is to be paid.

Impact

4.3-2 The Proposed Project could conflict with existing zoning for agricultural use, or a Williamson Act contract.

APN 137-050-020 and APN 137-050-010 are currently under active Williamson Act contracts. These parcels consist of 25.48 acres located in the southwestern corner of the site, which represents approximately 9.5 percent of the project area. As described in **Section 3.5**, the Proposed Project would require that the Williamson Act Contracts be terminated by Solano County prior to any construction on the parcels. The parcels would be rezoned as Residential Estate, resulting in the development of several large lots that would border the adjacent grazing lands. As discussed under **Impact 4.3-3** below, with mitigation the Proposed Project would be compatible with on-going agricultural activities on adjacent lands. Because no development would be initiated prior to termination of the Williamson Act Contract and the Proposed Project would fulfill future plans for the City, the impact is considered less than significant. **Less than Significant.**

Impact

4.3-3 Due to the location and nature of proposed land uses, the Proposed Project could result in land use incompatibilities that would result in the conversion of adjacent agricultural land uses.

The Proposed Project would result in the development of a residential area in close proximity to agricultural uses located to the south and east within unincorporated Solano County. Land use conflicts could occur due to potential nuisances to residents created by noise, dust, and possible chemical overspray associated with farming practices. Agricultural lands adjacent to the project site are designated within the Solano County General Plan as the Vacaville-Fairfield-Solano Greenbelt, the purpose of which is to "serve as a community separator, a setting for recreational activities, a buffer between agricultural and urban areas, and as an ultimate limit for urban growth" (Solano County General Plan Resources Element, 2008). These lands have historically been used for low intensity agricultural uses, including field crops and livestock grazing, which require less intensive management practices that are more compatible with urban uses when

compared to intensive agricultural crops. Because cultivation of field crop and livestock grazing typically does not generate large amounts of dust, or require excessive use of pesticides and frequent use of loud farm equipment, fewer potential nuisances would be experienced by proposed residential housing on the project site.

The Vanden Meadows Specific Plan includes many specific goals and policies to ensure consistency with the City's General Plan. The following policies regarding agriculture are included within the Specific Plan to further the General Plan goal to provide a development that is compatible with agricultural uses to the east:

- 5.1-P-1: The area within the 500 foot buffer, west of the existing Leisure Town Road right of way, will be dedicated to the City of Vacaville as backup landscaping for Leisure Town Road with maintenance paid for by the residents of Vanden Meadows through the use of a Lighting and Landscape District (LLD).
- 6.2-P-2: Create a suitable buffer between the Vanden Meadows development and the agricultural uses to the east.

The detention basin and right-of-way easements along the eastern border of the project site would provide a minimum of 500 feet of separation between proposed residential land uses and agricultural uses within the Vacaville-Fairfield-Solano Greenbelt, ensuring potential land use conflicts would not occur.

However, the proposed residential estate area located along the southern border of the project would be directly adjacent to agricultural uses to the south. The General Plan does not identify the southern boundary of the project site as an area requiring an agricultural buffer, therefore the requirements of General Plan policy 2.5-18 do not apply to this area of the project site. In accordance with General Plan Implementation Policy 2.3-112, proposed residential land uses south of Foxborrow Parkway and west of Vanden Road are very low density, with the minimum lot size being 10,000 square feet (approximately 0.25-acres). Low density housing is typically considered to be more compatible with agricultural uses as fewer residences would be exposed to potential nuisances. Due to the nature of agricultural activities in the area, sensitive land uses proposed along the southern border of the project site would not be adversely affected by dust, noise and pesticide use from adjacent Solano County agricultural operations. Regardless, nuisance complaints from residents on the project site may still have the potential to impede agricultural operations on adjacent lands. **Mitigation Measure 4.3-3** requires that prior to recording, residential property titles shall include a deed restriction prohibiting complaints by future residents related to potential inconsistency with ongoing surrounding agricultural operations.

After the implementation of recommended mitigation measures, potential impacts would be reduced to less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.3-3: In order to protect ongoing surrounding agricultural operations from future complaints by future Vanden Meadow residents, a note on the

final subdivision maps for the Project shall be included. The note shall require that, prior to recording, residential property titles shall include a deed restriction prohibiting complaints by future residents related to potential inconsistency with ongoing surrounding agricultural operations. The nature of prohibited complaints would include those attributable to nearby ongoing agricultural operations related to generation of noise, odor, dust, and other elements generally associated with agricultural operations and potentially inconsistent with residential development.

Cumulative Impacts

4.3-4 The Proposed Project could contribute to adverse cumulative impacts associated with conversion of agricultural land uses.

Cumulative projects in the vicinity of the project site, including growth resulting from build-out of the City's General Plan and the development of the South Town Project north of the project site and the Fairfield Train Station Specific Plan located south of the project site, would contribute to the cumulative conversion of prime and important agricultural land in Solano County. As described above, the project site is located within the City's Urban Services Boundary and is identified within the City's Municipal Service Review and Comprehensive Annexation Plan (City of Vacaville, 2004) as Site K – Vanden South of the identified near-term growth areas of the City. The conversion of agricultural lands within the project site has been planned to in order to accommodate the growing population of the City. No additional annexations or developments are planned to occur to the east and south of the project site; therefore, the project would not facilitate or induce any additional conversion of farmland to non-agricultural use. **Mitigation Measure 4.3-1** has been recommended to help off-set the project's direct conversion of important farmland through the preservation of farmland with similar qualities in another location within the County. Nevertheless, the Proposed Project would significantly contribute towards the conversion of prime and important farmland within Solano County. This cumulative impact is considered significant and unavoidable. **Significant and Unavoidable.**

Mitigation Measure 4.3-4: Implement **Mitigation Measure 4.3-1.**

4.4 BIOLOGICAL RESOURCES

4.4.1 INTRODUCTION

This section addresses the potential for the Proposed Project to impact biological resources. Following an overview of the relevant regulatory setting in **Subsection 4.4.2** and the biological resources setting in **Subsection 4.4.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.4.4**.

4.4.2 REGULATORY CONTEXT

Federal

Wetlands and Other Waters of the U.S.

Any project that involves working in navigable and other waters of the U.S., including the discharge of dredged or fill material, must first obtain authorization from the U.S. Army Corps of Engineers (USACE), under Section 404 of the Clean Water Act. The Central Valley Regional Water Quality Control Board (RWQCB) will require a Water Quality Certification (Clean Water Act Section 401 permit) before other permits are issued. Stream crossings and any other direct impacts to drainage channels require notification to the California Department of Fish and Game (DFG) and may require the issuance of a Streambed Alteration Agreement. In addition, the project must comply with the terms of the General Construction National Pollution Discharge Elimination System (NPDES) Permit for construction activities in excess of one acre.

Federal Endangered Species Act (ESA) of 1973

The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) enforce the provisions of the federal Endangered Species Act (ESA). The USFWS administers ESA for all terrestrial species. The NMFS administers ESA for marine fish species, including anadromous salmonids. Section 9 (§1538) prohibits the "taking" of a listed species by anyone, including private individuals, and state and local agencies. Threatened and endangered species on the federal list (50 CFR Sections 17.11 and 17.12) are protected from take, defined as direct or indirect harm. If "take" of a listed species is necessary to complete an otherwise lawful activity, this triggers the need for consultation under Section 7 of the ESA for federal agencies. Under Section 7 of the ESA, all federal agencies are required to ensure that any action they authorize, fund, or carry out will not likely jeopardize the continued existence of a listed species or modify their critical habitat. Therefore, project-related impacts to these species, or their habitats, would be considered significant and require mitigation.

Critical habitat is defined as a geographic area with certain features determined by USFWS to be essential to the conservation of a species listed as threatened or endangered under the ESA. Critical habitat does not have to be occupied by the species at the time it is designated, but it may be considered by the USFWS as necessary for the recovery of the species. On August 11, 2005, the USFWS designated critical habitat for 15 vernal pool species (70 FR 46924) (USFWS, 2006).

Section 10(a)(1)(b) of the ESA allows non-federal entities, under consultation with the USFWS and the NMFS, to obtain incidental take permits for federally listed wildlife. Section 10 (a)(1)(b) is not required for federally listed plants. Under Section 10 of the ESA, the applicant for an incidental take permit is required to submit a "conservation plan" to the USFWS or the NMFS that specifies, among other things, the impacts that are likely to result from the taking, and the measures the permit applicant will undertake to minimize and mitigate such impacts, and the funding that will be available to implement those steps. Conservation plans under the ESA have come to be known as habitat conservation plans (HCPs).

The USFWS published the *Recovery Plan for Vernal Pool Ecosystems for California and Southern Oregon* (Recovery Plan) (USFWS, 2005) on December 15, 2005. The Recovery Plan covers 33 plants and animals that occur exclusively or primarily within a vernal pool ecosystem: 15 endangered or threatened plants, five endangered or threatened animals, ten plant species of concern, and three animal species of concern. The overall goals of the Recovery Plan are to: achieve and protect in perpetuity self-sustaining populations of each species; delist the 20 federally listed plant and animal species; and ensure the long-term conservation of the 13 species of special concern.

Migratory Bird Treaty Act (MBTA)

Migratory birds are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, abandonment of nestlings, or forced fledging would be considered take under federal law. As such, project-related disturbances must be reduced or eliminated during the nesting cycle. The general nesting season extends from March 1 to September 15.

State

California Endangered Species Act (CESA)

The California Endangered Species Act (CESA) declares that deserving plant or animal species will be given protection by the state because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the state. The CESA established that it is state policy to conserve, protect, restore, and enhance endangered species and their habitats. Under State law, plant and animal species may be formally designated rare, threatened, or endangered by official listing by the California Fish and Game Commission.

The CESA authorizes that "Private entities may take plant or wildlife species listed as endangered or threatened under the ESA and the CESA, pursuant to a federal incidental take permit issued in accordance with Section 10 of the ESA, if the DFG certifies that the incidental take statement or incidental take permit is consistent with the CESA (Fish & Game Code § 2080.1[a]).

California Environmental Quality Act (CEQA)

Section 15380(b) of the California Environmental Quality Act (CEQA) *Guidelines* provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the

species can be shown to meet certain specified criteria. Section 15380 defines “endangered” species of plants, fish, or wildlife as those whose survival and reproduction in the wild are in immediate jeopardy and “rare” species as those who are in such low numbers that they could become endangered if their environment worsens. Therefore, a project will normally have a significant effect on the environment if it will substantially affect a rare or endangered species or the habitat of the species. The significance of impacts to a species under CEQA must be based on analyzing actual rarity and threat of extinction despite legal status or lack thereof.

Fish and Game Code of California

The California Fish and Game Code defines take (Section 86) and prohibits taking of a species listed as threatened or endangered under the CESA (California Fish and Game Code Section 2080), or otherwise fully protected (California Fish and Game Code Sections 3511, 4700, and 5050). Section 2081(b) and (c) of the CESA allows DFG to issue an incidental take permit for a state listed threatened and endangered species if specific criteria outlined in Title 14 CCR, Sections 783.4(a), (b) and DFG Code Section 2081(b) are met. The DFG Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Section 3503.5 states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird. Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. If a project is planned in an area where a species or specified bird occurs, an applicant must design the project to avoid all take; the DFG cannot provide take authorization under the CESA.

Waters of the State

Waters of the United States in California are also "waters of the state" (defined by the Porter-Cologne Water Quality Control Act as "any surface water or ground water, including saline waters, within the boundaries of the state." [Water Code Section 13050(e)]). Not all waters of the state (e.g., ground water) are waters of the United States. For the purposes of this EIR, all waters of the U.S. are also considered waters of the state.

Streambed Alteration Agreement (Section 1600 of the DFG Code)

Fish and Game Code Section 1602 requires notification before beginning any activity that may obstruct or divert the natural flow of a river, stream, or lake; change or use any material from the bed, channel, or bank of a river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state. Notification from DFG will be required prior to installation of the water diversion pump and facilities, excavation or filling in of both natural or constructed channels, and installation of culverts and pipelines within a channel.

Native Plant Protection Act of 1977

Native Plant Protection Act of 1977 and implementing regulations in Section 1900 et seq. of the Fish and Game Code designates rare and endangered plants, and provides specific protection measures for identified populations. The DFG administers the Native Plant Protection Act.

Local

City of Vacaville General Plan

The City of Vacaville (City) General Plan (General Plan) seeks to preserve and enhance creeks and their associated vegetation. Riparian woodland and associated undergrowth serve as habitat and cover for wildlife and also as a retardant for creek erosion. The General Plan's conservation strategy focuses on the protection of natural areas, particularly riparian corridors, wildlife and vegetation. The City protects habitats for three special-status plants and nine special-status wildlife.

The following General Plan guiding and implementation policies associated with biological resources are applicable to the Proposed Project.

Guiding Policies

- 8.1-G 1 Preserve and enhance Vacaville's creeks for their value in providing visual amenity, drainage, and wildlife habitat.
- 8.1-G 4 Preserve and protect water resource areas, including the Alamo, Encinosa, Gibson, and Ulatis Creek watersheds.
- 8.2-G 1 Protect natural environments in recognition of their importance as wildlife habitats and visual amenities.
- 8.2-G 2 Manage open space in a manner consistent with wildlife protection.

Implementing Policies

- 8.1-I 5 Protect existing stream channels by requiring buffering or landscaped setbacks and storm runoff interception.
- 8.2-I 1 Require preservation or, where preservation is not possible, replacement of riparian vegetation.
- 8.2-I 2 Minimize removal of woodland habitat.
- 8.2-I 3 Provide wildlife corridors, where feasible, to enable free movement of animals and minimize wildlife-urban conflicts.
- 8.2-I 4 Continue to implement the City's existing regulations which protect mature trees and existing natural non-agricultural trees.
- 8.2-I 5 Require that, as appropriate, new Policy Plans or Specific Plans contain a resource management component.
- 8.2-I 6 Identify areas of wetlands at the earliest possible stage of development application processing. Policies to protect and preserve wetland habitats shall be contained in the Resource Management section of applicable Policy Plans.

The City is currently in the process of updating its General Plan and anticipates adoption of the update will occur in late 2012. The City's General Plan Update will include revisions to the policies and land use map of the existing General Plan. Available technical documents developed for the General Plan Update were used, as applicable, in the development of the section.

City of Vacaville Municipal Code

The Chapter 14.09.131 of the City's Zoning Code contains a tree preservation ordinance identifying preservation and protection measures during construction, and specifying permit requirements for the removal of any trees with a combined trunk circumference of 31 inches or greater when measured at 4.5 feet above ground level. Preservation priority is given to native trees.

Final Administrative Draft Solano Multispecies Habitat Conservation Plan (2009)

The *Solano Multispecies Habitat Conservation Plan: Final Administrative Draft* (SMHP) has been prepared to establish a framework for complying with state and federal endangered species regulations while accommodating future urban growth, development of infrastructure, and ongoing operations and maintenance activities associated with flood control, irrigation facilities, and other public infrastructure (LSA, 2009). The purpose of the Draft SMHCP is to streamline the local, state, and federal regulatory processes to provide a consistent and predictable treatment of actions requiring discretionary approvals from participating agencies for obtaining incidental take permits and other required authorization for modifications to natural communities and other habitats in a manner that is consistent with the conservation of covered species and existing regulations and to lessen or avoid site specific and cumulative effects of development on covered species by replacing project-by-project mitigation with comprehensive, long-term strategies for conserving, protecting, and maintaining viable populations of covered species and natural habitats. The SMHCP was prepared in 2009, and until it is adopted, the recommendations and requirements are preliminary (LSA, 2009). Until the SMHCP is adopted, the applicant shall consult with the USFWS and the CDFG to determine the significance of potential impacts on special status plant and wildlife, and to develop appropriate mitigation measures.

The project site occurs within Zone 1 – Urban Development of the SMHCP. Zone 1 includes all ground- or habitat-disturbing projects and activities needed to accommodate urban growth including the construction and maintenance of public and private facilities, consistent with local general plans and local, state, and federal laws. This category includes, but is not limited to, the construction, maintenance, and operation of new commercial, residential, institutional, and industrial uses and associated infrastructure and facilities (i.e., roads, utilities, stormwater control measures, parks, golf courses). The majority of the project site is designated as planned development. The southwestern portion of the project site is designated as grassland-vernal pool system. The purpose of the SMHCP reduce conflicts between listed species and economic development, agriculture, and other land use activities to promote conservation of biological diversity and, to the maximum extent practicable, contribute to the recovery of plant and animal species addressed in the SMHCP.

4.4.3 ENVIRONMENTAL SETTING

Solano County is located within the Bay Area/Delta bioregion of California. This bioregion is one of the most populated in California, encompassing the San Francisco Bay area and the Sacramento-San

Joaquin River Delta. The bioregion extends from the Pacific Ocean to the Sacramento and San Joaquin Valley bioregions and contains vital aquatic resources. These resources provide substantial fish and wildlife habitats. The habitats and vegetation within the bioregion are varied based on the unique geography of the region, ranging from coastal and salt marsh habitats to western valley plains.

The project site is located within the western valley geography of the bioregion, just east of the Central Coast Mountain range that descends into the San Francisco Bay area. The project site has historically been utilized for agriculture, which has resulted in the elimination of any natural communities that originally occurred in the vicinity. Currently, the project site is primarily used for dry farming of field crops and has not been irrigated for over ten years. The project site is surrounded on the west and north by residential development and on the east and south by agricultural land. Union Pacific Railroad (UPRR) tracks are oriented northeast to southwest, and are adjacent to the eastern boundary of the project site. Soil types on the project site are addressed in **Section 4.6**.

Wildlife Corridors

Wildlife corridors in the vicinity of the project site include the Pacific Flyway, a common route of bird migration that extends along the west coast of North America from Alaska to South America, and from the Eastern Pacific to the Great Basin. Also present is a terrestrial wildlife corridor consisting of a narrow band of riparian woodland bordering Alamo Creek, approximately 1.5 miles north of the northern boundary of the project site. The project site is not comprised of a wildlife corridor as the project site is surrounded by residential development, paved roads, and the UPRR.

Habitat Types

This section includes biological data obtained during biological surveys, focused botanical surveys, and wetland delineations conducted by AES biologists on June 18, 2010, January 31, February 28, April 28, and July 29, 2011, and from a Biological Constraints Analysis for the project site prepared in September 2009 (**Appendix E**). Plant communities were classified based on *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Natural Communities; Holland, 1986) and the *Manual of California Vegetation, Second Edition* (MCV; Sawyer, Keeler-Wolf, and Evens, 2009). The nomenclature described in the plant communities was based on the *Jepson Manual-Higher Plants of California* (Hickman, 1993). Terrestrial habitat types within the project site include: non-native annual grassland, *Eucalyptus* woodland, agriculture, and ruderal/developed areas. Aquatic habitat types within the project site include: Brazeltine Drain, earth-lined canal and detention basin, concrete-lined irrigation canal, wetland drainage swale, ephemeral drainage swale, roadside ditch, and seasonal wetland. A list of plants and wildlife observed within the project site is included in **Appendix F**. Photographs of representative habitat types are illustrated in **Figures 4.4-1a** and **b**. Habitat types observed during the biological surveys of the project site are illustrated in **Figure 4.4.2**. **Table 4.4-1** provides a summary of the habitat types by acreages. Dominant vegetation in each habitat type is discussed below.

AES conducted a general biological survey of the proposed offsite sewer connection upgrades on September 21, 2011. A technical letter report documenting the results of the biological survey is provided in **Appendix F**.



PHOTO 1: View north of fallow agricultural land on the northeastern portion of the project site. Photograph taken on January 31, 2011.



PHOTO 3: View north of eucalyptus grove with non-native annual grassland on the north-central portion of the project site. Photograph taken on January 31, 2011.



PHOTO 5: View north of manmade earth-lined canal, located north of the detention basin on eastern portion of the project site, east of Leisure Town Road. Photograph taken on January 31, 2011.



PHOTO 2: View northeast of ruderal/disturbed areas and manmade agricultural ditch within the central portion of the project site. Photograph taken on January 31, 2011.



PHOTO 4: View west of Brazeltine Drain on the northeast portion of the project site. Photograph taken on January 31, 2011.



PHOTO 6: View east of cement-lined canal on the southwestern portion of the project site. Photograph taken on June 18, 2010.



PHOTO 8: View east of seasonal wetland on the south western portion of the project site. Photograph taken on June 18, 2010.



PHOTO 10: View north of roadside ditch on the central portion of the project site. Photograph taken on January 31, 2011.

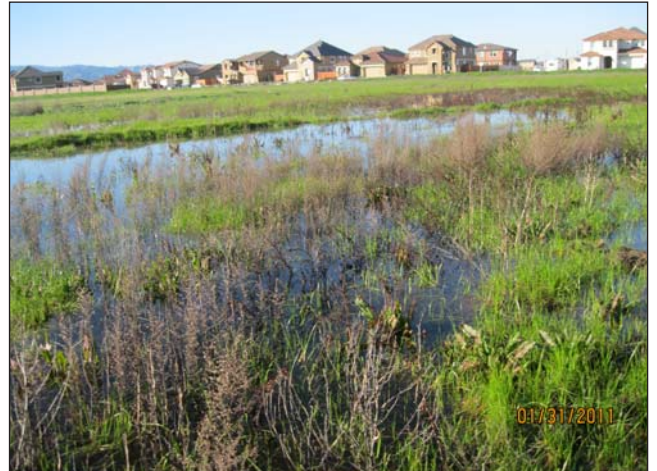


PHOTO 7: View northwest of seasonal wetland on the north-central portion of the project site. Photograph taken on January 31, 2011.



PHOTO 9: View north of ephemeral drainage swale on the northeastern portion of the project site. Photograph taken on January 31, 2011.

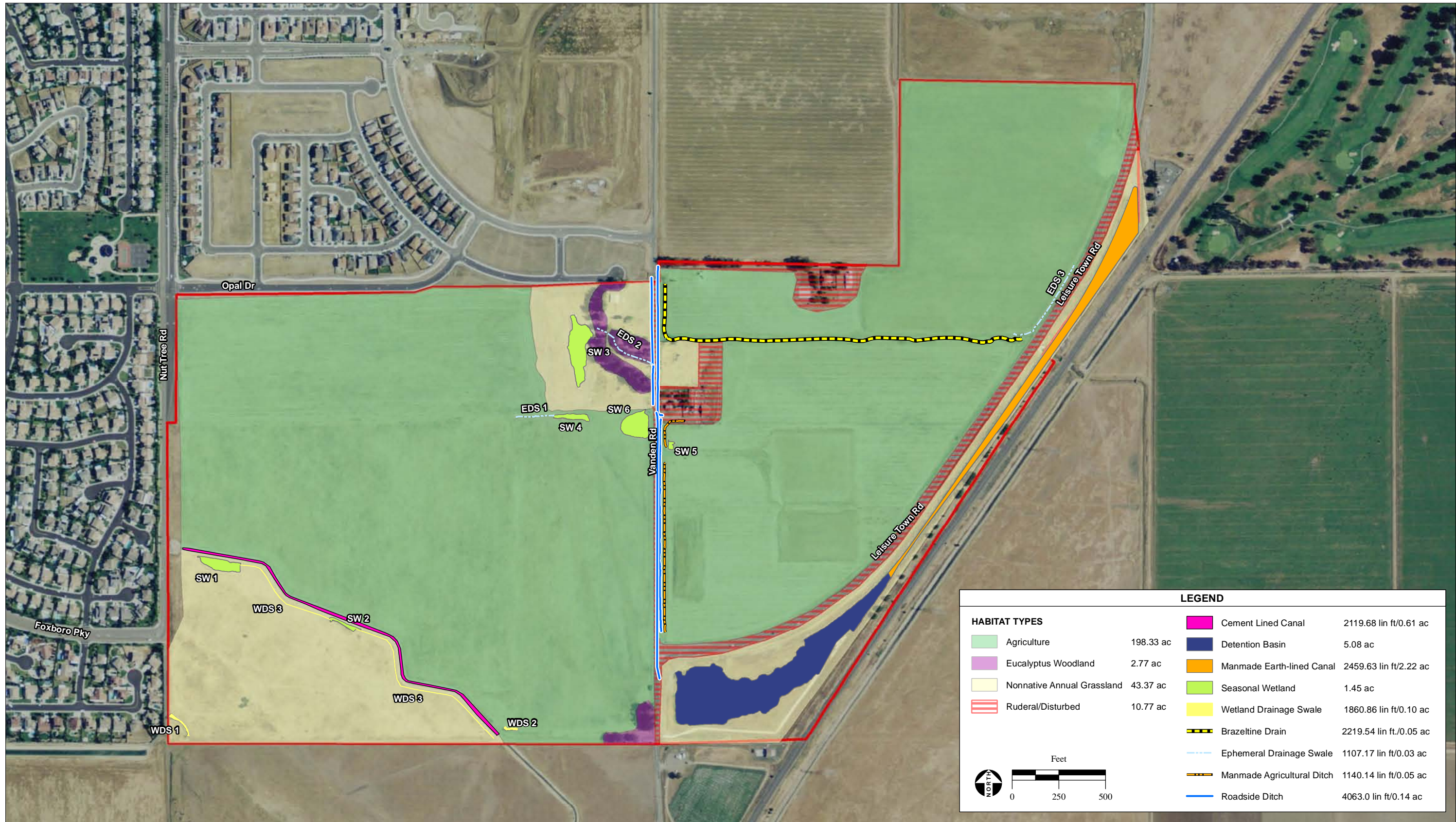


Figure 4.4-2
Habitat Types

Terrestrial Habitats

Non-native Annual Grassland

Non-native annual grassland occurs within portions of the project site (**Figure 4.4-1a: Photograph 3**). Dominant vegetation observed in the nonnative grassland includes: wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Lolium multiflorum*), field mustard (*Brassica rapa*), winter vetch (*Vicia villosa*), purple wild radish (*Raphanus sativus*), English plantain (*Plantago lanceolata*), and yellow star thistle (*Centaurea solstitialis*). This habitat type corresponds to the Non-Native Grassland Element #42200, which is found throughout the valleys and foothills of most of California on fine-textured, usually clay soils (Holland, 1986). This habitat also corresponds to the Wild Oat Grassland (*Avena [barbata, fatua]* Semi-Natural Herbaceous Stand) in the MCV (Sawyer et al., 2009).

TABLE 4.4-1
PROJECT SITE HABITAT TYPES

Habitat Type	Acreage ¹
Terrestrial	
Non-native Annual Grassland	45.14
Eucalyptus Woodland	2.77
Agricultural	196.18
Ruderal/Disturbed	10.77
Subtotal	254.86
Aquatic	
Brazeltine Drain	0.05
Earth-Lined Canal and Detention Basin	7.30
Concrete-Lined Canal	0.61
Wetland Drainage Swale	0.10
Ephemeral Drainage Swale	0.03
Roadside Ditch	0.14
Remnant Manmade Agricultural Ditch	0.05
Seasonal Wetland	1.45
Subtotal	9.73
Total	264.59
Source: AES, 2011b; Appendix G.	
¹ GIS calculations may not reflect exact acreage due to rounding.	

Eucalyptus Woodland

Nonnative blue gum eucalyptus (*Eucalyptus globulus*) occurs adjacent to a roadside ditch and an ephemeral drainage swale on the north central portion of the project site (**Figure 4.4-1a: Photograph 3**). The mature blue gum trees comprise the over story with non-native annual vegetation beneath. Several volunteer trees exist along the ephemeral drainage swale, including California black walnut (*Juglans hindsii*), English walnut (*Juglans regia*), and sycamore (*Platanus racemosa*), all which appear to have sprouted from rootstock remaining from past cultivation. This plant community does not correspond to any natural community in the Natural Communities (Holland, 1986). It does, however, correspond to the Eucalyptus groves (Eucalyptus [*globulus, camaldulensis*] Semi-Natural Woodland Stands) classification in

the MCV (Sawyer et al., 2009). Though this habitat type is dominated by non-native species, it potentially provides habitat for a number of raptors, small mammals, and reptiles.

Agriculture

Much of the project site was previously utilized for hay crops and pasture for cattle (**Figure 4.4-1a: Photograph 1**). These fields have not been irrigated for over ten years and have been fallow for several years, having become re-vegetated primarily by non-native annual species consistent with those described in the non-native annual grassland above. Several large borrow piles of soil exist on the southeastern portion of the project site within this habitat. Several ground squirrel (*Otospermophilus beecheyi*) burrows are present in the burrow piles.

Ruderal/Disturbed

Ruderal/disturbed areas include existing buildings and associated infrastructure, graded areas, paved roads, and ornamental landscaping (**Figure 4.4-1a: Photographs 2**). Existing ornamental landscaping within the project site includes ornamental trees and shrubs that have been planted around existing houses on the project site. This habitat type does not correspond to any natural community in the Preliminary Descriptions of the Natural Communities or the MCV (Holland, 1986 and Sawyer et al., 2009, respectively).

Aquatic Habitats

Brazeltine Drainage Canal

A remnant segment of the Brazeltine Drain occurs within eastern portion of the project site (**Figure 4.4-1a: Photograph 4**). The Brazeltine Drain includes a man-made and earth-lined canal with approximately 10-foot wide and 5-foot deep scoured bed and banks. The Brazeltine Drain flows eastward beneath Leisure Town Road through three culverts and drains to the manmade irrigation canal and detention basin within the eastern portion of the project site. The Brazeltine Drain contained ponded water during the January 31 and February 28, 2011 delineations; no water was present during the June 18, 2010 or the April 28 and July 29, 2011 biological surveys of the project site. The Brazeltine Drain receives surface runoff from the Southtown development situated north of the project site. Water within the Brazeltine Drain drains eastward to the canal and a detention basin located within the southeastern portion of the project site. Dominant vegetation observed within the Brazeltine Drain includes: broad-leaved cattail (*Typha latifolia*), English plantain, and curly dock (*Rumex crispus*).

Earth-Lined Canal and Detention Basin

A man-made, earth-lined canal and a detention basin occur on the east side of Leisure Town Road along the eastern boundary of the project site (**Figure 4.4-1a: Photograph 5**). The man-made earth-lined canal flows southward and drains to the detention basin on the southeastern portion of the project site. The man-made, earth-lined canal is comprised of approximately 125-foot wide bed and banks in the northeast portion for approximately 100 feet and narrows in the southeast portion to approximately 50-foot wide bed and banks until it drains to the detention basin. The earth-lined canal and detention basin contained ponded water during the biological surveys of the project site. The man-made, earth-lined canal and detention basin function as a stormwater detention basin and receive water from direct precipitation, the Brazeltine Drain, and surface runoff from the Southtown development situated north of

the project site through storm drains. During large storm events, water within the earth-lined canal and detention basin exits the project site, flows north for approximately 0.3 miles, and drains to New Alamo Creek. Otherwise, the detention basin holds water until it percolates through the soil. Dominant vegetation observed within the earth-lined canal and detention basin includes: broad-leaved cattail, umbrella sedge (*Cyperus eragrostis*), duck-weed fern (*Azolla filiculoides*), and curly dock.

Concrete-Lined Canal

A concrete-lined Solano Irrigation District (SID) canal occurs on the southwestern portion of the project site (**Figure 4.4-1b: Photograph 6**). The canal is comprised of approximately ten-foot wide bed and banks and is devoid of vegetation. The concrete-lined canal contained flowing water during the biological surveys of the project site. The concrete-lined canal receives surface runoff from the residential development located outside of the western boundary of the project site. Water within the concrete-lined canal exits the southern boundary of the project site.

Wetland Drainage Swale

Three wetland drainage swales occur within the project site. The wetland drainage swales exhibit defined bed and banks and contained ponded water during the biological surveys of the project site. Two of the wetland drainage swales appear to hold water until the water percolates into the ground. The third flows southeast and exits the southern boundary of the project site. The wetland drainage swales receive water from direct precipitation and from surface runoff from the surrounding agricultural land. The third wetland drainage swale also receives water from the concrete-lined canal via seepage. Dominant vegetation occurring within the wetland drainage swales includes: swamp grass (*Crypsis schoenoides*), cocklebur (*Xanthium strumarium*), and umbrella sedge (Davis Environmental, 2009).

Ephemeral Drainage Swale

Three ephemeral drainage swales occur within the project site (**Figure 4.4-1b: Photograph 9**). The ephemeral drainage swales within the western side of the project site were likely man-made as they are fairly linear features. The ephemeral drainage swale on the eastern side of the project site was formed as a result of soil erosion due to runoff from the surrounding area. The ephemeral drainage swales are comprised of approximately one to 1.5-foot wide, one-foot deep defined bed and banks. The ephemeral drainage swales did not contain water during the biological surveys of the project site. The ephemeral drainage swales receive water from direct precipitation and from surface runoff from the surrounding agricultural land. Dominant vegetation observed within the ephemeral drainage swales includes: milk thistle (*Silybum marianum*), yellow star-thistle, filaree, and wild oat.

Remnant Man-made Agricultural Ditch

The remnant man-made agricultural ditch occurs along the eastern side of Vanden Road in the central area of the project site (**Figure 4.4-1a: Photograph 2**). The man-made agricultural ditch is comprised of approximately one-foot wide, two-foot deep defined bed and banks. The agricultural ditch contained ponded water during the January 31 and February 28, 2011 delineations, but not during the June 18, 2010 or the April 28 and July 29, 2011 biological surveys of the project site. The remnant man-made agricultural ditch appears to begin just south of a residential dwelling and terminate at a cement storm drain just north of the intersection of Leisure Town Road and Vanden Road. The agricultural ditch

receives water from direct precipitation and surface runoff from the surrounding agricultural land. Dominant vegetation observed along the banks of the agricultural ditch includes: filaree and wild oat.

Roadside Ditch

Man-made roadside ditches occur along both sides of Vanden Road in the central portion of the project site (**Figure 4.4-1b: Photograph 10**). The man-made roadside ditches contained ponded water during the January 31 and February 28, 2011 delineations, but not during the June 18, 2010 or the April 28 and July 29, 2011 biological surveys of the project site. The roadside ditches have one to three-foot wide defined beds and banks and distinct drainage patterns. The roadside ditches were excavated wholly and drain only uplands; they do not carry a relatively permanent flow of water. The man-made roadside ditches initiate on the south side of the project site where they establish defined beds and banks, flow north, and drain to the Brazeltine Drain. The man-made roadside ditches receive water from direct precipitation, from surface runoff from the surrounding agricultural land, and from an ephemeral drainage on the north-central portion of the project site. Dominant vegetation observed within the roadside ditches includes: milk thistle, yellow star-thistle, filaree, and wild oat.

Seasonal Wetland

Six seasonal wetlands occur within the project site (**Figure 4.4-1b: Photograph 7 and 8**). The seasonal wetlands contained ponded water during the January 31 and February 28, 2011 delineations, but not during the June 18, 2010 or the April 28 and July 29, 2011 biological surveys of the project site. The seasonal wetlands receive water from direct precipitation, overflow from the cement-lined canal, and from an ephemeral drainage swale on the north-central portion of the project site. Dominant vegetation observed within the seasonal wetlands includes: Italian ryegrass, umbrella sedge, Mediterranean barley (*Hordeum marinum*), and curly dock.

City Tree Preservation Ordinance

Several trees with trunk circumferences of 31 inches or greater at 4.5 feet above ground level occur within the eucalyptus woodland within the project site. These trees are protected under the City's tree preservation ordinance.

Waters of the U.S.

Definition

Waters of the U.S. are defined as:

- All waters which are currently used or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands; or
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use degradation of which could affect interstate or foreign commerce including any such waters (40 CFR 230.3).

Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (40 CFR 230.41). Wetlands that meet these criteria during only a portion of the growing season are classified as seasonal wetlands.

Wetlands and Other Waters of the U.S. Delineation

A preliminary Wetland Delineation for the project site is provided in **Appendix G**. All wetland and water features identified within the project site were assessed to determine whether these features would potentially be subject to USACE jurisdiction under Section 404 of the Clean Water Act. **Figure 4.4-2** illustrates wetland features by acreages within the project site. Photographs of representative habitat types are illustrated in **Figures 4.4-1a** and **b**.

The results of the preliminary Wetland Delineation indicate that there are 9.77 acres of potentially jurisdictional features within the project site. The results are considered preliminary until the USACE verifies the findings. The roadside ditches are excavated wholly and drain only uplands, and do not carry a relatively permanent flow of water. Therefore, these ditches are not considered waters of the U.S. because they do not have a significant nexus to downstream traditional navigable waters (51 FR 41206, 41217).

The Brazeltine Drain, earth-lined canal and detention basin, wetland drainage swales, concrete-lined canal, ephemeral drainage swales, remnant man-made agricultural ditch, and seasonal wetlands are considered jurisdictional. These features drain to the earth-lined canal and detention basin. Runoff from the earth-lined canal and detention basin drains to Noonan Drain. The Noonan Drain is tributary to Barker Slough or to Union Creek, which are tributary to Suisan Bay. During instances of 100-year flow, the detention basin releases water through an overland release path to New Alamo Creek to the north of the project site. New Alamo Creek is tributary to Old Alamo Creek. Old Alamo Creek is tributary to Cache Slough. Cache Slough is tributary to the Sacramento River Deep Water Ship Canal. The Sacramento River Deep Water Ship Canal is a traditionally navigable waters of the U.S.

Special-Status Species

For the purposes of this EIR, special-status has been defined to include those species that meet the definitions of rare or endangered plants or animals under the CEQA including species that are:

- Listed as endangered or threatened (or formally proposed for, or candidates for, listing) under the ESA (50 CFR §17.11 and §17.12);
- Listed as endangered or threatened (or proposed for listing) under the CESA (California Fish and Game Code §2050, *et seq.*);
- Designated as endangered or rare, pursuant to California Fish and Game Code (§1901);
- Designated as fully protected, pursuant to California Fish and Game Code (§3511, §4700, or §5050); or
- Designated as species of special concern to the DFG.

4.4 Biological Resources

A list of regionally occurring special-status plants and wildlife was compiled based on: a review of pertinent literature; a USFWS list (last updated April 29, 2010 and accessed February 2, 2011) of federally-listed special-status species with the potential to occur on or be affected by projects on the Elmira USGS 7.5 minute topographic quad (USFWS, 2011b); a DFG California Natural Diversity Database (CNDDDB) query, dated February 2, 2011, of special-status species known to occur on the Elmira quad and the eight surrounding quads (CDFG, 2003a); a CNDDDB map of known occurrences of special-status species documented within five miles of the project site (**Figure 4.4-3**); and a California Native Plant Society (CNPS) query, viewed February 2, 2011, of special-status species known to occur on the Elmira quad and the eight surrounding quads (CNPS, 2011). The USFWS list and the CNDDDB and CNPS queries are included within **Appendix F**.

Table 4.4-2 summarizes the biological surveys conducted within the project site by biological surveyor's firm, type of survey conducted, and date.

TABLE 4.4-2
BIOLOGICAL SURVEYS OF THE PROJECT SITE

Surveyor	Purpose of Survey	Year	Date
Davis Environmental, LLC.	Reconnaissance, Preliminary Wetland Delineation	2009	July 29 and 30
Analytical Environmental Services	Reconnaissance, Assessment of Habitats, Special Status Species	2010	June 18
	Wetland Delineation, Special Status Species	2011	January 31, February 28
	Floristic, Special Status Species	2011	April 28, July 29

Source: Davis Environmental, LLC, 2009; AES, 2011.

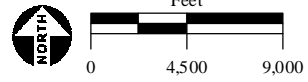
The potential for each of the regionally occurring special-status species to occur in the project site was subsequently evaluated based on the results of the biological field surveys, review of reported occurrences of special-status species within five miles of the project site (**Figure 4.4-3**), and review of biological documentation pertaining to the project site including the Biological Constraints Analysis (Davis Environmental LLC, 2009; **Appendix E**), the USFWS critical habitat mapper (USFWS, 2011), and the SMHCP, which is currently undergoing environmental review and has not been adopted. A discussion of the distribution and habitat requirements for each species and an evaluation of the potential for each species to occur in the project site are included in **Appendix F**. Several regionally occurring special-status species were eliminated for the following reasons: the project site lacks suitable habitat, the project site occurs outside of the known elevation range or geographical distribution, or the plants were not observed during the focused botanical surveys conducted within the blooming period. Species that have no potential to occur in the project site are not discussed further.

Critical Habitat

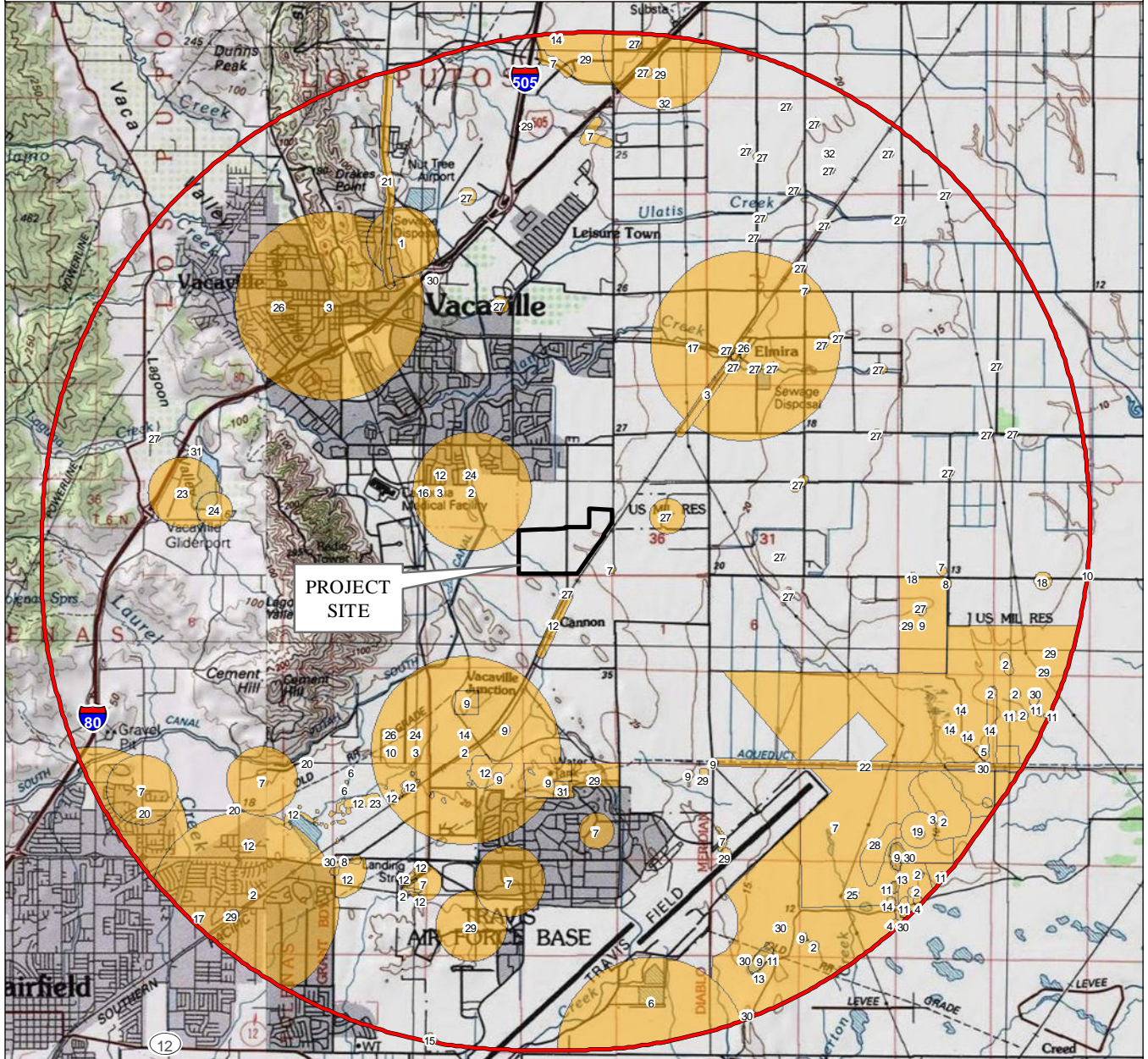
The southwestern portion of the project site occurs within designated critical habitat for three of the 15 vernal pool species (USFWS, 2006): vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardii*), and Contra Costa goldfields (*Lasthenia conjugens*). Approximately 25.48 acres of the project site lies within portions of this critical habitat, as shown in **Figure 4.4-4**. Designated critical habitat is discussed in detail under each of the species below.

SPECIAL STATUS SPECIES DATA

5-Mile Radius
 Project Site
 CNDDDB Occurrences



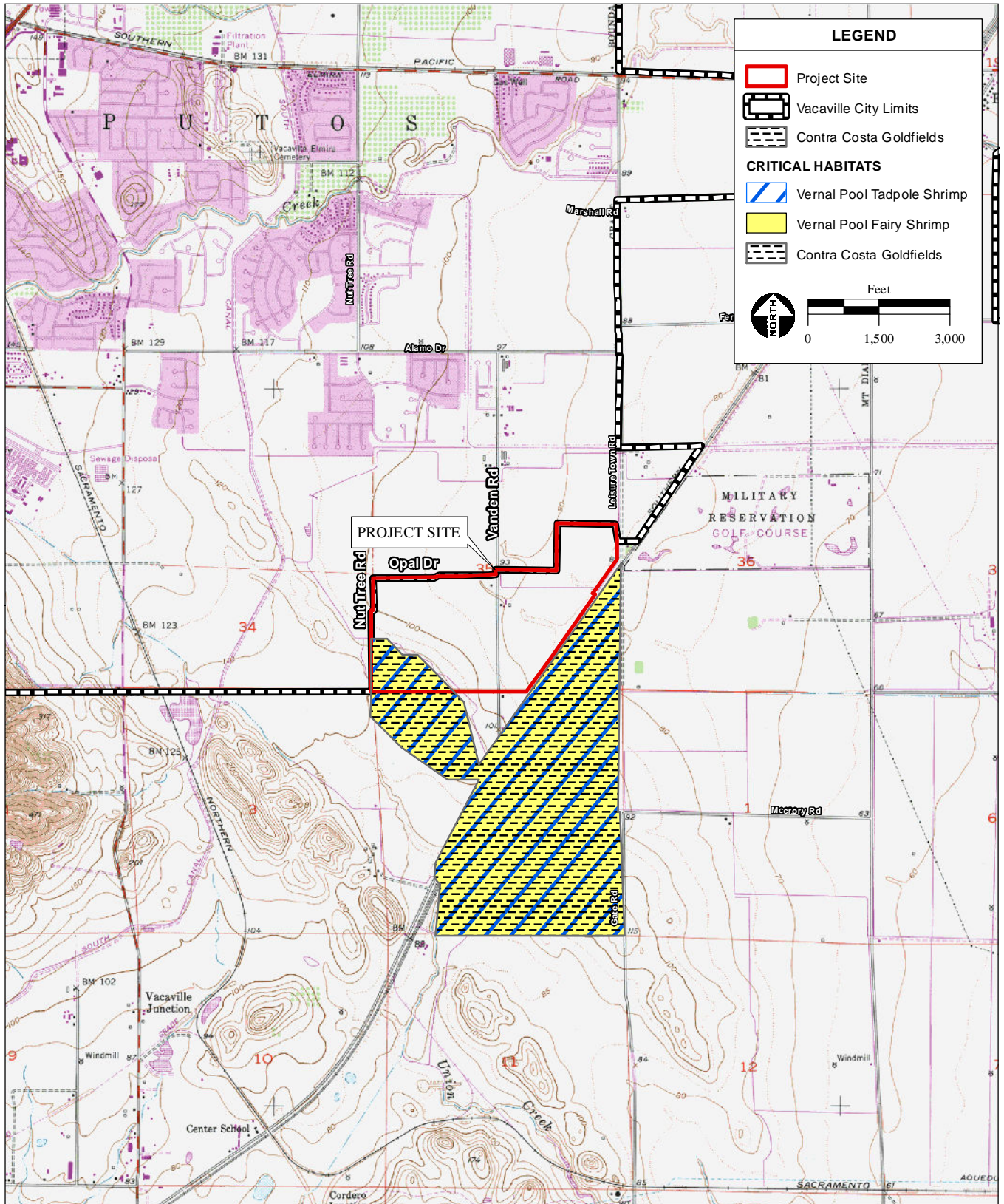
- | | | | |
|-----------------------------|---------------------------------|--|--------------------------------------|
| 1 - adobe-lily | 9 - California tiger salamander | 17 - legenere | 25 - San Joaquin Valley Orcutt grass |
| 2 - alkali milk-vetch | 10 - Carquinez goldenbush | 18 - midvalley fairy shrimp | 26 - showy rancheria clover |
| 3 - Baker's navarretia | 11 - Conservancy fairy shrimp | 19 - Northern Claypan Vernal Pool | 27 - Swainson's hawk |
| 4 - bearded popcorn-flower | 12 - Contra Costa goldfields | 20 - pappose tarplant | 28 - Valley Needlegrass Grassland |
| 5 - Boggs Lake hedge-hyssop | 13 - Delta green ground beetle | 21 - recurved larkspur | 29 - vernal pool fairy shrimp |
| 6 - brittlescale | 14 - dwarf downingia | 22 - Ricksecker's water scavenger beetle | 30 - vernal pool tadpole shrimp |
| 7 - burrowing owl | 15 - hairy water flea | 23 - saline clover | 31 - western pond turtle |
| 8 - California linderiella | 16 - heartscale | 24 - San Joaquin spearscale | 32 - white-tailed kite |



SOURCE: "Lodi, CA" USGS 100k Topographic Quadrangle, Mt. Diablo Baseline & Meridian, StreetMap World, 2010; California Natural Diversity Database, 2/2011; AES 2011

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Figure 4.4-3
CNDDDB 5-Mile Radius



SOURCE: "Elmira, CA" USGS 7.5 Minute Topographic Quadrangle, T R Section 35, Mt. Diablo Baseline & Meridian; StreetMap World, 2008; AES 2011

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Figure 4.4-4

USFWS Designated Critical Habitats

Special-Status Plants

Contra Costa Goldfields (*Lasthenia conjugens*)

Federal Status – Endangered, Critical Habitat

State Status – None

Other – CNPS 1B

Contra Costa goldfields is an annual found in vernal pools, cismontane woodland, valley and foothill grassland, and alkaline playa habitats from sea level to 470 meters above mean sea level. The blooming period for this species is from March to June (CNPS, 2011).

This species was listed as endangered by the USFWS in June of 1997 and is discussed in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS, 2005). Approximately 25.48 acres in the southwest corner of the project site are within USFWS designated Contra Costa goldfields Critical Habitat Unit 4A (refer to **Figure 4.4-4**), and are designated as the Valley Floor Grassland and Vernal Pool Natural Community in the SMHCP. Contra Costa goldfields is a covered species under this community.

The nearest CNDDDB record for this species is approximately 0.5 miles due south of the project site, along the UPRR (Figure 4.4-3; CDFG, 2003b). Although the non-native annual grassland and seasonal wetlands within the project site provides suitable habitat, this species was not observed during the June 18, 2010 or April 28, 2011 biological surveys, which were conducted within the evident and identifiable blooming period for this species. This species does not occur within the project site.

Special-Status Invertebrates

Conservancy Fairy Shrimp (*Branchinecta conservatio*)

Federal Status – Endangered

State Status – None

This species is aquatic and lives in large cool-water vernal pools with moderately turbid water. Conservancy fairy shrimp are only present in pools from early April until November, though pools may last until June (USFWS, 2006). When the vernal pools fill with rainwater, fairy shrimp hatch from cysts (shell-covered dormant embryos) present in the soil from previous years of breeding. Hatching may occur at the same time the pool begins to fill with water. On average, it takes 49 days for eggs to reach maturity. In warmer pools, eggs can hatch in about 19 days.

This species was listed as endangered by the USFWS in September of 1994 (59 FR 48136-48153) and is discussed in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS, 2005). The nearest CNDDDB records for this species occur approximately four miles southeast of the project site at the Jepson Prairie Vernal Pool Preserve (**Figure 4.4-3**; CDFG, 2003b). Suitable habitat for conservancy fairy shrimp occurs in the project site's seasonal wetland and wetland swale areas. This species was not observed during the biological surveys; however, conservancy fairy shrimp have the potential to occur within the project site.

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

Federal Status – Threatened, Critical Habitat

State Status – None

Vernal pool fairy shrimp inhabit vernal pools of the Central Valley and Coast Ranges from elevations that range from 10 to 290 meters above mean sea level. Vernal pool fairy shrimp are found most commonly in small swales, earth slumps, or basalt-flow depression basins with grassy or muddy bottoms in unplowed soils, and occasionally in depressions less than one-meter diameter within sandstone outcrops surrounded by foothill grasslands. Vernal pool fairy shrimp occur in waters between 4.5 and 23°C, with low to moderate total dissolved solids (48 to 481 parts per million (ppm), and a pH between 6.3 and 8.5 (Syrdahl, 1993; Eriksen and Belk, 1999). When the vernal pools fill with rainwater, fairy shrimp hatch from cysts (shell-covered dormant embryos) present in the soil from previous years of breeding. Egg cysts normally hatch in water around 10°C. Vernal pool fairy shrimp reach maturity approximately 18 days under conditions when daytime temperatures reach 20°C, but 41 days are more typical if water remains near 15°C (Gallagher, 1996; Helm, 1998).

This species was listed as threatened by the USFWS in September of 1994 (59 Federal Register 48136-48153) and is discussed in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS, 2005). Approximately 25.48 acres in the southwest corner of the project site are within USFWS designated Vernal Pool Fairy Shrimp Critical Habitat Unit 16C (refer to **Figure 4.4-4**) and are designated as the Valley Floor Grassland and Vernal Pool Natural Community in the SMHCP. Vernal pool species are covered under this community.

The nearest CNDDDB records for this species occur approximately 3.5 miles south of the project site (**Figure 4.4-3**; CDFG, 2003b). Suitable habitat for vernal pool fairy shrimp occurs in the project site within the seasonal wetland and wetland swale areas. This species was not observed during biological surveys; however, vernal pool fairy shrimp have the potential to occur within the project site.

Vernal Pool Tadpole Shrimp (*Lepidurus packardii*)

Federal Status – Endangered, Critical Habitat

State Status – None

Vernal pool tadpole shrimp inhabits vernal pools containing clear to highly turbid water, ranging in size. The life history of the vernal pool tadpole shrimp is linked to the seasonal cycle of the vernal pool. After winter rainwater fills the pool, the population is re-established by new shrimp that hatch from cysts that lie dormant in the dry pool sediments. Sexually mature adults have been observed in vernal pools three to four weeks after the pools had been filled. Some cysts hatch immediately and the others remain dormant in the soil to hatch during later rainy seasons (USFWS, 2005).

This species was listed as threatened by the USFWS in 1994 and is discussed in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (USFWS, 2005). Approximately 25.48 acres in the southwest corner of the project site are within USFWS designated Vernal Pool Tadpole Shrimp Critical Habitat Unit 11B for this species (refer to **Figure 4.4-4**) and are designated as the Valley Floor

Grassland and Vernal Pool Natural Community in the SMHCP. Vernal pool species are covered under this community.

The nearest CNDDDB records for this species occur approximately 3.5 miles southwest of the project site (**Figure 4.4-3**; CDFG, 2003b). Suitable habitat for vernal pool tadpole shrimp occurs in the project site within the seasonal wetland and wetland swale areas. This species was not observed during biological surveys; however, vernal pool tadpole shrimp have the potential to occur within the project site.

Special-Status Amphibians

California Tiger Salamander (*Ambystoma californiense*)

Federal Status – Threatened

State Status – Threatened

California tiger salamanders (CTS) require suitable aquatic habitat for breeding and upland habitat for aestivation. Aquatic breeding habitat includes vernal pools and seasonal or perennial ponds in grassland and oak savannah plant communities from sea level to 1,100 meters. Aquatic breeding ponds are almost always found in grassland habitats. CTS spend most of their lives in upland habitats. In general, breeding occurs between December and March. Upland habitat consists of grassland and oak savannah with burrows of small mammals such as California ground squirrels and Botta's pocket gopher (*Thomomys bottae*). They cannot dig or maintain their own burrows, and consequently require the presence of burrowing mammals for burrow construction and maintenance.

Approximately 25.48 acres in the southwest corner of the project site are designated as the Valley Floor Grassland and Vernal Pool Natural Community in the SMHCP. CTS are covered under this community. The SMHCP considers this area to be within the range for CTS.

The nearest CNDDDB occurrence for this species is located approximately two miles south of the project site where two larvae were observed in a vernal pool complex on the south side of Vanden Road in 2008 (**Figure 4.4-3**; CDFG, 2003b). The seasonal wetlands onsite provide marginally suitable habitat for this species, and the non-native annual grassland and agriculture habitat provides suitable upland habitat. The southwestern corner of the project site is within the range of CTS, as designated in the SMHCP. The cement lined canal marks the boundary of the range of CTS in this area, and the remainder of the project site is not designated as known or potential habitat for this species in the SMHCP. Though this species was not observed onsite during the biological surveys, CTS has the potential to occur within the project site.

Special-Status Reptiles

Western Pond Turtle (*Emys marmorata*)

Federal Status – None

State Status – Species of Concern

The western pond turtle is found in Pacific-slope drainages to an elevation of approximately 1,450 meters above mean sea level. The northwestern pond turtle intergrades with southwestern pond turtles

(*Actinemys marmorata pallida*, the other subspecies) in California's Central Valley and San Francisco Bay Area (Stebbins, 2003). These turtles are found along ponds, marshes, rivers, streams, and irrigation ditches that typically have muddy or rocky bottom and grow aquatic vegetation. They require basking sites such as logs or mats of submergent vegetation. It prefers habitats with stable banks and open areas to bask on, as well as underwater cover provided by logs, large rocks, bulrushes, or other vegetation. This subspecies generally leaves the aquatic site only to reproduce and to hibernate. Hibernation typically takes place from October or November to March or April. Egg-laying typically occurs in May and June, and may take place up to 0.31 miles from water (Stebbins, 2003; CDFG, 2003b).

Western pond turtle is a covered species associated with the riparian, streams, and ponds within the SMHCP. Suitable habitat is present onsite in the earth-line canal and detention basin. The nearest CNDDDB occurrence for this species is located approximately 2.5 miles south of the project site where, in 2008, one turtle of indeterminable age was sighted in a pond within non-native annual grassland (**Figure 4.4-3**; CDFG, 2003b). Though no individuals were observed during biological surveys of the project site, the earth-lined canal and detention basin provide suitable habitat for this species.

Special-Status Birds

Tricolored Blackbird (*Agelaius tricolor*)

Federal Status – None

State Status – Species of Concern

Tricolored blackbirds nest in large flocks, with greater than 50 breeding pairs, in dense vegetation near water, or by emergent wetlands. Nesting sites are typically associated with cattails, tules (*Scirpus acutus*), willows, blackberry, and wild rose. Nests can be built a few centimeters above the ground or from water level to two meters high. Nesting typically occurs from April to July, though it may extend later into the year. Within the Sacramento Valley, breeding has been observed as late as October and November. During the non-breeding season, they can be found foraging in open habitats such as croplands and grassy fields (ICE, 2009).

Tricolored blackbird is a covered species associated with the riparian, streams, and marsh communities within the SMHCP. Though the project site does not contain these habitats, and there are no CNDDDB records for this species within five miles of the project site, biologists reported tri-colored blackbirds sightings along Alamo Creek to the north of the Proposed Project site during a biological survey for the neighboring Southtown Project (City of Vacaville, 2004). AES biologists observed and heard red-winged blackbird at the project site during the January 31, 2011 site visit. It is not uncommon for male red-winged blackbirds to mistakenly be identified as male tricolored blackbirds due to the coloring of the wing band. Red-winged blackbirds have a red wing patch often subtended by a yellow band whereas tricolored blackbirds have a white band beneath the red patch. They can, however, be properly identified by their song, if heard.

Vegetation within the earth-lined canal and detention basin onsite contain suitable vegetation, though they do not provide a large enough area to support 50 breeding pairs of tricolored blackbirds; therefore, the project site does not provide nesting habitat for this species. The riparian habitat surrounding Alamo Creek outside the northern boundary of the project site as well as the cattails surrounding the detention

basin at the southeastern corner of the project site provide potential nesting habitat for this species. The nonnative grassland habitat within the project site provides foraging habitat for this species. This species has the potential to nest and forage within the project site.

Burrowing Owl (*Athene cunicularia*)

Federal Status – None

State Status – Species of Concern

Burrowing owls occur in suitable habitat throughout California, except in northwestern coastal forests and on high mountains. Suitable habitat consists of open grasslands, especially prairie, plains, savanna, and in open areas, including vacant lots and spoils piles near human habitat. Nesting and roosting occurs in burrows dug by mammals (such as ground squirrels), but may also occur in pipes, culverts, and nest boxes. Occupied nests can be identified by the lining of feathers, pellets, debris, and grass. Burrowing owls search for prey on the ground or on low perches such as fence posts or dirt mounds. Burrowing owls are diurnal, crepuscular, and nocturnal depending on time of year. Burrowing owls nest from March to August (CDFG, 2005).

The project site is within an area identified in the SMHCP as an Irrigated Agriculture Conservation Area and Valley Floor Grassland Conservation Area for burrowing owl (LSA, 2009). The nearest CNDDDB record is from 2004 (occurrence number: 722) and is approximately 0.25 miles south-east of the project site (**Figure 4.4-3**; CDFG, 2003b), where several adults and juveniles were observed at burrows under a concrete block. The project site provides potential habitat for burrowing owls within the nonnative grassland. Numerous animal burrows that provide potential habitat for this species were noted along the edges of the spoils piles in the eastern portion of the project site, as well as in the disturbed grassland at the southwestern corner of the project site. No burrowing owls were observed during the biological surveys of the project site; however, the burrows observed in the spoils piles and in the southwest portion of the project site provide suitable nesting habitat. Burrowing owls have the potential to occur within the project site.

Swainson's Hawk (*Buteo swainsoni*)

Federal Status – None

State Status – Threatened

Swainson's hawks arrive to their breeding grounds in the Central Valley in early March. They often nest peripherally to valley riparian systems, and also utilize lone trees or groves of trees near agricultural fields. Valley oak, Fremont cottonwood, walnut, and large willow trees, ranging in height from 41 to 82 feet, are the most commonly used nest trees in the Central Valley (CDFG, 2003a). Breeding pairs immediately construct nests; eggs are laid from mid- to late-April, and are incubated into mid-May when young begin to hatch. Young remain near the nest and depend on the adults for approximately four weeks after fledging until they permanently leave the breeding territory. Nesting occurs from March 1 to August 15. Swainson's hawks feed primarily on small mammals, birds, and insects. Young are fed rodents, rabbits, and reptiles. When not breeding, however, this hawk is atypical because it is almost exclusively insectivorous. Typical foraging habitat includes annual grasslands, alfalfa, and other dry farm

crops that provide suitable habitat for small mammals. Suitable foraging habitat nearby nesting sites is critical for fledgling success.

Swainson's hawk is a Neotropical migrant, leaving California in September and October for Mexico and South America, returning in the spring (March-May). Breeding activities peak from May to July with an average clutch size of three. Nesting sites are primarily composed of sticks, leaves, and bark. Usually located near water, the nests can be at elevations of four to 100 feet above the ground. They typically forage from high to low elevations in search of small mammals, fish, reptiles, and amphibians. Habitats for foraging include: open desert, grassland, or croplands containing intermittent tree stands.

Summer breeding range along the Pacific Coast, extends west to central Washington and Oregon into the extreme northeast of California, disjunctly in the Sacramento and San Joaquin Valleys and valleys of the Sierra Nevada in Inyo and Mono counties. A portion of their winter range includes the Sacramento-San Joaquin River delta in the north central part of California. Historical breeding populations in California have been extirpated from Southern California along the coast, most likely due to urban development; as well as from the central Coast Ranges, and essentially extirpated from the Mojave Desert in southern California. Transient birds formerly common in northern Baja California are now rarely observed. Previously unrecorded winter population of approximately 30 individuals reported annually since the 1990–1991 winter in Sacramento–San Joaquin River delta (Cornell, 2011).

The nearest CNDDDB record for this species occurs approximately 211 feet south of the project site (**Figure 4.4-3**; CDFG, 2003b). In 2005, an adult was observed occupying a nest in a blue gum eucalyptus along Vanden Road adjacent to the railroad tracks. Though no Swainson's hawk was observed onsite during the biological surveys, the eucalyptus trees provide potential nesting habitat and the agricultural fields and non-native annual grasslands provide suitable foraging habitat. This species has the potential to nest and forage within the project site.

Northern Harrier (*Circus cyaneus*)

Federal Status – None

State Status – Species of Concern

Northern harriers occur year-round in the Central Valley, along the coast, in the Sierra Nevada, and in northeastern California. They winter throughout California in suitable habitat, which includes meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands, and frequently in wooded areas. Suitable foraging habitat consists of open areas, such as grassland or agricultural fields where they can fly close to the ground. Northern harriers roost on the ground in tall grasses or emergent wetland species including cattails. Nesting habitat occurs predominately in marshes or emergent wetlands or along rivers or lakes, and occasionally in grasslands, grain fields, or on sagebrush flats. Nesting season occurs from April to September (CDFG, 2005).

There are no CNDDDB records for this species within five miles of the project site (CDFG, 2003a). The nonnative grassland and agricultural habitats within the project site provides suitable foraging habitat for this species. Two northern harriers were sighted flying over the non-native annual grassland habitat at

the northern end of the property during the January 31, 2011 biological survey of the project site. This species has the potential to nest and/or forage within the project site.

White-Tailed Kite (*Elanus leucurus*)

Federal Status – None

State Status – Fully Protected

White-tailed kites are year-round residents in coastal and valley lowlands. White-tailed kites forage in open grasslands, meadows, agricultural fields, and emergent wetlands. Nesting occurs in dense stands of oaks, willow, or other deciduous trees from February through October (CDFG, 2003b).

CNDDDB map shows the nearest white-tailed kite occurrence is approximately 4.5 miles northeast of the project site (**Figure 4.4-3**; CDFG, 2003b). The project site does not provide nesting habitat for this species. The non-native annual grassland and agricultural habitats within the project site provides foraging habitat for this species. One individual was observed perching on a utility wire along Vanden Road within the project site during the January 31, 2011 survey. This species has the potential to forage within the project site.

Migratory Birds and Bird of Prey

Migratory birds and other birds of prey, protected under 50 CFR 10 of the MBTA, have the potential to nest in the trees and shrubs within the non-native annual grassland, ruderal/disturbed areas, and the detention basin. No migratory birds or other birds of prey were observed nesting during the surveys of the project site. Several birds protected under the MBTA were observed foraging within the project site including: Brewer's blackbird (*Euphagus cyanocephalus*), red-winged blackbird (*Agelaius phoeniceus*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), American crow (*Corvus brachyrhynchos*), Western kingbird (*Tyrannus verticalis*), black-headed phoebe (*Sayornis nigricans*), yellow-billed magpie (*Pica nuttalli*), Anna's hummingbird (*Calypte anna*), killdeer (*Charadrius vociferus*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), and Western meadow lark (*Sturnella neglecta*). Migratory birds and other birds of prey have the potential to nest within the project site.

4.4.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

Analysis of potential project impacts to biological resources is based on biological surveys and wetland delineations of the project site and a review of the following: a USFWS list of species with the potential to occur on or be affected by projects on the Elmira quad (USFWS, 2011b); CNDDDB and CNPS queries of special-status species known to occur on the Elmira quad and surrounding eight quads (CDFG, 2003a; CNPS, 2011); a CNDDDB query of special-status species known to occur within five miles of the project site; a Biological Constraints Analysis of the project site (Davis Environmental LLC, 2009); and special status species covered within the SMHCP (LSA, 2009). Mitigation measures for the special-status species identified below were modified from the SMHCP and will be required should the SMHCP be adopted prior to the approval of the proposed project. **Table 4.4-3** summarizes the acreages of impacts to habitat types as a result of the proposed project.

TABLE 4.4-3
ACREAGES OF HABITAT TYPES IMPACTED BY THE PROPOSED PROJECT

Habitat Type	Acreage ¹
Terrestrial	
Non-Native Annual Grassland	45.14
Eucalyptus Woodland	2.77
Agricultural	196.18
Ruderal/Disturbed	10.77
Subtotal	254.86
Aquatic	
Brazeltine Drain	0.05
Earth-Lined Canal and Detention Basin	--
Concrete-Lined Canal	0.61
Wetland Drainage Swale	0.10
Ephemeral Drainage Swale	0.03
Roadside Ditch	0.14
Remnant Manmade Agricultural Ditch	0.05
Seasonal Wetland	1.45
Subtotal	2.38
Total	257.24
Source: AES, 2011b; Appendix E.	
¹ GIS calculations may not reflect exact acreage due to rounding.	

Significance Criteria

Criteria for determining the significance of impacts to biological resources have been developed based on Appendix G of the CEQA *Guidelines* and relevant agency thresholds. Impacts to biological resources would be considered significant if the Proposed Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG, or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the DFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Effects Found Not to be Significant

The Initial Study (**Appendix B**) concluded that the Proposed Project would not result in adverse effects on any riparian habitat or sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. The two sensitive communities identified in the Biological Resource Assessment (Davis Environmental, 2009) are not present on the site, nor are there any streams supporting riparian vegetation present. These effects are therefore not considered within this EIR.

Project-Specific Impacts

Waters of the U.S.

Impact

4.4-1 Implementation of the Proposed Project could result in the placement of fill material into potential jurisdictional waters of the U.S.

As discussed within the results of the preliminary wetland delineation included within **Appendix G**, approximately 9.73 acres of potentially jurisdictional wetlands or other waters of the U.S. were identified within the project site. Assuming that the USACE verifies the findings of this amount, 2.38 acres of the 9.73 acres will be impacted by the Proposed Project. Mitigation measures require that the applicant shall obtain a Section 404 Clean Water Act permit from the USACE for impacts to wetlands and waters of the U.S. and comply with the mitigation measures identified in the Hydrology and Water Quality Section to prevent discharge of pollutants to surface waters during construction. This shall include complying with the State's National Pollution Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit) issued by the Regional Water Quality Control Board (RWQCB). The applicant shall replace, restore, or enhance, in accordance with the USACE and the RWQCB policies, the acreages of all waters of the U.S., and waters of the state that would be removed, lost, and/or degraded with implementation of Proposed Project. Wetland habitat shall be restored, enhanced, and/or replaced on a "no net loss" basis at an acreage and location and by methods agreeable to the USACE and the RWQCB, as determined during the Section 404 and Section 401 permitting processes. With mitigation, impacts to wetlands and other waters of the U.S. and of the state would be considered less than significant.

Less than Significant with Mitigation.

Mitigation Measure 4.4-1a. Prior to commencement of construction activities that would result in discharge of fill material to wetlands and other waters of the U.S., the applicant shall obtain a Section 404 Clean Water Act permit from the USACE and a Section 401 Water Quality Certification from the SWRCB prior to discharge of fill of waters of the state. As a condition of these permits, the applicant shall provide compensatory mitigation for the restoration, enhancement, and/or replacement of wetland habitat on a "no net loss" basis at an acreage and location and by methods agreeable to the USACE and the RWQCB. At minimum, the applicant shall be required to mitigate at a one:one ratio for construction of new wetlands. The creation credits purchased in accordance with **Mitigation Measure 4.4-2** for seasonal wetlands and wetland drainage swales

located within critical habitat may contribute to a portion of this mitigation requirement. Evidence of the Section 404 and 401 permits shall be submitted to the Community Development Department prior to the issuance of any grading permits or building permits for construction activities that would result in discharge of fill to waters of the U.S. and of the state. All conditions of the permits shall be adhered to.

Mitigation Measure 4.4-1b. The applicant shall implement **Mitigation Measure 4.8-1** to obtain coverage the SWRCB NPDES General Construction Permit. This shall include preparation of a SWPPP and implementation of the BMPs specified in **Mitigation Measure 4.8-1**. Evidence of the SWPPP and coverage under the Construction General Permit shall be submitted to the Community Development Department prior to the issuance of any building or grading permits for construction activities within the project site.

Federally Listed Special-Status Species and Critical Habitat

Impact

4.4-2 Construction of the Proposed Project could impact potentially occurring federally listed species, including Contra Costa Goldfields, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

The Proposed Project would remove approximately 1.55 acres of seasonal wetlands and wetland drainage swales, which provide potential habitat for vernal pool branchiopods. Approximately 0.39 acres of the 1.55 acres of seasonal wetlands and wetland drainage swales occur within USFWS-designated critical habitat for Contra Costa Goldfields (Unit 4A), vernal pool fairy shrimp (Unit 16C), and vernal pool tadpole shrimp (Unit 11B) (**Figure 4.4-4**; USFWS, 2005). Impacts associated with the conversion of the critical habitat areas for these species are considered significant. However, implementation of **Mitigation Measure 4.4-2a** would ensure that the removal of critical habitat would not result in jeopardy to the species through compensatory mitigation. The expansion of permanent habitat at a two-to-one ratio via the purchase of preservation credits and the creation of new wetlands at a one:one ratio would off-set the loss of critical habitat. Therefore, the impacts associated with conversion of 0.39 acres of suitable habitat within critical habitat would not result in jeopardy as compensatory mitigation would facilitate their recovery through the preservation and creation of suitable habitat. The Proposed Project would remove approximately 1.16 acres of the 1.55 acres of seasonal wetlands and wetland drainage swales occurring outside of critical habitat that have the potential to provide habitat for vernal pool branchiopods. This is considered a potentially significant impact. Impacts will be mitigated by conducting protocol level surveys to determine presence/absence and purchasing compensatory mitigation should presence be determined within the wetland features. Should the surveys result in negative findings and the USFWS accepts the negative findings, then no mitigation would be required for the 1.16 acres of potential vernal pool branchiopod habitat occurring outside of designated critical habitat beyond the mitigation identified within **4.4-1a** for impacts to wetlands and other waters of the U.S. and of the state. Implementation of **Mitigation Measures 4.4-2b** through **4.4-2d** would reduce impacts to vernal pool branchiopods to less than significant with mitigation incorporated. **Less than Significant with Mitigation.**

Mitigation Measure 4.4-2a: A Biological Assessment, in accordance with USFWS standards, shall be prepared and submitted to the USACE, the federal lead agency for issuance of 404 permits, to support consultation with the USFWS pursuant to Section 7 of the ESA. A Biological Opinion with an incidental take statement for Contra Costa goldfields, vernal pool fairy shrimp, and vernal pool tadpole shrimp shall be obtained from the USFWS prior to construction within designated critical habitat. All mitigation measures in the Biological Opinion and incidental take statement issued by USFWS shall be adhered to. At minimum, these measures shall include:

- The applicant shall purchase preservation credits at a two:one ratio and creation credits at a one:one ratio for removal of critical habitat at a USFWS-approved mitigation bank prior to commencement of construction activities, including discharge of fill material. Preservation credits are calculated based on the direct impacts of 0.39 acres and the indirect impacts of 6.9 acres (a 250-foot buffer around the seasonal wetlands and wetland drainage swales for land occurring within critical habitat). Creation credits are calculated based on direct impacts to the 0.39 acres. The preservation and creation credits will be a condition of the Biological Opinion with an incidental take statement. Evidence of the purchase of preservation credits shall be submitted to the Community Development Department prior to the issuance of grading or building permits for construction activities within critical habitat.

Mitigation Measure 4.4-2b. Prior to construction within the project site, a USFWS-approved biologist who holds a Recovery Permit for vernal pool branchiopods shall conduct protocol level surveys within the 1.16 acres of seasonal wetlands and wetland drainage swales occurring outside of critical habitat, in accordance with the USFWS (1996) *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods*. The protocol level surveys may be conducted during two wet seasons within five years or two consecutive seasons of one full wet season survey and one dry season survey. The results of the surveys shall be summarized within the Biological Assessment prepared under **Mitigation Measure 4.4-2a**.

Mitigation Measure 4.4-2c. Should it be determined that federally listed species are not present, and the USFWS agrees within its Biological Opinion, then no further mitigation would be required for effects to federally listed species as a result of construction outside of designated critical habitat. Evidence of compliance with the measures and conditions of the Biological Opinion shall be submitted to the Community Development Department prior to the issuance of any grading and building permits within the project site.

Mitigation Measure 4.4-2d. Should the protocol level surveys determine presence of federally listed vernal pool branchiopods, this impact shall be addressed within the Biological Opinion with an incidental take statement for vernal pool branchiopods to be obtained from the USFWS, in accordance with **Mitigation Measure 4.4-2a**. All conditions of the permit required by USFWS shall be implemented. At a minimum, the following conservation measure shall be implemented to minimize impacts to the

federally listed species:

- The applicant shall purchase preservation credits at a two:one ratio and creation credits at a one:one ratio for removal of habitat at a USFWS-approved mitigation bank prior to commencement of construction activities, including discharge of fill material.
- Evidence of the incidental take statement and purchase of preservation credits shall be submitted to the Community Development Department prior to the issuance of any grading and building permits within the project site.

Impact

4.4-3 Construction of the Proposed Project could result in the removal of breeding habitat within the seasonal wetlands and upland habitat within the non-native annual grassland habitat for California tiger salamander.

CTS have the potential to breed within the seasonal wetlands and aestivate within the non-native annual grassland and agricultural habitat in the vicinity of the seasonal wetlands. The Proposed Project would remove approximately 0.39 acres of potential breeding habitat within the known range documented in the draft SMHCP for CTS and 1.16 acres of potential breeding habitat and 215.84 acres of potential upland habitat occurring outside of the known range documented in the draft SMHCP for CTS. (The known range for CTS includes the same area designated as critical habitat for vernal pool branchiopods and Contra Costa goldfields). This is considered a significant impact. Implementation of **Mitigation Measures 4.4-3a** through **4.4-3d** would reduce impacts to CTS to less than significant with mitigation incorporated. **Less than Significant with Mitigation.**

Mitigation Measure 4.4-3a. Prior to construction with the project site, a qualified biologist shall prepare and submit a CTS Site Assessment to the USFWS and the DFG, in accordance with the USFWS (2003) *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (CTS Guidance). The CTS Site Assessment shall be submitted to the USFWS and the DFG to provide recommendations to the appropriateness of the field surveys and guidance of the surveys conducted.

Mitigation Measure 4.4-3b. Upon USFWS and DFG's request, a biologist who holds a USFWS Recovery Permit and a state Scientific Collecting Permit for CTS shall conduct protocol level surveys within the construction site in accordance with the CTS Guidance. A Memorandum of Understanding shall be obtained from the CDFG prior to commencement of protocol level surveys. Results of the surveys shall be summarized within a letter report submitted to DFG and the City, and the Biological Assessment submitted to USACE for consultation with USFWS in accordance with **Mitigation Measure 4.4-2a**. Should the surveys determine that CTS is not present within the project site, then no further mitigation is necessary.

Mitigation Measure 4.4-3c. Should surveys determine presence of CTS, then a

Biological Opinion with an incidental take statement shall be obtained from the USFWS and an Incidental Take Permit shall be obtained from the DFG for impacts to CTS prior to construction. All conditions of the permits, including preservation and compensatory measures required by USFWS and by DFG, shall be implemented.

Mitigation Measure 4.4-3d. Evidence of the incidental take permits from USFWS and CDFG, or evidence of concurrence by USFWS with a finding of no effect to CTS, shall be submitted to the Community Development Department prior to the issuance of any grading and building permits.

State Listed Special-Status Species and Species of Concern

Impact

4.4-4 Construction activities have the potential to impact aquatic habitat for western pond turtle.

Western pond turtles have the potential to occur within the earth-lined canal and the detention basin on the project site. The Proposed Project was designed to avoid impacts to these features, however, construction activities associated with grading within 300 feet of the earth-lined canal and the detention basin between April and November could disturb or harm western pond turtles during the active nesting season. The following measures have been recommended to ensure that western pond turtles are not impacted during construction activities. After implementation of **Mitigation Measures 4.4-4a** and **4.4-4b**, impacts would be considered less than significant.

Less than Significant with Mitigation.

Mitigation Measure 4.4-4a. If grading within 300 feet of either of the detention basin or earth-lined canal is scheduled during the active nesting period (April through November), a pre-construction survey shall be conducted by a qualified biologist prior to commencement of construction activities. The survey shall be conducted no more than 14 days prior to initiation of grading to provide confirmation on presence or absence of active nests in the vicinity. The biologist shall look for adult western pond turtles, in addition to nests containing pond turtle hatchlings and eggs. If a western pond turtle is located in the construction area, the biologist will move the turtle to a suitable aquatic site, outside of the construction area. If an active pond turtle nest containing either pond turtle hatchlings or eggs is found, DFG will be consulted to determine and implement appropriate avoidance measures, which may include a “no-disturbance” buffer around the nest site until the hatchlings have moved to a nearby aquatic site. Evidence, in the form of a letter report documenting the results of the survey (and any consultation with DFG in the event that nesting pond turtles are found) shall be submitted to the Community Development Department prior to the issuance of any grading or building permits for construction activities within 300 feet of either of the detention basin or earth-lined canal between April and November.

Mitigation Measure 4.4-4b. A qualified biologist shall conduct an environmental awareness training for construction crew members prior to commencement of construction activities within 300 feet of the earth-lined canal or the detention basin. The

training shall consist of a brief presentation by persons knowledgeable in western pond turtle biology to contractors, their employees, and military and agency personnel involved in the project. A fact sheet conveying this information should be prepared for distribution to the above-mentioned people and anyone else who may enter the project site. A letter report shall be submitted to the City within 30 days following the worker awareness training to document the results.

Impact

4.4-5 Grading and construction activities associated with the Proposed Project could result in the removal of potential nesting habitat for burrowing owls.

Burrowing owls were not observed within the project site during biological surveys; however, burrowing owls have the potential to nest or winter within the non-native annual grassland and agricultural areas, especially in the borrow piles in the southeastern portion of the project site where numerous animal burrows were observed. Potential disruption of burrowing owls from construction activities could result in the abandonment or loss of active nests through burrow destruction. This is considered a potentially significant impact. The mitigation described below adheres to the *Staff Report on Burrowing Owl Mitigation* (CDFG, 1995). The mitigation measures would reduce potential impacts to burrowing owls through the avoidance of any active burrowing owl nests, the safe exclusion of burrowing owls from any burrows to be destroyed prior to construction of the Proposed Project, and the passive relocation of nesting birds and purchase of additional burrowing owl habitat should occupied burrows be discovered on the project site. After implementation of **Mitigation Measures 4.4-5a** through **4.4-5d**, impacts would be considered less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.4-5a. A qualified biologist shall conduct a survey during the non-breeding season (September through January 31), prior to the anticipated start of construction. In accordance with the DFG burrowing owl survey protocol, the survey area will extend 500-feet from construction areas (CDFG, 1995) where legally permitted. The non-breeding season survey shall either take place from one hour before to two hours after sunrise or from two hours before to one hour after sunset. –The biologist will use binoculars to visually determine whether burrowing owls occur beyond the construction areas if access is denied on adjacent properties. If no burrowing owls or their sign are detected in the vicinity of the project site during the pre-construction survey, a letter report documenting survey methods and findings shall be submitted to the City and the DFG within 30 days following the survey. If unoccupied burrows are detected during the non-breeding season (September 1 through January 31), the City shall be contacted within one day following the pre-construction survey to report the findings. A qualified biologist shall collapse the unoccupied burrows, or otherwise obstruct their entrances to prevent owls from entering and nesting in the burrows.

Mitigation Measure 4.4-5b. A qualified biologist shall conduct a survey during the peak breeding season (April 15 through July 15), prior to the anticipated start of construction. A minimum of four survey visits shall be conducted. In accordance with the DFG

burrowing owl survey protocol, the survey area will extend 500-feet from construction areas (CDFG, 1995) where legally permitted. The breeding season survey shall either take place from one hour before to two hours after sunrise or from two hours before to one hour after sunset. If no burrowing owls or their sign are detected in the vicinity of the project site during the breeding season surveys, a letter report documenting survey methods and findings shall be submitted to the City and the DFG within 15 days following the survey, and no further mitigation is required so long as construction commences within seven days of the breeding season survey.

Mitigation Measure 4.4-5cb. A qualified biologist shall conduct a pre-construction survey within ~~30~~seven (7) days prior to construction activities. In accordance with the DFG burrowing owl survey protocol, the survey area will extend 500-feet from construction areas (CDFG, 1995) where legally permitted. The survey shall either take place from one hour before to two hours after sunrise or from two hours before to one hour after sunset. If no burrowing owls or their sign are detected in the vicinity of the project site during the pre-construction survey, a letter report documenting survey methods and findings shall be submitted to the City and the DFG within ~~30~~five (5) days following the survey, and no further mitigation is required. If more than seven days has lapsed between the survey date and site disturbance, then an additional survey shall be conducted a maximum of seven days prior to construction activities. Mitigation Measure 4.4-5a or Mitigation Measure 4.4-5b may meet the requirements of this pre-construction survey mitigation measure, so long as construction commences within seven days of the breeding or non-breeding season surveys.

Mitigation Measure 4.4-5de. If occupied burrowing owl burrows are detected, impacts on burrows shall be avoided by providing a buffer of 160 feet during the non-breeding season (September 1 through January 31) or 250 feet during the breeding season (February 1 through August 31). The size of the buffer area may be adjusted if a qualified biologist or the DFG determine the burrowing owl would not likely be affected by the Proposed Project. Project activities shall not commence within the buffer area until a qualified biologist confirms that the burrow is no longer occupied. If the burrow is occupied by a nesting pair, a minimum of 7.5 acres of foraging habitat contiguous to the burrow shall be maintained until the breeding season is finished.

Mitigation Measure 4.4-5ed. If impacts to occupied burrows are unavoidable, onsite passive relocation techniques approved by the DFG shall be used to encourage burrowing owls to move to alternative burrows outside of the project site. No occupied burrows shall be disturbed during the nesting season unless a qualified biologist verifies through non-invasive methods that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Mitigation for foraging habitat of relocated pairs shall follow the guidelines provided in *the California Burrowing Owl Survey Protocol and Mitigation Guidelines* (California Burrowing Owl Consortium, 1993). The mitigation for foraging habitat for relocated pairs range from 7.5 to 19.5 acres per pair.

Impact

4.4-6 Construction activities have the potential to result in the disturbance of nesting habitat for Swainson's hawk.

Although unlikely, Swainson's hawk has the potential to nest within the project site in the eucalyptus trees adjacent to Vanden Road. Construction activities could result in disturbance of potential Swainson's hawk nest sites through the removal of the potential nest trees and the temporary increases in ambient noise levels and increased human activity on the project site. This is considered a potentially significant impact. The mitigation measures identified below would ensure that impacts to nesting Swainson's hawks are reduced to less than significant levels through identification and avoidance of active nests. These measures comply with the SMHCP (LSA, 2009) and the *State Fish and Game Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (CDFG, 1994) as they relate to the Proposed Project. After implementation of **Mitigation Measures 4.4-6a** through **4.4-6b**, impacts would be considered less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.4-6a. A qualified biologist shall conduct a minimum of three protocol level preconstruction surveys during each survey period immediately prior to start of construction, in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (DFG, 2000). ~~a qualified biologist shall conduct a minimum of two protocol level preconstruction surveys during the recommended survey periods for the nesting season that coincides with the commencement of construction activities, in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000).~~ The survey methodology shall be submitted to CDFG 15 days prior to survey activities. The qualified biologist shall conduct surveys for nesting Swainson's hawk in the project site and within 0.25 miles of construction activities where legally permitted. The biologist will use binoculars to visually determine whether Swainson's hawk nests occur beyond the 0.25-mile survey area if access is denied on adjacent properties. If no active Swainson's hawk nests are identified on or within 0.25 miles of construction activities within the recommended survey periods, a letter report summarizing the survey results shall be submitted to the City and the DFG within 30 days following the survey, and no further mitigation for nesting habitat is required. Evidence, in the form of a letter report documenting the results of the survey, shall be submitted to the Community Development Department prior to the issuance of any grading or building permits within the project site.

Mitigation Measure 4.4-6b. If active Swainson's hawk nests are found within 0.25 miles of construction activities, the biologist shall contact the City and the DFG within one day following the pre-construction survey to report the findings. For purposes of this mitigation requirement, construction activities are defined to include heavy equipment operation associated with construction (use of cranes or draglines, new rock crushing activities) or other project-related activities that could cause nest abandonment or forced fledging within 0.25 miles of a nest site between March 1 and September 15. Should an active nest be present within 0.25 miles of construction areas, then the DFG shall be

consulted to establish an appropriate noise buffer, develop take avoidance measures, and implement a monitoring and reporting program prior to any construction activities occurring within 0.25 miles of the nest. The monitoring program would require that a qualified biologist shall monitor all activities that occur within the established buffer zone to ensure that disruption of the nest or forced fledging does not occur. Should the biologist determine that the construction activities are disturbing the nest, the biologist shall halt construction activities until the DFG is consulted. The construction activities shall not commence until the DFG determines that construction activities would not result in abandonment of the nest site. If the DFG determines that take may occur, the applicant would be required to obtain a CESA take permit. Should the biologist determine that the nest has not been disturbed during construction activities within the buffer zone, then a letter report summarizing the survey results shall be submitted to the City and the DFG and no further mitigation for nesting habitat is required.

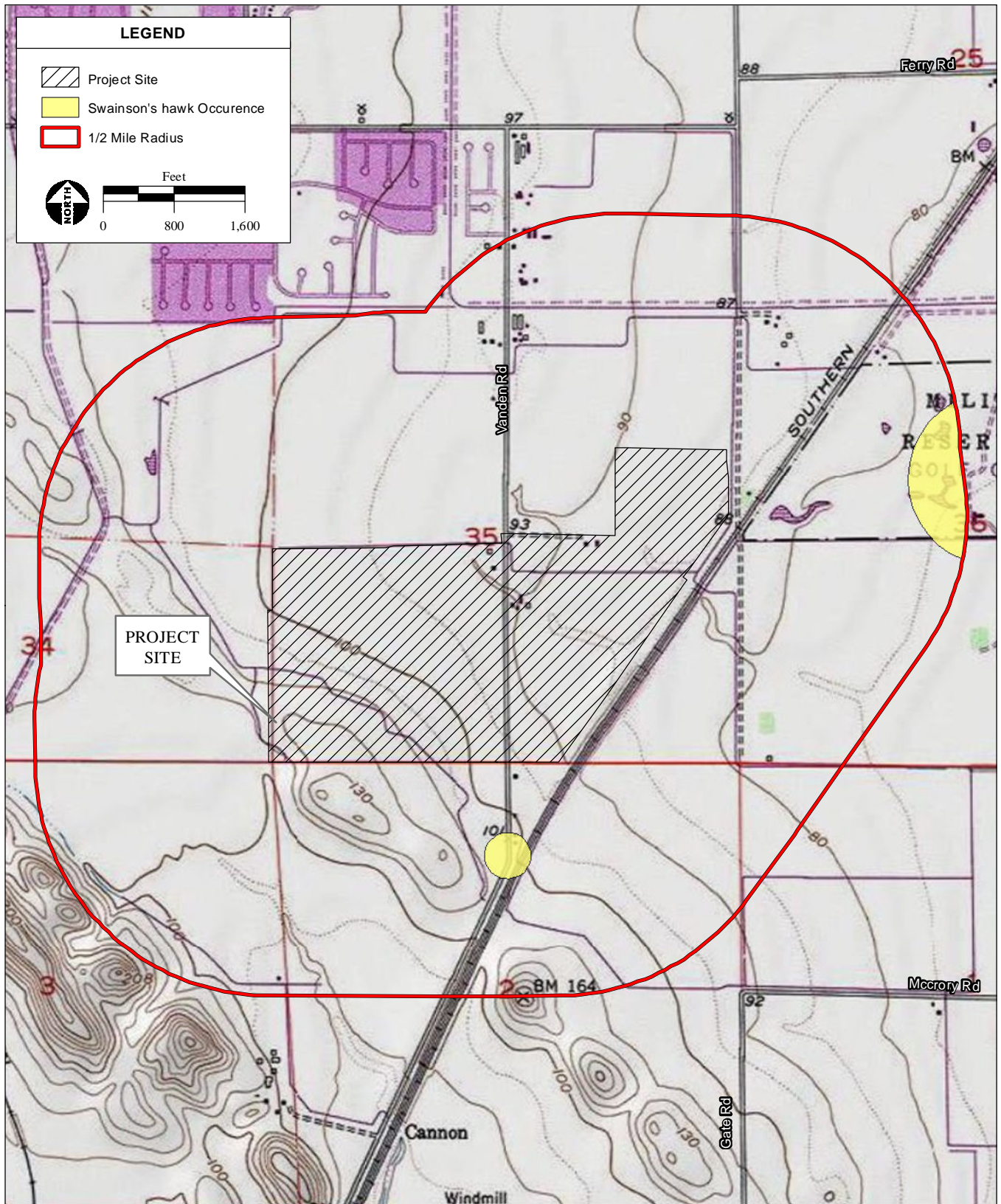
Impact

4.4-7 Construction activities for the Proposed Project could result in the removal of Swainson's hawk foraging habitat.

The DFG considers five or more vacant acres within ten miles of an active nest to be significant foraging habitat for Swainson's hawk, the conversion of which to urban uses is considered a significant impact. The project site occurs within 0.5 miles of active Swainson's hawk nests documented within the last five years (**Figure 4.4-5**). The project site is in an area designated by the draft SMHCP as Irrigated Agriculture Conservation Area. The project would directly convert up to 45.14 acres of non-native grassland and 196.18 acres of agricultural land that is considered suitable foraging habitat for Swainson's hawk. This is considered a potentially significant impact. Implementation of **Mitigation Measure 4.4-7a** would require that the City complies with the conservation requirements of the draft SMHCP. This potential impact is considered less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.4-7a. Mitigation measures for impacts to foraging habitat in areas designated as Irrigated Agriculture Conservation Area in the draft SMHCP may include the preservation and management of like foraging habitat at a ratio of 1:1 (241.32 acres). In accordance with the conservation measures identified within the draft SMHCP, the applicant shall purchase credits for the conversion of 241.32 acres of Swainson's hawk foraging habitat at a 1:1 ratio.

Mitigation Measure 4.4-7b. If determined acceptable by the DFG, the preservation of 68.83 acres of active farmland in Solano County as required by **Mitigation Measure 4.3-1** may could count towards this requirement to preserve Swainson's Hawk foraging habitat at a 1:1 ratio, reducing the additional preservation requirement to 172.49 acres. In order for this land to be considered suitable mitigation, the 68.83 acres of land must be



SOURCE: "Elmira, CA" USGS 7.5 Minute Topographic Quadrangle, T R Section 35, Mt. Diablo Baseline & Meridian; California Natural Diversity Database, 2/2011; AES 2011

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Figure 4.4-5

Half-Mile Radius Map for Swainsons Hawk Records

preserved with a conservation easement, include an endowment fund for long-term resource management, and specify it is for the long-term sustainability and management of resources. Incompatible land uses would be prohibited on lands designated for species protection within the conservation easement area. A detailed Mitigation and Monitoring Plan (MMP) shall be prepared, including a site-specific habitat assessment, species occurrence information, effective compensatory mitigation, monitoring methods, performance criteria to ensure mitigation success, adaptive management, and reporting requirements. The MMP would be prepared in consultation with the DFG and submitted to the DFG for review and approval prior to implementation of the project.

Impact

4.4-8 Grading and construction activities have the potential to result in the disturbance of nesting habitat for migratory birds and other birds of prey, including the northern harrier.

Nesting habitat for migratory birds and other birds of prey protected under the MBTA, including the northern harrier, may include eucalyptus woodland, nonnative annual grassland, and agriculture areas within the project site and vicinity. Potential disruption of nesting migratory birds and other birds of prey during construction could result in nest abandonment or mortality.

Likewise, increased human activity and traffic, elevated noise levels, and operation of machinery could also impact birds if their nests are located within the vicinity of development areas. These impacts are considered significant. After implementation of **Mitigation Measures 4.4-8a** through **4.4-8c**, impacts would be considered less than significant with mitigation incorporated. **Less than Significant with Mitigation.**

Mitigation Measures 4.4-8a. A qualified biologist shall conduct a pre-construction bird survey for nesting within 14 days prior to commencement of construction activities if anticipated to commence during the nesting season (between March 1 and September 15). The qualified biologist shall document and submit the results of the pre-construction survey in a letter to the DFG and the City within 30 days following the survey. The letter shall include: a description of the methodology including dates of field visits, the names of survey personnel, a list of references cited and persons contacted, and a map showing the location(s) of any bird nests observed on the project site. If no active nests are identified during the pre-construction survey, then no further mitigation is required. Evidence, in the form of a letter report documenting the results of the survey, shall be submitted to the Community Development Department prior to the issuance of any grading or building permits within the project site.

Mitigation Measures 4.4-8b. If any active nests are identified during the pre-construction survey within the project site, a buffer zone will be established around the nests. A qualified biologist will monitor nests weekly during construction to evaluate potential nesting disturbance by construction activities. The biologist will delimit the buffer zone with construction tape or pin flags within 250 feet of the active nest and maintain the buffer zone until the end of the breeding season or until the young have fledged. Guidance from the DFG will be requested if establishing a 250-foot buffer zone

is impractical. Guidance from the DFG will be requested if the nestlings within the active nest appear disturbed.

Mitigation Measures 4.4-8c. Trees anticipated for removal should be removed outside of the nesting season. The nesting season occurs between March 1 and September 15. If trees are anticipated to be removed during the nesting season, a pre-construction survey shall be conducted by a qualified biologist. If the survey shows that there is no evidence of active nests, then the tree shall be removed within ten days following the survey. If active nests are located within trees identified for removal, a 250-foot buffer shall be installed around the tree. Guidance from the DFG will be requested if the 250-foot buffer is infeasible.

Wildlife Movement and Migratory Corridors

Impact

- 4.4-9 The Proposed Project could interfere with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.**

The Proposed Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native residents or migratory wildlife corridors or impede the use of native wildlife nursery sites because none occur within the project site. **Less than Significant Impact.**

Conservation Plans

Impact

- 4.4-10 The Proposed Project could conflict with provisions of the SMHCP should it be adopted prior to the approval of the Proposed Project.**

With implementation of **Mitigation Measures 4.4-2a** through **4.4-2d**, **4.4-3a** through **4.4-3d**, **4.4-5a** through **4.4-5d**, **4.4-6a** through **4.4-6b**, **4.4-7a**, the Proposed Project is consistent with and will not significantly impact the long-term conservation goals contained in the SMHCP. The SMHCP has deemed 25.48 acres within the southwestern portion of the project site as Medium Value Conservation Area for Valley Floor Grassland and Vernal Pools and, more specifically, Low Value Conservation area for vernal pool branchiopods and potential habitat for Contra Costa goldfields. The SMHCP has also designated the 25.48 acres within the southwestern portion of the project site as occurring within the range for CTS. The SMHCP defines preservation and creation credits for the conversion of these areas. Even if the SMHCP is adopted prior to the approval of the Proposed Project, the recommended purchase of preservation credits for the conversion of critical habitat is consistent with the requirements identified within the SMHCP. Implementation of the Proposed Project would not result in development of restricted areas as designated by the SMHCP and the proposed mitigation measures above are consistent with the requirements of the SMHCP. With implementation of **Mitigation Measures 4.4-2a**, **4.4-6a** through **4.4-6d**, **4.4-7a** through **4.4-7b**, and **4.4-8a** above, this impact is considered less than significant. **Less than Significant Impact with Mitigation.**

Mitigation Measure 4.4-10. Implement of **Mitigation Measures 4.4-2a, 4.4-6a through 4.4-6d, 4.4-7a through 4.4-7b, and 4.4-8a.**

Impact

4.4-11 Construction of the Proposed Project could remove trees protected within the tree preservation ordinance specified in Chapter 14.09.131 of the City's Zoning Code.

The City has a tree ordinance that protects trees with trunk circumferences of 31 inches or greater. Approximately ten eucalyptus trees with trunk circumferences of 31 inches or greater would be removed as a result of development of the Proposed Project. This is considered a significant impact. Implementation of **Mitigation Measure 4.4-11** would reduce impacts to protected trees to less than significant with mitigation incorporated. **Less than Significant with Mitigation.**

Mitigation Measure 4.4-11. Prior to the issuance of grading permits and removal of any trees, a certified arborist or registered professional forester shall conduct an arborist survey documenting all trees with trunk circumferences of 31 inches or greater and their location. The report shall be submitted to the Community Development Department. The applicant shall not remove any trees without prior approval from the Community Development Department. All recommendations of the arborist report shall be implemented prior to the issuance of building permits for development on the project site. The arborist report shall specify measures including, but not limited to the following:

- To the extent feasible, trees anticipated for removal shall be removed outside of the nesting season for birds. The nesting season is from March 1 to September 15.
- The project proponent shall plant replacement tree species recommended by the City at a 1:1 ratio within the project site.

Off-site Sewer Upgrades

4.4-12 Development of the proposed off-site sewer connection upgrades could impact biological resources.

The Proposed Project would contribute towards the need to upgrade sewer conveyance lines to the Easterly Wastewater Treatment Plant (EWWTP). The anticipated sewer upgrade locations are shown in **Figure 3-8**. A survey of the off-site sewer upgrade alignment was conducted for biological resources. A technical memorandum summarizing the results of the survey is provided in **Appendix F**. As stated therein, the sewer lines would extend through graded and compacted, unpaved access/maintenance roadways and agricultural land. No special-status species or potential habitat was identified within the area of potential effects of the sewer upgrades. However, the survey was not conducted within the blooming period for special-status plant species that have the potential to occur within the area, so it is possible that these species may be present but were not identifiable. Additionally, temporary construction noise and equipment has the potential to disturb nesting birds. Potential disruption of nesting migratory birds and other

birds of prey during construction could result in nest abandonment or mortality. Mitigation requires rare plant and nesting bird surveys. After implementation of **Mitigation Measures 4.4-12a** through **4.4-12c**, impacts would be considered less than significant with mitigation incorporated. **Less than Significant with Mitigation.**

Mitigation Measure 4.4-12a. A qualified biologist shall conduct a botanical inventory focusing of the nine special status plants with the potential to occur within the ruderal vegetation in the vicinity of Upgrade 2 prior to the trenching activities associated with installing the proposed off-site sewer connection upgrades within Upgrade 2 (**Figure 3-8**). The botanical survey should be conducted in April, which is within the evident and identifiable blooming period for these species. A Rare Plant Survey Report shall be prepared and submitted to DFG prior to trenching in the vicinity of Upgrade 2. The Rare Plant Survey Report shall recommend measures to avoid impacts to special-status species, if present. If special status species would be impacted by the Proposed Project, recommended measures could include transplanting individual specimens or providing compensatory conservation lands.

Mitigation Measures 4.4-12b. A qualified biologist shall conduct a pre-construction survey for nesting birds within 14 days prior to commencement of construction activities if anticipated to commence during the nesting season (between March 1 and September 15). The qualified biologist shall document and submit the results of the pre-construction survey in a letter to the DFG and the City within 30 days following the survey. If no active nests are identified during the pre-construction survey, then no further mitigation is required. Evidence, in the form of a letter report documenting the results of the survey, shall be submitted to the Community Development Department prior to the issuance of any grading or building permits within the project site.

Mitigation Measures 4.4-12c. If any active nests are identified during the pre-construction survey within the off-site sewer connection upgrade route, a buffer zone will be established around the nests. A qualified biologist will monitor nests weekly during construction to evaluate potential nesting disturbance by construction activities. The biologist will delimit the buffer zone with construction tape or pin flags within 250 feet of the active nest and maintain the buffer zone until the end of the breeding season or until the young have fledged. Guidance from the DFG will be requested if establishing a 250-foot buffer zone is impractical. Guidance from the DFG will be requested if the nestlings within the active nest appear disturbed.

Cumulative Impacts

Impact

4.4-13 Development of the Proposed Project could contribute to the cumulative loss of special-status wildlife species or their habitat in the region.

Cumulative projects in the vicinity of the project site, including growth resulting from build-out of the City's General Plan and proposed development of the Northeast Fairfield Station Area Master

4.4 Biological Resources

Plan located to the south project site, are anticipated to permanently remove plant and wildlife resources, which could affect special-status species and their habitat, nesting and foraging habitat for resident and migratory birds, and/or local policies or ordinances protecting biological resources. The primary effects of the Proposed Project, when considered with other projects in the region, would be the cumulative direct loss of sensitive or special-status wildlife species and their habitat, loss of migratory birds, and conflicts with local plans or policies protecting biological resources. As development in the City continues, sensitive plant and wildlife species native to the region and their habitat, including those species listed under CESA and ESA and those individuals identified by state and federal resources agencies as species of concern, fully protected, or sensitive will be lost through conversion of existing open space to urban development. Although mobile species may have the ability to adapt to modifications to their environment by relocating, less mobile species may be locally extirpated. With continued conversion of natural habitat to human use, the availability and accessibility of remaining foraging and natural habitats in this ecosystem would dwindle and those remaining natural areas may not be able to support additional plant or animal populations above their current carrying capacities. The conversion of plant and wildlife habitat on a regional level as a result of cumulative development would potentially result in a regional significant cumulative impact on special-status species and their habitats.

Development of the Proposed Project would contribute to a loss of regional biological resources through the conversion of habitat for special-status species to human use, and thus limit the availability and accessibility of remaining natural habitats to regional wildlife. Although the project site contains highly disturbed plant and wildlife habitat and is isolated from many other areas of similar habitat by urban development, the City would implement mitigation measures specifically designed to avoid, reduce, or mitigate potential impacts to special-status species and their habitat. With these measures, the project's contribution to regional impacts to biological resources would be less than cumulatively considerable and consistent with the Draft MSHCP prepared to address cumulative impacts to biological resources within Solano County. Therefore, after mitigation, impacts would be considered less than significant. **Less than Significant with Mitigation.**

Mitigation Measures 4.4-13. Implement **Mitigation Measures 4.4-1** through **4.4-12.**

4.5 CULTURAL RESOURCES

4.5.1 INTRODUCTION

This section addresses the potential for the Proposed Project to impact cultural resources. Following an overview of the cultural resources setting in **Subsection 4.5.2** and the relevant regulatory setting in **Subsection 4.5.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.5.4**.

4.5.2 CULTURAL RESOURCES SETTING

Prehistory

The most current research on the Central Valley is a combination of previous research conducted by Fredrickson (1974) and Moratto (1984), which have been adjusted to accommodate recent radiometric data. Based on all compiled data, Rosenthal et al. (2007) has devised the following chronological sequence: Paleo-Indian (13,500 to 10,550 B.P.), Lower Archaic (10,550 to 7,550 B.P.), Middle Archaic (7,550 to 2,550 B.P.), Upper Archaic (2,550 to 900 B.P.) and Emergent (900 to ca. 200 B.P.)

Little evidence exists of the Paleo-Indian period (13,500 to 10,550 B.P.) in the Central Valley. The scant evidence available is comprised primarily by basally thinned, fluted projectile points. These points are morphologically similar to the well dated Clovis points (ca. 13,500 to 11,550 B.P.) found elsewhere in North America. Due to the similarity of tools, it is inferred that the fluted points recovered from cultural deposits within California were also used to hunt extinct megafauna. A possible fluted point was recovered from near Thomas Creek in the Sacramento Valley; this is the only example of the fluted tradition in the northern Central Valley (Rosenthal et al., 2007: 151).

The knowledge regarding the Lower Archaic period (10,550 to 7,550 B.P.) in the Central Valley is gleaned from a single site in Kern County (CA-KER-116). This site produced a stemmed projectile point, lithic crescent tools and faunal remains representing birds, fish and shellfish. The absence of milling implements on the valley floor suggests the inhabitants of the Lower Archaic were travelling to the nearby Sierra Nevada and Coastal Ranges where abundant grinding stones have been recovered. This pattern of artifacts further suggests that during this period people were highly mobile and moved continually to access available resources (Rosenthal et al., 2007: 152).

The chronological sequence for the Middle Archaic (7,550 to 2,550 B.P.) is divided into two geographical areas: the foothills tradition and the valley tradition. Overall, Middle Archaic deposits are quite rare in the Sacramento Valley. Generally, the Middle Archaic period is a shift from the highly mobile Paleo-Indian and Lower Archaic peoples to the semi-sedentary people of the Middle Archaic. Grinding tools, including mortars and pestles, become common in Middle Archaic and reflect a greater reliance on acorn and pine nuts. Fish and other aquatic resources become a large part of the diet as seen through the variety of new technologies devised for fishing, such as hooks and spears, and plethora of fish remains. A variety of

new artifact types are introduced in the Middle Archaic such as basketry awls, baked clay objects, and impressions of cordage. Artifacts used for personal adornment, such as plummet stones, bird bone tubes and shell beads also become common in Middle Archaic assemblages. A new reliance on riverine environments is also apparent from material culture of the Middle Archaic (Rosenthal et al., 2007: 153-154).

The Upper Archaic (2,550 to 900 B.P.) is better understood than any of the preceding periods. Technology becomes specialized during this period, resulting in innovations within bone tools, shell beads, charmstones, and ceremonial blades. The abundance of grinding tools and archeobotanical remains indicates a heavy dependence upon acorn. Sites in the upper Sacramento Valley such as CA-BUT-288 represent large village-like settlements (Rosenthal et al., 2007: 155-156).

The Emergent Period (900 B.P. to ca. 200 B.P.) in the Central Valley was also a period of technological adaption. A number of cultural innovations shaped the Emergent Period. The bow and arrow was introduced during the Emergent Period and effectively replaced the previously used dart and atlatl technology. Burial associated artifacts become more elaborate, suggesting an increase in social stratification and complexity. Subsistence during this period is based on plant foods and aquatic resources (Rosenthal et al., 2007: 158-159).

Ethnography

The project site is located in a portion of the Sacramento – San Joaquin Delta region that was subject to extended seasonal inundation and thus was not suitable for terrestrial land use activities by the native inhabitants of the region. Located as it is near the territorial boundaries of the Plains Miwok and Southern Patwin, the open waters and tidal sloughs of the area may have been used on occasion by both ethnographic groups. As such, the following discussion will focus on Patwin ethnography.

Patwin are members of the California Penutian linguistic stock and are the southernmost division of the Wintuan group, a distinction based primarily on linguistic variation. Synonymous names for the Patwin include Copeh and Southern Wintun.

The core Patwin territory included lands in the southern Sacramento Valley west of the Sacramento River from the town of Princeton, north of Colusa, south to San Pablo and Suisun bays. Distinction is made between the River Patwin, who resided in large villages near the Sacramento River, and the Hill Patwin, whose villages were situated in the Long, Bear, Indian, Capay, Pope, and Cortina valleys. The term “Patwin” refers to the people belonging to the many small contiguous independent political entities who shared linguistic and cultural similarities. Hill and River Patwin dialects are grouped into a Northern Patwin language, separate from southern Patwin, spoken by people that occupied present-day Knight’s Landing and Suisun. Together, they are classified as southern Wintuan and belong to the Penutian language family (Johnson, 1978: 350-360).

The Patwin made full use of the various environments within their territory, emphasizing different areas depending on the season and availability of resources. Game was hunted either by the individual or in

community drives. Salmon runs and other food resources available along Sacramento River also contributed significantly to the Southern Patwin subsistence. Acorns represented one of the most important staples of Patwin subsistence and were particularly abundant within oak woodlands. Some Patwin communities claimed possession of specific resource gathering areas such as valuable fishing holes and oak groves (Lightfoot and Parrish, 2009:304).

The “tribelet” village community formed the primary social unit among the Patwin (Kroeber, 1925). Tribelets were autonomous social units generally composed of a central village site, with outlying hamlets. Dialects were sometimes shared across tribelets. Fishing, hunting, and gathering formed the basis of the Patwin domestic economy. Patwin houses appear conical in shape and were made with bark stretched over a skeleton frame. Ceremonial structures were the same shape and construction on a larger scale (Johnson, 1978).

Traditional Patwin culture was significantly disrupted during the historic period as a result of introduced diseases, forced labor, religious conversion, violence, and theft of traditional lands.

History

Following the settlement of San Diego in 1769, the Spanish made steady progress in the exploration and settlement of the coastal regions of Alta (Northern) California. By 1776, the Spaniards established the Presidio of San Francisco and by 1798 the Mission San Jose. The Central Valley would remain largely uncharted in the first decades of Spanish settlement. Early in the colonial period, Spaniards made occasional forays into the Central Valley in pursuit of stolen livestock or natives who had fled the forced labor imposed at coastal missions. In addition, diseases introduced by Spanish settlers and other foreigners inflicted a heavy toll on native populations in California. The Measles epidemic of 1806 struck Missions Santa Clara, San Jose, and Dolores (San Francisco) particularly hard and, while it is known to have spread to remnant villages, its effect on populations inhabiting the Sacramento Valley is less understood (Milliken, 2005).

Between 1804 and 1823 the Spanish made numerous trips into the Central Valley prospecting for new mission site, attempting to recover stolen goods, or making punitive raids on the local natives. Gabriel Moraga is credited with leading the first documented Spanish expedition into the Sacramento Valley in 1808. It was during this journey between the Feather and Sacramento Rivers that the Spanish party first came in contact with Patwin-speaking people (Milliken, 2005).

In 1821, Mexican forces prevailed in their struggle for independence and declared California part of the Mexican empire. This event marked the beginning of the short-lived Mexican Period in California history. In 1833, the formal process of secularizing the missions began and the land holdings were divided among the Californios. The grants, known as ranchos, enriched those individuals fortunate enough to receive one, while effectively subjugating the native tribes as an indentured labor force.

The project area is located within the *Rancho Los Putos*, which was granted to Juan Manuel Vaca and Juan Felipe Pena in 1842 by Governor Micheltorena. However, the language of the written grant was vague and it was soon discovered that the boundaries overlapped a neighboring rancho granted to John

Wolfskill. Eventually, the courts ruled in favor of Wolfskill and Vaca, determined to stay in the area, built an adobe structure roughly two miles south of the modern City of Vacaville. The Pena Adobe, named in honor of Juan Felipe Pena, was restored in the 1960s and remains extant today (Hoover et al., 2002:492).

In 1850, William McDaniel purchased nine square miles of land within the *Rancho Los Potos* from Manuel Vaca for the sum of \$3,000. His intention was to plat out a town, name it after Vaca and give them particular plots within the town. The town was recorded as Vacaville in December of 1851 and was incorporated in 1892. The first Euro-American settlers to live in Vacaville besides McDaniel toiled on the land cutting wild oats for transport up to the Sacramento River (Hoover et al., 2002:500; City of Vacaville, 2010d).

Meanwhile, the agricultural industry in Vacaville grew to become a booming business. A black walnut tree, reportedly planted in 1860 by Josiah Allison, became the site of a fruit stand that became known as the Nut Tree. The huge tree that sheltered the fruit stand was located adjacent to the Western Wagon Road which later became I-80. The fruit stand evolved into one of California's first roadside attractions with restaurants, retail stores, a miniature railroad, and an airport. The growing popularity of travel by automobile in the mid 20th Century, catapulted the Nut Tree to an icon within the Sacramento Valley and the larger State of California (Hoover et al., 2002; Nut Tree, 2010). The Nut Tree Plaza is roughly three miles due north of the subject APE.

4.5.3 REGULATORY CONTEXT

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Several laws and regulations at the state level govern archaeological and historic resources deemed to have scientific, historic, or cultural value. The pertinent regulatory framework, as it applies to the Proposed Project, is summarized below.

Federal

National Historic Preservation Act

The National Historic Preservation Act of 1966 (as amended through 2000) authorizes the National Register of Historic Places (NRHP), a program for the preservation of historic properties ("cultural resources") throughout the Nation. The significance criteria for evaluating cultural resources for listing in the NRHP are defined in 36 CFR 60.4 as follows.

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

- A. that are associated with events that have made a significant contribution to the broad patterns of our history;

- B. that are associated with the lives of persons significant in our past;
- 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 may be likely to yield, information important to prehistory or history.

Sites younger than 50 years, unless of exceptional importance, are not eligible for listing in the NRHP.

All properties change over time; therefore, it is not necessary for a property to retain all its historic physical features or characteristics in order to be eligible for listing on the NRHP. The property must, however, retain enough integrity to enable it to convey its historic identity; in other words, to be recognizable to a historical contemporary.

While most historic buildings and many historic archaeological properties are significant because of their association with important events, people, or styles (criteria A, B, and C), the significance of most prehistoric and historic-period archaeological properties is usually assessed under criterion D. This criterion stresses the importance of the information contained within an archaeological site, rather than its intrinsic value as a surviving example of a type or its historical association with an important person or event. As discussed further in **Section 4.5.4**, no cultural resources eligible for listing in the NRHP are known to exist in the project area.

State

California Register of Historical Resources

PRC Section 5024.1 authorizes the establishment of the California Register of Historical Resources (CRHR). Any identified cultural resources must therefore be evaluated against the CRHR criteria. In order to be determined eligible for listing in the CRHR, a property must be significant at the local, state, or national level under one or more of the four significance criteria, modeled on the NRHP. In order to be determined eligible for listing in the CRHR, a property must be significant at the local, state, or national level under one or more of the following four criteria:

1. It is associated with events or patterns of events that have made a significant contribution to the broad patterns of the history and cultural heritage of California and the United States.
2. It is associated with the lives of persons important to the nation or to California's past.
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. It has yielded, or may be likely to yield, information important to the prehistory or history of the state and the nation.

In addition to meeting one or more of the above criteria, a significant property must also retain integrity. Properties eligible for listing in the CRHR must retain enough of their historic character to convey the reason(s) for their significance. Integrity is judged in relation to location, design, setting, materials,

workmanship, feeling, and association. As discussed further in **Subsection 4.5.4**, no cultural resources eligible for listing in the CRHR are known to exist in the project area.

California Environmental Quality Act (CEQA)

CEQA requires that, for projects financed by or requiring the discretionary approval of public agencies in California, the effects of the project on historical resources must be considered (PRC Section 21083.2). Historical resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 50201).

Under the CEQA *Guidelines*, an effect is considered significant if a project will result in a substantial adverse change to the resource (PRC Section 21084.1). Actions that would cause a substantial adverse change to a historical resource include demolition, replacement, substantial alteration, and relocation. Before the significance of impacts can be determined and mitigation measures developed, the significance of cultural resources must be determined. The 2000 CEQA *Guidelines* (Section 15064.5) define four cases in which a property may qualify as a significant historical resource for the purposes of CEQA review:

- A. The resource is listed in or determined eligible for listing in the CRHR. Section 5024.1 defines eligibility requirements and states that a resource may be eligible for inclusion in the CRHR if it:
 1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
 2. Is associated with the lives of persons important in our past;
 3. Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
 4. Has yielded, or may be likely to yield, information important in prehistory or history.
- B. In addition to meeting one or more of the above criteria, a significant property must also retain integrity. Properties eligible for listing in the CRHR must retain enough of their historic character to convey the reason(s) for their significance. Integrity is judged in relation to location, design, setting, materials, workmanship, feeling, and association. Properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR, and thus are significant historical resources for the purpose of CEQA (Public Resources Code section 5024.1[d][1]).
- C. The resource is included in a local register of historic resources, as defined in section 5020.1(k) of the Public Resources Code, or is identified as significant in a historical resources survey that meets the requirements of section 5024.1(g) of the Public Resources Code (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant).
- D. The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record.
- E. The lead agency determines that the resource may be a historical resource as defined in Public

Resources Code section 5020.1(j) or 5024.1.

CEQA also provides for the protection of *unique archaeological resources*. Public Resource Code Section 21083.2 defines unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets one or more of the following criteria: (1) that it contains information needed to answer important scientific research questions and that there is demonstrable public interest in that information; (2) that it has a special and particular quality, such as being the oldest of its type or the best available example of its type; or (3) that it is directly associated with a scientifically recognized important prehistoric or historic event or person.

Local

City of Vacaville General Plan

The Conservation Element of the Vacaville General Plan (2007) contains the guiding and implementation policies relating to historic and archeological resources that are applicable to the Proposed Project.

Guiding Policies

8.5-G 1: Continue to protect historic sites and archaeological resources for their aesthetic, scientific, educational, and cultural values.

8.5-G 2: Continue to protect the historic value of the Downtown area.

Implementing Policies:

8.5-I 1: Working in conjunction with the California Archaeological Inventory, review each proposed development project to determine whether the site contains known prehistoric or historic cultural resources and/or to determine their potential for as-yet-undiscovered cultural resources.

8.5-I 2: Require that areas found to contain significant historic or prehistoric artifacts be examined by a qualified consulting archaeologist or historian for appropriate protection and preservation, if feasible. The City's Historic Preservation Ordinance mandates the maintenance of designated buildings and the review of any changes to building exteriors or building demolitions.

8.5-I 3: Continue to encourage the renovation of designated historic structures in the Downtown historic district to preserve the architectural, historical, and cultural significance of those buildings; continue to require new buildings in the Downtown historic district to be complementary to the character of the existing buildings.

8.5-I 4: Consider the creation of a Historic Preservation District for the residential areas west of Downtown.

8.5-I 5: Encourage property owners to rehabilitate historic buildings, consistent with regulations which allow such properties, with densities that exceed General Plan standards or are residential uses in a commercial district to be legally conforming. (See also Land Use Element, policy 2.5-I 16.)

Municipal Code: Historic Preservation Chapter 14.09.105 Historic Preservation Overlay District

The City of Vacaville established the *Historic Preservation Overlay District* (Municipal Code Chapter 14.09.105) to provide for “the identification of historically significant buildings and areas and the adoption of standards to ensure the preservation of such areas.” The objectives of the Historic Preservation Overlay District are:

- A. To implement the policies of the General Plan regarding the preservation and adaptive reuse of historic buildings;
- B. To foster awareness of and interest in the heritage of the City of Vacaville through the designation of historic buildings and districts;
- C. To provide for the preservation of buildings which exhibit varied architectural styles reflecting the cultural, social, and economic phases of the City’s history; and
- D. To enhance property values, stimulate economic activity, and provide for the stabilization of commercial and neighborhood areas.

The relevant chapter of the Code establishes provisions for the designation of historic buildings and historic districts and provides guidance related to the modification, maintenance, and demolition of historic buildings.

4.5.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

Records Search and Literature Review

A records search was conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System by NWIC staff, on February 16, 2011 (NWIC File No. 10-0723). The NWIC, an affiliate of the State of California Office of Historic Preservation, is the official state repository of archaeological and historic records and reports for a 16-county area that includes Solano County. Additional research was conducted using the files and literature maintained at AES.

The records search and literature review for this study were done to (1) determine whether known cultural resources have been recorded within or adjacent to the study area and determine if the project site has been subject to survey in the past; (2) assess the likelihood of unrecorded cultural resources based on archaeological, ethnographic, and historical documents and literature; and (3) to review the distribution of nearby archaeological sites in relation to their environmental setting. Sources reviewed include the *California Inventory of Historical Resources* (California Office of Historic Preservation, 1976), the California Office of Historic Preservation’s *Five Views: An Ethnic Historic Site Survey for California* (1988), *California Historical Landmarks* (1990), *California Points of Historical Interest* (1992), and the *Historic*

4.5 Cultural Resources

Properties Directory Listing for Solano County (2010). The Historic Properties Directory includes the National Register of Historic Places, the California Register of Historical Resources, and the most recent listings (through 2010) of the California Historical Landmarks and California Points of Historical Interest.

The records search revealed that a total of 13 cultural resources investigations have been conducted within ¼-mile radius of the project area. The names and locations of the previously conducted cultural resource investigations are included in **Table 4.5-1**.

TABLE 4.5-1
PREVIOUSLY CONDUCTED CULTURAL RESOURCES STUDY IN THE APE AND ¼-MILE CIRCUMFERENCE

Author	Date	Title	Location	S-Number
Fredrickson	1977	A Summary of Knowledge of the Central and Northern California Coastal Zone and Offshore Areas, Vol. III, Socioeconomic Conditions, Chapter 7: Historical and Archaeological Resources	includes portions of the APE	S-848
Wilson	1978	Cultural Resources Survey of Peabody 230 kV Transmission Line and 230/21 kV Substation, Pacific Gas and Electric Company	east of the APE	S-5115
Treganza et al.	1965	Archeological Survey and Excavation Along the Tehama-Colusa Canal, Central California	includes portions of the APE	S-5156
Chavez and Associates	1986	Cultural Resources Evaluation for the North Bay Aqueduct Water Treatment Facilities EIR, Solano County, California	southwest of APE	S-8951
Miller	1977	Identification and Recording of Prehistoric Petroglyphs in Marin and Related Bay Area Counties	includes portions of the APE	S-9462
Curtice	1964	An Archaeological Survey of the Ulatis Creek Soil Conservation Service Watershed Project	includes portions of the APE	S-15491
Chartoff	1969	Archaeological Resource of the West Sacramento Canal Unit	includes portions of the APE	S-17899
Jones & Stokes Associates, Inc.	2000	Volumes I, II, and III: Final Cultural Resources Inventory for the Williams Communications Inc. Fiber Optic Cable System Installation Project, Point Arena to Robbins and Point Arena to Sacramento, California	east of the APE	S-22736
Nelson et al.	2000	Cultural Resources Survey for the Level (3) Communications Long Haul Fiber Optics Project, Segment WS01: Sacramento to Oakland	east of the APE	S-22817
Self and Popetz	2001	Inspection of Line Section 25, Solano and Yolo Counties, California (letter report)	south of the project area	S-23920

4.5 Cultural Resources

Author	Date	Title	Location	S-Number
Gross	2002	Results of an Archaeological Survey at Travis Air Force Base, Contract Number DACW05-99-D-0006-014 (letter report)	east of the APE	S-25880
Bowen and Siskin	2005	Historical Resources Evaluation Report and Archaeological Survey Report, Jepson Parkway Project, Caltrans District 4, Solano County	east of the APE	S-32047
Milliken et al.	2006	The Central California Ethnographic Community Distribution Model Version 2.0 with Special Attention to the San Francisco Bay Area, Cultural Resources Inventory of Caltrans District 4 Rural Conventional Highways	includes portions of the APE	S-32596
Meyer and Rosenthal	2007	Geoarchaeological Overview of the Nine Bay Area Counties in Caltrans District 4	includes portions of the APE	S-33600
URS Corporation	2008	Cultural Resources Baseline Literature Review for the Urban Levee Project	includes portions of the APE	S-35031
*Source: NWIC, 2011.				

The search also revealed one previously recorded resources located within a ¼-mile radius of the APE. No previously recorded cultural resources are located the boundaries of the APE. Cultural resource P-48-549/P-57-400 is a railroad that exists in two counties and thus the CHRIS assigned it two primary numbers. It consists of a railroad grade that runs from the Davis to Cordelia that was originally built in 1866-1868 by the California Pacific Railroad. The grade was purchased in 1871 by Central Pacific Railroad and again in 1884 by Southern Pacific Railroad. Union Pacific Railroad acquired Southern Pacific in 1996. P-48-549/P-57-400 continues to be used and maintained by the Union Pacific Railroad (Les, 1986; Nelson et al., 1999; Syda, 1999). Cultural Resource P-48-549/P-57-400 is located outside of the APE and would not be disturbed.

Given the environmental and historical setting, it was considered likely that historical resources relating to homesteads and agricultural activities would be present in within the project site. It was also considered possible, yet unlikely as no recorded Native American sites are located within the project area, that intact prehistoric deposits might be present within the project area. Prehistoric archaeological constituents in the region range from isolates and lithic scatters to intact midden deposits.

Native American Consultation

Consultation with Native American Tribes was conducted for the Proposed Project in accordance with Section 106 of the NHPA and Senate Bill (SB) 18 (Government Code Section 65352.3). Prior to the initiation of fieldwork, AES initiated consultation by notifying the Native American Heritage Commission (NAHC) on February 2, 2011. The NAHC was asked to search their Sacred Lands Inventory File and to submit a list of local Native American contacts that may have information regarding the project area. The

NAHC responded on February 24, 2011 with the results of the sacred lands file and Native American contacts. The record search failed to identify known sacred Native American sites within or adjacent to the project site. However, the NAHC provided a list of six Native American individuals and organizations that potentially have knowledge of the project site. The individuals and organizations identified by the NAHC were contacted by letter on March 4, 2011 to solicit their comments and concerns regarding the project. To date, only one response has been received. On June 25, 2010, the Yocha DeHe Wintun Nation responded by stating they have no knowledge of cultural sites within the project area and requires notification in the event that human remains or cultural material is uncovered during excavation. They also recommend a Tribal Monitor be present for ground disturbing activities, especially in areas that are undisturbed. Consultation letters are provided in **Appendix H**.

Field Survey

On February 28 and March 1, 2011, AES Staff Archaeologists conducted a pedestrian survey of the project site. The survey was conducted in transects no larger than 30 meters apart; the entire project area was surveyed except for the pools of standing water located adjacent to the west side of Vanden Road. Surface visibility was poor due to dense grasses and ranged from 10-30 percent. The ground surface was examined for archaeological remains, while rodent burrow backdirt piles were examined for indicators of buried archaeological deposits. The survey found that much of the project site has been subject to long-term agricultural activities resulting in fallow fields covered in non-native grassland. A total of three cultural resources dating to the historical period were recorded as a result of the reconnaissance survey. These resources were designated VM 1-3 and are described below.

VM-1

One cultural resource was observed in the western portion of the project site and was designated VM-1. This resource consists of the remnants of a ranch complex with features including two foundations, a utility pole with ceramic insulators, and a fence line. According to a Mr. Chickov, a long time resident of 5598 Vanden Road, the house was demolished within the last decade as it was vacant and being heavily vandalized.

VM-1 was encountered adjacent to Vanden Road within the large extant eucalyptus grove. The site consists of five features including: two concrete foundations, one electrical pole, one fence line and one possible well. Modern trash was present throughout the site including beer cans and bottle glass. No historical artifacts were observed in association with Features 1-5 at VM-1. A structure is depicted in the same location on the 1980 USGS Vacaville topo quad (USGS, 1980b). The immediate vicinity of VM-1 was surveyed in transects of 10 meters or less.

Feature 1 associated with VM-1 consists of a concrete foundation and connected set of three stairs. This feature is comprised of a concrete square foundation with an attached stairway and fragmented pathway. The attached staircase trends north/south and is has a set of three stairs at the south end. Just north of the stairs was a short concrete path leading to the east. The main square portion of the feature was enclosed on three sides with a concrete curb. The majority of this foundation feature appears intact including the curbs, stairs, pathway, and several bolts protruding from the surface of the concrete. Vegetation is present growing up through the lines marked in the concrete. The method of construction

appears to be relatively modern as evidenced by the molded curbs and lines implanted in the surface of the concrete to reduce cracking. However, the lack of temporally diagnostic characteristics prevents a determination regarding age of this foundation.

Feature 2 associated with VM-1 is also a foundation that measures approximately 15 ft. (north/south) by 18 ft (east/west). This foundation is in poor condition in comparison to Feature 1 as it is cracked in several places, heavily overgrown with grasses, and covered in soil. Several fragments of broken clear window glass were lying on the surface of the foundation but none presented any temporally diagnostic marks.

Feature 3 associated with VM-1 is a utility pole with a height of approximately seven ft. The pole forms a T-shape at the top and retains two brown ceramic insulators. The pole does not retain any wires and is not connected to any other utility lines in the area. Two metal straps remain on the pole, one continues to support the horizontal bar, while is broken and hangs off the vertical pole.

Feature 4 associated with VM-1 is north/south trending wooden fence line. The vertical poles that comprise the fence are metal and round while the horizontal boards are wooden. The fence is in fair condition and three non-continuous segments remains intact. The fence measures over 6 ft. in height. The nails present on the fence are modern. No artifacts were observed in association with Feature 4.

Feature 5 associated with VM-1 is a large metal tube protruding from the ground with diameter of roughly 12 inches located north of Feature 1. It is likely that this object once functioned as a well or similar function. No cover is present on the top of the features.

VM-2: 5566 Vanden Road

VM-2 consists of a residence located at 5566 Vanden Road that meets the minimum age criteria for consideration as a cultural resource. This residence is present on the Army Corps of Engineers Vacaville Quadrangle Tactical Map from 1941. The residence closely resembles the Craftsman type typical of the period of 1905-1930 (McAlester and McAlester, 2009: 453). The residence is a one-story house with a simple front facing T-plan with a normal pitched crossed gabled roof. Exposed eaves are present just below the roof. At the time of the survey the residence was in poor condition as a result of exposure to the elements, neglect, and vandalism. This wood framed house was clad with vinyl horizontal boards. The residence was not entered due to safety concerns; however, a view through the window revealed the interior is in very poor condition. A large wooden barn and small shed are located to the east of the main residence.

Façade

The residence fronts to Vanden Road, and thus, the west elevation is the façade. There is a central door flanked by two wooden double hung windows. Neither of the windows retain glass; one is covered with sheet plastic and the other is covered in plywood. The door remains intact and locked. A front above the door and a set of stairs once complimented the door, but neither remains intact.

East Elevation

The east elevation of 5566 Vanden Road presents an enclosed porch with nine fixed (or possibly casement) windows and a door. All the windows appear to be intact. A metal stovepipe is present on the south half of the east elevation. The enclosed porch covers the entire length of the east elevation.

North Elevation

The north elevation of 5566 Vanden Road contains four windows, of which only one remains intact. One window is present on the westernmost unit of the house, two windows are present in the central unit, and one window is present on the easternmost unit which is also the enclosed porch.

South Elevation

The south elevation of 5566 Vanden Road is similar to the north elevation. There are three double hung windows present in the same pattern as is present on the north elevation. There are several areas on the south elevation where the siding is missing and the interior walls are exposed.

VM-3: 5598 Vanden Road

VM-3 consists of an existing residence that meets the minimum age for consideration located at 5598 Vanden Road. This two story house exhibits a simple square plan on the ground floor with a one room second story. This style of house is often termed an 'airplane bungalow'. The house is set back approximately 950 feet west of Vanden Road and is accessed by a dirt driveway. The roof is covered in composite shingles. A structure is present on the 1908 USACE Tactical quad map. According to Mr. Chickov, the residence burned down several times and the present structure was built in 1953, making it at least 58 years old.

Façade

The residence at 5598 Vanden Road fronts to the north placing the façade of the building on the north elevation. A covered porch, two casement windows, and a door are the only features present on the north elevation.

South, east and west elevations

The south elevation of the residence did not contain any windows or additional features. The west elevation contained two casement windows and one bay window, each of which was covered with a metal awning. A brick chimney running from the ground floor to the past the roof was present on the west elevation. The east elevation presents two three-part windows with a fixed center panel flanked by two casement windows.

Significance Criteria

The following significance criteria associated with cultural resources have been adapted from Appendix G of the CEQA *Guidelines*. An impact to cultural resources is considered significant if implementation of the Proposed Project would:

- Cause a substantial adverse change in the significance of a historic resource pursuant to CEQA *Guidelines* Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA *Guidelines* Section 15064.5,
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

CEQA *Guidelines* Section 15064.5 defines “substantial adverse change” as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings.

Project Specific Impacts

Impact

4.5-1 Construction of the Proposed Project has the potential to cause a substantial adverse change in the significance of a historic resource as defined in PRC 21083.2, CEQA *Guidelines* Section 15064.5, or 36 CFR 60.4.

As a result of the field survey, one historical archaeological site (VM-1) and two structures (VM-2/5566 Vanden Road and VM-3/5598 Vanden Road) that meet the minimum age requirement for consideration for the CRHR/NRHP were identified on the project site. Clearing and grading activities associated with the development of the Proposed Project would result in demolition and destruction of these structures.

VM-1

VM-1 consists of the remnants of a ranch complex with features including two foundations, a utility pole with ceramic insulators, and a fence line. These features are in poor condition, and lack temporally diagnostic characteristics. The features of VM-1 do not retain sufficient historical integrity to be considered a valuable historic resource. This resource does not meet the criteria required for listing in the CRHR/NRHP. Impacts to VM-1 are considered less than significant.

Less than Significant.

VM-2

Although VM-2 meets the minimum age criteria for consideration as a historic resource, the building represents typical Craftsman construction of the historic period (1905-1930), which are abundant throughout the region. Therefore, solely being of Craftsman construction does not indicate the building is of historical significance. Having a simple front facing T-plan with a normal pitched crossed gabled roof, the building does not exhibit significant artistic features of the Craftsman movement that would be of historical significance. In addition, the structure and interior itself are in poor condition with damage to the vinyl siding and windows. The structure does not exhibit characteristics that would indicate the building is associated with events that

have made a significant contribution to the broad patterns of California's history and cultural heritage, is not associated with the lives of persons important to the past, and would not likely yield information important to prehistory or history. This resource does not meet the criteria required for listing in the CRHR/NRHP. Impacts to VM-2 are considered less than significant. **Less than Significant.**

VM-3

VM-3 consists of a two-story air plane bungalow that was reportedly built in 1953 after the original structure was burned down. Although the structure resembles an air plane bungalow, the actual structure itself was constructed outside of the historic Craftsman period (1909-1930) and does not exhibit significant artistic features of the Craftsman movement that would be of historical significance. The structure does not exhibit characteristics that would indicate the building is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage, is not associated with the lives of persons important to the past, and would not likely yield information important to prehistory or history. This resource does not meet the criteria required for listing in the CRHR/NRHP. Impacts to VM-32 are considered less than significant. **Less than Significant.**

4.5-2 **Ground-disturbing work associated with construction of the Proposed Project has the potential to affect previously undocumented archaeological resources and human remains.**

The results of the research, Native American consultation, and field surveys indicate a low probability of Native American sites and a high potential for homestead and agricultural historic-period archaeological resources within the project area. Although there are no recorded Native American archaeological sites within the project area, the area is within the territorial boundaries of the Plains Miwok and the Southern Patwin. Additionally, agricultural operations have been conducted in the region for over a century and the project site has been under agricultural operations for several decades. Due to the historical presence of Native Americans and historical agricultural operations, there is the possibility that previously unknown archaeological resources, paleontological resources, and/or human remains could be encountered during subsurface construction activities. This is considered a potentially significant adverse impact.

Recommended mitigation for potential impacts to unknown cultural resources and human remains is specified below. Implementation of **Mitigation Measures 4.5-2a** and **4.5-2b** would ensure that inadvertently discovered resources that may be eligible to the NHP and CRHR are identified and important information regarding these remains is recovered. Moreover, implementation of the mitigation measures will provide for the appropriate treatment of human remains. These actions would reduce potential impacts to previously unidentified subsurface cultural resources to a less-than-significant level. **Less than Significant with Mitigation.**

Mitigation Measures 4.5-2a. Applicant shall require that, in the event of any inadvertent discovery of archaeological resources, all such finds shall be subject to PRC 21083.2 and CEQA *Guidelines* 15064.5. Procedures for inadvertent discovery include the following:

- All work within 50 feet of the find shall be halted until a professional archaeologist, or paleontologist if the find is of a paleontological nature, can evaluate the significance of the find in accordance with NRHP and CRHR criteria.
- If any find is determined to be significant by the archaeologist, or paleontologist as appropriate, then representatives of the City shall meet with the archaeologist, or paleontologist, to determine the appropriate course of action. If necessary, the Applicant shall provide a Treatment Plan, prepared by an archeologist (or paleontologist), outlining recovery of the resource, analysis, and reporting of the find. The Treatment Plan shall be submitted to the City for review and approval prior to resuming construction.
- All significant cultural or paleontological materials recovered shall be subject to scientific analysis, professional curation, and a report prepared by the professional archaeologist, or paleontologist, according to current professional standards.

Mitigation Measure 4.5-2b. If human remains are encountered during construction activities, work shall halt immediately in the vicinity and the Solano County Coroner should be notified in accordance with California Health and Safety Code Section 7050.5. If human remains are of Native American origin, the Coroner must, in accordance with PRC Section 5097, notify NAHC within 24 hours of this identification.

Cumulative Impacts

Impact

4.5-3 Ground-disturbing construction activities may result in cumulatively considerable adverse impacts to previously unidentified subsurface archeological resources or human remains.

Potential cumulative projects in the vicinity of the project site, including growth resulting from build-out of the City's General Plan, have the potential to impact cultural resources. Archaeological and historic resources are afforded special legal protections designed to reduce the cumulative effects of development. Potential cumulative projects and the Proposed Project would be subject to the protection of cultural resources afforded by the CEQA *Guidelines* Section 15064.5 and related provisions of the Public Resources Code. In addition, projects with federal involvement would be subject to Section 106 of the National Historic Preservation Act. Given the non-renewable nature of cultural resources, any impact to protected sites could be considered cumulatively considerable. As discussed under Impact 4.5-1, the Proposed Project would not impact any known archaeological or historic resources eligible for listing in the CRHR/NRHP.

Mitigation Measures 4.5-2a and 4.5-2b would provide for the protection of unanticipated discoveries during ground disturbing activities associated with the Proposed Project. Therefore, with implementation of mitigation, the Proposed Project's incremental contribution to cumulative impacts to cultural resources would be less than significant. **Less than Significant.**

Mitigation Measure 4.5-3. Implement **Mitigation Measures 4.5-2a and 4.5-2b.**

4.6 GEOLOGY, SOILS AND MINERAL RESOURCES

4.6.1 INTRODUCTION

This section addresses the potential for the Proposed Project to result in impacts associated with geology and soils. Following an overview of the environmental setting in **Subsection 4.6.2** and the relevant regulatory setting in **Subsection 4.6.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.6.4**.

4.6.2 ENVIRONMENTAL SETTING

REGIONAL SETTING

The project site is located in the Great Valley geomorphic province of California, which lies between the Coast Range and Sierra Nevada provinces. The Great Valley province is an alluvial plain approximately 50 miles wide and 400 miles long that has been formed by continual sedimentation since the Jurassic Period (CGS, 2002). The Great Valley is drained by the Sacramento River in the north and the San Joaquin in the south. The two rivers converge south of Solano County and form the Sacramento-San Joaquin River Delta. This region is typically underlain by sedimentary and metasedimentary alluvium which was formed by erosion of the two mountain ranges during the Mesozoic and Cenozoic eras. Mesozoic rocks include marine Cretaceous sandstone and shale, as well as metamorphosed clastic and volcanic rocks of the Franciscan assemblage (**Figure 4.6-1**). The Cenozoic rocks consist of strata of continental and marine origin, and Pliocene-Pleistocene volcanic rocks (USDA, 1977).

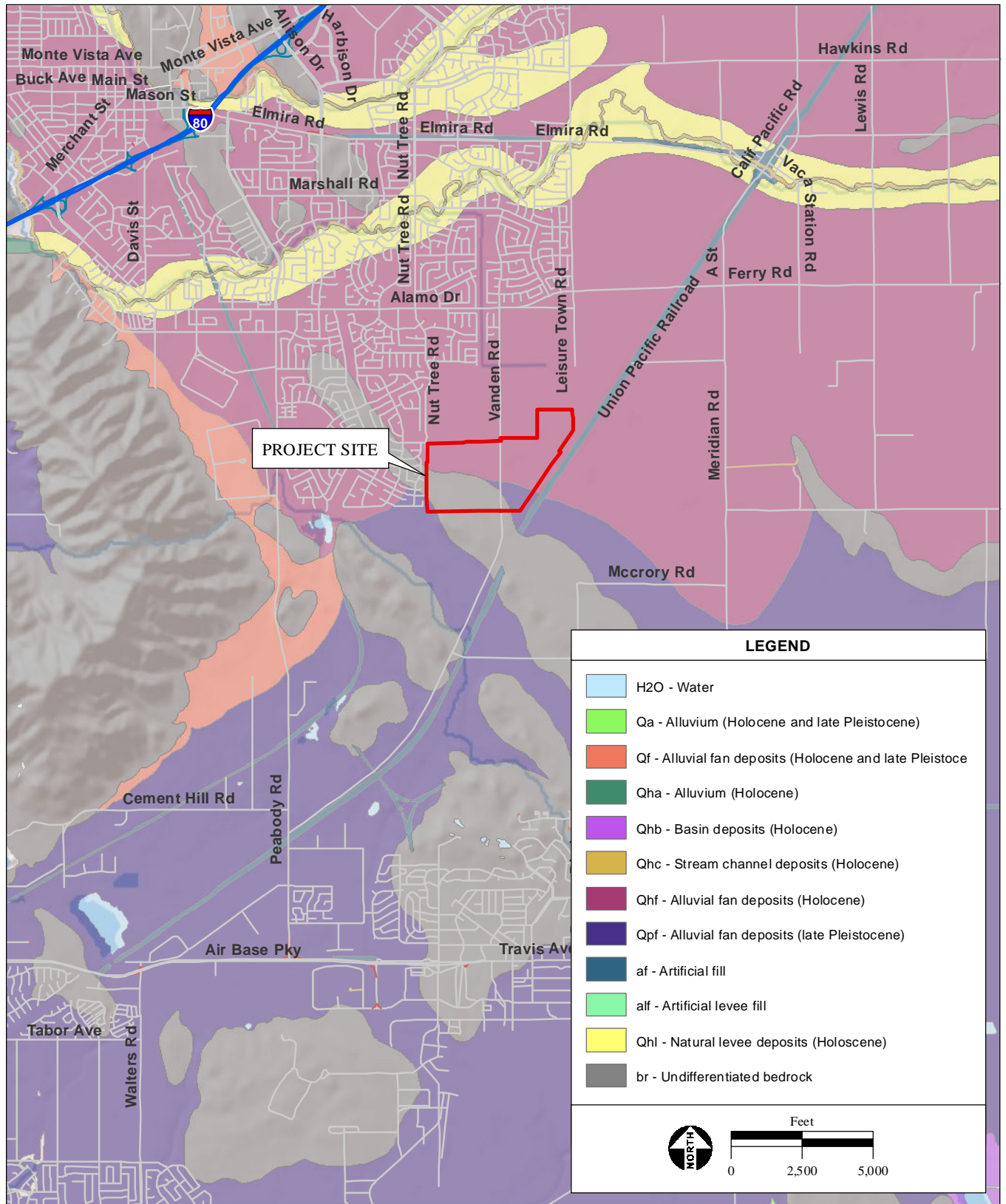
The western portion of Solano County is dominated by mountains and valleys as the Great Valley geomorphic province transitions into the Coast Ranges province, while the southern and eastern portions are dominated by flat broad valleys, marshes, sloughs, and low-lying hills. These low lands are associated with the Sacramento River Alluvial Fan (Solano County, 2008).

SITE TOPOGRAPHY

The Project Site is located in central Solano County, an area with flat topography and little topographical variation that provides spacious views in all directions. Project site elevations range from approximately 85 to 120 feet above mean sea level (amsl). The surrounding topography is characterized by similar terrain and elevation.

REGIONAL SEISMICITY AND FAULT ZONES

The Alquist-Priolo Act defines active faults as those that have shown seismic activity during the Holocene period, approximately the past 11,000 years, while potentially active faults are those that have shown activity within the Quaternary period, or the past 1.8 million years (CGS, 2003). According to the United States Geological Survey (USGS) Earthquake Hazards Program (2007), the nearest fault is the potentially active Vaca fault line located approximately 0.23 miles southwest of the project site. Another



SOURCE: USGS Earthquake Hazards Program, 2007; AES, 2011

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Figure 4.6-1
Regional Geology

potentially active fault is the Great Valley fault, located roughly 0.27 miles northeast from the project site. The Cordelia fault zone is situated approximately 11.5 miles to the southwest of the project site and is a relatively minor active fault zone in relation to other major faults in the San Andreas system. The Green Valley fault is an active dextral strike-slip Holocene fault of the San Andreas system and is found roughly 13.0 miles southwest of the project site (Bryant, 2002). **Figure 4.6-2** illustrates the faults within the vicinity of the project site.

Seismic Shaking Intensity

A common measure of earthquake intensity and effects due to ground shaking is the Modified Mercalli Intensity (MMI) Scale. The range of MMI values and a description of intensity factors are displayed in **Table 4.6-1**. The MMI values for intensity range from I to XII, with intensity descriptions ranging from an event not felt by most people (I) to nearly total damage (XII). Between these two extreme ranges, intensities that range from IV to XI have the potential to cause moderate to significant structural damage.

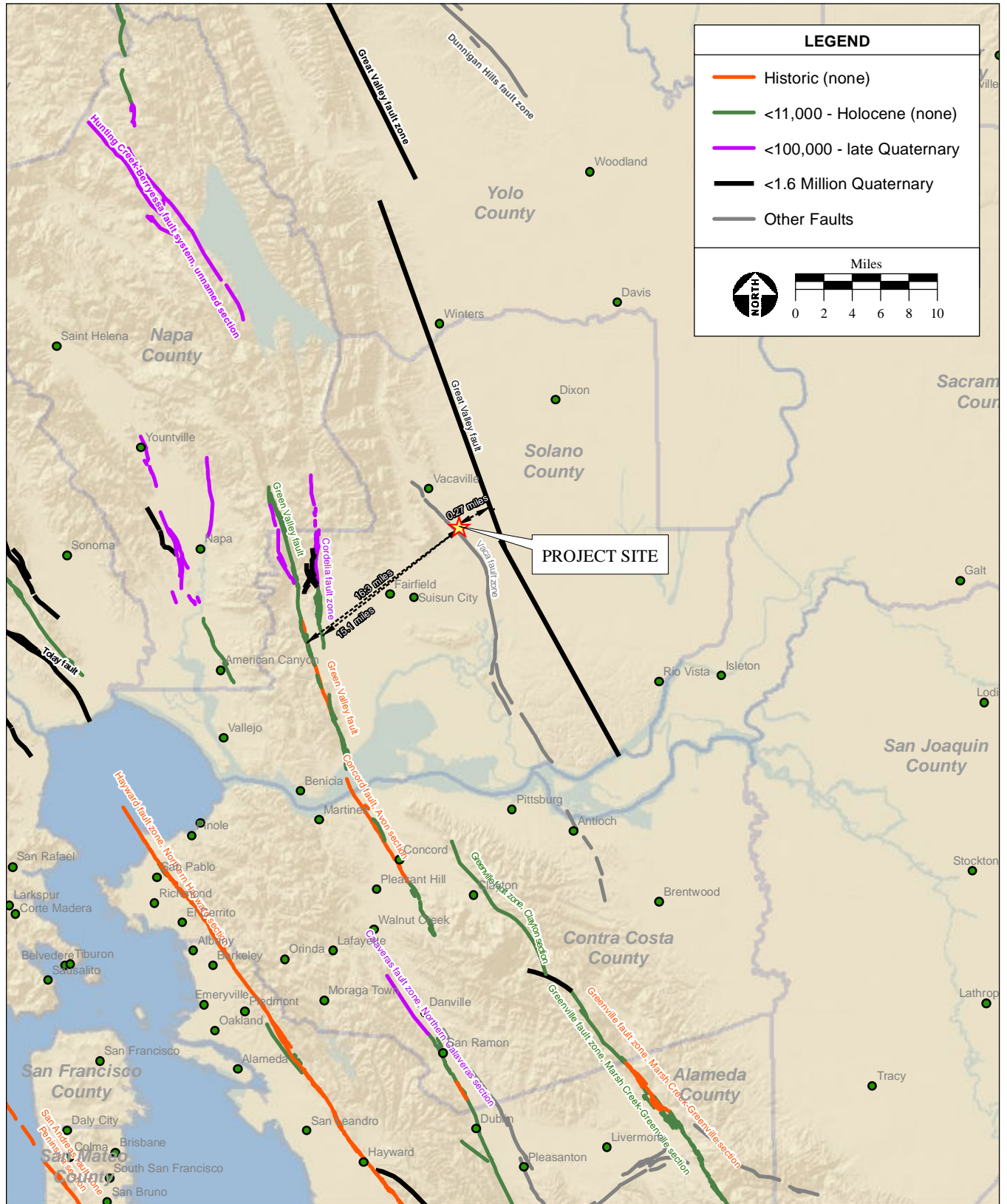
The Richter Scale is a measure of magnitude of an earthquake’s seismic energy release, with higher numerical values for stronger earthquakes and the effects associated with each level. The relationship between an earthquake’s magnitude (Richter) and intensity (MMI) is shown in **Table 4.6-1**.

TABLE 4.6-1
APPROXIMATE RELATIONSHIP BETWEEN EARTHQUAKE MAGNITUDE AND INTENSITY

Richter Scale Magnitude	Maximum Expected Intensity (MMI) Scale	Distance Felt (Approximate Miles)
3.0 – 3.9	I – III	15
4.0 – 4.9	IV – V	30
5.0 – 5.9	VI – VII	70
6.0 – 6.9	VII – VIII	125
7.0 – 7.9	IX - X	250

Source: California Office of Emergency Services, 2005

According to the California Geological Survey (CGS), a probabilistic seismic hazard map is a map that shows the potential hazards of earthquakes, which geologists and seismologists agree could occur in California. These maps are probabilistic due to the inherent uncertainties of the size, location and the resulting ground motion effects to a particular area of California. The seismic hazard maps are expressed in terms of the probability of exceeding a certain ground motion (how many times the acceleration of gravity). For example, if a location has a ten-percent probability of exceedance in 50 years map, then there is an annual probability of 1 in 475 of being exceeded each year (CGS, 2008). Engineers use these probability measurements to design buildings to withstand large ground motions; more than what is believed to occur during a 50-year interval, and effectively make buildings safer (CGS, 2008).



SOURCE: USGS Earthquake Hazards Program, 2007; AES, 2011

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Figure 4.6-2
Regional Faults

4.6 Geology, Soils and Mineral Resources

TABLE 4.6-2
MODIFIED MERCALLI INTENSITY SCALE

Intensity Value	Intensity Description	Average Peak Acceleration
I.	Not felt except by a very few persons under especially favorable circumstances.	< 0.0015g
II.	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.0015g
III.	Felt quite noticeably indoors, especially on upper floors of buildings, but many persons do not recognize it as an earthquake. Standing cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.	< 0.0015g
IV.	During the day felt indoor by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.	0.015g-0.02g
V.	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.	0.03g-0.04g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.	0.06g-0.07g
VII.	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 persons driving cars.	0.10g-0.15g
VIII.	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, and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed.	0.25g-0.30g
IX.	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.	0.50g-0.55g
X.	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.	> 0.60g
XI.	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.	> 0.60g
XII.	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.	> 0.60g
<p>Note: ^a g is gravity = 9.8 meters per second squared. Source: Bolt, 1988.</p>		

Ground motion probabilities are dependent upon site specific soil conditions, which CGS Seismic Hazard Maps classified for three types of soils: firm rock, soft rock, and alluvium. According to the CGS Probabilistic Seismic Hazards Map, there is a 10 percent probability that the peak horizontal acceleration experienced at the site would exceed 0.477 gravity (g) from a seismic event in 50 years (CGS, 2008). The ground-shaking probabilities have associated average peak acceleration rates that correspond to MMI rating between VIII and IX (**Table 4.6-2**). Earthquakes of these intensity values could cause slight damage in specially designed buildings and considerable damage to buildings of ordinary design. If affected building structures are of a poor design or outdated, then the damage from such an earthquake could be substantial.

Liquefaction, Slope Instability and Surface Rupture Potential

Liquefaction is the sudden loss of soil strength caused by seismic forces acting on water-saturated, granular soil, leading to a “quicksand” condition generating various types of ground failure. Estimating the potential for liquefaction must account for soil types, soil density, and groundwater table depth, and the duration and intensity of ground-shaking. Liquefaction can occur during seismic events with a MMI intensity value of VII or higher.

Soils comprised of sand and sandy loams that are in areas with high groundwater tables or high rainfall are subject to liquefaction. The project site is located in an area classified as having a moderate liquefaction potential (Solano County, 2008).

Subsidence and Settlement

Seismic settlement is the compaction of soil materials caused by ground-shaking or the extraction of underground fluids (water, oil, gas). Settlement can be caused by liquefaction or densification of silts and loose sands as a result of seismic loading. Such settlement may range from a few inches to several feet, and be controlled in part by bedrock surfaces (which prevent settlement) and old lake, slough, swamp, or stream beds which settle readily. Static settlement can occur through increased loading of the surface or subsurface materials, such as that imposed by foundations for structures. Dewatering for excavation and foundation construction can cause settlement of drying subsurface materials if water formed part of the support for the surface soils.

Surface Fault Rupture

Surface ground rupture along faults is generally limited to a linear zone a few meters wide. Because no active faults have been mapped across the project site by the California Geological Survey or USGS, nor is the project site located within an Alquist-Priolo Earthquake Fault Zone, fault ground rupture does not represent a hazard at the project site

SOIL RESOURCES

Soil Types

Soil types and their distribution in the project area are depicted in **Figure 4.6-3** and were identified through a review of maps provided by the Natural Resources Conservation Service (NRCS). With the

exception of urbanized areas where soils typically consist of engineered fill, the NRCS soil characteristics describe native, undisturbed soils. Descriptions of the soil units mapped for the study area are provided below (NRCS, 2009).

Capay silty clay loam, 0%-2% Slopes (Ca)

This is a deep, moderately well drained soil which generally occurs at elevations between 10 and 130 feet above sea level (asl). Included in this unit are small areas of Rincon, Yolo, and Brentwood soils. These soils comprise approximately 44 percent of the total acreage. The typical profile of this soil is 0-21 inches below surface level (bsl) of silty clay loam, 21-50 inches bsl of clay, and 50-80 inches bsl of clay loam. This soil is characterized as having a slight hazard of erosion, a high shrink-swell potential, and being moderately corrosive to concrete. The Ca soil unit has been assigned to hydrologic group D, which corresponds to having a slow infiltration rate when thoroughly wet.

Dibble-Los Osos Loams, 2%-9% Slopes (DbC)

This soil unit is a well-drained soil that occurs at elevation ranging from 100 to 2,00 feet asl. Comprised mostly of dibble and similar soils with a small, remaining portion to be los osos, this soil is comprised of 0-13 inches bsl of loam, 13-30 inches of clay loam, and 30-39 inches of weathered bedrock.

Millsap sandy loam, 0% - 2% Slopes (MkA)

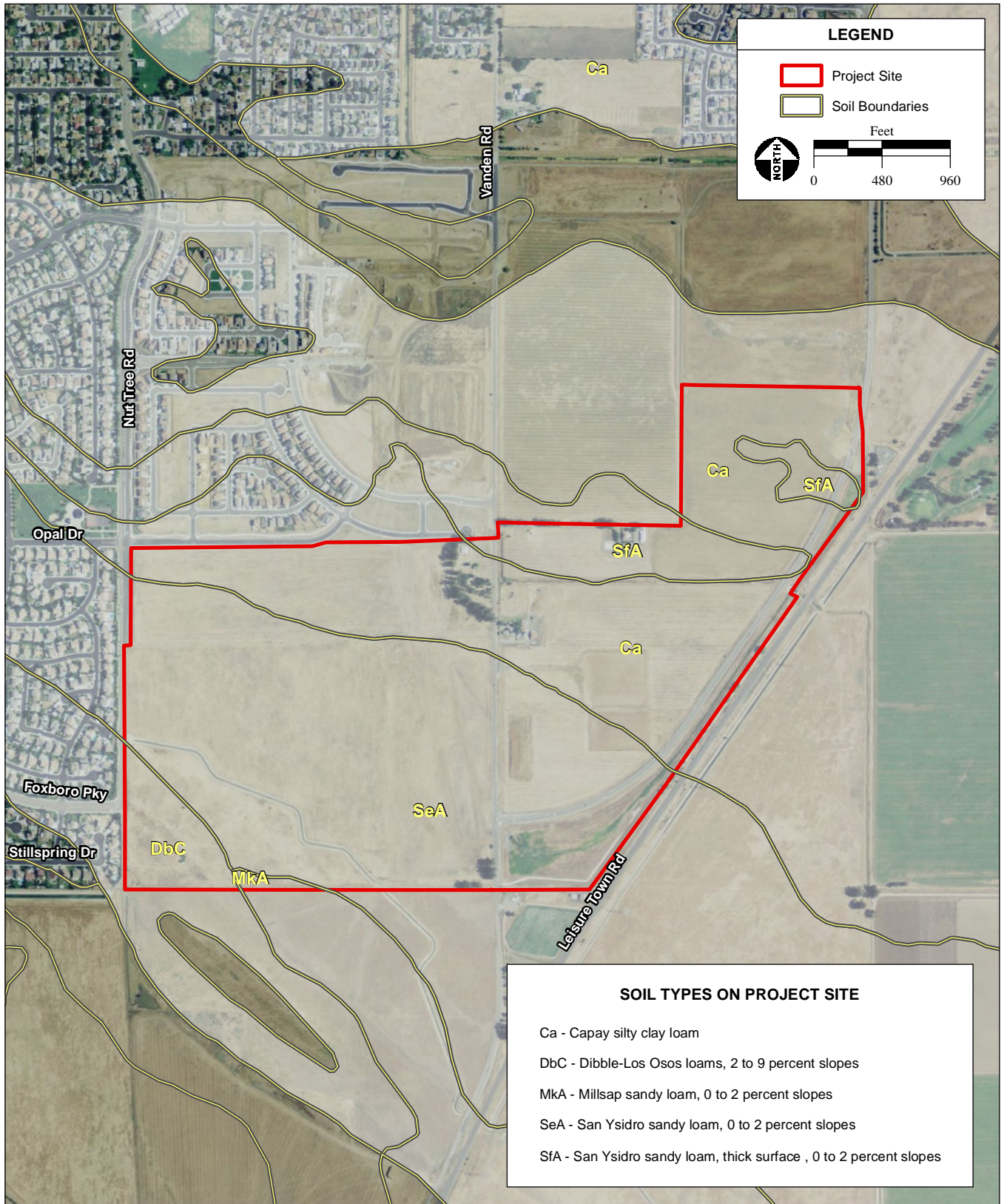
Mka is a well drained soil which generally occurs at elevations between 80 to 200 feet asl. Included in this unit are small areas of Los Osos and San Ysidro soils. This soil comprises approximately 85 percent of the total acreage. The typical profile of this soil is 0-16 inches bsl of sandy loam, 16-28 inches bsl of clay, 28-32 inches bsl of weathered bedrock.

San Ysidro sandy loam, 0% - 2% Slopes (SeA)

SeA is a moderately well drained soil which generally occurs at elevations between 30 and 100 feet asl. Included in this unit are small areas of Antioch and San Ysidro, thick surface soils. These soils comprise approximately 15 percent of the total acreage. The typical profile of this soil is 0-14 inches bsl of sandy loam, 14-28 inches bsl of clay loam, 28-54 inches bsl of sandy clay loam, and 54-68 inches bsl of stratified sandy loam to clay loam. SeA has a moderate hazard of erosion, a low shrink-swell potential, is moderately corrosive to concrete, and is associated with hydrologic group D. However, this soil is not considered prime farmland under any condition. These soils comprise approximately 37 percent of the total acreage

San Ysidro sandy loam, thick surface, 0% - 2% Slopes (SfA)

SfA has very similar characteristics to SeA. This soil group is also moderately well drained and erosive. It is also moderately corrosive to concrete, and has a low shrink-swell potential. SfA differs from SeA in its minor components and soil profile. A typical SfA profile includes 0-14 inches of sandy loam, 14-28 inches of clay loam, 28-54 inches of sandy clay loam, and 54-68 inches of stratified sandy loam to clay loam. These soils comprise approximately 15 percent of the total acreage



SOURCE: USDA NAIP Aerial Photograph, 2009; USDA NRCS SSURGO Soils Database, Soil Survey of Solano County, 2001-2007; AES 2011

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Figure 4.6-3
Soils Map

Soil Erosion

Soil erosion is the removal and transportation of soil materials from the ground surface that results in deposition in a remote location. Common mechanisms of soil erosion include natural occurrences, such as wind and storm water runoff, as well as human activities that may include changes to drainage patterns and the removal of vegetation. Factors that influence the rate of soil erosion include the physical properties of the soil, topography and slopes, rainfall and peak rainfall intensity. Erosion and potential project-related impacts due to erosion are discussed in more detail within **Section 4.8** (Hydrology and Water Quality).

MINERAL RESOURCES

In compliance with the California Surface Mining and Reclamation Act (SMARA), the California Division of Mines and Geology (CDMG) has established the classification system shown in **Table 4.6-3** to denote both the location and significance of key extractive mineral resources.

TABLE 4.6-3
CALIFORNIA DIVISION OF MINES AND GEOLOGY MINERAL LAND CLASSIFICATION SYSTEM

Classification	Description
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood for their presence exists
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated from existing data
MRZ-4	Areas where available data are inadequate for placement in any other mineral resource zone
Note: MRZ = Mineral Resource Zone Source: DOC, 2009a	

Under SMARA, the State Mining and Geology Board may designate certain mineral deposits as being regionally significant to satisfy future needs. The Board’s decision to designate an area is based on a classification report prepared by CDMG and on input from agencies and the public. Known mineral resource zones in Solano County consist of an area located northeast of Vallejo, south and southeast of Green Valley, areas south and east of Travis Air Force Base, and pockets located within both Vacaville and Fairfield (Solano County, 2008). Two mines are located within five miles of the project site: 1) the Green Stone Quarry, approximately 1.9 miles southwest of the site, produces stone and 2) the Pacific Portland Cement Company, approximately 3.7 miles southwest of the site, produces crushed/broken stone, sand, and gravel. No known mineral resources occur on the project site.

4.6.3 REGULATORY CONTEXT

FEDERAL

Federal Earthquake Hazards Reduction Act

In October 1997, the U.S. Congress passed the Earthquake Hazards Reduction Act to “reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program.” To accomplish this, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was significantly amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of agency responsibilities, program goals, and objectives. NEHRP’s mission includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improvement of building codes and land use practices; risk reduction through post earthquake investigations and education; development and improvement of design and construction techniques; improvement of mitigation capacity; and accelerated application of research results. The NEHRPA designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and USGS.

STATE

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed by the California Legislature to mitigate the hazard of surface faulting to structures. The act’s main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. Local agencies must regulate most development in fault zones established by the State Geologist. Before a project can be permitted in a designated Alquist-Priolo Fault Study Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

California Seismic Hazards Mapping Act

The California Seismic Hazards Mapping Act of 1990 (Public Resources Code Sections 2690–2699.6) addresses seismic hazards other than surface rupture, such as liquefaction and induced landslides. The Seismic Hazards Mapping Act specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

National Pollutant Discharge Elimination System Permit (NPDES)

The State Water Resources Control Board (State Water Board) administers regulations and permitting for the U.S. Environmental Protection Agency (55 CFR 47990) for pollution generated from stormwater under the NPDES. There are nine Regional Water Quality Control Boards (RWQCBs) that implement the State

4.6 Geology, Soils and Mineral Resources

Water Board's jurisdiction and require that an operator of any construction activities with ground disturbances of 1.0 acre or more obtain a General Permit through the NPDES Stormwater Program. The project site is within the jurisdiction of the Central Valley RWQCB (CVRWQCB). The General Permit requires that the implementations of Best Management Practices (BMPs) be employed to reduce sedimentation into surface waters and control erosion. The preparation of a Storm Water Pollution Protection Plan (SWPPP) addresses control of water pollution that includes the effects of sediments in the water during construction activities. These elements are further explained within **Section 4.9**, Hydrology and Water Quality.

California Building Standards Code

The State of California provides minimum standard for building design through the California Building Standards Code (CBC) (California Code of Regulations, Title 24). Where no other building codes apply, Chapter 29 regulates excavation, foundations, and retaining walls. The CBC also applies to building design and construction in the state and is based on the federal Uniform Building Code (UBC) used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The CBC has been modified for California conditions with numerous more detailed and/or more stringent regulations.

The state earthquake protection law (California Health and Safety Code Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the CBC. The CBC identifies seismic factors that must be considered in structural design.

California Surface Mining and Reclamation Act

SMARA was enacted by the California Legislature to regulate activities related to mineral resource extraction. The act requires the prevention of adverse environmental effects caused by mining, the reclamation of mined lands for alternative land uses, and the elimination of hazards to public health and safety from the effects of mining activities. At the same time, SMARA encourages both the conservation and the production of extractive mineral resources, requiring the State Geologist to identify and attach levels of significance to the state's varied extractive resource deposits. Under SMARA, the mining industry in California must plan adequately for the reclamation of mined sites for beneficial uses and provide financial assurances to guarantee that the approved reclamation will actually be implemented. The requirements of SMARA must be implemented by the local lead agency with permitting responsibility for the proposed mining project.

LOCAL

City of Vacaville General Plan

The following General Plan guiding and implementation policies associated with geologic hazards are applicable to the Proposed Project.

Guiding Policies

- 9.1-G 1 Investigate and mitigate geologic and seismic hazards or locate development away from such hazards in order to preserve life and protect property.

Implementation Policies:

- 9.1-I 2 Analyze proposed development sites at the earliest stage of the detailed planning process to determine geologic suitability. The analysis should include the structural engineering for the actual site and possible impacts of the project on adjacent lands.
- 9.1-I 4 To the extent practicable, do not allow critical facilities, structures involving high occupancies, and public facilities to be sited in areas of high damage susceptibility. Where such location is deemed essential to the public welfare, these structures will be sited, designed and constructed with due consideration of the potential for earthquake damage due to ground shaking, associated ground deformation, seismically triggered flooding, liquefaction and landslide.
- 9.1-I 9 Require preparation of a soils report prior to issuing a building permit, except where the Building Official determines that a report is not needed.
- 9.1-I 10 Limit cut slopes to 2:1 (50 percent slope) except where an engineering geologist can establish that a steeper slope would perform satisfactorily over the long term. Where practicable, require more gentle slopes than the 2:1 standard. Encourage use of retaining walls, rock-filled crib walls, or stepped-in buildings as alternatives to high cut slopes.
- 9.1-I 11 Require contour rounding and revegetation to preserve natural qualities of sloping terrains and mitigate the artificial appearance of engineered slopes, and control erosion.

4.6.4 IMPACTS AND MITIGATION MEASURES

METHOD OF ANALYSIS

This section identifies any impacts associated with geology and soils that could occur from construction, operation, and/or maintenance of the Proposed Project. Impacts to and from geological resources were analyzed based on an examination of the project site, published information regarding geological hazards of the project area, field studies, and comparison of these factors to the significance criteria listed below.

The impact analysis focused on the potential for the Proposed Project to impact the geology and soils within the project site, as well as geologic features in close proximity that might have an adverse impact on the site. The evaluation was made in light of project plans and applicable regulations and guidelines. If it was determined that implementation of the Proposed Project has the potential to meet or exceed the significance criteria listed below, mitigation measures have been recommended to increase the compatibility and safety of the project site and to reduce impacts to less-than-significant levels.

SIGNIFICANCE CRITERIA

Criteria for determining the significance of impacts associated with geology and soils have been developed based on Appendix G of the California Environmental Quality Act's (CEQA) *Guidelines*. Impacts associated with geology and soils would be considered significant if the Proposed Project would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
 - Strong seismic ground shaking;
 - Seismic-related ground failure, including liquefaction; or
 - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located in a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- of off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

EFFECTS FOUND NOT TO BE SIGNIFICANT

The Initial Study (**Appendix B**) concluded that the Proposed Project would not expose people or structures to landslides or expansive soils or result in the loss of mineral resources. Additionally, the Proposed Project does not propose the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. These effects are therefore not considered within this EIR.

PROJECT SPECIFIC IMPACTS

Impact

4.6-1 Earth-moving activities associated with construction of the Proposed Project have the potential to result in accelerated runoff, erosion and sedimentation.

Construction of the Proposed Project would involve grading, clearing, and landscaping activities associated with the development of residential units, the proposed school, and roadways and corresponding infrastructure (including potable water lines and storm water and sewage conveyance lines). Construction would result in the temporary disturbance of soil and would expose disturbed areas to potential storm events, which could generate accelerated runoff, localized erosion, and sedimentation of local waterways. In addition, construction activities could expose soil to wind erosion effects that could adversely affect both on-site and nearby soils and the re-vegetation potential of the area. Soils at the project site are characterized as having moderate erosion hazards.

Implementation of **Mitigation Measures 4.6-1a** and **4.6-1b** would require construction contractors to install erosion and sediment control measures in accordance with the CWA NPDES construction general permit regulations and incorporate building standards outlined in Chapter 14.19 of the Vacaville Municipal Code, which require application for a grading permit from the City and corresponding development of a Erosion and Sediment Control Plan (ESC Plan) and a Post-Construction Sediment Control Plan (PC Plan). After implementation of these measures, potential impacts would be reduced to less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.6-1a: Implement **Mitigation Measure 4.8-1 (Section 4.8; Hydrology and Water Quality)** to identify and implement erosion control BMPs within the SWPPP prepared for construction activities in accordance with the State's Clean Water Act Nation Pollutant Discharge Elimination System (NPDES) general permit for construction activities. Implementation of these BMPs would ensure that temporary and short-term construction-related erosion impacts under the Proposed Project would be reduced to a less-than-significant level.

Mitigation Measure 4.6-1b: The applicant shall obtain a grading permit which includes the requirement of an ESC plan and a PC Plan. These plans shall include sufficient engineering analysis to show that the proposed erosion and sediment control measures during preconstruction, construction, and post-construction are capable of controlling surface runoff and erosion, retaining sediment on the project site, and preventing pollution of site runoff in compliance with the Clean Water Act.

Impact

4.6-2 The Proposed Project has the potential to result in structural damage and injury from seismic activity and related geologic hazards.

The nearest mapped active fault to the project site is the Cordelia fault located approximately 11.5 miles to the southwest. Although potential damage to people or structures from seismic ground shaking could be a concern, compliance with the CBC would require the site's seismic-design response spectrum to be established and incorporated into the design of all new structures. Structures and utilities would be designed to withstand seismic forces per CBC requirements. These construction standards would minimize the seismic ground shaking effects on developed structures.

It is anticipated that a moderate amount of on-site soils may be used as engineered fill. If this fill material is determined to be unsuitable for use on-site, soils from other sources from construction sites in the project vicinity would be utilized. Fill materials would be tested to ensure their stability for use on the project site, and placement of fill would be monitored to ensure compliance with all state and local requirements.

As mentioned in **Subsection 4.6.2**, the project site is not located within an Alquist-Priolo Fault Zone and is therefore not susceptible to surface rupture. However, the project site does have the potential for liquefaction. This is considered a potentially significant impact.

Before a building permit can be issued for any structure, the Project applicant must submit a detailed soils study to the building department (General Plan Policy 9.1-1-9). A geologic suitability analysis would be completed to address the structural engineering for the actual site and possible impacts of the project on adjacent lands prior to construction. With mitigation, the project design would reduce all potential impacts associated with liquefaction to a less than significant level. **Less than Significant with Mitigation.**

Mitigation Measures 4.6-2. Prior to issuance of building permits, the Project applicant shall contract with a certified geologic engineer to perform a soils analysis of the Project site, consistent with requirements of the City of Vacaville. Grading and building designs, including foundation requirements, shall be consistent with the findings of the soils report, the California Code of Regulations, and the Uniform Building Code. The Building Department shall require that foundation design and grading requirements of individual lots and buildings are sufficient to reduce potential liquefaction of soils to a low level.

Impact

4.6-3 Portions of the Proposed Project are located on expansive soils.

The Project Site contains Capay Clay soil series and Capay Silty Loam series which have high shrink-swell potentials. Other soils found on the Project Site are designated as having only slight shrink-swell potentials. The physical forces exerted by shrink-swell process have the potential to

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cause damage to foundations and infrastructure lines, resulting in potential hazards to environmental and/or human health. Before a building permit can be issued for any structure, the Project applicant must submit a detailed soils study to the building department (General Plan Policy 9.1-1-9). A geologic suitability analysis would be completed to address the structural engineering for the actual site and possible impacts of the project on adjacent lands prior to construction. The following mitigation measure would ensure that all structures within the Proposed Project are designed to withstand settlement impacts resulting from unstable soil conditions onsite. **Less than Significant with Mitigation.**

Mitigation Measure 4.6-3. Implement **Mitigation Measures 4.6-2.**

CUMULATIVE IMPACTS

Impact

4.6-4 Development of the Proposed Project in combination with future projects in the City of Vacaville could result in cumulative effects associated with geology and soils.

Implementation of the Proposed Project and other potential cumulative projects in the region, including growth resulting from build-out of the City's General Plan and proposed developments adjacent to the project site, could result in increased erosion and soil hazards and could expose additional structures and people to seismic hazards. Potential soil and seismic hazards from cumulative development could represent a significant cumulative impact if projects do not incorporate grading/erosion plans and are not developed to the latest building standards incorporating recommendations from site-specific geotechnical reports prepared for these projects. The City and surrounding jurisdictions would implement mitigation measures specifically designed to avoid, reduce, or mitigate potential impacts associated with geology and soils. Therefore, after mitigation, cumulative impacts would be considered less than significant and would not be cumulatively considerable. **Less than Significant with Mitigation.**

Mitigation Measure 4.6-4. Implement **Mitigation Measures 4.6-1 through 4.6-3.**

4.7 HAZARDS AND HAZARDOUS MATERIALS

4.7.1 INTRODUCTION

This section addresses the potential effects on human health and the environment due to hazards and hazardous materials in conjunction with the Proposed Project. **Subsection 4.7.2** describes the environmental setting, including hazards and hazardous materials in and around the project site. **Subsection 4.7.3** describes the relevant regulatory setting. Project-related impacts and recommended mitigation measures, if any, are presented in **Subsection 4.7.4**.

4.7.2 ENVIRONMENTAL SETTING

DEFINITION OF HAZARDOUS MATERIAL

A material is considered hazardous if it appears on a list of hazardous materials prepared by a Federal, State, or local agency, or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the California Code of Regulations (CCR) as:

“A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed” (CCR, Title 22, Section 66260.10).

PROJECT AREA DATABASE REPORT

Database searches were conducted for records of known storage tank sites and known sites of hazardous materials generation, storage, and/or contamination within the vicinity of the project site. Databases were searched for sites and listings up to 1.0 mile from a point roughly equivalent to the center of project site. The environmental database review was accomplished by using the services of the computerized search firm *Environmental Data Resources, Inc.* (EDR). EDR uses a geographical information system to plot locations of past and/or current hazardous materials involvement. The analysis determines if hazards/hazardous materials incidents on and/or adjacent to the project site would adversely impact surface and/or subsurface conditions resulting in significant impacts associated with implementation of the Proposed Project. No known sites of past or current hazardous materials contamination occur within the project site; however, the EDR report identified one site located a quarter mile north of the project site. A description of this site is provided below. The complete list of reviewed databases is provided in **Appendix I** and is summarized in **Table 4.7-1**.

4.7 Hazards and Hazardous Materials

TABLE 4.7-1
ENVIRONMENTAL DATA RESOURCES (EDR) SUMMARY OF AGENCY DATABASES

Agency Database	Survey Distance (miles)	Number of Sites Identified	
		Within Search Radius	Within Project Site
United States Environmental Protection Agency (USEPA) National Priorities List (NPL) for Superfund Sites	1.0	0	0
USEPA Delisted NPL Site List	1.0	0	0
Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS)	0.5	0	0
USEPA CERCLIS-No Further Remedial Action Planned (CERC-NFRAP)	0.5	0	0
Corrective Action Report (CORRACTS)	1.0	0	0
USEPA RCRA Treatment, Storage, and Disposal (TSD) Facilities	0.5	0	0
USEPA RCRA Large and Small Generators of Hazardous Waste (RCRA-LQG and RCRA-SQG)	0.25	0	0
Federal Institutional Control/Engineering Control Registries	0.5	0	0
USEPA Emergency Response Notification System (ERNS) List	Project Site Only	0	0
State and Tribal-Equivalent CERCLIS Hazardous Waste Sites (SHWS)	1.0	0	0
State and Tribal-Equivalent SWF/LF, State Landfill	0.5	0	0
State and Tribal Leaking Underground Storage Tank Database (LUST)	0.5	2	0
State and Tribal Registered Underground Storage Tank	0.250	1	0
State Hazardous Wastes and Substances Sites (Cortese)	0.50	0	0
Waste Management Unit Database (WMUDS/SWAT)	0.50	0	0
State Hazardous Material Incidents, Including Accidental Releases and Spills (CHMIRS)	Project Site Only	0	0
State Hazardous Substance Storage Container Database (HIST UST)	0.250	0	0
State Facilities Inventory System (CA FID UST)	0.250	0	0
State Spills Leaks Incidences and Clean-ups (CA SLIC)	1.0	0	0
California DTSC Drycleaners (CLEANERS)	0.250	0	0
Hazardous Waste Information System (HAZNET)	Project Site Only	0	0
EDR Historical Auto Station	0.250	0	0
Source: EDR, 2011 (Appendix I).			

- Vanden II Partnership is located at 5714 Vanden Road, approximately one-quarter mile north of the project boundary. The Vanden II property is listed twice on the State Leaking Underground Storage Tank (LUST) site list, wherein two 350 gallon USTs were removed in September of 2004. Soil sampling revealed petroleum contamination in the soil below the tanks, which has not yet been remediated, although a workplan for the excavation of the contaminated soils has been approved by the County. Due to the lack of groundwater encountered during UST removal activities, the distance and depth of groundwater in the vicinity, and the remediation activities anticipated to occur at the Vanden II Partnership site, this site does not likely to pose a risk to the environmental quality of the project site.

Project Site Setting

The project site is mostly undeveloped and dominated by non-native vegetation, generally agricultural crops, ruderal grasses, and other low-lying vegetation with the exception of two eucalyptus groves. Herbicides, pesticides, and fungicides were possibly used at one point on the project site, although the presence of these substances has not been identified. One abandoned home site, located on the west side of Vanden Road in the north central portion of the project site. Two home sites are located on the east side of Vanden Road and contain dwelling units and accessory structures. These home sites are likely to contain underground ground septic systems and associated leach fields. Several canals and drainages are also present throughout the project site.

Sensitive Receptors

Sensitive receptors are primarily those that have the potential to be harmed through exposure to hazardous materials. Cypress Lakes Golf Course is located 500 feet directly northeast of the project site on the east side of Leisure Town Road and the railroad tracks. The Cambridge Elementary School is located approximately 0.6 miles to the north of the project site. Surrounding the project site are the Southtown and Foxboro housing developments to the immediate north and west, respectively.

Air Strips and Airports

The Travis Air Force Base (AFB) is located approximately 3.6 miles south of the project site. According to the 2002 Travis AFB Land Use Compatibility Plan (LUCP), discussed in **Section 4.7.3** below, the project site is located within Compatibility Zone D. The Nut Tree Airport is located approximately 3.3 miles northwest of the project site. The project site is not located within the Nut Tree Airport's area of influence.

Wildland Fires

The Project Site is located on land designated as "LRA Unzoned" according to the Solano County Draft Fire Hazard Zones Map produced by the California Department of Forestry and Fire Protection (CAL Fire) (CAL Fire, 2008). Agricultural land and housing developments surround the project site. A minimal wooded area at the Cypress Lakes Golf course is located approximately 500 feet northeast from the project site. There are also uncultivated lands to the south and east. The Union Pacific Railroad (UPRR) to the east and several detention basins surrounding the project site would help serve as fire brakes.

4.7.3 REGULATORY CONTEXT

FEDERAL

United States Environmental Protection Agency

The United States Environmental Protection Agency (USEPA) administers numerous statutes pertaining to human health and the environment. The EPA regulates toxic air contaminants through its implementation of the Clean Air Act (CAA). Although the CAA covers a range of air pollutants, Section 112(r) specifically covers “extremely hazardous materials” which include acutely toxic, extremely flammable, and highly explosive substances. Section 112(r) (referred to as the EPA’s Risk Management Program) requires facilities involved in the use or storage of extremely hazardous materials to implement a Risk Management Plan (RMP). A RMP requires a detailed analysis of potential accident factors present at a facility and requires the implementation of mitigation measures designed to reduce the identified accident potential.

The EPA also regulates the land disposal of hazardous materials through the Resource Conservation and Recovery Act (RCRA). Under RCRA, the EPA regulates the activities of waste generators, transporters, and handlers (any individual who treats, stores, and/or disposes of a designated hazardous waste). RCRA further requires the tracking of hazardous waste from its generation to its final disposal through a process often referred to as the “cradle-to-grave” regulation. The “cradle-to-grave” regulation requires detailed documentation and record keeping for hazardous materials generators, transporters, and/or handlers in order to ensure proper accountability for violations.

Federal Occupational Safety and Health Administration

The Occupational Safety and Health Act (OSHA) regulates the preparation and enforcement of occupational health and safety regulations with the goal of providing employees a safe working environment. OSHA regulations apply to the work place and cover activities ranging from confined space entry to toxic chemical exposure. OSHA regulates workplace exposure to hazardous chemicals and activities through regulations governing work place procedures and equipment.

U.S. Department of Transportation (U.S. DOT)

The United States Department of Transportation (USDOT) regulates the interstate transport of hazardous materials and wastes through implementation of the Hazardous Materials Transportation Act. This act specifies driver-training requirements, load labeling procedures, and container design and safety specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA, discussed previously.

Travis Air Force Base Land Use Compatibility Plan

The Travis LUCP “sets forth land use compatibility policies applicable to future development in the vicinity of the base”. The geographic scope of the Travis LUCP is broken up into six zones, Zones A-D and the Height Review Overlay Zone; Zone A being the closest to and most affected by the Travis AFB. The entirety of the project site is located in Zone D. The delineation of Zone D is described below:

4.7 Hazards and Hazardous Materials

Compatibility Zone D - Zone D includes all other locations beneath any of the Travis AFB airspace protection surfaces delineated in accordance with Federal Aviation Regulations Part 77. Limitations on the height of structures are the only compatibility factors within this zone.

The Travis LUCP assigns basic compatibility criteria applicable to the review of proposed land use actions in each of the zones. The general criteria for nonresidential development within any of the zones requires that the “total number of people permitted on a project site at any time, except for rare special events, must not exceed indicated usage intensity times the gross acreage of the site.” The usage intensity, prohibited uses, and other development conditions for Zone D are listed in **Table 4.7-2**.

TABLE 4.7-2
BASIC COMPATIBILITY CRITERIA FOR ZONE D

Zone	Maximum Usage Intensity (persons)			Additional Criteria	
	Ave. Indoor Uses	Ave. Outdoor Uses	Single Acre	Prohibited Uses	Other Development Conditions
D	No Limit	No Limit	No Limit	<ul style="list-style-type: none"> ▪ Hazards to flight ^a 	<ul style="list-style-type: none"> ▪ Airspace review required for objects > 200 ft. tall.

Notes: a – Hazards to flight include physical, visual, and electronic forms of interference with the safety of aircraft operations. Land use development that may cause the attraction of birds to increase is also prohibited.
Source: AFB, 2002

STATE

Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) regulates the generation, transportation, treatment, storage, and disposal of hazardous waste under RCRA and the State Hazardous Waste Control Law. Both laws impose “cradle-to-grave” regulatory systems for handling hazardous waste in a manner that protects human health and the environment.

California Occupational Safety and Health Administration

Cal/OSHA assumes primary responsibility for developing and enforcing state workplace safety regulations. Because California has a federally approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR. Cal/OSHA standards are generally more stringent than federal regulations.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace, as detailed in Title 8 of the CCR, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Material Safety Data Sheets (MSDSs) be available to employees and that employee information and training programs be documented.

California Hazardous Materials Release Response Plans and Inventory Law of 1985

The California Hazardous Materials Release Response Plans and Inventory Law of 1985, often referred to as the Business Plan Act, requires facility operators to prepare Hazardous Materials Business Plans (HMBP). HMBPs are required to inventory hazardous materials stored and used on site, disclose the location of storage and use on site, maintain an emergency response plan, and contain provisions specifying employee training in safety and emergency response procedures. Local regulatory authorities such as local Environmental Health Departments collect hazardous Materials Business Plans.

Regional Water Quality Control Board

The State Water Resources Control Board, and the Regional Water Quality Control Boards, also regulate hazardous substances, materials and wastes through a variety of state statutes including, for example, the Porter Cologne Water Quality Control Act, Cal. Water Code §13000 et seq., and the underground storage tank cleanup laws. Cal. Health and Safety Code §§25280-25299.8. Regional Boards regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. Any person proposing to discharge waste within any region must file a report of waste discharge with the appropriate regional board. The project is located within the jurisdiction of the CVRWQCB.

California Accidental Release Program

The California Accidental Release Program (CalARP), governed by regulations set forth in the California Health and Safety Code (Section 25531 through 25543.3), requires that a facility that stores, generates, treats, or manufactures a regulated hazardous material to develop and submit Risk Management Plans (RMPs). The RMPs must document all regulated hazardous materials, method of storage, location of storage areas, amounts present at a facility, and safety features for containing a potential release. The purpose of the CalARP is to prevent the accidental release of hazardous materials from a stationary source. The Solano Environmental Health Services Department administers the CalARP Programs within the City and Solano County.

Emergency Response to Hazardous Materials Incidents

California has developed an Emergency Response Plan to coordinate emergency services provided by Federal, State, and local government and private agencies. Response to hazardous materials incidents is one part of this plan. The plan is administered by the state OES, which coordinates the responses of other agencies including CalEPA, the California Highway Patrol (CHP), California Department of Fish and Game (CDFG), the CVRWQCB, the Solano County Office of Emergency Services, and the City.

Municipal Solid Waste

The California Integrated Waste Management Board (CIWMB) is the State-level agency within the CalEPA that oversees solid waste disposal and recycling and implements the Integrated Waste Management Act of 1989. The CIWMB issues, and in some cases enforces, regulations, policies and guidance on waste prevention and reduction, and closure. The CIWMB has promulgated detailed regulations for the closure and post closure monitoring and maintenance of municipal solid waste landfill. Additionally, because a municipal solid waste landfill may impact groundwater, a Regional Water Quality Control Board (RWQCB) may assert jurisdiction over an operating or closed landfill that is discharging or has discharged effluent and/or require corrective actions.

SOLANO COUNTY

Solano County Hazardous Waste Management Plans

The County Department of Environmental Management maintains hazardous materials management plans to address emergency response to incidents involving hazardous materials over 55-gallons, 500 pounds or 200 cubic feet of gas. These plans include an inventory of hazardous materials located within the County, which is updated annually.

The County also maintains a Hazardous Waste Management Plan (Tanner Plan) for the management of all hazardous wastes generated and disposed of within the County. Information in the plan can also be used to help guide and coordinate mitigation activities and local policy decisions for future land use decisions.

Solano County Department of Resource Management

The Solano County Department of Resource Management has been designated by the CalEPA as the Certified Unified Program Agency (CUPA) for the County. As the CUPA, the Department of Resource Management is responsible for the implementation of five environmental programs for the County. These include:

- Permitting and inspection of businesses that handle certain quantities of hazardous materials/waste.
- Hazardous Materials Business Plan (HMP) requirements
- Hazardous Waste Control Act
- California Accidental Release Prevention (Cal-ARP) program
- Emergency response to incidents involving hazardous materials through the hazardous management plan

The implementation of these programs involves:

- Permitting and inspection of regulated facilities.
- Providing educational guidance and notice of changing requirements stipulated in State or Federal laws and regulations.
- Investigations of complaints regarding spills or unauthorized releases.
- Administrative enforcement actions levied against facilities that have violated applicable laws and regulations

The County Department of Resource Management also continues the implementation of the provisions of the Tanner Plan and siting locations for new hazardous waste storage and transfer facilities through the Association of Bay Area Governments' (ABAG) Hazardous Waste Allocation Committee.

CITY OF VACAVILLE

City of Vacaville General Plan

The Safety Element of the City General Plan contains the following goals and policies that relating to hazards and hazardous materials that are applicable to the proposed project.

Guiding Policies:

9.4-G 2 Cooperate with Solano County on implementation of the Hazardous Waste Management Plan and review proposals for hazardous waste facilities for consistency with that Plan.

Implementing Policies:

9.4-I 1 Do not encourage industries which rely extensively on use of hazardous materials unless an acceptable use, storage and disposal program is approved by the appropriate agencies.

9.4-I 2 Ensure that development proposals involving hazardous waste facilities are consistent with the Solano County Hazardous Waste Management Plan.

9.4-I 3 Continue to implement a hazardous materials information disclosure program.

City of Vacaville Municipal Code, Division 14.20 – Construction and Fire Standards

The City's Municipal Code, Chapter 14.20 – Construction and Fire Standards, includes provisions for the protection of life and property from wildfire occurring on open lands. These provisions include, but are not limited to, requirements to maintain 50-foot wide fire buffer zones between residential yards that are adjacent to open lands, maintain adequate ingress and egress, water supply for fire protection purposes, and residential construction standards.

4.7.4 IMPACTS AND MITIGATION MEASURES

METHOD OF ANALYSIS

Potential hazardous materials and hazards impacts were analyzed through a review of the existing project site setting, project description, and risks inherent to the proposed treatment process and construction methods and materials. As discussed above, methods used to characterize the existing hazardous material setting in the project site and vicinity include, but are not limited to, regulatory agency database searches conducted for records of known storage tank sites and known sites of hazardous materials generation, storage, and/or contamination within the project area.

The impact analysis focused on potential effects of hazardous materials or waste associated with current and past conditions at the project site, as well as properties and associated hazards in close proximity that might have an adverse impact on the site. The evaluation was made in light of project plans, and applicable regulations and guidelines. If it was determined that implementation of the Proposed Project has the potential to meet or exceed the significance criteria listed below, mitigation measures have been

recommended to increase the compatibility and safety of the project site and to reduce impacts to less-than-significant levels.

SIGNIFICANCE CRITERIA

Criteria for determining the significance of impacts to hazardous materials have been developed based on Appendix G of the CEQA *Guidelines* and any relevant agency thresholds. For the purposes of this EIR, the proposed project would generally be considered to have a significant adverse impact to the public or the environment if it would:

- Create a significant hazard through the routine transport, use or disposal of hazardous materials;
- Create a significant hazard through reasonably foreseeable upset and accident conditions involving the release hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter miles of an existing or proposed school;
- Be located on a site that is listed as a hazardous materials site compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- Be located within an airport land use plan or within an area were such a plan has not been adopted, that would result in a safety hazard to people residing or working in the project area;
- Result in a safety hazard for people residing or working in the project area for a project located within the vicinity of a private airstrip;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- Or expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

EFFECTS FOUND NOT TO BE SIGNIFICANT

The Initial Study (**Appendix B**) concluded that project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Operation of the Proposed Project would not emit hazardous materials nor result in a safety hazard for people residing or working in the vicinity of a private airstrip. The implementation of emergency response or evacuation plans would not be interfered with as a result of the proposed project. These effects are therefore not considered within this EIR.

PROJECT SPECIFIC IMPACTS

Construction

Impact

- 4.7-1 Construction of the Proposed Project would include the routine storage and handling of hazardous materials, which could result in a public health or safety hazard from the accidental release of hazardous materials into the environment.**

During grading and construction activities it is anticipated that limited quantities of miscellaneous hazardous substances, such as gasoline, diesel fuel, hydraulic fluid, solvents, oils, paints, etc. would be brought onto the site. Temporary storage units (bulk above-ground storage tanks, 55-gallon drums, sheds/trailers, etc.) would likely be used by various contractors for fueling and maintenance purposes. As with any liquid and solid, the handling and transfer between one container to another has the potential for an accidental release. Construction contractors will be required to comply with applicable federal and state environmental and workplace safety laws. Adherence to these regulatory requirements would ensure that this impact is less than significant.

Mitigation Measures 4.7-1 is provided to further decrease the potential for impacts from accidental release of hazardous materials during construction of the Proposed Project. **Less than Significant**

Mitigation Measure 4.7-1. The Applicant shall ensure through the enforcement of contractual obligations that all contractors transport, store, and handle construction-required hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the City of Vacaville Fire Department and the Solano County Fire Protection District. Recommendations may include, but are not limited to, transporting and storing materials in appropriate and approved containers, maintaining required clearances, and handling materials using approved protocols.

Impact

- 4.7-2 Construction of the Proposed Project could result in a public health or safety hazard from accidental or upset conditions involving release of hazardous materials into the environment from potential damage to underground utilities or septic systems, or demolition of buildings containing asbestos materials.**

Underground utilities, such as water, sewer, electrical, and gas lines, may be located in the proposed construction area of the project site. During the initial phases of project construction, underground utilities could be encountered. Ground disturbance and excavation activities in areas with underground utilities could result in damage to those utilities, increasing the risk for explosion or release of hazardous materials into the environment. This is considered a potentially significant impact. Implementation of **Mitigation Measure 4.7-2 (a and b)** recommended below would require construction contractors to coordinate with utility service providers prior to ground disturbing activities to identify the location and information necessary to avoid accidental damage

4.7 Hazards and Hazardous Materials

to underground utilities present of the project site. Therefore, after mitigation, the risk of potential health and safety hazards associated with damage to underground utilities would be reduced to a less than significant level. **Less than Significant with Mitigation.**

The residences and other buildings on the project site are at an age where ACMs and lead-based paints could be encountered. Most of the roofing materials used prior to the 1980s contained ACMs, specifically, composition shingle roofing material and acoustical ceilings. The residential structures in the center of the project site appear to have been built prior to 1980. Due to the age of the existing structures on the property, it is likely that ACMs and lead-based paint would have been used in the construction of those structures. Indiscriminate and unmitigated demolition or renovation of structures containing ACMs and lead-based paint could create asbestos dust, lead paint chips and lead dust, which pose as inhalation hazards for both construction workers and the surrounding public. In addition, collection and disposal of ACMs and lead paint debris by untrained personnel could cause asbestos and lead paint dust emissions to be transported offsite, resulting in the release of hazardous material into the environment. This is considered a potentially significant impact. Implementation of **Mitigation Measure 4.7-2c** would require project compliance with YSAQMD special provisions for structures containing ACMs, as well as implementation of DHS recommendations and Cal/OSHA requirements for lead-containing painted surfaces would reduce impacts associated with ACMs and lead-based paints to less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.7-2a: The project applicant shall require through contractual obligations that the construction contractor(s) marks the areas planned to be disturbed in white paint and notify Underground Service Alert (USA) one week prior to the beginning of excavation activities. This will be completed so the entire construction area is properly surveyed in order to minimize the risk of exposing or damaging underground utilities. USA provides a free "Dig Alert" service to all excavators (contractors, homeowners and others), in northern California, and will automatically notify all USA Members (utility service providers) who may have underground facilities at their work site. In response, the USA Members will mark or stake the horizontal path of their underground facilities, provide information about, or give clearance to dig. This service protects excavators from personal injury and underground facilities from being damaged. The utility companies will be responsible for the timely removal or protection of any existing utility facilities located within construction areas.

Mitigation Measure 4.7-2b: Septic systems must be removed by a licensed septic system contractor. A permit must first be obtained from the YCPHD, Division of Environmental Health Services. The septic tank must be emptied and the sewage must be disposed by a licensed septic hauler. The septic tank must then be removed and the hole must be back-filled with soil or gravel. On-site wells must be abandoned and capped in accordance with appropriate regulatory requirements.

Mitigation Measure 4.7-2c: Prior to issuance of grading permits, the applicant shall hire a Certified Asbestos Consultant (CAC) to perform an asbestos survey on building

4.7 Hazards and Hazardous Materials

materials located throughout the existing structures on the project site to determine if ACMs and lead-based paints are present. If the results of the asbestos survey indicate ACMs and/or lead-based paint are present within the structures that will be demolished, then the applicant shall require through contractual obligations that the following mitigation measure will be implemented:

- All construction activities shall comply with all requirements and regulations promulgated through the YSAQMD Rule 9.9 and Rule 4.3. Rule 9.9 requires special provisions for structures containing ACMs. These provisions focus on limiting the emission of asbestos to the atmosphere and require an appropriate waste disposal procedure.
- Construction activities involving the demolition of structures containing lead based paints shall conform to DHS recommendations and OSHA requirements. Recommendations could include construction BMPs such as applying water to the structures before, during, and after demolition.

Impact

4.7-3 Construction activities conducted during the dry season in and around dry grasses that pose a fire hazard.

Equipment used during grading and construction activities may create sparks, which could ignite dry grass on the project site. During construction, the use of power tools and acetylene torches may also increase the risk of fire hazard. This risk, similar to that found at other construction sites, is considered potentially significant. Implementation of recommended **Mitigation Measure 4.7-3** would reduce potential impacts to less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.7-3. The applicant shall ensure through the enforcement of contractual obligations that the following measures are implemented by contractors during project construction:

- Staging areas, welding areas, or areas slated for development using spark-producing equipment shall be cleared of dried vegetation or other materials that could serve as fire fuel. To the extent feasible, the contractor shall keep these areas clear of combustible materials in order to maintain a fire break.
- Any construction equipment that normally includes a spark arrester shall be equipped with an arrester in good working order. This includes, but is not limited to, vehicles, heavy equipment, and chainsaws.

Operation

Impact

4.7-4 The Proposed Project is located within the planning area for the Travis Air Force Land Use Base, and therefore could result in potential safety hazards for people residing or working in the project area.

Operation of the Proposed Project would not exceed the maximum usage intensities assigned to the project site nor would it result in the construction of any object over 100 feet tall. The Proposed Project would utilize the existing Southtown storm water detention basin on the east side of Leisure Town Road. The utilization of this detention basin would not result in the attraction of wildlife and waterfowl beyond existing conditions as it would not increase the size of the basin or the frequency and amount of standing water on the project site. Due to the infrequent and short periods of time that water would be stored in the existing detention basin, the increase in storm water run-off from the Proposed Project that would be diverted to the basin is not expected to result in the attraction of wildlife and waterfowl beyond existing conditions. Thus, the Proposed Project would not result in the development of facilities that would increase hazardous wildlife attractants on the project site. A discussion of the Proposed Project's consistency with Travis LUCP policies on lighting and noise is included within **Sections 4.1 and 4.10**, respectfully. It was determined that the Proposed Project would not result in conflicts with adopted policies in the Travis LUCP. Therefore, the Proposed Project is not expected to result in a safety hazard to people residing or working in the project area. This impact is considered less than significant. **Less than Significant.**

Impact

4.7-5 Potential for increased hazard of wildland fires during operation of the Proposed Project.

The Project Site is not located in close proximity to heavily wooded wildlands, or within the boundaries of the Solano County Fire Hazard Severity Zone (CAL FIRE, 2008); however, portions of the project site are bordered by uncultivated grassland. Any buildings and infrastructure associated with the Proposed Project would be required to meet all applicable fire standards relating to construction quality, equipment access, and fire flow requirements. Chapter 14.20.290 of the Vacaville Municipal Code, the International Business Code, and current Fire Department regulations adequately address issues related to wildland fires. This impact is considered less than significant with mitigation. **Less than Significant with Mitigation.**

Mitigation Measure 4.7-5. The City shall ensure through conditions of project approval or requirements of the adopted Specific Plan, that development south of Foxboro Parkway and west of Vanden Road is in compliance with Chapter 14.20.290 of the Vacaville Municipal Code with respect to residential uses adjacent to open space areas where wildfire is a threat.

Impact

4.7-6 The adjacent railroad line could create a significant health or safety hazard to proposed residential uses on the project site.

The project site is bounded on the southeast by an existing Union Pacific Railroad right-of-way and tracks. Due to the proximity to the railroad, the potential exists for hazardous railroad related impacts to occur. However, the nearest residential units, located along the southeastern portion of the site, would be separated from the railroad by the detention basin, agricultural buffer, and Leisure Town Road. These features would create a buffer of greater than 300 feet between the railroad and the nearest proposed residential properties (adjacent to the bike station). In addition, with the implementation of **Mitigation Measure 4.10-6**, solid noise barriers would be constructed along the north side of Leisure Town Road from the northern site boundary to Vanden Road South providing an additional protective barrier for the residences closest to the railroad tracks. The buffer area would reduce the potential for hazardous materials to reach the project site in the unlikely event of a railroad spill and the protective wall would provide an additional barrier to prevent potential contaminants from entering the site during an emergency event.

The severity of potential health risks associated with a railroad hazardous emergency could vary substantially and is dependent on the location of the accident, the type of cargo, and the extent of the damage. The City's Fire Department is the responsible City agency for responding to hazardous materials incidents. The project site currently lies outside of the five minute response time coverage area for the City's existing Fire Department stations. Refer to **Section 4.12** for the analysis of potential impacts to the City's Fire Department. As discussed there within, a new fire station will be constructed within the Southtown development area to provide emergency services to the area, including the Proposed Project site (City of Vacaville Southtown EIR, 2004). With the implementation of **Mitigation Measure 4.12-5**, the Southtown Fire Station would be developed prior to development of the proposed residences adjacent to the railroad tracks; ensuring adequate hazardous materials response services are available to the Proposed Project. In addition, the open space buffer area between project development and the railroad right-of-way would reduce potential direct impacts from occurring and would allow additional time for a response from emergency responders from the Southtown Fire Station. This impact is considered less-than-significant. **Less than Significant.**

Cumulative Impacts

Impact

4.7-7 The Proposed Project in combination with future growth and development in the project vicinity could result in cumulative effects associated with hazards and hazardous materials.

If unmitigated, construction and operation of the Proposed Project in combination with potential cumulative development in the project vicinity could lead to impacts related to hazards and hazardous materials. The Proposed Project and related projects in the cumulative year, would all involve the storage, use, disposal, and transport of hazardous materials to varying degrees during

4.7 Hazards and Hazardous Materials

construction. Impacts related to these activities are extensively regulated by various federal, state, and local agencies and it is assumed that related projects would also comply with these hazardous materials regulations.

Hazard-related impacts are site specific (e.g., have the potential to affect only a limited area). These hazards require implementation of project-specific mitigation measures to reduce the potential for adverse impacts to a less-than-significant level. Reduction of on-site hazardous-related impacts, as discussed above, would ensure that construction activities would not result in impacts that would be cumulatively considerable.

Operation of the Proposed Project and cumulative development projects could result in impacts if development were to result in potential exposure of hazardous materials to sensitive individuals or the general public-at-large, or if additional projects in the vicinity were to include the use or storage of hazardous materials. Because hazardous materials impacts are site specific and the Proposed Project would not include land uses that utilize or require substantial volumes of hazardous materials, the project would not contribute to cumulatively considerable hazardous impacts. Recommended mitigation measures would ensure that cumulatively considerable impacts would not occur. Therefore, this impact is considered less than significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.7-7: Implement **Mitigation Measures 4.7-1** through **4.7-3**, and **4.7-5**.

4.8 HYDROLOGY AND WATER QUALITY

4.8.1 INTRODUCTION

This section addresses the potential for the Proposed Project to cause impacts associated with hydrology and water quality. Following an overview of the hydrological and water quality setting in **Subsection 4.8.2** and the relevant regulatory setting in **Subsection 4.8.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.8.4**.

4.8.2 ENVIRONMENTAL SETTING

Surface Water

Regional

The City of Vacaville (City) lies within the Sacramento River Hydraulic Region (HR). The Sacramento River HR drains 17.4 million acres (27,200 square miles) in twenty-two counties, including Solano County (DWR, Bulletin 118, 2004). The Sacramento River HR includes several major river systems such as the Sacramento River, the longest river system in California. The Sacramento River flows through the Sacramento Valley, a low flat alluvial plain bounded on the north by the Cascade Range and Modoc Plateau, on the east by the southern Cascades and Sierra Nevada mountains, on the west by the Coast Range and Klamath Mountains, and to the south by the Sacramento-San Joaquin Delta. Solano County is located on the southernmost portion of the Sacramento River HR. The Sacramento River HR produces nearly 22.4 million acre feet (AF) of runoff each year, which represents a third of California's total natural runoff (DWR Bulletin 118, 2004).

The City is located approximately 13 miles north of the Sacramento River and Sacramento-San Joaquin Delta in the Ulatis Creek watershed, a 150 square-mile area within the Elmira Hydrologic Subarea (HSA) of the Valley Putah-Cache Hydrologic Unit. The Elmira HSA does not contain any major surface water resources, such as a river or portions of the delta; however, it does contain several creeks, drainages, sloughs, and marshes that drain towards the Sacramento River which forms the southern border of the HSA. **Figure 4.8-1** illustrates the area's surface water resources. Ulatis Creek originates in the Vaca Mountains and flows down in a southeasterly direction towards the Sacramento River. Other major creeks that flow into the Ulatis Creek watershed included Alamo Creek, Laguna Creek, Encinosa Creek, Gibson Canyon Creek, and Horse Creek.

Local

The project site is located within the Noonan Drain watershed due to its proximity to the Noonan Drain to the southeast. The southern portion of Vacaville drains to the Noonan Drain, which functions both to convey runoff during the winter and as a drain for irrigation during the summer. Originally connected to the now non-operational Brazelton Drain, the Noonan Drain is connected to the detention basin located in the southeastern portion of the project site. Runoff flows into the Noonan Drain from the detention basin

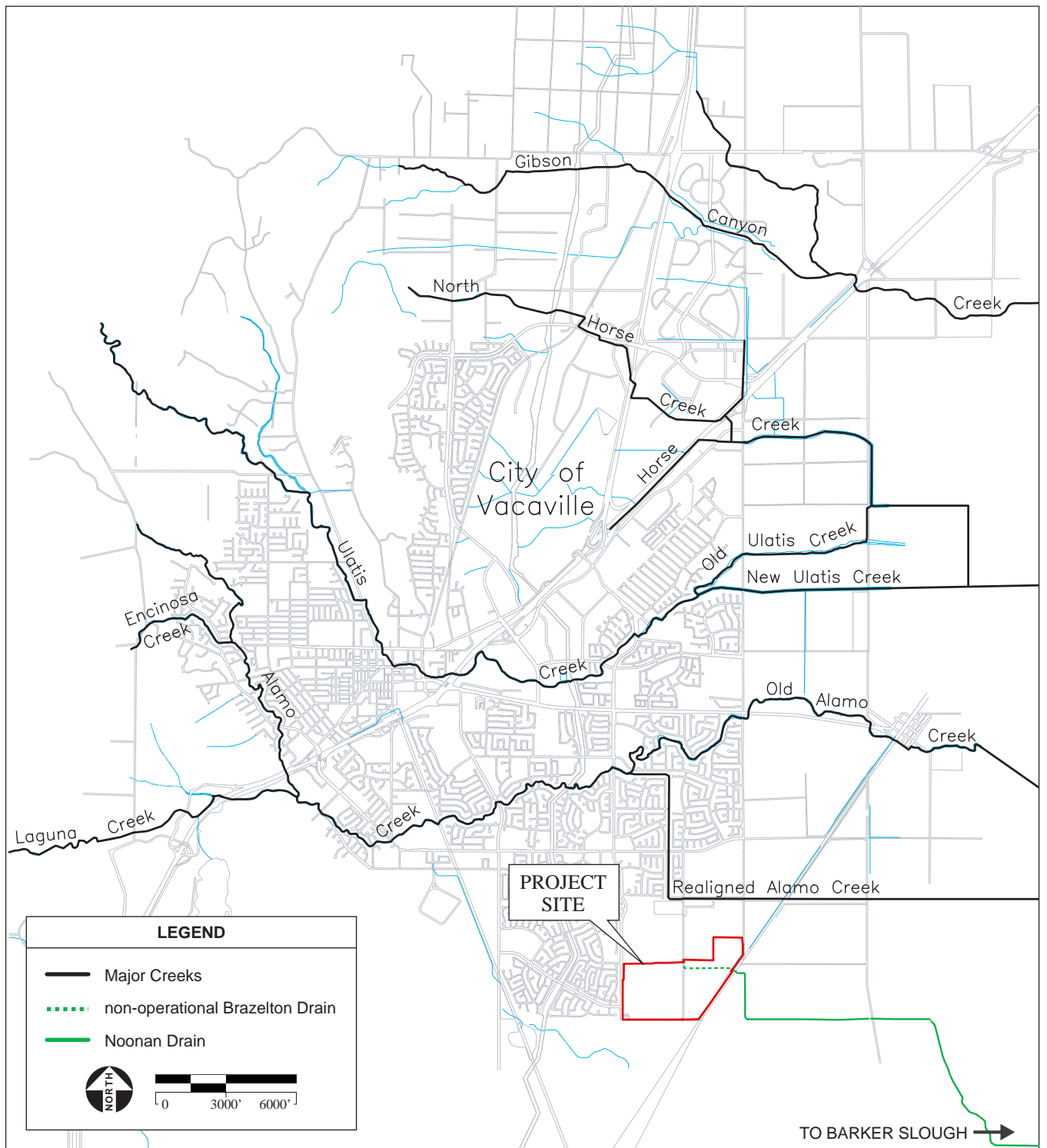


Figure 4.8-1
Surface Water Resources

and eventually discharges into Barker Slough, or to Union Creek, which discharges into Suisan Bay. During instances of 100-year flow, the detention basin releases water through an overland release path to New Alamo Creek to the north. New Alamo Creek is an engineered channel designed and constructed to collect and convey stormwater runoff from surrounding agricultural and urban lands. New Alamo Creek extends from its original tributary Old Alamo Creek in the southeast corner of the City joining Ulatis Creek near the intersection of Fry Road and SR-113. From the diversion, the original channel traverses through Vacaville and on the south side of Elmira towards the Cache Slough to the east. There are no significant water resources on the project site (such as creeks, rivers, ponds or lakes). Various defined drainage channels and wetlands are located on the project site and are discussed in more detail below and in **Section 4.4, Biological Resources**.

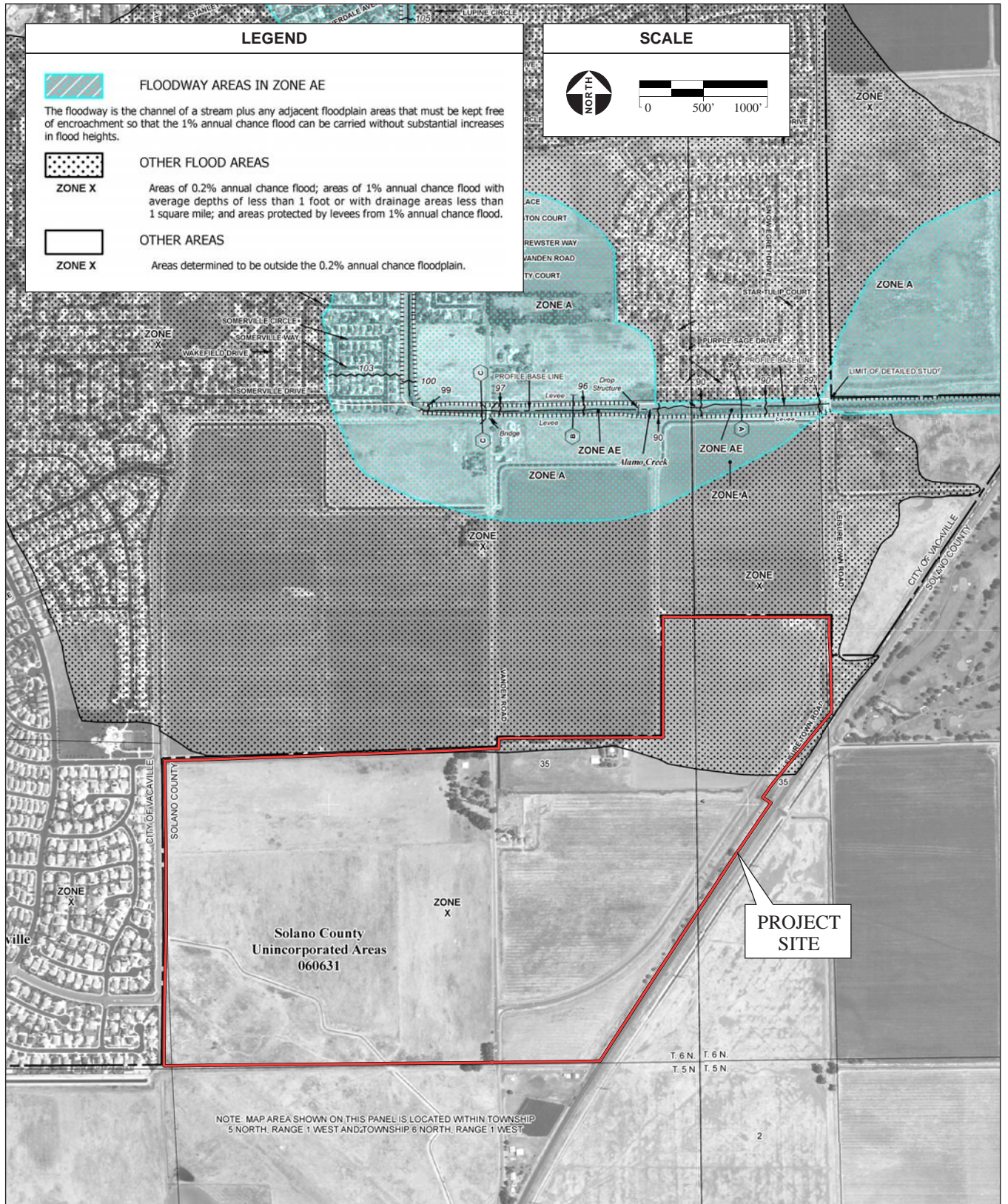
Flooding

The Federal Emergency Management Agency (FEMA) oversees the delineation of flood zones and the provision of federal disaster assistance. FEMA manages the National Flood Insurance Program (NFIP) and publishes the Flood Insurance Rate Maps (FIRMs), which show the expected frequency and severity of flooding by area, typically for the existing land use and type of drainage/flood control facilities present. Flood zones are determined by the probability of flooding within a certain time period, such as a 100-year or 500-year flood event. Floodplains are divided into flood hazard zones, designate by the potential for flooding of an area during a flood event. Flood zones ~~B, C, and X~~ shaded and unshaded X may include those areas that are located within the 100-year flood plain but are adequately protected by levee systems, while Zone A, AE, and AO ~~are~~ is designated as areas inundated by a 100-year storm event.

The project site is located in ~~an area~~ designated shaded Zone X and unshaded Zone X ~~on~~ by the Federal Emergency Management Agency. As shown in **Figure 4.8-2**, the project site is located on (FEMA) Flood Insurance Rate Map (FIRM) numbers 06095C0279E and 06095C0283E. Shaded Zone X is defined as " areas of 0.2 percent annual chance flood, areas of 1 percent annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1 percent annual chance flood." Unshaded Zone X is defined as "(a)reas determined to be outside the 0.2 percent annual chance floodplain," (FEMA, 2011~~09~~). The closest floodplain follows the banks of the Old Alamo Creek approximately 2 miles northwest of the project site. The floodplain does not overlap the project site.

Drainage and Stormwater

Regionally, drainage is provided by the Alamo Creek, Noonan Drain, and Ulatis Creek watersheds which discharge into the Cache Slough system. The City's drainage system is highly urbanized, with a network of storm-drains and channelized drainages providing infrastructure for stormwater drainage to the Alamo Creek and Ulatis Creek watersheds. The majority of stream courses that flow through Vacaville are generally in their natural state and alignment (General Plan, 1990). Under existing conditions, at times channel capacities are exceeded in isolated locations and flooding does occur during moderate storm events. Although the City is responsible for keeping the channel flow lines free from debris and vegetation, a majority of the natural streams are managed by adjacent property owners to the channel



centerline. The Solano County Water Agency is responsible for maintenance and any alterations of the modified channels.

Currently, the project site consists primarily of undeveloped agricultural lands and is mostly unimproved with the exception of several residential homes and outbuildings in the northern portion of the property. Remnants of the inactive Brazelton Drain traverses across the northeastern boundary of the site and a canal owned and operated by the Solano Irrigation District (SID) transects the southwest portion of the project site (refer to **Figure 4.8-2**). The majority of stormwater runoff percolates into the soils; however, stormwater conveyance and storage facilities that serve the project site have already been constructed as a requirement of the Southtown Project development agreement to the north. A detailed description and diagram of the on-site stormwater conveyance lines and connection to the existing stormwater conveyance lines is provided within the Specific Plan (**Appendix C**). Drainage facilities located within the project site and vicinity are shown in **Figure 4.8-3**.

Southeast Vanden Area Major Drainage Master Plan

In July 2005, the Southeast Vanden Area Major Drainage Facilities Master Plan (Master Plan) was completed (**Appendix J**) for both the Southtown and Vanden Meadows Developments. Computer modeling was conducted to determine the extent of the existing flood plain for the entire Southtown and Vanden Meadow Developments, calculate the pre-development 10- and 100-year peak flows while evaluating detention storage alternatives, and determine the capacity of existing drainage facilities to convey estimated peak flows for the projects (including the now non-operational Brazelton Drain). In October 2005, the City approved a revised improvement plan concluding that some of the drainage analysis in the Master Plan was no longer valid. Using additional survey data detailing drainage patterns downstream of the Railroad, the Master Plan's drainage estimates were revised to ensure that the recommended southeastern detention basin could accommodate flooding following the subsequent construction of the Southtown and Vanden Meadow projects. As the construction of the Southtown project is ongoing, the City of Vacaville has constructed several of the infrastructure improvements recommended in both the Master Plan and the subsequent improvement plans. Existing stormwater facilities within the project site now include twin 60-inch and twin 72-inch diameter conveyance lines in Vanden Road, triple 36-inch reinforced concrete pipe (RCP) culverts that convey stormwater under Leisure Town Road, twin 60-inch CMP culverts and a 36-inch RCP culvert that convey stormwater under the Union Pacific Railroad (Railroad), and a regional detention basin with a capacity of 110-acre feet to the southeast of the project which drains into the SID managed Noonan Drain which eventually discharges into Suisan Bay. During 100-year storm events, the detention basin releases water into Alamo Creek to the north through an overland release path. Overflow to Alamo Creek begins to occur at elevation 88.5 feet, the detention basin spillway crest elevation (**Appendix J**).

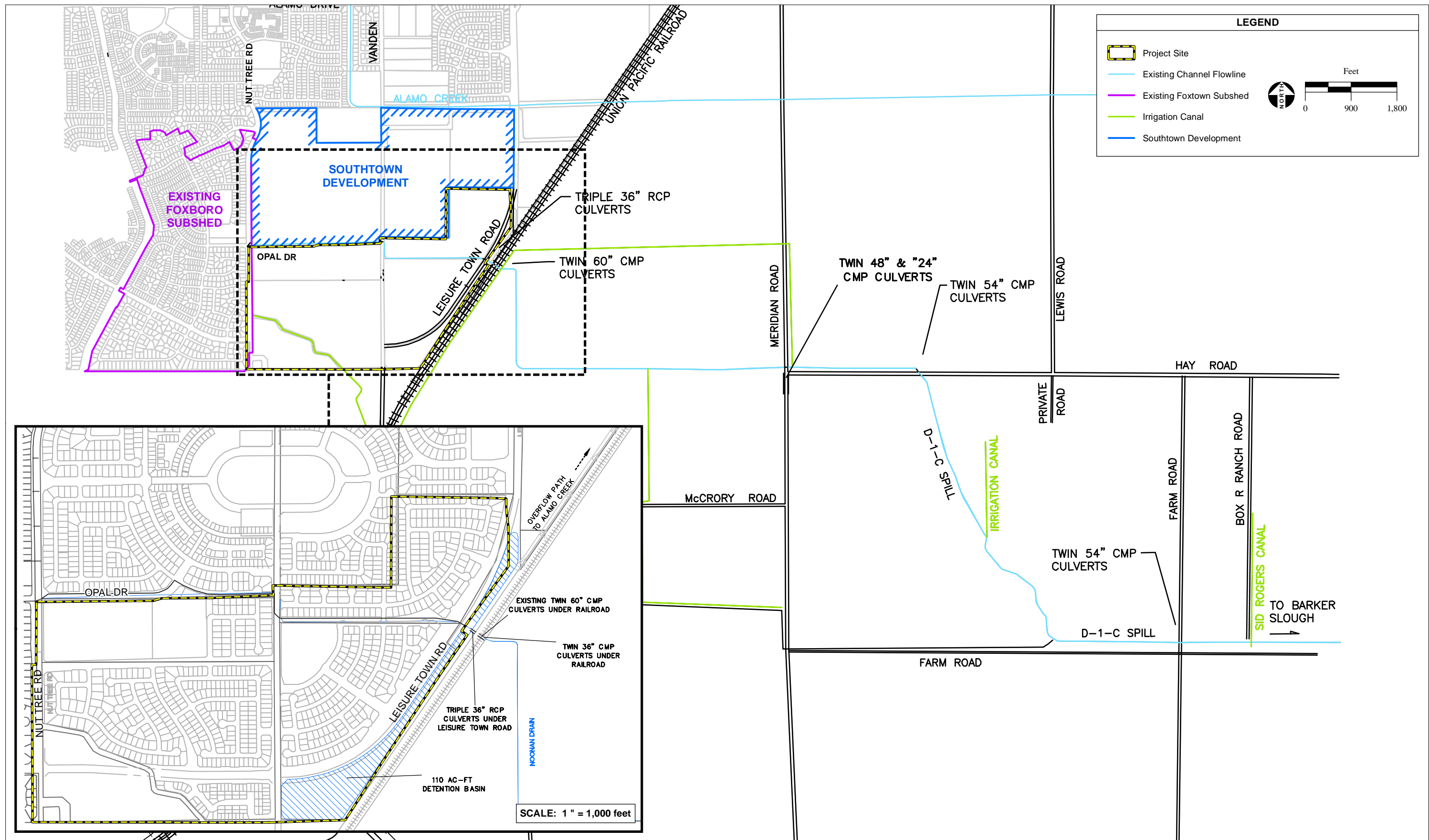
Surface Water Quality

The Sacramento River watershed provides water for a variety of uses, including municipal, agricultural, and recreational water supply, as well as providing important fish and wildlife habitat. Water quality in the Sacramento River watershed is affected by a myriad of sources including soil erosion, wastewater

treatment discharge, stormwater runoff, agricultural runoff, recreation activities, mining activities, and plants and animals. The Sacramento River is listed as impaired under the 303(d) list for chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, mercury, unknown toxicity, and polychlorinated biphenyls (PCBs) and diazinon (CVRWQCB DWR, 201002). According to the State Water Resources Control Board (SWRCB), the Sacramento River was listed as impaired for diazinon in 2002, but has since been delisted. Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards. TMDLs have not yet been defined for the Sacramento River for mercury, unknown toxicity, chlordane, PCBs, DDT, and dieldrin. TMDLs are anticipated to be defined for these pollutants between 2012 and 2022. Other impaired water bodies listed on the 303(d) list near the project site are listed in **Table 4.8-1**.

**TABLE 4.8-1
LIST OF 303(D) LISTED IMPAIRED WATER BODIES NEAR THE PROJECT SITE**

<u>Water body</u>	<u>Impairment</u>	<u>Anticipated Date for Establishment of TMDL by DWR</u>
<u>Sacramento River</u>	<u>Mercury</u>	<u>2012</u>
	<u>Unknown toxicity</u>	<u>2019</u>
	<u>Chlordane</u>	<u>2021</u>
	<u>PCBs</u>	<u>2021</u>
	<u>DDT</u>	<u>2021</u>
	<u>Dieldrin</u>	<u>2022</u>
<u>Ulatis Creek</u>	<u>Chlorpyrifos</u>	<u>2021</u>
	<u>Diazinon</u>	<u>2021</u>
<u>Ledgewood Creek</u>	<u>Diazinon</u>	<u>2007</u>
<u>Suisun Slough</u>	<u>Diazinon</u>	<u>2007</u>
<u>Suisun Marsh</u>	<u>Mercury</u>	<u>2013</u>
	<u>Nutrients</u>	<u>2013</u>
	<u>Organic enrichment/low dissolved oxygen</u>	<u>2013</u>
	<u>Salinity/TDS/Chlorides</u>	<u>2013</u>
<u>Putah Creek</u>	<u>Mecury</u>	<u>2017</u>
	<u>Boron</u>	<u>2021</u>
<u>Delta Waterways (northwestern portion)</u>	<u>Chlorpyrifos</u>	<u>2007</u>
	<u>Diazinon</u>	<u>2007</u>
	<u>Mercury</u>	<u>2009</u>
	<u>Group A pesticides</u>	<u>2011</u>
	<u>DDT</u>	<u>2011</u>
	<u>Electrical conductivity</u>	<u>2019</u>
	<u>Invasive species</u>	<u>2019</u>
<u>Unknown toxicity</u>	<u>2019</u>	
Source: Department of Water Resources, 2010		



Local water quality within the Ulatis Creek watershed is heavily influenced by surrounding land uses. Constituents found in urban runoff vary depending on the location and storm event. In the Vacaville area, the natural weather patterns consists of long dry summers and wet winters; during the seasonal dry periods, pollutants contributed by vehicle exhaust, spills, and atmospheric fallout accumulate in the watershed. Precipitation from the early portion of the wet season displaces these pollutants into the stormwater drainage that can result in elevated pollutant concentrations. During dry weather runoff events (such as runoff from landscape irrigation and street washing), concentrations of heavy metals are typically lower than concentrations measured in wet weather runoff.

Groundwater

Groundwater Supply

The project site is located within Solano Groundwater Subbasin, within the larger Sacramento Valley Groundwater Basin, as delineated in the California Department of Water Resources (DWR) Bulletin 118 (DWR, 2004). Groundwater levels in the main water bearing formation of Solano Subbasin are generally between 60 feet and 130 below ground surface level (DWR, 2004). Currently, groundwater is provided through 17 wells, 15 of which withdraw water from the basal zone of the Tehama Formation. Wells 2 through 16 pump from the basal zone of the Tehama Formation, while Well 1 and the Demello well (located northeast of the city) pump from the non-basal zone of the Tehama Formation; however the Demello well has been used only for backup supplies since 2004 and has been offline as of 2005 (Luhdorff & Scalmanini, 2011). The Tehama Formation is a highly confined aquifer consists of consolidated fluvial, alluvial, and lacustrine deposits (Nolte, 2011). Overlying the Tehama are Quaternary alluvial deposits; neither these nor the upper or middle zones of the Tehama formation are suitable for high production municipal consumption. However they are used for some domestic and agricultural purposes in unincorporated areas of Vacaville. East of Vacaville, these aquifers supply supplemental water to surface water supplies for the Solano Irrigation District. The majority of the City's wells are located in the Elmira well field. However, new wells are being sited further north, near I-80.

Average groundwater pumping rates for the City have been variable. From 2002 to 2007, pumping rates were generally constant, averaging about 6,635 AF per year. Since 2007, the City has gradually reduced the amount of groundwater it produces to 5,068 AF in 2010, which represents 31 percent of total water use for that year; in 2007, 34 percent of water demand was supplied by groundwater (Luhdorff & Scalmanini, 2011). Based on projections, the City of Vacaville has estimated that by the year 2030, the total groundwater pumping allocation per year will be 8,000 AF (Nolte, 2011).

Recent groundwater levels were obtained from the DWR Water Data Library website (<http://www.water.ca.gov/waterdatalibrary/>). Well 06N01W36C004M is approximately 2,000 feet to the northeast of the project site. Groundwater levels in this well have been monitored from 1975 to 2010 and the depth to the groundwater has fluctuated between 9.8 feet (recorded in 2003) and 24.7 feet (recorded in 1975). The most recent measurement recorded a groundwater depth of 11.9 feet on May 05, 2011 (DWR, 2011).

Groundwater Quality

Groundwater quality in the Solano Subbasin is generally of good quality typically meeting requirements for municipal and agricultural uses (DWR, 2004). Every three years, the city performs water quality monitoring as required for all public water systems. The city also collects annual samples for nitrate analysis. Historical groundwater quality data for the City's water supply has been available from 1986 to the present, and most of the historical data does indicate municipal water supplies meet Federal and State drinking water standards. Total Dissolved Solids (TDS) concentrations range from 270 to 546 milligrams per liter (mg/L) in 2008. The TDS concentration in Well 1 was 546 mg/L in 2008, which slightly exceeds the California recommended secondary standard for taste relating to TDS of 500 mg/L, but not the upper secondary limit of 1,000 mg/L. Nitrate concentrations show more variability from well to well than TDS, but concentrations are mostly stable in most wells. Concentrations of trace elements in the wells have generally been low, with copper and selenium having not been detected at any of the City wells. Iron, manganese, and zinc have mostly not been detected, but Arsenic, boron, chromium-VI, and total chromium are typically detected at relatively low concentrations. Additionally, there have been instances of impacts to shallow groundwater quality due to hazardous chemical contamination, but municipal supplies have not been affected. Volatile organic compounds and other man made constituents in the City's water supply wells have also been not detected (Luhdorff & Scalmanini, 2011).

4.8.3 REGULATORY CONTEXT

Federal

Clean Water Act

The Clean Water Act (CWA) (33 USC § 1251-1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important sections of the Act are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 (Water Quality Certification) requires an applicant for any federal permit that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the Act. There are no waivers for Water Quality Certifications in the State of California, and the Water Quality Certification serves as both a certification of a federal permit, under Section 401 of the Clean Water Act, as well as a Waste Discharge Requirement under the Porter-Cologne Water Quality Control Act. Additionally, under Section 401 of the Clean Water Act, the State of California can review and approve or deny all federal permits that may result in a discharge to waters of the State, including wetlands.

- Section 402 establishes the NPDES, a permitting system for the discharge of any pollutant (except for dredged or fill material) into waters of the United States. This permit program is administered by the SWRCB and is discussed in detail below.
- Section 404 establishes a permit program for the discharge of dredged or fill material into waters of the United States. This permit program is jointly administered by the United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (USEPA).

Federal Anti-degradation Policy

The federal antidegradation policy is designed to protect water quality and water resources. The policy directs states to adopt a statewide policy that includes the following primary provisions: (1) existing instream uses and the water quality necessary to protect those uses shall be maintained and protected; (2) where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development; and (3) where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA) (Public Law 93-523), passed in 1974, USEPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by USEPA primary and secondary Maximum Contaminant Levels (MCLs). MCLs and the process for setting these standards are reviewed triennially. Amendments to the SDWA enacted in 1986 established an accelerated schedule for setting drinking water MCLs.

Federal Emergency Management Agency

Solano County and the City are participants in the National Flood Insurance Program (NFIP), a Federal program administered by FEMA. Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 adopted a desired level of protection that would protect developments from floodwater damage associated with an Intermediate Regional Flood (IRF), a flood which is defined as having an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year.

State

Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) provides the basis for water quality regulation within California. The Act requires a "Report of Waste Discharge" for

any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. The Central Valley Regional Water Quality Control Board (CVRWQCB) implements waste discharge requirements identified in the Report.

State Water Resources Control Board and Regional Water Quality Control Board

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the Regional Water Quality Control Boards conduct planning, permitting, and enforcement activities. The Proposed Project area lies within the jurisdiction of the CVRWQCB.

Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

The CVRWQCB uses planning, permitting, and enforcement authorities to meet this responsibility, and has adopted the Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins (Basin Plan) (CVRWQCB, 2007) to implement plans, policies, and provisions for water quality management. The Basin Plan was prepared in compliance with the federal CWA and the State Porter-Cologne Water Quality Control Act. The Basin Plan establishes beneficial uses for major surface waters and their tributaries, water quality objectives that are intended to protect the beneficial uses, and implementation programs to meet stated objectives.

NPDES Program - Construction Activity

The CVRWQCB will require that the proposed project comply with the provisions established by the National Pollutant Discharge Elimination System (NPDES). The NPDES program regulates municipal and industrial storm water discharges under the requirements of the CWA. California is authorized to implement a state industrial storm water discharge permitting program, with the SWRCB as the permitting agency.

The City must comply with the requirements of the most recent version of the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ). This permit regulates discharges from construction sites that disturb one acre of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres or more of total land area. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance must comply with the provisions of this NPDES permit. The permitting process requires the development and implementation of an effective Storm Water Pollution Prevention Plan (SWPPP). The project applicant must submit a Notice of Intent to the SWRCB to be covered by a NPDES permit and prepare the SWPPP prior to the beginning of construction. The SWPPP must include best management practices- (BMPs) to reduce pollutants and any more stringent controls necessary to meet water quality standards. Dischargers must also comply with water quality objectives as defined in the Central Valley Basin Plan. If Basin Plan objectives are exceeded, corrective measures would be required.

Implementation of the SWPPP starts with the commencement of construction and continues through completion of the project. Upon completion of the project, the applicant must submit a Notice of Termination to the SWRCB to indicate that construction is completed.

General NPDES Permit for Small Municipal Separate Storm Sewer Systems (MS4)

The USEPA has identified storm water and urban runoff as one of the most significant sources of water pollution in the country and a serious threat to aquatic life and habitat as well as to human health. Federal regulations require that National Pollutant Discharge Elimination System (NPDES) permits be issued to manage the Municipal Separate Storm Sewer Systems (MS4s). An MS4 is a conveyance or system of conveyances that is owned by a state, city, town village, or other public entity that discharges to waters of the U.S. and is designed or used to collect or convey stormwater. The MS4 permitting program has been implemented in a two-phased approach. Beginning in 1990, Phase I required that permits be issued to those MS4s that served a population of 100,000 persons or more. In 1999, USEPA promulgated the Phase II MS4 regulations. This required that Small MS4s, those serving a population less than 100,000 persons, be issued permits. The State Water Resources Control Board adopted a General Permit for the Small MS4s in 2003 and is in the process of reissuing the permit with revised regulatory standards (SWRCB, 2012).

In accordance with the General Permit for the Small MS4s, the City of Vacaville, in association with the City of Dixon, developed a Storm Water Management Plan (SWMP). The activities described in the SWMP are based on the USEPA's stormwater regulations and the SWRCB General Permit for Small MS4s (City of Vacaville and City of Dixon, 2003). Once annexed, the project site would be subject to the conditions of the City's SWMP and the General Permit for Small MS4s.

State Nondegradation-Antidegradation Policy

In 1968, as required under the federal antidegradation policy described previously, the State Water Board adopted an ~~nondegradation~~ Antidegradation Policy aimed at maintaining high quality for waters in California. The ~~nondegradation~~ Antidegradation Policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy provides as follows:

- a. Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.
- b. Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge requirements which would ensure (1) pollution or nuisance would not occur and (2) the highest water quality consistent with the maximum benefit to the people of the state would be maintained.

California Toxics Rule

In May 2000, the State Water Board adopted and USEPA approved the California Toxics Rule (CTR), which establishes numeric water quality criteria for approximately 130 priority pollutant trace metals and organic compounds. The State Water Board subsequently adopted its State Implementation Policy (SIP) of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries. The SIP outlines procedures for NPDES permitting for toxic pollutant objectives that have been adopted in Basin Plans and in the CTR.

Local

City of Vacaville General Plan

The City's General Plan (General Plan) seeks to preserve and enhance creeks and their associated watershed. The General Plan's conservation strategy focuses on the protection of creeks and drainage areas by incorporating creeks into recreational areas and preserving the creeks to enhance the City's visual characteristics, drainage capabilities, and wildlife habitats, while balancing preservation with protection of private property. The following General Plan guiding and implementation policies are applicable to the Proposed Project.

Conservation Element

The following General Plan guiding and implementation policies associated with hydrological resources are applicable to the Proposed Project.

Guiding Policies

8.1-G1: Preserve and enhance Vacaville's creeks for their value in providing visual amenity, drainage, and wildlife habitat.

8.1-G4: Preserve and protect water resource areas, including the Alamo, Encinosa, Gibson, and Ulatis Creek Watersheds.

Implementing Policies

8.1-15: Protect existing stream channels by requiring buffering or landscaped setbacks and storm runoff interception.

Safety Element

The following General Plan guiding and implementation policies associated with flooding are applicable to the Proposed Project.

Guiding Policies

9.2-G1: Locate development outside mapped flood-prone areas unless mitigation of flood risk is assured.

9.2-G3: The additional runoff caused by development shall be mitigated.

Implementing Policies

9.2-I2: Evaluate storm-drainage needs for each project in the context of demand and capacity when the drainage area is fully developed. Continue to require Development Impact Fees for new development to construct planned regional drainage detention basins to accommodate increased flow. In the Alamo Creek watershed upstream of Peabody Road, which includes Alamo, Laguna and Encinosa creeks, require post-development 10-year and 100-year peak flows to be reduced to 90 percent of predevelopment levels. For the remainder of the study area, for development involving new connections to the creeks, peak flows shall not exceed predevelopment levels for 10- and 100-year peak flow.

City of Vacaville Municipal Code

Division 14.26 of the City's Municipal Code provides regulations for Urban Stormwater Quality Management and Discharge Control. The purpose and intent of this division is to ensure the general welfare of the City's citizens of the City of Vacaville and protect water bodies by reducing pollutants in stormwater discharges to the maximum extent practicable and by prohibiting non-stormwater discharges to the storm drain system. The code includes several discharge prohibitions, including prohibiting discharges in violation of construction activity NPDES Storm Water Discharge Permits, which are enforced by a series of regulations and requirements.

4.8.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

This section identifies any impacts to hydrology and water quality that could occur from construction, operation, and/or maintenance of the proposed project. An examination of the project site, project components, and published information regarding the water resources in the project area was conducted to determine impacts to hydrology and water quality.

The impact analysis in this section is primarily focused on impacts associated with construction and stormwater drainage. Where it was concluded that impacts to hydrology and water quality resulting from the Proposed Project would exceed the significance thresholds listed below, mitigation measures have been recommended to reduce impacts to less-than-significant levels.

Significance Criteria

Criteria for determining the significance of impacts to hydrology and water quality have been developed based on Appendix G of the California Environmental Quality Act's (CEQA) *Guidelines* and relevant agency thresholds. Impacts to hydrology and water quality would be considered significant if the Proposed Project would:

- violate any water quality standards or waste discharge requirements;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial pollution on-site or off-site;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on-site or off-site;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- otherwise substantially degrade water quality;
- place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- place within a 100-year flood hazard area structures that would impede or redirect flood flows; or
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam or inundation by seiche, tsunami, or mudflow.

Project Specific Impacts

Impact

4.8-1 Construction activities may substantially degrade surface water and/or groundwater quality.

Construction related earth disturbing activities associated with the Proposed Project would involve land clearing and soil disturbances to clear the existing project site for the development of proposed roadways, residences, parkways, and school. Disturbed areas and stockpiled soils exposed to winter rainfall could lead to sediment discharge into surface waters, resulting in a degradation of water quality. In addition, construction equipment and materials have the potential to leak, thereby discharging additional pollutants into local waterways. Pollutants potentially include particulate matter, sediment, oils, and greases and construction supplies such as concrete, paints and adhesives. Changes to drainage patterns resulting from construction activities could result in discharge of these pollutants into surface waterways causing an

exceedance of water quality objectives, which could adversely impact beneficial uses of downstream water resources.

Mitigation Measure 4.8-1 requires the Proposed Project to comply with the California General NPDES Permit for construction activities. The General NPDES Permit requires that all construction sites have adequate control measures to reduce the discharge of sediment and other pollutants to streams to ensure compliance with Section 303 of the Clean Water Act. Dischargers must also comply with water quality objectives as defined in the Central Valley Basin Plan. If Basin Plan objectives are exceeded, corrective measures would be required. Additionally, the project must comply with the Vacaville Municipal Code's Grading Permit standards (Chapter 14.19.242.010). With compliance with the grading standards of the Vacaville Municipal Code and implementation of the proposed mitigation, impacts to surface water, including impaired water bodies listed on the 2012 Clean Water Act 303(d) list, and groundwater quality from construction activities would be considered less-than-significant. After mitigation, the project would be consistent with federal and state water quality standards, including the objectives within the federal and state antidegradation policies. Because impacts to surface water quality are considered less than significant, the project would have no affect on the water quality objectives and beneficial uses described in the Basin Plan for the Sacramento River and San Joaquin River Basins. **Less Than Significant Impact with Mitigation.**

Mitigation Measure 4.8-1. The Applicant shall comply with the SWRCB NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit). The SWRCB requires that all construction sites have adequate control measures to reduce the discharge of sediment and other pollutants to streams to ensure compliance with Section 303 of the Clean Water Act. To comply with the NPDES permit, the applicant will file a Notice of Intent with the SWRCB and prepare a SWPPP prior to construction, which includes a detailed, site-specific listing of the potential sources of stormwater pollution; pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills) to include a description of the type and location of erosion and sediment control BMPs to be implemented at the project site, and a BMP monitoring and maintenance schedule to determine the amount of pollutants leaving the Proposed Project site. A copy of the SWPPP must be current and remain on the project site. Control measures are required prior to and throughout the rainy season. Water quality BMPs identified in the SWPPP shall include but are not limited to the following:

- Temporary erosion control measures (such as silt fences, staked straw bales, and temporary revegetation) shall be employed for disturbed areas. No disturbed surfaces will be left without erosion control measures in place during the winter and spring months.
- Sediment shall be retained onsite by the detention basin, onsite sediment traps, or other appropriate measures.

- A spill prevention and countermeasure plan shall be developed which would identify proper storage, collection, and disposal measures for potential pollutants (such as fuel, fertilizers, pesticides, etc.) used onsite. The plan would also require the proper storage, handling, use, and disposal of petroleum products.
- Construction activities shall be scheduled to minimize land disturbance during peak runoff periods and to the immediate area required for construction. Soil conservation practices shall be completed during the fall or late winter to reduce erosion during spring runoff. Existing vegetation will be retained where possible. To the extent feasible, grading activities shall be limited to the immediate area required for construction.
- Surface water runoff shall be controlled by directing flowing water away from critical areas and by reducing runoff velocity. Diversion structures such as terraces, dikes, and ditches shall collect and direct runoff water around vulnerable areas to prepared drainage outlets. Surface roughening, berms, check dams, hay bales, or similar devices shall be used to reduce runoff velocity and erosion.
- Sediment shall be contained when conditions are too extreme for treatment by surface protection. Temporary sediment traps, filter fabric fences, inlet protectors, vegetative filters and buffers, or settling basins shall be used to detain runoff water long enough for sediment particles to settle out. Store, cover, and isolate construction materials, including topsoil and chemicals, to prevent runoff losses and contamination of groundwater.
- Topsoil removed during construction shall be carefully stored and treated as an important resource. Berms shall be placed around topsoil stockpiles to prevent runoff during storm events.
- Establish fuel and vehicle maintenance areas away from all drainage courses and design these areas to control runoff.
- Disturbed areas shall be revegetated after completion of construction activities.
- All necessary permits and approvals shall be obtained.
- Provide sanitary facilities for construction workers.

Impact

4.8-2 Urban run-off resulting from the development of impervious surfaces and urban land uses on the project site could result in adverse effects to surface water quality.

The Proposed Project would include the conversion of 265.6 acres of existing open space and agricultural lands to residential, school, and recreational land uses. The conversion of land would significantly increase the amount of impervious surfaces, which would alter the existing drainage pattern of the project site resulting in increased runoff flows that could lead to increased soil

4.8 Hydrology and Water Quality

erosion or sedimentation to local surface waters. During storm events, rainwater collects atmospheric pollutants and, upon surface impact, gathers roadway contaminant deposits including oxygen-consuming constituents, suspended solids/particulates, nutrients, heavy metals, trace organics, and microorganisms. The increase in vehicular traffic and roadway surfaces on the project site would increase the level of contaminants in stormwater run-off. In addition, residential land uses typically result in the use of various household products that often are deposited into the drainage system both directly by pouring oil down a storm drain or indirectly by fertilizer and pesticide runoff into storm drains. Landscaped areas typically result in the use of pesticides, herbicides, and fertilizers. Potential adverse impacts to local surface waters include an exceedance of surface water quality objectives resulting in sedimentation, eutrophication, and accumulation of pollutants in sediments and benthic organisms, and harm to native species.

As described above, once the project site is annexed the project must comply with the City of Vacaville's SWMP which includes activities and BMPs described in the USEPA's stormwater regulations and the SWRCB General Permit for Small MS4s (City of Vacaville and City of Dixon, 2003) . The regional detention basin described above would detain stormwater before it is released to surface waters. The detention time would allow suspended solids, including silt, metals, and organic matter, time to settle to the bottom of the detention pond. It would also allow for degradation of organic contaminants, including petroleum products and pesticides, by inorganic and organic processes. While the detention basin would help to attenuate some constituents of concern in stormwater, discharge of stormwater and constituents could occur into Noonan Drain or Alamo Creek during overflow events. Impacts to receiving surface waters, including impaired water bodies listed on the 2012 Clean Water Act 303(d) list, from constituents of concern present in on-site run-off would be considered potentially significant. Potentially significant effects to water quality resulting from urban run-off would be reduced to less than significant through the implementation of **Mitigation Measure 4.8.2** which requires that the procedures outlined in the California Storm Water Best Management Practice Handbooks be followed to ensure less-than-significant impacts to water quality. These procedures include biofilters and vegetative swale drainage systems, structural source controls, and protective covering for trash storage areas which would reduce the likelihood that constituents will enter stormwater and surface waters. following mitigation measure. After mitigation, the project would be consistent with federal and state water quality standards, including the objectives within the federal and state antidegradation policies. Because impacts to surface water quality are considered less than significant, the project would have no affect on the water quality objectives and beneficial uses described in the Basin Plan for the Sacramento River and San Joaquin River Basins. **Less than Significant with Mitigation.**

Mitigation Measure 4.8-2. Infiltration systems shall be designed in accordance with the following procedures outlined in the California Storm Water Best Management Practice Handbooks to reduce runoff and restore natural flows to groundwater:

- Biofilters and/or vegetative swale drainage systems will be installed at roof downspouts for all buildings on the project site, allowing sediments and particulates to filter and degrade biologically.
- Structural source controls, such as covers, impermeable surfaces, secondary containment facilities, runoff diversion berms, sediment and grease traps in parking lots will be included in the project design.
- Designated trash storage areas will be covered to protect bins from rainfall.

Impact

4.8-3 Development of the Proposed Project may substantially alter the existing drainage patterns and cause flows to exceed the capacity of existing stormwater drainage systems.

The Proposed Project would result in the conversion of 265.6 acres existing agricultural and open space lands to residential, commercial, public facilities, school, and recreational land uses. The conversion of land would significantly increase the amount of impervious surfaces, altering the existing drainage pattern and resulting in a significant increase in stormwater runoff flows. Several stormwater collection and storage facilities that would serve the Proposed Project have already been constructed as a component of the Southtown Project. The stormwater facilities currently in place within the project site include twin 72" diameter conveyance lines in Vanden Road and a detention basin located within the project site boundaries on the east side of Leisure Town Road. A detailed description and diagram of the on-site stormwater conveyance lines and connection to the existing stormwater conveyance lines is provided within the Specific Plan (**Appendix C**). The proposed network of internal storm drain facilities will result in the collection of surface runoff into a system of underground piping, channeling, and storage facilities to concentrate and convey runoff more efficiently and avoid flooding. The eastern half of the property would drain directly into the existing detention basin located on the east side of Leisure Town Road, while the remaining areas within the project site would drain into stormwater collection facilities that would also discharge to the detention basin. The existing detention basin has a capacity of 110-acre feet, including a spillway with a crest elevation of 88.5 feet. From the detention basin, water will percolate into the groundwater or flow into the Noonan Drain towards the east. During 100-year storm events, when stormwater run-off exceeds the holding capacity of the basin, stormwater will be discharged into Alamo Creek through an overland release path.

An updated hydrologic stormwater modeling analysis was completed for the Proposed Project that assessed the capacity of the existing storm water conveyance system, including the storm water improvements outlined in the Master Plan constructed to date, to accommodate the increase in flows resulting from the implementation of the Proposed Project in combination with the Southtown Development, and is included in Appendix J (Yost, West & Associates, 2011). The study demonstrated that flow levels downstream of the regional detention basin would increase over pre-development levels and concluded that various improvements outlined in the Master Plan would still be required to adequately convey the combined flows from the Proposed

Project and the Southtown Development. **Table 4.8-24** compares the findings of the Master Plan to the subsequent Addendum (**Appendix J**).

Because the Proposed Project would substantially increase the rate and amount of surface runoff in a manner that would exceed the capacity of existing stormwater drainage systems, a potentially significant impact would occur. Proposed mitigation measures would require the installation of various improvements identified in the Storm Water Master Plan that would increase the capacity of the drainage system to accommodate the increase in stormwater flows resulting from the Proposed Project and planned growth with the City. **Less than Significant with Mitigation.**

TABLE 4.8-24
COMPARISON OF MASTER PLAN AND UPDATED ANALYSIS DETENTION BASIN MODEL RESULTS

Description	10 year				100 year			
	Pre-development		Post-development		Pre-development		Post-development	
	Master plan ¹	Updated Analysis ²	Master Plan	Updated Analysis	Master Plan	Updated analysis	Master Plan	Updated Analysis
Basin Discharge, cfs	321 ³	330 ³	334	385	602 ³	599 ³	577	578
Basin Water Surface Elevation (WSEL), ft	n/a	n/a	87.1	86.6	n/a	n/a	89.3	88.7
Overflow to Alamo Creek, cfs ⁴	176	129	0	0	456	389	101	30
Remaining Flow in Noonan Drain, cfs	144 ⁵	145 ⁵	334	385	146 ⁵	145 ⁵	456	548

Southwest Vanden Area Major Drainage Facilities Master Plan Addendum. West, Yost & Associates 2011 (**Appendix J**)
¹ Southeast Vanden Area Major Drainage Facilities Master Plan (July 22, 2005)
² Updated Analysis (May 2007), based on detention basin grading plans by PEI (September 20, 2005)
³ Flow after detention storage upstream of Railroad and Leisure Town Road, but prior to overflow to Alamo Creek.
⁴ Overflow to Alamo Creek begins to occur at elevation 87.5 feet under pre-development conditions and at elevation 88.5 feet, the detention basin spillway crest elevation, post-development conditions.
⁵ The Master Plan assumed that flow that exceeds the capacity of the SID twin 36-inch culverts was diverted to Alamo Creek, while the Updated Analysis by PEI assumes that a portion of the overflow would be diverted to Alamo Creek and the remainder of the overflow would leave between the Railroad culverts and the SID culverts.

Mitigation Measure 4.8-3. The City shall require that the following drainage improvements outlined in the Master Plan and subsequent Addendum (**Appendix J**) be completed prior to the issuance of building permits for construction of the Proposed Project.

- The existing SID twin 36-inch CMP culverts located just east of the Railroad shall be replaced with twin 60-inch culverts in order to match capacity or exceed the combined capacity of the current culverts under the Railroad. Alternatively, the culverts under the Railroad shall be extended.
- Replace the existing culverts at Meridian Road, Hay Road, and Farm Road (**Figure 4.8-3**) with the one of the following alternatives:

- Twin 96-inch RCP culverts with concrete headwalls
- 16-foot by 8-foot Conspan culverts at Meridian Road and Hay Road, and 16-foot by 10-foot Conspan culverts at Farm Road.
- Raise and maintain the top-of-bank elevations along reaches of the Noonan Dam as recommended in the Master Plan and Addendum (**Appendix J**).

Impact

4.8-4 Development of the Proposed Project could place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; place within a 100-year flood hazard area structures that would impede or redirect flood flows; or expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam or inundation by seiche, tsunami, or mudflow.

As shown in **Figure 4.8-2**, the project site is located in an area designated shaded Zone X and unshaded Zone X on the FEMA FIRM map. Shaded Zone X is defined as “ areas of 0.2 percent annual chance flood, areas of 1 percent annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1 percent annual chance flood.” Unshaded Zone X is defined as “(a)reas determined to be outside the 0.2 percent annual chance floodplain.” (FEMA, 2011). ~~Zone X is defined as “(a)reas determined to be outside the 0.2 percent annual chance of a flood plain (FEMA, 2011).~~ The closest floodplain follows the banks of the Old Alamo Creek directly to the northwest of the project site. The floodplain does not overlap the project site. Additionally, there are no water bodies or unstable soil types within or adjacent to the project site that could lead to inundation from by seiche, tsunami, or mudflow. **No Impact.**

Impact

4.8-5 Implementation of the Proposed Project could degrade groundwater quality nor substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.

The use of groundwater resources is expected to increase as the population of the City increases. The City prepared a groundwater source sufficiency report in support of the SB610 water supply assessment report prepared for the Vanden Meadows, Lower Lagoon Valley, Southtown, and Rice McMurty development projects (City of Vacaville, 2011). As part of the sufficiency report, an analytical groundwater flow model was used to provide a preliminary assessment of water level impacts from future increases in groundwater pumping by the City to meet future water needs. The model included simulations of eight future pumping scenarios in which groundwater use would be increased or distributed within the study area. The simulation

results provided a basis for City water managers to better define the annual pumping amount that could be used in conjunction with surface water (Nolte, 2011).

The model helped to determine that the increased demands on the City's groundwater system would have no impact on the City's water supply. Through the continued application of water conservation ordinances, conjunctive use of water supplies, and on-going education initiatives, the City has sufficient groundwater to meet its customers' needs through 2030, including the Vanden Meadows development project (Nolte, 2011).

Development of the Proposed Project will increase the amount of impervious surfaces on the project site which would prevent infiltration of water into the soil, potentially affecting groundwater recharge. However, the loss of pervious surface is minimal compared to the overall size of the groundwater subbasin. Additionally, stormwater runoff would drain into the detention basin to the southeast which will allow slow infiltration into the soils.

Groundwater quality will not be affected as water will flow into storm drains and/or vegetated channels prior to discharge to the detention basin, allowing time for contaminant breakdown and/or sediment deposition prior to release to surface water resources. In addition, percolation within the detention basin would be sufficiently filtered by the soil environment prior to reaching the nearest groundwater aquifer.

Implementation of the Proposed Project would not result in a new deficit in aquifer volume nor degrade groundwater quality. **Less Than Significant Impact.**

Cumulative Impacts

Impact

4.8-6 The Proposed Project in combination with future growth and development within the City and project vicinity could result in cumulative impacts to hydrology and water quality.

The Proposed Project and potential cumulative projects in the vicinity of the project site, including growth resulting from build-out of the City's General Plan and Fairfield Train Station Specific Plan, would be required to comply with the general NPDES permit of the SWRCB, which is intended to reduce the potential for cumulative impacts to water quality during construction. Cumulatively considerable projects that would discharge stormwater runoff would be required to comply with NPDES discharge permits from the CVRWQCB and would be subject to subsequent environmental review. Therefore, impacts on cumulative construction related water quality effects would be less than significant.

Each of the cumulative development projects and the Proposed Project would be subject to local, state, and federal regulations designed to minimize cumulative impacts. Mitigation measures for the Proposed Project in combination with compliance with City, state, and federal regulations, are

4.8 Hydrology and Water Quality

expected to reduce cumulatively considerable impacts to a less than significant level. **Less Than Significant Impact.**

4.9 LAND USE

4.9.1 INTRODUCTION

This section addresses the potential for land use impacts and evaluates the consistency of the Proposed Project with applicable land use designations and policies intended to reduce environmental impacts of development projects. Following an overview of existing land uses in **Subsection 4.9.2** and the relevant regulatory setting in **Subsection 4.9.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.9.4**.

4.9.2 LAND USE SETTING

The project site is located within unincorporated Solano County (County), adjacent to the southeastern boundary of the City of Vacaville (City). The project is located outside of the City limits, but within the City's Sphere of Influence (SOI) and General Plan study area. The County consists of approximately 582,255 acres in northern California, northeast of San Pablo Bay. The majority of the County consists of agricultural/rural land, while the remaining area includes several towns and cities, including the City of Vacaville (City), which is located in the northwestern portion of County mid-way between Sacramento and San Francisco on Interstate 80 (I-80) (Solano County, 2009).

As discussed in **Section 4.11**, the County has experienced an 8.3 percent increase in population between 2000 and 2010 while the City experienced a 9.7 percent increase. Vacaville's development has transformed it from a small agricultural community to a suburban city in a major transportation corridor, however many of its small town qualities have been preserved and farming continues outside the City's planned urban growth area (City of Vacaville, 2007a).

Project Site Land Uses

As described in **Section 3.2**, the Proposed Project site consists of approximately 265.6 acres. The project site is mostly undeveloped and dominated by non-native vegetation, generally agricultural crops, ruderal grasses, and other low-lying vegetation with the exception of two eucalyptus groves. Three home sites are located on the project site. One home site, located on the west side of Leisure Town Road in the north central portion of the project site, is abandoned while the remaining two home sites are located on the east side of Vanden Road and contain dwelling units and accessory structures.

Surrounding Land Uses

Land uses adjacent to the project site consist of residential housing to the northwest and west within the City limits, and farmland under active agricultural production or grazing to the south, east, and northeast. Additionally, the Union Pacific Railroad (UPRR) runs along the eastern boundary of the proposed site parallel to Leisure Town Road; Cypress Lakes Golf Course is 500 feet to the northeast of the project site; Vaca Valley Hospital is located approximately two miles north of the site on Nut Tree Road; and Travis Air Force Base (AFB) is approximately three miles south of the project site. Directly north of the site, the Southtown Planned Development is currently being constructed. The Southtown Project is a mixed-use development master plan that includes residential development, neighborhood commercial development,

parcs and open spaces, a town center/community facility site, and a fire station. This project also required a GP Amendment, annexation into the City, and rezoning. The environmental review process has been completed, the area annexed into the City, and the first phase of construction is currently underway. The majority of the Southtown homes located west of Vanden Road have been completed and are currently occupied.

4.9.3 REGULATORY CONTEXT

The proposed Vanden Meadows Specific Plan outlines the development of the 265.6-acre project site which has been designated for annexation by the City within the City's Municipal Service Review and Comprehensive Annexation Plan (MSR/CAP; City of Vacaville, 2004b). The project site is currently under the sole jurisdiction of the County; therefore, only the County General Plan and Zoning Ordinance are currently applicable to land uses on the site. However, once the proposed site is annexed by the City, the project site will be under the sole jurisdiction of the City and its regulations.

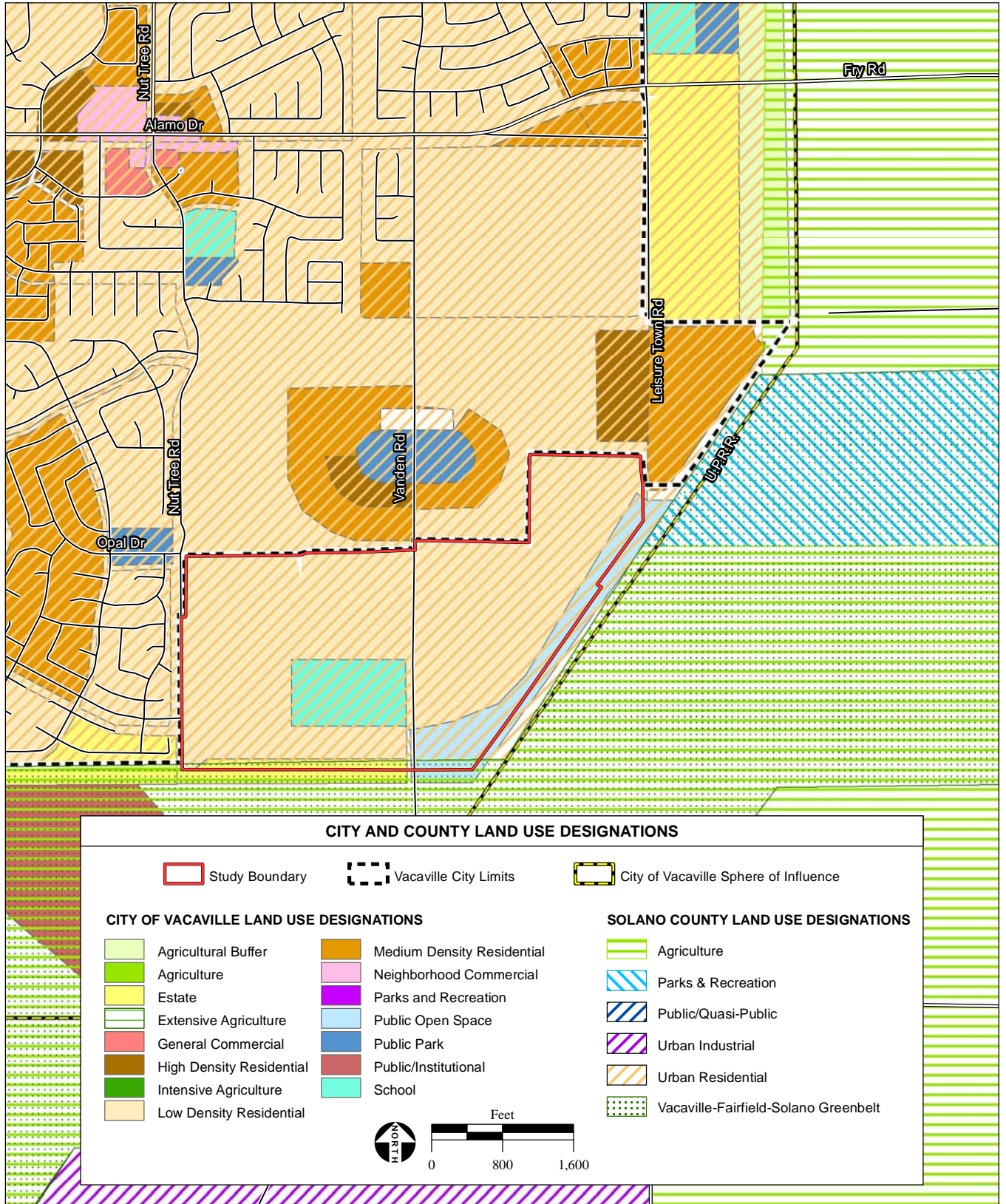
CEQA *Guidelines* Section 15125(d) states that an "EIR shall discuss any inconsistencies between the proposed project and applicable general plans and regional plans." General Plan Amendments and rezoning proposed as part of the Project would make the proposed Project consistent with the General Plan and zoning, and would create specific development policies to guide project development (refer to **Section 3.4.2**). Adopted land use plans and regulations relevant to existing conditions on the project site and implementation of the Proposed Project are described below.

Solano County

The Solano County General Plan serves as a guide for both land development and conservation in the unincorporated portions of the County, with sustainability as its core focus. As shown in **Figure 4.9-1**, the Solano County General Plan (2008) designates the project site for Urban Residential uses. The Urban Residential Designation provides for urban densities of residential development within municipal service areas. The permitted density under this designation is determined from the City's General Plan, which is discussed below. Unincorporated lands surrounding the project site to the east and south are designated as "Agriculture", with a planning overlay of "Vacaville-Fairfield-Solano Greenbelt (VFS)" (Solano County, 2008). The purpose of these designations is provided below:

Agriculture: Provides areas for the practice of agriculture as the primary use, including areas that contribute significantly to the local agricultural economy, and allows for secondary uses that support the economic viability of agriculture.

Vacaville-Fairfield-Solano Greenbelt Overlay: Identifies the area of Solano County subject to the Vacaville-Fairfield-Solano Greenbelt Authority agreement. This overlay identifies the area between Vacaville and Fairfield to provide a permanent separation between the urban areas of Fairfield and Vacaville and maintain the area in agriculture and open space uses consistent with the provisions of the agreement (Solano County, 2008). The aim of the separator is to establish a permanent, one-mile-wide, open space greenbelt that serves as a community separator, a setting for recreational activities, a buffer between



SOURCE: City of Vacaville, 2006 & 2008; Solano County, 2008; AES 2011

Vanden Meadows Specific Plan and Development Project EIR / 210532 ■

Figure 4.9-1
City and County General Plan Land Use Designations

agricultural and urban areas, and as an ultimate limit for urban growth (Solano County General Plan, 2008).

The project site is within the City's Municipal Service Area (MSA) as defined in the County General Plan. An MSA is the area that is a city's current and/or future jurisdictional responsibility and reflects the city's planned urban growth areas, which are based on a County review of city general plans and spheres of influence. Within MSAs, future development of urban land uses is to be facilitated and served through city annexation. Unincorporated lands within the MSAs that are designated Agriculture will continue in agricultural use until annexed to a city for urban development.

Although the project site has a County General Plan land use designation of Urban Residential, currently it is zoned as Exclusive Agriculture (A-20 and A-40) by the Solano County Zoning Ordinance (**Figure 4.9-2**). The unincorporated land to the south is zoned as Exclusive Agriculture (A-20) and the unincorporated land to the east as Exclusive Agriculture (A-40).

Solano County LAFCO Annexation Standards and Procedures

The Solano Local Agency Formation Commission (LAFCO) is the State-mandated commission empowered to make decisions within Solano County regarding agency boundary changes, such as City annexations (City of Vacaville, 2004b). LAFCO's powers, procedures, and functions are set forth in the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (Solano LAFCO, 2010). Annexation procedures include a review of the proposed boundary change in light of 11 standards established by Solano County LAFCO's adopted *Standards and Procedures* (Solano LAFCO, 2010). Six of the standards are mandatory and five are discretionary. If LAFCO determines that one or more of the discretionary standards cannot be met, then they may still approve a boundary change subject to adopting overriding considerations that justify the decision to approve a proposal (City of Vacaville, 2004b). The adopted standards of evaluation are summarized below:

Mandatory Standards

- Consistency with Sphere of Influence Boundaries.
- Change of Organization and Reorganization to the Limits of the Sphere of Influence Boundaries.
- Consistency with Appropriate City General Plan, Specific Plan, Area-Wide Plan, and Zoning Ordinance.
- Consistency with the County General Plan of Proposed Change of Organization or Reorganization Outside of a City's Sphere of Influence Boundary.
- Requirement for Pre-Approval
- Effect on Natural Resources

Discretionary Standards

- Relationship to Established Boundaries, Streets and Roads, Lines of Assessment, Remaining Unincorporated Territory; Proximity to Other Populated Areas; Assessed Valuation.
- Likelihood of Significant Growth and Effect on Other Incorporated or Unincorporated Territory.
- Protection of Prime Agricultural Land.
- Provision and Cost of Community Services.
- The Effect of the Proposed Action on Adjacent Areas, Mutual Social and Economic Interests, and on Local Governmental Structure.

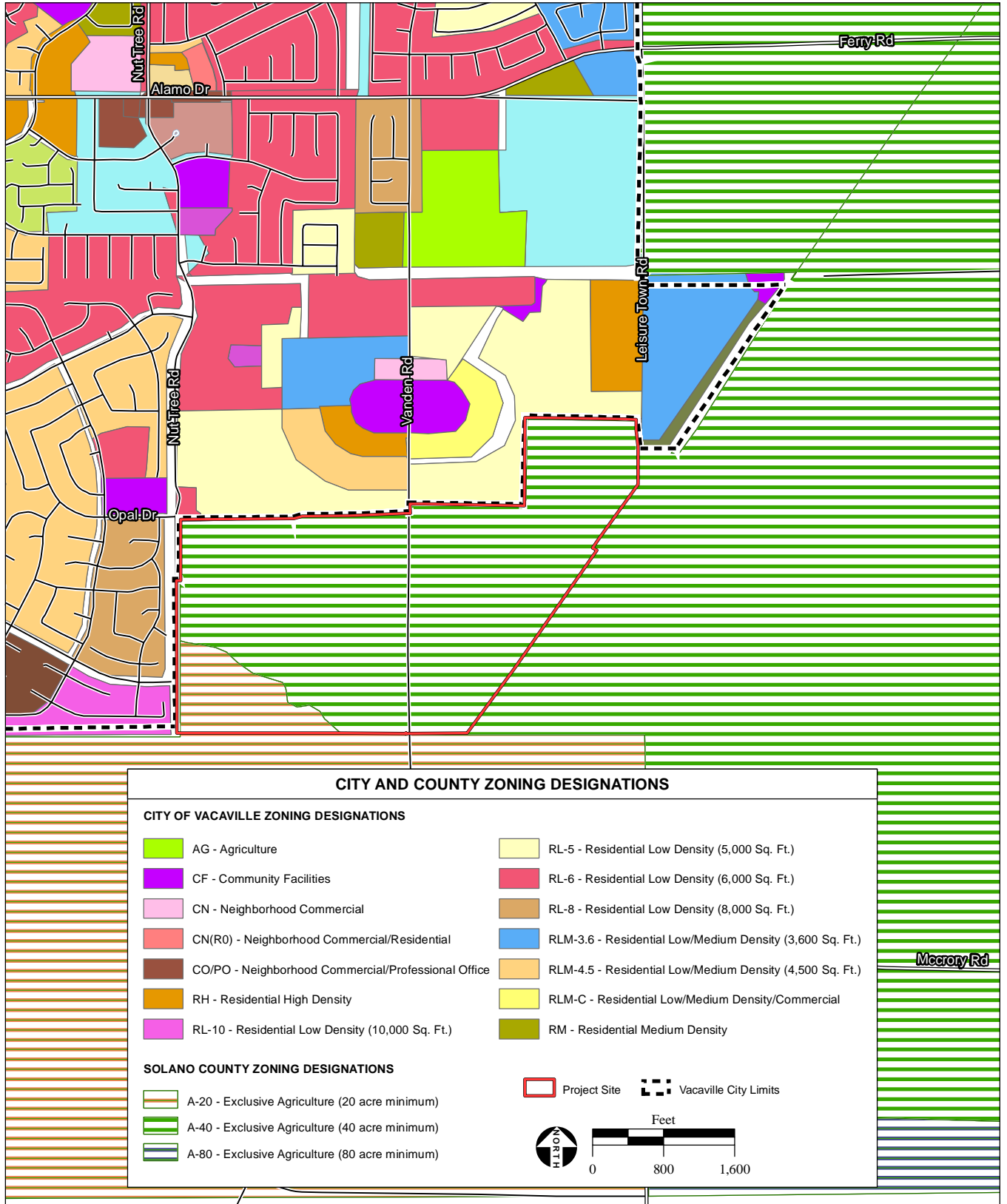


Figure 4.9-2
City and County Zoning Designations

Government Code Section 56430 requires LAFCO to conduct Municipal Service Reviews (MSRs). Solano LAFCO also requires a CAP intended to consolidate and summarize development policies of the City and provide an overview of growth within Vacaville and priorities for annexation over a 10- to 15-year planning period. Required elements within a CAP include: an urban growth strategy, an infill strategy, and an agricultural preserve strategy. Pursuant to the Standards and Procedures adopted by the Solano LAFCO, the City of Vacaville MSR/CAP was adopted by the Vacaville City Council on June 22, 2004 and by LAFCO on September 12, 2004. The project site is identified as Site K – Vanden-South, a Near-Term Annexation Area in the Annexation Plan, and was anticipated to be annexed between 2004 and 2009. The site is considered a new residential growth area and is required to be developed through a specific plan (or planned development). The Southtown Project to the north, designated as Site J – Vanden-North in the Annexation Plan, was required to be annexed prior to Vanden-South to prevent the creation of an “unincorporated island” within city limits (City of Vacaville, 2004).

City of Vacaville

City of Vacaville General Plan

The City of Vacaville General Plan Land Use Element was adopted in August 1990 and was last amended July 12, 2011. The General Plan serves as the overall guiding policy document for land use and development within the City by incorporating standards of population density and building density so that circulation and public-facilities needs can be determined. Although the project site is outside of the City limits, it is within the city’s sphere of influence and is considered an Urban Growth Area. As shown in **Figure 4.9-1**, the General Plan designates most of the project site for low density residential, the southern border as estate residential, the eastern boundary as a public open space, and a central portion for a school. The purposes of these designations are defined below (City of Vacaville, 2007a).

Residential Low Density – To provide opportunities for single-family residential use neighborhoods on lots ranging in size from 6,000 to 10,000 square feet, subject to appropriate standards. The base density is 3.1 units per gross developable acre, and the maximum potential density is 5 units per gross developable acre.

Residential Estate – To provide opportunities for very low-density residential land use, compatible with the topography and public service capacities. The minimum lot size is 10,000 square feet, and larger lots may be required in specific areas by policy plans and/or zoning regulations because of topography or limited public service capacities. The base density is 0.5 units per gross developable acre, and the maximum potential density is 3 units per gross developable acre.

Schools – Existing and proposed public elementary, junior high, and high schools are shown on the Plan maps. These are subject to review by the school districts and ultimate locations may not be the same as proposed.

Public Open Space - Public open space consists of lands that are owned or controlled by the City, other public entity, or by a non-profit entity, as well as lands that are designated for future acquisition by the City, and which are to be preserved as permanent open space. This category

includes lands such as creekways, hillsides, ridgelines, transmission line corridors, and the hillside areas of the California Medical Facility (CMF). Public open space lands may be used for recreational purposes such as hiking, to preserve a permanent inventory of open space lands, or for agricultural grazing uses. The public open space designation, however, does not necessarily guarantee public access. The physical characteristics of the land or the extent that improvements are required may restrict the accessibility of the site

Goals and policies within the City's General Plan applicable to the Proposed Project are listed in **Table 4.9-1**, at the end of this section.

The City is currently in the process of updating its General Plan and anticipates adoption of the update will occur in the summer/fall of 2012. The City's General Plan Update will include revisions to the policies and land use map of the existing General Plan.

City of Vacaville Zoning

The purpose of the City of Vacaville Zoning Ordinance (City's Municipal Code Chapter 14.09) is to "protect and promote the public health, safety, and general welfare of the citizens of Vacaville" (Chapter 14.09.070). As shown in **Figure 4.9-2** and described above, the project site is within the unincorporated area of the County and is therefore not presently subject to the City's zoning ordinance. The surrounding City lands are zoned as Residential Low Density (RL-5, RL-6, RL-8, and RL-10), Residential Low/Medium Density (RLM-3.6 and RLM-4.5), Residential High Density (RH), Residential Low/Medium Density/Commercial (RLM-C), and Community Facilities (CF).

City of Vacaville Planned Growth Ordinance

Vacaville's Planned Growth Ordinance (PGO; Division 14.05 of the Vacaville Municipal Code) was adopted in 1991 and revised in 2000. The PGO was established to ensure that all new residential development within the city has adequate infrastructure for water treatment and supply, wastewater collection and treatment, and stormwater drainage, to serve new units and residents. The PGO allows a base inventory of up to 1,000 units within approved and unbuilt projects be maintained on an annual basis. Units that have building permit allocations and/or are eligible to be issued permits at any time make up the 1,000-unit inventory. The allocation process, established by the PGO, provides a mechanism to maintain the 1,000 unbuilt unit base inventory. As the inventory falls below 1,000 unbuilt units, new projects are added through the recording of a final map or through City Council approval of allocations following the approval of a planned development. The City Council retains the flexibility to grant allocations over the 1,000 unbuilt units. The PGO limits consideration of annexation to sites designated as near term annexation areas in the CAP, which includes the project site. New growth areas are expected to include phasing plans as a part of the development agreement. The phasing plan sets forth the number of units to be eligible for building permits each year.

Vacaville-Fairfield-Solano Greenbelt Authority

On September 13, 1994, the City of Vacaville, City of Fairfield and Solano County entered into a joint agreement for the formation of the Vacaville-Fairfield-Solano Greenbelt Authority (VFSGA) and creation of the Vacaville-Fairfield Greenbelt. The site is contiguous to the northern boundary of the Greenbelt.

The goals of the VFSGA are to provide for the preservation and conservation of viable agricultural and open space land, and to provide a permanent separation between the urban areas of Fairfield and Vacaville. The agreement does not stipulate minimum buffer widths between urban uses and agricultural uses within the greenbelt; however, it does require that “Urban Limit Line Buffers” be established in areas outside of the greenbelt with a minimum width of 500 feet when adjacent to residential uses and a minimum width of 300 feet when adjacent to non-residential uses.

Solano County Airport Land Use Commission

The Solano County Airport Land Use Commission (SCALUC) is charged with determining consistency between actions of local agencies and airport operators and adopted airport land use plans. The SCALUC has no authority over existing land uses or over the operation of airports. As adopted by the SCALUC, the compatibility plan for each of the airports in Solano County consist of two documents, the *Solano County Airport Land Use Compatibility Review Procedures* (Compatibility Review Procedures; SCALUC, 2002) and the current compatibility plan for the respective airport. As described within the Compatibility Review Procedures, the adoption or approval of any amendment to a general, specific plan and/or zoning ordinance affecting the property within an airport influence area shall be referred to the SCALUC for determination of consistency. The project site is located within the area of influence of the Travis Air Force Base (AFB). The land use compatibility plan for Travis AFB is briefly described below. The site is not within the area of influence for the Nut Tree Airport.

Travis Air Force Base Land Use Compatibility Plan

The *Travis Air Force Base Land Use Compatibility Plan* (SCALUC, 2002) sets forth land use compatibility policies applicable to future development in the vicinity of the base. The Compatibility Plan delineates its “Area of Influence” into six zones which are defined as follows:

- **Zone A-** Zone A consists of the Travis Air Force Base runways together with immediately adjoining areas within the runway primary surface and clear zones. The dimensions are set in accordance with Federal Aviation Regulations (FAR) Part 77 and Air Force criteria.
- **Zone B1-** Zone B1 comprises Accident Potential Zone I (APZI) as defined by the Air Force.
- **Zone B2-** This zone is comparable to Accident Potential Zone II (APZII) as defined by the Air Force, but is also expanded to encompass approach and departure flight tracks that are not aligned with the runway.
- **Zone C-** Zone C encompasses locations exposed to potential noise in excess of approximately 60 decibels (dB) together with additional areas occasionally affected by concentrated numbers of low-altitude aircraft overflights.
- **Zone D-** Zone D includes all other locations beneath any of the Travis AFB airspace protection surfaces delineated in accordance with FAR Part 77.
- **Height Review Overlay Zone-** This zone covers locations where the terrain exceeds or comes within 35 feet of any of the FAR Part 77 airspace protection surfaces for Travis AFB.

The project site is located within Zone D, which requires airspace review for objects over 200 feet tall. Prohibited uses within Zone D are those that are considered “hazards to flight”, which include physical,

visual, and electronic forms of interference with the safety of aircraft operations. Land use development that may cause the attraction of birds is also prohibited (SCALUC, 2002).

4.9.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

The Proposed Project was evaluated for compatibility with existing and planned land uses adjacent to the project site, and consistency with adopted plans, policies, and zoning designations. While this EIR analyzes consistency with local policies, it is the Planning Commission and City Council who will make the ultimate determination regarding land use compliance. The Solano LAFCO will also review the Proposed Project and make findings related to land use planning and policy impacts prior to approval or disapproval of annexation of the project site into the city limits.

Long-term incompatibilities arise when adjacent land uses result in activities that could conflict with each other. For example, land uses that produce excessive noise, light, dust, odors, traffic, or hazardous emissions may be undesirable when they intrude on places where people sleep and recreate (residences and parks). Therefore, some industrial or agricultural uses (which can produce noise and odor) would not be considered compatible with residential uses, unless buffers, landscaping or screening can be used to protect residents from health hazards or nuisances. The respective environmental sections of this Draft EIR discuss any potential physical/environmental impacts that could impact adjacent sensitive receptors.

Significance Criteria

Section 15125(d) of the CEQA *Guidelines* states that “[t]he EIR shall discuss any inconsistencies between the Proposed Project and applicable general plans and regional plans.” Criteria for determining the significance of land use impacts to have been developed based on Appendix G of the CEQA *Guidelines*. For the purposes of this Draft EIR, land use impacts are considered significant if the Proposed Project would:

- Physically divide an existing community;
- Result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect; or
- Conflict with any applicable habitat conservation plan, or natural community conservation plan.

Effects Found Not to be Significant

The Initial Study (**Appendix B**) concluded that the Proposed Project would not physically divide an established community. This effect is therefore not considered within this EIR.

Project Specific Impacts and Mitigation Measures

Impact

- 4.9-1 The Proposed Project could result in a substantial inconsistency with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.**

Implementation of the Proposed Project requires annexation of the project site to the City of Vacaville, adoption of the proposed Vanden Meadows Specific Plan (Specific Plan; **Appendix C**), minor amendments to the General Plan Land Use designations, and pre-zoning of the project site for a variety of urban uses. Proposed land uses outlined within the Specific Plan are described in detail within **Section 3.4.3** and consist of 939 single-family, clustered and multi-family units, a public school site, seven acres of park, and connecting pedestrian trails within the project site. Proposed General Plan Land Use and zoning designations for the project site are illustrated and defined in **Figure 3-4**. The following discussion evaluates the consistency of the Proposed Project with applicable land use plans, including the Vacaville General Plan, and Comprehensive Annexation Plan.

City of Vacaville General Plan

The 265.6-acre project site is designated for urban uses by both the County and City General Plans. The site is within the MSA and Sphere of Influence of the City. The Vacaville General Plan states that a policy plan or specific plan shall be prepared when new areas are annexed into the City for development. The purpose of a specific plan is to implement the City's General Plan through the development of policies, programs and regulations that provide an intermediate level of detail between the General Plan and individual development projects (City of Vacaville, 2007a). Consistent with this requirement, the proposed Vanden Meadows Specific Plan would guide development on the project site.

In order to approve proposed General Plan amendments associated with annexation of the project site and adoption of the Vanden Meadows Specific Plan, the City must determine that the Proposed Project is consistent with the goals, objectives, and policies of the current General Plan. The Proposed Project is required to maintain a balance of land uses and be compatible with adjoining land uses. The General Plan amendment must not result in detrimental impacts to the health, safety, and welfare of the existing community. A discussion of consistency with General Plan goals and policies and compatibility with surrounding land uses is provided below.

Consistency with General Plan Goals and Policies

Table 4.9-1 lists the General Plan goals and policies that would be applicable to the Proposed Project and includes a general discussion of the project's consistency with these policies. General Plan consistency will be ultimately be determined as a part of City Staff application review. With the adoption of the proposed General Plan amendment and completion of the various actions listed within **Section 3.5**, the Proposed Project will be considered consistent with the goals, objectives, and policies of the City's General Plan.

Compatibility Issues

Proposed land uses on the project site consist of high-, medium-, and low-density residential housing and school facilities with parks and pedestrian trails dispersed throughout the site. These uses are commonly sited next to each other, and are generally considered to be compatible.

Existing and future residential land uses to the north and west of the project site would also be compatible with the proposed residential and school facilities on the project site. While land uses located to the northwest of the project site are still transitioning from agricultural to urban uses, it is expected that this area will be fully built-out prior to construction of the Proposed Project.

Lands to the south and east consist of agricultural lands within unincorporated Solano County. These lands are designated within the Solano County General Plan as the Vacaville-Fairfield-Solano Greenbelt, the purpose of which is to “serve as a community separator, a setting for recreational activities, a buffer between agricultural and urban areas, and as an ultimate limit for urban growth” (Solano County General Plan, 2008). These lands have historically been used for low intensity agricultural uses, including field crops and livestock grazing. These uses require less intensive management practices that are more compatible with urban uses when compared to intensive agricultural crops as they typically do not generate large amounts of dust, or require excessive use of pesticides and frequent use of loud farm equipment. The detention basin and right-of-way easements along the eastern border of the project site would provide a minimum of 500 feet of separation between proposed residential land uses along the eastern border of the project site and agricultural uses within the Vacaville-Fairfield-Solano Greenbelt. As discussed under **Impact 4.3-3** in **Section 4.3**, Agricultural Resources, this buffer would be sufficient to ensure sensitive land uses proposed along the eastern border of the project site, including low and medium density residential housing, would not be adversely affected by dust, noise and pesticide use from adjacent Solano County agricultural operations.

However, the proposed residential estate area located along the southern border of the project would be directly adjacent to adjoining agricultural uses to the south. The General Plan does not identify the southern boundary of the project site as an area requiring an agricultural buffer, therefore the requirements of General Plan policy 2.5-18 do not apply to this area of the project site. In accordance with General Plan Implementation Policy 2.3-112, proposed residential land uses south of Foxborrow Parkway and west of Vanden Road are very low density, with the minimum lot size being 10,000 square feet (approximately 0.25-acres). Low density housing is typically considered to be more compatible with agricultural uses as fewer residences would be exposed to potential nuisances. Due to the nature of agricultural activities in the area, sensitive land uses proposed along the southern border of the project site would not be adversely affected by dust, noise and pesticide use from adjacent Solano County agricultural operations. Potential conflicts with agricultural uses would be reduced to less than significant through the implementation of mitigation measures identified within the **Section 4.3**.

The South Pacific Rail Road tracks are also located along the eastern boundary of the site. As discussed further in **Section 4.2**, Air Quality, **Section 4.10**, Noise, and **Section 4.7**, Hazards, impacts to proposed sensitive receptors on the project site from emissions, odors, noise levels and potential hazards along the tracks are considered to be less than significant.

Therefore, with the implementation of mitigation measures identified in other issue area sections of this EIR, land use compatibility impacts are expected to be less than significant.

Comprehensive Annexation Plan

Pursuant to the Standards and Procedures adopted by the Solano County LAFCO, the City has adopted a CAP. The project site is identified as a Near Term Annexation Area in the CAP, indicating a projected annexation between 2004 and 2009. The Proposed Project would result in the annexation development of the project site and is, therefore, consistent with the CAP.

Travis Air Force Base Land Use Compatibility Plan

The Proposed Project is located within the area of influence of the Travis Air Force Base, and therefore is subject to formal review by the SCALUC for determination of consistency with the Travis Air Force Base Land Use Compatibility Plan. The project site is located within Zone D as designated within the Compatibility Plan. The Proposed Project would not result in the development of land uses that would interfere with the safety of aircraft operations, including the development of land uses that may cause the attraction of birds. None of the structures developed within the project site would exceed 200 feet in height. Therefore, the project would be compatible with Travis Air Force Base Operations based on the land use compatibility factors listed in the Travis Air Force Base Land Use Compatibility Plan. The final determination of consistency will be made by the SCALUC.

Summary

The variety of housing types and densities included in the Proposed Project are anticipated to balance the City's overall housing stock with an increase in affordable market rate units and the Proposed Project is supportive of the Solano County growth initiative's practice of directing urban development to the existing cities. The Proposed Project would implement the City's long-term plan for urbanization and annexation of the project site consistent with the City's CAP prepared pursuant to LAFCO requirements, and does not exceed the urban limit line established by the Vacaville-Fairfield-Solano Greenbelt Authority agreement. The Proposed Project would be generally compatible with adjoining land uses with implementation of mitigation measures identified in other issue area sections of this EIR, and thus will be considered consistent with the goals, objectives, and policies of the City's General Plan. This impact is considered less than significant. **Less than Significant.**

Impact

4.9-2 The Proposed Project could result in an inconsistency with any applicable habitat conservation plan or natural community conservation plan.

The Proposed Project location is within an area covered under the Draft Solano Habitat Conservation Plan. A final administrative draft of this document was released in August 2009; however, the plan has not been adopted. Consistency with the recommendations and conservation strategies within the administrative draft plan are discussed in detail in **Section 4.4, Biological Resources**, of this EIR. The Proposed Project is consistent with and will not impact the

long-term conservation goals contained in the City’s General Plan and the Draft Solano HCP.
Less than Significant.

Cumulative Impacts

4.9-3 The Proposed Project could contribute to adverse cumulative impacts associated with land use.

Cumulative projects in the vicinity of the project site, including the Southtown Project located directly north of the project site and Fairfield Train Station Specific Plan located to the south in the City of Fairfield, would be developed in accordance with local and regional planning documents; thus, cumulative impacts associated with land use compatibility are expected to be less than significant. Additionally, as discussed above, the Proposed Project will be consistent with the City and County’s General land use designations, goals, and policies, and thus would not contribute to the potential for adverse cumulative land use effects. **Less than Significant.**

TABLE 4.9-1
 CONSISTENCY WITH CITY OF VACAVILLE GENERAL PLAN POLICIES

Land Use Plan Policy	Consistent	Discussion
Guiding Policies		
2.1-G 4 Minimize conflicts between agriculture and urban uses and provide for a transitional area or buffer between agricultural and urban uses.	Yes	Agricultural land is immediately east and south of the project site. The detention basin and right-of-way areas located along the eastern boundary of the project site would serve as a buffer, providing a transitional area between the proposed development and the adjacent agricultural lands. No buffer is proposed between the project site and the Vacaville-Fairfield-Solano Greenbelt, located immediately south of the project site. However, as described in Section 4.3 , the General Plan does not identify the southern boundary of the project site as an area requiring an agricultural buffer. In accordance with General Plan Implementation Policy 2.3-112, proposed residential land uses south of Foxborrow Parkway and west of Vanden Road are very low density, with the minimum lot size being 10,000 square feet (approximately 0.25-acres). Due to the nature of low intensity agricultural activities in the area, sensitive land uses proposed along the southern border of the project site would not be adversely affected by dust, noise and pesticide use from adjacent Solano County agricultural operations.
2.1-G 5 Design aesthetically pleasing roadways, including a loop street system lined with trees or other appropriate landscaping, that connect Vacaville neighborhoods and serve planned development. Streets alone should not be used to set the outer limits of urbanization.	Yes	The Vanden Meadows Project will provide its residents with a looping street system, extensive pedestrian and bike trails, and extensive landscaping, as required by City standards. The outer limits of the Proposed Project is occupied by residential estates and a detention basin, not a street and, therefore, is consistent with City policy.

Land Use Plan Policy	Consistent	Discussion
<p>2.1-G 8 Preserve the predominant single-family residential character of Vacaville while providing other housing opportunities. Protect established neighborhoods from incompatible uses.</p>	Yes	<p>The Proposed Projects includes the development of 939 single-family, clustered, and multi-family units. Approximately 47 percent (441 units) of the housing proposed consists of estate and low density housing units and approximately 33 percent (306 units) consists of moderate density housing units. Thus, the project will provide a range of housing opportunities, but will be predominantly single family. Because the project site is currently vacant, and because of the proximity of existing and proposed residential development, established neighborhoods will not be adversely affected.</p>
<p>2.2-G 3 Ensure that scarce natural resources, such as water, are allocated and utilized to maximize community benefits, and manage growth so that the quantity and quality of public services and utilities within the City provided to existing businesses and residents will not drop below an acceptable level of service because of new development. New development is not responsible for resolving all existing service and facility deficits. Existing development bears some responsibility to fund improvements that will resolve such deficits, and development is likewise responsible for funding the costs of maintenance and depreciation of facilities.</p>	Yes	<p>This EIR provides an in-depth analysis of the Project's potential to impact environmental resources and public services. Refer to Section 4.8, Water Quality and Section 4.12, Public Services and Utilities, for an in-depth analysis. As discussed therein, no significant unavoidable impacts to water resources would occur as a result of the Proposed Project.</p>
<p>2.2-G 10 Ensure that all new urban development within the Planning Area occurs within the City of Vacaville. New urban developments not within the City limits are expected to annex to the City of Vacaville as a prerequisite to development.</p>	Yes	<p>The project site is located within the City's Sphere of Influence, and as part of the Proposed Project the project site will be annexed into the City prior to development.</p>
<p>2.5-G 2 Provide a citywide housing mix of approximately 60 percent single-family detached, 20 percent single-family with zero lot lines, duplexes, triplexes, mobile homes, and townhouses, and 20 percent garden apartments and condominiums. To achieve this approximate housing mix citywide, new development areas must contain a larger component of certain housing types, as specified in Policy 2.5-I 3.</p>	Yes	<p>See discussion under Implementing Policy 2.5-I 3, below.</p>
<p>2.5-G 5 Encourage creative site design and architectural quality and variety by a design approval process that provides for a variety of single-family houses and designs and/or multi-family designs.</p>	Yes	<p>The Proposed Project will provide a variety of housing types throughout the 265-acre site. The types of homes will vary by type, size, and affordability. The Proposed Project is subject to Use Permit approval by the Planning Commission and each project design phase is subject to Design Review approval to evaluate aesthetic details and impose requirements, including mitigation measures, to limit adverse aesthetic impacts.</p>
<p>2.5-G 6 Provide for a transition between higher-density and lower-density housing and require buffers between residential and incompatible land uses.</p>	Yes	<p>The specific plan has designed greenbelts, parks, and roadways to serve as buffers between varying types of uses on and around the proposed site. This will serve to create distinct identities for each use.</p>

Land Use Plan Policy	Consistent	Discussion
<p>2.5-G 7 Ensure that new residential development shares the cost of providing services and amenities for Vacaville residents.</p>	<p>Yes</p>	<p>The Southtown Benefit District has been established for this area which ensures that each project will pay for its fair share of public facility improvements (see Appendix C).</p>
<p>Implementing Policies</p>		
<p>2.1-I 12 Land use changes and development proposals within the Vacaville planning area shall be consistent with the Nut Tree Airport Land Use Plan and the Travis Airport Land Use Compatibility Plan and are subject to review per the Solano County Airport Land Use Compatibility Review Procedures.</p>	<p>Yes</p>	<p>As described above, the project site is located within Zone D of the Travis AFB “Area of Influence”, which requires airspace review for objects over 200 feet tall and prohibits uses within that are considered “hazards to flight” (SCALUC, 2002b). The Proposed Project does not include any structures over 200 feet in height and therefore does not require formal review. Furthermore, the Proposed Project does not propose any new uses that may cause visual, electronic, or bird strike hazards to aircraft in flight.</p>
<p>2.2-I 10 Require new development to pay capital improvement fees for public facilities as necessary to maintain adequate resources and service levels.</p>	<p>Yes</p>	<p>The Proposed Project will fund the construction of required underground public facilities. The Project will also pay its fair share of improvement costs for off-site improvements necessary to support the development. Refer to the public services and utilities section for an in-depth analysis.</p>
<p>2.3-I 12 In the portion of the Vanden Specific Plan area south of Foxboro Parkway and west of Vanden Road, the minimum lot size shall be 10,000 square feet.</p>	<p>Yes</p>	<p>As shown on Figure 3-4, the proposed designation for the portion of the Specific plan area south of Foxboro Parkway is Residential Estate, which, as described above, has a minimum lot size of 10,000 square feet.</p>
<p>2.3-I 13 Require that the South Vanden Area, including the Southtown and Moody Project Areas, facilitate the development of a range of housing densities and opportunities, pedestrian and bicycle friendly design, neighborhood commercial sites, and recreational and neighborhood facilities, by including the following requirements:</p> <ul style="list-style-type: none"> ▪ A network of landscaped pedestrian/bike corridors that connect key elements of the area, such as the regional park and arterial streets. ▪ New development adjacent to existing homes within the City limits shall match or exceed the size, character, and quality of adjacent homes and lots. ▪ All new residential development shall conform with the Residential Design Requirements for New Single Family Development. ▪ The Southtown project area will include a range of housing types and densities, attached, detached, and cluster housing. ▪ Land shall be reserved for community uses such as private schools, 	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>	<p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the Proposed Project.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the residential components of the Proposed Project.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the residential components of the Proposed Project.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the residential components of the Proposed Project.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the</p>

Land Use Plan Policy	Consistent	Discussion
<p>membership organization, day care centers, and senior centers.</p> <ul style="list-style-type: none"> ▪ A financing mechanism for all public facility improvements shall be established before development occurs. ▪ Nut Tree Road and Vanden Road shall be widened to the City standard width through the project sites for all projects that front on these streets. ▪ Leisure Town Road shall be widened and improved to the standards for the Jepson Parkway along the frontage of all projects that abut to Leisure Town Road. ▪ Foxboro Parkway shall be extended between Nut Tree Road and Vanden Road. The extension will be completed prior to the reconstruction and reconfiguration of Vanden Road. ▪ A site within the Vanden Road loop shall be reserved for a park. ▪ Different development projects within the South Vanden Area shall coordinate their respective roads, bike paths, landscape corridors and design standards to create a unified sense of place and identity. ▪ Infrastructure master plans for sewer, water, storm drain, and traffic improvements shall be prepared prior to or in conjunction with the processing of subdivision maps for all development within the South Vanden areas, including the Southtown and Moody Project Areas. ▪ Prior to the approval of any subdivision applications, the developers shall assure that all required domestic water supply and distribution systems, wastewater collection and treatment facilities, storm water management facilities, and roadway segment and intersection improvements will be incorporated into the final project plans. 	<p>Proposed Project.</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>	<p>The Southtown Benefit District has been established for this area which ensures that each project will pay for its fair share of public facility improvements.</p> <p>These street widenings will be constructed as part of the Proposed Project. It should be noted that in response to concerns expressed by the Traffic Department, development of the project area will result in a realignment of Vanden Road so that it does not intersect with the Foxboro Parkway/Leisure Town Road intersection. This realignment will significantly improve the Traffic Level of Service (LOS) at the Foxboro/Leisure Town Road/Vanden Road (south) intersection.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the Proposed Project.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the proposed Foxboro Parkway alignment.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the park component of the Proposed Project.</p> <p>This is provided for in the Vanden Meadows Specific Plan. See Section 3.0 for a detailed description of the Proposed Project.</p> <p>Master plans for sewer, water, storm drainage and traffic improvements were created for the South Vanden Area as part of the Southtown Project which included development of the Vanden Meadows area. Amendments/ updates to these plans are included as part of the Proposed Project.</p> <p>Final Plans will incorporate necessary infrastructure improvements as outlined in the master plans mentioned previously and mitigation identified in this EIR. Consistency with this policy will be enforced by city staff prior to the approval of final plans.</p>
<p>2.5-I 3 In the Alamo Place Policy Plan and the</p>	<p>Yes</p>	<p>The Project will provide a total of 939 residences. Of</p>

Land Use Plan Policy	Consistent	Discussion
<p>Hawkins, Fry and Vanden Specific Plans, development areas require a housing unit dwelling mix of 55% single family, 25% moderate density, and 20% high density.</p>		<p>these residences approximately 441 traditional low density units, approximately 306 medium density, and approximately 192 high density, resulting in housing mix of 46.96 percent low density housing, 32.59 percent medium density housing, and 20.45 percent high density housing. The recommended housing mix is approximately 55-25-20. It should be noted that the majority of units (209 units) considered medium density are designated as Residential Low Medium Density, which could also be considered low density if the minimum density is constructed.</p>
<p>2.5-I 6 Locate lower-density housing at the edge of the planned urban area to buffer rural residential from higher urban density housing.</p>	<p>Yes</p>	<p>As shown on Figure 3-4, the proposed designation for the portion of the Specific plan area south of Foxboro Parkway is Residential Estate, which, as described above, has a minimum lot size of 10,000 square feet. This shall act as a buffer between higher density housing and the Vacaville-Fairfield-Solano Greenbelt.</p>
<p>2.5-I 8 Maintain buffers between residential and agricultural areas and between residential areas and industrial parks as required by adopted regulations and Policy Plans. (See Figure 2-5.) The minimum separation shall be as follows:</p> <ul style="list-style-type: none"> • Between residential and agricultural uses: 500 feet. Standards for walls and landscaping and compatible uses permitted within the buffer area are defined in the Land Use and Development Code and Policy Plans. The Planning Commission may reduce this standard upon review and approval of a Planned Development where design features such as solid masonry walls and appropriate building setbacks are provided. In addition, Disclosure Statements and Right to Farm Deed Restriction may also be required. • Between residential, business and industrial park uses: 200 feet. 	<p>Yes</p>	<p>The Vanden Meadows Specific Plan calls for a buffer between the proposed residential and the existing agricultural uses east of the railroad track. This buffer would result in a large landscaped area on the west side of Leisure Town Road. With this buffer in place agricultural uses to the west will not be impacted by the Proposed Project.</p> <p>The General Plan does not identify the southern boundary of the project site as an area requiring an agricultural buffer, therefore the requirements of General Plan policy 2.5-I8 do not apply to this area of the project site. In accordance with General Plan Implementation Policy 2.3-I12, proposed residential land uses south of Foxborrow Parkway and west of Vanden Road are very low density, with the minimum lot size being 10,000 square feet (approximately 0.25-acres). Low density housing is typically considered to be more compatible with agricultural uses as fewer residences would be exposed to potential nuisances.</p> <p>Mitigation Measures 4.3-3 requires residential property titles to include a deed restriction prohibiting complaints by future residents related to potential inconsistency with ongoing surrounding agricultural operations.</p> <p>No business and/or industrial park uses are within the vicinity of the project site.</p>
<p>2.5-I 10 Require impact fees from developers, as appropriate and necessary, for provision of community facilities and services. Maintain the existing policy that development "must pay its own way."</p>	<p>Yes</p>	<p>The Project will participate in the payment of all required impact fees necessary for the provisions of community facilities and services. Fees will be assessed appropriately for each land use type. See Section 4.12 for a discussion of impacts to Vacaville's existing facilities and services.</p>
<p>2.5-I 13 Require that all residential development meeting one or more of the following criteria be subject to discretionary review as a planned</p>	<p>Yes</p>	<p>The Vanden Meadows Project is a mixed use development including components of various residential density, open space, and community</p>

Land Use Plan Policy	Consistent	Discussion
<p>development or similar procedure, consistent with the adopted Planned Development Regulation:</p> <ul style="list-style-type: none"> • Multi-family projects of 10 units or more; • Mixed housing types (detached vs. attached, etc) • Mixed Use; • A location potentially subject to a natural or man-made geologic hazard including hillside areas; or; • Any project exceeding the minimum density with the land use designation or with 50 units or more. 		<p>facilities. The project is a within the city's planning area and future Project components will be subjected to further discretionary review.</p>
<p>2.5-1 14 Design residential neighborhoods to avoid fronting on major streets expected to carry inter-neighborhood or community traffic.</p>	<p>Yes</p>	<p>Residential neighborhoods are oriented to front away from major streets that will carry inter-neighborhood or community traffic.</p>
<p>Source: City of Vacaville General Plan, 2007a.</p>		

4.10 NOISE AND VIBRATION

4.10.1 INTRODUCTION

This section addresses the potential for the Proposed Project to produce noise and vibration impacts. Following an overview of the existing noise setting in **Subsection 4.10.2** and the relevant regulatory setting in **Subsection 4.10.3**, project-related impacts and recommended mitigation measures, if any, are presented in **Subsection 4.10.4**.

Bollard Acoustical Consultants (BAC) prepared a 2011 Noise Impact Assessment (NIA) for the Vanden Meadows Specific Plan, which is provided as **Appendix K**. A combination of visual and noise level measurement surveys, use of existing acoustical literature, and application of accepted noise prediction methodologies were used by BAC to quantify the existing ambient noise environment in the vicinity of the project site.

4.10.2 ENVIRONMENTAL SETTING

Fundamentals of Acoustics

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If pressure variations occur frequently enough (at least 20 times per second) they can be heard and hence are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness.

Acoustical Terminology

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptors, Ldn and CNEL, and shows very good correlation with community response to noise.

The Day-Night Average Level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though

they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment. Where short-term noise sources are an issue, noise impacts may be assessed in terms of maximum noise levels, hourly averages, or other statistical descriptors.

Another common descriptor is the community noise equivalency level (CNEL). The CNEL is similar to the Ldn, except it has an additional weighting factor. Both average noise energy over a 24-hour period. The CNEL applies a +5 decibel weighting to events that occur between 7:00 p.m. and 10:00 p.m., in addition to the +10 decibel weighting between 10:00 p.m. and 7:00 a.m. associated with Ldn. Typically, the CNEL and Ldn have similar results for the same noise events, with the CNEL sometimes reporting a 1 dB increase compared to the Ldn to account for noise events between 7-10 p.m. that have the additional weighting factor.

The perceived loudness of sounds and corresponding reactions to noise are dependent upon many factors, including sound pressure level, duration of intrusive sound, frequency of occurrence, time of occurrence, and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessments. All noise levels reported in this section are in terms of A-weighted levels in decibels.

Table 4.10-1 shows examples of noise levels for several common noise sources and environments.

TABLE 4.10-1
TYPICAL A-WEIGHTED SOUND LEVELS OF COMMON NOISE SOURCES

Loudness Ratio	dBA	Description
128	130	Threshold of pain
64	120	Jet aircraft take-off at 100 feet
32	110	Riveting machine at operators position
16	100	Shotgun at 200 feet
8	90	Bulldozer at 50 feet
4	80	Diesel locomotive at 300 feet
2	70	Commercial jet aircraft interior during flight
1	60	Normal conversation speech at 5-10 feet
1/2	50	Open office background level
1/4	40	Background level within a residence
1/8	30	Soft whisper at 2 feet
1/16	20	Interior of recording studio

Source: BAC, 2011 (**Appendix K**).

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 9 dB per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate, approximately 4 to 6 dB.

Vibration

Vibration is similar to noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating. Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (PPV) in inches per second. The vibration velocity, VdB, is a logarithmic scaling of vibration magnitude, and it allows relative measurements to be easily made.

Existing Conditions

The existing ambient noise environment in the project vicinity is defined primarily by traffic on the local roadways, Union Pacific Railroad (UPRR) train operations, and aircraft operations associated with Travis Air Force Base, located approximately 3.5 miles south of the project site.

Existing Roadway Traffic Noise Levels

The Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used to determine the existing noise due to traffic. Average daily traffic (ADT) volumes were obtained from the TIS provided as **Appendix O**. The Model inputs and detailed results are provided in **Appendix K**. **Table 4.10-2** shows the predicted existing traffic noise levels at a reference distance of 100 feet from the roadway centerlines, as well as the distances to the Ldn contours.

Existing Railroad Noise Levels

The UPRR tracks traverse northeast to southwest along the southeast border of the project site. BAC conducted noise level measurements near the project site on July 12-13, 2011. The railroad noise measurement location is shown on Figure 1 of **Appendix K**, as well as the methodology used to collect the noise level measurements.

A total of 51 apparent trains passed the project site during the 24-hour monitoring event. The measured railroad noise levels were used to predict railroad noise exposure at the project site, with the results of those predictions provided in **Table 4.10-3**. **Table 4.10-3** provided existing UPRR noise levels contours of 60, 65, and 70 dB Ldn and 95 dB sound exposure level (SEL). SEL describes a receiver's total noise exposure from a single impulsive event, SELs are often used to characterize noise from aircraft takeoffs

and flyovers, as well as noise from individual railroad passages. The estimated Ldn and SEL at a distance of 300 feet from the railroad tracks, the approximate distance from the railroad tracks to the nearest proposed residences within the project area, is 63 dB and 87 dB, respectively.

TABLE 4.10-2
EXISTING TRAFFIC NOISE LEVELS AND CONTOUR DISTANCES

Roadway	Segment Description	L _{dn} @ 100 feet from C/L (dB)	Distance (Feet) from C/L		
			70 dB L _{dn}	65 dB L _{dn}	60 dB L _{dn}
Vanden Rd.	S of Alamo Dr.	59	18	38	82
Vanden Rd.	N of Foxboro & S of Vanden Meadows Collector	64	41	87	188
Vanden Rd.	S of Foxboro Pkwy (also Jepson Pkwy)	66	54	116	250
Alamo Dr.	W of I-80 EB Ramps	65	49	106	229
Alamo Dr.	W of Marshall Rd.	66	54	116	251
Alamo Dr.	W of Peabody Rd.	66	57	122	264
Alamo Dr.	W of Nut Tree Rd.	66	51	110	236
Alamo Dr.	W of Vanden Rd.	65	49	105	227
Alamo Dr.	W of Leisure Town Rd.	61	27	57	123
Leisure Town Rd.	N of I-80 EB Ramps	66	57	122	264
Leisure Town Rd.	N of Orange Dr.	67	60	129	278
Leisure Town Rd.	N of Sequoia Dr.	66	52	112	240
Leisure Town Rd.	N of Elmira Rd.	66	55	117	253
Leisure Town Rd.	N of Alamo Dr.	64	41	88	189
Leisure Town Rd.	S of Alamo Dr.	62	30	64	138
Leisure Town Rd.	E of Foxboro Pkwy	62	29	62	133
Leisure Town Rd.	S of Foxboro Pkwy	65	46	99	213
Nut Tree Rd.	N of Alamo Dr.	65	50	107	231
Nut Tree Rd.	S of Alamo Dr.	64	41	88	189
Peabody Rd.	N of Alamo Dr.	67	61	131	282
Peabody Rd.	S of Alamo Dr.	68	79	170	366
Peabody Rd.	N of Foxboro Pkwy	68	74	159	342
Peabody Rd.	S of Foxboro Pkwy	68	71	153	330
Peabody Rd.	N of City Limits	68	75	162	349

Source: BAC, 2011 (**Appendix K**).
Notes: S: south; C/L: center line; N: north; W: west; E: east; EB: east bound

TABLE 4.10-3
EXISTING UNION PACIFIC RAILROAD NOISE LEVELS
VANDEN MEADOWS PROJECT AREA

Distance to Noise Contours (feet)*			
60 dB L _{dn}	65 dB L _{dn}	70 dB L _{dn}	95 dB SEL
503	233	108	172
*Predicted distances to noise level contours are from the railroad track centerline. Distances to contours were predicted assuming a 4.5 dB decrease for each doubling of distance and an additional attenuation rate of 1.5 dB per thousand feet for atmospheric absorption and excess ground attenuation. Source: BAC, 2011 (Appendix K).			

Railroad Vibration Levels

The only identified source of vibration in the vicinity of the project site is from the trains traveling on the UPRR rail road tracks located along the southeast boundary of the project site. To quantify existing railroad vibration levels at 110 feet from the project site, BAC used previously recorded vibration measurements. The results of the previously recorded vibration measurements are shown in **Table 4.10-4**.

TABLE 4.10-4
MEASURED RAILROAD VIBRATION LEVELS

Time	Event Duration	# Engines	# Cars	Peak Vibration at 110 feet (in/sec)
8:09	1:18	3	60	0.015
10:01	1:28	2	80	0.012
10:13	1:38	2	84	0.009
10:29	1:31	5	80	0.013
10:45	:53	2	34	0.014
Source: BAC, 2011 (Appendix K).				

Aircraft Noise

Travis Air Force Base (TAFB) is located approximated 3.5 miles south of the project site. The TAFB Land Use Compatibility Plan (adopted by Solano County Airport Land Use Commission on June 13, 2002) provides predicted future noise contours for aircraft operations at the AFB. The contours represent future scenario of operations at Travis Air Force base and are provided in Figure 3 of **Appendix K**. The future scenario includes a potential doubling of the 2000 aircraft operations level (approximately 127,000 total annual operations). As shown in Figure 3 of **Appendix K**, the project site lies outside of the 60 dB CNEL contour for air traffic noise. Regarding single-event noise associated with aircraft from TAFB, BAC observed very low noise levels during its field inspection. In addition, the single-event noise measurement program conducted indicated that SEL values associated with aircraft operations at TAFB were well below 80 dB SEL at the project site.

Noise Sensitive Receptors

Noise sensitive land uses are generally defined as land uses with the potential to be adversely affected by the presence of noise. Examples of noise sensitive land uses include residential housing, schools, health care facilities, and outdoor activity areas. Existing noise sensitive receptors in the project area with the potential to be adversely affected by the project are residential housing projects located adjacent to the project site and along roadways utilized by construction-related traffic. The nearest residential sensitive receptors consist of a single family homes located within approximately 100 feet from the west and north west boundary of the project site where major construction activities would occur.

4.10.3 REGULATORY CONTEXT

Federal

Travis Air Force Base Land Use Compatibility Plan (2002)

The project site is located within the boundaries of the Travis AFB LUCP. The LUCP sets forth land use compatibility policies to ensure that future land uses in the surrounding area will be compatible with the realistically foreseeable aircraft activity at the base. As described in more detail in **Section 4.9.3**, the project site is located within Zone D.

Noise is one of three Compatibility Factors identified within the LUCP. The LUCP states that “it is the objective of the ALUC to minimize new residential development within areas significantly impacted by noise from Travis Air Force Base aircraft operations. For this purpose, the noise impact area is defined as being all locations within the outer boundary of *Compatibility Zone C*.” As discussed above, the project site is located within Zone D, which is outside the outer boundary of Zone C. Limitations on structure height are the only compatibility factors within this zone.

U.S. Department of Transportation, Federal Transit Administration

The Federal Transit Administration set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These criteria include 65 VdB for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, and laboratory facilities), 80 VdB for residential uses and buildings where people sleep, and 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, and offices) (NIA 2011).

Standards have been established by the Committee of Hearing, Bio Acoustics, and Bio Mechanics (CHABA) to address the potential for groundborne vibration, which may cause structural damage to buildings. For fragile structures, CHABA recommends a maximum limit of 0.25 in/sec PPV (NIA, 2011).

Federal Interagency Committee on Noise

The Federal Interagency Committee on Noise (FICON) provides guidance in the assessment of changes in ambient noise levels resulting from transportation operations. The recommendations are based upon studies that relate noise levels to the percentage of persons highly annoyed by noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these criteria have been applied to other sources of noise. The FICON noise threshold is generally applied to transportation

noise sources, such as traffic noise.

Table 4.10-5 provides the FICON noise thresholds as incremental increase of the ambient noise level. The rationale for the Table 9 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

TABLE 4.10-5
SIGNIFICANCE OF CHANGES IN CUMULATIVE NOISE EXPOSURE

Ambient Noise Level Without Project, L_{dn}	Increase Required for Significant Impact
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: BAC, 2011 (**Appendix K**).

Local

City of Vacaville General Plan

The City of Vacaville General Plan Noise Element contains noise policies and standards (e.g., exterior and interior noise level performance standards for new projects affected by or including non-transportation noise sources, and maximum allowable noise exposure levels for transportation noise sources).

Policy 10.6-G 1: Require new residential projects and outdoor activity areas in lodging, hospital and nursing/convalescent home projects to meet acceptable exterior noise level standards as shown in Tables 10-1 and 10-4 of the General Plan (presented as **Table 4.10-6** and **Table 4.10-7** below); discourage residential areas from directly abutting Interstate 80 or 505.

Policy 10.6-G 3: Ensure that noise does not exceed interior noise levels of 45 DNL for residential, transient lodging, hospital and nursing/convalescent structures from transportation or fixed-point noise sources.

Policy 10.6-G 4: Minimize vehicular noise sources and noise emanating from transportation activities; control noise at its source to maintain existing noise levels, and in no case exceed acceptable noise levels as established in the Noise and Land Use Compatibility Guidelines reproduced in Tables 10-1 of the General Plan (**Table 4.10-6**).

Policy 10.6-G 9: Noise created by transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards shown in Tables 10-1 of the General Plan (**Table 4.10-6**).

TABLE 4.10-6
NOISE & LAND USE COMPATIBILITY POLICY FOR TRANSPORTATION SOURCES (TABLE 4.10-1)

Land Use Category	Noise standard (Ldn)		Community Noise Exposure Unmitigated Day/Night Average Noise Level (Ldn) in Decibels (dB)														
			Noise contour														
	Interior	Exterior	40	45	50	55	60	65	70	75	80						
Residential	45	60															
Transient Lodging Motels, Hotels	45	--															
Hospitals, Nursing Homes	45	60															
Other uses	--	--															
	Normally acceptable with typical conditions of approval (setbacks, walls, fences and standard building practices).																
	Conditionally acceptable - subject to noise study to demonstrate noise can be reduced to normally acceptable levels with acceptable mitigation																
	Normally unacceptable - regardless of measures implemented to reduce noise.																
Notes:																	
1. This table establishes the maximum transportation noise levels that persons should be exposed to and helps determine the type of review necessary when land uses are proposed within existing noise contours. For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight.																	
2. In multi-family/attached unit projects, applies to courtyards, patios, private areas and activity areas.																	
3. Areas designed for outdoor activity should be located away from noise sources.																	
4. Applies to courtyards, patios, private areas and activity areas.																	
5. Other uses are subject to federal and state OSHA noise exposure standards.																	
Source: City of Vacaville, 1990																	

Policy 10.6-G 10: Noise created by non-transportation noise sources shall be mitigated so as not to exceed the interior and exterior noise level standards of Tables 10-4 of the General Plan (**Table 4.10-7**).

Policy 10.6-G 12: New residential land uses shall be precluded where the exterior noise associated with aircraft operations at Nut Tree Airport or Travis Air Force Base exceeds 60 dB CNEL.

Policy 10.6-I 7: Encourage the use of open space, parking, accessory buildings, and landscaping to buffer new and existing development from noise. Use sound walls when other methods are not practical or when recommended by an acoustical expert as part of a mitigation program, consistent with back-up landscape treatments where residential subdivision back-up to roadway.

TABLE 4.10-7
 NOISE & LAND USE COMPATIBILITY POLICY FOR NON-TRANSPORTATION SOURCES (TABLE 4.10-4)

Land Use Category	Noise Level Descriptor	Exterior Noise Levels ^{2, 3, 4, 5}		Interior Noise Levels ^{2, 3, 4, 5}	
		Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Residential	Hourly Leq, dBA	50 ⁶	45 ⁶	45	35
	Maximum Level, dBA	70 ⁶	65 ⁶	--	--
Transient Lodging	Hourly Leq, dBA	-- ⁷	-- ⁷	45	35
Hospitals, Nursing Homes	Hourly Leq, dBA	50 ⁸	45 ⁸	45	35
Other uses ⁹	Hourly Leq, dBA	--	--	--	--
	Maximum Level, dBA	--	--	--	--
Each of the noise levels specified above shall be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).					
Notes: 1. This table establishes the maximum non-transportation noise levels that persons should be exposed to. For the purposes of the Noise Element, non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, construction equipment, etc. 2. Compliance with the noise level standards is to be measured at the affected location of the land use category. 3. If the existing noise levels exceed that of a proposed noise generator, these standards would not be applied to the new noise source unless the additional noise generated would increase the projected, combined noise levels a minimum of three decibels. 4. These standards are applicable to land use determinations and entitlements. They are not applicable for nuisance abatement within residential areas. 5. Exceptions to the standards may be approved for public parks or playgrounds upon a finding that the facility has been designed in a manner that practically limits the noise impact upon other land uses. 6. In multi-family/attached unit projects, applies to courtyards, patios, private areas and activity areas. 7. Areas designed for outdoor activity should be located away from noise sources. 8. Applies to courtyards, patios, private areas and activity areas. 9. Other uses are subject to federal and state OSHA noise exposure standards. Source: City of Vacaville, 1990					

Single Event Levels

Single event levels (SEL) describes a receiver's total noise exposure from a single impulsive event. SELs are often used to characterize noise from aircraft takeoffs and flyovers, as well as noise from individual railroad train passages. The City of Vacaville has not established SEL standards and no definitive, widely-recognized, SEL guidelines currently exist. The Federal Aviation Administration (FAA) has suggested that the threshold of speech interference, which is 60 dBA be used. The Federal Interagency Committee on Aviation Noise (FICAN) has provided studies on sleep disturbance; however, FICAN has not recommended a threshold for SELs.

4.10.4 IMPACTS AND MITIGATION MEASURES

This section identifies any impacts to the existing noise environment that could occur from construction, operation, and/or maintenance of the Proposed Project. If significant impacts are likely to occur, mitigation measures are included to increase the compatibility of the Proposed Project and reduce impacts to less-than-significant levels.

Methodology

Impacts to ambient noise conditions were analyzed based on an examination of the project site and published information regarding noise in the project area, and comparison of these factors to the significance criteria listed below.

Project-related traffic noise impacts on existing and proposed residences were evaluated by estimating the project traffic noise levels for each of the project-area roadways using project-related traffic counts, which are provided in **Appendix O**, and the FHWA traffic noise prediction model. The results of the model were compared to estimated baseline and predicted 2030 traffic noise levels listed below.

SELs for railroad and aircraft actions at the project site were evaluated using the Travis Air Force Base noise contour map, and single-event noise level data collected at the project site by BAC in 2011. SELs were compared to a 70 dB SEL threshold, which is applied inside residences with windows in the closed position to minimize the potential for sleep disturbance. The 70 dB SEL threshold use in this analysis is based on professional judgment and best available research (NIA, 2011).

Railroad noise and vibration exposure are evaluated based on results of the 2011 railroad noise monitoring survey conducted by BAC. The results were compared to significance criteria to determine if the noise or vibration from the railroad would expose residence to excessive groundborne noise or vibration.

All proposed structures shall be constructed to meet the California Building Standards Code. Standard construction in accordance with building code requirements will typically provide 25 dB of exterior to interior noise reduction with windows in the closed position. This level of reduction is based on standard 2x4 stud walls with stucco siding exterior and gypsum board interior surfaces, and fiberglass insulation in the stud cavity. It also assumes standard ½-inch dual pane thermal windows (sound transmission class rating 27), and composition roof.

Thresholds of Significance

Criteria for determining the significance of impacts to the noise environment have been developed based on Appendix G of the CEQA *Guidelines* and relevant agency thresholds. Impacts to the noise environment would be considered significant if the proposed project would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels

Additionally, the following significance criteria were developed based on guidance provided by the State CEQA Guidelines, and on other Federal, State, and local guidance. Impacts of the Proposed Project on noise would be significant if project implementation would do any of the following:

- Exposure of persons to or generation of noise levels in excess of the City of Vacaville's noise threshold of 60 dB Ldn, exterior or 45 dB Ldn, interior.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels that exceed the annoyance threshold of 0.1 inches per second peak particle velocity (PPV), would be considered significant.
- A substantial permanent increase in ambient noise level in the project vicinity above the FICON levels of 1.5, 3 and 5 dB as being significant where existing, pre-project, noise levels are greater than 65 dB Ldn, between 60 and 65 dB Ldn, and less than 60 dB Ldn, respectively.
- Exposure of people residing or working in the area to excessive noise levels from railroad and aircraft, including single event noise incidents that would result in speech interference or disturb sleep.

Effects Found Not to be Significant

The Initial Study (**Appendix B**) concluded that the project site is located within the boundaries of the Travis Air Force Base (AFB) Land Use Compatibility Plan (LUCP). The project is consistent with acceptable uses defined within the LUCP for the Proposed Project zone and would not expose people residing or working in the project area to excessive noise levels. These effects are therefore not considered within this EIR.

Project Specific Impacts and Mitigation Measures

Construction

Impact

- 4.10-1 Project-related construction has the potential to generate a substantial temporary or periodic noise level greater than existing ambient levels in the project vicinity.**

During the construction phases of the project, noise from construction activities would add to the noise environment in the immediate project vicinity. Activities involved in construction would generate maximum noise levels, as indicated in **Table 4.10-8**. Noise would also be generated during the construction phase by increased truck traffic on area roadways. Noise increases would be of short duration, and would occur primarily during daytime hours.

Impacts to Existing Sensitive Receptors

The nearest sensitive receptor is approximately 100 feet from the west and northwest boundary of the project site where construction activities would occur. As indicated in **Table 4.10-8**, the loudest activities associated with construction would be 85 dBA, L_{max} at 50 feet from the construction equipment. Construction noise attenuates at a rate of between 6 and 9 dBA per doubling of distance (FHWA, 2006). The area between where construction would occur and the nearest sensitive receptor is buffered with an approximately 7-foot brick wall; therefore, it is appropriate to use a 7.0 dBA reduction for construction noise. Taking into account existing ambient noise levels, the resulting maximum noise level as a result of construction activities that would occur at the nearest sensitive receptor west of the project site would be approximately 78 dBA L_{max}.

Impacts to Future Sensitive Receptors from Phased Construction

As described in **Section 3.4.4**, for the purposes of this analysis, it is anticipated that construction would occur continuously over a six year period. Like other residential developments, residences are likely to be occupied as they are constructed; therefore, sensitive receptors will potentially be located adjacent to construction areas. Future sensitive receptors located adjacent to construction areas will experience the unattenuated noise levels of activities associated with construction. As indicated in **Table 4.10-8**, the loudest activities associated with construction would average 85 dBA, L_{max} at 50 feet from the construction equipment.

Conclusion

Noise levels as a result of construction would cause an exceedance of the City's land use compatibility max level of 70 dBA for residential land uses. Implementation of the mitigation measures identified below would reduce noise-related construction impacts and facilitate communication between construction managers and adjacent sensitive receptors. However, because of the nature of project construction activities, feasible noise mitigation for consistently reducing the noise levels below the 70 dBA threshold is unavailable. As a result, temporary substantial noise increases associated with project construction would be considered significant and unavoidable. **Significant and Unavoidable.**

TABLE 4.10-8
NOISE EMISSION LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment Description	Typical Use Factor %	Predicted Lmax @ 50 ft (dBA, Lmax)
Backhoe	40	80
Concrete Mixer Truck	40	85
Concrete Pump Truck	20	82
Dozer	40	85
Dump Truck	40	84
Excavator	40	85
Flat Bed Truck	40	84
Front End Loader	40	80
Jack Hammer	25	80
Pickup Truck	40	55
Pneumatic Tools	50	85
All Other Equipment > 5 HP	50	85

Source: FHWA, 2006.

Mitigation Measure 4.10-1: The Applicant shall ensure through contractual agreements that the following measures are implemented during construction:

- Construction activities shall be limited to occur between the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays, Sundays, and Federal Holidays. The intent of this measure is to prevent construction activities during the more sensitive nighttime period.
- Stationary equipment and staging areas shall be located as far as practical from noise-sensitive receptors.
- All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and acoustical shields or shrouds, in accordance with manufacturers' recommendations.
- To the extent feasible existing barrier features (structures) shall be used to block sound transmission between noise sources and noise sensitive land uses.
- Construction activities shall conform to the following standards: (a) there shall be no start-up of machines or equipment, no delivery of materials or equipment, no cleaning of machines or equipment and no servicing of equipment except during the permitted hours of construction; (b) radios played at high volume, loud talking and other forms of communication constituting a nuisance shall not be permitted; and (c) there shall be no construction on Sundays or legal holidays. Exceptions to these time restrictions may be granted by the Community Development Director for one of the following reasons: (1) inclement weather affecting work; (2) emergency work; or (3) other work, if work and equipment will not create noise that may be unreasonably offensive to neighbors so as to constitute a

nuisance. The Community Development Director must be notified and must approve the work in advance.

- The general contractors for all construction and demolition activities shall provide a contact number for citizen complaints and a methodology for dealing with such complaints such as designating a noise disturbance coordinator. This noise disturbance coordinator shall receive all public complaints about construction-related noise and vibration, shall be responsible for determining the cause of the complaint, and shall implement any feasible measures to be taken to alleviate the problem. All complaints and resolution of complaints shall be reported to the City weekly.

Transportation Noise

Impact

4.10-2 The Proposed Project could expose proposed outdoor activity areas for sensitive receptors to traffic noise in excess of the City's noise standards.

The Proposed Project would result in the development of sensitive receptors within the project site, including residential housing and Travis Unified School District (TUSD) school facilities along existing and proposed roadways. Proposed sensitive receptors could be exposed to excessive traffic noise levels in excess of the City's General Plan thresholds for outdoor activity areas.

Table 4.10-9 provides a comparison of future traffic noise levels (existing plus approved projects for the year 2030) and future plus Proposed Project noise levels, both with and without the proposed extension of Foxboro Parkway, at a reference distance of 100 feet from the roadway centerlines. The analysis of the Proposed Project with and without the extension of Foxboro Parkway is provided separately below.

Proposed Project with Foxboro Parkway Extension

Future year 2030 traffic noise levels provided in **Table 4.10-9** show that with the Foxboro Parkway extension, the predicted future noise levels would exceed the City's 60 dB Ldn noise threshold approximately 100 feet from the centerline of segments of Leisure Town Road, Vanden Road South, and the proposed Foxboro Parkway Extension, resulting in a potentially significant impact. Therefore, **Mitigation Measure 4.10-2** has been proposed, which would reduce noise levels at proposed outdoor activity areas to below the City of Vacaville's 60 dB Ldn exterior noise level standard, resulting in a less than significant impact to the sensitive receptors. **Less than Significant with Mitigation.**

TABLE 4.10-9
PREDICTED (2030) TRAFFIC NOISE LEVEL AND PROJECT-RELATED
TRAFFIC NOISE LEVEL INCREASES WITH EXTENSION VARIATIONS

Road	Segment	L _{dn} @ 100 Feet				
		Cum. No Project	Cum. +Proj w/ Ext.	Change	Cum+ Proj w/o Ext..	Change
Vanden Rd.	S of Alamo Dr.	58	59	1	59	1
Vanden Rd.	N of proposed Southtown park	51	54	3	54	3
Vanden Rd.	S of proposed Southtown park	50	58	8	58	8
Vanden Rd.	N of Foxboro Pkwy & S of Vanden Meadows Collector	61	56	-5	57	-4
Vanden Rd.	S of Foxboro Pkwy & N of proposed City limits	65	65	0	65	0
Vanden Rd.	S of proposed City limits	69	69	0	69	0
Alamo Dr.	W of Interstate 80 EB Ramps	67	67	0	67	0
Alamo Dr.	W of Marshall Rd.	67	67	0	67	0
Alamo Dr.	W of Peabody Rd.	68	68	0	68	0
Alamo Dr.	W of Nut Tree Rd.	67	68	1	68	1
Alamo Dr.	W of Vanden Rd.	66	66	0	66	0
Alamo Dr.	W of Leisure Town Rd.	65	64	-1	64	-1
Leisure Town Rd.	N of EB Ramps	72	71	-1	72	0
Leisure Town Rd.	N of Orange Dr.	72	72	0	72	0
Leisure Town Rd.	N of Sequoia Dr.	70	71	1	71	1
Leisure Town Rd.	N of Elmira Rd.	69	69	0	69	0
Leisure Town Rd.	N of Alamo Dr.	69	69	0	69	0
Leisure Town Rd.	S of Alamo Dr.	69	69	0	69	0
Leisure Town Rd.	N of Vanden Meadows Collector	n/a	68	n/a	67	n/a
Leisure Town Rd.	S of Vanden Meadows Collector	n/a	67	n/a	67	n/a
Leisure Town Rd.	E of Foxboro Pkwy	67	67	0	67	0
Nut Tree Rd.	N of Alamo Dr.	66	66	0	66	0
Nut Tree Rd.	S of Alamo Dr.	65	66	1	66	1
Nut Tree Rd.	N of Opal Way	58	62	4	62	4
Nut Tree Rd.	N of Vanden Meadows Collector	n/a	59	n/a	60	n/a
Nut Tree Rd.	S of Vanden Meadows Collector	n/a	57	n/a	50	n/a
Nut Tree Rd.	N of Foxboro Pkwy	n/a	57	n/a	50	n/a
Peabody Rd.	North of Alamo Dr.	68	68	0	68	0
Peabody Rd.	S of Alamo Dr.	71	70	-1	70	-1
Peabody Rd.	N of Foxboro Pkwy	70	70	0	70	0
Peabody Rd.	S of Foxboro Pkwy	70	70	0	70	0
Peabody Rd.	N of City Limits	70	70	0	70	0
Foxboro Pkwy	West of Nut Tree Rd.	55	58	3	51	-4
Foxboro Pkwy	East of Nut Tree Rd,	57	61	4	n/a	n/a
Foxboro Pkwy	W of Vanden Meadows Collector	n/a	61	n/a	n/a	n/a
Foxboro Pkwy	E of Vanden Meadows Collector	57	62	5	61	4

Source: BAC, 2011 (**Appendix K**).

Proposed Project without Foxboro Parkway Extension

Future year 2030 traffic noise levels provided in **Table 4.10-9** show that without the Foxboro Parkway extension the predicted future noise levels would exceed the City's 60 dB Ldn noise threshold approximately 100 feet from the centerline of segments of Leisure Town Road, Vanden Road South, and the proposed Foxboro Parkway east of the proposed Vanden Road and west of Vanden Road South, resulting in a potentially significant impact. Therefore, **Mitigation Measure 4.10-2** has been proposed, which would reduce noise levels at proposed outdoor activity areas to below the City of Vacaville's 60 dB Ldn exterior noise level standard, resulting in a less than significant impact to the sensitive receptors. **Less than Significant with Mitigation.**

Mitigation Measure 4.10-2: Prior to the issuance of building permits for residential units located within 200 feet of Leisure Town Road, Vanden Road South, and the proposed Foxboro Parkway Extension, the applicant shall construct solid noise barriers along these roadway segments as indicated in Figure 4 of the NIA (**Appendix K**). The noise barrier shall be uniform with a height of 8 feet relative to backyard elevations to reduce future traffic noise levels to 60 dB Ldn within the outdoor activity areas of the residences proposed adjacent to these roadways.

Impact**4.10-3 The Proposed Project has the potential to expose sensitive receptors to interior noise levels resulting from cumulative traffic conditions in excess of the City's noise standard.**

As shown in **Table 4.10-9**, the greatest predicted traffic noise level within the project site is 67 dB, Ldn. At elevated second-floor locations, which would not be shielded by the recommended noise barriers; reduced ground absorption typically results in a 2 dB, Ldn increase over first-floor levels. As a result, elevated second-floor residential traffic noise exposure is predicted to be 69 dB Ldn. Assuming a minimum building façade noise level reduction of 25 dB for new residential construction, the resulting interior noise levels would be 44 dB Ldn, which is below the City's interior noise level threshold of 45 dB Ldn. This is considered a less than significant impact. **Less than Significant.**

Impact**4.10-4 The Proposed Project has the potential to substantially increase baseline traffic noise levels at existing residences.**

The Proposed Project would generate additional traffic along local roadways which would contribute to the exposure of existing residences along roadways to increased noise levels in excess of the City's General Plan thresholds. **Table 4.10-10** provides a comparison between noise levels generated from baseline traffic (existing plus approved projects) and baseline plus Proposed Project traffic, both with and without the proposed extension of Foxboro Parkway, at a reference distance of 100 feet from the roadway centerlines. The analysis of the Proposed Project with and without the extension of Foxboro Parkway is provided separately below.

TABLE 4.10-10
BASELINE TRAFFIC NOISE LEVELS, L_{DN} AT 100 FEET FROM ROADWAY CENTERLINES

Road	Segment	Existing Plus Approved Projects Conditions		Existing Plus Approved Projects, Plus Proposed Project Conditions	
		w/ Extension of Foxboro	w/o Extension of Foxboro	w/ Extension of Foxboro	w/o Extension of Foxboro.
Vanden Rd.	S of Alamo Dr.	57	58	58	58
Vanden Rd.	N of proposed Southtown park	55	56	56	56
Vanden Rd.	S of proposed Southtown park	53	59	54	54
Vanden Rd.	N of Foxboro Pkwy & S of Vanden Meadows Collector	59	65	62	66
Vanden Rd.	S of Foxboro Pkwy (also Jepson Pkwy)	67	67	67	67
Vanden Rd.	Realigned with Project	n/a	n/a	49	49
Alamo Dr.	W of Interstate 80 EB Ramps	66	65	66	66
Alamo Dr.	W of Marshall Rd.	67	67	67	67
Alamo Dr.	W of Peabody Rd.	67	68	68	68
Alamo Dr.	W of Nut Tree Rd.	67	66	67	67
Alamo Dr.	W of Vanden Rd.	63	64	64	64
Alamo Dr.	W of Leisure Town Rd.	61	61	61	61
Leisure Town Rd.	N of EB Ramps	69	69	69	69
Leisure Town Rd.	N of Orange Dr.	68	68	68	68
Leisure Town Rd.	N of Sequoia Dr.	67	67	64	67
Leisure Town Rd.	N of Elmira Rd.	63	65	64	64
Leisure Town Rd.	N of Alamo Dr.	64	65	64	64
Leisure Town Rd.	S of Alamo Dr.	64	65	65	64
Leisure Town Rd.	N of Vanden Meadows Collector	n/a	n/a	63	62
Leisure Town Rd.	S of Vanden Meadows Collector	n/a	n/a	62	62
Leisure Town Rd.	E of Foxboro Pkwy	61	63	62	62
Leisure Town Rd.	S of Foxboro Pkwy	66	66	66	66
Nut Tree Rd.	N of Alamo Dr.	68	65	66	66
Nut Tree Rd.	S of Alamo Dr.	69	65	66	67
Nut Tree Rd.	N of Opal Way	62	56	64	64
Nut Tree Rd.	N of Vanden Meadows Collector	n/a	n/a	62	63
Nut Tree Rd.	S of Vanden Meadows Collector	n/a	n/a	61	53
Nut Tree Rd.	N of Foxboro Pkwy	61	n/a	61	53
Peabody Rd.	N of Alamo Dr.	68	68	68	68
Peabody Rd.	S of Alamo Dr.	70	70	70	70
Peabody Rd.	N of Foxboro Pkwy	70	70	70	70
Peabody Rd.	S of Foxboro Pkwy	69	69	69	69
Peabody Rd.	N of City Limits	69	69	69	69
Foxboro Pkwy	W of Nut Tree Rd.	69	n/a	61	54
Foxboro Pkwy	E of Nut Tree Rd.	64	n/a	65	n/a
Foxboro Pkwy	W of Vanden Meadows Collector	n/a	n/a	64	n/a
Foxboro Pkwy	E of Vanden Meadows Collector and W of Vanden Rd.	n/a	n/a	65	65

Source: BAC, 2011 (**Appendix K**).

Notes: S: south; C/L: center line; N: north; W: west; E: east; EB: east bound

Proposed Project with Foxboro Parkway Extension

As shown in **Table 4.10-10**, three segments of Vanden Road adjacent to existing residences are predicted to have baseline traffic noise levels below the City's 60 dB threshold. The project-related increase in noise would not increase noise levels at these segments above the City's 60 dB threshold and, therefore, would have a less-than-significant effect. The baseline traffic noise levels for the remaining road segments adjacent to existing residences are predicted to be greater than the City's 60 dB threshold. With the extension of Foxboro Parkway, the project-related increase in noise at these roadway segments would be insignificant relative to the FICON criteria shown in **Table 4.10-5**. Therefore, the increase in traffic noise levels at existing residences due to the project development is considered to be less than significant. **Less than Significant.**

Proposed Project without Foxboro Parkway Extension

As shown in **Table 4.10-10**, three segments of Vanden Road and Nut Tree Road north of Opal Way are predicted to have baseline traffic noise levels below the City's 60 dB threshold. The project-related increase in noise would not increase noise levels at the Vanden Road segments above the City's 60 dB threshold; however, the project-related traffic would increase the noise level at the Nut Tree Road segment by 8 dB Ldn (increase from 56 Ldn to 64 Ldn), which is considered a substantial increase. Noise barriers have been constructed as part of the developments on each side of Nut Tree Road north of Opal Way, which would reduce the projected exposure at the outdoor activity areas of these residences to below the City's 60 dB Ldn threshold, resulting in a less-than-significant effect (BAC, 2011; **Appendix K**). Additionally, assuming a minimum building façade noise level reduction of 25 dB, interior noise levels at these residences will be below the City's 45 dB threshold. The baseline traffic noise levels for the remaining road segments adjacent to existing residences are predicted to be greater than the City's 60 dB threshold. Without the extension of Foxboro Parkway, the project-related increase in noise would be insignificant relative to the FICON criteria shown in **Table 4.10-5**. Therefore, the increase in traffic noise levels at existing residences due to the project development is considered to be less than significant. **Less than Significant.**

Other Noise Sources**Impact****4.10-5 The Proposed Project has the potential to expose proposed sensitive receptors to excessive noise levels resulting from aircraft.**

TAFB is located approximately 3.5 miles south of the project site. As indicated in the TAFB Land Use Compatibility Plan, the project site lies outside of the 60 dB CNEL contour for aircraft noise (see Figure 3 of **Appendix K**). Building façade construction would result in a minimum noise level reduction of 25 dB Ldn for new residential and educational facilities on the project site, resulting in an interior noise level of 35 db Ldn. Proposed sensitive land uses within the project site, including residential uses and the TUSD school facilities, would not be exposed to average ambient interior or exterior noise levels in excess of the City's noise level standards as a result of aircraft noise.

As discussed under **Section 4.10.3**, there are no City, state or federal thresholds for single event noise levels. Relatively low noise levels were observed during field inspections of the property, and measured SEL values for single aircraft events were well below 80 dBA at the project site (**Appendix K**). Assuming interior noise levels are reduced by 25 dB, a maximum interior noise level of 55 dB SEL may occur during single events from aircraft, which is below the FAA’s suggested threshold of speech interference of 60 dBA. The Proposed Project would not result in the exposure of proposed sensitive receptors to excessive noise levels that would exceed the thresholds established by the City’s General Plan. This is considered a less than significant impact. **Less than Significant.**

Impact

4.10-6 The Proposed Project has the potential to expose proposed sensitive receptors to excessive noise levels resulting from railroad operations.

The UPRR tracks traverse northeast to southwest along the southeast border of the project site. The Proposed Project would result in the construction of low and low-medium density residential housing within 300 feet of the rail tracks. A detention basin, roadway, and agricultural buffer would be located between the rail tracks and the backyard fence lines.

Exterior Noise Levels

Table 4.10-11 shows the predicted noise level at the nearest proposed residential outdoor activity areas (backyards) is 63 dB Ldn. The predicted noise level exceeds the City’s 60 dB Ldn exterior noise level standard applicable to residential uses affected by transportation noise sources (see **Table 4.10-6**). Locating residential outdoor activity areas within 300 feet of the railroad track results in a potentially significant impact. **Mitigation Measure 4.10-6** would result in the installation of a sound barrier wall between proposed sensitive receptors and the UPRR tracks that would reduce noise levels at nearby residential outdoor activity areas to below the City of Vacaville’s 60 dB Ldn exterior noise level standard. Therefore, this impact is considered less than significant with mitigation. **Less than Significant with Mitigation.**

TABLE 4.10-11
EXISTING UNION PACIFIC RAILROAD NOISE
LEVELS VANDEN MEADOWS PROJECT AREA

Predicted L _{dn} at 300 feet (dB Ldn)	Predicted SEL at 300 feet (dB Ldn)
63	87
Source: NIA, 2011 (Appendix K).	

Interior Noise Levels

Table 4.10-11 shows that the predicted railroad noise level at the nearest residences proposed within the project site is 63 dB Ldn, and the typical SEL is 87 dB SEL. It is assumed for this

analysis that residences and the school would have a minimum building façade noise level reduction of 25 dB Ldn. The resulting interior noise levels would be 38 dB Ldn and 62 dB SEL. Interior noise levels would be further reduced through the installation of sound wall as a result of implementation of **Mitigation Measure 4.10-6** to 33 dB Ldn and 57 db SEL. This is below the City's threshold of 45 dB Ldn for interior noise levels and the FAA's suggested threshold of speech interference of 60 dBA SEL. The Proposed Project would not result in the exposure of proposed sensitive receptors to excessive noise levels that would exceed the thresholds established by the City's General Plan. Therefore, this impact is considered less than significant with mitigation. **Less than Significant with Mitigation.**

Mitigation Measure 4.10-6: The applicant shall construct a solid noise barrier of sufficient height to intercept line of sight between a point 10 feet above the railroad tracks and a backyard receiver five feet in height. The barrier should be constructed along the north side of Leisure Town Road, from the northern site boundary to Vanden Road South, at the locations shown in Figure 4 of the NIA (**Appendix K**). Construction of the noise barrier would provide a reduction of 5 dB Ldn. The noise barrier shall be installed prior to the issuance of building permits for residential units within 300 feet of the UPRR rail tracks.

Vibration

Impact

4.10-7 The Proposed Project has the potential to expose proposed residences to railroad vibration or generate excessive groundborne vibration or groundborne noise levels.

Measurement of existing railroad vibration is provided in **Table 4.10-4**. As shown in **Table 4.10-4**, the maximum measured existing railroad vibration level during passage of freight train is 0.015 inches per second peak particle velocity at 110 feet from the railroad tracks. Because the nearest proposed residences are 300 feet from the railroad tracks, projected vibration levels would be significantly lower than 0.015 inches per second peak particle velocity. The measured vibration level at 110 feet from the railroad tracks is less than the 0.1 in/sec PPV threshold of significance, which represents the threshold of annoyance. Since the nearest residences will be located 300 feet from the railroad track, a less than significant impact would occur. **Less than Significant.**

Cumulative Impacts and Mitigation Measures

Impact

4.10-8 Traffic resulting from the Proposed Project in combination with cumulative development has the potential to increase cumulative traffic noise levels at existing residences in excess of the City's thresholds.

The Proposed Project in combination with cumulative development would generate additional traffic along local roadways which would contribute to the exposure of existing residences to

increased noise levels in excess of the City's General Plan thresholds. Proposed sensitive receptors could be exposed to excessive traffic noise levels in excess of the City's General Plan thresholds for outdoor activity areas in under cumulative traffic conditions. **Table 4.10-9** provides a comparison of future traffic noise levels (existing plus approved projects for the year 2030) and future plus Proposed Project noise levels, both with and without the proposed extension of Foxboro Parkway, at a reference distance of 100 feet from the roadway centerlines.

As shown in **Table 4.10-9**, three segments of Vanden Road and the segment of Nut Tree Road north of Opal Way are predicted to have future traffic noise levels below the City's 60 dB threshold. The project-related increase in noise with or without the extension of Foxboro Parkway would not increase noise levels at the Vanden Road segments above the City's 60 dB threshold; however, the project-related traffic would increase the noise level at the Nut Tree Road segment by 4 dB Ldn (increase from 58 Ldn to 62 Ldn), which is considered a substantial increase. Noise barriers have been constructed as part of the developments on each side of Nut Tree Road north of Opal Way, which would reduce the projected exposure at the outdoor activity areas of these residences to below the City's 60 dB Ldn threshold, resulting in a less-than-significant cumulative effect (BAC, 2011; **Appendix K**). Additionally, assuming a minimum building façade noise level reduction of 25 dB, interior noise levels at these residences will be below the City's 45 dB threshold. The baseline traffic noise levels for the remaining road segments adjacent to existing residences are predicted to be greater than the City's 60 dB threshold. With or without the extension of Foxboro Parkway, the project-related increase in noise would be insignificant relative to the FICON criteria shown in **Table 4.10-5**. Therefore, the Proposed Project's contribution to traffic noise in the cumulative year 2030 would be considered a less-than-significant impact.

Less than Significant.

4.11 POPULATION AND HOUSING

4.11.1 INTRODUCTION

This section addresses the potential for population and housing impacts and evaluates the consistency between the Proposed Project and the City of Vacaville’s General Plan Housing Element (2010e). Following an overview of the environmental setting in **Subsection 4.11.2** and the relevant regulatory setting in **Subsection 4.11.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.11.4**.

4.11.2 ENVIRONMENTAL SETTING

Population

Regional

As shown in **Table 4.11-1**, the population of Solano County as of January 1, 2010 was approximately 427,837 people. The 2010 population of the City of Vacaville (City) was approximately 97,305 people or 22.7 percent of Solano County’s total population.

TABLE 4.11-1
REGIONAL POPULATION

Location	Population		
	2000	2005	2010
State of California	33,873,086	36,676,931	38,648,090
Solano County	394,930	419,004	427,837
Vacaville	88,642	96,222	97,305
Unincorporated County	19,305	19,556	20,165
Source: California Department of Finance, 2000-2010			

Population Trends

The population of Solano County grew from 394,930 people in 2000 to 419,004 people in 2005, an increase of approximately 6.1 percent. Between 2005 and 2010, Solano County’s population expanded to approximately 427,837 people, an increase of about 2.1 percent. The population of the City increased by 8.6 percent from 88,642 residents in 2000 to 96,222 residents in 2005. Between 2005 and 2010, the City saw a population increase of approximately 1,083 residents, or 1.1 percent. The unincorporated portions of the county experienced approximately 1.3 percent growth between 2000 and 2005, and approximately 3.1 percent growth between 2005 and 2010. Overall, the state experienced approximately 14.1 percent growth between 2000 and 2010; whereas Solano County has experienced approximately 8.3 percent growth over this same period.

Housing

According to the California Department of Finance, California was estimated to have approximately 13,591,866 housing units as of January 1, 2010, of which approximately 801,920 units, or 5.90 percent, were vacant. In the same year, compared to the State of California, both Solano County and the City had a lower percentage of vacant units. As shown in **Table 4.11-2**, in 2010, there were estimated to be 153,280 housing units in Solano County, of which 4.03 percent were vacant (California Department of Finance, 2010). The City had 33,119 housing units, of which 2.05 percent were vacant. Between 2000 and 2010, the County experienced steady housing growth. The City experienced a 10.8 percent increase in housing units between 2000 and 2005, and a 4.1 percent increase in housing units between 2005 and 2010. Based on the information presented in **Table 4.11-2**, it was determined that the total number of housing units in Solano County tends to increase annually by approximately 1.31 percent.

TABLE 4.11-2
REGIONAL HOUSING

Location	2000		2005		2010	
	Total Units	% Vacant	Total Units	% Vacant	Total Units	% Vacant
State of California	12,214,550	5.83	12,941,231	5.85	13,591,866	5.90
Solano County	134,513	3.06	146,251	3.46	153,280	4.03
Vacaville	28,702	2.06	31,805	2.06	33,119	2.05
Unincorporated County	6,961	5.88	7,134	6.03	7,564	6.94
Source: California Department of Finance, 2000-2010						

Growth Projections

According to the Association of Bay Area Governments (ABAG), Vacaville's population will increase by 1.6 percent annually between 2010 and 2015. ABAG projects the number of Vacaville households will grow faster than the population, averaging approximately two percent per year through 2015. A Population and Housing Conditions and Trends memorandum was prepared by the City for the Vacaville General Plan Update. As stated in the memorandum, Vacaville's population grew by a 0.9 percent average annual growth rate from 2000 to 2009. Additionally, ABAG projects Vacaville's population will grow at a slower rate, averaging 0.5 percent per year for next 20 years; however, with a large supply of land available for residential development, Vacaville's growth rate may exceed the ABAG projections.

Growth rates can be partially attributed to the City's location midway between Sacramento and San Francisco on Interstate 80 (I-80); in 2000 approximately 66 percent of employed residents commuted out of Vacaville for work. ABAG estimates that Vacaville will grow at a slower rate between 2010 and 2030 than in previous years because of the assumption that new development will be directed to communities supported by transit versus outlying communities that have land available to accommodate long-term growth. ABAG projects the City's 2030 population to be approximately 109,000 residents. However, as stated previously, the City has an ample supply of land available for housing development and, therefore, could potentially exceed ABAG's estimated growth rate (City of Vacaville, 2011).

4.11.3 REGULATORY CONTEXT

As shown in **Figure 3-2**, the 265.6-acre project site is located just outside of the City limits in unincorporated Solano County. While the project site is currently under the jurisdiction of the County, it is within the City's Sphere of Influence and is designated for future annexation and residential development.

Solano County General Plan (2008)

The Solano County General Plan serves as a guide for both land development and conservation in the unincorporated portions of Solano County. The Solano County General Plan (2008) designates the project site as Agricultural and within a Municipal Service Area (MSA). An MSA is an area designated as an incorporated city's current and/or future jurisdictional responsibility and reflects planned urban growth areas, which are based on a County review of city general plans and spheres of influence established by the Solano Local Agency Formation Commission (LAFCO) (Solano County General Plan, 2008). Under the Solano County General Plan, unincorporated lands within MSAs that are designated Agriculture will continue in agricultural use until they are annexed to a city for urban development. As such, the County has jurisdiction over the project site until the land is annexed to the City for the proposed conversion to urban and residential uses.

City of Vacaville General Plan Housing Element (2010)

Regional Housing Needs Allocation

The California Department of Housing and Community Development (HCD) identifies the supply of housing necessary to meet the existing and projected growth in population and households in the State, and passes a portion along to each of the State's 38 Councils of Government (COG). As the local COG, the Association of Bay Area Governments (ABAG) receives a Regional Housing Needs Allocation (RHNA) from HCD that specifies the number of units, by affordability level, that need to be accommodated within the nine-county Bay Area during the Housing Element planning period. ABAG is then responsible for calculating specific RHNAs for Vacaville and other jurisdictions.

The RHNA for the City of Vacaville for the 2007 to 2014 planning period identified a total need for 2,901 units to be constructed during this time period in order to accommodate for population growth (City of Vacaville, 2010e). Of this overall amount, 1,152 units have been approved/permitted as of January 2011 (City of Vacaville, 2011f). Therefore, as of January 2011, there is a remaining need for 1,749 housing units to be provided by 2014. Current development plans in the City undergoing review of development applications that would provide approximately 957 new housing units in Vacaville, not including the Vanden Meadows Project. Additionally, the approved Southtown development north of the project site has not yet been fully constructed; as such, additional previously-approved housing units are anticipated to be developed north of the project site.

Vacaville 2007-2014 Housing Element

The most recent Vacaville Housing Element was adopted on April 27, 2010, and HCD verified that it meets State requirements in a letter dated July 21, 2010. The 2007-2014 Housing Element includes a housing needs assessment that identifies current and projected housing needs, as well as policies to

accommodate housing development that will be affordable to a range of household types and income ranges. The Housing Element of the General Plan serves as the overall guiding policy document for housing and development within the City by incorporating standards of population density and building density so that circulation and public-facilities needs can be met.

The Housing Element identifies several areas that are developed or are potentially developable from 2007 to 2014, including the Southtown Project located immediately north of the project site's northern boundary. Although the Proposed Project has not been included the Housing Element's land inventory, it is considered a future annexation area and an important portion of the inventory for the 2014 Housing Element revision as it would likely provide housing opportunities for lower and moderate income households. The General Plan designation for the 265.6-acre property is predominantly Low Density Residential, with Estate Residential in a southern portion of the property; a junior high designation; and an agricultural buffer adjacent to the southeast edge of the area.

Planned Growth Ordinance

Vacaville's Planned Growth Ordinance (PGO) was adopted in 1991 and revised in 2000. The PGO was established to ensure that all new residential development within the city has adequate infrastructure for water treatment and supply, wastewater collection and treatment, and stormwater drainage, to serve new units and residents. The amendment to the PGO in 2000 included a requirement that a base inventory of up to 1,000 units within approved and unbuilt projects be maintained on an annual basis. Units that have building permit allocations and/or are eligible to be issued permits at any time make up the 1,000-unit inventory. The allocation process, established by the PGO, provides a mechanism to maintain the 1,000 unbuilt unit base inventory. As the inventory falls below 1,000 unbuilt units, new projects are added through the recording of a final map or through City Council approval of allocations following the approval of a planned development. The City Council retains the flexibility to grant allocations over the 1,000 unbuilt units.

4.11.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

This section evaluates the Proposed Project's compatibility with existing and planned development, and discusses the consistency of the Proposed Project with adopted plans, policies, and zoning designations. Physical environmental impacts resulting from the Proposed Project and mitigation measures are discussed in the applicable technical sections in this EIR.

Significance Criteria

Section 15125(d) of the CEQA *Guidelines* states that "[t]he EIR shall discuss any inconsistencies between the Proposed Project and applicable general plans and regional plans." Criteria for determining the significance of population and housing impacts have been developed based on Appendix G of the CEQA *Guidelines*. For the purposes of this Draft EIR, population and housing impacts are considered significant if the Proposed Project would:

- Induce substantial population growth in an area, either directly or indirectly;

- Displace substantial numbers of existing homes, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Project Specific Impacts and Mitigation Measures

Impact

4.11-1 Construction of the Proposed Project could induce substantial population growth in the area, resulting in adverse environmental consequences.

Construction of the Proposed Project would generate a temporary increased demand for construction workers. Project construction is anticipated to occur over a period of 72 months beginning in 2013. Construction jobs are expected to be filled by people who already reside in the area, and the construction of the Proposed Project is not anticipated to contribute to population growth or increase housing demand. The impact of the construction of Proposed Project on the housing and population is considered less than significant. **Less than Significant.**

Impact

4.11-2 Development of the Proposed Project could induce substantial population growth in the area, resulting in adverse environmental consequences.

The Proposed Project would result in the development of approximately 939 dwelling units on the project site, consisting of a mixture of single family, clustered, and multi-family units. Assuming an average of 2.83 people per household, as specified in the General Plan Housing Element, full build-out of proposed residential development is estimated to generate approximately 2,657 new residents. Buildout of the Proposed Project is expected to occur over a six year period with an anticipated completion date of 2019. Development of the project will result in the conversion of approximately 265.6 acres of rural land to urban land uses; however, this area is within the City's urban service area and identified within the current Comprehensive Annexation Plan (CAP) as near-term annexation area.

According to the RHNA reported by the City as of January 1, 2011, the City had a remaining need for 1,792 residential units, including 193 moderate-income homes, and 422 above-moderate income homes. The RHNA takes into account all development approved by the County to date, which includes the approved full buildout of the Southtown project. While development of the Proposed Project would exceed the current housing need assessed for both moderate and above-moderate income categories, it is expected be an important portion of the inventory for future housing needs that will be identified within the 2014 Housing Element revision (City of Vacaville, 2010e). The City implements several mechanisms in order to avoid growth-inducing impacts, including the annual residential allocation system established by the Planned Growth Ordinance which limits population growth. Annual residential growth is monitored and regulated by the City. Additionally, developers are required to fund all necessary infrastructure and provide

access to non-renewable resources including water, electricity, and natural gas, without adversely impacting existing residents. The Proposed Project would not affect any assumptions for buildout in the City's General Plan, and would be consistent with applicable General Plan policies. Population growth is considered to have significant adverse environmental impacts only if it results in adverse physical environmental consequences. These could occur through land conversions, commitment of resources, exceeding the capacity of utilities and other infrastructure, and other mechanisms as discussed in the appropriate issue area sections of **Chapter 3.0** (please refer to **Section 4.9 Land Use**, **Section 4.13 Traffic and Circulation**, and **Section 4.12 Public Services**). A full discussion of the potential for indirect and growth inducing impacts is provided in **Section 5.1**. The Proposed Project would not result in direct adverse effects from population growth. This impact is considered less than significant. **Less than Significant.**

Impact

4.11-3 Development of the Proposed Project could displace substantial numbers of existing housing and/or people, necessitating the construction of replacement housing elsewhere.

Two existing, occupied residential structures are located on the project site. Implementation of the Proposed Project would require abandonment and demolition of these dwelling units. Based on Housing Element estimates of the number of persons per household for Vacaville (2.83/household), this translates to approximately 6 persons subject to displacement by the proposed project. Currently, the projected number of vacant housing units in the City would more than accommodate the housing demand generated through the displacement of persons on the project site. Compared to the 939 new housing units that would be developed as a result of the Proposed Project, the demolition of two housing units is not considered to be a substantial displacement of existing units in either a local or regional context, as the City would still experience a net gain of up to 937 units. It is anticipated that these displaced individuals would be accommodated by the proposed housing units within the project or by housing units located elsewhere in the Vacaville region. Therefore, this impact is considered less than significant. **Less than Significant.**

Cumulative Impacts

4.11-4 The Proposed Project could contribute to adverse cumulative impacts associated with population and housing.

The Proposed Project and cumulative development, including buildout of the City's General Plan and the Fairfield Train Station Specific Plan, would induce substantial population growth in an area through the development of new homes and businesses. As discussed in **Section 3.11**, the Proposed Project would contribute to the anticipated population growth of Vacaville and the greater Solano County region. Guided by the policies set forth in the existing General Plan, Specific Plans, Ordinances, and other planning documents, this growth is projected to be orderly and have a less than significant cumulative impact. Population growth alone is not considered a significant cumulative effect. As discussed above, the Proposed Project will be consistent with

4.11 Population and Housing

the General Plan land use designations, goals, and policies, and thus would not contribute to the potential for adverse cumulative population and housing effects. Land conversions, utility upgrades, and other cumulative physical impacts associated with population growth are considered in applicable issue areas. **Less than Significant.**

4.12 PUBLIC SERVICES, UTILITIES, AND RECREATION

4.12.1 INTRODUCTION

This section addresses the potential for the Proposed Project to impact public services, utilities, and recreational facilities. Following an overview of the existing public services, utilities and recreation in **Subsection 4.12.2** and the relevant regulatory setting in **Subsection 4.12.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.12.4**.

4.12.2 ENVIRONMENTAL SETTING

Water Supply

The City's existing water system consists of surface water treatment facilities, wells, pumping facilities, distribution and transmission pipelines, and storage reservoirs. A description of the water supply system is provided below. City water supplies include Bureau of Reclamation (BOR) Solano Project water from the Lake Berryessa reservoir, State Water Project and Settlement Water from the North Bay Aqueduct (NBA), and groundwater from City owned wells. Each of these sources is summarized below and described in detail in the *City of Vacaville 2010 Urban Water Management Plan Update, July 2011* (2010 UWMP Update; Nolte, 2011b), which is included as **Appendix L**.

Water Supply Facilities

Surface water is treated at either the North Bay Regional Plant (NBR Plant) or at the City's diatomaceous earth water treatment plant (DE Plant). The NBR Plant provides approximately 13.3 million gallons per day (MGD) of treated surface water to the City. The DE Plant has a rated capacity of 12 MGD and a firm capacity of 10 MGD. Wells 1, 6, and 13 also supply water directly to the DE Plant clearwell. From the clearwell, a booster pump station pumps the water into the distribution system. Water from the remaining wells (2, 3, 5, 8, 9, 14, 15, 16, and De Mello) is treated at the wellhead and pumped directly into the distribution system (2010 UWMP Update; Nolte, 2011b).

The City's water system consists of one main pressure zone with various upper pressure zones. The main zone is designed to serve development with building pad elevations up to 222.7 feet mean sea level (msl) (currently these limits are exceeded at a few areas within the City). The upper pressure zones vary in design elevations due to the wide range of building pad elevations throughout the City. Currently the City has a total of four (4) upper pressure zones: Vine Street, Wykoff, Hidden Valley, and Tranquility Lane (City of Vacaville General Plan; City of Vacaville, 2007a). The project site is located within the main zone.

The existing storage facilities for the main zone include 5 storage reservoirs for a total storage capacity of 18.1 million gallons (Existing Conditions Technical Memorandum: *Water Supply and Service in Vacaville*; City of Vacaville 2011c). Additional storage reservoirs will be required to serve the future buildout of the City. The storage capacity is designed to provide operational, fire, and emergency storage for the entire main zone.

The existing water distribution system in the vicinity of the project site includes 8-inch and 12-inch pipes within the initial phases of the Southtown development area northwest of Vanden Road and an existing 12-inch water main which runs parallel to the project boundary along Nut Tree Road (Vanden Meadows Project Water Modeling Technical Memorandum; Nolte, 2011; **Appendix M**).

Surface Water Supply

The City receives surface water from three separate sources, which include the Solano Project, the State Water Project, and Settlement Water. Below are descriptions of each water source.

Solano Project (Vacaville Supply, SID Agreement)

The Solano Project was constructed in 1958 by the BOR, who holds water rights permits in trust for Solano County water users. Unlike most federal water projects, the water rights to the Solano Project are reserved solely for Solano County water users. Surface water is provided to the City through a contract between the BOR and the Solano County Water Agency (SCWA) and delivered by the Solano Irrigation District (SID). The main feature of the Solano Project is Monticello Dam, which provides storage for up to 1.6 million acre-feet of water in Lake Berryessa. Water from Lake Berryessa is diverted through the Putah Diversion Dam to the 32-mile Putah South Canal, which transports water to the eight Solano County Water Agency (SCWA) member unit contractors for the Solano Project water. SCWA has entered into agreements with cities, districts, and state agencies to provide water from the Solano Project. The Solano Project contracting agencies are: Fairfield, Suisun City, Vacaville, Vallejo, SID, Maine Prairie Water District, University of California at Davis, and California State Prison-Solano. As shown in **Table 4.12-1**, below, the annual entitlement for the City from the Solano Project is 5,750 acre-feet.

The contracts with the public entities that use Solano Project water provide for the sale and distribution of water made available by the BOR each year. Under contract, the BOR must deliver the full amount of water supply from the Solano Project unless the water supply does not physically exist (e.g. an empty reservoir). All Solano Project water contractors, whether they are municipal or agricultural, are impacted by water supply reductions on an equal basis.

In addition to its entitlement from SCWA, the City entered into a 1995 Master Water Agreement (Agreement) with SID and in June 2010 a second amendment to the Agreement was adopted. Pursuant to this amendment, the City receives an increased supply from SID through the year 2039 and a consistent supply thereafter until the year 2050. The amendment also allows the City to request additional water if needed to support growth and provides for changes in the delivery schedule. An adjustable delivery schedule means that the City could request that the maximum annual entitlement of 10,050 acre-feet, which is scheduled to be available in 2040, could be available at an earlier date. **Table 4.12-1** shows the City's current estimated annual entitlements for SID water in the years 2010, 2020, and 2035; as described previously, the delivery schedule could be modified to increase these entitlements to support growth.

State Water Project (SCWA Agreement, KCWA Agreement)

The City receives water allocations from the State Water Project through the SCWA (termed Table A water) and from a year 2000 purchase agreement from Kern County Water Agency (KCWA). As shown on **Table 4.12-1**, the annual entitlement from the State Water Project is 6,100 acre-feet, while the KCWA Agreement totals 2,878 acre-feet. Surface water received pursuant to these agreements is delivered through the NBA, which is 28 miles long starting from Barker Slough in the Delta and ending in Napa County. As a State Water Project facility, the California Department of Water Resource (DWR) is the owner and operator of the NBA. Within Solano County there are currently seven agencies with NBA water allocations. These include Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo. The annual State Water Project allocation to the SCWA has been increasing by 50 acre feet per year from 2010 and shall continue increasing until 2015 where each year thereafter the SCWA shall have an annual allocation of 47,756 acre feet per year.

Settlement Water (DWR Agreement)

Settlement Water is surface water that is diverted from the Sacramento River and Sacramento-San Joaquin Delta Estuary under water rights held by the DWR. This is not considered part of the State Water Project; instead the water is made available by DWR in settlement of area-of-origin water right applications by the cities of Fairfield, Benicia, and Vacaville. A total of 31,620 acre-feet per year are divided amongst the three cities, with the City's annual allocation being 9,320 acre-feet (**Table 4.12-1**).

Groundwater Supply

A description of the underlying groundwater aquifer and existing pump rates are provided in **Section 4.8**, Hydrology and Water Quality. As described therein, currently, water supply is provided through 12 permitted wells, 10 of which withdraw groundwater from the deep aquifer in the basal zone of the Tehama Formation. Well #1 and the De Mello well (located northeast of the City) pump from the non-basal zone of the Tehama Formation; however the De Mello well has been used only for backup supplies since 2004.

Currently, approximately 5,000 acre-feet per year of groundwater is withdrawn and the City continuously explores the possibility of well field expansion to maintain an adequate water supply. A regional program is being implemented to monitor groundwater data as a means of insuring against overdraft or contamination (City of Vacaville, 2011c). Based on projections, the City has estimated that by the year 2035, the total groundwater pumping allocation per year will be 8,100 AF (Nolte, 2011b).

Recycled Water Supply

Currently, the City does not use a recycled water supply source; however in 2003, the City began developing a Recycled Water Master Plan. Preliminary planning estimates indicate that tertiary treated recycled water will be available for delivery and the necessary infrastructure will be in place by 2020. It has been estimated that in 2020 a total of 1,175 acre-feet per year will be available. However, this drought-proof resource will require user contracts and possible retrofit costs on the user's behalf. Therefore, for planning purposes, only 75 percent of the total delivery estimate, or 880 acre-feet per year, is assumed to be available beginning in 2020.

Water Supply Summary

Table 4.12-1 summarizes the current and projected water supply for each water source to the year 2035. Due to the City's conjunctive use of these sources, the percentage of water used from each supply source varies. If any one source has limited water availability or poor water quality, use from other sources is increased. Likewise, if unscheduled water becomes available it can be utilized to the City's advantage.

TABLE 4.12-1
CURRENT AND PROJECTED WATER SUPPLY

Water Supply Sources	2010	2020	2035
Solano Project			
Vacaville Entitlement	5,750	5,750	5,750
SID Agreement	2,500	4,125	8,625
State Water Project			
Vacaville Table A	6,100	6,100	6,100
KCWA Agreement	2,878	2,878	2,878
Settlement Water	9,320	9,320	9,320
Groundwater	6,500	7,000	8,100
Recycled	--	880	880
Total Entitlements	33,048	36,053	41,653
Note: All values are acre-feet annually Source: Nolte, 2011b			

Table 4.12-2 summarizes the estimated water availability for each source under normal, single dry, and multiple dry years as determined by the DWR Sacramento Valley Water Hydrologic Classifications. The three separate hydrologic conditions considered are described as follows:

TABLE 4.12-2
WATER SUPPLY AVAILABILITY

Year Type	2010	2020	2035
Normal Year	29,734	32,723	38,278
Single Dry Year	30,861	33,834	38,118
Multiple Dry Year	27,368	30,194	35,477
Note: All values are acre-feet annually Source: Nolte, 2011b			

- **Normal Year:** This is a year when average rainfall has been received. During a normal year, the water availability from some sources may be less than the allocated amount.
- **Singe Dry Year:** This is a solitary dry or critical dry year and may be the first year of a multiple year drought.
- **Multiple Dry Years:** This is a series of three consecutive dry and/or critical dry years.

Wastewater

Wastewater Collection System

The project site is located adjacent to the service area of the City's wastewater collection system. Existing City wastewater collection infrastructure includes pressurized force mains, gravity mains, lift stations, and a City-owned wastewater treatment plant. A portion of the project site is located within the designated service area for the CSP-S Trunk Sewer. The CSP-S Trunk Sewer system includes a 21-inch sewer main along Nut Tree Road, a 21-inch cross country to Vanden Road, a 24-inch sewer main along Vanden Road, and a 24-inch cross country through Purple Martin Drive to the Southern Pacific Railroad (SPRR) tracks, then cross country along the crossing the SPRR tracks to the east of the project site.- In addition, the Southtown Project proposed to expand the wastewater collection facilities north of the project site including a 12-inch pipeline which would terminate at the northeastern portion of the project site.

In general, upgrades to the wastewater collection system are funded through the City's Development Impact Fee (DIF) program. The DIF program is the major funding source for infrastructure capacity projects; it relies upon connection fees.

The City entered into a Joint Powers Agreement in June of 2000 with the California Department of Corrections (CDC) that updated the terms of funding the original construction of the CSP-S Trunk Sewer. This Joint Powers Agreement reserved 2.14 million gallons per day (MGD) of peak hour flow capacity within the sewer line for use by the CDC.

Wastewater Treatment

The CSP-S Trunk Sewer transmits existing wastewater flows to the Easterly Wastewater Treatment Plant (EWWTP), located immediately southeast of the community of Elmira and northeast of the project site. The EWWTP provides wastewater treatment services to the developed areas within the City limits and the unincorporated community of Elmira. Treated effluent is discharged to Old Alamo Creek, which is a tributary to the Sacramento-San Joaquin Delta. Waste solids are beneficially reused either as alternative daily cover at a private nearby landfill, or applied as a soil amendment on City-owned agricultural lands.

The EWWTP is operated under National Pollutant Discharge Elimination System (NPDES) permit #CA0077691 issued by the California Regional Water Quality Control Board – Central Valley Region (RWQCB). The permit, which is reissued every five years, specifies waste discharge and monitoring requirements to protect the water quality of downstream water bodies.

The average dry weather flow (ADWF) capacity specified in the discharge permit for the EWWTP is defined in the NPDES permit as the average daily flow over three consecutive dry weather months (e.g., July, August, and September). There is no permit limit for the annual average flow, so the ADWF is used to define plant capacity. EWWTP flows are reported monthly. A 2004 expansion increased the ADWF capacity of the EWWTP to 15 million gallons per day (MGD) in response to growth projections of the City's 1990 General Plan. Current flows to the EWWTP are approximately 8 MGD (West-Yost, 2011; **Appendix N**).

During the planning of the Easterly WWTP Expansion Project (in 1996), it was expected that when plant reached its 15 MGD threshold it would be necessary to have an intermediate expansion to 17.5 MGD, with an eventual expansion to 22 MGD to accommodate City General Plan buildout conditions (City of Vacaville, 2009).

Winter wet weather flow is also an important plant and wastewater collection system capacity consideration. Typically, flow in a wastewater collection system is a combination of sanitary sewage and fresh water entering the system as infiltration and inflow. Infiltration and inflow are the result of groundwater entering the collection system from high water tables, leaking pipe joints, or damaged pipes and manholes; rainfall runoff from flooding fields and streets entering manhole tops; and drains improperly connected to the sanitary sewer. Infiltration and inflow can represent a significant portion of the flow in a wastewater collection and treatment system, especially during the rainy season. The capacity of the overall system must be adequate to contain peak sanitary flow plus peak infiltration and inflow. This flow condition is termed "peak wet weather flow" (PWWF). The existing EWWTP was designed for an hourly peak wet weather flow capacity of 55 MGD (**Appendix N**).

Solid Waste Disposal

Recology Vacaville Solano Service (RVSS) provides solid waste disposal service to the City through existing contractual agreements. The City has an exclusive franchise agreement with RVSS as the sole service provider of all garbage services within the City (RVSS, 2011). RVSS additionally provides services to unincorporated Solano County surrounding Vacaville, Dixon, and the unincorporated area of Vallejo known as Home Acres and Sandy Beach.

RVSS disposes non-recycled solid waste at the 256-acre Recology Hay Road landfill. The Recology Hay Road landfill is a permitted Solid Waste landfill that has an estimated permitted capacity of 37,000,000 cubic yards. The maximum disposal volume that is permitted is 2,400 tons a day. The Recology Hay Road has an estimated remaining capacity of approximately 30,433,000 cubic yards, which is 82.3 percent of the total capacity. The estimated closure date for this landfill is January 2077 (Calrecycle, 2011a).

In 1989 California passed the Integrated Waste Management Act to reduce the amount of solid waste disposed to landfills by fifty percent before the year 2000. In 1995 the City developed a mandated Source Reduction and Recycling Elements (SRRE) to achieve this goal. Cities were also required to develop Household and Hazardous Waste disposal programs. Under this mandate, the City provides residential curbside recycling, green waste, and household hazardous waste collection programs. The diversion rate

for the reporting year 2006 is estimated at 52 percent (Calrecycle, 2011b). This exceeds the State requirement of 50 percent reduction (Calrecycle, 2009).

Fire Protection and Emergency Medical Services

City of Vacaville Fire Department

The City of Vacaville Fire Department (VFD) provides fire protection services and emergency medical services to the City and unincorporated Solano County surrounding the City. The VFD is organized into two divisions: the Operations Division and the Support Services Division. The Operations Division is responsible for fire fighting, emergency rescue and medical response, and hazardous materials response. VFD currently has ~~77~~73 employees, of which ~~72~~65 are firefighters and emergency response personnel (VFD, 2011). The Fire Department has a ratio of 0.88 fire and rescue personnel per 1,000 persons of the City's population (City of Vacaville, 2007). The Support Services Division ~~is headed by a division chief and~~ is responsible for human resources, computer reporting and records management services, fire prevention and education, and administrative support (VFD, 2011).

VFD provides these services through four fully-staffed fire stations that are located strategically throughout the City. The following stations are staffed 24-hours a day, 7-days a week (staffing numbers):

- Station 71 – 111 South Orchard Avenue (6 personnel)
- Station 72 – 2001 Ulatis Drive (5 personnel)
- Station 73 – 650 Eubanks Court (3 personnel)
- Station 74 – 1850 Alamo Drive (5 personnel)

Fire Station 74 is closest to the project site and is located approximately 2.2 miles northwest from the project site.

Response times vary depending on the location; however, the City Council has adopted Fire Department performance standards for emergency response to critical fire and medical calls. The goal is to have an appropriately staffed and equipped unit on the scene of these types of calls within seven minutes (starting from receipt of 9-1-1 call) 90 percent of the time (VFD, 2011). The average response time in 2010 was 5.3 minutes for most areas of the City (City of Vacaville, 2011g).

In accordance with the Southtown development agreement, a new fire station will be constructed within the Southtown development area within the first phase of Southtown development to provide emergency fire and paramedic services to the area (City of Vacaville, 2007b). The Southtown Fire Station is anticipated to be staffed by a minimum of three firefighters, with five firefighters staffed during full build-out. The development agreements for the Southtown and Moody projects required the formation of a single Community Facilities District to pay for the full cost of fire protection services (including the additional fire personnel) required to serve the two developments. Public safety Community Fee Districts (CFDs) have been formed to fund the increased staffing needs from new development within the City to help maintain existing levels of service. CFD # 11 was created to fund these services for development in

the Southtown/Vanden area. Due to the location, the Proposed Project would be expected to join this CFD.

City of Vacaville Standards of Response Cover Study

A Fire Department's Standards of Response Cover Study for the City was conducted in 2003 to assess the impacts of increased demands on fire protection services resulting from community growth. A major objective of the study was to identify the number, locations, and schedule for construction of fire stations in the City. The study found that proposed future development combined with existing needs would require the construction of an additional fire station in order to maintain the service level goals for first response and multiple unit coverage. The report suggested thresholds that would assist the City in determining when new fire department facilities should be operational (City of Vacaville, 2003).

Vacaville Fire Protection District

The project site is currently within the boundaries of the Vacaville Fire Protection District (VFPD), which provides fire protection services to unincorporated Solano County to the north and southeast of the City (VFPD, 2011). VFPD provides these services through four fire stations located within unincorporated Solano County:

- Station 64 – 420 Vine Street, Vacaville
- Station 65 – 6080 A Street, Elmira
- Station 67 – 4135 Cantelow Road, Vacaville
- Station 68 – 8684 Pleasants Valley Road, Winters

During 2010, VFPD responded to 457 calls for services, including 215 medical calls, 69 mutual aid assistance calls, 67 fires, and 106 other calls for service (VFPD, 2011). The project site is located within the service boundary of Station 65.

Law Enforcement

The City of Vacaville Police Department (VPD) provides law enforcement services within the City through ~~its patrol division and investigations division, along with a special weapon and tactics team, a Youth Services Section, and K-9 units~~ three divisions: Administrative Services Division, Investigative Services Divisions, and the Field Operations Division. VPD operates out of a central station located at 660 Merchant Street; however, there is also a Family Resource Center located at 312 Cernon Street, Suite D and ~~two four~~ four Youth Services Offices located at the Vacaville High School ~~and the~~, Will C. Wood High School, Vaca Pena Middle School, and Willis Jepson Middle School (City of Vacaville, 2011b).

VPD serves a population of 91,461 located within the 28 square mile incorporated area of the City. ~~VPD has more than 220 employees, including over 100 sworn law enforcement officers.~~ VPD has 91 sworn law enforcement officers and 53 full-time civilian employees. VPD is organized into ~~four~~ three divisions: Administrative Services Division, Investigative Services Division, and Field Operations Division, each with a specific purpose. The Administrative Service Division includes the Office of Professional standards.

Traffic, Training, Records, Communications, Crime Analysis, volunteer/crossing guard, Crime Prevention, and Crime-Free Multi Housing. The Investigative Service Division includes Family Investigative Response Services, Youth Services, Family Resource and Clinical Services, Investigative Services, Crime Suppression, Narcotics Enforcement, and Property and Evidence. The Field Operations Division includes six patrol teams. Each division is under the direct command of a police lieutenant. Additionally, the Patrol Division has four K-9 units. The Field Operations Division includes 48 patrol officers, 6 sergeants, and 1 lieutenant; as well as civilian community service officers that handle main nonemergency calls for the service. Patrol officers provide the first contact with law enforcement for the city. The division responds to emergencies, alarms, and any other reports of criminal activity 24 hours a day, 7 days a week.

VPD responds to an average of 32,000 citizen-initiated calls a year within its service boundaries. On average, 2011 VPD response times were 6.17 minutes for Priority 1 calls and 15.30 minutes for Priority 2 calls (City of Vacaville, 2011b). Both Priority 1 and Priority 2 call response times were slightly slower than VPDs adopted standard of 6 minutes (City of Vacaville, 2011b). At the same time, there were approximately 669 calls per office per year, lower than the 700 annual calls the department targets for officers. Once annexed, the project site would be located within existing VPD Patrol Area No. 5. **Table 4.12-3** details the 8-10 most common crimes-complaints in the City during 2009-2011. Family and Professional Services Division, Administration Services Division, Investigations Division, and a Field Services Division. Each Division has a specific purpose. The Family Services Division includes the Family Investigative Response Services Team, the Family Resource Center, Youth Services, and the Office of Professional Standards, while the Administrative Services Division is comprised of the Communications Center, Records, Property and Evidence, Training, Human Resources and the Volunteer Crossing Guard Program. The Investigations Division includes the Investigative Services Section, Crime Suppression Team, Narcotics Enforcement Team, Crime Analysis, and Crime Prevention. The largest division, Field Services, consists of Patrol, Traffic, and the Canine units (City of Vacaville, 2009). The Field Services Division includes 48 patrol officers, six sergeants, two lieutenants, as well as civilian Community Services Officers (CSOs) that handle many non-emergency calls for service. The Patrol officers provide first contact law enforcement for the City. This Division responds to law enforcement emergencies and alarms or any other reports of criminal activity 24 hours a day, 7 days a week. The Field Services Division is divided into two patrol teams; each team is assigned one lieutenant and within each team there are three watches. The Field Services Division also operates a bicycle patrol program and 4 K9 units (VPD, 2011).

VPD responses to an average of 40,000 citizen-initiated calls a year within its service boundaries (VPD, 2011). On average, 2010 VPD response times were 6:00 minutes for priority one calls and 16.46 minutes for priority two calls (City of Vacaville, 2011g). Priority two call response times are slightly slower than the VPD's adopted standard of 15:00 minutes (City of Vacaville, 2011g). At the same time, there are approximately 625 calls per officer per year, lower than the 700 annual calls that the department targets per officer. Once annexed, the project site would be located within existing VPD patrol area Number 5 (VPD, 2011).

TABLE 4.12-3
MOST COMMON CALL TYPES/COMPLAINTS (2010-2011)

Type of Crime	Number of Crimes
Homicide <u>Disturbing the Peace</u>	2 <u>4,867</u>
<u>Welfare Check</u>	<u>1,863</u>
<u>Suspicious Vehicle</u>	<u>1,853</u>
Rape <u>Traffic Concern</u>	2 <u>1,833</u>
Robbery <u>Alarm</u>	68 <u>1,816</u>
Assault <u>Theft</u>	767 <u>1,532</u>
Commercial Burglary <u>Battery</u>	74 <u>1,479</u>
Residential Burglary <u>Suspicious Person</u>	224 <u>1,411</u>
Larceny <u>Information</u>	4319 <u>1,279</u>
Vehicle Theft <u>Suspicious Circumstances</u>	468 <u>1,057</u>
Total Crime Complaints	7350 <u>32,145</u>
Source: VPD, 2010-2012.	

Public Schools

The Proposed Project is located within the Travis Unified School District (TUSD) service area. TUSD provides educational services to the communities of Vacaville, Fairfield, and Travis Air Force Base (TAFB). School facilities operated by TUSD include three elementary schools (K-6) located on Travis Air Force Base, two elementary schools located in Vacaville, and the Vanden High School, Golden West Middle School and Travis Education Center all located adjacent to Travis Air Force Base. During the 2009-2010 school year, TUSD had a total enrollment of 5,300 students (TUSD, 2011). The project site is within the enrollment boundaries of Vanden High School located to the south, adjacent to the Travis Air Force Base. In the TUSD's latest master plan studies, it was determined that there is a need for new school facilities in the Southeast/Vanden area within the next 3-5 years (TUSD, 2011). TUSD is currently conducting studies to determine if they would build a middle school, elementary school, or a K-8 school on the project site.

The funding for the development of the school facility is derived from the development impact fees, paid by the developers as houses are constructed in the Southtown and Vanden Meadows area. Development fees are imposed by school districts to finance the construction of new schools as deemed necessary. Fees are assessed based on the type of land use and square footage of the development and are regulated by state law. Residential developments in particular are subject to school impact fees as determined within the Facility Master Plan prepared for the TUSD. Prospective developers are required to work with school district's to ensure that adequate educational resources are available for all new

residential developments. Additional funding for development of educational facilities comes from a variety of state and local programs.

As described in **Section 3.4**, new school facilities will be built on the project site and either be an Elementary School and a Middle School or a combined K-8 School. That determination will take place over the next year or two as development occurs within the adjacent Southtown development area and within the project site.

Parks and Recreation

Parks and Recreation activities within the City are regulated through the goals and policies included within Chapter 4 (Parks and Recreation Element) of the Vacaville General Plan and Section 12.28 of the Vacaville Municipal Code. The Parks and Recreation Element of the Vacaville General Plan call for 4.5 acres of public park for every 1,000 people. The City has defined different types of parks, Neighborhood Parks, Community Parks, and City Parks. The Parks and Recreation Element includes the ratio of 1.8 acres of Neighborhood Park, 1.7 acres of Community park, and 1.0 acres of City Park per every 1,000 people. Currently, there are 144.5 acres of Neighborhood Parks (including Neighborhood School Parks), 112.4 acres of Community Parks, and 41.0 acres of City Parks within the City limits. The City additionally controls the 300-acre Lagoon Valley Regional Park and 1,906.2-acres of Urban Open Space within City limits (City of Vacaville 2007a).

The General Plan indicated that three new Community Parks are planned. One of these park sites (Elmira\Leisure Town) is at the edge of the urban service area. The second proposed Community Park, Lagoon Valley, is located within the Lagoon Valley Park designations and Laguna Hills Open Space Area between the center of Vacaville and the new urban areas proposed for the Lagoon Valley. A third park will be created at California Drive and Peabody Road to supplement William Keating Park. A total of 111 acres are planned (City of Vacaville, 2007). Details about park design and the type of park and recreation facilities needed are contained in the Comprehensive Parks, Recreation and Open Space Master Plan adopted in 1992 (City of Vacaville, 1992).

Funds for the development of City parks are primarily from development impact fees. Operation of City parks is financed through the City's General Fund.

Electrical Natural Gas and Telephone Service

Pacific Gas & Electric provides electrical and natural gas service to the City and will provide these services to the project area. There are currently no existing electrical lines within the project site; however, existing overhead electrical utility lines run adjacent to the project site along Nut Tree Road and Opal Way. During the construction of the Proposed Project the City and developers will work with the utility companies in order to ensure that the transmission line corridors are within appropriate rights-of-way and that all new utilities and utility vault appurtenance will be placed underground in accordance with the Vacaville Municipal Code.

4.12.3 REGULATORY CONTEXT

Federal

National Pollutant Discharge Elimination System Permit (NPDES)

The NPDES permit system was established in the Federal CWA to regulate municipal and industrial discharges to surface waters of the United States. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. The Central Valley RWQCB establishes the quality of the effluent that can be discharged to waterways within the Sacramento area through Waste Discharge Requirements (WDRs) that implement the NPDES permit. WDRs are updated at least every five years. A new permit must be issued in the event of a major change or expansion of the facility.

Safe Drinking Water Act

Under the Safe Drinking Water Act (SDWA) (Public Law 93-523), passed in 1974, USEPA regulates contaminants of concern to domestic water supply. Contaminants of concern relevant to domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by USEPA primary and secondary Maximum Contaminant Levels (MCLs). MCLs and the process for setting these standards are reviewed triennially. Amendments to the SDWA enacted in 1986 established an accelerated schedule for setting drinking water MCLs.

State

Senate Bill 610 and 221

Senate Bill 610 and Senate Bill 221 amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 are intended to promote collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of development projects proposing over 500-dwelling units, unless there is verification of sufficient water supplies for the project, and of subdivisions that would cause an increase of 10 percent or more of service connections for public water systems with less than 500 service connections. Under SB 610, water supply assessments (WSA) must be furnished to local governments for inclusion in any environmental documentation for certain projects (as defined in Water Code 10912 [a]) subject to CEQA. The assessment must include an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts. Under SB 221, approval by a city or county of residential subdivisions which include more than 500-dwelling units requires a written verification of sufficient water supply. The absence of an adequate current water supply does not preclude project approval, but it does require a lead agency to address a water supply shortfall in its project approval findings.

According to the *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001* prepared by the California Department of Water Resources, a UWMP can be used to satisfy compliance with SB610 and SB221. The City adopted the 2010 UWMP Update in July 2011. The 2010 UWMP accounted for supplies and demands for ultimate build-out provided for under the City's current General Plan, and accounted for demands resulting from the Proposed Project. Therefore preparation of a separate WSA for the Proposed Project is not required for compliance with SB 610 and SB 221.

The Urban Water Management Planning Act

The Urban Water Management Planning Act (Planning Act) was established in 1983 and was most recently amended in 2010 (California Code –§10620-10621). The Planning Act requires urban water suppliers, such as the City, to prepare a management plan of its current and future water sources so as to continue to provide its customers with a 20-year plan to provide adequate and reliable water supply. Urban Water Management Plans describe the projected uses for all water resources within an agency to meet the goal of managing water supplies for their highest and best uses. The City of Vacaville adopted its 2010 UWMP Update in July 2011 (Nolte, 2011b). The 2010 UWMP Update is included within this EIR as **Appendix L**. Urban Water Management Plans must be updated every five years, and the next update is due in 2015.

Urban Water Management Plan

Water supplies and demands for the year 2035 are accounted for within the 2010 UWMP Update. For a large portion of the City, future water supply (**Table 4.12-1**) is assured under the SID contract, even if its appropriative rights and SCWA contract deliveries are reduced. At this time, the City expects that it will be able to renew its contract with the Bureau of Reclamation in order to guarantee a continued and reliable water supply for the portion of the City that is outside of SID boundaries. Capital improvements to the City's water supply facilities and distribution system have been outlined in the recent UWMP. These improvements include improvements to waterlines, storage reservoirs, booster pump stations, and the recently improved EWWTP. The City is also exploring well field expansion as a means of maintaining adequate water supply. A regional program is being implemented to monitor groundwater data in order to ensure that overdraft and/or contamination does not occur.

AB 939 – The Integrated Waste Management Act

The Integrated Waste Management Act, adopted in 1989, was adopted with the purpose of directing attention to the nation's increasing waste stream and decreasing landfill capacity, and to mandate a reduction of waste being disposed. For this purpose the act established waste diversion goals for cities and counties of 25 percent by 1995 and 50 percent by the year 2000. A disposal reporting system was established with California Integrated Waste Management Board (CIWMB) oversight, and jurisdictions were required to develop Source Reduction and Recycling Elements and Household and Hazardous Waste disposal programs.

Local

City of Vacaville General Plan Goals and Policies

Goals and policies within the City's General Plan applicable to public services and utilities are listed below (City of Vacaville 2007a).

Guiding Policies

Parks and Recreation

- 4.6-G 1 Develop a high-quality public park system that provides varied recreational opportunities accessible to all City residents.
- 4.6-G 2 Provide parks that reflect and respect Vacaville's natural setting.
- 4.6-G 3 Recognize the role that parks play in preserving natural features and establishing urban limits.
- 4.6-G 4 Establish standards for the provision of public parks to ensure adequate distribution, size, and service area.
- 4.6-G 6 Encourage development of private and commercial recreational facilities at appropriate locations. Substitution of private recreational facilities for public parks is discouraged in order to ensure access to outdoor recreation by all sectors of the population. Included under private recreational facilities are golf courses, health and racquet clubs, and riding centers.
- 4.6-G 7 Distribute public parks and recreational facilities throughout the urban service zone according to service area standards specified in this Element.
- 4.6-G 8 Evaluate the impact of proposed urban development on open space lands in terms of recreational opportunities and consider means of protecting these lands.
- 4.6-G 11 Provide neighborhood parks to serve the special recreational, cultural, and educational needs of different neighborhoods.
- 4.6-G 12 Locate new neighborhood parks adjacent to new elementary schools where possible.
- 4.6-G 13 Provide community parks encompassing a range of uses including active high investment (gymnasiums, swimming pools, etc.), active low-investment (playfields, etc.) and passive recreational facilities. Community parks shall contain facilities to serve the entire City or large portions of the City by providing recreational and cultural activities beyond those supplied by neighborhood parks.
- 4.6-G 14 Plan park and recreational facilities in cooperation with concerned public and private agencies and organizations. Among the agencies and organizations that need to be consulted in order to implement the policies of the Parks and Recreation Element are the Solano County Parks Department, Caltrans, the school districts (Vacaville, Travis, Dixon, and Fairfield-Suisun) and the Solano County Farmlands and Open Space Foundation. Coordination and contact with other agencies may also be required.

Public Facilities, Institutions, and Utilities

- 5.1-G 4 Plan for public safety facilities for new areas. Maintain comprehensive Hazardous Materials and Emergency Response plans.
- 5.1-G 6 Improve upon and expand waste disposal programs and methods in order to divert a minimum 50 percent of the waste stream from the landfill by the year 2000.
- 5.1-G 7 Strive for a minimum 90 percent of City residents to participate in waste diversion programs.

Wildfires and Urban Fires

- 9.3-G 1 Reduce the risk of wildfires by implementing policies restricting development in Extreme and High Hazard areas.
- 9.3-G 2 Ensure adequate funding is available to provide fire protection services, equipment, and maintenance as new development takes place.

Schools

- 5.3-G 1 Recognize that high quality education for Vacaville's school children is a community priority.
- 5.3-G 2 Promote the construction of school buildings and facilities which will be a source of civic pride, visual pleasure, and community identity.
- 5.3-G 3 Support the principle that school children deserve to attend schools that are housed in permanent facilities and located within close proximity to their homes.
- 5.3-G 4 Work towards close cooperation and coordination between the City of Vacaville and the school districts.
- 5.3-G 5 Inform the school districts of policies and projects that may affect the provision of educational facilities and services.
- 5.3-G 6 Plan educational facilities with sufficient permanent capacity to meet the needs of current (1999) and projected future enrollment and ensure that there are mechanisms to provide for the timely construction of the facilities.
- 5.3-G 7 Cooperate with school districts in planning school parks as a means of meeting neighborhood recreation, child care, and open space needs.

Implementation Policies

Parks and Recreation

- 4.6-I 1 Maintain a Public Parks Distribution Standard of 4.5 acres of park for every 1,000 residents with 1.8 acres/1,000 residents of neighborhood park, 1.7 acres/1,000 residents of community park, and 1.0 acres/1,000 residents of city park.
- 4.6-I 4 Implement the Comprehensive Parks, Recreation, and Open Space Master Plan, consisting of the following elements:
 - Standards for all park classifications and guidelines for public open space.

- An assessment of existing and future parks, recreation and open space needs, including a review of opportunities to link the City's facilities with those of neighboring jurisdictions.
 - Development of an action plan to provide for sites, funding and facilities to meet the City's needs.
 - A schedule for acquisition, development, and maintenance of facilities.
 - An Action Plan for the Community Services Department.
- 4.6-I 6 Develop the Trails and Trailhead system as shown in the Comprehensive Parks, Recreation and Open Space Master Plan. These trails provide access to and linkage of recreation sites and facilities, provide an alternative circulation system where more feasible and appropriate, and complement and tie in with the City's bikeways system.
- 4.6-I 9 Require developers of moderate and high density projects that do not contain standard yards to incorporate private recreation areas into subdivisions and to create homeowners associations or similar mechanisms for developing, supervising, and maintaining such areas. These recreation areas are in addition to the public parks paid for by building or other fees. All other parks and recreation facilities required by this Plan shall be publicly owned, operated, and maintained and shall be funded, at least in part, by fees paid by new development.
- 4.6-I 10 Require all residential developers, including apartment builders, to provide public park and recreation facilities either by paying Park Development Impact Fees and/or dedicating sites in lieu of Park Development Impact Fees. Dedication of turn-key neighborhood parks (parks completed in conjunction with development of a new subdivision) rather than in-lieu fees is desirable subject to policy plan and development plan review for individual master planned areas. In-lieu fees should meet the cost of purchasing parkland if land is not dedicated.
- 4.6-I 13 Locate parks and recreation facilities in relation to components of the Trails System, buffers, urban separators, and natural features. Wherever possible, site new parks in locations that encourage pedestrian access and that do not require that users cross arterials.

Public Facilities, Institutions, and Utilities

- 5.1-I 1 Continue to update the five-year Capital Improvement Plan to provide for the facilities determined to be needed in relation to the City's financial resources and develop a long-range strategic capital development plan consistent with the General Plan.
- 5.1-I 3 Replace existing water mains with larger mains, as necessary, to serve intensified land use in developed areas.
- 5.1-I 5 Replace existing sewer pipelines and lift stations with larger facilities as necessary to serve intensified land use in developed areas.
- 5.1-I 7 Maintain an adequate level of disaster response preparedness through careful review of proposed developments and through staff training in and exercise of the Emergency Operations Plan.
- 5.1-I 8 Ensure that new development provides funding for adequate facilities services.
- 5.1-I 9 Work with PG&E to develop transmission line corridors for attractive, community-serving, compatible uses.
- 5.1-I 11 Require the undergrounding of all utility lines adjacent to new residential and commercial construction as a condition of development.

- 5.1-I 12 Do not approve any development that will not, even with identified mitigation measures, maintain standards for water, sewer, police, and fire service unless there are overriding findings of special circumstances or economic or social benefits and the service standards will be achieved at the time of project occupancy.
- 5.1-I 13 Evaluate the feasibility of using wastewater for irrigation. Whenever possible, use non-treated water for irrigation in large landscaped areas.

Schools

- 5.3-I 2 If proposed school sites are not required or are needed in an alternate location, as determined by the school districts, the land use of the site will automatically revert to the predominant land use in the area.
- 5.3-I 3 In conjunction with the approval of residential development, cooperate with local school districts to provide sufficient school facilities to serve the enrollment generated by the new development. (See Policy 2.2-I 8)
- 5.3-I 5 Replace existing sewer pipelines and lift stations with larger facilities as necessary to serve intensified land use in developed areas.

Conservation

- 8.4-I 2 Require development proposals to incorporate water-conserving landscape designs.
- 8.4-I 3 Continue to implement a water conservation landscape standard, which address the use of drought-tolerant plant materials, for public buildings, park and recreation facilities.
- 8.4-I 5 Do not allow development that would adversely affect the City's well field.
- 8.4-I 6 Whenever possible, use non-treated water for irrigation in large landscaped areas.

Wildfires and Urban Fires

- 9.3-I 3 Coordinate fire protection services with the other agencies to ensure minimum coverage for all areas within Vacaville's Planning Area.
- 9.3-I 4 Provide adequate access to and fire breaks adjoining open space areas subject to fire hazard as part of new developments.

4.12.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

This section identifies any impacts to existing public services, utilities, and recreation facilities that could occur from the implementation of the Proposed Project as determined in the Initial Study (**Appendix B**). Impacts to public services, utilities, and recreation facilities were analyzed based on existing and future service capacities of the public services, utilities, and recreation facilities and comparison of these factors to the significance criteria listed below. If significant impacts are likely to occur, mitigation measures are included to increase the compatibility of the Proposed Project and to reduce impacts to less-than-significant levels. Because impacts associated with public services are inherently cumulative in nature,

both the direct and cumulative impacts of the Proposed Project are discussed under each identified issue area below.

Significance Criteria

Criteria for determining the significance of impacts to public utilities and services have been developed based on Appendix G of the CEQA *Guidelines*. For the purposes of this DEIR, an impact to public services, utilities, and recreation facilities would be considered significant if the Proposed Project would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response time, or other performance objectives for any of the public services (fire protection, police protection, schools, parks, other public facilities);
- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated;
- Include recreational facilities or require the construction or expansion of recreational facilities that might have been an adverse physical effect on the environment;
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- Not have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed
- Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs
- Not comply with federal, state, and local statutes and regulations related to solid waste.

Project Specific and Cumulative Impacts and Mitigation Measures

Impact

4.12-1 The Proposed Project would not exceed the City's water supply capacity requiring the acquisition or expansion of entitlements.

Annexation of the project site into the City and development of land uses proposed by the project could substantially increase the City's water supply demands. According to the *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001* prepared by the California Department of Water Resources, a UWMP can be used to satisfy compliance with SB 610 and

SB 221. The 2010 UWMP included as **Appendix L** accounted for supplies and demands for ultimate build-out provided for under the City’s current General Plan, and accounted for demands resulting from the Proposed Project. As determined within the Vanden Meadows Project Water Modeling Technical Memorandum (Nolte, 2011b) included in **Appendix M**, the total demand for City water supplies generated by the Proposed Project would be approximately 523,940 gpd (587 acre feet per year). The Proposed Project is subject to assessment and payment of the City’s Water Annexation Fees.

Table 4.12-4 summarizes the projected normal year annual water demands in 10 year increments for the City and future developments. Water demands for future developments for the year 2030 were based on the growth projected in the land use database prepared by the City’s Community Development Department. It was assumed that full build out of the Proposed Project would occur by 2015 and that cumulative City development of Lower Lagoon Valley, Southtown, and Rice McMurtry would be build out by 2025. As summarized in **Table 4.12-4**, the City’s estimated normal year annual water demand in 2035 with the Proposed Project is 20,660 acre-feet per year.

TABLE 4.12-4
SUMMARY OF PROJECTED NORMAL YEAR ANNUAL WATER DEMAND^a

Demand	2015	2025	2035
Existing City (2010) ^b	16,329	16,329	16,329
Proposed Developments ^c	1,432	2,902	3,510
Other Future Development ^d	126	378	821
Total	17,887	19,609	20,660
Note: ^a All values are acre-feet annually ^b Existing City demand based on actual water supply data for January through December 2010. ^c Proposed developments include Lower Lagoon Valley, Southtown, Rice McMurtry, and Vanden Meadows. ^d Other future development water demands are based on the most current land use information in the City’s Web Based Land Use Database Management System (WBLUDMS). Source: 2010 UWMP Update; Nolte, 2011b.			

~~Using water conservation programs included within the 2010 UWMP Update, the City has the ability to reduce demand by 10 percent during a single dry year and by 20 percent during a multiple dry year (2010 UWMP Update; Nolte, 2011b; **Appendix L**). **Table 4.12-5** compares the City’s projected water demand with the Proposed Project to estimated available water supply during normal, single dry, and multiple dry years.~~

As indicated in **Table 4.12-5**, the City has sufficient and secure water supplies available to accommodate the increase in water demand resulting from the Proposed Project, as well as other future demands through the year 2030. The Proposed Project would not exceed current water supply capacity or require the acquisition of entitlements. The Proposed Project’s direct and cumulative impact is considered less than significant. **Less than Significant.**

TABLE 4.12-5
SUMMARY OF PROJECTED WATER DEMAND VERSUS AVAILABLE SUPPLY
DURING NORMAL, SINGLE DRY, AND MULTIPLE DRY YEARS^a

Year	Normal Year		Single Dry Year		Multiple Dry Year	
	Projected Demand	Available Supply	Projected Demand ^a	Available Supply	Projected Demand ^b	Available Supply
2015	17,887	30,853	16,098	31,974	14,310	28,424
2025	19,609	34,508	17,648	35,704	15,687	31,929
2035	20,660	38,278	18,594	38,118	16,528	35,477
Note: a: Based on historical experience, the City has the ability to reduce demand by 10 percent during single dry years. b: Based on historical experience, the City has the ability to reduce demand by 20 percent during multiple dry years. Source: 2010 UWMP Update; Nolte, 2011b						

Impact

4.12-2 The Proposed Project could exceed the City's water supply capacity requiring the acquisition or expansion of entitlements under potential global climate change conditions.

It is unknown to what degree global climate change will impact the City's future water supply and availability. However, based on consideration of DWR's July 2006 "Progress on Incorporating Climate Change into Management of California's Water Resources," as well as an assessment of the reliability of the City's water supply under single and multiple dry years, it is reasonably expected that global climate change would not considerably affect water supplies for the Proposed Project. Water delivery to the City and the project site is assured in that the City's water supply is not expected to be impacted by the State Water Board restrictions during single dry or even multiple dry years due to multiple water source entitlements and sources. In addition, the City has included reduced resource reliability due to climate change impact within the 2029 model included within the City's 2010 Urban Water Management Plan. These lower resource reliabilities were used in the 2030 and 2035 water supply estimates. The City also plans to construct additional reservoirs to serve future buildout of the City. The City is expected to have sufficient water supplies even under long-term drought conditions when delivery restrictions are implemented (2010 UWMP Update; Nolte, 2011b; **Appendix L**). For these reasons, the Proposed Project's direct and cumulative impacts to the City's water supply under potential future global climate change conditions are considered less than significant. **Less than Significant.**

Impact

4.12-3 The Proposed Project could require expansion of the City's water treatment, storage, and distribution facilities, the construction of which could result in environmental impacts.

The Proposed Project will be required to pay the City's Development Impact Fee for water to provide adequate financing for planning, design, construction, and inspection of future water

supply and distribution system projects. The City's Development Impact Fee program is adjusted annually to reflect inflation and other changes in the cost of providing service and, every five years or when a major change occurs that would impact fees, can be significantly revised. Water fees are assessed based on meter size and average citywide consumption for each meter size. The charges are based on equivalent dwelling unit (EDU) factors and assessed relative to a single family home, which is one EDU. A discussion of potential effects associated with potential expansion of water distribution, treatment, and storage facilities is provided below.

Water Distribution Facilities

Currently the project site does not have a connection to a municipal water distribution system. A detailed description and diagram of the on-site water supply utilities and connection to the City's water system is provided within the Vanden Meadows Specific Plan (**Appendix C**) and the Vanden Meadows Water Modeling Study Technical Memorandum (Vanden Meadows Project Water Modeling Technical Memorandum; Nolte, 2011; **Appendix M**). As summarized within **Section 3.4.3**, in order to meet the potable water and fire flow demands of the Proposed Project, connections to the following existing/future water mains are required: an 18-inch water main in Leisure Town Road, a 12-inch water main in Vanden Road, a 12-inch water main at the intersection of Foxboro Parkway and Nut Tree Road, a 12-inch water main in Nut Tree Road, and two 8-inch water mains located in Phase 1A and 3 of the Southtown Project, respectively. As each sub-area of the Proposed Project is developed, a water system analysis would be required to ensure adequate water supply and pressure as a condition of approval of tentative maps. Construction of water mains would be done in accordance with applicable building standards and city regulations.

Off-site water supply improvements associated with the Southtown development are assumed to be in place prior to the development of the Proposed Project. In the event that these improvements are not in place prior to construction of the Proposed Project, the Vanden Meadows development would be responsible for construction of these improvements. Off-site water main improvements were previously analyzed within the EIR for the Southtown Development. These facilities would be located within road-right-ways and previously disturbed areas devoid of sensitive biological and other environmental resources. Environmental impacts resulting from construction of off-site improvements would be less than significant.

As shown in **Figure 3-6**, the internal water system will include connections to existing adjacent water mains in locations around the project boundary at the intersection of Foxboro Parkway and Nut Tree Road, in Nut Tree Road, in Vanden Road, in Street X, in Street Y, and in Leisure Town Road. An 18-inch distribution main outlined in DIF 88 is proposed in Leisure Town Road from the connection point at the northern project boundary with Southtown Phase 1A, to the current intersection of Leisure Town Road and Vanden Road. A 12-inch main is proposed in the following locations: in Foxboro Parkway from the intersection of Foxboro Parkway and Nut Tree Road to the existing intersection of Vanden Road and Leisure Town Road, and in the realigned Vanden Road, A Street, G Street, H Street, N Street, O Street, P Street, and Q street. Internal 8-inch water mains are planned to be located in all other public streets within the development area.

Construction of all internal water mains and water supply infrastructure (8-inch, 12-inch, and 18-inch lines) would be located within roadway right-of-ways, and constructed in accordance with applicable building standards and City regulations. Temporary impacts associated with construction of on-site water distribution mains are analyzed within other issue area sections of this EIR. No significant environmental effects are expected to result from construction of on-site facilities.

Construction of new water mains required to serve the Proposed Project would not cause significant environmental effects. Potential impacts are considered less than significant. **Less than Significant.**

Water Treatment

As determined within the Vanden Meadows Project Water Modeling Technical Memorandum (Nolte, 2011) included in **Appendix M**, the total City supplied water demand for the Proposed Project would be approximately 523,990 gpd (587 acre feet per year). Surface water resources from the Solano Project and the State Water Project are treated at either the NBR Water Treatment Plant or the City's DE Plant. The City's current maximum day allocation from the North Bay Regional Water Treatment Plant is estimated at 13.3 MGD and the DE Plant provides a firm capacity of 10 MGD for a total water current treatment capacity of 23.3 MGD (2010 UWMP Update; Nolte, 2011b; **Appendix L**). This is sufficient capacity to treat the City's current water supply entitlements, which are sufficient to accommodate existing water demands plus the increase in demands resulting from the Proposed Project. Therefore, the project would not directly require the expansion of water treatment facilities.

To accommodate future demands and regional growth, the NBR Plant has been designed for ultimate expansion of capacity from 40 MGD to ~~90~~60 MGD. The City's maximum day allocation from the NBR Plant at buildout is ~~30~~20 MGD (approximately 33,604 acre-feet per year) which is sufficient capacity to treat the City's future water supply entitlements (listed in **Table 4.12-1** and described in detail in the 2010 UWMP Update). Expansion of the NBR Water Treatment Plant would occur within the existing, previously disturbed site boundaries and would be subject to environmental review pursuant to CEQA. Mitigation would be recommended and implemented to reduce the potential environmental effects to the extent feasible. The Proposed Project would contribute towards the need to expand the NBR Water Treatment Plant under cumulative conditions, however, environmental impacts resulting from the expansion are expected to be less than significant through adherence to environmental laws and the incorporation of mitigation measures identified through the CEQA review process.

Existing and planned water treatment capacity is sufficient to meet the anticipated increase in demand of the Proposed Project. The City's water model and related supply infrastructure plans for the project site are based on the level of development projected within approved land use plans. The increased potable water demand resulting from the Proposed Project would not require further expansion of water treatment facilities the construction of which could result in environmental impacts. **Less than Significant.**

Water Storage

The City's *Water System Master Plan* specifies requirements for total water storage within the distribution system related to operational, emergency, and fire. Operational and emergency storage are established as 25 percent and 50 percent of maximum day demand, respectively. Storage for firefighting purposes is based upon a demand of 4,500 gpm sustained for four hours. This is the highest fire flow requirement, for industrial, commercial, and high density residential land uses, described in the Master Plan. As stated in **Section 3.4.3**, the internal water supply infrastructure must be designed to provide the Proposed Project with the fire flow rates required by the City.

The City is currently investigating sites for new storage reservoirs, as future buildout of the City's General Plan, including the Proposed Project, would require additional storage within the main pressure zone. As described above, the Proposed Project will be required to pay the City's Development Impact Fee for water to provide adequate financing for planning, design, construction, and inspection of water supply and distribution system projects that would be carried out by the City to serve the Proposed Project. Buildout of the Proposed Project would contribute towards the need to construct planned water reservoirs. These reservoirs would be provided as needed by the City and financed through a combination of developer funds and existing impact fee reserves. The potential locations for the additional reservoirs are generally in undeveloped and/or agricultural areas. Construction of the proposed reservoirs would be in accordance with the City's standard specifications and would be subject to environmental review in compliance with CEQA. The CEQA review and mitigation measures will be funded, in part, by the development impact fees that will be paid by the Project Proponent. Due to the general locations of the additional reservoirs, potentially significant and unavoidable environmental effects to agricultural and/or biological resources may occur as a result of construction. The Proposed Project's cumulative contribution to the triggering of the construction of the planned reservoirs is, therefore, considered a significant and unavoidable impact. **Significant and Unavoidable.**

Impact

4.12-4 The Proposed Project could exceed the capacity of the wastewater ~~treatment-collection~~ and ~~collection-treatment~~ facilities serving the project site.

Wastewater Collection

The Proposed Project would require the development of on-site wastewater collection utilities and connection to the City's wastewater collection system as described within the *City of Vacaville Vanden Meadows Project Sewer Modeling Study (Appendix N)* and summarized in **Section 3.4.3**. The Proposed Project would include connections to existing/future City wastewater collection facilities along project site boundaries. These connections include: four connections to existing CSP-S trunk sewer lines and a connection to the 12-inch trunk sewer proposed within the Southtown development area (see **Figure 3-7** of this EIR, and Figure 4.1 of **Appendix N**). Prior to issuance of building permits, the City shall require that necessary wastewater collection system improvements within the Southtown development area be completed to ensure that connection to

existing City wastewater collection system would occur. The environmental impacts of wastewater collection infrastructure within the Southtown Development area were analyzed within the Southtown EIR, and all impacts were determined to be less than significant with the mitigation provided.

To accommodate the cumulative increase in flows resulting from the Proposed Project in combination with the adjacent Southtown development, three off-site sewer upgrades to the City's wastewater collection pipeline which runs from Leisure Town Road to the EWWTP are required. The locations of the off-site sewer upgrades are shown in **Figure 3-8** (also Figure 6.1 of **Appendix N**) and described in **Section 3.4.3**. Upgraded wastewater collection facilities necessary to serve the Proposed Project and the adjacent Southtown development would be located within areas previously disturbed during installation of the existing sewer pipeline. The upgraded pipeline will extend through graded and compacted unpaved access/maintenance roadways and agricultural land where sensitive environmental resources are not present. Potential impacts associated with biological resources from construction activities are discussed in **Section 4.4**, Impact 4.4-12 and summarized within a Technical Memorandum included in **Appendix E**. As stated therein, no sensitive biological resources were observed during surveys of the pipeline alignments; however, temporary construction activities have the potential to impact rare plants and disturb nesting birds. Mitigation measures would require that pre-construction biological surveys be conducted and avoidance measures implemented during construction. Wastewater collection facilities would be designed and constructed according to the City's standard code and specifications. Significant environmental effects associated with construction of wastewater collection lines would not occur. Thus, the project's direct and cumulative contribution to environmental effects resulting from the construction of new wastewater collection infrastructure is considered to be less than significant with mitigation. **Less than Significant with Mitigation.**

Wastewater Treatment

The proposed residential and school facilities within the project site would generate a sanitary base flow (Qa) of approximately 0.28 MGD of wastewater. The EWWTP currently has a permitted treatment capacity of 15 MGD ADWF and current flows to the EWWTP are approximately 8 MGD ADWF. Therefore, the EWWTP has an available ADWF capacity of 7 MGD which is adequate to accommodate the increase in wastewater flows generated by the Proposed Project (West-Yost, 2011; **Appendix N**). Since the existing EWWTP has sufficient capacity to serve the wastewater generated directly as a result of the Proposed Project, no expansion of the facilities would be required. Impacts to the City's EWWTP as a direct result of the development of the Proposed Project are less than significant.

Although the EWWTP currently has the capacity to accommodate the Proposed Project, the treatment plant would ultimately need one or more capacity expansions in order to serve the full amount of development allowed under to General Plan, in accordance with previous treatment planning documents (West-Yost, 2011). Expansion of the EWWTP would be constructed in accordance with the City's standard specifications on the existing previously disturbed EWWTP

site and would be subject to environmental review in compliance with CEQA. However, potentially significant and unavoidable short-term environmental effects from construction would likely occur as a result of construction emissions and noise, similar to the effects that were identified within the EIR for the previous expansion of the EWWTP (City of Vacaville, 1998). The Proposed Project's cumulative contribution to the need to expand the EWWTP is, therefore, considered a significant and unavoidable impact. **Significant and Unavoidable.**

Mitigation Measure 4.12-4. Prior to the construction of off-site sewer upgrades, the City shall implement **Mitigation Measures 4.4-12a-c** to conduct pre-construction surveys for rare plants and nesting birds and implement avoidance measures during construction.

Impact

4.12-5 The Proposed Project would generate a demand for fire protection services, and could require the construction of new or expanded facilities to maintain service level standards.

The Proposed Project would include the development of a residential community within an area historically used for agricultural purposes. Residential uses require a higher level of fire protection services than rural or agricultural land uses, due to the increased number of emergency calls and higher associated fire risk. The Proposed Project would be designed to minimize service demands on the Fire Department, including the installation of fire hydrants, access roads without physical barriers and water service to provide adequate fire flow. All buildings would be built to current California Building Code and California Fire Code.

The project site currently lies outside of the five minute response time coverage area for the City's existing Fire Department stations. The nearest existing station to the project site is Station 74, which is located 2.2 miles southwest of the project site. New fire protection facilities would be required to provide an adequate level of fire protection services to the project site and maintain the Fire Department's response time goals for emergency service calls. Construction of the Proposed Project prior to new fire protection facilities would be a potentially significant impact.

In accordance with the Southtown development agreement, a new fire station will be constructed within the Southtown development area to provide emergency fire and paramedic services to the area, including the Proposed Project site (City of Vacaville Southtown EIR, 2007). With construction of this VFD Southtown fire station, Fire Department standards for response times would be met for all areas within the project site. All environmental impacts resulting from the construction of the fire station were analyzed within the South Town Development EIR, and mitigation measures were recommended to reduce effects to less than significant. As of September 2011, the permit requirements triggering development of the VFD Southtown fire station under the Southtown Development Agreement have not been reached.

The payment of fire facility impact fees in accordance with the City Municipal Code and participation in the existing Southtown CFD #11 or similar mechanism would ensure that the adequate funding is available to construct the necessary fire protection facilities to serve the

increase in demands of the Proposed Project. No additional fire protection facilities beyond those planned and analyzed within the Southtown Development would be required to maintain service level standards. However, in order to ensure that adequate fire protection facilities are available to serve the Proposed Project, the Southtown Fire Station would need to be constructed prior to development of any project homes beyond the City's five minute response time coverage area.

Mitigation Measure 4.12-5 would ensure that adequate fire protection facilities are available prior to the development of the Proposed Project, resulting in a less-than-significant impact. **Less than Significant with Mitigation.**

Mitigation 4.12-5: The Vanden Meadows Specific Plan shall incorporate phasing standards to require development of the VFD Southtown Fire Station prior to issuance of the first development permit of any project homes that are located outside of the City's five minute response time coverage area.

Impact

4.12-6 The Proposed Project would generate a demand for law enforcement services, and could require the construction of new or expanded facilities to maintain service level standards.

Based on the existing staffing levels and calls for service identified above, the Proposed Project would generate an increased need for service on the project site due to the proposed construction of 939 residential units. Assuming the average household size of 2.83 residents per housing unit (U.S. Census, 2010) and assuming the City of Vacaville Police Department would maintain service staffing levels of 1.12 officers per 1,000 citizens, the Proposed Project would potentially require 3 new officers to maintain service ratios and service level goals to off-set potential increased calls for law enforcement services at locations within the project site.

The City requires that new developments pay impact fees to cover police station expansion and improvement. A Public Safety District also known as CFD #11 has been established by the City Council to pay for police and fire services in the project area. The CFD #11 currently includes the adjacent Southtown development area. The payment of development fees in accordance with CFD #11 or a project specific CFD to be required within the Development Agreement, would ensure that adequate funding is available for police protection services. As the Vacaville Police Department has indicated in the Vacaville General Plan Update-Public Service Technical Memorandum that there are no plans to expand its current facilities, this funding would offset any increased need for services created by the Proposed Project. Additional future developments within the City would be subject to the same development fees. Direct and cumulative impacts associated with the new police protection facilities are considered less than significant. **Less than Significant.**

Impact

4.12-7 The Proposed Project may require additional capacity or substantially increase demand for telecommunication services that could require the development of new

telecommunications infrastructure, the construction of which could result in adverse environmental effects.

Development of the Proposed Project would require the extension of telephone and telecommunication service lines to the project site. The developer would be required to coordinate with Pacific Bell and the City regarding placement and type of equipment needed to serve the project.

All telephone and telecommunications lines would be placed underground, and would tie into the project site from existing lines located in the near vicinity of the project site installed to serve adjacent development. The applicant shall be required to demonstrate to the City that they have coordinated with Pacific Bell regarding the extension, location and phasing of telecommunications to serve the project. The project site is not constrained by any features that may limit or impair the ability of Pacific Bell, or similar service provider, to provide these services. The environmental effects associated with new telecommunication facilities would be less than significant as all utilities would be located within previously disturbed right-of-ways in urban areas, and construction would occur in compliance with state and local regulations. Direct and cumulative impacts to telephone and communication services are considered less than significant, and no mitigation is required. **Less than Significant.**

Impact

4.12-8 The Proposed Project may require additional capacity, substantially increase demand, or affect energy supplies for electrical and natural gas services that could require the development of new energy transmission infrastructure, the construction of which could result in adverse environmental effects.

The Proposed Project would require the extension of electrical and natural gas facilities to the project site. The developer would be required to submit a development application to PG&E. PG&E would determine the appropriate facilities to adequately serve the Proposed Project. The project would result in new gas and electrical facilities for approximately 939 residential units, a school, and various other uses such as traffic and street lights. The estimated energy consumption of Proposed Project has not been quantified in this EIR as this amount would be dependent on project specific aspects of the project, such as total square footage for residential units, potential alternative energy uses, energy efficient structural materials and appliances, and the duration of occupancy for proposed residential units. It is anticipated that new electrical and natural gas facilities would be located in previously developed areas and connecting natural gas pipelines would be located primarily within existing roadways. Per Vacaville Municipal Code, all new utilities and utility vault appurtenance will be placed under ground. The project site is not constrained by any features that may limit or impair the ability of PG&E, or similar service provider, to provide these services. The direct and cumulative environmental impacts associated with installation of new electrical and natural gas services are considered less than significant, and no mitigation is required. **Less than Significant.**

Impact

4.12-9 The Proposed Project could generate solid waste beyond the capacity of the landfill and solid waste collectors serving the project area requiring development of new solid waste management facilities, the construction of which could result in adverse environmental effects.

The amount of solid waste generated by the Proposed Project was estimated based on an average amount of daily residential waste generated per resident (Calrecycle, 2011). **Table 4.12-6** presents the total solid waste generated through the proposed land uses and subsequent increases in population. The total solid waste generated by the Proposed Project is estimated at 6,114 pounds per day (approximately 3.1 tons per day). According to information provided by the Calrecycle, approximately 52 percent of household waste generated would be diverted through the implementation of the City's recycling program (Calrecycle, 2011). The City's recycling program, which involves curbside pick-up of recyclable materials, currently assists the City in meeting the requirements of AB 939. Assuming a continued reduction of 52 percent for household waste, the total amount of waste generated by the Proposed Project that would be disposed of at a landfill would be 3,179 pounds per day (or 1.6 tons).

TABLE 4.12-6
SOLID WASTE GENERATION

Land Use	Generation Rate (pounds/capita/day)	Estimated Population	Daily Waste Generation (pounds)	Daily Disposal Requirements After Diversion (pounds)
Residential	2.3	2,658	6,114	3,179
Source: Calrecycle, 2011.				

The Recology Hay Road Landfill has an allowable daily disposal capacity of 2,400 tons. Assuming an increase of 1.6 tons of waste per day, the Proposed Project would not cause the average daily disposal to exceed the permitted capacity. The estimated closure date of the landfill is 2077. It is not anticipated that development of the Proposed Project would significantly impact the operational lifetime of the landfill.

The City of Vacaville has contracts with solid waste collectors and haulers. The Proposed Project would require the City to expand these contracts to service the Proposed Project. The expansion of solid waste services to residential units under the Proposed Project would not significantly impact solid waste facilities or impact the local Recology Hay Road Landfill. Because the Proposed Project would not result in the expansion of solid waste facilities that would result in significant environmental effects, direct impacts are considered less than significant.

Buildout of the General Plan, including the proposed project, would generate approximately 225,450 tons of solid waste per year, an estimated 112,725 tons of which would be diverted for recycling with the implementation of mandatory diversion programs. Policies within the General Plan would ensure that solid waste and recycling facilities such as transfer stations are

adequately provided throughout the City and ensure that the City continues to provide recycling and clean-up services for its residents and businesses (City of Vacaville, 2007).

With the remaining capacity and expected lifespan of the Recology Hay Road Landfill and the proposed addition to existing transfer station facilities, the additional solid waste generated by the build out of the General Plan would not exceed capacity of the landfills. Thus, the cumulative impact would be less than significant. **Less than Significant.**

Impact

4.12-10 The Proposed Project would generate a demand for educational services, and could require the construction of new or expanded school facilities to maintain service level standards.

The Proposed Project would result in the development of approximately 939 single family residential units in the Vanden Meadows development area. Assuming approximately 0.727 new students per unit in accordance with the projections outlined in the City's Comprehensive Annexation Plan (City of Vacaville, 2004b), it is expected that the Proposed Project would increase student enrollment within the TUSD by approximately 683 students. As described within **Section 3.4.3**, approximately 28 acres within the project site is owned by the TUSD and would likely be developed as an Elementary School and Middle School, which would provide additional facilities that would accommodate the increase in enrollment of elementary/middle school aged children resulting from the Proposed Project.

New high school aged students assumed to enter TUSD would be enrolled at Vanden High School, which during the 2009-2010 school year had an enrollment of 1,527 (Vanden High School, 2011). The Vacaville General Plan Update – Public Services Technical Memorandum indicates that the 1,800 student capacity of Vanden High School would not meet by projected enrollment growth. This project enrollment growth includes the Proposed Project.

As required by State law, the applicant shall pay state-mandated school impact fees to the TUSD or provide an alternative strategy acceptable to the TUSD. These fees would mitigate any impacts to potentially affected schools in the City prior to the issuance of building permits. With the payment of such school impact fees or other mutually acceptable strategy, the Proposed Project and cumulative developments would have a less-than-significant impact on the public school facilities and systems affected by the project. Payment of statutory fees is considered appropriate mitigation under CEQA. Direct and cumulative impacts are considered less than significant. **Less than Significant.**

Impact

4.12-11 The Proposed Project may increase the use of City's parks, resulting in physical deterioration of recreational facilities.

Implementation of the Proposed Project would increase the City's population by an estimated 2,658 people. The City's Park Service Standard Ratio specify that 1.8-acres of neighborhood parks, 1.0-acres of city parks, and 1.7-acres of community parks are to be established for every 1,000 new residents.

In order to meet the City's park service level standards, 4.8-acres of neighborhood parks, 4.4-acres of community parks, and 2.6-acres of additional city parks would be required to meet the increase in population resulting from the Proposed Project. Within the project site, 7.4-acres would be dedicated for a neighborhood park. This would fulfill the Proposed Project's neighborhood park requirements, as well as contribute extra area that may improve the City's current neighborhood park acreage shortage. Additionally trails and public open space areas are incorporated throughout the project site. These trails, along with the park and landscaping, comprise 22.98 acres of dedicated open space and recreational area. Consistent with General Plan goals, these open space areas would be in proximity to residential housing and would provide focal points for the proposed residential neighborhoods.

At this time, the 22.98-acres of open space areas associated with the Proposed Project have not been accepted by the City as qualifying as city or community park facilities; therefore, the Proposed Project would not meet the City's desired service-area ratio. However, development fees associated with the Proposed Project would provide the project's fair share payment for the development of 4 planned community parks, and facilitate the expansion of the Centennial city park as described within the Vacaville General Plan Update –Parks and Recreation Technical Memorandum (City of Vacaville, 2011f). Therefore, with development impact fees, the Proposed Project's direct and incremental contribution to cumulative impacts associated with regionally serving parks would be less than significant. Direct and cumulative impacts are considered less than significant. **Less than Significant.**

4.13 TRANSPORTATION AND CIRCULATION

4.13.1 INTRODUCTION

This section addresses the potential for the Proposed Project to impact transportation and circulation. Following an overview of the existing traffic setting in **Subsection 4.13.2** and the relevant regulatory setting in **Subsection 4.13.3**, project-related impacts and recommended mitigation measures are presented in **Subsection 4.13.4**. A Traffic Impact Study has been prepared for the project alternatives and is included as **Appendix O**.

4.13.2 ENVIRONMENTAL SETTING

Existing Roadway Network

The Proposed Project is located in southeast Vacaville in central Solano County. Vacaville lies midway between San Francisco and Sacramento. Neighboring cities include Fairfield to the south and Dixon to the north. Access to the project area is primarily provided by Leisure Town Road, Nut Tree Road, and Vanden Road on the existing roadway network shown in **Figure 4.13-1**. Major roadways that would provide circulation to and from the project area are described below.

Interstate 80 (I-80) is a major east-west freeway originating in the San Francisco Bay Area to the west, continuing east towards Sacramento, and terminating in New Jersey. Interstate 80 passes through the cities of Fairfield, Vacaville, and Dixon in a southwest-to-northeast direction. In the cities of Fairfield and Vacaville, I-80 provides four mixed-flow lanes in each direction, with a posted speed limit of 65 mph. A fifth lane for high-occupancy vehicles (HOVs) is provided between Red Top Road and Air Base Parkway in Fairfield, and a sixth “auxiliary lane” is provided between Interstate 680 (I-680) and State Route 12 (SR 12) in Fairfield. Current traffic volumes on I-80 in the vicinity of the Specific Plan area are shown in **Table 4.13-1**.

Interstate 505 (I-505) is a north-south freeway connecting I-80 in Vacaville to Interstate 5 just north of the City of Woodland in unincorporated Yolo County. Current traffic volumes on I-505 in the vicinity of the project area are shown in **Table 4.13-2**.

Leisure Town Road is designated as an arterial in the current Vacaville General Plan from its intersection with Vanden Road to the recently constructed I-80 interchange. This segment of Leisure Town Road is designated to be part of the approved Jepson Parkway Reliever Route that will connect Highway 12 south of Vacaville to I-80 in Vacaville. Leisure Town Road generally exists as a two-lane road between Vanden Road and Orange Drive. From south of Orange Drive to the I-80 interchange, it operates as a six-lane arterial. Leisure Town Road curves in a westerly direction west of I-80 and continues as Vaca Valley Parkway. Leisure Town Road has a speed limit of 55 miles per hour (MPH) from Vanden Road to the current southern city limits, 50 MPH from the city limits to New Alamo Creek, 45 MPH from New Alamo Creek to Alamo Drive, and 40 MPH from Alamo Drive to the I-80 interchange.

Figure 4.13-1 – Existing Transportation Network

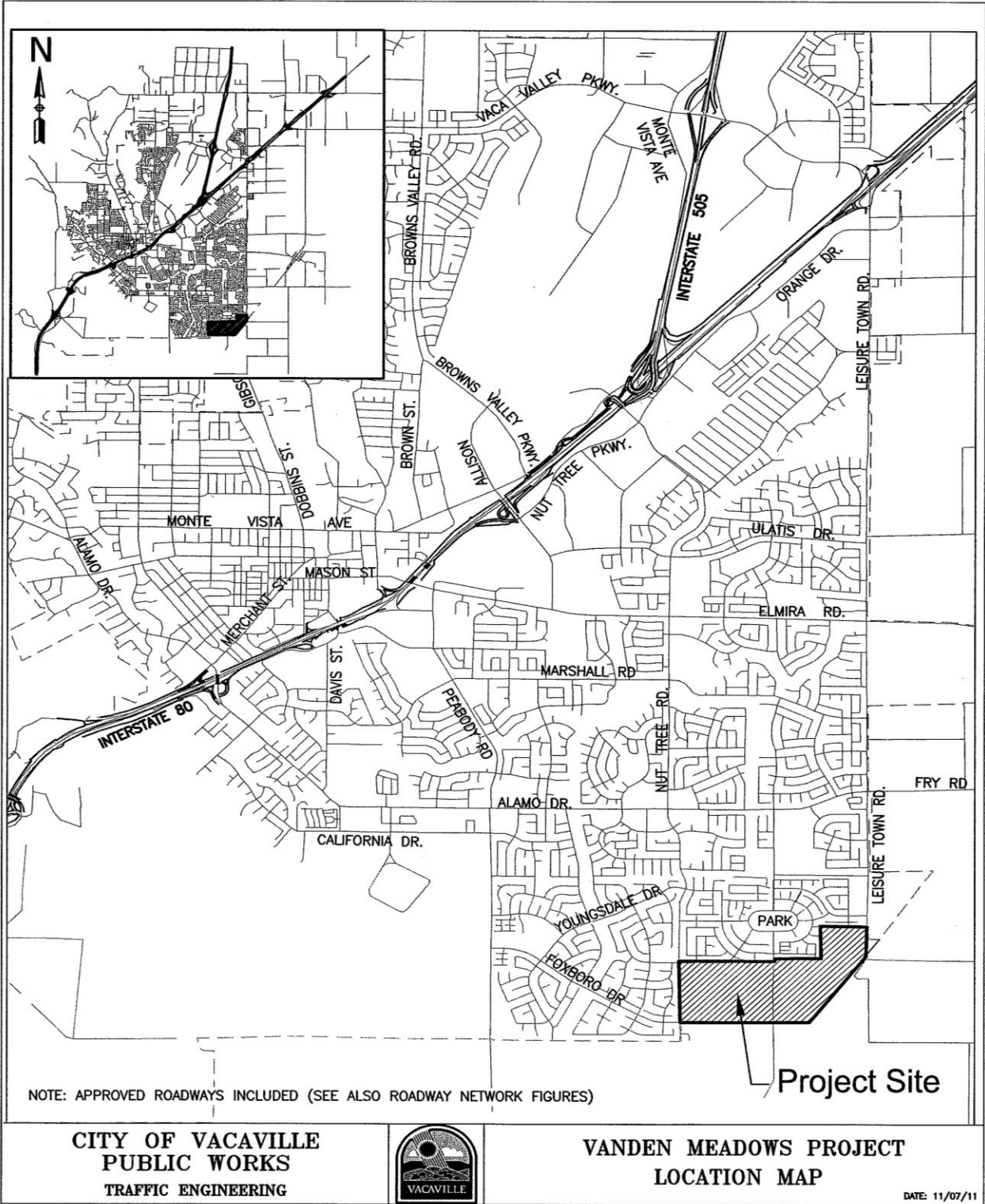


TABLE 4.13-1
INTERSTATE 80 VOLUMES – YEAR 2010

Description	Peak Hour	AADT
Fairfield, North Texas Street	12,000	161,000
Pleasanton Valley Road	12,000	161,000
Alamo Drive	11,400	153,000
Davis Street	11,100	148,000
Monte Vista Avenue	10,500	140,000
Jct Rte 505 North	9,400	121,000
Dixon/Grant Road	9,500	121,000
AADT = Average Annual Daily Traffic Source: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm 2010 AADT.		

TABLE 4.13-2
INTERSTATE 505 VOLUMES - YEAR 2010

Description	Peak Hour	AADT
Vacaville, Jct. Route 80	3,100	34,500
Vaca Valley Parkway	2,700	30,000
Midway Road	2,150	24,100
Allendale Road	2,500	25,000
Solano/Yolo County Line	2,400	22,200
AADT = Average Annual Daily Traffic Source: http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm 2010 AADT.		

Foxboro Parkway is a four-lane arterial that connects Peabody Road to Nut Tree Road. It has a posted speed limit of 45 MPH. Foxboro Parkway is planned to be extended between Nut Tree Road and Vanden Road within the project area.

Vanden Road is designated as a collector in the current Vacaville General Plan. It generally exists as a two-lane rural road with paved shoulders. Vanden Road spans from a point just east of Peabody Road in Fairfield through unincorporated Solano County and into Vacaville, terminating at Marshall Road. The segment of Vanden Road between Peabody Road and Leisure Town Road would be a part of the approved four-lane Jepson Parkway. Within Solano County, the speed limit on Vanden Road is 55 MPH, transitioning to 50 MPH between the Vacaville city limits and New Alamo Creek, 45 MPH from New Alamo Creek to Alamo Drive, and a 25 MPH residential district from Alamo Drive to Marshall Road.

Vanden Road currently provides a direct connection between north Fairfield and Vacaville. As a condition of approval for the Southtown Project in Vacaville, a development north and adjacent to the project area, Foxboro Parkway would be extended from Nut Tree Road to the intersection of Leisure Town Road and the existing Vanden Road. Furthermore, Vanden Road would be off-set to the west at the future Foxboro Parkway within the project area so that it would no longer provide a direct connection between Leisure

Town Road and Alamo Drive. North-south traffic on Vanden Road is expected to divert to Leisure Town Road and to the future Foxboro Parkway extension.

Nut Tree Road is a north-south arterial that connects Foxboro Parkway, across I-80 and East Monte Vista Avenue, to the Nut Tree Development area. Where development exists along Nut Tree Road, from south of Alamo Drive to its north terminus, Nut Tree Road has four travel lanes. The southern portion of Nut Tree Road adjacent to the Southtown Project is being widened to four lanes. Improvements to the segment of Nut Tree Road north of Foxboro Parkway would be considered as a part of the Vanden Meadows Specific Plan project.

Peabody Road is a north-south road extending from Air Base Parkway in Fairfield to Elmira Road in Vacaville. Within Vacaville, Peabody Road is designated as a four-lane arterial. South of Vacaville within Solano County, Peabody Road exists as a two-lane rural road with paved shoulders. Speed limit on Peabody Road are 45 MPH south of Alamo Drive, 40 MPH from Alamo Drive to Beelard Drive, and 35 MPH from Beelard Drive to Elmira Road.

Alamo Drive is an east-west roadway that spans between Hidden Glen Court and Leisure Town Road at the current city limits. Beyond Leisure Town Road, it continues eastward as Fry Road into unincorporated Solano County. Alamo Drive is primarily a four-lane roadway with a posted speed limit of 25 MPH west of its intersection with Foothill Drive/West Monte Vista Avenue, 30 MPH from West Monte Vista Drive to Marshall Road, 35 MPH from Marshall Road to Peabody Road, and 40 MPH from Peabody Road to Leisure Town Road.

Existing Traffic Volumes

The City of Vacaville (City) has a count program in which traffic volumes are collected at selected locations throughout the City. This analysis is based on volumes collected during the a.m. and p.m. commuter periods (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.) from Fall 2007 through 2008. While more recent count data became available while this analysis was being accomplished, the newer traffic counts were generally found to be lower, this is assumed to be due to recent economic conditions. The counts used for this study provide a more conservative analysis. The existing traffic volumes and the count data at each intersection are provided in **Appendix O**.

Existing Level of Service

“Level of service” (LOS) describes the operating conditions experienced by motorists. Level of service is a qualitative measure of the effect of a number of factors, including speed and travel time, traffic interruptions, freedom to maneuver, driving comfort, and convenience. Levels of service are designated "A" through "F" from best to worst, which cover the entire range of traffic operations that might occur. Level of Service "A" through "E" generally represents traffic volumes at less than roadway capacity, while LOS "F" represents over capacity and/or forced flow conditions. As described in the Regulatory Context section below, each agency established its own LOS standards for roadways and intersections within its jurisdiction.

Roadway Segments

The Vacaville General Plan established peak hour traffic capacities to achieve LOS C for various roadway facility types. The capacity standards for directional flow are set at 60 percent of bi-directional flow for LOS C and 67.5 percent for LOS D as shown in **Table 4.13-3**.

TABLE 4.13-3
VACAVILLE GENERAL PLAN PEAK-HOUR TRAFFIC CAPACITIES

Facility Type	Peak-Hour Bi-Directional Capacity	Peak-Hour Directional Capacity	Peak-Hour Directional Capacity
	LOS C	LOS C	LOS D
2 lane Arterial	1,500	900	1,013
2 Lane Collector	1,000	600	675
2 lane Local	750	450	506
4 Lane Div. Arterial	3,500	2,100	2,363
4 Lane Arterial	2,500	1,500	1,688
6 Lane Div. Arterial	4,500	2,700	3,038
8 Lane Freeway	12,000	7,200	8,100

Source: City of Vacaville General Plan Transportation Element, 2007; Dowling Associates, 2011 (Appendix O)

The existing roadway volumes and levels of service at the study roadway segments during the PM peak hour are shown in **Table 4.13-4**. Two roadway segments operate at LOS D or below under existing conditions. The segment of Vanden Road south of Foxboro Parkway operates at LOS D. The segment of Peabody Road south of Vacaville City Limits operates below LOS D (e.g. LOS E or below).

Freeway Segments

The freeway mainline segments are analyzed based on methodology outlined in the 2000 *Highway Capacity Manual*. The LOS criteria are provided in **Table 4.13-5**. Two mainline segments on I-80 were selected for analysis. These segments represent the eastern and western segments of the freeway that would be traversed by the highest amounts of project generated trips. Existing traffic counts on the two study freeway segments were not directly available from the California Department of Transportation (Caltrans). Therefore, existing freeway volumes were derived based on available Caltrans counts collected between 2008 and 2010 at nearby freeway mainline segments and ramps. The existing directional operations at these two segments are presented in **Table 4.13-6**. The results indicate that both segments are operating at LOS D or better.

Intersections

The City of Vacaville currently utilizes a planning level of intersection analysis that provides LOS based on a calculation of volume to capacity (V/C) results. The computer software that implements the intersection analysis utilizes an Intersection Capacity Utilization (ICU) method for capacity analysis and is similar to the planning applications described in Interim Materials in Highway Capacity, Transportation Research Board Circular 212. **Table 4.13-7** presents the LOS criteria for signalized intersections.

TABLE 4.13-4
ROADWAY SEGMENT ANALYSIS

Roadway Segment	Facility Type	Volume		LOS C (D) Exceeded?
		SB	NB	
VANDEN ROAD		SB	NB	
South of Alamo Dr	2 lane Arterial	136	427	NO (NO)
North of Leisure Town Rd	2 lane Arterial	130	487	NO (NO)
South of Leisure Town Rd	2 lane Arterial	273	907	YES (NO)
ALAMO DRIVE		WB	EB	
West of Interstate 80 EB Ramps	6 Lane Div. Arterial	1003	1233	NO (NO)
West of Marshall Rd	6 Lane Div. Arterial	1120	1452	NO (NO)
West of Peabody Rd	4 Lane Div. Arterial	908	1190	NO (NO)
West of Nut Tree Rd	4 Lane Div. Arterial	735	644	NO (NO)
West of Vanden Rd	4 Lane Div. Arterial	762	532	NO (NO)
West of Leisure Town Rd	4 Lane Div. Arterial	332	186	NO (NO)
LEISURE TOWN ROAD		SB	NB	
North of EB Ramps	4 Lane Div. Arterial	1022	603	NO (NO)
North of Orange Dr	4 Lane Div. Arterial	1015	745	NO (NO)
North of Sequoia Dr	2 lane Arterial	782	632	NO (NO)
North of Elmira Rd	2 lane Arterial	804	722	NO (NO)
North of Alamo Dr	2 lane Arterial	448	540	NO (NO)
South of Alamo Dr	2 lane Arterial	193	420	NO (NO)
East of Vanden Rd	2 lane Arterial	152	429	NO (NO)
NUT TREE ROAD		SB	NB	
North of Alamo Dr	4 Lane Div. Arterial	674	656	NO (NO)
South of Alamo Dr	4 Lane Div. Arterial	519	463	NO (NO)
PEABODY ROAD		SB	NB	
North of Alamo Dr	4 Lane Arterial	911	882	NO (NO)
South of Alamo Dr	4 Lane Arterial	1092	1002	NO (NO)
North of Foxboro Pkwy	4 Lane Arterial	756	1134	NO (NO)
South of Foxboro Pkwy	4 Lane Arterial	590	1202	NO (NO)
South of City Limits	2 lane Arterial	1091	843	YES (YES)
Note: SB = southbound; NB = northbound; LOS = level of service Bold denotes LOS D and Bold Italicized denotes LOS E or LOS F Source: City of Vacaville, 2011 (Appendix O)				

TABLE 4.13-5
LEVEL OF SERVICE CRITERIA – FREEWAY MAINLINE

Level of Service	Maximum Density
	passenger vehicles per mile per lane
A	11
B	18
C	26
D	35
E	45
F	>45

Source: Transportation Research Board, Highway Capacity Manual, Washington, D.C., 2000, pages 23-3 and 23-4.

TABLE 4.13-6
EXISTING CONDITIONS - FREEWAY MAINLINE LOS SUMMARY

Location	AM Peak Hour			PM Peak Hour		
	Volume	Density ¹	LOS ²	Volume	Density ¹	LOS ²
I-80 West of Lagoon Valley Road						
Eastbound - No Project	4,281	17.1	B	7,083	30.4	D
Westbound - No Project	5,802	23.4	C	6,085	24.8	C
I-80 East of Midway Road						
Eastbound - No Project	2,275	12.1	B	4,395	23.7	C
Westbound - No Project	3,911	20.9	C	3,760	20.1	C

¹ Density = passenger cars per mile per lane
² LOS = Level of Service
 Source: Dowling Associates, Inc., 2011 (Appendix O)

TABLE 4.13-7
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING V/C RATIO

Level of Service	Description of Traffic Conditions	V/C Ratio
A	Operations with very slight delay, with no approach phase fully utilized.	0.00 – 0.60
B	Operations with slight delay, and an occasional approach phase is fully utilized.	0.61 – 0.70
C	Operations with average delay. Individual cycle failures begin to appear.	0.71 – 0.80
D	Operations with tolerable delay. Many vehicles stop and individual cycle failures are noticeable.	0.81 – 0.90
E	Operations with high delay, up to several signal cycles. Long queues form upstream of intersection.	0.91 – 1.00
F	Operation with excessive and unacceptable delays. Volumes vary widely depending on downstream queue conditions.	> 1.00

Source: Intersection Capacity Utilization (ICU) method for capacity analysis.

4.13 Transportation and Circulation

The City of Vacaville has initiated a General Plan update that may include updating intersection analysis methodology to current methods documented in the *Highway Capacity Manual* for all intersections. Mitigation monitoring for this and subsequent projects processed under the updated General Plan will be based on the updated methodology and policy documented in updated General Plan.

A total of 24 intersections were selected for analysis. These intersections are shown in **Figure 4.13-2**. The existing levels of service at the study intersections are shown in **Table 4.13-8**. The intersection of Davis Street and Alamo Drive and the intersection of Peabody Road and Elmira Road are operating at LOS D in either the AM or PM peak hours. The intersection of Davis Street and Hume Way is operating at LOS D in the AM peak hour and LOS E in the PM peak hour. All other intersections operate at LOS C or better.

TABLE 4.13-8
EXISTING INTERSECTION LEVEL OF SERVICE

Number	N-S Street	E-W Street	AM peak hour		PM peak hour	
			LOS	V/C	LOS	V/C
1	Leisure Town Rd	I-80 WB ramps	A	0.4	A	0.42
2	Leisure Town Rd	I-80 EB ramps	A	0.35	A	0.37
3	Leisure Town Rd	Orange Dr	A	0.41	A	0.42
4	Leisure Town Rd	Sequoia Dr	A	0.53	A	0.58
5	Leisure Town Rd	Elmira Rd	A	0.56	B	0.67
6	Leisure Town Rd	Alamo Dr/Fry Rd	A	0.47	A	0.55
7	Vanden Rd	Leisure Town Rd	A	0.43	A	0.5
8	Vanden Rd	Alamo Dr	A	0.48	B	0.65
9	Nut Tree Rd	Alamo Dr	A	0.54	B	0.68
10	Peabody Rd	Alamo Dr	A	0.58	B	0.64
11	Davis St	Alamo Dr	D	0.84	A	0.60
12	Alamo Dr	Marshall Rd	B	0.61	B	0.62
13	Alamo Dr	I-80 EB ramps	B	0.64	A	0.49
14	Alamo Dr	Merchant St	C	0.73	A	0.6
15	Peabody Rd	Elmira Rd	A	0.59	D	0.84
16	Nut Tree Rd	Elmira Rd	A	0.48	A	0.59
17	Nut Tree Rd	Ulatis Rd	A	0.48	C	0.71
18	Peabody Rd	CSP-Solano	A	0.57	C	0.78
19	Peabody Rd	Foxboro Pkwy	A	0.53	B	0.65
20	Peabody Rd	California Dr	A	0.41	A	0.49
21	Peabody Rd	Cliffside Dr	A	0.57	C	0.74
22	Davis St	Hume Wy	D	0.85	E	0.95
23	I-80 WB ramp	Cherry Glen Rd	A	0.12	A	0.14
24	Cherry Glen Rd	I-80 EB ramp	A	0.12	A	0.13

Note: V/C = volume-to-capacity ratio; LOS = level of service
Source: City of Vacaville, 2011 (Appendix O)

Bikeways and Pedestrian Facilities

No bicycle and pedestrian facilities are currently provided at the project site. Bicycle pathways/routes in the immediate project vicinity exist or will be provided as approved developments are constructed. An off-street pedestrian and bicycle path is provided along the east side of Nut Tree Road between Somerville Drive and Opal Drive and the north side of Opal Drive between Nut Tree Road and Newcastle Drive. Sidewalks are provided on existing roadways and are standard improvements required when new streets are built. The project site has included a plan to establish bicycle and pedestrian routes.

Public Transit System

City Coach provides local bus service in Vacaville. No public transit currently serves the project site. The nearest bus stop for City Coach Route 8 is located on Nut Tree Road near Somerville Drive north of the project site. The local bus provides connections to local and regional destinations via the Intermodal Transportation Center located on Allison Drive between Ulatis Drive and Nut Tree Parkway just off I-80. The planned Fairfield/Vacaville Intermodal Train Station, located just to the south of project site, would also provide regional and long-distance services in the future.

4.13.3 REGULATORY CONTEXT

State

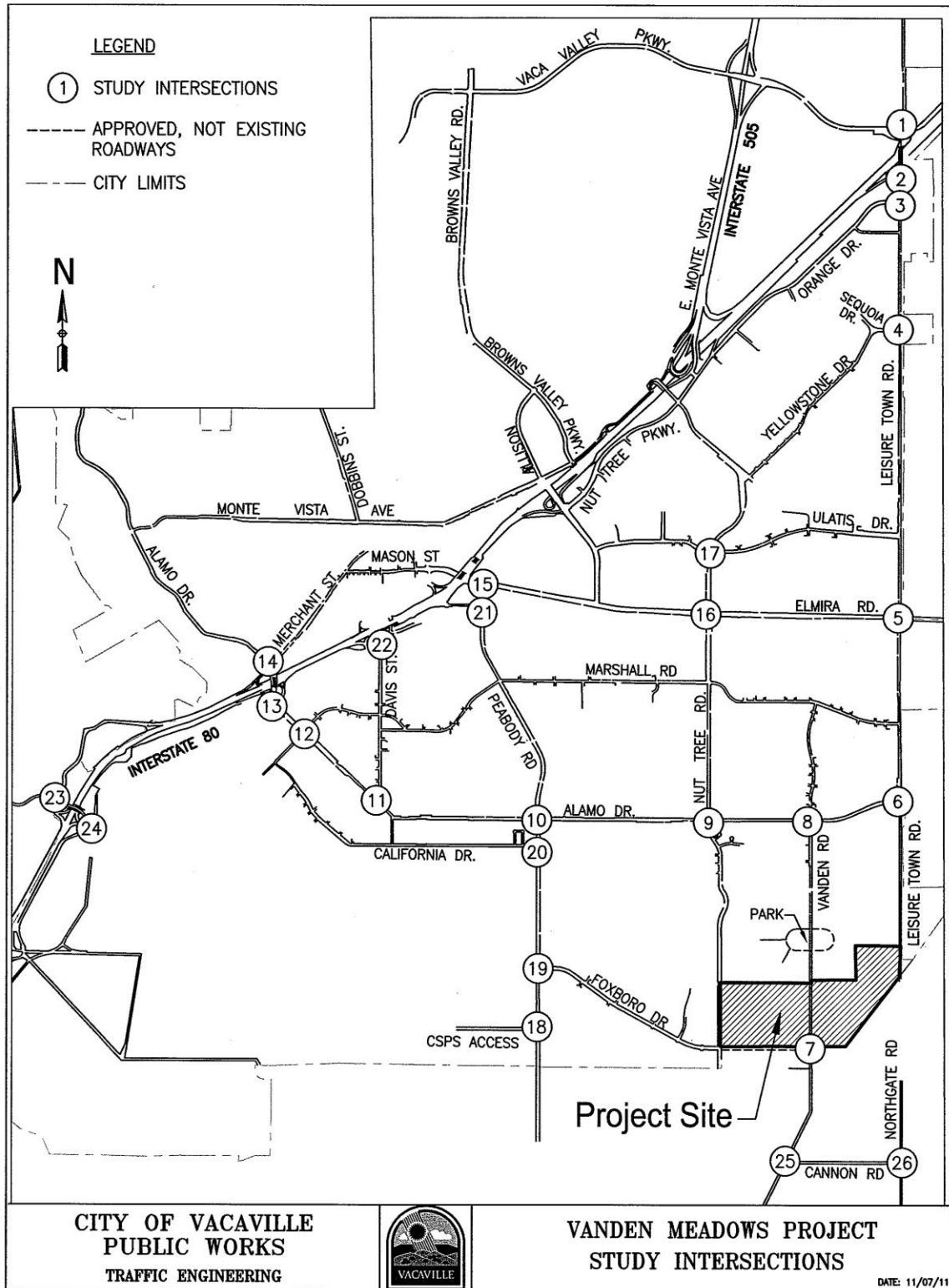
California Department of Transportation (Caltrans)

Caltrans manages interregional transportation, including the management and construction of the California highway system. In addition, Caltrans is responsible for the permitting and regulation of state roadways. The State facilities providing access to and from Vacaville include I-80 and I-505. Caltrans establishes performance standards that apply to specific routes and publishes those standards in transportation concept reports (TCRs). Performance standards in TCRs are often expressed as LOS standards. LOS standards are established based on current operating conditions, surrounding land uses, local policies, and current plans for improvement on the facility.

Caltrans is a Responsible Agency for projects requiring permits for encroaching on land within its jurisdiction. Caltrans reviews projects to ensure that the proposed encroachment is compatible with the primary uses of the State highway system, to ensure the safety of both the permittee and the highway users, and to protect the State's investment in the highway facility. As stated in Caltrans' Traffic Impact Studies Guidelines¹, "Caltrans endeavors to maintain a target LOS at the transition between LOS 'C' and LOS 'D' on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing measures of effectiveness should be maintained".

¹ State of California Department of Transportation, *Guide for The Preparation of Traffic Impact Studies*, December 2002.

Figure 4.13-2 Study Intersections



Caltrans standards for interchange ramp terminal intersections or other state route intersections are typically consistent with the local jurisdiction's standards, which may include the City or County, as well as the Regional Congestion Management Agency, Solano Transportation Authority. For this study, the LOS standard applied to Caltrans-operated intersections is LOS D for intersections located in Vacaville. In Vacaville the LOS goal is LOS C, with LOS D acceptable with decision-maker approval for intersections located in Vacaville.

Regional

Solano Transportation Authority (STA)

The Solano Transportation Authority administers the Congestion Management Program (CMP) for Solano County and would be the Responsible Agency to review conformance of the Proposed Project with the regional CMP. The first CMP for Solano County was adopted in October 1991 and has been updated every two years, most recently in 2009. The CMP requires that the transportation system within the County be monitored biennially for compliance with LOS standards. Each jurisdiction is responsible for monitoring the LOS on segments or intersections within its jurisdiction. The LOS standard for the County CMP facilities has been set at a minimum of LOS E for all roadways except for those already operating at LOS F when the first CMP was prepared. The CMP applies the LOS E threshold primarily to roadway segments, not intersections. Therefore, for purposes of intersection analysis, the local jurisdiction's LOS threshold should be applied.

The CMP transportation system includes all of the state routes in the County and other Routes of Regional Significance. In the project vicinity, such routes include Peabody Road between the Vacaville city limits and California Drive where the CMP standard is LOS E, and Vanden Road between Peabody Road and Leisure Town Road where the CMP standard is LOS D. The freeway network is also a part of the CMP system. In the project vicinity, the CMP standard for I-80 is LOS F with the exception of the segment between post mile 23.034 and 24.08, where the standard is LOS E. This segment is located near Cherry Glen Road/Lagoon Valley Road. A comprehensive list of the Routes of Regional Significance is available in the CMP.

The biennial LOS measurements submitted to the STA may exclude trips generated by high density residential development located within ¼ mile of a fixed rail passenger station or traffic generated by any mixed use development located within ¼ mile of a fixed rail passenger station, if more than half of the land area, or floor area of the mixed use development is used for high density residential housing. Reasoning and supporting measurements of such traffic exclusion is the responsibility of the submitting jurisdiction and should be submitted in writing to the STA for review and approval.

In addition to LOS, the CMP considers four other performance measures. These performance measures are travel times to and from work, ridership for intercity transit, bicycle and pedestrian movement, and multimodal split.

In the CMP, the STA commits to the following projects in Vacaville or near the project site:

- New Fairfield/Vacaville Intermodal Train Station (in construction) for Capital Corridor and intercity rail service (Station). The Station will be located at the corner of Peabody Road and Vanden Road in northeast Fairfield. It is anticipated that the station will open around 2014. The Capital Corridor has authorized its trains to utilize the station upon its opening.
- Construct a 200 space at-grade parking lot as Phase 1 of the Vacaville Intermodal Station located on Allison Drive just south of Interstate 80 (recently completed),
- Construct a four-lane Jepson Parkway as an intercity route between Suisun City, Fairfield and Vacaville. The planned alignment within the project vicinity includes Vanden Road between Peabody Road and Leisure Town Road, and Leisure Town Road between Vanden Road and the I-80 interchange.
- Construct a planned 400-space parking garage as Phase 2 of the Vacaville Intermodal Transportation Station.

In addition to administering the CMP, STA is heading up a process reviewing implementation of a Transportation Impact Fee program to establish a funding source for improvements determined to be impacted by regional development. City of Vacaville decision makers and staff have representatives on the Policy and Technical Advisory committees guiding the policy being incorporated into this program.

Local

Solano County

Solano County would be the Responsible Agency to review and assess the impacts of the Proposed Project on county roadways. The Transportation and Circulation Element of the Solano County General Plan (2008) establishes policies and standards for transportation. Furthermore, Section 1–4 of the Solano County Road Improvement Standards and Land Development Requirements establishes LOS C as the standard for all roads and intersections. This standard requires all projects to maintain a level of service of C except where the existing LOS is below C, at which point the project should not decrease the existing LOS.

City of Fairfield

The City of Fairfield is the Responsible Agency to review and assess the impacts of the Proposed Project on City roadways. Objective C1 3 of the City of Fairfield’s General Plan Circulation Element requires intersections to maintain a peak hour LOS of D or better for arterial intersections, LOS C or better for collector intersections, and LOS B or better for local intersections unless other public health, safety, or welfare factors determine otherwise.

City of Vacaville

City of Vacaville is the responsible agency for the transportation infrastructure within its City limits and should apply the same standards to areas within the recently approved Urban Limit Line. Vacaville General Plan Guiding Policy 6.1-G 1 establishes LOS C as the minimum standard at all intersections, interchanges, and road links. Guiding Policies 6.1-G 2 and 6.1–G 3 allow LOS D, E, or F under special

circumstances and as approved by the City. Based on these policies, LOS D is established to be a potentially significant impact, and the transition from LOS D to LOS E as a significant impact. Vacaville's General Plan is currently being updated and the updated General Plan may include revisions to the current LOS policies upon adoption.

The City of Vacaville has a Development Impact Fee Program that has established costs for the cumulative impacts that development will have on transportation infrastructure. Further, the Vacaville Land Use and Development Code Traffic Impact Mitigation Chapter provides a basis to condition development to provide transportation improvements. It is the intent of this program and policy to establish fair share contributions for mitigating cumulative transportation impacts from all responsible developments, rather than use up available transportation capacity over time until mitigation is found to be warranted, which would not hold prior developments accountable for their contributions to the impacts.

4.13.4 IMPACTS AND MITIGATION MEASURES

Method of Analysis

This section identifies impacts to transportation and circulation that could occur from the implementation of the Proposed Project under existing, near term and cumulative conditions. Impacts to transportation and circulation were analyzed based on an examination of the project site and published information regarding transportation and circulation within the project area, and comparison of these factors to the significance criteria listed below. If significant impacts may occur, mitigation measures are included to increase the compatibility and safety of the Proposed Project and reduce impacts to less-than-significant levels. Impacts that were determined to be less than significant in the Initial Study do not warrant further analysis and are not discussed within this EIR.

This transportation impact assessment has been conducted in a manner consistent with the requirements and methodologies of the City of Vacaville, and transportation planning industry standards. This traffic analysis describes the operational characteristics of the existing study area, circulation system, determines the circulation system needs based on future traffic demand, and summarizes the potential circulation impacts associated with the development of the proposed project.

Project Land Use and Circulation

The Proposed Project includes a series of local and collector streets within the Specific Plan area that would serve the project land uses and would complete a portion of the transportation network in southeast Vacaville as it was envisioned in the General Plan by providing an east-west connection. It assumes the extension of Foxboro Parkway to connect with Leisure Town Road (Option 1) to the east and the realignment of Vanden Road to the west at Foxboro Parkway to provide a discontinuous roadway. Besides Foxboro Parkway, a new "Street A" would also connect the realigned Vanden Road to Nut Tree Road. The Proposed Project has been included in the cumulative land use projections in regional transportation models, i.e. the Solano-Napa Regional Travel Model operated and maintained by Solano Transportation Authority.

For each of the study scenarios, a “without Foxboro Parkway extension” access option (Option 2) was also analyzed for the study intersections. The roadway network was revised to remove the Foxboro Parkway extension between Nut Tree Road and the realigned Vanden Road. Under the No Project conditions with this option, Foxboro Parkway was not assumed to be extended between Nut Tree Road and Vanden Road. Under the With Project condition with this option, Vanden Road is realigned to the west and a connecting road is provided between the off-set segments of Vanden Road. Traffic would use Street A between Vanden Road and Nut Tree Road.

The roadway network for both the Project and the Project without Foxboro Parkway Extension are shown in **Figure 4.13-3** and **Figure 4.13-4**.

Trip Generation and Distribution

Table 4.13-9 presents the estimated number of trips generated by the proposed project and by the project without the Foxboro Parkway Extension on a daily basis as well as the AM and PM peak hours. The projected project trip generation is based on the proposed land uses and trip generation rates in the *Trip Generation, 7th Edition* informational report published by the Institute of Transportation Engineers (ITE). For residential uses, peak hour trip generation rates are factored for local conditions based on a sample of recent field counts. It is noted that the factored trip rates for residential uses are higher and closer to ITE rates than the comparable calibrated trip rates in the Vacaville Citywide Traffic Model. The project trips are distributed onto the roadway network by the Vacaville Citywide Traffic Model, consistent with standard Vacaville traffic analysis procedures. Elimination of the Foxboro Parkway Extension from the Proposed Project would alter the distribution of trips on the roadway network while the trip generation rate would remain unchanged.

Thresholds of Significance

Criteria for determining the significance of impacts to traffic and circulation have been developed based on Appendix G of the California Environmental Quality Act's (CEQA) *Guidelines* and relevant agency guidelines. Impacts to the existing transportation network would be considered significant if the Proposed Project would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. For the purpose of this analysis, impacts at locations under the City of Vacaville jurisdiction would be considered significant if the Project would:
 - Cause a roadway or intersection to operate at LOS D or worse on a long-term basis (when the roadway or intersection operates at LOS C or better without the Project);
 - Significant impair operation of a nearby intersection that operates, or is projected to operate, at unacceptable levels without the Project such that the v/c ratio is degraded by a total of 0.02 or greater by the Project;

TABLE 4.13-9
ESTIMATED PROJECT TRIP GENERATION

Description	Quantity	ITE Trip Rate ¹	Vacaville Factor ²	Vacaville Trip Rate	Trips
AM PEAK HOUR (BETWEEN 7:00- 9:00 AM)					
Single Family (SF)	650 Units	0.75	0.94	0.71	462
Medium Density (RMD)	97 Units	0.67	0.94	0.63	61
High Density (RHD)	192 Units	0.475	0.94	0.45	86
<i>Subtotal</i>	<i>939 Units</i>				<i>609</i>
Elem. & Junior High School (ESC) per student	2000 Students	0.53	1	0.53	1,060
TOTAL AM PEAK HOUR TRIPS					1,669
PM PEAK HOUR (BETWEEN 4:00- 6:00 PM)					
Description	Quantity	ITE Trip Rate	Vacaville Factor	Vacaville Trip Rate	Trips
Single Family (SF)	650 Units	1.01	0.92	0.93	605
Medium Density (RMD)	97 Units	0.78	0.92	0.72	70
High Density (RHD)	192 Units	0.62	0.92	0.57	109
<i>Subtotal</i>	<i>939 Units</i>				<i>784</i>
Elem. & Junior High School (ESC) per student	2000 Students	0.15	1	0.15	300
TOTAL PM PEAK HOUR TRIPS					1,084
DAILY					
Description	Quantity	ITE Trip Rate	Vacaville Factor	Vacaville Trip Rate	Trips
Single Family (SF)	650 Units	9.57	1.02	9.76	6344
Medium Density (RMD)	97 Units	7.39	1.02	7.54	731
High Density (RHD)	192 Units	6.72	1.02	6.85	1315
<i>Subtotal</i>	<i>939 Units</i>				<i>8390</i>
Elem. & Junior High School (ESC) per student	2000 Students	1.455	1	1.455	2,910
TOTAL AVERAGE DAILY TRIPS					11,300
¹ ITE Trip Rates - Institute of Transportation Engineers, <i>Trip Generation</i> , 7th Edition ² Vacaville Factor is based on recent sample counts for Single Family residential areas compared to ITE Rate(Vacaville Rate/ITE Rate) Source: City of Vacaville, 2011 (Appendix O)					

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in area traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; and/or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Figure 4.13-3 Project Roadway Network

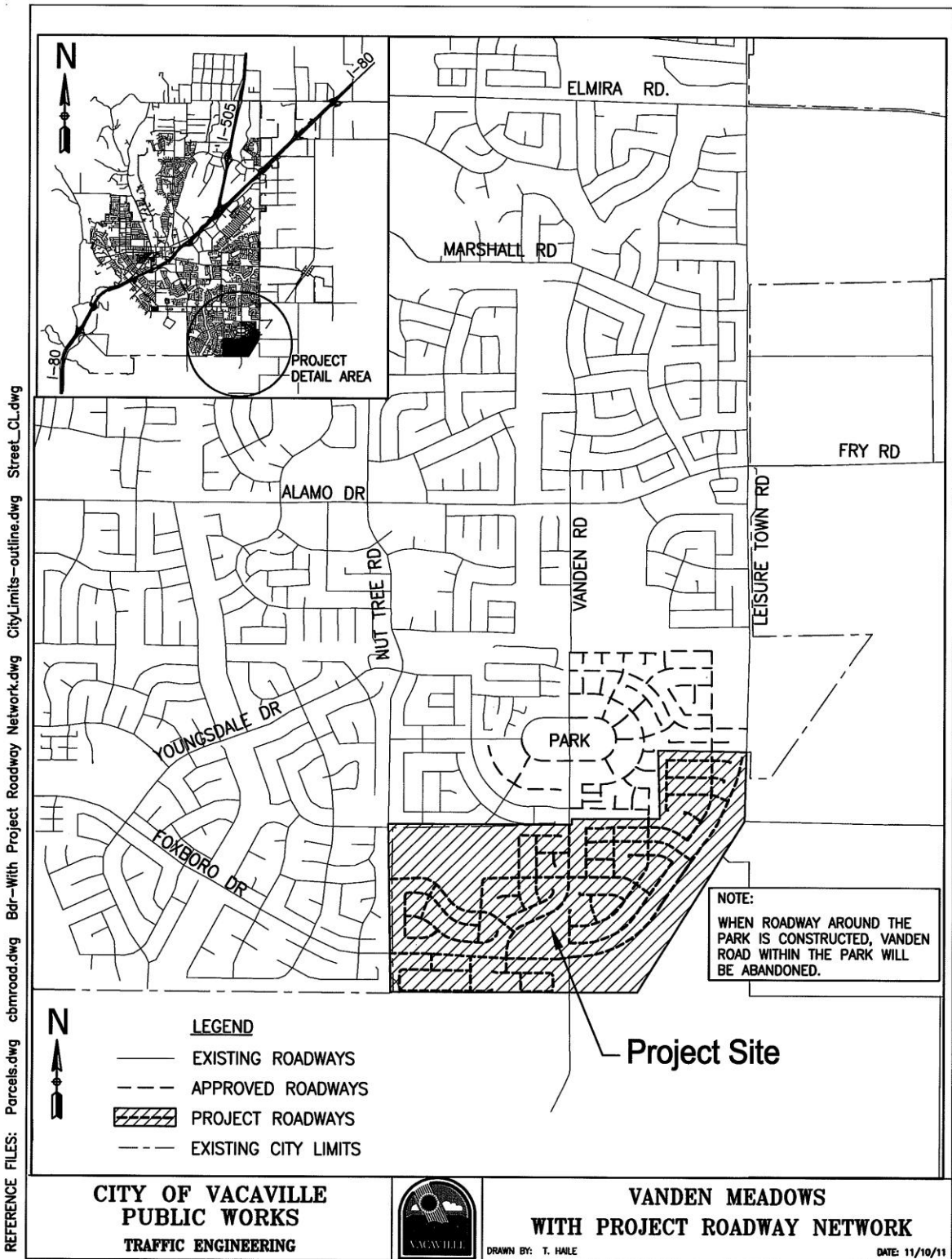
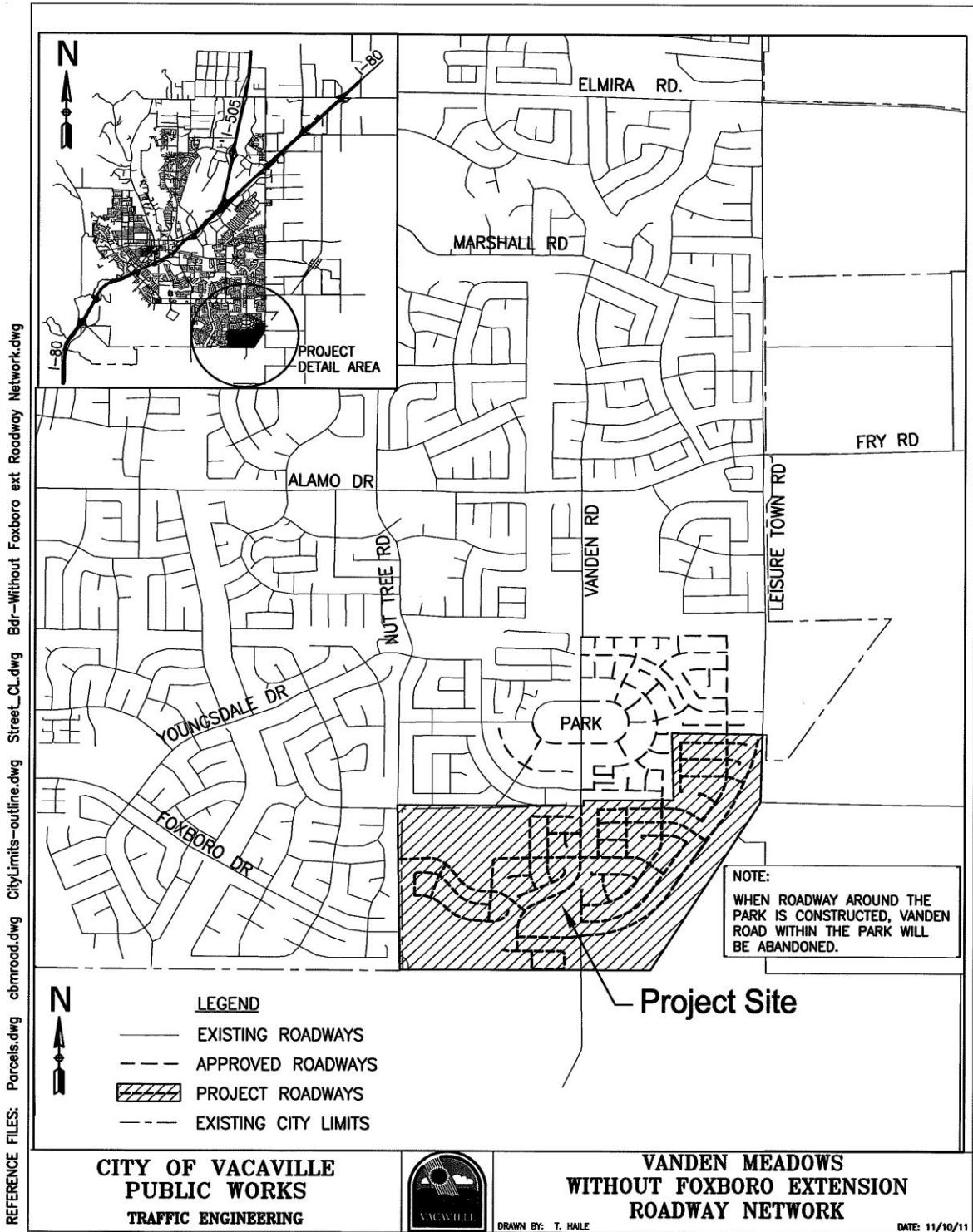


Figure 4.13-4 Project Roadway Network without Foxboro Parkway Extension



Effects Found Not to be Significant

As discussed within the Initial Study of the Proposed Project (see **Appendix B**), the Proposed Project would not result in a change in area traffic patterns or propose changes to area roadway design features or uses. The realignment of Vanden Road and the extension of Foxboro Parkway are proposed as a part of the approved Southtown Development project and are consistent with the General Plan. Street design within the Specific Plan area would be accomplished in accordance with State and local design standards. The adequacy of emergency service access would comply with State and local design standards and would be reviewed as a part of the approval process of the project's detail plans to ensure compliance. Therefore, further discussion of these issue areas is not included within this EIR.

Project Specific Impacts and Mitigation Measures

Existing Conditions

An analysis of existing conditions was performed to determine the potential transportation impacts of the Proposed Project with and without the Foxboro Parkway Extension. Full development of the Proposed Project is assumed to occur "instantaneously". In this manner, the traffic and impacts associated with the Proposed Project can be directly compared to known and measured conditions.

Roadway Segments

Impact

4.13-1 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on Vacaville and Solano County roadways beyond acceptable capacities under Existing Conditions.

The operations results for roadway segments in the PM peak hour are presented in **Table 4.13-10**. Under Existing Conditions, two roadways would operate at LOS D or below:

- Vanden Road south of Leisure Town Road – LOS D
- Peabody Road south of Vacaville City Limits – below LOS D

With the addition of project traffic, the same two segments would continue to operate at substandard levels as described below.

The Vanden Road segment south of Leisure Town Road would continue to operate at LOS D with the addition of project traffic with and without the Foxboro Parkway Extension. This segment is located in Solano County and is a designated Route of Regional Significance. The CMP standard on this regional route is LOS D; therefore, the segment operations would be within the acceptable standard with the addition of project trips. The County allows the operations to fall below its LOS C standard as long as the existing LOS level is maintained. Since the segment is already operating at LOS D under Existing No Project conditions and the project would not cause the LOS level to further deteriorate, the project impact would be less than significant. The approved Jepson Parkway project includes widening of Vanden Road and Leisure Town Road to

TABLE 4.13- 10
ROADWAY SEGMENT ANALYSIS – EXISTING CONDITIONS (PM PEAK HOUR)

ROADWAY SEGMENT	FACILITY TYPE	LOS C (D) DIRECTIONAL CAPACITY	No Project			With Project		
			VOLUME		LOS C (D) EXCEEDED?	VOLUME		LOS C (D) EXCEEDED?
VANDEN ROAD			SB	NB		SB	NB	
S of Alamo Dr	2 lane Arterial	900 (1013)	136	427	NO (NO)	174	447	NO (NO)
North of Leisure Town Rd (NP) or North of Foxboro Pkwy Extension (with Project)	2 lane Arterial	900 (1013)	130	487	NO (NO)			
	2 Lane Collector	600 (675)				183	306	NO (NO)
South of Leisure Town Rd	2 lane Arterial	900 (1013)	273	907	YES (NO)	334	1003	YES (NO)
ALAMO DRIVE			WB	EB		WB	EB	
W of Interstate 80 EB Ramps	6 Lane Div. Arterial	2700 (3038)	1003	1233	NO (NO)	1010	1318	NO (NO)
W of Marshall Rd	6 Lane Div. Arterial	2700 (3038)	1120	1452	NO (NO)	1207	1660	NO (NO)
W of Peabody Rd	4 Lane Div. Arterial	2100 (2363)	908	1190	NO (NO)	1011	1366	NO (NO)
W of Nut Tree Rd	4 Lane Div. Arterial	2100 (2363)	735	644	NO (NO)	864	810	NO (NO)
W of Vanden Rd	4 Lane Div. Arterial	2100 (2363)	762	532	NO (NO)	773	565	NO (NO)
W of Leisure Town Rd	4 Lane Div. Arterial	2100 (2363)	332	186	NO (NO)	334	187	NO (NO)
LEISURE TOWN ROAD			SB	NB		SB	NB	
N of EB Ramps	6 Lane Div. Arterial	2700 (3038)	1022	603	NO (NO)	1065	617	NO (NO)
N of Orange Dr	6 Lane Div. Arterial	2700 (3038)	1015	745	NO (NO)	1100	768	NO (NO)
N of Sequoia Dr	2 lane Arterial	900(1013)	782	632	NO (NO)	873	658	NO (NO)
N of Elmira Rd	2 lane Arterial	900(1013)	804	722	NO (NO)	901	753	NO (NO)

4.13 Transportation and Circulation

ROADWAY SEGMENT	FACILITY TYPE	LOS C (D) DIRECTIONAL CAPACITY	No Project			With Project		
			VOLUME		LOS C (D) EXCEEDED?	VOLUME		LOS C (D) EXCEEDED?
N of Alamo Dr	2 lane Arterial	900(1013)	448	540	NO (NO)	570	585	NO (NO)
S of Alamo Dr	2 lane Arterial	900(1013)	193	420	NO (NO)	328	471	NO (NO)
E of Vanden Rd	2 lane Arterial	900(1013)	152	429	NO (NO)	195	455	NO (NO)
NUT TREE ROAD			SB	NB		SB	NB	
N of Alamo Dr	4 Lane Div. Arterial	2100 (2363)	674	656	NO (NO)	789	826	NO (NO)
S of Alamo Dr	4 Lane Div. Arterial	2100 (2363)	519	463	NO (NO)	771	704	NO (NO)
PEABODY ROAD			SB	NB		SB	NB	
North of Alamo Dr	4 Lane Arterial	1500(1688)	911	882	NO (NO)	932	899	NO (NO)
S of Alamo Dr	4 Lane Arterial	1500(1688)	1092	1002	NO (NO)	1152	1016	NO (NO)
N of Foxboro Pkwy	4 Lane Arterial	1500(1688)	756	1134	NO (NO)	854	1149	NO (NO)
S of Foxboro Pkwy	4 Lane Arterial	1500(1688)	590	1202	NO (NO)	591	1205	NO (NO)
S of City Limits	2 lane Arterial	900(1013)	1091	843	YES (YES)	1104	843	YES (YES)
N = North; S = South; E = East; W = West Bold denotes LOS D and <i>Bold Italicize</i> denotes LOS E or LOS F Source: City of Vacaville, 2011 (Appendix O)								

a four-lane divided arterial standard. The widening of Vanden Road within Solano County is currently in design and a funding agreement is being finalized. This improvement would maintain an acceptable level of service for this segment of Vanden Road. **Less than Significant.**

The Peabody Road segment south of Vacaville City Limits would continue to operate at LOS E with the additional of project traffic with and without the Foxboro Parkway Extension. This segment is located in Solano County and is also a designated Route of Regional Significance. The CMP standard on this segment is LOS E; therefore, the segment operations would be within the acceptable standard. The County allows the operations to fall below its LOS C standard as long as the existing LOS level is maintained. Since the segment is already operating at LOS E under Existing (No Project) conditions and the project would not cause the LOS level to further deteriorate, the project impact would be less than significant. **Less than Significant.**

Freeway Segments

Impact

4.13-2 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on area freeway beyond acceptable capacities under Existing Conditions.

As shown in **Table 4.13-6**, the freeway mainline segments operate at LOS D or better under Existing (No Project) conditions. **Tables 4.13-11 and 4.13-12** show that with the addition of project-generated traffic, the freeway mainline segments would continue to operate at acceptable levels. Therefore, the project impact is less than significant.

TABLE 4.13-11
EXISTING PLUS PROJECT CONDITIONS - FREEWAY MAINLINE LOS SUMMARY

Location	AM Peak Hour			PM Peak Hour		
	Volume	Density ¹	LOS ²	Volume	Density ¹	LOS ²
I-80 West of Lagoon Valley Road						
Eastbound - No Project	4,281	17.1	B	7,083	30.4	D
Eastbound - With Project	4,343	17.4	B	7,272	31.7	D
Westbound - No Project	5,802	23.4	C	6,085	24.8	C
Westbound - With Project	6,003	24.4	C	6,144	25.1	C
I-80 East of Midway Road						
Eastbound - No Project	2,275	12.1	B	4,395	23.7	C
Eastbound - With Project	2,317	12.4	B	4,408	23.8	C
Westbound - No Project	3,911	20.9	C	3,760	20.1	C
Westbound - With Project	3,937	21.0	C	3,797	20.3	C
¹ Density = passenger cars per mile per lane ² LOS = Level of Service Source: Dowling Associates, Inc., 2011 (Appendix O)						

TABLE 4.13-12
 EXISTING PLUS PROJECT CONDITIONS - FREEWAY MAINLINE LOS SUMMARY
 (WITHOUT FOXBORO PARKWAY EXTENSION)

Location	AM Peak Hour			PM Peak Hour		
	Volume	Density ¹	LOS ²	Volume	Density ¹	LOS ²
I-80 West of Lagoon Valley Road						
Eastbound - No Project	4,282	17.1	B	7,080	30.4	D
Eastbound - With Project	4,342	17.4	B	7,256	31.6	D
Westbound - No Project	5,799	23.4	C	6,085	24.8	C
Westbound - With Project	5,987	24.3	C	6,141	25.0	C
I-80 East of Midway Road						
Eastbound - No Project	2,275	12.1	B	4,398	23.7	C
Eastbound - With Project	2,314	12.3	B	4,410	23.8	C
Westbound - No Project	3,912	20.9	C	3,761	20.1	C
Westbound - With Project	3,938	21.0	C	3,795	20.2	C
¹ Density = passenger cars per mile per lane ² LOS = Level of Service Source: Dowling Associates, Inc., 2011 (Appendix O)						

Intersections

Impact

4.13-3 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic at study intersections beyond acceptable capacities under Existing Conditions.

The operations results for study intersections in the AM and PM peak hours are presented in **Tables 4.13-13** and **4.13-14**. Under Existing conditions, the following intersections would operate at LOS D or below during one or both peak hours:

- Davis Street and Alamo Drive (#11) – AM peak hour
- Peabody Road and Elmira Road (#15) – PM peak hour
- Davis Street and Hume Way (#22) – AM and PM peak hours

The project would contribute to the already substandard operations at these three intersections with and without the Foxboro Parkway Extension. Furthermore, the project, with the Foxboro Parkway Extension only, would cause the Alamo Drive and Merchant Street intersection to degrade to LOS D in the AM peak hour. However, as discussed below, the project impact is considered to be less than significant at the Peabody Road and Elmira Road intersection and at the Davis Street and Hume Way intersection.

The Peabody Road and Elmira Road intersection and the Davis Street and Hume Way intersection would operate below acceptable standard with and without the project. However, the project would not increase the v/c by 0.02 or more. Therefore, the project impacts are considered to be less than significant.

TABLE 4.13-13
EXISTING AND WITH PROJECT CONDITIONS – AM PEAK HOUR

No.	N-S STREET	E-W STREET	Existing		Existing with Project	
			LOS	V/C	LOS	V/C
1	Leisure Town Rd	I-80 WB ramps	A	0.40	A	0.41
2	Leisure Town Rd	I-80 EB RAMPS	A	0.35	A	0.35
3	Leisure Town Rd	Orange Dr	A	0.41	A	0.44
4	Leisure Town Rd	Sequoia Dr	A	0.53	A	0.58
5	Leisure Town Rd	Elmira Rd	A	0.56	B	0.62
6	Leisure Town Rd	Alamo Dr/Fry Rd	A	0.47	A	0.53
7	Vanden Rd	Leisure Town Rd	A	0.43	A	0.52
8	Vanden Rd	Alamo Dr	A	0.48	A	0.51
9	Nut Tree Rd	Alamo Dr	A	0.54	C	0.75
10	Peabody Rd	Alamo Dr	A	0.58	B	0.64
11	Davis St	Alamo Dr	D	0.84	D	0.88
12	Alamo Dr	Marshall Rd	B	0.61	B	0.65
13	Alamo Dr	I-80 EB ramps	B	0.64	B	0.69
14	Alamo Dr	Merchant St	C	0.73	D	0.81
15	Peabody Rd	Elmira Rd	A	0.59	A	0.59
16	Nut Tree Rd	Elmira Rd	A	0.48	A	0.51
17	Nut Tree Rd	Ulatis Rd	A	0.48	A	0.51
18	Peabody Rd	CSP-Solano	A	0.57	A	0.57
19	Peabody Rd	Foxboro Pkwy	A	0.53	A	0.53
20	Peabody Rd	California Dr	A	0.41	A	0.42
21	Peabody Rd	Cliffside Dr	A	0.57	A	0.59
22	Davis St	Hume Wy	D	0.85	D	0.85
23	I-80 WB ramp	Cherry Glen Rd	A	0.12	A	0.12
24	Cherry Glen Rd	I-80 EB ramp	A	0.12	A	0.12
25	Vanden Rd	Canon Rd	B	0.68	C	0.73
26	Northgate Rd	Canon Rd	B	0.69	C	0.73

LOS based on Existing + Approved Project Model Results
City Project for the improvement of Davis Street at Hume is currently in construction
Bold denotes LOS D.
Source: City of Vacaville, 2011 (Appendix O)

TABLE 4.13-14
EXISTING AND WITH PROJECT CONDITIONS – PM PEAK HOUR

No.	N-S STREET	E-W STREET	Existing		Existing with Project	
			LOS	V/C	LOS	V/C
1	Leisure Town Rd	I-80 WB ramps	A	0.42	A	0.44
2	Leisure Town Rd	I-80 EB RAMPS	A	0.37	A	0.39
3	Leisure Town Rd	Orange Dr	A	0.42	A	0.45
4	Leisure Town Rd	Sequoia Dr	A	0.58	B	0.64
5	Leisure Town Rd	Elmira Rd	B	0.67	C	0.73
6	Leisure Town Rd	Alamo Dr/Fry Rd	A	0.55	A	0.58
7	Vanden Rd	Leisure Town Rd	A	0.5	A	0.60
8	Vanden Rd	Alamo Dr	B	0.65	B	0.66
9	Nut Tree Rd	Alamo Dr	B	0.68	C	0.80
10	Peabody Rd	Alamo Dr	B	0.64	B	0.68
11	Davis St	Alamo Dr	A	0.60	B	0.67
12	Alamo Dr	Marshall Rd	B	0.62	B	0.70
13	Alamo Dr	I-80 EB ramps	A	0.49	A	0.51
14	Alamo Dr	Merchant St	A	0.6	B	0.62
15	Peabody Rd	Elmira Rd	D	0.84	D	0.84
16	Nut Tree Rd	Elmira Rd	A	0.59	B	0.62
17	Nut Tree Rd	Ulatis Rd	C	0.71	C	0.74
18	Peabody Rd	CSP-Solano	C	0.78	C	0.78
19	Peabody Rd	Foxboro Pkwy	B	0.65	C	0.71
20	Peabody Rd	California Dr	A	0.49	A	0.51
21	Peabody Rd	Cliffside Dr	C	0.74	C	0.75
22	Davis St	Hume Wy	E	0.95	E	0.95
23	I-80 WB ramp	Cherry Glen Rd	A	0.14	A	0.14
24	Cherry Glen Rd	I-80 EB ramp	A	0.13	A	0.13

LOS based on Existing + Approved Project Model Results
City Project for the improvement of Davis Street at Hume is currently in construction
Bold denotes LOS D and **Bold Italicized** denotes LOS E or LOS F
Source: City of Vacaville, 2011

The Davis Street and Alamo Drive intersection would operate at LOS D with and without the project and the project would increase the v/c by more than 0.02. Therefore, the project impact is considered potentially significant. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-3a. The City shall accept LOS D as the standard for the intersection as allowed by City General Plan Policies. The City of Vacaville shall continue to monitor the operation of the AM peak hour intersection operation to maintain an acceptable LOS. Based on the outcome of the monitoring, the City shall optimize signal timing and update transportation portion of Vacaville Development Impact Fee Program to consider funding improvements at this intersection to address cumulative

impact. Upon implementation of the measure, the project impact would be **less than significant**.

The Alamo Drive and Merchant Street intersection would degrade from LOS C to LOS D with the addition of project traffic. This is considered a potentially significant impact. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-3b. The City shall widen northbound (Alamo Drive) approach to provide a third left turn lane and a free right turn under signal control. With the improvement, the intersection operations would improve to operate within acceptable standards. The Project shall pay transportation portion of the Development Impact Fees that would provide funding towards the implementation of this improvement. Alternatively, should widening be determined unfeasible, the City may accept LOS D as the standard at this intersection as allowed by City General Plan Policies. Upon implementation of the measure, the project impact would be **less than significant**.

Alternative Modes

Impacts

4.13-4 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to affect the bicycle and pedestrian systems under Existing plus Approved Projects conditions.

The proposed project with or without the Foxboro Parkway Extension would result in an increase in bicycle and pedestrian trips in the study area by residents and visitors. However, the project is not anticipated to hinder or eliminate the existing bikeways or pedestrian way or interfere with the implementation of the planned bicycle and pedestrian improvements in the study area. The project would provide off-street multi-use paths along the frontage of the site on Leisure Town Road, which is consistent with the approved Jepson Parkway Concept Plan. The paths would also be provided along both sides of Foxboro Parkway Extension and collector roads within the Specific Plan area. Such provisions would result in enhanced bicycle and pedestrian connectivity between the existing neighborhoods to the north and west of the project site and between existing and future bikeways in the southeastern portion of Vacaville. Further, the project is not anticipated to result in unsafe condition for pedestrians and bicyclists. Therefore, the project impact would be less than significant. **Less than Significant.**

4.3-5 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to affect the public transit under Existing plus Approved Projects conditions.

The proposed project with or without the Foxboro Parkway Extension would result in an increase demand for transit service. However, the level of transit usage is not expected to exceed the capacity of the available/planned transit system in the study area. The City may explore modification to the existing City Coach Route 8 to better serve the project site. The project impact is less than significant. **Less than Significant.**

Existing plus Approved Projects Conditions

An analysis of Existing plus Approved Projects conditions was performed to determine the potential traffic impacts of the Proposed Project with and without the Foxboro Parkway Extension in combination with other projects that have already been approved but not yet built. The project would not cause additional impacts beyond those already identified for existing conditions in the areas of bikeways and pedestrian facilities and transit service.

Roadway Segments

Impact

4.13-6 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on Vacaville and Solano County roadways beyond acceptable capacities under Existing plus Approved Projects Conditions.

The operations results for roadway segments are presented in **Table 4.13-15**. Under Existing plus Approved Projects conditions, five roadway segments would operate at LOS D or below and may exceed acceptable standards. Generally, the operations are similar with or without the Foxboro Parkway Extension exceptions for the following roadway segments:

- Leisure Town Road north of Sequoia Drive – below LOS D
- Peabody Road south of Alamo Drive – LOS D
- Peabody Road north of Foxboro Parkway (with Foxboro Parkway Extension only) – LOS D
- Peabody Road south of Foxboro Parkway (with Foxboro Parkway Extension only) – LOS D
- Peabody Road south of City Limits – below LOS D

With the addition of project-generated traffic, the same five roadway segments cited above would continue to operate at LOS D or below. Furthermore, the Vanden Road north of Foxboro Parkway Extension segment would operate at LOS D without the Foxboro Parkway Extension.

The segment of Vanden Road north of Foxboro Parkway Extension would operate at LOS D with the addition of project trips without the installation of the full Foxboro Parkway Extension. This is a potentially significant impact. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-6a. The City shall accept LOS D as the standard for this roadway segment as allowed by the City General Plan Policies.

The segment of Leisure Town Road north of Sequoia would operate at below LOS D with or without the addition of project traffic. This Leisure Town Road segment is a part of the approved Jepson Parkway project that would improve the roadway to a four-lane arterial. With the implementation of the Jepson Parkway improvements, the segment would operate at LOS C or better under Existing plus Approved Projects conditions. However, because the Jepson Parkway project is not under the City's jurisdiction, the timing and implementation is not under the City's

control and therefore the impact would be significant and unavoidable. **Significant and Unavoidable.**

TABLE 4.13-15
ROADWAY SEGMENT ANALYSIS - EXISTING PLUS APPROVED PROJECTS PM PEAK HOUR

ROADWAY SEGMENTS	FACILITY TYPE	No Project			With Project		
		VOLUME		LOS C (D) EXCEEDED?	VOLUME		LOS C (D) EXCEEDED?
VANDEN ROAD		SB	NB		SB	NB	
S of Alamo Dr	2 lane Arterial	265	148	NO (NO)	287	147	NO (NO)
N of Cogburn Wy	2 lane Arterial	154	96	NO (NO)	181	100	NO (NO)
N of Newcastle Dr	2 lane Arterial	85	78	NO (NO)	89	80	NO (NO)
N of Leisure Town Rd (No Project) or N of Foxboro Pkwy Extension (with Project)	2 lane Arterial	77	130	NO (NO)	N/A	N/A	N/A
	2 Lane Collector	N/A	N/A	N/A	112	237	NO (NO)
S of Foxboro Pkwy	2 lane Arterial	546	835	NO (NO)	596	893	NO (NO)
ALAMO DRIVE		WB	EB		WB	EB	
W of Interstate 80 EB Ramps	6 Lane Div. Arterial	1853	665	NO (NO)	1933	669	NO (NO)
W of Marshall Rd	6 Lane Div. Arterial	1220	2189	NO (NO)	1292	2290	NO (NO)
W of Peabody Rd	4 Lane Div. Arterial	1031	1622	NO (NO)	1115	1694	NO (NO)
W of Nut Tree Rd	4 Lane Div. Arterial	707	1062	NO (NO)	816	1190	NO (NO)
W of Vanden Rd	4 Lane Div. Arterial	359	469	NO (NO)	352	507	NO (NO)
W of Leisure Town Rd	4 Lane Div. Arterial	319	182	NO (NO)	316	169	NO (NO)
LEISURE TOWN ROAD		SB	NB		SB	NB	
N of EB Ramps	6 Lane Div. Arterial	2030	1101	NO (NO)	2087	1105	NO (NO)
N of Orange Dr	6 Lane Div. Arterial	1540	644	NO (NO)	1597	661	NO (NO)
N of Sequoia Dr	2 lane Arterial	1190	425	YES (YES)	1256	447	YES (YES)
N of Elmira Rd	2 lane Arterial	602	212	NO (NO)	678	296	NO (NO)
N of Alamo Dr	2 lane Arterial	566	319	NO (NO)	683	363	NO (NO)
S of Alamo Dr	2 lane Arterial	555	351	NO (NO)	674	401	NO (NO)
N of Vanden Meadows Collector	2 lane Arterial	N/A	N/A	N/A	365	304	NO (NO)
E of Vanden Rd	2 lane Arterial	270	255	NO (NO)	321	297	NO (NO)

4.13 Transportation and Circulation

ROADWAY SEGMENTS	FACILITY TYPE	No Project			With Project		
		VOLUME		LOS C (D) EXCEEDED?	VOLUME		LOS C (D) EXCEEDED?
NUT TREE ROAD		SB	NB		SB	NB	
N of Alamo Dr	4 Lane Div. Arterial	1185	1221	NO (NO)	876	686	NO (NO)
S of Alamo Dr	4 Lane Div. Arterial	1538	1634	NO (NO)	927	748	NO (NO)
N of Opal Wy	2 lane Arterial	277	323	NO (NO)	371	485	NO (NO)
N of Street "A"	2 lane Arterial	N/A	N/A	N/A	275	316	NO (NO)
N of Foxboro Pkwy	2 lane Arterial	178	289	NO (NO)	194	281	NO (NO)
PEABODY ROAD		SB	NB		SB	NB	
North of Alamo Dr	4 Lane Arterial	1185	1221	NO (NO)	1197	1257	NO (NO)
S of Alamo Dr	4 Lane Arterial	1538	1634	YES (NO)	1580	1663	YES (NO)
N of Foxboro Pkwy	4 Lane Arterial	1446	1555	YES (NO)	1507	1590	YES (NO)
S of Foxboro Pkwy	4 Lane Arterial	1080	1504	YES (NO)	1087	1531	YES (NO)
S City Limits	2 lane Arterial	1073	1425	YES (YES)	1080	1453	YES (YES)
FOXBORO PARKWAY		WB	EB		WB	EB	
West of Nut Tree Rd	2 lane Arterial	197	56	NO (NO)	213	137	NO (NO)
East of Nut Tree Rd	2 lane Arterial	486	235	NO (NO)	492	329	NO (NO)
W of Vanden Rd (north)	2 lane Arterial	N/A	N/A	N/A	495	313	NO (NO)
W of Vanden Rd (south)	2 lane Arterial	N/A	N/A	N/A	670	351	NO (NO)
N = North; S = South; E = East; W = West; LOS = Level of Service; N/A = not applicable. Bold denotes LOS D and Bold Italicized denotes LOS E or LOS F Source: City of Vacaville, 2011 (Appendix O)							

The segment of Peabody Road south of Alamo Drive would operate at LOS D with and without the addition of project traffic. The transportation portion of the Development Impact Fee Program includes development of the 5th and 6th lanes of Peabody Road south of Alamo Drive. This improvement would provide capacity for this segment to operate at LOS C or better for the Existing + Approved Project Condition. Furthermore, this segment is a designated Route of Regional Significance. Implementation of **Mitigation Measure 4.13-6b** would reduce the impact to less than significant by accepting the LOS level. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-6b. The City of Vacaville shall continue to monitor the operation on Peabody Road. The City shall use the results of the monitoring to

coordinate the development of the 5th and 6th lane of Peabody Road south of Alamo Drive with the next update of the Development Impact Fee Program. The City shall accept LOS D as an acceptable LOS for this segment in the interim until the impact fee program provides for this project. Alternatively, should widening be determined unfeasible, the City may accept LOS D as the standard at this intersection as allowed by City General Plan Policies.

The segment of Peabody Road north of Foxboro Parkway would operate at LOS D with the additional of project traffic with and without the Foxboro Parkway Extension. It would also operate at LOS D under the No Project under Option 1, while it would operate at LOS C under Option 1 of the Foxboro Parkway Extension. The development of the 5th and 6th lane of Peabody Road south of Alamo Drive of the Development Impact Fee Program would provide capacity for this segment to operate a LOS C or better for the Existing + Approved Project Condition. Furthermore, this segment is a designated Route of Regional Significance. Implementation of **Mitigation Measure 4.13-6c** would reduce the impact to less than significant by accepting the LOS level. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-6c. Implement **Mitigation Measure 4.13-6b.**

Similar to the segment north of Foxboro Parkway, the segment of Peabody Road south of Foxboro Parkway would operate at LOS D except under No Project under Option 2 of the Foxboro Parkway Extension conditions, when it would operate at LOS C. The development of the 5th and 6th lane of Peabody Road south of Alamo Drive of the Development Impact Fee Program would provide capacity for this segment to operate a LOS C or better for the Existing + Approved Project Condition. Furthermore, this segment is a designated Route of Regional Significance. Implementation of **Mitigation Measure 4.10-6d** would reduce the impact to less than significant by accepting the LOS level. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-6d. Implement **Mitigation Measure 4.13-6b**

The Project would contribute to the already substandard operations at the segment of Peabody Road south of the Vacaville City Limit, which would operate below LOS D under Existing + Approved Project Conditions. This segment is located in Solano County and is also designated as a Route of Regional Significance. The CMP standard on this segment is LOS E. This segment is projected to operate beyond the capacity of a two lane arterial and the project trips would exacerbate the conditions. The Fairfield Train Station Specific Plan has included widening of this segment of Peabody Road to a four lane arterial. This improvement would provide capacity for Existing plus Approved Projects. However, the implementation of this improvement is uncertain. Therefore, this is a cumulative project impact. The City shall continue to work with Solano County Solano Transportation Authority and City of Fairfield in determining means to mitigate cumulative impacts to regional roadways. This will include continuing to support updates of the Congestion Management Program and participating in regional transportation impact fee process being lead by Solano Transportation Authority. City of Vacaville shall also coordinate and support the City of Fairfield in the timing and providing the 5th and 6th lanes of Peabody Road from City limits to

Alamo Drive. However, the cumulative project impact would remain significant and unavoidable.
Significant and Unavoidable.

Freeway Segments

The operations results for freeway segments are presented in **Tables 4.13-16** and **4.13-17**. Under Existing plus Approved Projects conditions, the freeway segment on I-80 west of Lagoon Valley Road would operate at LOS F on the eastbound direction during the PM peak hour under both with and without the Foxboro Parkway Extension. With the addition of project-generated traffic, the same location would continue to operate at LOS F as described below.

TABLE 4.13-16
 EXISTING PLUS APPROVED CONDITIONS - FREEWAY MAINLINE LOS SUMMARY

Location	AM Peak Hour			PM Peak Hour		
	Volume	Density ¹	LOS ²	Volume	Density ¹	LOS ²
I-80 West of Lagoon Valley Road						
Eastbound - No Project	3,382	13.5	B	9,468	>45	F
Eastbound - With Project	3,444	13.8	B	9,657	>45	F
Westbound - No Project	8,199	40.2	E	5,730	23.1	C
Westbound - With Project	8,400	42.6	E	5,789	23.4	C
I-80 East of Midway Road						
Eastbound - No Project	3,101	16.5	B	4,097	21.9	C
Eastbound - With Project	3,143	16.8	B	4,110	22.0	C
Westbound - No Project	3,676	19.6	C	4,553	24.7	C
Westbound - With Project	3,702	19.7	C	4,590	24.9	C
¹ Density = passenger cars per mile per lane ² LOS = Level of Service Source: Dowling Associates, Inc., 2011 (Appendix O)						

Impact

4.13-7 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on area freeway beyond acceptable capacities under Existing plus Approved Projects Conditions.

While the CMP standard is LOS E for this segment, the project would add less than two percent of the traffic volumes to the mainline segment, which is well within normal volume fluctuation. Further, the segment would already operate at LOS F without the project. Therefore, the project impact is less than significant. **Less than Significant.**

TABLE 4.13-17
FREEWAY MAINLINE LOS - EXISTING PLUS APPROVED CONDITIONS
(WITHOUT FOXBORO PARKWAY EXTENSION)

Location	AM Peak Hour			PM Peak Hour		
	Volume	Density ¹	LOS ²	Volume	Density ¹	LOS ²
I-80 West of Lagoon Valley Road						
Eastbound - No Project	3,383	13.5	B	9,465	>45	F
Eastbound - With Project	3,443	13.8	B	9,641	>45	F
Westbound - No Project	8,196	40.1	E	5,730	23.1	C
Westbound - With Project	8,384	42.4	E	5,786	23.4	C
I-80 East of Midway Road						
Eastbound - No Project	3,101	16.5	B	4,100	21.9	C
Eastbound - With Project	3,140	16.7	B	4,112	22.0	C
Westbound - No Project	3,677	19.6	C	4,554	24.7	C
Westbound - With Project	3,703	19.7	C	4,588	24.9	C
¹ Density = passenger cars per mile per lane ² LOS = Level of Service Source: Dowling Associates, Inc., 2011. (Appendix O)						

Intersections

Impact

4.13-8 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic at study intersections beyond acceptable capacities under Existing plus Approved Projects Conditions.

The operations results for study intersections are presented in **Tables 4.13-18** and **4.13-19**. Generally, the operations are similar with or without the Foxboro Parkway Extension.

Under Existing plus Approved Projects conditions, 14 of the 24 study intersections would operate at LOS C or better in the AM and PM peak hours. The following eight study intersections located in Vacaville would operate at LOS D with and without the addition of project traffic during one or both peak hours. These are potentially significant impacts. **Less than Significant with Mitigation.**

- Peabody Road and Alamo Drive (#10) – PM peak hour
- Davis Street and Alamo Drive (#11) – PM peak hour
- Alamo Drive and Merchant Street (#14) – AM and PM peak hours
- Nut Tree Road and Ulatis Road (#17) – PM peak hour
- Peabody Road and CSP-Solano (#18) – AM peak hour
- Peabody Road and Foxboro Parkway (#19) – PM peak hour
- Peabody Road and California Drive (#20) – PM peak hour
- Peabody Road and Cliffside Drive (#21) – PM peak hour

TABLE 4.13-18
EXISTING PLUS APPROVED PROJECT CONDITONS – AM PEAK HOUR (MITIGATED)

No.	N-S STREET	E-W STREET	No Project		With Project	
			LOS	V/C	LOS	V/C
1	Leisure Town Rd	I-80 WB ramps	C	0.72	C	0.74
2	Leisure Town Rd	I-80 EB ramps	A	0.56	A	0.57
3	Leisure Town Rd	Orange Dr	A	0.37	A	0.39
4	Leisure Town Rd	Sequoia Dr	A	0.52	A	0.55
5	Leisure Town Rd	Elmira Rd	A	0.38	A	0.42
6	Leisure Town Rd	Alamo Dr/Fry Rd	A	0.35	A	0.42
7	Vanden Rd	Leisure Town Rd	A	0.31	A	0.31
8	Vanden Rd	Alamo Dr	A	0.34	A	0.34
9	Nut Tree Rd	Alamo Dr	A (A)	0.55 (0.55)	B (B)	0.70 (0.68)
10	Peabody Rd	Alamo Dr	C (C)	0.73 (0.73)	C (C)	0.73 (0.73)
11	Davis St	Alamo Dr	C (C)	0.75 (0.75)	C (C)	0.76 (0.76)
12	Alamo Dr	Marshall Rd	A	0.49	A	0.48
13	Alamo Dr	I-80 EB ramps	C	0.71	B	0.69
14	Alamo Dr	Merchant St	D (C)	0.90 (0.80)	D (C)	0.89 (0.79)
15	Peabody Rd	Elmira Rd	A	0.36	A	0.36
16	Nut Tree Rd	Elmira Rd	A	0.5	A	0.51
17	Nut Tree Rd	Ulatis Rd	A (A)	0.44 (0.42)	A (A)	0.44 (0.42)
18	Peabody Rd	CSP-Solano	D (A)	0.87 (0.51)	D (A)	0.87 (0.51)
19	Peabody Rd	Foxboro Pkwy	B (B)	0.65 (0.65)	B (B)	0.66 (0.66)
20	Peabody Rd	California Dr	B (B)	0.65 (0.65)	B (B)	0.64 (0.64)
21	Peabody Rd	Cliffside Dr	B (A)	0.63 (0.56)	B (A)	0.64 (0.57)
22	Davis St	Hume Wy	A (A)	0.48 (0.43)	A (A)	0.48 (0.42)
23	I-80 WB ramp	Cherry Glen Rd	A	0.12	A	0.12
24	Cherry Glen Rd	I-80 EB ramp	A	0.13	A	0.13

Bold denotes LOS D and **Bold Italicized** denotes LOS E or LOS F
Source: City of Vacaville, 2011 (Appendix O)

TABLE 4.13-19
EXISTING PLUS APPROVED PROJECT CONDITONS – PM PEAK HOUR (MITIGATED)

No.	N-S STREET	E-W STREET	No Project		With Project	
			LOS	V/C	LOS	V/C
1	Leisure Town Rd	I-80 WB ramps	B	0.69	B	0.70
2	Leisure Town Rd	I-80 EB ramps	B	0.68	B	0.69
3	Leisure Town Rd	Orange Dr	A	0.53	A	0.54
4	Leisure Town Rd	Sequoia Dr	B	0.66	B	0.70
5	Leisure Town Rd	Elmira Rd	A	0.58	B	0.63
6	Leisure Town Rd	Alamo Dr/Fry Rd	A	0.48	A	0.55
7	Vanden Rd	Leisure Town Rd	B	0.62	B	0.69
8	Vanden Rd	Alamo Dr	A	0.42	A	0.41
9	Nut Tree Rd	Alamo Dr	C (B)	0.71 (0.67)	D (C)	0.85 (0.76)
10	Peabody Rd	Alamo Dr	D (C)	0.85 (0.75)	D (C)	0.85 (0.76)
11	Davis St	Alamo Dr	D (C)	0.86 (0.72)	D (C)	0.86 (0.75)
12	Alamo Dr	Marshall Rd	C	0.75	C	0.75
13	Alamo Dr	I-80 EB ramps	A	0.55	A	0.57
14	Alamo Dr	Merchant St	D (B)	0.81 (0.64)	D (B)	0.82 (0.66)
15	Peabody Rd	Elmira Rd	A	0.45	A	0.45
16	Nut Tree Rd	Elmira Rd	A	0.58	B	0.61
17	Nut Tree Rd	Ulatis Rd	D (C)	0.86 (0.77)	D (C)	0.87 (0.78)
18	Peabody Rd	CSP-Solano	C (A)	0.80 (0.58)	C (A)	0.80 (0.59)
19	Peabody Rd	Foxboro Pkwy	D (C)	0.84 (0.72)	D (C)	0.84 (0.76)
20	Peabody Rd	California Dr	D (B)	0.81 (0.67)	D (B)	0.83 (0.69)
21	Peabody Rd	Cliffside Dr	D (C)	0.89 (0.72)	D (C)	0.90 (0.69)
22	Davis St	Hume Wy*	E (A)	0.91 (0.59)	E (A)	0.92 (0.59)
23	I-80 WB ramp	Cherry Glen Rd	A	0.12	A	0.12
24	Cherry Glen Rd	I-80 EB ramp	A	0.59	B	0.61

* City Project for the improvement of Davis Street at Hume Way is currently under construction.
Bold denotes LOS D and **Bold Italicized** denotes LOS E or LOS F
Source: City of Vacaville, 2011 (Appendix O)

Mitigation Measure 4.13-8a. The City of Vacaville shall accept LOS D as an acceptable LOS at the eight intersections, where the operation would be LOS D with or without the proposed project. The City shall continue to monitor the operations at these intersections, optimize signal timing, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of the **Mitigation Measures 4.13-8a** through **d**, the project impacts at the eight intersections would be **less than significant**.

The City shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. Under the Development Impact Fee Program, the following mitigations would be needed to achieve LOS C at these intersections for Existing + Approved Project Conditions:

Peabody Road and Alamo Drive (#10) - Widen southwest corner to provide an additional third EB thru lane. With improvement, intersection is projected to operate at LOS C in the PM peak hour.

Davis Street and Alamo Drive (#11) - Widen southwest corner to provide an additional (3rd) EB thru lane. With improvement intersection is projected to operate at LOS C in the PM peak hour.

Alamo Drive and Merchant Street (#14) - Widen northbound (Alamo Drive) approach to provide a third left turn lane and a free right turn under signal control. With improvement intersection is projected to operate at LOS C in the AM peak hour and LOS B in the PM peak hour.

Nut Tree Road and Ulatis Road (#17) - Widen west side of Nut Tree to provide a third southbound thru lane. With improvement intersection is projected to operate at LOS C in the PM peak hour.

Peabody Road and CSP-Solano (#18) - Widen west side of Peabody Road to provide second southbound thru lane. With improvement intersection is projected to operate at LOS A in the AM peak hour.

Peabody Road and Foxboro Parkway (#19) - Widen Peabody Road to add a third northbound thru lane. With improvement intersection is projected to operate at LOS C in the PM peak hour.

Peabody Road and California Drive (#20) - Reconfigure three northbound lanes to provide two thru lanes and a shared thru/right turn lane. With improvement intersection is projected to operate at LOS B in the PM peak hour.

Peabody Road and Cliffside Drive (#21) - Reconfigure three southbound lanes to provide two thru and 3rd thru shared with right turn lane, and provide an eastbound free right turn lane. With improvement intersection is projected to operate at LOS B in the PM peak hour.

The intersection of Nut Tree Road and Alamo Drive (#9) is projected to operate at LOS C (V/C =0.71) without Project and LOS D (V/C=0.85) with Project. This is a potentially significant impact.

Less than Significant with Mitigation.

Mitigation Measure 4.13-8b. The City shall widen the southwest corner of the intersection to provide a dedicated eastbound right turn lane would improve the intersection operation to LOS C in the PM peak hour. The Project shall be conditioned to provide this improvement as a condition of approval of development with appropriate timing tied to level of project development. Alternatively, the Project could be conditioned to fund the improvement by providing cash deposit to the City. The City would provide this improvement as appropriate through regular monitoring of the intersection to maintain acceptable LOS.

The City may alternatively accept LOS D as an acceptable LOS at the Nut Tree Road and Alamo Drive intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing according to the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of the **Mitigation Measure 4.13-8b**, the project impacts at the intersection would be **less than significant**.

The intersection of Davis Street and Hume Way would operate at LOS E in the PM peak hour with and without the project with the Foxboro Parkway Extension with a V/C of 0.91 and 0.92 without and with the project, respectively. This is a potentially significant impact. Given the intersection is projected to operate at LOS E without the addition of project traffic, Foxboro Parkway is planned for roadway connection, and change in V/C is only 0.01 with the project, this impact is found to be a result of Citywide traffic. Further, a City Capital Improvement Project has begun construction to widen the intersection of Davis Street and Hume Way as well as widen the segment of Davis Street between Hume Way and Bella Vista Road to two lanes in each direction. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-8c. The City shall complete the City Capital Improvement Project to the Davis Hume intersection and associated widening of Davis Street. With these improvements this intersection is project to operate at LOS A without and with the Project with or without Foxboro Parkway Extension. Upon implementation of **Mitigation Measure 4.13-8c**, the project impact would be **less than significant**.

Cumulative Impacts

The analysis of transportation under cumulative conditions focuses on year 2030 conditions. The discussion below addresses project impacts related to roadway operations, freeway operations, and intersection operations. The project would not cause additional cumulative impacts beyond those already identified for existing conditions in the areas of bikeway and pedestrian facilities and transit service.

Cumulative conditions were analyzed to determine the effect of the project in combination with the effects of a 2030 projected build-out of the surrounding community. Cumulative traffic volumes were derived from the Vacaville citywide traffic model. The traffic projections based on the Vacaville citywide traffic model were compared to those based on the Napo/Solano regional model, which utilizes land use forecasts from the Association of Bay Area Governments, and those used in the EIR for the proposed Fairfield Train Station Specific Plan. It was found that a cumulative analysis that uses the citywide model would generate more conservative results than one that uses the 2030 regional model; but less conservative than a cumulative analysis that assumes full occupancy of all uses allowable within the proposed Fairfield Train Station Specific Plan. It should be noted that the cumulative transportation analysis performed for the Fairfield Train Station Specific Plan EIR included the proposed Vanden Meadows Specific Plan project. The Proposed Project is also consistent with land use assumptions in the project site in the

Vacaville General Plan. A memorandum summarizing the comparison results is included in **Appendix O**.

Roadway Segments

Impact

4.13-9 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on Vacaville and Solano County roadways beyond acceptable capacities under Cumulative Conditions.

The operations results for roadway segments are presented in **Table 4.13-20**. Under Cumulative conditions, seven roadway segments, including three on Leisure Town Road and four on Peabody Road, would operate at LOS D or below and may exceed acceptable standards. Generally, the operations are similar with or without the Foxboro Parkway Extension.

The segment of Leisure Town Road north of I-80 eastbound ramps would operate below LOS D with and without the addition of project trips. This is a potentially significant impact. However, the Cumulative with Project volumes on this segment are lower than the Cumulative No Project volumes with or without the Foxboro Parkway Extension. Therefore, the project impact is less than significant. **Less than Significant.**

The segment of Leisure Town Road north of Orange Drive would operate at LOS D with or without the addition of project traffic. The project would add traffic onto this segment of Leisure

Town Road; thereby exacerbating the substandard conditions. This is a potentially significant impact. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-9a. The City of Vacaville shall accept LOS D as an acceptable LOS. The City shall continue to monitor the operation on Leisure Town Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS. Upon implementation of **Mitigation Measure 4.13-9a**, the project impact would be less than significant.

The segment of Leisure Town Road north of Sequoia Drive would operate at LOS D with or without the addition of project traffic. The project would add traffic onto this segment of Leisure Town Road; thereby exacerbating the substandard conditions. This is a potentially significant impact. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-9b. The City of Vacaville shall accept LOS D as an acceptable LOS. The City shall continue to monitor the operation on Leisure Town Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS. Upon implementation of **Mitigation Measure 4.13-9b**, the project impact would be less than significant. **Less than Significant with Mitigation.**

TABLE 4.13- 20
CUMULATIVE CONDITIONS PM PEAK HOUR ROADWAY SEGMENT ANALYSIS

ROADWAY SEGMENTS	FACILITY TYPE	No Project			With Project		
		VOLUME		LOS C (D) EXCEEDED?	VOLUME		LOS C (D) EXCEEDED?
VANDEN ROAD		SB	NB		SB	NB	
S of Alamo Dr	2 lane Arterial	363	156	NO (NO)	409	183	NO (NO)
N of Cogburn Wy	2 lane Arterial	51	36	NO (NO)	103	69	NO (NO)
N of Newcastle Dr	2 lane Arterial	45	28	NO (NO)	265	163	NO (NO)
N of Leisure Town Rd (No Project) or N of Foxboro Pkwy Extension (with Project)	2 lane Arterial	182	62	NO (NO)	N/A	N/A	N/A
	2 Lane Collector	N/A	N/A	N/A	107	169	NO (NO)
S of Foxboro Pkwy	2 lane Arterial	1015	1200	NO (NO)	1068	1229	NO (NO)
ALAMO DRIVE		WB	EB		WB	EB	
W of Interstate 80 EB Ramps	6 Lane Div. Arterial	2278	762	NO (NO)	2293	747	NO (NO)
W of Marshall Rd	6 Lane Div. Arterial	1005	2272	NO (NO)	1046	2327	NO (NO)
W of Peabody Rd	4 Lane Div. Arterial	1045	1868	NO (NO)	1124	1941	NO (NO)
W of Nut Tree Rd	4 Lane Div. Arterial	787	1304	NO (NO)	883	1402	NO (NO)
W of Vanden Rd	4 Lane Div. Arterial	565	797	NO (NO)	565	823	NO (NO)
W of Leisure Town Rd	4 Lane Div. Arterial	591	450	NO (NO)	568	435	NO (NO)
LEISURE TOWN ROAD		SB	NB		SB	NB	
N of EB Ramps	6 Lane Div. Arterial	4102	1812	YES (YES)	4043	1810	YES (YES)
N of Orange Dr	6 Lane Div. Arterial	2925	2473	YES (NO)	2997	2482	YES (NO)
N of Sequoia Dr	2 lane Arterial	2281	1936	YES (NO)	2331	1963	YES (NO)
N of Elmira Rd	2 lane Arterial	1511	1538	NO (NO)	1573	1580	NO (NO)
N of Alamo Dr	2 lane Arterial	1420	1647	NO (NO)	1555	1707	NO (NO)
S of Alamo Dr	2 lane Arterial	1373	1376	NO (NO)	1579	1483	NO (NO)
N of Vanden Meadows Collector	2 lane Arterial	N/A	N/A	N/A	957	1212	NO (NO)

4.13 Transportation and Circulation

ROADWAY SEGMENTS	FACILITY TYPE	No Project			With Project		
		VOLUME		LOS C (D) EXCEEDED?	VOLUME		LOS C (D) EXCEEDED?
E of Vanden Rd	2 lane Arterial	816	1177	NO (NO)	878	1189	NO (NO)
NUT TREE ROAD		SB	NB		SB	NB	
N of Alamo Dr	4 Lane Div. Arterial	872	502	NO (NO)	963	585	NO (NO)
S of Alamo Dr	4 Lane Div. Arterial	779	323	NO (NO)	972	525	NO (NO)
N of Opal Wy	2 lane Arterial	199	64	NO (NO)	390	220	NO (NO)
N of Street "A"	2 lane Arterial	N/A	N/A	N/A	275	42	NO (NO)
N of Foxboro Pkwy	2 lane Arterial	55	1	NO (NO)	187	14	NO (NO)
PEABODY ROAD		SB	NB		SB	NB	
North of Alamo Dr	4 Lane Arterial	1300	1287	NO (NO)	1282	1294	NO (NO)
S of Alamo Dr	4 Lane Arterial	1732	1641	YES (YES)	1686	1636	YES (YES)
N of Foxboro Pkwy	4 Lane Arterial	1646	1635	YES (NO)	1673	1638	YES (YES)
S of Foxboro Pkwy	4 Lane Arterial	1332	1724	YES (YES)	1319	1734	YES (YES)
S City Limits	2 lane Arterial	1296	1408	YES (YES)	1283	1418	YES (YES)
FOXBORO PARKWAY		WB	EB		WB	EB	
West of Nut Tree Rd	2 lane Arterial	44	46	NO (NO)	57	127	NO (NO)
East of Nut Tree Rd	2 lane Arterial	46	102	NO (NO)	64	306	NO (NO)
W of Vanden Rd (north)	2 lane Arterial	N/A	N/A	N/A	67	290	NO (NO)
W of Vanden Rd (south)	2 lane Arterial	46	102	NO (NO)	162	312	NO (NO)
N = North; S = South; E = East; W = West; LOS = Level of Service; N/A = not applicable. Bold denotes LOS D and Bold Italicized denotes LOS E or LOS F Source: City of Vacaville, 2011 (Appendix O)							

The segment of Peabody Road south of Alamo Drive would operate below LOS D without the addition of project traffic. It would continue to operate below LOS D with the project. However, the Cumulative with Project volumes on this segment are lower than the Cumulative No Project volumes with or without the Foxboro Parkway Extension. Therefore, the project impact is less than significant. **Less than Significant.**

The segment of Peabody Road north of Foxboro Parkway would operate at LOS D without the project; and would continue to operate at LOS D with the additional of project traffic without the Foxboro Parkway Extension. However, the operation would deteriorate to LOS E with the Foxboro Parkway Extension. This is a significant impact. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-9c. The City shall continue to monitor the operation on Peabody Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS. Upon implementation of **Mitigation Measure 4.13-9c**, the project impact would be less than significant.

The segment of Peabody Road south of Foxboro Parkway would operate below LOS D without the Proposed Project and would continue to operate below LOS D with the addition of project traffic with the Foxboro Parkway Extension. This is a significant impact. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-9d. The City shall continue to monitor the operation on Peabody Road and continue to implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain an acceptable LOS. Upon implementation of **Mitigation Measure 4.13-9d**, the project impact would be less than significant.

The segment of Peabody Road south of Vacaville City would operate at LOS F with and without the addition of project traffic. This segment is located in Solano County and is also a designated Route of Regional Significance. The CMP standard on this segment is LOS E; therefore, the segment operations would exceed acceptable standards. The County allows the operations to fall below its LOS C standard as long as the existing LOS level is maintained. The segment is operating at LOS E under Existing No Project conditions and the LOS level would further deteriorate under Cumulative conditions. The project is projected to add less than one percent to PM peak hour directional volumes and therefore this impact is a result of Cumulative Condition. It is noted that widening of this segment of Peabody Road is being considered for inclusion in the nexus study used for Regional Transportation Impact Fee Program. Also the Proposed Fairfield Train Station Specific Plan addresses the widening of this segment of Peabody Road. Cumulative analysis for Fairfield Train Station Specific Plan did include Vanden Meadows Project. **Significant and Unavoidable.**

Mitigation Measure 4.13-9e. The City shall continue to monitor the operation of Peabody Road south of City Limits and support regional efforts to provide additional

capacity on this segment of Peabody Road through the proposed Regional Transportation Impact Fee Program. City shall continue to participate and support the Regional Transportation Impact Fee.

Should Regional Transportation Impact Fee be approved prior to issuance of building permits for the project, the Project shall participate in the Regional Transportation Impact Fee Program. With implementation of Regional Impact Fee Program that includes improves to two lane section of Peabody Road south of Vacaville City Limits, impact would be less than significant. However, since the implementation and timing of the Fee Program is beyond the City's control, this impact remains **significant and unavoidable**.

Freeway Segments

Impact

4.13-10 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on area freeway beyond acceptable capacities under cumulative conditions.

The operations results for freeway segments are presented in **Tables 4.13-21** and **4.13-22**. Under Cumulative conditions, the freeway segment on I-80 west of Lagoon Valley Road would operate at LOS F with the addition of project traffic on the westbound direction during the AM peak hour and the eastbound direction during the PM peak hour under both with and without Foxboro Parkway Extension conditions. While the CMP standard is LOS E for this segment, the project would add less than two percent of the traffic volumes to the mainline segment, which is well within normal volume fluctuation. Further, the segment would already operate at LOS F without the project. Therefore, the project impact is less than significant. **Less than Significant.**

Intersections

Impact

4.13-11 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic at study intersections beyond acceptable capacities under cumulative conditions.

The operations results for study intersections are presented in **Tables 4.13-23** and **4.13-24**. Under Cumulative conditions, five of the 24 study intersections would operate acceptably at LOS C or better in the AM and PM peak hours; while nine intersections would experience substandard conditions at LOS E or below in at least one peak hour. The remaining study intersections would operate at LOS D in one or both peak hours. Generally, the operations are similar with or without the Foxboro Parkway Extension; exceptions are noted.

The following seven study intersections located would operate at LOS D with and without the addition of project traffic during one or both peak hours. These are potentially significant impacts. **Less than Significant with Mitigation.**

- Leisure Town Road and I-80 Eastbound Ramps (#2) – PM peak hour
- Leisure Town Road and Sequoia Drive (#4) – PM peak hour
- Leisure Town Road and Elmira Road (#5) – PM peak hour
- Davis Street and Alamo Drive (#11) – AM and PM peak hour
- Peabody Road and Foxboro Parkway (#19) – PM peak hour
- Peabody Road and Cliffside Drive (#21) – PM peak hour
- I-80 Westbound Ramp and Cherry Glen Road (#23) – PM peak hour

TABLE 4.13-21
CUMULATIVE CONDITIONS - FREEWAY MAINLINE LOS SUMMARY

Location	AM Peak Hour			PM Peak Hour		
	Volume	Density ¹	LOS ²	Volume	Density ¹	LOS ²
I-80 West of Lagoon Valley Road						
Eastbound - No Project	4,686	18.7	C	11,933	>45	F
Eastbound - With Project	4,739	18.9	C	12,093	>45	F
Westbound - No Project	11,195	>45	F	8,002	38.0	E
Westbound - With Project	11,383	>45	F	8,055	38.6	E
I-80 East of Midway Road						
Eastbound - No Project	4,572	24.8	C	9,702	>45	F
Eastbound - With Project	4,611	25.1	C	9,720	>45	F
Westbound - No Project	8,259	>45	F	8,024	>45	F
Westbound - With Project	8,310	>45	F	8,057	>45	F
¹ Density = passenger cars per mile per lane ² LOS = Level of Service Source: Dowling Associates, Inc., 2011 (Appendix O)						

TABLE 4.13-22
CUMULATIVE CONDITIONS - FREEWAY MAINLINE LOS (WITHOUT FOXBORO PARKWAY EXTENSION)

Location	AM Peak Hour			PM Peak Hour		
	Volume	Density ¹	LOS ²	Volume	Density ¹	LOS ²
I-80 West of Lagoon Valley Road						
Eastbound - No Project	4,686	18.7	C	11,929	>45	F
Eastbound - With Project	4,738	18.9	C	12,078	>45	F
Westbound - No Project	11,191	>45	F	8,001	38.0	E
Westbound - With Project	11,367	>45	F	8,051	38.5	E
I-80 East of Midway Road						
Eastbound - No Project	4,571	24.8	C	9,707	>45	F
Eastbound - With Project	4,608	25.1	C	9,724	>45	F
Westbound - No Project	8,263	>45	F	8,025	>45	F
Westbound - With Project	8,314	>45	F	8,056	>45	F
¹ Density = passenger cars per mile per lane ² LOS = Level of Service Source: Dowling Associates, Inc., 2011 (Appendix O)						

TABLE 4.13-23
INTERSECTION CUMULATIVE (YEAR 2030) CONDITIONS – AM PEAK HOUR

No.	N-S STREET	E-W STREET	Cumulative No Project		Cumulative with Project	
			LOS	V/C	LOS	V/C
1	Leisure Town Rd	I-80 WB ramps <i>after Mitigation</i>	D	0.89	E	0.91
			B	0.68	B	0.70
2	Leisure Town Rd	I-80 EB RAMPS <i>after Mitigation</i>	B	0.7	B	0.70
			A	0.59	A	0.59
3	Leisure Town Rd	Orange Dr <i>after Mitigation</i>	D	0.86	D	0.87
			A	0.59	A	0.60
4	Leisure Town Rd	Sequoia Dr <i>after Mitigation</i>	C	0.75	C	0.76
			C	0.75	C	0.76
5	Leisure Town Rd	Elmira Rd <i>after Mitigation</i>	C	0.75	C	0.78
			C	0.72	C	0.74
6	Leisure Town Rd	Alamo Dr/Fry Rd <i>after Mitigation</i>	B	0.68	B	0.70
			B	0.66	B	0.67
7	Vanden Rd	Leisure Town Rd	A	0.55	A	0.57
8	Vanden Rd	Alamo Dr	A	0.47	A	0.48
9	Nut Tree Rd	Alamo Dr <i>after Existing + Approved Mitigation</i> <i>after Mitigation</i>	A	0.57	B	0.67
			A	0.57	B	0.67
			A	0.51	B	0.63
10	Peabody Rd	Alamo Dr <i>After Existing+Approved Mitigation</i> <i>After Mitigation</i>	C	0.79	D	0.83
			C	0.79	D	0.83
			C	0.72	C	0.74
11	Davis St	Alamo Dr <i>After Existing+Approved Mitigation</i> <i>After Mitigation</i>	D	0.87	D	0.90
			D	0.81	D	0.90
			B	0.70	C	0.73
12	Alamo Dr	Marshall Rd <i>After Mitigation</i>	C	0.74	C	0.77
			B	0.67	B	0.69
13	Alamo Dr	I-80 EB ramps	B	0.61	B	0.63
14	Alamo Dr	Merchant St <i>After Existing+Approved Mitigation</i> <i>After Mitigation</i>	D	0.86	D	0.88
			C	0.76	C	0.78
			C	0.76	C	0.78
15	Peabody Rd	Elmira Rd	A	0.48	A	0.47
16	Nut Tree Rd	Elmira Rd	B	0.62	B	0.62
17	Nut Tree Rd	Ulati Rd <i>Mitigation - Add 3rd SB Thru</i> <i>With Mitigation - Provide 2nd EB Thru and Ded. R</i> <i>Addit. Mitigation - Add NB Lane 2 L, 2 T and unsplit NB/SB Signal Phasing.</i>	A	0.45	A	0.45
			A	0.44	A	0.44
			A	0.40	A	0.39
			A	0.40	A	0.39
18	Peabody Rd	CSP-Solano <i>After Existing+Approved Mitigation</i>	D	0.84	D	0.83
			A	0.49	A	0.48
19	Peabody Rd	Foxboro Pkwy <i>After Existing+Approved Mitigation</i>	B	0.65	B	0.67
			B	0.65	B	0.67
20	Peabody Rd	California Dr <i>After Existing+Approved Mitigation</i>	C	0.78	C	0.79
			C	0.78	C	0.79

4.13 Transportation and Circulation

No.	N-S STREET	E-W STREET	Cumulative No Project		Cumulative with Project	
			LOS	V/C	LOS	V/C
			<i>B</i>	<i>0.65</i>	<i>B</i>	<i>0.67</i>
		<i>With Mitigation - Add SB (3rd) Thru Addit. Mitigation - Unsplit E/W Signal Phasing</i>	<i>B</i>	<i>0.65</i>	<i>B</i>	<i>0.67</i>
21	Peabody Rd	Cliffside Dr <i>After Existing + Approved Mitigation</i>	<i>B</i>	<i>0.68</i>	<i>B</i>	<i>0.69</i>
			<i>B</i>	<i>0.61</i>	<i>B</i>	<i>0.62</i>
22	Davis St	Hume Wy <i>After Existing + Approved Mitigation</i>	<i>C</i>	<i>0.71</i>	<i>C</i>	<i>0.71</i>
			<i>C</i>	<i>0.76</i>	<i>C</i>	<i>0.75</i>
23	I-80 WB ramp	Cherry Glen Rd <i>After Mitigation</i>	<i>A</i>	<i>0.42</i>	<i>A</i>	<i>0.43</i>
			<i>A</i>	<i>0.40</i>	<i>A</i>	<i>0.41</i>
24	Cherry Glen Rd	I-80 EB ramp <i>After Mitigation</i>	<i>A</i>	<i>0.23</i>	<i>A</i>	<i>0.23</i>
			<i>A</i>	<i>0.22</i>	<i>A</i>	<i>0.22</i>

Bold denotes LOS D and **Bold Italicized** denotes LOS E or LOS F
Source: City of Vacaville, 2011 (Appendix O)

TABLE 4.13- 24
INTERSECTION CUMULATIVE (YEAR 2030) CONDITIONS – PM PEAK HOUR

No.	N-S STREET	E-W STREET	Cumulative No Project		Cumulative with Project	
			LOS	V/C	LOS	V/C
1	Leisure Town Rd	I-80 WB ramps <i>after Mitigation</i>	<i>F</i>	<i>1.05</i>	<i>F</i>	<i>1.04</i>
			<i>D</i>	<i>0.85</i>	<i>D</i>	<i>0.84</i>
2	Leisure Town Rd	I-80 EB RAMPS <i>after Mitigation</i>	<i>D</i>	<i>0.89</i>	<i>D</i>	<i>0.90</i>
			<i>D</i>	<i>0.85</i>	<i>D</i>	<i>0.82</i>
3	Leisure Town Rd	Orange Dr <i>after Mitigation</i>	<i>F</i>	<i>1.14</i>	<i>F</i>	<i>1.15</i>
			<i>D</i>	<i>0.88</i>	<i>D</i>	<i>0.88</i>
4	Leisure Town Rd	Sequoia Dr <i>after Mitigation</i>	<i>D</i>	<i>0.82</i>	<i>D</i>	<i>0.83</i>
			<i>C</i>	<i>0.72</i>	<i>C</i>	<i>0.73</i>
5	Leisure Town Rd	Elmira Rd <i>after Mitigation</i>	<i>D</i>	<i>0.81</i>	<i>D</i>	<i>0.84</i>
			<i>C</i>	<i>0.71</i>	<i>C</i>	<i>0.73</i>
6	Leisure Town Rd	Alamo Dr/Fry Rd <i>after Mitigation</i>	<i>D</i>	<i>0.90</i>	<i>E</i>	<i>0.92</i>
			<i>C</i>	<i>0.75</i>	<i>C</i>	<i>0.77</i>
7	Vanden Rd	Leisure Town Rd	<i>A</i>	<i>0.52</i>	<i>A</i>	<i>0.45</i>
8	Vanden Rd	Alamo Dr	<i>A</i>	<i>0.58</i>	<i>A</i>	<i>0.57</i>
9	Nut Tree Rd	Alamo Dr <i>After Existing + Approved Mitigation</i> <i>after Mitigation</i>	<i>C</i>	<i>0.79</i>	<i>D</i>	<i>0.87</i>
			<i>C</i>	<i>0.72</i>	<i>C</i>	<i>0.80</i>
			<i>B</i>	<i>0.64</i>	<i>C</i>	<i>0.72</i>
10	Peabody Rd	Alamo Dr <i>After Existing + Approved Mitigation</i> <i>After Mitigation</i>	<i>D</i>	<i>0.87</i>	<i>D</i>	<i>0.88</i>
			<i>C</i>	<i>0.78</i>	<i>C</i>	<i>0.79</i>
			<i>C</i>	<i>0.78</i>	<i>C</i>	<i>0.79</i>
11	Davis St	Alamo Dr <i>After Existing + Approved Mitigation</i> <i>After Mitigation</i>	<i>D</i>	<i>0.87</i>	<i>D</i>	<i>0.88</i>
			<i>C</i>	<i>0.80</i>	<i>D</i>	<i>0.82</i>
			<i>B</i>	<i>0.70</i>	<i>C</i>	<i>0.72</i>
12	Alamo Dr	Marshall Rd <i>After Mitigation</i>	<i>E</i>	<i>0.92</i>	<i>E</i>	<i>0.96</i>
			<i>C</i>	<i>0.78</i>	<i>D</i>	<i>0.82</i>
13	Alamo Dr	I-80 EB ramps	<i>A</i>	<i>0.48</i>	<i>A</i>	<i>0.49</i>

4.13 Transportation and Circulation

No.	N-S STREET	E-W STREET	Cumulative No Project		Cumulative with Project	
			LOS	V/C	LOS	V/C
14	Alamo Dr	Merchant St	F	1.23	F	1.22
		<i>After Existing+Approved Mitigation</i>	F	1.09	F	1.06
		<i>After Mitigation</i>	B	0.62	B	0.62
15	Peabody Rd	Elmira Rd	A	0.50	A	0.51
16	Nut Tree Rd	Elmira Rd	C	0.75	C	0.78
17	Nut Tree Rd	Ulatis Rd	F	1.18	F	1.21
		<i>MITIGATION - Add 3rd SB Thru</i>	F	1.04	F	1.07
		<i>With Mitigation - Provide 2nd EB Thru and Ded. R</i>	D	0.86	D	0.87
		<i>Addit. Mitigation - Add NB Lane 2 L, 2 T and unsplit NB/SB Signal Phasing.</i>	C	0.75	C	0.76
18	Peabody Rd	CSP-Solano	E	0.96	E	0.95
		<i>After Existing+Approved Mitigation</i>	C	0.72	C	0.72
19	Peabody Rd	Foxboro Pkwy	D	0.87	D	0.89
		<i>After Existing+Approved Mitigation</i>	C	0.75	C	0.79
20	Peabody Rd	California Dr	D	0.90	E	0.91
		<i>After Existing+Approved Mitigation</i>	D	0.87	D	0.88
		<i>With Mitigation - Add SB (3rd) Thru</i>	D	0.82	D	0.84
		<i>Addit. Mitigation - Unsplit E/W Signal Phasing</i>	C	0.76	C	0.77
21	Peabody Rd	Cliffside Dr	D	0.87	D	0.86
		<i>After Existing+Approved Mitigation</i>	C	0.79	C	0.78
22	Davis St	Hume Wy	D	0.86	E	0.93
		<i>After Existing+Approved Mitigation</i>	C	0.73	C	0.72
23	I-80 WB ramp	Cherry Glen Rd	D	0.86	D	0.89
		<i>After Mitigation</i>	B	0.67	C	0.71
24	Cherry Glen Rd	I-80 EB ramp	C	0.78	D	0.83
		<i>After Mitigation</i>	B	0.66	C	0.73

Bold denotes LOS D and **Bold Italicized** denotes LOS E or LOS F
Source: City of Vacaville, 2011 (Appendix O)

Mitigation Measure 4.13-11a. The City shall accept LOS D as an acceptable LOS at the seven intersections, where the operation would be LOS D with or without the proposed project. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of this measure, the project impacts at the eight intersections would be **less than significant**.

Alternatively, the City shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. Upon implementation of the measure, the project impacts at these locations would be **less than significant**. Under the Development Impact Fee Program, the following mitigations would be needed to achieve LOS C at these intersections for Cumulative Conditions:

Leisure Town Road and I-80 Eastbound Ramps (#2) - Widen Leisure Town Road to provide additional (4th) northbound and southbound thru lanes. With this improvement, the intersection operation is projected to be LOS D ($V/C=0.85$), or better in the PM peak hour.

Leisure Town Road and Sequoia Drive (#4) - Reconfigure southbound lanes to provide three thru lanes including a shared through-right turn lane. With this improvement, the intersection is projected to operate at LOS C ($V/C=0.72$ or 0.73) in the PM peak hour.

Leisure Town Road and Elmira Road (#5) - Reconfigure southbound lanes to provide three thru lanes including a shared through-right turn lane. With improvement intersection is projected to operate at LOS C ($V/C=0.75$ or 0.78 in the PM peak hour.

Davis Street and Alamo Drive (#11) – Implement Mitigation Measure 4.10-8a by widening the southwest corner to provide an additional (3rd) EB thru lane. In addition, widen Alamo Drive to provide an additional (3rd) westbound thru lane. With this improvement intersection is projected to operate at LOS B or C ($V/C=0.65$ to 0.73) with and without Project in the AM and PM peak hours.

Peabody Road and Foxboro Parkway (#19) - Implement Mitigation Measure 4.10-8a by widening Peabody Road to add third northbound thru lane. With this improvement, the intersection is projected to operate at LOS C ($V/C=0.75$ to 0.79) in the PM peak hour.

Peabody Road and Cliffside Drive (#21) - Implement Mitigation Measure 4.10-8a by reconfiguring three southbound lanes to provide two thru and one thru-right shared lane, and providing an eastbound free right turn lane. With this improvement, the intersection is projected to operate at LOS C ($V/C=0.78$ or 0.79) in the PM peak hour.

I-80 Westbound Ramp and Cherry Glen Road (#23) - Reconfigure southbound lanes to provide one through lane and one through-right shared lane, and add a second eastbound left turn lane along with corresponding receiving lane on the north leg. With improvement intersection is projected to operate at LOS b or C ($V/C=0.67$ to 0.71) in the PM peak hour.

The following three intersections would operate at LOS C without the project but would degrade to LOS D with the addition of project traffic in one or both of the peak hours. These are potentially significant impacts.

- Nut Tree Road and Alamo Drive (#9) – PM peak hour
- Peabody Road and Alamo Drive (#10) – AM peak hour (LOS D in the PM peak hour)

- Cherry Glen Road and I-80 Eastbound Ramp (#24)

The Nut Tree Road and Alamo Drive (#9) intersection would operate at LOS C ($V/C=0.79$ and 0.80), with and without the Foxboro Parkway Extension, respectively) without the project but would degrade to LOS D ($V/C=0.87$ and 0.88) with the addition of project traffic the PM peak hour. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-11b. The City of Vacaville shall accept LOS D for operation at this intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of this mitigation, the project impact would be **less than significant**.

Alternatively, implementation of **Mitigation Measure 4.13-8b** by widening the southwest corner of this intersection to provide a dedicated eastbound right turn lane would improve the operations to LOS C with the project with the Foxboro Parkway Extension but the operations would remain at LOS D if the Foxboro Parkway Extension is not constructed. If the Extension would not be constructed, the City shall approve LOS D as acceptable for this intersection or limit future approvals to maintain an acceptable LOS at this intersection. Upon implementation of this mitigation, the project impact would be **less than significant**.

Alternatively, in addition to **Mitigation Measure 4.13-8b**, the Project shall be conditioned to also widen Nut Tree Road to provide a dedicated southbound right-turn lane as a condition of approval of development with appropriate timing tied to level of project development if the Foxboro Parkway Extension would not be constructed,. Alternatively, the Project could be conditioned to fund the improvement by providing cash deposit to the City. The City would provide this improvement as it regularly monitors the intersection and would determine the appropriate timing to implement in order to maintain acceptable LOS. With the addition of a southbound right-turn lane, the operation would be LOS C with the project even if the Foxboro Parkway Extension is not constructed; therefore, the project impact would be less than significant.

The Peabody Road and Alamo Drive (#9) intersection would operate at LOS C ($V/C=0.79$) without the project but would degrade to LOS D ($V/C=0.83$ and 0.82 , with and without the Foxboro Parkway Extension, respectively) with the addition of project traffic in the AM peak hour. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-11c. The City of Vacaville shall accept LOS D for operation at this intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of this mitigation, the project impact would be less than significant.

Alternatively, implement **Mitigation Measure 4.13-8a** by widening the southwest corner to provide an additional third EB thru lane. In addition, also widen Alamo Drive to provide an additional (3rd) westbound thru lane. With this improvement, the intersection is projected to operate at LOS C during both AM and PM peak hours.

The Cherry Glen Road and I-80 Eastbound Ramp (#24) intersection would operate at LOS C (V/C=0.78) without the project but would degrade to LOS D (V/C=0.87 and 0.88, with and without the Foxboro Parkway Extension, respectively) with the addition of project traffic the PM peak hour. **Less than Significant with Mitigation.**

Mitigation Measure 4.13-11d. The City of Vacaville shall accept LOS D for operation at this intersection. The City shall continue to monitor the operations at these intersections, optimize signal timing based on the results of the monitoring, and implement Transportation Impact Mitigation provisions of Land Use and Development Code. Upon implementation of the **Mitigation Measure 4.13-11d**, the project impact would be less than significant.

Alternatively, to achieve LOS C at the Cherry Glen Road and I-80 Eastbound Ramp intersection, the intersection would need to be widened on Cherry Glenn Road to provide an additional southbound lane to provide two left turn lanes and an outside shared through-right lane, and widen eastbound onramp to receive two left turn lanes. The City shall continue to regularly monitor the operation of this intersection, optimize signal timing based on the results of the monitoring, implement Transportation Impact Mitigation provisions of Land Use and Development Code, and update transportation portion of the Development Impact Fee Program to maintain an acceptable LOS at this intersection. Implementing this mitigation would result in acceptable LOS at this intersection and therefore result in a less than significant impact.

The following two study intersections would operate at LOS E with and without the addition of project traffic during one or both peak hours. These are significant impacts. **Less than Significant with Mitigation.**

- Alamo Drive and Marshall Road (#12) – PM peak hour
- Peabody Road and CSP-Solano (#18) – PM peak hour (LOS D in AM peak hour)

Mitigation Measure 4.13-11e. The City of Vacaville shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. The following mitigations would be developed under the Development Impact Fee to achieve acceptable service levels under Cumulative Conditions:

Alamo Drive and Marshall Road (#12) - Widen Alamo Drive to provide an additional (3rd) southbound thru lane and reconfigure eastbound lanes on Marshall Road to provide two thru lanes with outside shared with right turns. With

this improvement, the operation is projected to be LOS C ($V/C=0.78$) without Project, LOS D ($V/C=0.82$) with Project. The City shall accept LOS D for operation of the Alamo Drive and Marshall Road intersection. This improvement would require right-of-way acquisition. Upon implementation of this measure, the project impact would be less than significant.

Peabody Road and and CSP-Solano (#18) - Implement Mitigation Measure 4.10-8a by widening the west side of Peabody Road to provide a second southbound thru lane. With this improvement, the intersection is projected to operate at LOS A ($V/C= 0.489$ Or 0.49) in AM peak hour, and LOS C ($V/C=0.72$) in the PM peak hour. This improvement would require right-of-way acquisition. Upon implementation of this measure, the project impact would be less than significant.

The City shall continue to regularly monitor the operation of these is intersections, optimize signal timing, implement Transportation Impact Mitigation provisions of Land Use and Development Code and update transportation portion of Development Impact Fee Program to maintain acceptable LOS.

The following three intersections would degrade from LOS D without the project to LOS E with the addition of project traffic the PM peak hour. These are significant impacts. **Less than Significant with Mitigation.**

- Leisure Town Road and Alamo Drive/Fry Road (#6)
- Peabody Road and California Drive (#20)
- Davis Street and Hume Way (#22)

Mitigation Measure 4.13-11f. The City of Vacaville shall include funding for improvements at these intersections to achieve LOS C in updates to the transportation portion of the Development Impact Fee Program. The following mitigations would be developed under the Development Impact Fee Program to achieve acceptable service levels under Cumulative Conditions:

Leisure Town Road and Alamo Drive/Fry Road (#6) - Widen Leisure Town Road to provide additional (3rd) southbound lane, the outside shared with right turn lane. With improvement intersection is projected to operate at LOS C. Consequently, the project impact would be less than significant.

Peabody Road and California Drive (#20) – Implement Mitigation Measure 4.10-8a by reconfiguring three northbound lanes to provide two thru lanes and one shared thru-right turn lane. With improvement intersection is projected to operate at LOS D with and without the project. In addition, widen Peabody Road to provide an additional (3rd) southbound thru lane and improve geometrics of intersection to allow east-west signal phasing to operate without split phasing.

With these improvements, the intersection is projected to operate at LOS C. Consequently, the project impact would be less than significant.

Davis Street and Hume Way (#22) - Reconfigure three southbound lanes to provide two thru and 3rd thru shared with right turn lane, and provide an eastbound free right turn lane. With the improvements, the intersection is projected to operate at LOS C. Consequently, the project impact would be less than significant.

The following four study intersections would operate at LOS F with and without the addition of project traffic during one or both peak hours. These are significant impacts. **Less than Significant with Mitigation.**

- Leisure Town Road and I-80 Westbound Ramps (#1) – PM peak hour (LOS E in the AM peak hour)
- Leisure Town Road and Orange Drive (#3) – PM peak hour (LOS D in the AM peak hour)
- Alamo Drive and Merchant Street (#14) – PM peak hours (LOS D in the AM peak hour)
- Nut Tree Road and Ulatis Drive(#17) – PM peak hour

Mitigation Measure 4.13-11g. The City of Vacaville shall continue to regularly monitor the operation of these intersections, optimize signal timing, implement Transportation Impact Mitigation provisions of Land Use and Development Code to maintain acceptable LOS. The City shall include funding for improvements at these intersections in updates to the transportation portion of the Development Impact Fee Program. The following measures would be developed under the Development Impact Fee Program:

Leisure Town Road and I-80 Westbound Ramps (#1) - Widen intersection to provide an additional (4th) southbound thru lane, an additional (3rd) northbound thru lane, and an additional (3rd) eastbound left turn lane with corresponding receiving lane on the north leg. With these improvements, the intersection is projected to operate at LOS D. These improvements would require right-of-way acquisition. Additional mitigation was not found that would mitigate to LOS C without significant impact to adjacent private property. The City shall accept LOS D for operation of this intersection. Upon implementation, the project impact would be less than significant.

Leisure Town Road and Orange Drive (#3) - Widen Leisure Town Road to provide an additional (3rd) southbound thru lane and an additional (2nd) southbound left turn lane, and also provide an additional (3rd) northbound thru and a dedicated northbound right turn lane. With the improvements, the intersection is projected to operation at LOS D. These improvements would require right-of-way acquisition. Additional mitigation was not found that would mitigate to LOS C without significant impact to adjacent private property. The

City shall accept LOS D for operation of this intersection. Upon implementation, the project impact would be less than significant.

Alamo Drive and Merchant Street (#14) – Implement **Mitigation Measure 4.10-8a** by widening northbound approach to provide a 3rd left turn lane and provide a free right turn under signal control on Alamo Drive. With the improvement, the operation is projected to be LOS C in AM peak; while remaining at LOS F in the PM peak hour. To improve the operation to LOS C or better, allow the northbound right-turn movement to operate free from signal control.

With this modification to the northbound right-turn control, the intersection is projected to operation at LOS C in the PM peak hour. These improvements would require right-of-way acquisition. Upon implementation, the project impact would be less than significant.

Nut Tree Road and Ulatis Drive (#17) – Implement **Mitigation Measure 4.10-8a** by widening the west side of Nut Tree Road to provide a third southbound thru lane and widening Ulatis Drive to provide a second eastbound thru lane and a dedicated right turn lane. With this improvement, the intersection is projected to operate at LOS D. To achieve LOS C, widen Nut Tree Road to provide two left turn lanes and two thru lanes on the northbound approach and modify signal phasing to remove north-south split phase. With these improvements, the intersection is projected to operate at LOS C in the PM peak hour. These improvements would require right-of-way acquisition. Upon implementation, the project impact would be less than significant.

SECTION 5.0

CEQA CONSIDERATIONS

5.0 CEQA CONSIDERATIONS

California Environmental Quality Act (CEQA)-required discussions are included in this section, including the following:

- Section 5.1: Indirect and Growth-inducing impacts of the Proposed Project
- Section 5.2: Cumulative Impacts of the Proposed Project
- Section 5.3: Significant and Unavoidable Impacts of the Proposed Project (i.e., residually significant impacts)
- Section 5.4: Irreversible Changes

5.1 INDIRECT AND GROWTH-INDUCING IMPACTS

CEQA *Guidelines* Section 15126.2 [d] requires that an EIR evaluate the growth-inducing impacts of a proposed project. A growth-inducing impact is defined by the CEQA *Guidelines* as an impact that fosters economic or population growth, or the construction of additional housing, either directly or indirectly. Direct growth inducement would result, for example, if a project involved the construction of new housing. Indirect growth inducement would result if a project established substantial new permanent employment opportunities (e.g., new commercial, industrial, or governmental enterprises) or if it would remove obstacles to population growth (e.g., expansion of a waste water treatment plant that could allow more construction in the service area).

Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and growth management plans and policies for the area affected. Local land use plans provide development patterns and growth policies that guide orderly urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer services, and solid waste services. A project that would induce “disorderly” growth (i.e., conflict with the local land use plans) could directly or indirectly cause additional adverse environmental impacts and other public services impacts. An example of this would be the re-designation of property planned for agricultural uses to urban uses, possibly resulting in the development of services and facilities that encourage the transition of additional land in the vicinity to more intense urban uses. Another example would be the extension of urban services to a non-urban site, thereby encouraging conversion of non-urban lands to urban lands.

5.1.1 GROWTH INDUCEMENT POTENTIAL OF PROPOSED PROJECT

Growth can be induced in several ways, such as eliminating obstacles to growth and stimulating economic activity within the region. Based on the significance thresholds contained in CEQA *Guidelines*, a project is considered to be directly or indirectly growth-inducing if it:

- Fosters economic or population growth or additional housing;
- Removes obstacles to growth (e.g., through development of physical infrastructure, roadways, and utilities); or
- Taxes community services or facilities to such an extent that new services or facilities would be necessary.

The following discussion examines whether the Proposed Project would induce growth beyond that envisioned in the Solano County General Plan or the City of Vacaville General Plan (City General Plan).

GEOGRAPHIC SETTING

Areas immediately surrounding the project site would be most susceptible to growth inducing impacts because of their proximity to project-related population growth and infrastructure expansion. Areas located to the north and west of the project site are within the City's jurisdiction. These areas are developed (Foxboro to the west) or currently being developed (Southtown to the north) and therefore land use constraints in these areas would limit the potential for growth inducement. East and adjacent to the project site are Union Pacific Railroad tracks that parallel Leisure Town with agricultural lands extending further east, both of which are located outside of the City's jurisdiction. These agricultural lands are zoned by Solano County as Exclusive Agriculture (A-40) (Solano County, 2010). The lands to the south are designated as the Vacaville-Fairfield Greenbelt (Greenbelt). The 2,325-acre Greenbelt provides an open space buffer between the City and the City of Fairfield. Currently, a majority of the Greenbelt is privately owned. The areas east and south of the project site are outside the planning boundary of the City. The project site is the furthest southeast area in the County designated for annexation within the City limits in accordance with the City's Comprehensive Annexation Plan. The agriculture and Greenbelt designations for these areas and the exclusion of these areas from the City's Comprehensive Annexation Plan or any other City planning documents further reduces the potential for growth inducement from the development of the Proposed Project.

FOSTERING OF ECONOMIC OR POPULATION GROWTH

The Proposed Project would contribute to future population growth in the City and Solano County. Anticipated population increases, job opportunity increases, and housing increases resulting from the Proposed Project are discussed in **Section 4.11**, Population and Housing. The annexation of the project site and corresponding increase in residential units within City boundaries (once the site is annexed) would result in substantial population growth. The inflow of residents and their demand for services would likely result in economic growth in areas surrounding the project site. However, the increase in the demands for goods and services as a result from the population growth attributable to the Proposed Project would be met from the existing services within the City. Implementation of the Proposed Project would not foster economic growth in such a manner that would result in substantial new growth within the City.

REMOVAL OF OBSTACLES TO GROWTH

Development of the Proposed Project would extend public services to the project site including water, sewer, and utility lines (see **Section 3.0**, Project Description and **Section 4.12**, Public Utilities and Services). Proposed infrastructure would be proportionate to the level of service necessary to accommodate the Proposed Project and would originate from the extension of City services provided to the Southtown Development north of the project site. The extension of services would not provide the means for new connections to the properties to the east or to the south of the Project Site and, therefore, the obstacles of growth related to City public services would not be removed for the properties east and south of the project site. In addition, as discussed in **Section 4.13** (Transportation and Circulation), the existing transportation network is adequate to meet the needs of the Proposed Project and no new major roadways would be required or new access roadways to the eastern and southern properties be developed that could result in growth-inducement on properties adjoining the project site.

COMMUNITY SERVICES AND FACILITIES

Development of the Proposed Project would result in an increased demand for community services and facilities. The direct impacts of the Proposed Project are addressed in **Section 4.12** (Public Utilities and Services). However, the City has implemented provisions to reduce impacts to community services through the establishment of development and impact fees to offset increased demands. Accordingly, a development agreement will be entered into by the City and the project proponent, which will include requirements to offset impact to community services.

SUMMARY OF GROWTH INDUCEMENT POTENTIAL

Development of the Proposed Project would generate population growth and stimulate economic growth within the City. As previously discussed, the project could increase the development value of surrounding lands. Extending public services, including water, sewer, and utility lines from the approved Southtown projects to the project site would not remove an obstacle to development of surrounding areas (particularly to the Greenbelt to the south and agricultural lands to the east). The indirect impacts of potential growth inducement are briefly discussed below.

5.1.2 INDIRECT IMPACTS OF POTENTIAL GROWTH INDUCEMENT

As previously stated, growth inducement may constitute an adverse impact if the growth is not consistent with adopted land use plans for the area affected. As discussed above, while the Proposed Project would induce growth within the City, existing constraints including land use designations and existing City planning documents on lands south and east of the project site outside of the City would prevent inconsistent growth associated with the Proposed Project. The Proposed Project and associated growth are consistent with the City's General Plan and Comprehensive Annexation Plan. As discussed above, implementation of the Proposed Project would not remove obstacles to development of the parcels east and south of the project site. While the Proposed Project would result in impacts to community services and facilities, mitigation incorporated into the project description would remove these impacts and the anticipated physical impacts associated with new public facilities have been either addressed in the

Southtown EIR (for example impacts associated with the fire station that would also serve the Proposed Project) or throughout **Section 4.0** of this EIR (such as the impacts associated with development of a school within the project site). Therefore, implementation of the Proposed Project would not result in significant indirect environmental impacts associated with population growth.

5.2 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts refer to the effects of two or more projects that, when combined, are considerable or compound other environmental effects. Cumulative impacts must consider the combined impact of past, present, and reasonably foreseeable future projects. When assessing a cumulative impact, an EIR must identify if the project makes a “cumulatively considerable” contribution to the cumulative impact. A project’s contribution may be cumulatively considerable even if the project’s individual impact is considered less than significant. CEQA *Guidelines* Section 15130(b) requires that discussion of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. The CEQA *Guidelines* state that the cumulative impacts discussion does not need to provide as much detail as is provided in the analysis of project-only impacts and should be guided by the standards of practicality and reasonableness. Pursuant to CEQA *Guidelines* Section 15130(b), this Draft EIR uses projections contained in the City of Vacaville General Plan (2007) and Solano County General Plan (2008) and related planning documents, and in prior environmental documents that have been adopted or certified, which described or evaluated regional or area-wide conditions contributing to cumulative impacts.

5.2.1 CUMULATIVE CONTEXT

For the purposes of this Draft EIR, the cumulative setting is defined primarily as the City with consideration of the broader development trends impacting the greater Solano County region. As discussed in **Section 4.11.3**, according to the General Plan Housing Element 2007-2014 (City of Vacaville, 2010e) the Regional Housing Needs Allocation (RHNA) for the City of Vacaville for the 2007 to 2014 planning period identified a total need for 2,901 units to be constructed during this time period in order to accommodate for population growth. Of this overall amount, 1,152 units have been approved/permitted as of January 2011 (City of Vacaville, 2011f). Therefore, as of January 2011, there is a remaining need for 1,749 housing units to be provided by 2014.

The cumulative analysis is based on the long term development levels projected in the City General Plan and County General Plan, as well as reasonably foreseeable potential development projects in the vicinity of the project site. Reasonably foreseeable development projects considered within this Draft EIR consist of the continued implementation of the Southtown Planned Development and the implementation of the Fairfield Train Station Specific Plan (located approximately 1.5 miles south of the project site between Old Canon Road, Vanden Road, and Peabody Road within the jurisdiction of the City of Fairfield). The Southtown Planned Development, which is briefly described in **Section 3.3**, includes the construction of approximately 1,410 housing units, 30,000 square feet of commercial space, 6.8 acres of self storage, 20 acres of park space, a fire station, and 14 acres of public/civil space. The Fairfield Train Station Specific Plan includes the construction of up to 6,800 dwelling units, approximately 5 million square feet of

commercial and industrial development, and 1,783 acres of parks and open space within the City of Fairfield.

5.2.2 CUMULATIVELY CONSIDERABLE IMPACTS

CEQA *Guidelines* Section 15130(a) provides the following direction with respect to the cumulative impact analysis and the determination of significant effects:

1. A cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts.
2. When the combined cumulative impact associated with the project's incremental effect is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed further.
3. An EIR may determine that a project's contribution to a significant cumulative effect will be rendered less than cumulative considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

The following is a list of cumulative impacts related to the Proposed Project by environmental topic as described in **Chapter 4.0**. Refer to **Chapter 4.0** for a detailed discussion of the nature and scope of cumulative impacts associated with the Proposed Project.

AESTHETICS

- 4.1-3 The Proposed Project in combination with cumulative development surrounding the project site could significantly impact visual resources and create new sources of light and glare. Less than Significant.

AIR QUALITY AND GREEN HOUSE GAS EMISSIONS

- 4.2-7 Operation of the Proposed Project could generate emissions of ROG, NO_x, PM₁₀, and PM_{2.5}, which in combination with past, present, and future criteria emissions, has the potential to cause and exceedance of the NAAQS and/or the CAAQS. Significant and Unavoidable.
- 4.2-8 Construction and operation of the Proposed Project has the potential to result in cumulatively considerable emissions of GHGs. Less than Significant with Mitigation.

AGRICULTURE AND FORESTRY RESOURCES

- 4.3-4 The Proposed Project could contribute to adverse cumulative impacts associated with conversion of agricultural land uses. Significant and Unavoidable.

BIOLOGICAL RESOURCES

4.4-13 Development of the Proposed Project could contribute to the cumulative loss of special-status wildlife species or their habitat in the region. Less than Significant with Mitigation.

CULTURAL RESOURCES

4.5-3 Ground-disturbing construction activities may result in cumulatively considerable adverse impacts to previously unidentified subsurface archeological resources or human remains. Less than Significant with Mitigation.

GEOLOGY, SOILS AND MINERAL RESOURCES

4.6-4 Development of the Proposed Project in combination with future projects in the City of Vacaville could result in cumulative effects associated with geology and soils. Less than Significant with Mitigation.

HAZARDS AND HAZARDOUS MATERIALS

4.7-7 The Proposed Project in combination with future growth and development in the project vicinity could result in cumulative effects associated with hazards and hazardous materials. Less than Significant with Mitigation.

HYDROLOGY AND WATER QUALITY

4.8-6 The Proposed Project in combination with future growth and development within the City and project vicinity could result in cumulative impacts to hydrology and water quality. Less than Significant.

LAND USE

4.9-3 The Proposed Project could contribute to adverse cumulative impacts associated with land use. Less than Significant.

NOISE AND VIBRATION

4.10-8 Traffic resulting from the Proposed Project in combination with cumulative development has the potential to increase cumulative traffic noise levels at existing residences in excess of the City's thresholds. Less than Significant.

POPULATION AND HOUSING

4.11-4 The Proposed Project could contribute to adverse cumulative impacts associated with population and housing. Less than Significant.

PUBLIC SERVICES, UTILITIES, AND RECREATION

Because impacts associated with public services, utilities, and recreation are inherently cumulative in nature, both the direct and cumulative impacts of the Proposed Project are discussed under each identified issue area in **Section 4.12**.

- 4.12-1 The Proposed Project could exceed the City's water supply capacity requiring the acquisition or expansion of entitlements. Less than Significant.
- 4.12-2 The Proposed Project could exceed the City's water supply capacity requiring the acquisition or expansion of entitlements under potential global climate change conditions. Less than Significant.
- 4.12-3 The Proposed Project could require expansion of the City's water treatment, storage, and distribution facilities, the construction of which could result in environmental impacts.
- Water Distribution Facilities – Less than Significant
 - Water Treatment – Less than Significant
 - Water Storage – Significant and Unavoidable
- 4.12-4 The Proposed Project could exceed the capacity of the wastewater treatment and collection facilities serving the project site.
- Wastewater Collection – Less than Significant with Mitigation
 - Wastewater Treatment – Significant and Unavoidable
- 4.12-5 The Proposed Project would generate a demand for fire protection services, and could require the construction of new or expanded facilities to maintain service level standards. Less than Significant with Mitigation.
- 4.12-6 The Proposed Project would generate a demand for law enforcement services, and could require the construction of new or expanded facilities to maintain service level standards. Less than Significant.
- 4.12-7 The Proposed Project may require additional capacity or substantially increase demand for telecommunication services that could require the development of new telecommunications infrastructure, the construction of which could result in adverse environmental effects. Less than Significant.
- 4.12-8 The Proposed Project may require additional capacity, substantially increase demand, or affect energy supplies for electrical and natural gas services that could require the development of new energy transmission infrastructure, the construction of which could result in adverse environmental effects. Less than Significant.
- 4.12-9 The Proposed Project could generate solid waste beyond the capacity of the landfill and solid waste collectors serving the project area requiring development of new solid waste management facilities, the construction of which could result in adverse environmental effects. Less than

Significant.

4.12-10 The Proposed Project would generate a demand for educational services, and could require the construction of new or expanded school facilities to maintain service level standards. Less than Significant.

4.12-11 The Proposed Project may increase the use of City's parks, resulting in physical deterioration of recreational facilities. Less than Significant.

TRANSPORTATION AND CIRCULATION

4.13-9 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on Vacaville and Solano County roadways beyond acceptable capacities under Cumulative Conditions. Significant and Unavoidable.

4.13-10 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic on area freeway beyond acceptable capacities under cumulative conditions. Less than Significant.

4.13-11 Implementation of the Proposed Project with and without the Foxboro Parkway Extension has the potential to increase traffic at study intersections beyond acceptable capacities under cumulative conditions. Less than Significant with Mitigation.

5.3 SIGNIFICANT AND UNAVOIDABLE IMPACTS

The following is a summary of significant unavoidable adverse impacts related to the Proposed Project as described in each issue area contained in **Chapter 4.0**.

AIR QUALITY AND CLIMATE CHANGE

Construction and operation of the Proposed Project would result in emissions of criteria air pollutants that would exceed the Bay Area Air Quality Management Districts (BAAQMD's) and Yolo-Solano Air Quality Management Districts (YSAQMD's) thresholds; therefore, emissions of criteria air pollutants during construction and operation of the Proposed Project would have a significant-and-unavoidable impact on local and regional air quality. This impact is both project specific and cumulatively considerable.

AGRICULTURAL RESOURCES

Development of the Proposed Project would convert approximately 68.83 acres of prime and important farmlands to urban uses. Proposed mitigation would help to off-set impacts through the preservation of active farmland in Solano County with soils similar in productive value to on-site soils. However, the agricultural conservation easements would be acquired on existing farmland, resulting in a net loss of important farmland within Solano County. This would be a significant and unavoidable impact. This impact is both project specific and cumulatively considerable.

NOISE

Construction of the Proposed Project would cause an exceedance of the City's land use compatibility maximum noise level of 70 dBA for residential land uses. Implementation of the mitigation measures would minimize noise-related construction impacts and facilitate communication between construction managers and adjacent sensitive receptors. However, because of the nature of project construction activities, feasible mitigation to consistently reducing the noise levels below the 70 dBA threshold is not feasible. As a result, temporary and intermittent substantial noise increases associated with project construction would be considered significant and unavoidable. This impact is project specific.

PUBLIC SERVICES, UTILITIES, AND RECREATION

Water Storage

The City is currently investigating sites for new storage reservoirs, as future buildout of the City's General Plan, including the Proposed Project, would require additional storage within the main pressure zone. Construction of the proposed reservoirs would be in accordance with the City's standard specifications and would be subject to environmental review in compliance with CEQA. The CEQA review and mitigation measures will be funded, in part, by the development impact fees that will be paid by the Project Proponent. However, due to the general locations of the additional reservoirs, potentially significant and unavoidable environmental effects to agricultural and/or biological resources may occur as a result of construction and, therefore, the Proposed Project's cumulative contribution to the need to construct the planned reservoirs is a significant and unavoidable impact.

Wastewater Treatment

The EWTP would require one or more capacity expansions in order to serve the full amount of development allowed under the General Plan, including the Proposed Project, in accordance with previous EWTP planning documents. Expansion of the EWTP would be constructed in accordance with the City's standard specifications on the existing previously disturbed EWTP site and would be subject to environmental review in compliance with CEQA. However, potentially significant and unavoidable short-term environmental effects from construction would likely occur as a result of construction emissions and noise, similar to the effects that were identified within the EIR for the previous expansion of the EWTP (City of Vacaville, 1998). The Proposed Project's cumulative contribution to the need to expand the EWTP is, therefore, considered a significant and unavoidable impact.

TRAFFIC AND CIRCULATION

Existing Plus Approved Projects Conditions

The Proposed Project would result in vehicle trip generation through the development of residential and school facilities on the project site. The addition of project related traffic to year 2008 traffic conditions in combination with other projects that have already been approved but not yet built would contribute to significant and unavoidable impacts along the following roadway segments:

Leisure Town Road north of Sequoia

The segment of Leisure Town Road north of Sequoia would operate at below LOS D with or without the addition of project traffic. This Leisure Town Road segment is a part of the approved Jepson Parkway project that would improve the roadway to a four-lane arterial. With the implementation of the Jepson Parkway improvements, the segment would operate at LOS C or better under Existing plus Approved Projects conditions. However, because the Jepson Parkway project is not under the City's jurisdiction, the timing and implementation is not under the City's control and therefore the impact would be significant and unavoidable.

Peabody Road south of the Vacaville City Limit

The Project would contribute to the already substandard operations at the segment of Peabody Road south of the Vacaville City Limit, which would operate below LOS D under Existing + Approved Project Conditions. This segment is located in Solano County and is also designated as a Route of Regional Significance. The Congestion Management Program (CMP) for Solano County standard on this segment is LOS E. This segment is projected to experience traffic beyond the accepted capacity of a two lane arterial and the project trips would exacerbate the anticipated conditions. The Fairfield Train Station Specific Plan has included widening of this segment of Peabody Road to a four lane arterial. This improvement would provide capacity for Existing plus Approved Projects. However, the implementation of this improvement is uncertain. Therefore, this is a cumulative project impact. The City shall continue to work with Solano County Solano Transportation Authority and City of Fairfield in determining means to mitigate cumulative impacts to regional roadways. This will include continuing to support updates of the Congestion Management Program and participating in regional transportation impact fee process being lead by Solano Transportation Authority. City of Vacaville shall also coordinate and support the City of Fairfield in the timing and providing the 5th and 6th lanes of Peabody Road from City limits to Alamo Drive. However, the cumulative project impact would remain significant and unavoidable..

2030 Cumulative Conditions

The addition of project related traffic to year 2030 traffic would contribute to significant and unavoidable impacts along the following roadway segment:

Peabody Road south of the Vacaville City Limit

The segment of Peabody Road south of the Vacaville City limits would operate at LOS F with and without the addition of project traffic. This segment is located in Solano County and is also a designated Route of Regional Significance. The CMP standard on this segment is LOS E; therefore, the segment operations would exceed acceptable standards. The County allows the operations to fall below its LOS C standard as long as the existing LOS level is maintained. The segment is operating at LOS E under Existing No Project conditions and the LOS level would further deteriorate under Cumulative conditions. The project is projected to add less than one percent to PM peak hour directional volumes and therefore this impact is a result of Cumulative Condition. It is noted that widening of this segment of Peabody Road is being considered for inclusion in the nexus study used for Regional Transportation Impact Fee Program. Also the Proposed Fairfield Train Station Specific Plan addresses the widening of this segment of

Peabody Road. Cumulative analysis for Fairfield Train Station Specific Plan did include Vanden Meadows Project.

5.4 IRREVERSIBLE CHANGES

State CEQA *Guidelines* Section 15126.2(c) provides the following direction for the discussion of irreversible changes:

Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

The Proposed Project would result in an irreversible commitment of energy resources, primarily fossil fuels for construction equipment (e.g., fuel, oil, natural gas, and gasoline), and the consumption or destruction of other nonrenewable or slowly renewable resources (e.g., gravel, metals, and water).

Construction of new facilities would involve substantial quantities of building materials and energy, some of which are nonrenewable. Implementation of the Proposed Project would result in the urbanization of agricultural land and will adversely affect potential wildlife habitat for special-status species. The significance of the Project's environmental impacts is characterized in **Sections 4.2** through **4.13**, including both reversible and irreversible impacts.

SECTION 6.0

ANALYSIS OF ALTERNATIVES

6.0 ANALYSIS OF ALTERNATIVES

6.1 INTRODUCTION

This chapter reviews alternatives to the Proposed Project considered during the preparation of this EIR. The purpose of the alternative analysis, according to CEQA *Guidelines* Section 15126.6(a), is to describe a range of reasonable alternative projects that could feasibly attain most of the objectives of the Proposed Project and to evaluate the comparative merits of the alternatives. CEQA *Guidelines* Section 15126.6(b) requires consideration of alternatives that could reduce to a less than significant level or eliminate any significant adverse environmental effects of the Proposed Project, including alternatives that may be more costly or could otherwise impede the Proposed Project's objectives. The range of alternatives evaluated in an EIR is governed by a "rule of reason," which requires the evaluation of alternatives "necessary to permit a reasoned choice." Alternatives considered must include those that offer substantial environmental advantages over the Proposed Project and may be feasibly accomplished in a successful manner considering economic, environmental, social, technological, and legal factors.

In accordance with the CEQA *Guidelines*, the alternatives considered in this EIR include those that 1) could accomplish most of the basic objectives of the project, and 2) could avoid or substantially lessen one or more of the significant effects of the project. To provide the appropriate context for this alternatives analysis, the objectives and key significant effects of the Proposed Project are summarized below in **Section 6.2**. Alternatives initially considered but eliminated from further consideration due to their inability to achieve the project objectives and/or to reduce environmental impacts associated with the Proposed Project are described in **Section 6.3**. Alternatives determined to achieve the selection criteria are discussed in **Section 6.4**. This discussion evaluates the capacity of selected project alternatives to accomplish the basic objectives of the project and provides a comparison of the potential environmental impacts expected to occur for each issue area. These comparisons are used in **Section 6.5** to determine the Environmentally Superior Alternative.

6.2 OVERVIEW OF THE PROPOSED PROJECT

6.2.1 PROJECT OBJECTIVES

The overarching goal of the Proposed Project is the orderly and systematic development of an integrated, community that is compatible with surrounding land uses and master planned communities. In support of this overarching goal, the Applicant has identified the following objectives for the Proposed Project:

- Develop a master planned community that ties into the theme and character of the Southtown Project;

- Establish an attractive community that provides a variety of residential and recreational opportunities;
- Provide for a diverse residential project with densities ranging from low density to high density with individual unique neighborhoods interconnected into a sustainable planned community;
- Provide unique opportunities for walking, running and biking; and
- Provide for a quality project by use of high standards for design of the homes, landscaping, streetscape, and public amenities.

The City identified the following objectives for the Proposed Project:

- Encourage development within the City of Vacaville Sphere of Influence of the 1990 General Plan by utilizing existing General Plan land use designations.
- Encourage development within the City of Vacaville's Urban Service Area as set by and in accordance with the May 1995 City of Vacaville / Solano Irrigation District Master Water Agreement.
- Utilize existing infrastructure; such as detention basins and the urban service area; to encourage economic vitality, accommodate new housing, increase City's revenue base, enhance mobility and economic opportunity, and correct deficiencies.
- Meet planned growth projections within the City's General Plan by providing smart growth through development of a mixture of single-family and multi-family dwellings in close proximity to public schools, public parks, and pedestrian trails;
- Encourage a range of housing types within the City with an emphasis on single family moderate density development while addressing the policies and goals in the City of Vacaville General Plan;
- Develop a comprehensive bikeway/ pedestrian system that connects the park, school(s), and Southtown development, and promote the use of alternative transportation within the City; and
- Incorporate planned public school development within a master planned community.

6.2.2 KEY IMPACTS OF THE PROPOSED PROJECT

The impacts of the Proposed Project are evaluated in **Section 4.0** of this Draft EIR and are summarized in **Table 2-1**. Construction of the Proposed Project could result in potential short-term impacts associated with air quality, biological resources, geology and soils, hazardous materials, hydrology and water quality, noise.. Project design, regulatory requirements, and mitigation measures would reduce all potential short-term impacts to a less-than-significant level, except for impacts associated with air quality emissions, which would be significant and unavoidable. Operation and maintenance of the Proposed Project could result in potential long-term adverse impacts associated with aesthetics, air quality, agricultural resources, biological resources, cultural resources, geology and soils, hazardous materials, hydrology and water quality, noise, water supply facilities, wastewater treatment facilities, and circulation. Project design,

regulatory requirements, and recommended mitigation measures would reduce all potential long-term impacts to a less-than-significant level, except for impacts to air quality and agricultural resources, which would be significant and unavoidable. Additionally, the Proposed Project would contribute towards the need to upgrade the City's water supply and wastewater treatment facilities, the construction of which could result adverse environmental impacts. This is considered a cumulatively significant and unavoidable impact.

6.3 ALTERNATIVES ELIMINATED FROM CONSIDERATION

In addition to the alternatives evaluated in **Section 6.4** below, an off-site alternative and mixed-use alternative were considered for their potential to reduce the environmental impacts of the Proposed Project. These alternatives were preliminarily considered but eventually excluded from full comparative analysis within the EIR because they were determined to be infeasible, unable to meet the objectives of the Proposed Project, and/or were not likely to reduce significant environmental impacts of the Proposed Project. Alternatives considered, but rejected, are briefly discussed below.

6.3.1 ALTERNATIVE LOCATION FOR THE HOUSING DEVELOPMENT

According to CEQA Guidelines Section 15126.6(b), the discussion of alternatives should focus on alternatives to the Proposed Project that would avoid or substantially lessen significant environmental impacts of the Proposed Project. Significant impacts identified for the Proposed Project that could potentially be avoided or lessened by relocating the project include traffic impacts and loss of agricultural land (additional significant effects associated with air quality and cumulative impacts associated with public utilities are associated with the proposed land uses, and not the project location); thus, review of potential alternative locations focused on areas that would avoid or lessen these impacts.

The City's Planned Growth Ordinance directs growth to infill areas and near term annexation areas identified in the Comprehensive Annexation Plan (CAP), and prohibits the consideration of development within long-term annexation areas. The City implements several programs to encourage and promote infill development, however, there are a number of sites within the City that remain vacant due to lack of infrastructure, environmental or other constraints (City of Vacaville, 2004b). Within the City, the only areas large enough to accommodate the proposed land uses are also located in agricultural or grazing land areas, and thus would also result in impacts associated with the conversion of agricultural resources. Therefore, these alternative locations would not lessen the potential impacts of the Proposed Project. Other smaller parcels are available in the City; however, utilization of smaller fragmented parcels would require that the project be divided between multiple unconnected areas. This would significantly increase development constraints and would not attain the project objective to create an integrated master planned community. While significant impacts of the Proposed Project associated with the loss of farmland could be lessened, splitting the project into a number of sites is not considered feasible due to financial and development constraints. As a result, splitting the project among a number of areas has been eliminated from consideration.

Additional areas identified as near term annexation areas within the CAP that would be large enough to accommodate the Proposed Project would also result in the conversion of prime farmland and grazing lands. Further, development of these areas would not accomplish the Proposed Project objectives to utilize existing infrastructure, such as the detention basin, water lines and sewer collection lines installed as part of the Southtown project and sized to meet the demands of the Proposed Project, to encourage economic vitality and accommodate the City's housing needs.

Thus, alternative site locations were not selected for detailed analysis as a site could not be identified that would reasonably accomplish the stated objectives of the project while reducing the environmental effects.

6.3.2 MIXED-USE RESIDENTIAL ALTERNATIVE

The following Guiding and Implementation Policies are established by the City's General Plan to encourage the development of neighborhood commercial facilities:

- 2.6-G 2 Provide neighborhood and community shopping centers of sizes and at locations that will maintain both choice and convenience for shoppers as well as the trade area buying power needed to support quality design, maintenance and merchandising.
- 2.6-G 3 Locate shopping centers and neighborhood commercial facilities at the intersection of major thoroughfares, and, where appropriate, adjacent to multifamily housing, and minimize conflicts between commercial areas and residences by requiring adequate buffers and screening.
- 2.6-I 5 Limit neighborhood commercial sites generally to between 4 and 10 acres, and consider setting specific limits on the size of establishments other than food stores to preserve opportunities for local-serving businesses and to exclude region-serving stores likely to generate high traffic volumes.

Under the Mixed-Use Residential alternative, a 10-acre neighborhood shopping center would be developed within the project site. The proposed neighborhood shopping center would be located at the northwest intersection of the proposed Vanden Road North and Foxboro Parkway on Sub-Area C. This location is at the intersection of the two major thoroughfares and is adjacent to proposed multifamily housing in accordance with Guiding Policy 2.6-G 3. All other Sub-areas (A, B, and D through N), would be developed according to the same land use designation and density as the Proposed Project. The alternative would result in the development of 905 residential units; which is 34 fewer units than the Proposed Project.

The Mixed-Residential Alternative would not likely reduce significant environmental impacts of the Proposed Project, because of the minimal decrease in the number of units that would be developed. In addition, the General Plan states that the intent of Guiding Policy 2.6-G 2 is discourage a proliferation of small centers that could preclude the establishment of more efficient larger centers. Since the Southtown Project includes the development of a 30,000 square feet of commercial users, the proposed

neighborhood commercial would be redundant and, therefore, go against the intent of Guiding Policy 2.6-G 2. Therefore, the Mixed-Residential Alternative was dismissed from further consideration within this EIR.

6.4 ALTERNATIVES EVALUATED IN THIS DRAFT EIR

6.4.1 ALTERNATIVE A – NO PROJECT/NO DEVELOPMENT ALTERNATIVE

Description

As required by CEQA *Guidelines* Section 15126.6(e), a No Project Alternative has been evaluated. The evaluation of the No Project Alternative allows decision makers to compare the impacts of the Proposed Project against no development of the project. According to the CEQA *Guidelines* Section 15126.6(e)(2), the No Project Alternative shall discuss what would reasonably be expected to occur in the foreseeable future if the project were not approved. Under the No Project/No Development Alternative there would be no change to the current land use of the project site, annexation into the City would not occur, and there would be no amendment to the City's General Plan. Thus, the No Project/No Development Alternative consists of the environmental conditions that currently exist with no future development on the project site. The project site would remain as currently described in the existing setting under each issue area discussed in **Chapter 3.0**.

Ability to Meet Project Objectives

This alternative would not accomplish the basic objectives of the Proposed Project to develop a master planned community that ties into the theme and character of the Southtown Project and other associated objectives as identified by the Applicant; nor would it meet the City's objective of providing smart growth through development of a mixture of single-family and multi-family dwellings in close proximity to public schools, public parks, and pedestrian trails and other associated objectives.

Summary of Environmental Impacts

Alternative A would eliminate the short-term impacts related to construction activities. Temporary impacts associated with noise, traffic, and pollutant emissions from construction activities would be avoided. Additionally, potential long term impacts relating to aesthetic resources, air quality, climate change, agricultural resources, biological resources, cultural resources, soils, hazards and hazardous materials, hydrology, noise, public utilities and services, and transportation would also be avoided. However, although the existing agricultural land use on the project site is consistent with the Solano County zoning status, it is inconsistent with the intent of the current Solano County and City land use designations for the project site (residential and school) and the City's Comprehensive Annexation Plan. In addition, because no homes would be constructed under Alternative A, the City would continue to have a remaining need of approximately 1,792 residential units, including 193 moderate-income homes, and 422 above-moderate income homes (see **Impact 4.11-2**) which would need to be constructed elsewhere. Therefore Alternative A would result in greater impacts in regards to land use planning and housing than the Proposed Project.

6.4.2 ALTERNATIVE B – REDUCED FOOTPRINT

Description

Alternative B consists of the annexation of the approximately 265.6-acre project site into the City, and the approval and implementation of a specific plan for the property of similar to the Proposed Project, with the exception that no development would occur within Sub-Areas J and K consisting of approximately 20.7 acres in the southwestern corner of the site (see **Figure 3-4**), resulting in the development of 57 fewer residential units than the Proposed Project (a total of 882 single-family clustered and multi-family units would be developed). All other Sub-areas (A through L and M through N), would be developed according to the same land use designation and density as the Proposed Project. Under Alternative B, the proposed extension of Foxboro Parkway would be aligned to run along the northern border of Sub-area J to connect to Nut Tree Road.

Ability to Meet Project Objectives

Alternative B would accomplish all of the project objectives identified by the City and Applicant.

Summary of Environmental Impacts

Short-term construction impacts resulting from Alternative B associated with traffic, noise, and air quality would be proportionately less than impacts from the Proposed Project because less construction would be required. The reduced development and construction footprint would result in proportionately lessened long-term impacts relating to aesthetic resources, air quality, climate change, agricultural resources, hydrology, noise, and public utilities and services.

As shown on **Figure 4.4-4**, Sub-Areas J and K are designated by the USFWS as critical habitat for Contra Costa Goldfields (Unit 4A), vernal pool fairy shrimp (Unit16C), and vernal pool tadpole shrimp (Unit 11B) (USFWS, 2005). Since Alternative B would not result in construction on Sub-Areas J and K, no impacts to the USFWS-designated critical habitat would occur and, therefore, the overall impact of Alternative B to biological resources is considered less than the Proposed Project.

As shown on **Figure 4.3-1** and **4.3-2**, respectively, Sub-areas J and K are designated as grazing land by the Department of Conservation and are currently under Williamson Act Contracts with the County. Under Alternative B, Sub-areas J and K would continue to be preserved under the Williamson Act and would not be developed. However, because Prime Farmland would be converted to non-agricultural uses, significant and unavoidable effects to agricultural resources would still occur under Alternative B. The overall impact of Alternative B to agricultural resources is considered similar to, but less than would occur under the Proposed Project.

As described under **Impact 4.11-2**, the City had a remaining need for 1,792 residential units, including 193 moderate-income homes, and 422 above-moderate income homes. Under Alternative B approximately 882 single-family clustered and multi-family units would be developed, approximately 44

percent (384 units) of which would be low-density housing and approximately 35 percent (306 units) would be moderate-density housing. Alternative B would exceed the current housing need for the moderate income/moderate density category. However, because only 882 units would be constructed under Alternative B, the City would have a remaining need of approximately 910 residential units, including 38 above-moderate income homes which would need to be constructed elsewhere. Therefore Alternative B would result in greater impacts in regards to housing than the Proposed Project.

The City modeled the potential impact to the transportation network from the reduction in total housing development associated with the removal of Sub-areas J and K from the project under Alternative B. The results indicated that impacts would be nearly identical to those identified in **Section 4.13.4**, with the exception of the mitigatable impacts identified to Intersection 14 (Alamo Drive at Merchant Street) for the Proposed Project would not be experienced under Alternative B. However, Alternative B would not be consistent with the existing General Plan for a Foxboro Parkway connection.

6.4.3 ALTERNATIVE C – REDUCED DENSITY ALTERNATIVE

Description

Alternative C consists of the annexation of the approximately 265.6-acre project site into the City and the approval and implementation of a specific plan for the property similar to the Proposed Project, with the exception that all proposed residential areas within the project site would be designated as low-density Residential Estate. As described within **Section 4.9.3**, the base density of the Residential Estate designation is 0.5 units per gross developable acre, and the maximum potential density is 3 units per gross developable acre. It is assumed for this analysis that the development would occur at the maximum density, which would result in the construction of approximately 520 units (419 fewer units than the Proposed Project). All other components of Alternative C would be identical to the Proposed Project, including the 28-acre school site, 7-acres of park, connecting pedestrian trails, bike station, and extension of Foxboro Parkway.

Ability to Meet Project Objectives

Alternative C would accomplish most of the project objectives. As with the Proposed Project, Alternative C would develop a master planned community within the City's Sphere of Influence of the 1990 General Plan by utilizing existing General Plan land use designations. However, the proposed low density construction would not meet the objectives which require a diverse residential project with densities ranging from low density to high density. Additionally, low density development would impact the ability of the City to meet housing needs as stated and required by the General Plan Housing Element by eliminating the Residential Medium Density (RMD) Residential High Density (RHD) zoned areas.

Summary of Environmental Impacts

Due to the reduced square footage of construction, short-term construction impacts resulting from Alternative C associated with traffic, noise, and air quality would be proportionately less than impacts from the Proposed Project. The reduced development would generate proportionately fewer long-term impacts

relating to air quality, climate change, noise, public utilities and services, and traffic. Because the entire site would be constructed, albeit to a lesser density than the Proposed Project, the overall impact of Alternative C to aesthetic, agricultural, biological resources, and hydrology is considered similar to the Proposed Project.

As shown in **Figure 4.9-1** and discussed in **Section 4.9**, the majority of the project site is currently designated as Residential Low Density and Residential Estate with the exception of the designated drainage basin and a school site. Alternative C would construct housing at densities consistent with the land designation currently in place and, therefore, would not require a General Plan amendment to adjust these densities. However, Alternative C would still require a General Plan amendment to relocate the proposed school site. Land use impacts are considered similar to the Proposed Project.

As described under **Impact 4.11-2**, the City had a remaining need for 1,792 residential units, including 193 moderate-income homes, and 422 above-moderate income homes. Under Alternative C approximately 520 low-density single-family units would be developed. Alternative C would exceed the current housing need for the above-moderate income/low-density category. However, because only 520 units would be constructed under Alternative C, the City would have a remaining need of approximately 1,272 residential units, including 138 moderate-income homes which would need to be constructed elsewhere. Alternative C would hinder the City's ability to meet housing needs by providing less diversity in housing. Therefore, Alternative C would result in greater impacts in regards to housing than the Proposed Project.

6.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA *Guidelines* Section 15126.6(d) requires an evaluation of alternatives to the Proposed Project.

The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

Consistent with this CEQA requirement, a summary matrix has been prepared which qualitatively compares the effectiveness of each of the alternatives in reducing environmental impacts. This matrix, presented in **Table 6-1** identifies whether each impact area of the project alternatives would have greater, lesser, or similar impacts compared with the Proposed Project.

Generally, the environmentally superior alternative is the alternative that would cause the least damage to the biological and physical environment. Since implementation of the No Project Alternative would result in the fewer adverse environmental effects than would occur under the Proposed Project and other alternatives, Alternative A - No Project/No Development Alternative would be considered the

environmentally superior alternative. However, the No Project/No Development Alternative would not achieve any of the project objectives.

If the No-Project Alternative is the environmentally superior alternative, CEQA *Guidelines* Section 1526.6(e)(2) requires identification of an environmentally superior alternative among the other alternatives considered in the EIR. When comparing the remaining development alternatives, Alternative B, the Reduced Footprint Alternative, is the most environmentally superior alternative. Under Alternative B, development of fewer housing units on a smaller area with increased open space would fulfill all of the project objectives and would result in lesser impacts than the Proposed Project in 8 issue areas and greater impacts in 1 issue area.

TABLE 6-1.
ENVIRONMENTAL IMPACT COMPARISON BETWEEN THE PROPOSED PROJECT AND ALTERNATIVES

Issue Area	Project Alternatives		
	Alternative A No Project/ No Development Alternative	Alternative B Reduced Footprint Alternative	Alternative C Reduced Density Alternative
Aesthetics	Lesser	Lesser	Similar
Air Quality	Lesser	Lesser	Lesser
Agricultural and Forestry Resources	Lesser	Lesser	Similar
Biological Resources	Lesser	Lesser	Similar
Cultural Resources	Lesser	Similar	Lesser
Geology and Soils	Lesser	Similar	Lesser
Hazards and Hazardous Materials	Lesser	Similar	Lesser
Hydrology and Water Quality	Lesser	Lesser	Lesser
Land Use	Greater	Similar	Lesser
Noise and Vibration	Lesser	Lesser	Lesser
Population and Housing	Greater	Greater	Greater
Public Services, Utilities, and Recreation	Lesser	Lesser	Lesser
Transportation and Circulation	Lesser	Lesser	Lesser

SECTION 7.0

REPORT PREPARATION

7.0 REPORT PREPARATION

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SECTION 8.0

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8.0 REFERENCES

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SECTION 9.0

ACRONYMS

9.0 ACRONYMS

This section presents a list of acronyms used throughout this document.

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ADF	Average daily flow
ADWF	average dry weather flow
AES	Analytical Environmental Services
AFB	Air Force Base
AFY	acre feet per year
APN	assessor's parcel numbers
AQMD	Air Quality Management District
asl	above sea level
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins
bgs	below the ground surface
BI	beneficial impact
BMPs	Best Management Practices
BOD	biological oxygen demand
B.P.	before present
bsl	below surface level
C	Celsius
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CA FID UST	State Facilities Inventory System
CalARP	California Accidental Release Program
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAP	criteria air pollutants
CARB	California Air Resources Board
CAT	Climate Action Team
CBC	California Building Standards Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CCTS	Central California Taxonomic System
CDFG	California Department of Fish and Game
CDMG	California Department of Mines and Geology
CEC	California Energy Commission
CEPA	California Environmental Protection Agency

CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CESA	California Endangered Species Act
CFR	Code of Federal Regulation
CGS	California Geological Survey
CH ₄	methane
CHMIRS	State Hazardous Material Incidents, Including Accidental Releases and Spills
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CIWMB	California Integrated Waste Management Board
CNDDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California National Plant Society
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CORRACTS	Corrective Action Report
CRHR	California Register of Historical Resources
CTR	California Toxics Rule
CUPA	Certified Unified Program Agency
CVC	California Vehicle Code
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
cy	cubic yards
dB	decibel
dBA	A weighted decibel
Delta	Sacramento-San Joaquin River Delta
DNL	day/night average noise level
DOC	California Department of Conservation
DPM	diesel particulate matter
Draft EIR	Draft Environmental Impact Report
DTSC	California Department of Toxic Substance Control
DWR	California Department of Water Resources
EDR	Environmental Data Resources
EIR	Environmental Impact Report
EO	Executive Order
EOP	Emergency Operations Plan
ESA	Endangered Species Act

EWWTTP	Easterly Wastewater Treatment Plant
F	Fahrenheit
FEMA	Federal Emergency Management Act
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
ft	feet
FTA	Federal Transit Administration
GHG	green house gasses
gpm	gallons per minute
H ₂ O	water vapor
HAZNET	Hazardous Waste Information System
HCP	habitat conservation plan
HMP	Hazardous Materials Business Plan
HSA	Hydrologic Subarea
Hz	hertz
IPCC	International Panel on Climate Change
IRF	Intermediate Regional Flood
L _{dn}	day/night average noise level
L _{eq}	equivalent sound level
L _{maz}	maximum noise level
L _{min}	minimum noise level
LOS	level of service
LTS	less than significant
LUCP	Land Use Compatibility Plan
LUST	Leaking Underground Storage Tanks
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Levels
Mgal	million gallon
mg/L	milligrams per liter
mgd	million gallons per day
ml	milliliters
mm	millimeter
MMI	Modified Mercalli Intensity
MMRP	Mitigation Monitoring and Reporting Program
mph	miles per hour
MPN	most probable number

MW	megawatt
N ₂ O	nitrous oxide
NA	not applicable
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEHRP	National Earthquake Hazards Reduction Program
NEHRPA	National Earthquake Hazards Reduction Program Act
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NI	no impact
No.	number
NOP	Notice of Preparation
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O ₃	ozone
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Act
PM	particulate matter
ppm	parts per million
PS	potentially significant
RCRA	Resource Conservation and Recovery Act
RCRA-LQG	RCRA – Large Generators of Hazardous Waste
RCRA-SQG	RCRA – Small Generators of Hazardous Waste
RMP	Risk Management Plan
ROG	reactive organic gas
ROW	right-of-way
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCS	sustainable communities strategy
SCWA	Solano County Water Agency
SDWA	Safe Drinking Water Act

SFNA	Sacramento Federal Nonattainment Area
SHWS	State and Tribal-Equivalent CERCLIS Hazardous Waste Sites
SIP	State Implementation Plan
SIP	State Implementation Policy
SLIC	Spill, Leaks, Investigation and Cleanup
SMARA	California Surface Mining and Reclamation Act
SO ₂	sulfur dioxide
SRF	State Revolving Funds
sq ft	square feet
STA	Solano Transportation Authority
SU	significant and unavoidable
SVAB	Sacramento Valley Air Basin
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TCR	transportation concept reports
TDS	total dissolved solids
TPH-g	total petroleum hydrocarbons as gasoline
TSD	Treatment, Storage, and Disposal
TSM	Transportation Systems Management
TSS	total suspended solids
UAA	Use Attainability Analysis
UBC	Uniform Building Code
UCDAIC	University of California Davis Agriculture Issues Center
ug/L	micrograms per liter
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Services
VMT	vehicle miles traveled
VOC	volatile organic compounds
WARN	Water Agency Response Network
WDRs	waste discharge requirements
WMUDS	Waste Management Unit Database

9.0 Acronyms

WPT	Western Pond Turtle
YSAQMD	Yolo-Solano Air Quality Management District