EIR11-0170

City Wide

9/1/2011

Draft EIR

City of Santa Cruz

General Plan 2030





DRAFT EIR



General Plan 2030

City of Santa Cruz

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1.0 INTRODUCTION

IN THIS SECTION:

1.1 Purpose of EIR
1.2 Project Overview
1.3 Consideration of Impacts
1.4 EIR Issues
1.5 EIR Process
1.6 Report Organization

1.1 PURPOSE OF EIR

This EIR has been prepared for the City of Santa Cruz (City), which is the lead agency for the project. This EIR has been prepared in accordance with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, which are found in Title 14 of the California Code of Regulations, commencing with section 15000. CEQA and the State CEQA Guidelines were most recently amended in 2009, and the amendments became effective in 2010.

As stated in the CEQA Guidelines section 15002, the basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

Pursuant to State CEQA Guidelines section 15121, an EIR is an informational document which will inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. The public agency shall consider the information in the EIR along with other information which may be presented to the agency. While the information in the EIR does not control the ultimate decision on the project, the agency must consider the information in the EIR and respond to each significant effect identified in the EIR by making findings pursuant to Public Resources Code section 21081.

This EIR is being prepared as a "Program EIR" pursuant to section 15168 of the State CEQA Guidelines. A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project, such as a General Plan, and are related geographically. A

program EIR can provide a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action and can ensure consideration of cumulative impacts. A program EIR can be used as part of the environmental review for later individual projects to be carried out pursuant to the project previously analyzed in the program EIR, where impacts have been adequately addressed in the program EIR. This is referred to as "tiering" as set forth in section 15152 of the State CEQA Guidelines. "Tiering" uses the analysis of general matters contained in a broader EIR (such as one prepared for a general plan) with later EIRs and negative declarations on narrower projects, incorporating by reference the general discussions from the broader EIR and concentrating the later EIR or negative declaration solely on the issues specific to the later project. The State CEQA Guidelines encourage agencies to tier the environmental analyses which they prepare for separate but related projects, including general plans, zoning changes, and development projects.

1.2 PROJECT OVERVIEW

This Environmental Impact Report (EIR) addresses the potential environmental effects of the proposed City of Santa Cruz Draft *General Plan 2030* (dated February 27, 2009), which is an update of the City's existing *General Plan and Local Coastal Plan 1990- 2005* that was adopted in 1992 and subsequently amended. As its title indicates, the draft *General Plan 2030* extends to the year 2030. The proposed General Plan, when adopted, will supersede the 1990-2005 General Plan and its several amendments.

Pursuant to State law, the proposed General Plan includes the following elements required by state law: Land Use, Circulation, Housing, Conservation, Open Space, Safety, and Noise, and also includes optional subjects set forth in the State General Plan Guidelines related to community design and economic development. Goals, policies and actions are provided for each element.

The General Plan also includes a Land Use Map as required by State law, which identifies land use designations and graphically depicts the arrangement and location of land uses throughout the City. The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan and Local Coastal Program, except for new mixed use designations along segments of Mission Street, Ocean Street, Soquel Avenue and Water Street. Additionally, land use designations for two sites ("Golf Club Drive" and "Swenson" properties) have been changed

To aid the environmental analysis, a "buildout" projection was developed, which considers the development potential under the proposed General Plan that is estimated to occur in Santa Cruz by the year 2030. In summary the estimates forecast the following new development by year 2030:

- 3,350residential units
- 1,087,983 square feet of commercial development and 311 hotel rooms
- 1,273,913 square feet of office space; and
- 776,926 square feet of industrial development.

A full description of all project components is provided in the PROJECT DESCRIPTION (Chapter 3.0) of this EIR.

1.3 CONSIDERATION OF IMAPCTS

As indicated above, the focus of the environmental review process is upon significant environmental effects. As defined in section 15382 of the CEQA Guidelines, a "significant effect on the environment" is:

> ...a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether a physical change is significant.

Section 15126 of the State CEQA Guidelines requires all phases of a project must be considered when evaluating its impact on the environment. Specifically, the following must be discussed in the EIR:

(a) Significant environmental effects of the proposed project.

(b) Significant environmental effects which cannot be avoided if the proposed project is implemented.

(c) Significant irreversible environmental changes which would be involved in the proposed project should it be implemented.

(d) Growth-inducing impacts of the proposed project.

(e) Mitigation measures proposed to minimize the significant effects.

(f) Alternatives to the proposed project.

In evaluating the significance of the environmental effect of a project, the State CEQA Guidelines require the Lead Agency to consider direct physical changes in the environment and reasonably foreseeable indirect physical changes in the environment which may be caused by the project (CEQA Guidelines section 15064[d]). A direct physical change in the environment is a physical change in the environment which is caused by and immediately related to the project. An indirect physical change in the environment is a physical change in the environment which is not immediately related to the project, but which is caused indirectly by the project. An indirect physical change is to be considered only if that change is a reasonably foreseeable impact which may be caused by the project. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects (CEQA Guidelines section 15126.2[a]).

CEQA Guidelines section 15064(e) further indicates that economic and social changes resulting from a project shall not be treated as significant effects on the environment, although they may be used to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant. For example, this could be a situation in which a large retail chain store enters a local market and outcompetes local stores, causing closure of local business(es) for an extended period of time and resulting conditions of urban blight.

The State CEQA Guidelines also provide that "the degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR " (CEQA Guidelines section 15146). In this case, the underlying activity is the adoption and implementation of an updated general plan for the City of Santa Cruz. As indicated in this section of the State CEQA Guidelines, an EIR on a construction project will necessarily be more detailed in the specific effects of the project than will be an EIR on the adoption of a local general plan or comprehensive zoning ordinance because the effects of the specific construction project can be predicted with greater accuracy. An EIR on a project such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan should focus on the secondary effects that can be expected to follow from the adoption or amendment, but the EIR need not be as detailed as an EIR on the specific construction projects that might follow.

1.4 EIR ISSUES

An Initial Study was not prepared for the project. In accordance with State CEQA Guidelines section 15060(d), the City determined that an EIR was required to assess the potential environmental impacts of the project, and chose to begin work directly on the EIR. Due to the comprehensive nature of the General Plan, the EIR covers all topics set forth in the State CEQA Guidelines Appendix G (Environmental Checklist) as outlined below. The EIR also evaluates topics required by CEQA and CEQA Guidelines for EIRs, including growth inducement, project alternatives and cumulative impacts. The environmental analysis for this EIR includes:

LAND USE AND DEVELOPMENT

- Land Use
- Population and Housing
- Aesthetics

PUBLIC FACILITIES AND SERVICES

- Transportation and Traffic
- Water Supply
- Public Services and Utilities
- Hydrology, Storm Drainage and Water Quality

RESOURCES AND HAZARDS

- Biological Resources
- Cultural Resources

- Geology and Soils
- Air Quality
- Global Climate Change
- Noise
- Hazardous Materials
- Agricultural, Forest and Mineral Resources

1.5 EIR PROCESS

As indicated above, an Initial Study was not prepared for the project in accordance with State CEQA Guidelines section 15060(d), because the City determined that an EIR was required to assess the potential environmental impacts of the project. A Notice of Preparation (NOP) for this EIR was circulated on March 2, 2009 (see Appendix A). The NOP was circulated to the State Clearinghouse and local, regional and federal agencies, as well as organizations and interested citizens. Additionally, an agency scoping meeting and a public scoping meeting were each held on March 16, 2009 to take public comment on the proper scope of the EIR's analysis and project alternatives. Comment letters were received from the agencies, organizations and individuals listed below. These letters are included in Appendix A. Both the written comments and oral comments received at the scoping meeting have been taken into consideration in the preparation of this EIR.

- FEMA, Region IX
- California Board of Forestry and Fire Protection
- California Department of Transportation (Caltrans)
- California Public Utilities Commission
- University of California, Santa Cruz
- Monterey Bay Unified Air Pollution Control District
- John Golder
- Mark Primack
- Celia Scott
- H. Reed Searle
- Ed Silveira

The Draft EIR will be published and circulated for review and comment by the public and other interested parties, agencies and organizations for a 60-day review period from September 9, 2011 through November 7, 2011. The Final EIR will include written responses to any significant environmental issues raised in comments received during the public review period, as well as any text changes and additions that become necessary after consideration of public comments.. (See CEQA Guidelines, § 15088c).) The Final EIR will then be presented to the City Planning Commission and City Council. The City Council must ultimately certify that it has reviewed and considered the information in the EIR, that the EIR has been completed in conformity with the

requirements of CEQA, and that the document reflects the City's independent judgment. (See CEQA Guidelines, § 15090, subd. (a).)

Pursuant to sections 21002, 21002.1 and 21081 of CEQA and sections 15091 and 15093 of the State CEQA Guidelines, no public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant effects unless both of the following occur:

> (a) The public agency makes one or more of the following findings with respect to each significant effect:
>
> 1. Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effects on the environment.
> 2. Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been or can and should be, adopted by such other agency.
> 3. Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report.
>
> (b) With respect to significant effects which were subject to a finding under paragraph (3) of subdivision (a), the public agency finds that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment.

Although these determinations (especially regarding feasibility) are made by the public agency's final decision-making body (here, the City Council) based on the entirety of the agency's administrative record as it exists after completion of a final EIR, the draft EIR must provide information regarding the significant effects of the proposed project and must identify the potentially feasible mitigation measures and alternatives to be considered by that decision-making body.

1.6 REPORT ORGANIZATION

The Draft EIR is organized with the following sections.

- **SUMMARY OF ENVIRONMENTAL IMPACTS:** This section provides a summary of all impacts, level of significance, and mitigation measures identified for the project, as well as a summary of alternatives. An overview of the project is provided, and issues of concern are summarized.

- **PROJECT DESCRIPTION:** A full description of all elements of the proposed General Plan is provided, including an overview of goals, policies, land uses and potential buildout.

- **ENVIRONMENTAL SETTING:** IMPACTS AND MITIGATION MEASURES: Each topical section in this EIR presents information in four parts. The "Environmental Setting" sections provide a general overview of the existing conditions throughout the City related to the topic being addressed. Local, State and federal regulations are also identified and discussed, when relevant.

  A "Relevant Project Elements" section provides a description of the elements of the project that are relevant to the impact analysis for a particular topic. Relevant project information may relate to proposed goals, policies, and actions, as well as to potential future development that may be supported and/or accommodated by the proposed General Plan. Any project elements that may cause impacts, as well as those that may serve to eliminate or reduce impacts, will be identified.

  The "Impacts and Mitigation Measures" section provides an outline of the criteria used to evaluate whether an impact is considered significant based on standards identified in the California Environmental Quality Act (CEQA) and State CEQA Guidelines. Agency policies or regulations and/or professional judgment are also used to further define what actions may cause significant effects. Significant impacts are identified and analyzed. Mitigation measures that would reduce significant impacts are identified. The significance of the impact after mitigation is also identified. For impacts found to be less-than-significant, mitigation measures are not required, but where relevant, the EIR recommends appropriate clarifications to the draft *General Plan 2030*.

  For convenience, all references cited in each section are listed at the end of the section, as well as in a complete "References" list at the end of the EIR.

- **CEQA CONSIDERATIONS:** This section evaluates the topics required to be included in an EIR including unavoidable impacts, irreversible impacts, growth inducement, cumulative impacts, and project alternatives.

- **REFERENCES:** This section identifies all contacted agencies and all references that were cited or utilized in preparation of the EIR.

- **FIGURES:** All EIR figures are located in one section at the end of the document for ease of reference as some figures are referenced in all sections.

It should be noted that a Mitigation Monitoring and Reporting Program will be included in the Final EIR, although it is not required to be included in the EIR.

2.0 SUMMARY OF IMPACTS

IN THIS SECTION:

2.1 Project Summary
2.2 Areas of Concern
2.3 Summary of Alternatives
2.4 Summary of Impacts & Mitigation Measures

This summary provides a brief description of the proposed project, known areas of concern, project alternatives, and all potentially significant impacts identified during the course of this environmental analysis. This summary is intended as an overview and should be used in conjunction with a thorough reading of the EIR. The text of this report, including figures, tables and appendices, serves as the basis for this summary.

2.1 PROJECT SUMMARY

This Environmental Impact Report (EIR) addresses the potential environmental effects of the proposed City of Santa Cruz Draft *General Plan 2030* (dated February 27, 2009), which is an update of the City's existing *General Plan and Local Coastal Plan 1990- 2005*. Pursuant to State law, the proposed General Plan includes the following elements required by state low: Land Use, Circulation, Conservation, Open Space, Safety, and Noise, and also includes optional subjects set forth in the State General Plan Guidelines related to community design and economic development. The City's Housing Element is prepared as a separate volume to the General Plan as it requires updates every seven years in accordance with State law. The City's current Housing Element was updated and adopted in 2010 (with formal state approval and final City adoption in 2011) and covers the years 2007 to 2014. Thus, the Housing Element is not part of the *General Plan 2030* document and not included in the environmental review.

Goals, policies and actions are provided for each element. The General Plan also includes a Land Use Map as required by State law, which identifies land use designations and graphically depicts the arrangement and location of land uses throughout the City. To aid the environmental analysis, a "buildout" projection was developed, which considers the development potential of land permitted under the proposed General Plan that is estimated to occur in Santa Cruz by the year 2030.

2.2 AREAS OF CONCERN

The City of Santa Cruz, as the Lead Agency, has identified areas of concern based on comments received on the Notice of Preparation (see Appendix A) and comments received at

two scoping meetings held on March 16, 2009. Eleven letters (or emails) of comment were received from agencies, organizations and individuals in response to the Notice of Preparation (see Appendix A) – six from agencies and five from members of the community.

Issues or concerns raised by other comment letters include:

- Safety and Hazards
- Consideration of safety requirements for the General Plan;
- Requirements for development in a floodplain;
- Consideration of safety requirements for the General Plan;
- Traffic impacts on State highways;
- Air quality impacts;
- Parks planning and park uses;
- Traffic impacts;
- Greenhouse gas emissions;
- Historical preservation;
- UCSC future enrollments;
- Alternatives and Cumulative impacts
- Community benefits

2.3 SUMMARY OF ALTERNATIVES

CEQA Guidelines require that an EIR describe and evaluate alternatives to the project that could eliminate significant adverse project impacts or reduce them to a less-than-significant level. The following alternatives are evaluated in this EIR in the Chapter 5 - CEQA Considerations.

- **ALTERNATIVE 1: No Project.** This alternative would maintain the City's existing 1990-2004 General Plan without new mixed-use land use designations or other land use changes and without new or revised policies and actions. The alternative would result in estimated development of 1,816 residential units and approximately 2,860,000 square of commercial, office and industries with an associated population increase of 4,360 residents and 7,710 employees.

- **ALTERNATIVE 2: Reduced Growth.** This alternative assumes that growth would occur as forecast by AMBAG under which 2,413 new housing units are projected between 2009 and 2030, which would result in a population increase of 5,790 residents. Under AMBAG forecasts, the City would experience an increase of approximately 8,080 new employees between 1990 and 2030.

- **ALTERNATIVE 3: Reduced Land Use Density/Intensity.** This alternative would reduce the projected General Plan buildout by reducing land use densities or intensities in some areas. This alternative assumes a reduction in land use density or intensity in the following areas: a) reduced density along transit corridors and/or elimination of specified segments of mixed

use designations to include removal of a mixed use segment along Mission between Bay Street and Walnut Avenue and changing the proposed mixed-use high density designated along Soquel Avenue to a mixed-used medium density designation; b) maintaining the existing General Plan land use designations (and density) at Swenson site and Golf Club Drive area; and elimination of support of large retail commercial in Harvey West area. The alternative would result in estimated development of 2,750 residential units and approximately 3,120,000 square of commercial, office and industries with an associated population increase of 6,600 residents and 8,645 employees.

As discussed in the "Alternatives" subsection of the CEQA CONSIDERATIONS (Chapter 5.0) section of this EIR, none of the alternatives, including the No Project Alternative (Alternative 1) would eliminate significant unavoidable project and cumulative impacts related to traffic and water supply, although all alternatives would result in a reduced level of traffic and water demand. The No Project Alternative would, however, reduce the other four identified significant impacts to less-than significant levels. Alternative 2 – Reduced Growth would also reduce the identified significant impact related to consistency with the Air Quality Management Plan to a less-than-significant level, although under the Alternative 3—Reduced Density/Land Use Intensity, this would remain significant and less-than-significant with mitigation. Potentially significant impacts on schools and cultural resources would remain significant under Alternatives 2 and 3, but could be mitigated. Table 5-5 provides a comparison of impact significant between the proposed *General Plan 2030* and the alternatives evaluated in this section. Alternatives 2 and 3 could attain some of the objectives (#1 and #3) and partially attain others (#2 and #4).

Excluding the No Project Alternative (Alternative 1), Alternative 2 – Reduced Growth, is considered the environmentally superior alternative of the alternatives considered. Although it would not eliminate significant unavoidable impacts, it could result in the greatest reduction of traffic and water demand impacts and reduce some of the other identified significant impacts. However, it would not fully meet project objectives.

2.4 SUMMARY OF IMPACTS AND MITIGATION MEASURES

All impacts identified in the subsequent environmental analysis are summarized in this section. This summary groups impacts of similar ranking together, beginning with significant unavoidable impacts, followed by significant impacts that can be mitigated, followed by impacts not found to be significant.

SIGNIFICANT UNAVOIDABLE IMPACTS

The following impacts have been identified as being significant, and although mitigation measures help reduce the level of significance, the impacts cannot be reduced to a less-than-significant level.

4.4 - Transportation and Traffic

Impact 4.4-1: Traffic Impacts on Intersections Levels of Service (LOS). Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic, resulting in changes in intersection levels of service to unacceptable levels or further deterioration of intersections currently operating at unacceptable levels of service. With implementation of proposed *General Plan 2030* policies and actions, including road improvements identified in an updated Traffic Impact Fee program, intersection operations would be improved and traffic levels would be reduced, except at eight intersections.

Mitigation Measures

With implementation of the proposed *Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, the impact could be reduced to a less-than-significant level at all but four intersections along state highways and the four local intersections. Impacts would remain significant and unavoidable. With uncertainly regarding funding and implementation of transportation projects for the other intersections, the impact remains significant and unavoidable. However, revision of the following *General Plan 2030* action is recommended.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

M3.1.4 Accept a lower level of service and higher congestion at major regional intersections if necessary improvements would be ~~too~~ prohibitively costly or result in significant, unacceptable environmental impacts.

Impact 4.4-2: Traffic Impacts on State Highway Levels of Service (LOS). Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic on state highways in the regions (Routes 1, 17, and 9), which would further exacerbate existing unacceptable levels of service.

Mitigation Measures

None are known beyond those being considered for Highway 1 by Caltrans as discussed in the EIR text.

4.5 - Water Supply

Impact 4.5-1 Water Supply. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in an increased demand for water supply in a system that currently has inadequate supplies during dry years and may have inadequate supplies in normal years in the future.

Mitigation Measures

Implementation of the proposed *General Plan 2030* policies and actions to reduce water demand, promote water conservation, and support development of reliable supplemental water supplies will not reduce this impact to a less-than-significant level due to uncertainties regarding funding and implementation of desalination or another adequate alternative water supply, which may be needed to serve future growth. Therefore, the conservative conclusion is that the project impact on City water supplies during both normal and during dry year conditions is significant and unavoidable, even with implementation of proposed *General Plan 2030* policies and actions.

Cumulative Impacts

The following were determined significant cumulative impacts to which the proposed project's incremental contribution was found to be cumulatively considerable, thus resulting in a significant unavoidable impact.

- **Population Growth**. Cumulative growth (City and UCSC) could result in an average annual growth rate of 1.3% if the North Campus area is annexed to the City in the next 20 years. This projected level of growth exceeds historical growth rates between 1990 and 2009 (0.901.9%), as well as the AMBAG population growth rate of 0.65% between 2009 and 2030.
- **Traffic**. Cumulative development and growth would generate traffic that would result in unacceptable levels of service at 26 intersections, all of which could be improved to acceptable levels or improved operations, except at 11 intersections, including five along state routes. Cumulative traffic along state highways would contribute to existing and future unacceptable levels of service. Therefore, the cumulative traffic would result in significant cumulative impacts at seven intersections and along Highways 1 and 17. Funding availability for facility improvements and expansion of transit service will likely remain constrained into the foreseeable future. Thus, implementation of recommended improvements and alternative transportation facilities cannot be assured, and the impact under the cumulative conditions remains significant, at City intersections and along state highways this is a significant cumulative impact, and the project's incremental increase would be cumulatively considerable.
- **Water Supply**. Cumulative development and growth in the City's water service area would result in a significant cumulative water impact, as it results in additional demand in a system that does not currently have adequate water supplies to meet existing or future demands during drought conditions or potentially during normal years at some time after the year 2020. The City's supplies are sufficient to meet cumulative water demands in a normal year through to the year 2030 if overall water use remains at 2007-2008 levels. However, if water demand is consistent with historic water use between 1999 and 2004, the City's total demand will be approximately 223 MGY greater than the available normal year supply of 4,314 MGY in 2030. Thus, cumulative development and growth would result in a significant cumulative impact during dry years and potentially during normal years. The project's

incremental contribution is therefore considered "cumulatively considerable" and thus significant in and of itself. The City has identified a desalination plant as its best, potentially feasible option to alleviate shortages in drought conditions and as a potential additional normal-year water supply to serve new growth, and therefore has committed to pursuing this option with the intent of obtaining all necessary regulatory approvals. However, the City acknowledges the inherent uncertainty about its ability to obtain all necessary approvals for the planned desalination facility. Furthermore, surface water supplies may be reduced due to implementation of wildlife protection strategies under a future HCP, which may require that the City seek additional supplies and/or expansion of a desalination facility beyond that capacity that is currently planned for drought supply. Thus, the impact remains significant and unavoidable.

- **Noise.** Cumulative development and growth would result in noise increases associated with the traffic increases, but the increases would not exceed significance criteria (more than a 3 dBA increase), except for three road segments (Swift Street north of Delaware and Mission Street between Bay and Walnut) that would be considered significant for some existing residences along these segments.

SIGNIFICANT IMPACTS

The following impacts have been identified as being significant which can be mitigated to a less-than-significant level with implementation of recommended mitigation measures.

4.6 – Public Services & Utilities

Impact 4.6-4 Schools. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would generate elementary school student enrollments that could exceed capacity of existing schools.

Mitigation Measures

No mitigation measures are required beyond payment of school impact fees that will be collected at the time of issuance of a building permit.

4.9 – Cultural Resources

Impact 4.9-1: Archaeological Resources and Human Remains. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could directly or indirectly disturb or alter archaeological resources, historical archaeological, and/or human remains. Even with implementation of the proposed General Plan policies and actions for cultural resource protection, this is considered a potentially significant impact.

Mitigation Measures

Implementation of Mitigation Measure 4.9-1 below, in conjunction with implementation of the proposed General Plan policies and actions and compliance with local

regulations, will mitigate potential impacts of future development on archaeological resources to a less-than-significant level.

MITIGATION 4.9-1 Add Action HA1.2.2 that establishes a procedure for preparing archaeological investigations as follows:

HA1.2.2 Require preparation of archaeological investigations on sites proposed for development within areas identified as "Highly Sensitive" or "Sensitive" on the "Areas of Archaeological Sensitivity" and "Historical Archaeology Sensitivity" maps, except for exempt uses within "Sensitive" areas as described below, prior to approval of development permits. The investigation shall include archival research, site surveys and necessary supplemental testing as may be required, conducted by a qualified archaeologist. The significance of identified resources shall be ascertained in accordance with CEQA definitions, and impacts and mitigation measures outlined if significant impacts are identified, including, but not limited to recovery options and onsite monitoring by an archaeologist during excavation activities. A written report describing the archeological findings of the research or survey shall be provided to the City.

Allow minor projects with little excavation to be exempt from this requirement for preparation of an archaeological assessment within designated "Sensitive" areas, but not within the "High Sensitivity" areas. Minor projects generally involve spot excavation to a depth of 12 inches or less below existing grade, or uses that have virtually no potential of resulting in significant impacts to archaeological deposits. Exempt projects may include: building additions, outdoor decks, or excavation in soil that can be documented as previously disturbed.

Impact 4.9-3: Paleontological Resources

Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could directly or indirectly disturb or alter paleontological resources. Even with implementation of the proposed policies and actions for cultural resource protection, this is considered a potentially significant impact.

Mitigation Measures

Implementation of the proposed General Plan policies and actions outlined above, and Mitigation Measure 4.9-2 identified below will mitigate potential impacts of future development to a less-than-significant level.

MITIGATION 4.9-2 Add Action HA1.2.3 that establishes a procedure for preparing archaeological investigations as follows:

HA1.2.3 The City shall notify applicants within paleontologically sensitive areas of the potential for encountering such resources during construction and condition approvals that work will be halted and resources examined in the event of encountering paleontological resources during construction. If the find is significant, the City should require the treatment of the find in accordance with the recommendations of the evaluating paleontologist. Treatment may include, but is not limited to, specimen recovery and curation or thorough documentation.

Air Quality

Impact 4.11-1 Consistency with AQMP. Adoption and implementation of the General Plan 2030 could indirectly result in increased population associated with potential development that would be accommodated by the Plan. The increased population would exceed population estimates in the Air Quality Management Plan in 2030, and thus the project would be inconsistent and conflict with the AQMP.

Mitigation Measures

Implementation of the following mitigation measure will reduce the impact to a less-than-significant level.

MITIGATION 4.11-1 The City shall work with the MBUAPCD and AMBAG and request that AMBAG's next population and housing forecast for the city of Santa Cruz and MBUAPCD's next *Air Quality Management Plan* be updated to reflect potential growth that could be accommodated by the General Plan 2030.

LESS-THAN-SIGNIFICANT IMPACTS

The following impacts were found to be less-than-significant. Mitigation measures are not required.

4.1 - Land Use

Impact 4.1-2: Introduce Incompatible Land Uses. The proposed *General Plan 2030* does not introduce new land uses that would be incompatible with existing land uses or land use designations, although residential densities may increase in limited areas. However, with implementation of proposed *General Plan 2030* policies and actions, compatibility between new higher density residential uses with adjacent lower density residential neighborhoods would be ensured.

4.2 - Population & Housing

Impact 4.2-1 Population Growth Inducement. Adoption and implementation of the *General Plan 2030* could indirectly result in increased population associated with potential development that could be accommodated by the Plan. However, the estimated amount and rate of growth are consistent with historic population growth patterns and trends, and would not be considered substantial.

Impact 4.2-3 Removal of Housing and/or Displacement of People. Adoption and implementation of the proposed *General Plan 2030* could indirectly result removal of existing housing and/or displacement of residents due to redevelopment of underutilized parcels. As most mixed-use and redevelopment areas include predominantly non-residential structures, and with adherence to City regulations and *Housing Element* policies, this is considered a less-than-significant impact.

4.3 - Aesthetics

Impact 4.3-1: Scenic Public Views. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could adversely affect scenic public views. However, such development would be limited to infill sites and with implementation of the proposed policies and actions for protection of scenic public views, this is considered a less-than-significant impact.

Impact 4.3-2: Scenic Resources. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could adversely impact scenic resources. However, with implementation of the proposed policies and actions for protection of scenic resources, this is considered a less-than-significant impact.

Impact 4.3-3: Degradation of Visual Quality of Surrounding Areas. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that would result in intensified structural development in some areas that could result in substantial degradation of the visual quality of surrounding neighborhoods. However, with implementation of the proposed policies and actions for siting of development to be sensitive to existing uses in concert with street landscaping, this is considered a less-than-significant impact.

Impact 4.3-4: Introduction of Light and Glare. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could introduce new sources of light or glare. However, given the infill nature of future development, it is not expected that new sources of substantial light or glare would be introduced. Implementation of the proposed policies and actions for minimizing lighting impacts would further reduce potential effects.

4.4 - Transportation and Traffic

Impact 4.4-3: Traffic Hazards. Adoption and implementation of the proposed *General Plan 2030* would not result in new roads that could potentially create hazards, and with implementation of proposed *General Plan 2030* policies and actions to ensure road safety, the

project would not result in direct or indirect impacts related to increased hazards. Therefore, there is *no impact* related to road safety/hazards.

Impact 4.4-4: Conflicts with Adopted Plans. Adoption and implementation of the proposed *General Plan 2030* would not result in conflicts with adopted plans, policies or programs that support alternative transportation, as the proposed goals, policies and actions directly support implementation and use of alternative transportation modes.

4.5 - Water Supply

Impact 4.5-2 Groundwater. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in an increased demand for water supply. However, the draft *General Plan 2030* plan does not propose expansion of groundwater supplies, and with implementation of proposed policies and actions, groundwater supplies would not be depleted, nor would development accommodated by the plan interfere with groundwater recharge.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* action is recommended.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

CC3.3.8 Provide adequate pumping, treatment, and distribution facilities for production of groundwater of 1 mgd ~~in normal years and 2 mgd during droughts~~.

4.6 – Public Services & Utilities

Impact 4.6-1 Fire Protection. Adoption and implementation of the General Plan 2030 could indirectly result in increased population associated with potential development that could be accommodated by the Plan that would result in increased fire protection and emergency service demands. However, future development and growth would not result in the need to construct new or expanded fire stations.

Impact 4.6-2 Police Protection. Adoption and implementation of the General Plan 2030 could indirectly result in increased population associated with potential development that could be accommodated by the Plan that would result in increased police protection service demands. However, future development and growth would not result in the need to construct new or expanded police stations.

Impact 4.3 Parks and Recreation. Adoption and implementation of the proposed General Plan 2030 could indirectly result in increased development and population growth that would result

in an indirect demand for parks and recreational facilities. However, the estimated growth would not increase use of parks or recreational facilities such that a substantial physical deterioration would occur. With implementation of proposed policies and actions, in combined with existing regulations, the impact to parks and recreational facilities is considered less-than-significant.

Impact 4.6-5 Wastewater Collection & Disposal. Adoption and implementation of the proposed General Plan 2030 could indirectly result in increased development and population growth that would result in indirect generation of wastewater that could be accommodated by the existing wastewater treatment plant and collection system improvements, as needed and supported in the General Plan.

Impact 4.6-6 Solid Waste Disposal. Adoption and implementation of the proposed General Plan 2030 could indirectly result in increased development and population growth that would result in indirect generation of solid waste that could be accommodated within the remaining landfill capacity.

Impact 4.6-7 Energy Use. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development that would result in indirect energy demands, which would not be wasteful or an inefficient use with implementation of state and local regulations and proposed *General Plan 2030* policies and actions.

4.7 – Hydrology, Drainage & Water Quality

Impact 4.7-1: Alteration of Drainage Patterns and Stormwater Runoff. Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development that could result in increased stormwater runoff. With implementation of the proposed policies and actions for stormwater management and adherence to other City's plans and regulations, there would be no alteration of drainage patterns and increases in runoff would be considered a less-than-significant impact.

Impact 4.7-2: Water Quality. Adoption and Implementation of the proposed General Plan 2030 would accommodate future development that could result in increased stormwater runoff and potential urban pollutants that contribute to water quality degradation. With implementation of the proposed policies and actions for water quality protection and adherence to other City's plans and regulations related to drainage and water quality controls, this would be considered a less-than-significant impact.

Impact 4.7-3: Flood Hazards. Adoption and Implementation of the proposed General Plan 2030 would accommodate future development that could result in exposure to flood hazards, including watercourse flooding, dam failure and/or tsunami. With implementation of the proposed policies and actions related to flood control and adherence to other City's plans and regulations, the project would not result in location of habitable structures within a floodplain or substantial risk of exposure of structures or people to flood hazards. This is considered a less-than-significant impact.

4.8 – Biological Resources

Impact 4.8-1: Riparian and Wetland Habitats. Adoption and Implementation of the proposed General Plan 2030 would accommodate future development that could directly or indirectly impact riparian and/or wetland habitat areas within and adjacent to the City. With implementation of the proposed policies and actions for resource protection and adherence to other City's plans and regulations protecting these habitat areas, this is considered a less-than-significant impact.

Impact 4.8-2: Other Sensitive Habitat Areas. Implementation of the proposed General Plan 2030 would result in future development that could directly or indirectly impact sensitive habitat areas within and adjacent to the City (other than riparian and wetland habitats). Within implementation of the proposed policies and actions for resource protection, this is considered a less-than-significant impact.

Impact 4.8-3: Special Status Species. Implementation of the proposed General Plan 2030 would result in future development that could directly or indirectly impact special status species. With implementation of the proposed policies and actions for resource protection, this is considered a less-than-significant impact.

Impact 4.8-4: Wildlife Movement & Breeding. Implementation of the proposed General Plan 2030 would result in future development that could directly or indirectly interfere with wildlife movement and/or breeding. With implementation of the proposed policies and actions for resource protection, this is considered a less-than-significant impact.

Impact 4.8-6: Tree Protection. Implementation of the proposed General Plan 2030 would result in future development that could directly or indirectly adversely affect heritage trees in conflict with local tree protection regulations. With implementation of the proposed policies and actions for resource protection, this is considered a less-than-significant impact.

4.9 – Cultural Resources

Impact 4.9-2: Historical Resources. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could directly or indirectly disturb or alter historical resources. With implementation of the proposed General Plan policies and actions for historic resource protection, this is considered a less-than-significant impact.

4.10 – Geology and Soils

Impact 4.10-1: Seismic Hazards. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could result in exposure of people and property to seismic hazards, including ground shaking, liquefaction, and ground settlement. With adherence to City regulations, the project would not result in increased risk of exposure to seismic hazards.

Impact 4.10-2: Other Geologic Hazards. Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could result in exposure to

people and property to potential hazards associated with landslides, slope stability, and/or coastal bluff retreat. With adherence to City regulations and proposed General Plan 2030 goals, policies and actions, the future development would not be located on unstable area related to landslides, slope instability or coastal bluff retreat.

Impact 4.10-3: Soil Constraints. Adoption and Implementation of the proposed General Plan 2030 would accommodate future development that could result in exposure to soil constraints, such as expansive soils, that could lead to structural damages. With adherence to City regulations, the project would not result in increased risk of exposure to soils constraints.

Impact 4.10-4: Erosion. Adoption and Implementation of the proposed General Plan 2030 would accommodate future development that could result in erosion and inadvertent sedimentation into storm drains or watercourses, if not properly controlled. With adherence to City regulations, the project would not result in substantial soil erosion.

4.11 – Air Quality

Impact 4.11-2 Increased Emissions of Criteria Pollutants. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in emissions of criteria pollutants due to new development that would be accommodated by the Plan within an air basin that currently exceeds state standards for ozone and PM_{10}. However, emissions of criteria pollutants are expected to decrease in the future, and new emissions would not contribute to potential air quality violations. Additionally, with implementation of proposed *General Plan 2030* policies and actions and adherence to regional guidelines for future project-level reviews, indirect emissions resulting from buildout under the Plan would not be expected to substantially increase ozone precursors and particulate matter or result in air quality violations.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* actions are recommended to strengthen support for MBUAPCD air pollution control strategies.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

HZ2.2.1 ~~Incorporate~~ Require future development projects to implement applicable Monterey Bay Unified Air Pollution Control District control measures and/or air quality mitigations in the design of new projects as set forth in the District's "CEQA Guidelines".

HZ2.2.2 Permit major indirect sources of air pollution only if they provide transportation measures to reduce their impacts to ~~an in~~ a less-than-significant level, consistent with applicable

MBUAPCD recommended mitigation and control measures as set forth in the District's "CEQA Guidelines".

HZ2.2.6 Support MBUAPCD air pollution control strategies, air quality monitoring and enforcement activities.

Impact 4.11-3 Exposure of Sensitive Receptors to Pollutants. The increased population or development accommodated by the proposed *General Plan 2030* could indirectly result in exposure of existing or new sensitive receptors to pollutant concentrations which would not be considered substantial with implementation of the proposed *General Plan 2030* policies and actions and the regulation of stationary sources by the Monterey Bay Unified Air Pollution Control District.

4.12 – Global Climate Change

Impact 4.12-1 Generation of Greenhouse Gas Emissions. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased greenhouse gas emissions from development accommodated by the proposed plan. However, the emissions level would not be considered substantial compared to long-term forecasts and state and regional targets, and implementation of the proposed *General Plan 2030* policies and actions, as well as planned implementation statewide actions, would further reduce emissions.

4.13 – Noise

Impact 4.13-1: Exposure to Noise. Implementation of the proposed General Plan 2030 would accommodate future development that could be exposed to noise levels that exceed state standards for compatible noise levels for residential uses. With implementation of the proposed General Plan policies and actions for noise, this is considered a less-than-significant impact.

Mitigation Measures

No mitigation measures are required, but revisions to the following General Plan 2030 actions are recommended to specifically reference land-use noise compatibility standards.

Recommended Revisions to the Draft General Plan 2030

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

HZ3.2.1 Apply noise and land use compatibility table and standards to all new residential, commercial, and mixed-use proposals, including condominium conversions in accordance with the standards set forth in the "Land Use – Noise Compatibility Standards" table.

Impact 4.13-2: Increase in Permanent Ambient Noise Levels. Implementation of the proposed General Plan 2030 would accommodate future development that would generate

traffic and contribute to increased noise levels along City streets and highways, but would not exceed criteria of significance or substantially increase ambient noise levels.

Impact 4.13-3: Increase in Temporary Noise Levels Due to Construction. Implementation of the proposed General Plan 2030 would accommodate future development that would generate temporary increases in ambient noise levels due to construction activities, although substantial generation of vibration would not be expected. Due to the temporary and short-term duration of construction with intermittent noise levels, this is considered a less-than-significant impact.

4.14 – Hazardous Materials

Impact 4.14-1 Creation of Hazard with Transport, Use or Disposal of Hazardous Materials. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in creation of a hazard to the public or environment through the routine transport, use or disposal of hazardous materials. With implementation of proposed *General Plan 2030* policies and actions and adherence to federal, state and local regulations, a significant hazard would not be expected to result.

Impact 4.14-2 Exposure to Hazardous Materials. Adoption and implementation of the proposed *General Plan 2030* could indirectly result in exposure to contaminated sites accidental release of hazardous materials. With adherence to federal, state and local regulations, a significant hazard would not be expected to be created.

4.15 – Agricultural, Forest & Mineral Resources

Impact 4.15-1: Conflicts with Agricultural Uses. Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development which would not result in conflicts with agricultural uses of that could lead to conversion of farmlands to non-agricultural uses with implementation of proposed policies and actions.

NO IMPACTS

The State CEQA Guidelines section 15128 require that an EIR contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. The EIR identified the following topics/issues as not being an impact for the reasons provided.

4.1 – Land Use

Impact 4.1-1: Divide an Established Community. Adoption and implementation of the *General Plan 2030* would not result in development or expansion of municipal boundaries that would result in a physical division of an established community.

Impact 4.1-3: Conflict with Applicable Land Use or Other Plans. Goals, policies and actions of the draft *General Plan 2030* would not conflict with other adopted plans. The plan consistency

analysis has not found any plan inconsistencies with the Draft General Plan that would result in adverse physical impacts.

4.4 - Transportation and Traffic

Impact 4.4-3: Traffic Hazards. Adoption and implementation of the proposed *General Plan 2030* would not result in new roads that could potentially create hazards, and with implementation of proposed *General Plan 2030* policies and actions to ensure road safety, the project would not result in direct or indirect impacts related to increased hazards.

Impact 4.4-4: Conflicts with Adopted Plans. Adoption and implementation of the proposed *General Plan 2030* would not result in conflicts with adopted plans, policies or programs that support alternative transportation, as the proposed goals, policies and actions directly support implementation and use of alternative transportation modes.

4.8 – Biological Resources

Impact 4.8-5: Habitat Reduction. Implementation of the proposed General Plan 2030 would result in future development that would be considered urban infill development and would not result in significant reduction of wildlife habitat or cause a wildlife or plant population to drop below self-sustaining levels or become eliminated. Therefore, there is no impact related to substantial habitat reduction.

Impact 4.8-7: Conflicts with Local Plans and Policies. Adoption and implementation of the proposed General Plan 2030 would not result in conflicts or inconsistencies with policies adopted to protect biological resources. Thus, there is no impact related to this issue.

4.11 – Air Quality

Impact 4.11-4 Odors. Adoption and implementation of the *General Plan 2030* would not directly or indirectly result in new uses that would be result in introduction of substantial odors with implementation of proposed policies and actions and adherence to City regulations.

4.12 – Global Climate Change

Impact 4.12-2: Conflicts with Applicable Plans. Potential development that could be accommodated in the draft *General Plan 2030* would result in increased greenhouse gas emissions, but the proposed project would not conflict with adopted plans.

4.15 – Agricultural, Forest & Mineral Resources

Agricultural Resources. There are no designated agricultural lands within City limits or the City's existing Sphere of Influence, and future development accommodated by the plan would not result in conversion of agricultural lands or conflict with existing agricultural zoning or Williamson Act contracts.

Forest Resources. There are no areas of protected timberland land within the City or its existing Sphere of Influence, and there are no protected timberlands within the General Plan 2030 planning area. Thus, there would be no conflicts with zoning of forest lands (15d) or the conversion of timberland (15e-f). Furthermore, the proposed plan includes goals, policies and actions that seek maintenance and expansion of the City's urban forest as summarized in Table 4.15-1.

Mineral Resources. There are no designated mineral resources within the City, its existing Sphere of Influence or the *General Plan 2030* planning area, and therefore, the proposed General Plan would have no impact to mineral resources (15g). An existing quarry is located west of the City within the General Plan planning area. The site is located within the unincorporated area of Santa Cruz County and subject to County regulations.

3.0 PROJECT DESCRIPTION

IN THIS SECTION:

3.1 Project Location & Regional Setting
3.2 General Plan Background
3.3 Project Objectives
3.4 Project Elements
3.5 Buildout Estimates
3.6 Area & Regional Plans & Zoning
3.6 Intended Uses of EIR

3.1 PROJECT LOCATION & REGIONAL SETTING

The City of Santa Cruz, one of the oldest cities in California, was founded in 1791 and incorporated in 1866. It is located approximately along the northern shore of Monterey Bay, approximately 75 miles south of San Francisco, 25 miles south of San Jose and 40 miles north of Monterey (see Figure 1-1).[1] The City occupies a picturesque location between the Pacific Ocean and the Santa Cruz Mountains along the banks of the San Lorenzo River. The City has a total land area of 12.7 square miles, and is bordered by parks, open space, and residential uses to the north, open space lands on the west, the Monterey Bay on the south, and a portion of the unincorporated urban community of Live Oak on the east. The City's western and northern borders are mostly defined by publicly- and privately-owned open space and agricultural lands, with the Monterey Bay on the south. Within the City, city-owned open space lands help establish a greenbelt around the city as depicted in the aerial on Figure 2-1.

The *General Plan 2030* planning area includes the following geographic areas as shown on Figure 1-3 that total approximately 26 square miles:

- All lands located within the incorporated Santa Cruz city limits (including the City's water treatment plant on Graham Hill Road and the City's Resource Recovery Facility (landfill) and Recycling Center on Dimeo Lane):
- Lands outside City limits but within the City's adopted Sphere of Influence that are located east of Highway 17 in the Carbonera neighborhood and along 7th Avenue, which total approximately 0.4 square miles;
- Unincorporated lands to the north and west of the City that generally extend from Graham Hill Road on the east to the Dimeo Lane and the City's landfill on the west. This area includes Henry Cowell State Park, University of California lands located outside City limits, Wilder Ranch State Park and privately-owned open space and agricultural lands adjacent to the city on the west. State law requires the general

[1] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

plan to consider any territory outside the city boundaries which, in the City's judgment, bears relation to its planning. These "lands of interest" total approximately 13.3 square miles.

Santa Cruz is the largest city in Santa Cruz County. As of January 1, 2009, the City of Santa Cruz supported a population of 58,982 (California Department of Finance, May 2009) with a mix of residential, commercial, industrial, visitor-serving, recreational, and open space uses. The City has been the urban center of the County providing employment and commercial, governmental, social, educational and cultural services to the area. The University of California Santa Cruz campus lies mostly within city limits.

3.2 GENERAL PLAN BACKGROUND

STATE GENERAL PLAN REQUIREMENTS

California state law requires each city and county to adopt a general plan for "the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" (Government Code section 65300). General plans are required to take a long-term perspective, and most jurisdictions select 15 to 20 years as the long-term horizon for the general plan (Governor's Office of Planning and Research, October 2003). The City Council adopts (and can later amend) the general plan by resolution. Once a general plan is adopted or amended, the zoning, subdivision, and other land use regulations and ordinances must be amended to be consistent with the general plan. State law allows up to four general plan amendments *per mandatory element* per year. Most amendments propose a change in the land use designation of a particular property (and thus propose a change to the land use element).

State law requires that a general plan contain seven elements: land use, circulation, housing, conservation, open space, noise and safety. Optional subjects added to a general plan (for example, community design and economic development in the City's proposed *General Plan 2030*) have the same status as mandated elements.

The general plan is to be considered and used as a whole. Case law and accepted land use practice stress the equality of the elements in a general plan. Since all general plan elements carry equal weight, it follows that no single section, chapter, or subject can be stressed while ignoring others. All of the sections should be read together. Although the law does not elevate any one element or elements over the others, the Land Use and Circulation Element are likely the most important because more than any other elements they guide the physical form of the community; in a sense they guide what will happen in the community. The other five required elements, Housing, Conservation, Open Space, Noise, and Safety, provide guidance on "how" things will occur, guiding the implementation of the Land Use and Circulation elements. While the plan must be internally consistent, an exception—passed into law in 2004—allows the Housing element to specify a different development density than set by the general plan.

GENERAL PLAN 2030 PROCESS

The *General Plan 2030* was prepared over a period of several years by city staff and a consultant team. To guide the process and prepare and recommend the outlines and essentials of a plan to the planning commission for review and elaboration, the city council formed a 17-member General Plan Advisory Committee (GPAC) made up of: all seven planning commissioners; one representative from each of the following City commissions: Arts, Historic Preservation, Parks and Recreation, Public Works, Transportation, and Water; three members of the general public; and a non-voting representative of the University of California Santa Cruz. A number of public workshops were conducted during this time. A vision for the future quality of life in the community and a set of principles to guide the development of the General Plan were drafted by the GPAC and accepted by the City Council on February 28, 2006, and are shown on Table 3-1 below. The Planning Commission and City Council also reviewed draft GPAC-recommended goals and policies at numerous meetings throughout 2008 as summarized below.

Planning Commission:

1-17-08	GP2030 Update and Review Historic, Arts, and Culture
3-20-08	Review GP 2030: Civic& Community Facilities; Hazards, Safety &Noise
3-27-08	Land Use; Community Design
4-17-08	Mobility; Economic Development
5-8-08	Parks, Recreation, and Open Space; Natural Resources and Conservation
6-12-08	Swenson and Golf Club Drive Discussion
7-17-08	Continued Discussion: Swenson and Golf Club Drive
7-24-08	Accept GP Goals, Policies, and Programs for Purposes of CEQA
12-4-08	GP Land Use Map and Designations

City Council:

6-28-2006	Vision & Principles
3-14-2006	GP Schedule
6-13-2006	Survey Results on GP Issues
9-12-2006	GP Boundary
2-13-2007	Draft Goals
3-27-2007	Draft Goals and Policies
5-15-2007	Draft Goals and Policies
6-26-2007	Land Use Map and Goals & Policies

3.3 PROJECT OBJECTIVES

The primary project objective is to update the City's General Plan, consistent with state law, and guided by the City's vision. The foregoing vision and guiding principles for General Plan 2030 have been distilled into the following project objectives for the purposes of CEQA. (CEQA Guidelines section 15124(b).)

1. Protect the unique environmental setting of the City, its natural and established open space, and the sustainable use of its natural resources.

2. Maintain the identity and vitality of existing neighborhoods, while actively pursuing affordable housing for a diversity of households and promoting compatible livability and high quality design in new buildings, major additions, and redevelopment.

3. Seek a mutually beneficial relationship with UC Santa Cruz, one where the City supports the University within the context of City responsibilities, community priorities, and the constraints of City infrastructure and resources; and one in which the University reciprocally supports the City by comprehensively addressing all of its needs to the greatest extent possible on the campus itself, and by fully mitigating whatever off-campus community impacts occur.

4. Provide an accessible, comprehensive, and effective transportation system that integrates automobile use with sustainable and innovative transportation options—including enhanced public transit, bicycle, and pedestrian networks throughout the community.

5. Ensure a sustainable economy for the community, actively encouraging the development of employment opportunities for residents of all levels and ages, and actively protecting from elimination current and potential sources of sustainable employment.

6. Encourage diverse technology, visitor serving, industrial, home business and commercial business enterprises, and strategic redevelopment.

7. Maintain the community's longstanding commitment to shared social and environmental responsibility, fostering a balance between employment, housing affordable to persons of all income levels, transportation, and natural resources.

8. Support education through the City's schools, educational systems and programs, library system and facilities, life-long learning community programs, and active communication/information network.

9. Support the City's arts community, unique historic areas and landmarks, cultural heritage and resources, and recreational facilities and community programs.

10. Offer high-quality social services and improve and maintain City infrastructure, community safety, and emergency preparedness.

11. Encourage citizen participation in government, respectful cooperation and mutual regard among residents, workers, students, and visitors, and shared responsibility for community well-being.

TABLE 3-1

***General Plan 2030* Vision Statement and Guiding Principles**

Surrounded by greenbelt and the Pacific Ocean, Santa Cruz is a compact, vibrant city that preserves the diversity and quality of its natural and built environments, creates a satisfying quality of life for its diverse population and workers, and attracts visitors from around the world.

GUIDING PRINCIPLES

To achieve our vision, we will follow these principles in drafting our general plan:

- **Natural resources.** We will highlight and protect our unique setting, our natural and established open space, and the sustainable use of our precious natural resources.
- **Neighborhood integrity and housing.** We will maintain the identity and vitality of our neighborhoods, actively pursuing affordable housing for a diversity of households and promoting compatible livability and high quality design in new buildings, major additions, and redevelopment.
- **The University.** We will seek a mutually beneficial relationship with UC Santa Cruz, one where the City supports the University within the context of City responsibilities, community priorities, and the constraints of City infrastructure and resources; and one in which the University reciprocally supports the City by comprehensively addressing all of its needs to the greatest extent possible on the campus itself, and by fully mitigating whatever off-campus community impacts occur.
- **Mobility.** We will provide an accessible, comprehensive, and effective transportation system that integrates automobile use with sustainable and innovative transportation options—including enhanced public transit, bicycle, and pedestrian networks throughout the community.
- **Prosperity for all.** We will ensure a sustainable economy for the community, actively encouraging the development of employment opportunities for residents of all levels and ages, and actively protecting from elimination our current and potential sources of sustainable employment.
- **A dependable municipal tax base.** We will encourage diverse technology, visitor serving, industrial, home business and commercial business enterprises, and strategic redevelopment.
- **A balanced community.** We will maintain the community's longstanding commitment to shared social and environmental responsibility, fostering a balance between employment, housing affordable to persons of all income levels, transportation, and natural resources.
- **Education.** We will reflect our commitment to education through our schools, educational systems and programs, library system and facilities, life-long learning community programs, and our active communication/information network.
- **Arts and culture.** We will recognize and support our vital arts community, our unique historic areas and landmarks, our cultural heritage and resources, and our recreational facilities and community programs.
- **Community facilities and services.** We will offer excellent social services and will improve and maintain our infrastructure, community safety, and emergency preparedness.
- **An involved citizenry.** We will welcome citizen participation in government, encourage respectful cooperation and mutual regard among residents, workers, students, and visitors, and fully accept shared responsibility for community well-being.

3.4 PROJECT ELEMENTS

The proposed project consists of the City's Draft *General Plan 2030* (dated February 27, 2009), which is an update of the City's existing *General Plan and Local Coastal Plan 1990- 2005* that was adopted in 1992 and subsequently amended. The draft *General Plan 2030* extends to the year 2030 to coordinate with the U.S. Census timeframe. The proposed General Plan, when adopted, will supersede the 1990-2005 General Plan and its several amendments.

PURPOSE

As described in the draft *General Plan 2030*, a general plan is a comprehensive, long-range, and internally consistent statement of a city's development and preservation policies. It sums up the City's philosophy of growth and preservation, highlights what is important to the community, and prescribes where different kinds of development should go. It is a city's primary tool for directing and managing growth and conservation.

- A general plan is *comprehensive*—it addresses all geographic areas within the city's planning area and all issues relating to the physical development of the city.
- The plan is *long-range*—it looks 20 or more years into the future and focuses on the broad trends that will shape tomorrow's city.
- The plan is *internally consistent*—each goal, policy, and action is checked against and integrated with every other goal, policy, and action in the plan.

GENERAL PLAN ELEMENTS / CHAPTERS

Pursuant to State law, a General Plan must include the following elements: Land Use, Circulation, Housing, Conservation, Open Space, Safety, and Noise. The draft General Plan (except for Housing as discussed below) addresses the State's requirements and also includes optional subjects set forth in the State General Plan Guidelines related to community design and economic development. Goals, policies and actions are provided for each element.

In addition to an Introduction, the *General Plan 2030* is organized in the following chapters which address state-mandated topics, as well as community design and economic development. A glossary of terms also is provided.

- Historic Preservation, Arts, and Culture
- Community Design
- Land Use
- Mobility
- Economic Development
- Civic and Community Facilities

- Hazards, Safety, and Noise
- Parks, Recreation, and Open Space
- Natural Resources and Conservation

An overview of each chapter is provided below and more details are provided in relevant sections of this EIR.

The HISTORIC PRESERVATION, ARTS, AND CULTURE chapter addresses these topics, and states that historic preservation, arts and culture contribute significantly to the unique character of Santa Cruz. The quality of life for residents is positively impacted by these qualities. Visitors and residents alike enjoy the history, arts and cultural resources in Santa Cruz.

The COMMUNITY DESIGN chapter addresses natural features, the built environment and linkages between the two, including neighborhood integrity.

The LAND USE chapter is the required "land use element". As required by California Government Code Section 65302(a), and Public Resources Code Section 2762(a), the Land Use chapter of the General Plan addresses: a) distribution, location, and extent of the uses of land for housing, business, industry, open space, natural resources, recreation and enjoyment of scenic beauty, education, public buildings and grounds, and other categories of public and private uses of land; and b) standards of population density and building intensity for the land use designations. The Land Use chapter also addresses solid and liquid waste disposal facilities.

The MOBILITY chapter is the required "circulation element." Its purpose is to ease the ability of people and vehicles to move around, out of, and into the city in the long term, through 2030.

The ECONOMIC DEVELOPMENT chapter covers the regional economy, the City's tax base, the role of the University in the local economy, the local workforce, the city's business districts, and a sustainable economy.

The CIVIC AND COMMUNITY FACILTIES chapter covers public works subjects (water, wastewater, stormwater, solid waste) plus citizen involvement, community safety, education, health and human services, childcare, and technical innovation.

The HAZARDS, SAFETY AND NOISE chapter includes the required noise and safety elements, and policies for the emergency systems needed to deal with a range of natural and manmade hazards that have the potential to affect Santa Cruz residents and workers.

The PARKS, RECREATION AND OPEN SPACE chapter includes the required open space element and also addresses parks, public access and trails, and recreational facilities and programs.

The NATURAL RESOURCES AND CONSERVATION chapter includes the required "conservation element" and also covers energy use and climate change.

The General Plan also includes a Land Use Map as required by State law. The map graphically depicts the arrangement and location of land uses. General plans must also contain a circulation element, showing the "general location and extent of existing and proposed major

thoroughfares, transportation routes, terminals, and other local public utilities and facilities, all correlated with the land use element." Santa Cruz's Circulation Map shows current and proposed arterials, collectors, and local streets. A separate map depicts pedestrian and bicycle routes. Together, the Land Use and Circulation maps illustrate the primary ways the City plans to direct and manage growth through 2030. The General Plan contains other maps that illustrate various resources, hazards, parks and community facilities.

OVERVIEW OF GOALS, POLICIES AND ACTIONS

For each of the above topics, the draft General Plan provides goals, policies and actions to address the topics. "Goals" are endstate—the long-range answers to what the community wants to accomplish to resolve a particular issue or problem. Each of the Plan's goals relates to fulfilling the City's Vision and at least one of the Guiding Principles. "Policies" and "actions" are medium-range or short-range. Together they guide day-to-day decision-making so there is continuing progress toward attaining the goals. Many of the actions in this Plan were promulgated in the 1990 Plan, and most of the actions continue programs already in effect in Santa Cruz. Goal, policy, and action are defined below.

- A goal is a general, overall and ultimate purpose, aim or end toward which the City will direct effort during the timeframe of the General Plan.
- A policy is a specific statement of principle or guidance that implies clear commitment; the direction the City elects to follow in order to meet its goals.
- An action is a program, activity or strategy carried out in response to adopted policy to achieve a specific goal.

The HISTORIC PRESERVATION, ARTS, AND CULTURE chapter includes four goals and associated policies and actions that address: 1) cultural resources (archaeological, paleontological and historical resources and historic buildings); 2) arts and cultural facilities and performances; 3) arts and cultural programs; and 4) establishing a strong identity as an arts and cultural community.

The COMMUNITY DESIGN chapter includes five goals and associated policies and actions that address: 1) preservation of natural features that visually define areas with a built environment in harmony with its natural setting; 2) diverse neighborhoods and business districts with well-defined character; 3) design and linkages between key areas; 4) attractive gateways, roadways and landscaping; and 5) walkable neighborhoods and districts with compatible uses and buildings.

The LAND USE chapter includes four goals and associated policies and actions that address: 1) sustainable land uses; 2) a compact community with boundaries defined by the city's greenbelt and Monterey Bay; 3) complementary balance of diverse land uses; and 4) land use patterns that facilitate alternative transportation and/or minimize transportation demand.

The MOBILITY chapter includes four goals and associated policies and actions that address: 1) facilitation of multiple transportation alternatives; 2) a safe, efficient, adaptive and accessible transportation system (alternative transportation, transit, multi-modal systems); 3) a safe, efficient and adaptive road system; and 4) safe and inviting pedestrian and bicycle access.

The ECONOMIC DEVELOPMENT chapter includes six goals and associated policies and actions that address: 1) the city as a vibrant regional economic center; 2) growth in the city's tax base; 3) the University as a major contributor to and beneficiary of a successful local economy; 4) diverse, educated and skilled work force; 5) diverse and dynamic business districts; and 6) a sustainable economy.

The CIVIC AND COMMUNITY FACILTIES chapter includes eleven goals and associated policies and actions that address: 1) an involved and informed citizenry; 2) provision of comprehensive community facilities and services; 3) a safe, reliable water supply; 4) a sustainable and efficient wastewater systems; 5) a sustainable and efficient stormwater system; 6) solid waste; 7) police services; 8) educational opportunities; 9) health and human services; 10) childcare facilities and services; and 11) technical innovation.

The HAZARDS, SAFETY AND NOISE chapter includes six goals and associated policies and actions that address: 1) emergency and disaster readiness; 2) air quality; 3) noise; 4) hazardous materials; 5) light pollution; and 6) natural hazards, including hazards related to erosion, steep slopes, earthquakes, flooding, tsunamis, and dam failure.

The PARKS, RECREATION AND OPEN SPACE chapter includes four goals and associated policies and actions that address: 1) parks, open space and recreational facilities; 2) recreational programs, activities, events and services; 3) managed and convenient public access to open space lands and coastline; and 4) an integrated system of citywide and regional trails.

The NATURAL RESOURCES AND CONSERVATION chapter includes seven goals and associated policies and actions that address: 1) creek, riparian and wetland systems; 2) plant and wildlife habitat; 3) conservation and stewardship of resources; 4) actions in reducing and responding to global warming; 5) a sustainable urban forest; 6) protected open space and coastline; and 7) reduction in energy use.

LAND USE MAP AND DESIGNATIONS

The General Plan also includes a Land Use Map as required by State law. The proposed Land Use Map identifies land use designations throughout the City as shown on Figure 2-2 and summarized on Table 3-2. The allowable development density for residential land use is defined as the minimum and maximum number of permanent dwelling units per acre over the entire project or development site. A mix of residential densities may be used to achieve that average.

For nonresidential uses, including commercial, office, and industrial uses, development intensity is expressed as an average Floor Area Ratio (FAR). FAR is a measure of the total building floor area in proportion to the size of the building's lot. For example, with a FAR of 1.75, a 10,000 square foot lot could support a 17,500 square foot building under a 1.75 FAR maximum.

Land Use Changes from 1990-2005 General Plan

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan and Local Coastal Program, except for the following:

- **NEW DESIGNATIONS & APPLICATION:** Three new mixed use land designations have been developed and applied to the following areas, and are depicted on Figure 2-2-2.
  - Mixed use high density designation is applied to segments of Soquel Avenue and Water Street that are designated Community Commercial in the existing General Plan.
  - Mixed use medium density designation is applied to segments of Mission Street and Ocean Street that are designated Community Commercial in the existing General Plan.
  - Mixed use visitor commercial designation is applied to segments of Ocean Street that is designated Community Commercial in the existing General Plan.

- **LAND USE MAP CHANGES:** Land Use Map Changes:
  - Golf Club Drive Property: Change the existing General Plan land use designation from Low Density Residential (1.1-10 DU/acre) to Very Low Density Residential (.1-1 DU/acre). However, a residential density of 10.1-20 dwelling units per acre could be applied to the 20-acre area with preparation and adoption of an area plan. This could result in more residential units (200+) than allowed in the existing General Plan (up to 100 units).
  - Swenson Property: The existing General Plan land use designation is Low Density Residential (1.1-10 DU/acre). The draft *General Plan 2030* would allow Low Medium Density Residential (10.1-20 DU/acre)/Neighborhood Commercial/Office designations with preparation of a Specific Plan.
  - Dimeo Lane Landfill and Resource Recovery Center: A 5.5-acre property adjacent to the facility's entrance was recently acquired by the City and is proposed to be designated as "Community Facilities." It is expected that future uses would be ancillary to the landfill and Resource Recovery Center uses and will be determined in the future. However, the parcel is not planned for expansion of the landfill disposal operations (Arman, personal communication, April 2010).

Floor area ratios are presented for non-residential designations that were not included in the previous General Plan or zoning ordinances. Additionally, residential densities permitted in commercial and general industrial designations (0-30 units/acre) have been eliminated in the *General Plan 2030* as the underlying zone districts generally permit residential uses under specified conditions. Residential density is specified for the new mixed use land use designations.

Some of the *General Plan 2030* policies and actions support mixed use districts and/or intensified redevelopment, such as a Mixed Use River District, expansion of the High Density

Overlay on Front and lower Pacific. A transition to higher densities along the City's transit and commercial corridors also is encouraged. Another policy allows maximum residential densities to be exceeded for the following uses: single-room occupancy (SRO) units; small ownership units (SOU); accessory dwelling units (ADU); density bonus units; and residential uses within areas designated High-Density Overlay District (HD-O).

TABLE 3-2
***General Plan 2030* Proposed Land Use Designations**

The General Plan 2030 land use designations consist of:

- RESIDENTIAL DESIGNATIONS
  - Very-Low-Density Residential (VL), 0.1 to 1 dwelling unit per acre (du/ac)
  - Low-Density Residential (L), 1.1 to 10 du/ac
  - Low-Medium-Density Residential (LM), 10.1 to 20 du/ac
  - Medium-Density Residential (M), 20.1 to 30 du/ac
  - High-Density Residential (H), 30.1 to 55 du/ac
- COMMERCIAL DESIGNATIONS
  - Neighborhood Commercial (NC), 0.25 to 1.5 FAR
  - Community Commercial (CC), 0.25 to 1.75 FAR
  - Regional Visitor Commercial (RVC), 0.25 to 3.5 FAR
  - Office (OF), 0.25 to 1.75 FAR
- MIXED USE DESIGNATIONS
  - Mixed-Use Medium Density (MXMD), 0.75 to 1.75 FAR, 10 to 30 du/ac
  - Mixed-Use High Density (MXHD), 1.0 to 2.75 FAR, 10 to 55 du/ac
  - Mixed-Use Visitor Commercial (MXVC), 1.0 to 2.75 FAR, 0.1 to 55 du/ac
- INDUSTRIAL DESIGNATIONS
  - Industrial (IND), 0.25 to 2.0 FAR
  - Coastal Dependent (CD), 0 to 0.1 FAR
- PUBLIC AND INSTITUTIONAL DESIGNATIONS
  - Community Facilities (CF), 0 to 2.5 FAR
  - UCSC Development (UC)
- PARKS AND OPEN SPACE DESIGNATIONS
  - Coastal Recreation (CR), 0 to 0.1 FAR
  - Parks (PK), 0 to 0.1 FAR
  - Natural Areas (NA), 0 to 0.1 FAR
  - Agriculture/Grazing (AG), 0.5 du/ac (1 du per 20 acres)

Additionally, several General Plan actions support specific types of development, although site-specific locations are not identified. These facilities include arts and cultural facilities, a performing arts center, high-end lodging, a large regional retail uses in the Harvey West area, and a desalination facility. Land uses that are promoted or identified in General Plan policies or actions are further described in LAND USE (Chapter 4.1) section of this EIR.

3.54 BUILDOUT ESTIMATES

GENERAL PLAN 2030 BUILDOUT ESTIMATES

To aid the environmental analysis related to potential impacts of new development accommodated by the draft General Plan, the City considered whether using the AMBAG population forecasts as a measure of potential future growth or developing estimates related to land uses envisioned in the draft plan. It was determined that a "buildout" projection would be more closely linked with potential land uses supported in the plan, and a projection was developed for the City's Planning Department by Design, Community and Environment (DC&E). The projection considers the development potential under the proposed *General Plan 2030* that is estimated to occur in Santa Cruz by the year 2030. The projections are based on the draft Land Use Map, and take into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels. The assumptions and methodology are further described in LAND USE (Chapter 4.1) of this EIR; the technical methodology is included in Appendix B. The buildout projections also were estimated for development under the existing General Plan as further described in the LAND USE (Chapter 4.1) section of this EIR.

The buildout estimates are provided for the year 2030 and by geographic area and are shown on Table 3-3; Figure 2-3 depicts the corresponding geographic areas. In summary the estimates forecast in the following new development by year 2030:

- 3,350 residential units
- 1,087,983 square feet of commercial development and 311 hotel rooms
- 1,273,913 square of office space;
- 776,926 square feet of industrial development.

As noted above, these buildout estimates were based on the development potential of land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels and therefore do not account for some major pending or approved projects (Design, Community & Environment, October 2009), most notably the Delaware Mixed Use Project, the Tannery Arts Center non-residential uses, the La Bahia Hotel Project, and several hotel projects in the beach and downtown area as summarized in Table 3-4. These projects have been added to the buildout projections to ensure that all potential development that would occur during the General Plan's timeframe is considered in the EIR impact analyses.

UCSC DEVELOPMENT AND GROWTH

The City of Santa Cruz designates the UCSC campus and off-campus lands as "UCSC Development" in the 2005 General Plan/Local Coastal Plan, which is retained in the General Plan 2030. The "UC" designation applies to land that is owned by the University of California, including the UCSC campus and the University's off-campus research facilities and residential developments. The University of California as a state agency is not required to obtain local use permits from the City or County. Campus development and growth is guided by the University's *2005 Long Range Development Plan* (LRDP) and any specific facility plans, such as the *Marine Science Campus Coastal LRDP*.

Table 3-3
Estimated *General Plan 2030* Buildout

General Plan Area	Dwelling Units	Commercial Square Footage	Office Square Footing	Industrial Square Footage
Beach Area	54	21,872	0	0
Carbonera Sphere	0	0	0	0
Downtown	299	38,913	4,495	0
Eastside Sphere	82	52,925	106,522	0
Golf Club	245	0	0	00
Harvey West	66	278,929	156,751	162,123
Lower Eastside	141	40,066	60,367	24,706
Lower Westside	188	0	0	0
Mission Street	314	68,409	203,829	0
Ocean Street	144	298,697	87,492	0
River St/Front Street	337	70,058	91,587	0
Soquel Avenue	690	60,938	248,422	0
Upper Eastside	143	3,415	12,311	0
Upper Westside	171	658	1,316	0
Water Street	280	36,274	118,667	0
Westside Industrial	34	116,828	77,384	194,714
Subtotal	**3,189**	**1,087,983**	**1,273,913**	**381,544**
Other Pending Development (see Table 3-3)	161	310 hotel rooms	0	395,382
TOTAL	**3,350**	**1,087,983 &** 311 hotel rooms	**1,273,913**	**776,926**

SOURCE: Design, Community & Environment, October 29, 2009 and City of Santa Cruz Planning and Community Development Department

TABLE 3-4
Pending/Approved Projects Added to the *General Plan 2030* Buildout Estimates

Area	Project	Description
Beach	La Bahia	125-room hotel with restaurant, meeting, spa
Beach	313 Riverside	155-room hotel with 200-seat banquet hall, café, pool, exercise room - replace 3 existing motels (64 rooms and manager unit) for net increase in 91 rooms and new ancillary facilities
Beach	550 Second	13-room addition to existing 21-room hotel
Downtown	555 Pacific Avenue	82 room hotel
Lower Westside	Delaware Mixed Use Project	Use worst-case numbers for EIR traffic:395,382 sf industrial, office AND 161 MFD units

While one of the General Plan 2030's Guiding Principles (see Table 3-1) and project objectives in this EIR is to seek a mutually beneficial relationship with UC Santa Cruz, the draft *General Plan 2030* generally does not address UCSC on- or off-campus growth or development. Planned UCSC development and growth will, however, be considered as part of cumulative impacts in this EIR. UCSC's LRDP, Coastal LRDP, growth and development are discussed in the "Cumulative Impacts" subsection (5.4) of the CEQA CONSIDERATIONS (Chapter 5.0) section of this EIR.

The draft *General Plan 2030* does support amendment of the City's Sphere of Influence to add approximately 374 acres of the north campus area pursuant to the UCSC/City Comprehensive Settlement Agreement signed in August 2008 (LU2.2.2). This agreement also is further discussed in Section 5.4 of this EIR. Several other policies are included that seek to encourage visual compatibility of the campus development (CD1.3.1) and preservation of UCSC open space uses (LU2.3.4). The proposed General Plan includes Goal ED 3 and supporting policy and actions to cooperate with the University toward a "mutually beneficial economic relationship." The proposed plan also includes several other actions to work with and/or encourage UCSC with planning and/or participation and support for community facilities (CC2.1.5), safety and emergency services (CC7.3.2), high-tech infrastructures (CC11.1.3), cooperative fire protection services (HZ1.4.5), schools and recreation (PR1.2.3), and electric vehicle use (NRC7.3.5).

3.6 AREA & REGIONAL PLANS AND ZONING

CITY PLANS

Housing Element

The City's Housing Element is prepared as a separate volume to the General Plan as it requires updates every seven years in accordance with State law. Thus, the Housing Element is not part of the *General Plan 2030* document and not included in the environmental review. The City's current Housing Element was updated with final City adoption and approval by the State Housing and Community Development Department in 2011. The updated element covers the years 2007 to

2014. The Housing Element is further described in the POPULATION and HOUSING (Chapter 4.2) section of this EIR.

Local Coastal Plan

The Local Coastal Program (LCP) consists of a land use plan, implementing ordinances and maps applicable to the coastal zone portions of the city to manage and protect coastal resources in accordance with requirements of the California Coastal Act. The City prepared and adopted its LCP as a part of the *1990-2005 General Plan and Local Coastal Program document*. The City is currently updating the LCP as a separate document, while coordinating closely with the *General Plan 2030* process.

Area and Resource Management Plans

EXISTING PLANS

Twenty different plans address land use and/or resource concerns in specific areas of the City. The City has adopted 15 area, design and/or resource management plans, and the California Department of Parks and Recreation and the University of California administer another five plans. Table 3-5 (at the end of this chapter) identifies these plans and the chapters in this EIR in which they are discussed in relationship to the proposed *General Plan 2030*.

The following five plans were adopted as part of, or as an amendment to, the existing General Plan/LCP. Amendment of these plans also requires a General Plan Amendment. The *City-wide Creeks and Wetlands Management Plan* (2006) is part of the City's LCP and was certified by the California Coastal Commission on in May 2009.

- Beach and South of Laurel (BSOL) Comprehensive Area Plan (1998)
- Downtown Recovery Plan (1991)
- Moore Creek Corridor Access and Management Plan (1987)
- San Lorenzo Urban River Plan (2003)
- Santa Cruz Harbor Development Plan (1992)

The following ten plans were adopted by the City, but not as part of the existing General Plan/LCP. However, some of these plans are summarized in a separate volume of the existing General Plan to include the Seabright Area Plan and Western Drive Master Plan. The Western Drive Master Plan was adopted "in concept", but was never officially adopted. The "adopted versions" of the following plans are incorporated by reference in the *General Plan 2030*. Each plan can be amended separately, and a concurrent amendment of the General Plan will be required only if an amendment revises a General Plan goal, policy, action or relevant text. These plans are identified below.

- Arana Gulch Master Plan (2006)
- Eastside Business Area Improvement Plan (1996)
- Jessie Street Marsh Management Plan (1999)
- Mission Street Urban Design Plan (2002)
- Moore Creek Interim Management Plan (2002)
- Neary Lagoon Management Plan (1987)

- Pogonip Master Plan (1998)
- Santa Cruz Harbor Development Plan (1992)
- Seabright Area Plan (1981)
- Western Drive Master Plan (1979)

PROPOSED PLANS

The City is in the process of preparing the following plans and studies, which are further described in LAND USE (Chapter 4.1) section of this EIR.

- Ocean Street Area Plan
- RiverFront & Lower Pacific Design Guidelines and Development Incentives

ZONING ORDINANCE

The City's existing Zoning Ordinance – Title 24 of the Municipal Code – includes 30 land use zone districts and 11 overlay districts. The regulations establish permitted and allowed uses, as well as site and building design regulations for different districts. The zoning regulations also include community design, environmental resource management, and affordable housing provisions and describe required permits and permitting processes.

REGIONAL PLANS

A number of regional plans have been adopted by other agencies that include the City of Santa Cruz. Section 15125 requires that an EIR discuss any inconsistencies between a proposed project and applicable regional plans. This review is provided for the adopted regional plans identified below in the section noted in parentheses. Other regional plans that have been adopted or are being prepared also are identified and discussed as relevant, such as AMBAG's "Envisioning the Monterey Bay Area – A Blueprint for Sustainable Growth and Smart Infrastructure" plan.

- *Air Quality Management Plan* (AIR QUALITY [Chapter 4.11])
- *Basin Plan* (HYDROLOGY, STORM DRAINAGE & WATER QUALITY [Chapter 4.7])
- *Regional Transportation Plan* (TRANSPORTATION & TRAFFIC [Chapter 4.4])

3.7 INTENDED USES OF EIR

As indicated in the Chapter 1 – INTRODUCTION, the EIR is an informational document for decision makers. CEQA requires that decision makers review and consider the EIR in their consideration of this project. The City of Santa Cruz is responsible for adopting the *General Plan 2030*, and will consider this EIR in its deliberations on the draft general plan. There are no other known agencies responsible for approving the City's General Plan that would also use this EIR. After certification, this EIR may be used by the City and other agencies as a "first tier" document for later projects as authorized by section 15183 of State CEQA Guidelines. Reviews of later projects under this provision would be required to consider any project-specific impacts

that were not adequately addressed in this EIR. The specific later projects are not known at this time, but could include, for example, subsequent rezoning to make zone districts consistent with the *General Plan 2030*, adoption of community plans to the extent that such plans are consistent with the General Plan, and site-specific development projects.

REFERENCES

California Governor's Office of Planning and Research. October 2003. "General Plan Guidelines."

Design, Community & Environment. October 29, 2009. "Methodology for General Plan 2030 Buildout Potential."

TABLE 3-5: Adopted Plans in the City of Santa Cruz

ADOPTED PLANS	WHERE ADDRESSED IN EIR
City-adopted plans in alphabetical order	
▪ Arana Gulch Master Plan (2006)	4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ Beach and South of Laurel Comprehensive Area Plan (1998) [Policies in the Beach Area Plan were revised by the California Coastal Commission & certified as part of the City's LCP.}	4.1 LAND USE 4.3 AESTHETICS 4.4 TRANSPORTATION & TRAFFIC
▪ Citywide Creeks and Wetlands Management Plan (2006) ❖	4.8 BIOLOGICAL RESOURCES
▪ Downtown Recovery Plan (1991)❖ [Adopted by NS-20,084 as a specific plan/GP amendment.]	4.1 LAND USE
▪ Eastside Business Area Improvement Plan (1996)	4.1 LAND USE
▪ Jessie Street Marsh Management Plan (1999)	4.8 BIOLOGICAL RESOURCES
▪ Mission Street Urban Design Plan (2002)	4.3 AESTHETICS
▪ Moore Creek Corridor Access and Management Plan (1987)❖ [Adopted by NS-17,849 as a GP amendment.]	4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ Moore Creek Interim Management Plan (2002)	4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ Neary Lagoon Management Plan (1992)	4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ Pogonip Master Plan (1998)	4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ San Lorenzo Urban River Plan (2003)❖ [Adopted by NS-26,849 as a GP/LCP amendment.]	4.1 LAND USE 4.3 AESTHETICS 4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ Santa Cruz Harbor Development Plan (1992)❖ [Adopted by City Council on November 23, 1993; Incorporated by reference into the City's LCP.]	4.1 LAND USE
▪ Seabright Area Plan (1981)	4.1 LAND USE
▪ Western Drive Master Plan (1979) [Adopted in concept, but no official adoption]	4.1 LAND USE 4.3 AESTHETICS
State-adopted plans in alphabetical order	
▪ Lighthouse Field State Beach General Plan (1984)	4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ Natural Bridges State Beach Plan (March 1992)	4.6 PUBLIC SERVICES – Parks & Recreation 4.8 BIOLOGICAL RESOURCES
▪ Twin Lakes State Beach General Plan (March 1992)	4.6 PUBLIC SERVICES – Parks & Recreation
▪ UCSC 2005 Long-Range Development Plan (2006)	5.4 CEQA CONSIIDERATIONS – Cumulative Impacts
▪ UCSC Marine Science Campus Coastal Long-Range Development Plan (2004)	5.4 CEQA CONSIIDERATIONS – Cumulative Impacts
❖ Adopted as GP/LCP Amendment	

4.0 ENVIRONMENTAL EVALUATION INTRODUCTION

The following 15 chapters evaluate the environmental impacts of the proposed City of Santa Cruz Draft *General Plan 2030*. In accordance with Appendix G of the CEQA Guidelines, the potential environmental effects of the proposed General Plan are analyzed for the following environmental issue areas:

LAND USE AND DEVELOPMENT

4.1 Land Use
4.2 Population, Employment and Housing
4.3 Aesthetics

PUBLIC FACILITIES AND SERVICES

4.4 Transportation and Traffic
4.5 Water Supply
4.6 Public Services and Utilities
4.7 Hydrology, Storm Drainage and Water Quality

RESOURCES AND HAZARDS

4.8 Biological Resources
4.9 Cultural Resources
4.10 Geology and Soils
4.11 Air Quality
4.12 Global Climate Change
4.13 Noise
4.14 Hazardous Materials
4.15 Agricultural, Forest and Mineral Resources

Each section in Chapter 4 generally follows the same format and consists of the following subsections

- **INTRODUCTION:** This section describes the scope of the issue under consideration. This section identifies key studies utilized in the environmental analysis.

- **ENVIRONMENTAL SETTING:** This section describes the existing physical environment, and applicable laws and regulations relevant to a discussion of impacts in the topic category. The Environmental Setting sections provide a general overview of the existing conditions throughout the City related to the topic being addressed. Local, State and federal regulations are also identified and discussed, when relevant.

- **RELEVANT PROJECT ELEMENTS:** A Relevant Project Elements section provides a description of the elements of the project that are relevant to the impact analysis for a particular topic. Relevant project information may relate to proposed policies, actions and guidelines, as well as to potential future development and growth that may be accommodated by the proposed General Plan. Any project elements that may cause

impacts, as well as those that may serve to eliminate or reduce impacts, will be identified.

- **ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES:** The Environmental Impacts and Mitigation Measures section provides an outline of the criteria used to evaluate whether an impact is considered significant based on standards identified in the California Environmental Quality Act (CEQA) and State CEQA Guidelines. In some cases, agency policies and regulations or professional judgment are used to further define CEQA standards of significance.

  This section first identifies issues for which no impacts have been identified. The section then evaluates and analyzes significant or potentially significant project impacts, states the level of significance prior to mitigation, and proposes mitigation measures (in bold) that can reduce such impacts. A statement regarding the level of significance of each impact after mitigation follows the mitigation measures for that impact. For impacts found to be less-than-significant, mitigation measures are not required, but where relevant, the EIR recommends project modifications or appropriate conditions of approval.

- **REFERENCES:** For convenience, all references cited in each section are listed at the end of the section, as well as in a complete "References" list at the end of the EIR.

4.1 LAND USE

4.1.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Municipal & Planning Boundaries
- Existing Land Uses & Vacant Lands
- Existing General Plan Designations & Buildout
- City Plans
- State-Adopted Plans

REGULATORY SETTING

California General Plan Requirements

Pursuant to California State (Government Code section 65040), each city and county in California must prepare a comprehensive, long-term general plan to guide its future. Seven elements are required by State law: land use, circulation, housing, conservation, open space, noise and safety. By statute, the housing element must be updated every seven years. The City's updated General Plan is the subject of this EIR, but does not include the Housing Element, which will be updated at the intervals prescribed by State law. Communities may also adopt area and community plans, which are part of the general plan.

California Coastal Act

A portion of Santa Cruz is located within the coastal zone, which is subject to the requirements of the California Coastal Act (Public Resources Code Section 30000 et seq). The Coastal Act is intended to "protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources." The Coastal Act requires preparation of a Local Coastal Program (LCP) for areas of cities and counties within the coastal zone, which must be certified by the California Coastal Commission (CCC). The City's certified LCP currently is part of the General Plan. All development in the coastal zone requires approval of a coastal development permit, which is administered by the City with its certified LCP. However, the CCC currently retains permit authority for portions of the Santa Cruz Harbor.

Local Agency Formation Commission Requirements

Pursuant to State law enacted in 1963 (Government Code Section 54773 et seq.), a Local Agency Formation Commission (LAFCO) was established in each county to promote the orderly development of local government agencies, efficient provision of services, guide development away from prime agricultural land and discourage urban sprawl. In meeting its responsibility, LAFCO is required to review and approve or disapprove, with or without amendments, wholly, partially, or conditionally, governmental boundary change proposals with regards to Spheres of Influence, annexation, detachment, reorganization and/or extending a city's water or sewer service area (Santa Cruz LAFCO website; http:///www.santacruzlafco.org). In addition to the regulatory responsibilities of LAFCO referred to above, the Commission is empowered to initiate and to make studies of existing governmental agencies. Such studies shall include but not be limited to inventorying such agencies and determining their maximum service areas and service capabilities.

Pursuant to State law, LAFCO must adopt a Sphere of Influence (SOI) for each governmental agency (including special districts. A sphere of influence means a plan for the probable future physical boundaries and service area of a local governmental agency that takes into account existing and future land uses, service needs and service capacities.

MUNICIPAL AND PLANNING BOUNDARIES

Municipal Boundaries

The City of Santa Cruz encompasses approximately 12.7 square miles, and its municipal boundaries are shown on Figure 1-1.[1] Santa Cruz has maintained clearly-defined urban boundaries as it has grown, formed by the UCSC campus and city-owned greenbelt lands (Moore Creek Preserve, Pogonip, and Delaveaga Park) as shown on Figure 1-2. The City's coastal zone, also shown on Figure 1-1, includes approximately 2,330 acres. The Santa Cruz Harbor is located within City limits but is operated under the authority of the Santa Cruz Port District, an independent special district. Development projects within Harbor lands and water are subject to coastal development permits from the City of Santa Cruz or the California Coastal Commission.

Sphere of Influence

The City's adopted Sphere of Influence (SOI) includes lands within City limits and some lands adjacent to the City, as shown on Figure 4.1-1, for a total of approximately 0.4 square miles within the SOI. In addition to land within the City limits, the SOI encompasses land in the Carbonera neighborhood near Highway 17, and along with a strip of land east of the City limits, between the Santa Cruz Harbor and 7th Avenue.

[1] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

In October 2008, the City of Santa Cruz filed an application to the Santa Cruz LAFCO to amend the City's Sphere of Influence (SOI), concurrent with the University's application to LAFCO for the provision of extraterritorial water and sewer services for a 374-acre portion of the UCSC campus identified as the North Campus (shown on Figure 4.1-1) for the development of 3,175,000 gross square feet of additional building space as described in the University's adopted 2005 Long-Range Development Plan (LRDP). Further description of the UCSC LRDP is provided below in the "State-Adopted Plans" subsection. At this time, no annexation of land is proposed, nor has the University proposed site-specific development or extension of infrastructure into the north campus area. The Santa Cruz City Council certified an EIR for the SOI amendment in August 2010, which was subsequently legally challenged. On July 20, 2011, the Superior Court of Santa Cruz County made a tentative ruling in which it upheld the adequacy of the EIR and the City's compliance with CEQA in all respects concerning the SOI amendment. The final ruling upholding the SOI EIR as adequate under CEQA was issued on August 31, 2011. The court is expected to issue its final decision in adopting its tentative ruling in full in early September. The applications for the Sphere of Influence Amendment and Provision of Extraterritorial Water and Sewer Services to UCSC are pending before LAFCO.

General Plan "Planning Area"

The State encourages cities to look beyond their borders when updating a General Plan. The City's *General Plan 2030* establishes and evaluates a "Planning Area," which includes land outside of the City limits, as shown on Figure 2-1. The Planning Area encompasses approximately 26 square miles and includes land within the City limits and adopted Sphere of Influence, portions of Henry Cowell Redwoods State Park and Wilder Ranch State Park, the northern portion of UCSC, which currently is not within City limits, and an area west of Graham Hill Road. The unincorporated land that is outside of the City limits, but within the Planning Area, remains under the jurisdiction of Santa Cruz County.

EXISTING LAND USES & VACANT LANDS

Existing Land Uses

Background studies prepared for the General Plan Update include estimates of existing land uses within the City. Existing land uses are summarized on Table 4.1-1 and depicted on Figure 4.1-2. Nearly 40% of existing land uses within the City are residential, followed by parks/open space and public/institutional each comprising approximately 25% of existing lands within the City. Approximately 8% of lands within the City currently consist of commercial and industrial uses, with remaining acreage being roads and vacant properties.

Vacant and Underutilized Lands

There are approximately 169 acres of vacant land within Santa Cruz's City limits (Design, Community & Environment, December 2006) as shown on Figure 4.1-3. In addition to vacant sites, there may be development opportunities on some of the City's underutilized sites, wherein the site is not completely developed and/or older development may be demolished and new development with a higher land use intensity may be constructed. Underutilized sites are

estimated to comprise a total of 185 acres within the City limits (Design, Community & Environment, December 2006) as shown on Figure 4.1-3. This map shows that all of Santa Cruz's commercial and industrial areas have a fairly large number of underutilized sites, including surface parking lots in downtown Santa Cruz and near the Santa Cruz Boardwalk. In addition, there are several large underutilized sites in the Harvey West area.

TABLE 4.1-1
Existing Land Uses in Santa Cruz City Limits

Designation	Acres	Subtotal	Percentage of Total Acres	Subtotal
RESIDENTIAL				
▪ *Single-Family Residential*	2,068		30.3%	
▪ *Two to Four Unit Residential*	198		2.9%	
▪ *Multi-Family Residential*	311		4.6%	
▪ *Mobile Home Park*	40		0.6%	
Subtotal		***2,617***		***38.3%***
COMMERCIAL & INDUSTRIAL				
▪ *Commercial/Mixed Use*	252		3.7%	
▪ *Office*	61		0.9%	
▪ *Industrial*	197		2.9%	
Subtotal		***510***		***7.5%***
PUBLIC/INSTITUTIONAL		***1,756***		***25.7%***
PARKS & OPEN SPACE				
▪ *Parks*	654		9.6%	
▪ *Open Space*	1,068		15.6%	
Subtotal		***1,722***		***25.2%***
PARKING & PRIVATE ROADS		***59***		***0.9%***
VACANT		***169***		***2.5%***
TOTAL		6,833		100%

SOURCE: Design, Community & Environment, December 2006

Approved and Pending Development Projects

There are numerous development projects that have recently been approved or have submitted use permit applications that are pending decisions. These include projects on some of the remaining vacant and underutilized sites. Taken together, these projects include approximately 35 single-family residential units, 425 multi-family residential units, 470 visitor-serving rooms, and approximately 460,000 square feet of commercial/industrial space.

EXISTING GENERAL PLAN DESIGNATIONS & BUILDOUT

Existing General Plan Designations

The existing General Plan Land Use Map is shown on Figure 4.1-4. The current land use designations for the City of Santa Cruz were created as part of the 1990 General Plan Update and include seventeen designations as summarized and described in Table 4.1-2.

Table 4.1-3 identifies the acreage of the existing General Plan land use designations within City limits. As can be seen, almost half of the lands within the City (about 43%) are currently designated for residential use, the majority of which are designated low density. Parks and open space designations (natural areas and agricultural lands) comprise the second largest portion of existing City General Plan designations (nearly 33%), the majority of which are natural areas. Of the remaining designations, approximately 13% are devoted to commercial, office, and industrial uses, and approximately 11% account for community facilities and UCSC.

Potential Buildout Under Existing General Plan

The 1990-2005 General Plan/Local Coastal Program estimated that approximately 2,030 residential units could be developed on vacant lands and an additional 460 units could be developed on underutilized residentially zoned sites. Thus, potential mixed use development on non-residentially designated sites was not considered in these previous estimates, nor were non-residential buildout estimates provided.

Buildout under the existing 1990-2005 General Plan was reviewed and updated for the City Planning Department by Design, Community & Environment (DC&E) as part of the General Plan Update process. The purpose was to account for mixed use, intensified redevelopment and non-residential development not estimated in the existing General Plan and to provide a buildout estimate using the same methodology that was used to project the draft *General Plan 2030* buildout. The assumptions and methodology are further described in Appendix B.

The buildout estimate included development potential on:

a) Existing vacant lands;

b) Redevelopment of uses on existing underutilized parcels to reflect intensification and/or mixed uses; and

c) Limited residential infill and intensification of land use was assumed on existing underutilized parcels within the Seabright residential neighborhood given existing land use designations in this area.

TABLE 4.1-2
1990-2005 General Plan Land Use Designations

- VERY LOW DENSITY RESIDENTIAL. This is a large-lot designation allowing up to one dwelling unit per acre.
- LOW DENSITY RESIDENTIAL. 1.1 to 10 dwelling units per acre.
- LOW MEDIUM DENSITY RESIDENTIAL. 10.1 to 20 dwelling units per acre.
- MEDIUM DENSITY RESIDENTIAL.20.1 to 30 dwelling units per acre.
- HIGH DENSITY RESIDENTIAL. 30.1 to 55 dwelling units per acre.
- NEIGHBORHOOD COMMERCIAL. This designation allows for up to 30 dwelling units per acre and up to 30 employees per acre and serves residential neighborhoods with small scale commercial uses such as laundromats, grocery and convenience stores, and mixed-use projects.
- COMMUNITY COMMERCIAL. This designation allows for up to 30 dwelling units per acre and up to 60 employees per acre and is intended to primarily serve the general needs of the community and includes retail, service and office establishments.
- REGIONAL/VISITOR COMMERCIAL. This designation allows for up to 30 dwelling units per acre and up to 80 employees per acre. This designation covers three areas: downtown central business district, the beach area and the south of laurel area. Each area specifies a different intensity, type and mix of regional/visitor-serving commercial development.
- OFFICE. This designation allows up to 30 dwelling units per acre and up to 60 employees per acre and acts as a transition area between commercial areas and residential zones.
- GENERAL INDUSTRIAL. This designation applies to non-coastal industrial uses. it allows up to 30 dwelling units and 60 employees per acre.
- COASTAL DEPENDENT. This designation applies to land that is to be utilized for coastal-dependent industries and allows no dwelling units and up to 20 employees per acre.
- COMMUNITY FACILITIES. This designation applies to land with existing or proposed community facilities. it allows up to 80 employees per acre.
- UCSC. UCSC is a state institution with its own development plan; therefore, a distinctive land use designation is assigned to that portion of the campus within the city boundaries, excluding long marine lab. (It should be noted that the northern, undeveloped portion of UCSC is currently not within city limits, but this portion is designated as "UCSC" on the city's current general plan land use map.)
- PARK LANDS. This designation includes neighborhood, community and regional park lands used for passive and/or active recreational uses by residents and visitors.
- COASTAL RECREATION. This designation includes lands along the coastline including beaches and outdoor and open water areas that are used for recreational activities such as swimming, boating, fishing, surfing, picnicking and parking.
- AGRICULTURAL/GRAZING. This designation allows one dwelling unit for every 20 acres and includes land used for production of food and fiber.
- NATURAL AREAS. This designation is for land that should remain in its natural and undeveloped state. The land can be used for educational and recreational uses.

TABLE 4.1-3
Existing General Plan Land Use Designation Acreages

Designation	Acres		Percentage of Total Acres	
		Subtotal		Subtotal
RESIDENTIAL				
▪ *Very-Low-Density Residential*	174		2.1%	
▪ *Low-Density Residential*	2,442		30.1%	
▪ *Low-Medium-Density Residential*	618		7.6%	
▪ *Medium-Density Residential*	234		3.9%	
▪ *High-Density Residential*	8		0.1%	
Subtotal		***3,477***		***42.8%***
COMMERCIAL & INDUSTRIAL				
▪ *Neighborhood Commercial*	14		0.2%	
▪ *Community Commercial*	304		3.7%	
▪ *Regional/Visitor Commercial*	198		2.4%	
▪ *Office*	56		0.7%	
▪ *General Industrial*	352		4.3%	
▪ *Coastal Dependent*	132		1.6%	
Subtotal		***1,056***		***12.9%***
COMMUNITY FACILITIES		***382***		***4.7%***
UCSC		***526***		***6.5%***
PARKS & OPEN SPACE				
▪ *Parks*	490		6.0%	
▪ *Agriculture/Grazing*	335		4.1%	
▪ *Natural Areas*	1,746		21.5%	
Subtotal		***2,571***		***32.6%***
TOTAL		8,118		100%

SOURCE: Design, Community & Environment, December 2006

The buildout estimates assumed that not all development will happen at the maximum possible intensity, and that not every parcel with development potential will be redeveloped by 2030. Consistent with past development patterns, the projections assume that on average, all new development will occur at 80% of the maximum permitted residential density or floor area ratio (FAR). Secondly, the following assumptions were made regarding the amount of development likely by the year 2030.

- Vacant Lands: 90% developed by 2030
- Reuse Potential Parcels: 75% developed by 2030
- Seabright LM/M Parcels: 10% developed by 2030

Based on these assumptions, it was estimated that buildout of the existing 1990-2005 General Plan would result in the following additional development as summarized on Table 4.1-4. The corresponding geographic areas are shown on Figure 2-3.

- 1,655 residential units
- 1,038,456 square feet of commercial development
- 942,101 square of office space;
- 877,447 square feet of industrial development.

TABLE 4.1-4
Estimated Existing *General Plan 2005* Buildout

GENERAL PLAN AREA	DWELLING UNITS	COMMERCIAL SQUARE FOOTAGE	OFFICE SQUARE FOOTING	INDUSTRIAL SQUARE FOOTAGE
Beach Area	54	21,872	0	0
Carbonera Sphere	0	0	0	0
Downtown	299	38,913	4,495	0
Eastside Sphere	82	52,925	106,522	0
Golf Club	117	0	0	00
Harvey West	27	158,303	106,490	262,645
Lower Eastside	141	40,066	60,367	24,706
Lower Westside	105	0	0	0
Mission Street	61	75,736	151,471	0
Ocean Street	-1	327,489	69,483	0
River St/Front Street	328	64,697	82,130	0
Soquel Avenue	68	88,684	177,369	0
Upper Eastside	143	8,895	17,791	0
Upper Westside	171	658	1,316	0
Water Street	27	43,390	86,780	0
Westside Industrial	34	116,828	77,886	194,714
Subtotal	**1,655**	**1,038,456**	**942,101**	**482,065**
Other Pending Development	161	310 hotel rooms	0	395,382
TOTAL	**1,816**	**1,038,456 & 310 hotel rooms**	**942,101**	**877,447**

SOURCE: Design, Community & Environment, October 29, 2009 and City of Santa Cruz Planning and Community Development Department

As indicated in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR, these buildout estimates do not account for some major pending or approved projects (Design, Community & Environment, October 2009), most notably the Delaware Mixed Use Project, the Tannery Arts

Center, the La Bahia project and several other projects shown on Table 3-4 of the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR. These projects have been added to the buildout projections to ensure that all potential development that could occur under the existing General Plan are considered, as these projects have already been approved.

CITY PLANS

The City has adopted 14 area and/or resource management plans as summarized on Table 3-5 in Chapter 3. The following section summarizes plans related to land use matters. Other relevant plans are discussed in the following sections of this EIR: AESTHETICS (Chapter 4.3); TRANSPORTATION & TRAFFIC (Chapter 4.4); PUBLIC SERVICES – Parks and Recreation (Chapter 4.6); and BIOLOGICAL RESOURCES (Chapter 4.8).

Housing Element

The Housing Element, which is a required General Plan element pursuant to state law, is prepared as a separate volume to the City's General Plan as it requires updates every seven years in accordance with State law. The City's existing Housing Element, which covers the years 2007 to 2014, was adopted in 2010 with final adoption and approval by the State Housing and Community Development Department in 2011. Given the shorter timeframe requirements for housing elements, the City's Housing Element is not part of the *General Plan 2030* document and not included in this environmental review for the draft *General Plan 2030*.

Local Coastal Program

The Local Coastal Program (LCP) consists of a land use plan, implementing ordinances and maps applicable to the coastal zone portions of the City to manage and protect coastal resources in accordance with requirements of the California Coastal Act. The City prepared and adopted its LCP as a part of the *1990-2005 General Plan and Local Coastal Program document*. The City is currently updating the LCP as a separate document, while coordinating closely with the *General Plan 2030* process.

Land Use & Area Plans

Some City plans have been adopted as part of the General Plan, and some have been prepared as "Area Plans". Area plans provide a more focused review of a specific area than provided in the General Plan. Summaries of these plans are provided below

BEACH AND SOUTH OF LAUREL COMPREHENSIVE AREA PLAN

The Beach and South of Laurel Comprehensive Area Plan (B/SOL Area Plan) was adopted by the City Council in October 1998. The California Coastal Commission certified policy revisions as an amendment to the City's General Plan/Local Coastal Plan in October 2002, but the B/SOL Plan is not part of the LCP. The purpose of the B/SOL Area Plan is to guide future development and redevelopment of visitor serving and residential neighborhood uses in terms of land use, circulation, and design (Santa Cruz 1998a). The Plan includes the commercial

Beach Boardwalk area, the residential Beach Hill and Beach Flats areas, and the area south of Laurel Street, generally between the San Lorenzo River on the east and neighborhoods off of Myrtle and Chestnut Streets on the east. The Plan's purpose is to:

- Propose a sensitive and realistic program for neighborhood preservation and revitalization in the beach flats, beach hill and south of laurel areas;
- Establish a comprehensive program for managing traffic and transportation, tourism and maritime assets, and linkage with the downtown; and
- Enhance the historic resort attributes of the beach area for residents and visitors.

The B/SOL Plan provides policy and land use recommendations for four areas: Beach Flats, Beach Hill, Beach Commercial area (i.e., Boardwalk), and South of Laurel area. The Plan also addresses housing strategies, circulation and parking, urban design, economic development and public and community facilities.

The Plan seeks to maintain and improve housing in the Beach Flats area to create a "diverse, quality residential neighborhood serving all income groups at urban densities and pedestrian scale." The Plan also recommends a neighborhood conservation overlay for residential areas in Beach Flats. A historic preservation district and conservation neighborhood are recommended for Beach Hill with policies designed to improve the Beach Hill quality of life and to protect and enhance its historical resources. Recommendations for the Beach Commercial Area are aimed at stimulating appropriate economic development, including significant upgrading and redevelopment of lodging and attracting a conference center; expanding the lodging operational season; developing linkages with downtown; and expanding educational opportunities of the Monterey Bay National Marine Sanctuary. The South of Laurel Area recommendations seek to create a diverse, urban density residential neighborhood that is pedestrian friendly.

The B/SOL Plan calls for major improvements and additions of commercial space, hotel facilities, residential uses, open space and infrastructure improvements necessary to accommodate existing and new development. The major components of development and/or land use intensification envisioned in the Plan are summarized below:

- 250-275 room conference hotel facility at the La Bahia site.[2]
- Approximately 125,000 square feet of new specialty retail/entertainment development.
- 157,000 square of commercial uses along major transportation corridors primarily along Pacific Avenue.
- 400+ new infill residential units at a variety of densities.
- Rehabilitation and redevelopment of existing residential, commercial and hotel properties (139 new hotel rooms in addition to the conference hotel).

[2] The B/SOL Plan supports a 250-275 room hotel with conference center on the La Bahia site and an adjoining property. However the City approved a 125-room hotel for the La Bahia site in 2009, which does not include a conference facility or development on the adjoining property, and thus, the approved project is smaller than what was supported in the B/SOL Plan.

- Multi-modal transit hub (Depot Park);
- 2-acre active recreation park in the South of Laurel area.
- Marine Sanctuary visitor center.

DOWNTOWN RECOVERY PLAN

The *Downtown Recovery Plan* was written to guide the rebuilding of Downtown Santa Cruz, which was devastated by the 1989 Loma Prieta earthquake. The plan was adopted by the City Council in 1991 as a specific plan with a General Plan amendment. The Plan covers the mixed-use area between the eastern banks of the San Lorenzo River, Center Street to the west, Laurel Street to the south and the blocks just north of Water Street. The Plan recognizes the Downtown as a place of commerce, cultural and recreation, as well as a place to live and work. The Plan seeks to strengthen the downtown area as a vital retail center and addresses land use, development standards and guidelines, circulation and parking, and open space.

The Plan proposes intensive mixed-use and pedestrian-oriented development along Pacific Avenue with ground-floor commercial uses that activate the street frontage, such as restaurants and galleries. A mix of housing types and offices is to be provided on upper levels, with parking located off-site. Along Front Street and the riverfront, the Plan calls for somewhat less intensive mixed-use development. The Plan envisions Cedar Street as a transition into a lower-intensity area, with a horizontal mix of uses. North Pacific Avenue is also seen as a lower-intensity area, though it would include ground-floor commercial uses and upper-level residential uses (Design, Community and Environment, December 2006).

SANTA CRUZ HARBOR DEVELOPMENT PLAN

The purpose of the Santa Cruz Harbor Development Plan is to increase the Harbor's capacity to serve recreational and commercial maritime uses. Land use policies specify that facilities that support boating, fishing, coastal recreation and visitor-serving uses will be favored over general office or retail uses. In addition, the Plan seeks to promote the intensification of these uses.

SAN LORENZO URBAN RIVER PLAN

The *San Lorenzo Urban River Plan* is the outcome of a planning process initiated by City Council in 1999 to update plans for the San Lorenzo River, Jessie Street Marsh, and Branciforte Creek. The plan serves as a guide for restoring and managing natural resources, riverfront development, and public access improvements for the lower San Lorenzo River, Jessie Street Marsh, and Branciforte Creek. The San Lorenzo River Urban River Plan promotes conservation of the river as a wildlife area, with complementary recreational uses. The *Urban River Plan* provides recommendations for specific public improvements and establishes design guidelines for redevelopment opportunity areas surrounding the river. New development proposed along the lower San Lorenzo River is subject to the guidelines of that *Plan.* Adjacent properties would be reviewed for their conformance to the *San Lorenzo Urban River Plan.*

The Plan also includes conceptual ideas to promote river-oriented development, site-specific recommendations for public areas along the river, and restoration recommendations. The Plan identifies Front Street and River Street as the best places to improve Santa Cruz's connection to

the river. Urban interface connections are envisioned as "fingers of green" that expand and connect the Riverway corridor into the adjoining community and neighborhoods. Recommended improvements include plazas, entry features, trail connections, interpretive features, seating, directional and informational signage, public art, tree planting, pavement treatment, and other design improvements. The Plan also identifies opportunities for redevelopment of specific sites. For example, it recommends redeveloping the Riverwalk Plaza site at Front Street and Soquel Avenue with smaller parking areas and buildings that have a stronger orientation to the river.

SEABRIGHT AREA PLAN

The Seabright Area Plan is intended to improve and preserve this historic, small-scale residential neighborhood in Santa Cruz's Eastside. The Seabright Area Plan does not address the area between Soquel Avenue and Clinton Street. The Plan proposes land use changes that are reflected in the City's current General Plan. The majority of Seabright is designated for single-family residential uses. Multi-family residential uses are concentrated near Seabright State Beach, a major visitor attraction, and along Seabright Avenue and Murray Street, two of the area's major streets. The Plan recommends retaining the historic commercial node at the intersection of Seabright Avenue and Murray Street (Design, Community and Environment, December 2006).

Other Adopted Land Use Plans

EASTSIDE BUSINESS AREA IMPROVMENT PLAN

The purpose of the Eastside Business Improvement Plan, which addresses the Soquel Avenue and Water Street commercial corridors, is to bring beneficial change to the area through economic development and the creation of a distinctive physical environment. Most of the Plan's recommendations focus on improvements for circulation, streetscapes and building façades. The Plan's objectives include establishing a coordinated strategy for circulation, parking and streetscape improvements; developing a design program for buildings to improve aesthetics while retaining individual character in the area; developing a strategy to improve linkages between the eastern and western portions of the area; and developing a retail and promotional strategy. The Plan also refers to a 1996 market analysis that identifies the types of businesses with the best sales performance in this area that includes: auto dealers and suppliers, building materials, eating and drinking establishments, food stores, and home furnishings and appliances (Design, Community and Environment, December 2006).

WESTERN DRIVE MASTER PLAN

The Western Drive Master Plan, prepared in 1979, includes lands along Western Drive, generally between Arroyo Seco Creek on the east and Moore Creek on the west from Highway 1 to High Street. The Plan seeks to improve the Western Drive right-of-way; retain the rural character of the area, protect Moore Creek and Arroyo Seco Canyons; and provide public access to them. The following goals and objectives are identified in the Plan; however, the plan was accepted in concept by the City Council on September 11, 1979. It is, however, included in the City's existing *General Plan/Local Coastal Plan 1990-2005*.

1. Preserve the rural character of the area where it now exists.
2. Establish criteria to continue the rural character as the area develops.
3. Preserve the existing trees.
4. Protect the quality of the adjacent canyons
5. Provide access to the canyon areas.
6. Maintain safety for motorists, pedestrians and cyclists with minimum impact to development and landscaping.
7. Rehabilitate disturbed areas.

The Plan establishes road, access, land use, design, landscaping and drainage recommendations for both publicly- and privately-owned lands to achieve these objectives.

Draft Plans

OCEAN STREET AREA PLAN

In May 2007, the City Council authorized staff to initiate Early Action Programs for the *General Plan 2030*, including the development of an Ocean Street Area Plan. A draft plan has been prepared that provides a background summary of existing conditions and details an overall vision and land use map for Ocean Street. The draft plan also includes goals, policies and actions,, as well as urban design guidelines. The proposed land use designations are the same as those portrayed on the Land Use Map in the draft *General Plan 2030*.

RIVER/FRONT & LOWER PACIFIC DESIGN GUIDELINES AND DEVELOPMENT INCENTIVES

A Design Guidelines & Development Incentives Study is being prepared for the River/Front & Lower Pacific area adjacent to the downtown area. Although envisioned as an important complement to the Downtown, the area continues to lag economically behind Santa Cruz's Downtown core on upper Pacific Avenue. It generally has higher vacancies, lower commercial rents, underutilized parcels, inconsistent development character and a lower quality pedestrian environment. The intent of the Study is to identify design guidelines and incentives that the City might implement to help remedy these issues by spurring development activity along the River Street, Front Street, and Lower Pacific Avenue corridor (WRT-Solomon E.T.C. February 2009).

A series of recommendations and alternative strategies for redevelopment have been developed and will be considered by the City Planning Commission and City Council, although the study is not a plan that will be adopted by the Council. General guidelines for redevelopment of the area emphasize promotion of mixed-use, river-oriented development with housing and visitor uses in some areas and preservation of commercial uses in other areas. The study also considers strategies and incentives to enhance cross-river connections, strengthen the riverway as a regional open space and recreational facility, enhance pedestrian and public access, support redevelopment and infill, as well as "catalyst" projects on key sites that would serve as an example of the type of development the City is seeking for the area. Circulation, shuttle, parking and streetscape improvements are addressed.

The study reviews two potential redevelopment sites. One site included a series of contiguous riverfront parcels just south of Soquel Avenue (Site #1), and the other was a large single parcel at the junction of Pacific Avenue and Front Street (Site #2). Mixed-use development concepts were developed for each site consistent with the vision for the area, including a strong orientation to the River at Site #1 and a strong definition of the southern gateway to Downtown at Site #2. Site 1 was found suitable for mixed-used housing (approximately 100 units) and commercial (approximately 40,000 square feet). Approximately 100 residential units also were identified for Site 2 with approximately 10,000 square feet of commercial uses (WRT-Solomon E.T.C. February 2009).

STATE-ADOPTED PLANS

The California Department of Parks and Recreation and the University of California have developed plans they administer as shown on Table 3-5 in Chapter 3. The three State Park plans are discussed in the Chapters 4.6 – PUBLIC SERVICES (Parks and Recreation) and 4.8 – BIOLOGICAL RESOURCES – of this EIR. The University plans and planned campus development and growth are summarized and analyzed as part of the "Cumulative Impacts" subsection of the CEQA CONSIDERATIONS (Chapter 5.1) section of this EIR. As state agencies, neither the California Department of Parks and Recreation nor the University of California are required to obtain local use permits from the City or County.

4.1.2 RELEVANT PROJECT ELEMENTS

SUMMARY OF LAND USE GOALS & POLICIES

The proposed *General Plan 2030* includes goals, policies and actions that address land use and future development. The LAND USE chapter is the "land use element" required by California Government Code Section 65302(a), and Public Resources Code Section 2762(a). The LAND USE chapter addresses: a) the distribution, location, and extent of the uses of land for housing, business, industry, open space, natural resources, recreation and enjoyment of scenic beauty, education, public buildings and grounds, and other categories of public and private uses of land; and b) standards of population density and building intensity for the land use designations.

The LAND USE chapter sets forth the following four goals with 24 associated policies and 61 accompanying actions that address land use.

GOAL LU1	*Sustainable land use.*
GOAL LU2	*A compact community with boundaries defined by the city's greenbelt and Monterey Bay.*
GOAL LU3	*Complementary balance of diverse land uses.*

GOAL LU4 *Land use patterns that facilitate alternative transportation and/or minimize transportation demand.*

The Land Use policies and actions address land use intensities, provision of services, and land use patterns, including preservation of open space. Several policies address job creation and commercial uses, as well as residential uses. Goal LU4 and its supporting policies and actions also seek land use patterns that facilitate use of alternative transportation and/or minimize transportation demand. (See also the TRANSPORTATION & TRAFFIC [Chapter 4.4] section of this EIR.) In addition, GOAL CD5 in the Community Design section of the draft general plan strives toward "*Walkable neighborhoods and districts of compatible uses and buildings.*"

In addition, the draft policies and actions in the *General Plan 2030* also support updating or amending some land use or area plans and preparation of a new Ocean Street Area Plan. The Plan also calls for updating the City's Area Plans as necessary to reflect new development, improvements and potential opportunities (CD2.1.1). The proposed plan updates include:

- Prepare Ocean Street Plan: CD.1.5, CD3.1.3, CD4.4.1
- Update Seabright Area Plan: CD2.1.6, LU3.9.1
- Update Downtown Recovery Plan: CD2.1.7
- Update San Lorenzo River Urban Plan: CD3.1.2

LAND USE MAP

The proposed *General Plan 2030* also includes a Land Use Map as required by State law that identifies land use designations throughout the City as shown on Figure 2-2. These designations include residential, commercial, mixed use, industrial, public and institutional, and parks and open space designations as summarized on Table 3-2 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR (see page 3-11). The *General Plan 2030* includes allowable development densities for residential land use that are the same as residential densities under existing land use designations.

For commercial and industrial land use designations, the proposed general plan eliminates dwelling units and employees per acre limits that are specified in the existing 1990-2005 General Plan, as the underlying zone districts generally permit residential uses under specified conditions. Instead, the *General Plan 2030* proposes average Floor Area Ratios (FAR) for non-residential uses. FAR is a measure of the total building floor area in proportion to the size of the building's lot. Specifically, FAR is the gross floor area permitted on a site divided by the total net area of the site, expressed in decimals. Residential density is, however, specified for the new mixed use land use designations.

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan and Local Coastal Program, except for three new mixed use designations and changes in land use designations for three specified properties/areas as described below.

- **NEW MIXED USE DESIGNATIONS & APPLICATION:** Three new mixed use land designations have been developed and applied to the following areas.

- Mixed use high density (MXHD) designation is applied to segments of Soquel Avenue and Water Street that are designated Community Commercial in the existing General Plan. The MXHD designation allows a maximum FAR of 1.75, including a maximum of 30 dwelling units per acre. However, a project that meets a number of specific criteria, as determined by the Planning Commission, may have an FAR of up to 2.75, including up to 55 dwelling units per acre. Details would be included in the Zoning Ordinance.
- Mixed use medium density (MXMD) designation is applied to segments of Mission Street and Ocean Street that are designated Community Commercial in the existing General Plan. This new district would allow a FAR of 0.75 to 1.75 and a residential density of 10 to 30 dwelling units per acre.
- Mixed use visitor commercial (MXVC) designation is applied to segments of Ocean Street that is designated Community Commercial in the existing General Plan. The *General Plan 2030* also indicates that the designation may be applied to sites within 1,000 feet of Ocean Street's centerline and which front on Water Street, Soquel Avenue, May Avenue, or Broadway. The designation is intended to encourage high-quality visitor-serving commercial development along Ocean Street, particularly hotels and motels. However, it also accommodates other multi-story commercial development, such as office buildings. The MXVC designation allows a maximum FAR of 2.75. It does not allow any dwelling units; however, a project that meets specific criteria, as determined by the Planning Commission, may include up to 55 dwelling units per acre within this FAR. Details will be included in the Zoning Ordinance.

❑ **LAND USE MAP CHANGES FOR SPECIFIC AREAS:**

- Golf Club Drive Property: Change the existing General Plan land use designation from Low Density Residential (1.1-10 DU/acre) to Very Low Density Residential (.1-1 DU/acre). However, a residential density of 10.1-20 dwelling units per acre could be applied to the 20-acre area with preparation and adoption of an area plan. This could result in more residential units (200+) than allowed in the existing General Plan (up to 100 units).
- Swenson Property: The existing General Plan land use designation is Low Density Residential (1.1-10 DU/acre). The draft *General Plan 2030* would allow Low Medium Density Residential (10.1-20 DU/acre)/Neighborhood Commercial/Office designations with preparation of a Specific Plan.
- Landfill and Resource Recovery Center: A 5.5-acre property adjacent to facility's entrance was recently acquired by the City and is proposed to be designated as "Community Facilities." It is expected that future uses would be ancillary to the landfill and Resource Recovery Center uses; specific uses have not yet been identified and will be determined in the future. However, the parcel is not planned for expansion of the landfill disposal operations (Arman, personal communication, April 2010).

According to the draft *General Plan 2030*, the mixed-use designations support the General Plan's goals and policies by encouraging new housing in places well served by transit. Each

mixed-use designation specifies the infill areas along Santa Cruz's transit corridors where the designation may be applied. Because these transit corridors also supply much of the City's commercial land, the mixed-use designations afford additional opportunities for the City's residents to live near their workplace. The draft plan also indicates that any site that is within one of these infill areas, and which also has a Community Commercial (CM) designation, may apply for a General Plan amendment to obtain a mixed-use designation. The City may choose to grant the mixed-use designation if it would support the General Plan's goals, policies, and actions.

FUTURE DEVELOPMENT POTENTIAL

Buildout Estimates

As described in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR, to aid the environmental analysis related to potential impacts of new development accommodated by the draft General Plan, the City considered whether to use the AMBAG population forecasts as a measure of potential future growth or to develop estimates related to land uses envisioned in the draft plan. It was determined that a "buildout" projection would be more closely linked with potential land uses supported in the plan, and therefore, a projection was developed for the City's Planning Department by Design, Community and Environment (DC&E). The projection considers the development potential under the proposed *General Plan 2030* that is estimated to occur in Santa Cruz by the year 2030. The projections are based on the draft Land Use Map, taking into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels, assuming that not all development will occur at maximum density. On the average it is assumed that all new development will occur at 80% of the permitted residential density or floor area ratio. The estimates also assume approximately 7.7 acres of land in the Harvey West area are designated Community Commercial in accordance with proposed Action LU3.2.8 that calls for directing large regional retail uses to the Harvey West area. The estimates are based on the following assumptions; a memo further explaining the assumptions and methodology is included in Appendix B.

- Vacant Lands. Existing vacant lands, including land use designation changes on Swenson and Golf Club Drive properties.
- Underutilized and Mixed Use Designations. Redevelopment and mixed use development given existing underutilized parcels and new mixed use land use designations and supporting policies as follows:
  - New Mixed Use Designations along Mission, Ocean, Soquel and Water.
  - Policies that encourage mixed-use development along the City's transit and commercial corridors (LU3.3.1 and LU4.1).
- Development in Sphere of Influence. Lands within the City's existing Sphere of Influence (SOI) were also considered. The draft General Plan policies do not support expansion of the City's Sphere of Influence (SOI) or annexation except for a small area in the Carbonera neighborhood and the north campus of UCSC. The City's existing adopted SOI includes the Carbonera area, as well as, an area along 7th Avenue. Since owners of lands within the existing SOI includes could apply directly for annexation to LAFCO, some limited development/growth has been

accounted for these areas that are within the City's existing SOI. (Potential development at UCSC is not subject to City land use regulations, and is discussed in the "Cumulative Impacts" subsection of the CEQA CONSIDERATIONS (Chapter 5.0) section of this EIR.

- Major Approved Projects. As discussed in the PROJECT DESCRPTION (Chapter 3.0) section of this EIR, major pending or recently approved projects were not included in the buildout projections (Design, Community & Environment, October 2009), and were added to ensure that all potential development anticipated to occur during the General Plan timeframe is included in the estimate and considered in the EIR impact analyses. These developments include the Delaware Mixed Use Project, the Tannery Arts Center non-residential uses, the La Bahia Hotel Project, Marriott Hotel Project, and an addition to an existing hotel on Second Street.

Table 3-3 in the PROJECT DESCRPTION (Chapter 3.0) section of this EIR, summarizes buildout estimates by planning area. As indicated, the projections estimate the following level of new development by the year 2030:

- 3,350 residential units
- 1,087,983 square feet of commercial development and 311 hotel rooms
- 1,273,913 square of office space;
- 776,926 square feet of industrial development.

The proposed *General Plan 2030* results in higher residential, commercial and office land uses, but slightly reduced industrial uses than would occur under the existing General Plan that is shown on Table 4.1-4. This is due to changes in land use designations for the Swenson and Golf Club Drive properties, addition of new mixed-used designations on segments of Mission Street, Ocean Street, Soquel Avenue and Water Street, and a future redesignation of industrial land in the Harvey West area to accommodate commercial uses (Design, Community & Environment, October 2009).

Policies Supporting Development / Intensification

Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment. Specifically, as indicated above, new mixed-use districts are proposed along the City's four major transportation corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. A new Mixed-Use River District (L3.6) also is proposed. Some policies support higher densities, infill and/or intensification of use. Policy LU1.1 seeks optimum utilization of infill parcels and consolidation of underdeveloped parcels (LU1.1.2). Another policy (LU3.8) allows maximum residential densities to be exceeded for the following uses: single-room occupancy (SRO) units; small ownership units (SOU); accessory dwelling units (ADU); density bonus units; and residential uses within areas designated High-Density Overlay District (HD-O). Intensified office development is encouraged in the downtown area (LU3).

Additionally, several General Plan actions support specific types of land uses or development, although site-specific locations are not identified. These facilities include arts and cultural facilities in a variety of zone districts (HA2.2.4), a performing arts center (HA2.2.5), high-end lodging (ED1.5, ED1.5.1), large regional retail uses in the Harvey West area (LU3.2.8), and

artist live-work units (HA4.4). Some policies address specific land uses in specific areas. For instance, neighborhood commercial uses are encouraged for the Prospect Heights neighborhood. Policy LU3.2 supports maintaining lands currently designated for industrial and office in land use designations that promote job creation and retention, and its accompanying actions seek employment-intensive uses (LU3.2.1) and support of uses in the Harvey West and Westside industrial areas. Public facilities supported by the draft plan include parks, schools, a transit center along the railroad, and a desalination facility (CC3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan*, but specific sites are not identified for these uses.

Table 4.1-5 summarizes key proposed policies and actions related to land uses, density and intensity, and potential development. While most of these are in the "Land Use" chapter of the draft plan, some are in other chapters, including "Community Design" and "Economic Development."

Policies Related to City Expansion and Annexation

The draft General Plan policies do not support expansion of the City's Sphere of Influence (SOI) or annexation except in the Carbonera Area (LU2.2.1), the UCSC north campus area pursuant to the UCSC/City Comprehensive Settlement Agreement (LU2.2.2), and a 5.5-acre addition to the City's Landfill and Resource Recovery Center (LU2.2.3). As indicated above, owners of lands within the existing adopted SOI could apply directly for annexation to LAFCO.

4.1.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

1a Physically divide an established community;

1b Introduce new land uses or alter the intensity of land uses, which could be considered incompatible with the surrounding land uses or with the general character of the area;

1c Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or

1d Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan.

TABLE 4.1-5
Summary of Proposed *General Plan 2030* Policies & Actions Related to Land Use Intensity and/or Development

Increased Density and/or Land Use Intensity	• Expand HDO (amend Downtown Recovery Plan) to include Front Street and portions of lower Pacific: LU3.6.1 • Encourage transition to higher densities along transit and commercial corridors: LU4.1 • Amend ZO to increase number of stories allowed within existing height limits in Westside Industrial area: LU3.2.6 • Encourage higher intensity residential & maximum densities: LU3.7, LU3.7.1 • Allow specified residential uses to exceed maximum densities (i.e., SRO, SOU, ADU): LU3.8 • PD changes & incentives for underutilized lands: LU1.1.1, 1.1.2 • Pursue employment-intensive uses: LU3.2.1
Mixed Uses	• Increased development in new mixed use districts: LU3.3.2 (Revise ZO), LU4.2, LU4.2.2, LU4.2.3 • Mixed Use River District: L3.6 • Support mixed-use development in Downtown, along primary transportation corridors and in employment centers: LU4.1.1, LU4.1.3, LU3.3.1, CD3.3 (encourage assembly of small parcels), ED5.3 • Encourage mix of uses, including public facilities along Lower Pacific: LU3.5 • Revise ZO to allow live-work units: LU4.1.4
Expand Land Uses	• Amend ZO to allow development of arts and cultural facilities in wide variety of designations: HA2.2.4, HA3.1, HA3.1.2 (Art & Entertainment District) • Amend Downtown Recovery & BSOL Plans to allow additional public & commercial uses along Lower Pacific Avenue & Front Street: LU3.5.1 • Expand Beach Area services and employment: ED5.1.2
Support of Specific Land Uses	*HOUSING* • Encourage a variety of housing types, when appropriate: LU3.1.1 • Encourage development of artist studios and artist live-work units: HA4.4 *VISITOR-SERVING* • Develop new lodging & attract top-end, full-service hotel: ED1.5, ED1.5.2 • Promote eco-tourism (ED1.3, ED1.3.1) • Promote City as conference destination (ED1.4) and support new conference center (ED1.4.1) *COMMERCIAL - INDUSTRIAL* • Encourage light industrial and creative industry: LU3.2.3 *PUBLIC FACILITIES* • Encourage neighborhood facilities – parks, schools, daycare centers & neighborhood commercial services: LU4.3, LU4.3.1 • Develop Desalination Plant: CC3.1.3, LU3.10.2 (Initiate GP amendment with selection of desal plant site) • Transit Center along rail corridor: LU4.5, LU1.1.4 (Golf Club Drive area) • Encourage and allow arts and facilities in variety of zones: HA2.2.4 • Countywide Emergency Operations Center: HZ1.1.5
Site or Area-Specific Development Support	• Support Tannery Arts Center development: HA2.2.3 • Downtown performing arts center or expansion of Civic: HA2.2.5 • Revitalize lower Pacific area (south of Cathcart): ED5.5.7 • Harvey West - Direct large regional retail uses to Harvey West: LU3.2.8; • Westside - Allow incubator uses in employment intensive areas: LU3.2.4 • Eastside – Retain/strengthen medical offices: ED2.2.5 • Depot Part - Further develop as a multi-modal center: LU3.5.2 • Prospect Heights - Encourage neighborhood commercial: ED5.2.3 • Seabright - Support redevelopment of LI properties on Murray (ED5.3.2); consider infill/intensification in Area Plan update (CD2.1.6); promote beaches (ED1.8.13); provide shopping services (ED1.8.14) • Encourage the location of University-serving shopping and services on University lands: LU4.2.5

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address: the potential to divide an established community (1a), introduction of incompatible land uses (1b), and potential conflicts with plans, policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect (1c). There are no existing adopted Habitat Conservation Plans or Natural Community Conservation Plans within the City of Santa Cruz. The City is in the process of developing a HCP to cover incidental take of listed species associated with City] projects and operations, including water supply, flood control, and landfill improvements. A draft has not been completed, and this is addressed in the BIOLOGICAL RESOURCES (Chapter4.8) section of this EIR. Thus, the proposed *General Plan 2030* goals, policies and planned land uses would not conflict with such plans (1d).

Impact 4.1-1: Divide an Established Community
Adoption and implementation of the *General Plan 2030* would not result in development or expansion of municipal boundaries that would result in a physical division of an established community. Therefore, there would be *no impact.*

The City of Santa Cruz is a compact urban community that is surrounded by natural barriers to outward expansion including the Santa Cruz Mountains, the Pacific Ocean and a designated greenbelt. The City is primarily built out and is surrounded on the west and north by mostly greenbelt, agricultural or open space lands and on the south by Monterey Bay. Thus, the City's western and northern borders are mostly defined by publicly- and privately-owned open space, agricultural, and park lands, which in conjunction with the Monterey Bay on the south, serve to limit the City's expansion. The Arana Gulch greenbelt property and the Santa Cruz Small Craft Harbor define the City's eastern boundary.

As an established community, new development accommodated by the proposed *General Plan 2030* would be considered infill development, both on limited remaining vacant lands, as well as, intensification and/or redevelopment on underutilized parcels. Thus, development would be within an established community and would not result in a physical division of an established community.

Furthermore, proposed goals, policies and actions in the draft *General Plan 2030* limit potential expansion of the City's boundaries. Land Use Goal LU2 envisions a "compact community with boundaries defined by the city's greenbelt and Monterey Bay." Supporting policies seek to maintain the City's urban development line and also include working with the County to preserve open space and agricultural land uses at the edge of the City. The proposed policies and actions also limit expansion of the City's Sphere of Influence (or annexation), except for three specified areas. These include: consolidation of a small area within the existing residential Carbonera neighborhood, most of which is included within city limits; the north campus area of UCSC pursuant to the terms of the UCSC/City Comprehensive Settlement Agreement; and a 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center.

A narrow band of land between the City's eastern city limit and Seventh Avenue is included within the City's existing Sphere of Influence, and, as such, property owners could apply for annexation. Currently within the unincorporated Live Oak area, this area is primarily residential with some commercial uses and many underutilized parcels. If annexation were approved in the future, this area would continue to be designated for residential uses and would be a logical expansion of the City without dividing an established community, as it is at the western edge of the unincorporated area known as Live Oak, which is also a developed area similar to the City.

Table 4.1-6 summarizes the proposed policies and actions that ensure that future development accommodated by the *General Plan 2030* would not result in physical division of an established community.

TABLE 4.1-6
Proposed General Plan Policies and Actions that Avoid Land Use Impacts

Type of Measure / Action	Policies / Actions
SUPPORT INFILL	• Ensure optimum utilization of infill parcels: LU1.1
LIMIT URBAN LIMITS	• Maintain City's urban development line at Moore Creek Preserve (east branch above Highway 1) and along the city limits below Highway 1: LU2.1
NO EXPANSION OF SPHERE OF INFLUENCE	• No expansion of SOI (LU2.2) except for three areas – a small area within the existing residential Carbonera neighborhood (LU2.2.1); the north campus area of UCSC pursuant to the terms of the UCSC/City Comprehensive Settlement Agreement (LU2.2.2); and a 5.5-acre addition to the City's Landfill and Resource Recovery Center (LU2.2.3)
SUPPORT PRESERVATION OF OPEN SPACE & AGRICULTURAL LANDS AT CTIY'S EDGE	• Preserve open space at edges of City: LU2.3 • Work with County to maintain lands in open space west of City: LU2.3.2 • Support County policies for agricultural and grazing uses within the Planning Area and on the North Coast: LU2.3.5

Conclusion. The City of Santa Cruz is primarily built out and as an established community, new development accommodated by the proposed *General Plan 2030* would be considered infill development. Thus, development would be within an established community and would not result in a physical division of an established community. Furthermore, proposed goals, policies and actions in the draft *General Plan 2030* limit potential expansion of the City's boundaries and seek to maintain the City's urban development limits. Thus, the project would not result in an impact related to division of an established community.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.1-2: Introduce Incompatible Land Uses
The proposed *General Plan 2030* does not introduce new land uses that would be incompatible with existing land uses or land use designations, although residential densities may increase in limited areas. However, with implementation of proposed *General Plan 2030* policies and actions, compatibility between new higher density residential uses with adjacent lower density residential neighborhoods would be ensured. Therefore, this is considered a *less-than-significant impact.*

The proposed *General Plan 2030* introduces three new mixed-use designations, which are applied to segments of the City's four major transportation corridors: Mission Street, Ocean Street, Soquel Avenue and Water Street. The designations include residential and non-residential land uses. However, the areas are currently zoned "Community Commercial," and residential uses are currently permitted with approval of a use permit or special use permit, subject to the a minimum net land area of the R-M (Multiple Residence-Medium Density District), which currently is 1,450 square feet. This represents a density of 30 units per acre under existing regulations. The proposed medium density mixed use designation maintains a residential density limit of 30 units per acre. However, the high density mixed use designation would allow up to 55 units per acre under specified conditions. The mixed use visitor designation (only along Ocean Street) also could allow up to 55 units per acre under specified conditions. Generally, existing lower density residential neighborhoods are situated adjacent to Water Street to the north of the proposed high density mixed use designation. However, the proposed segments along Soquel Avenue and Ocean Street that are designated for high density mixed uses generally are located adjacent to areas that are designated commercial and medium density residential. The medium density residential designation does allow up to 55 units per acre.

Thus, the new mixed use districts would not result in new land uses that could be considered incompatible with another land use, although the residential density could be increased in relation to existing adjacent uses in one area along Water Street. However, draft *General Plan 2030* policies and actions prevent potential land uses incompatibilities, as summarized in Table 4.1-7 below, in that it seeks to protect existing residential uses (LU3.9), seeks to ensure that infill and intensified development is sensitive to existing neighborhoods (LU4.1.2), restricts uses that are incompatible with industrial uses within industrial areas (LU2.3.6), and seeks to ensure appropriate land uses adjacent to open spaces (LJU3.11.2). The development permitted within the new mixed use designations may result in increased density or land use intensity, which may result in aesthetic or noise impacts to adjacent uses. These issues are discussed in the AESTHETICS (Chapter 4.3) and NOISE (Chapter 4.13) sections of this EIR. However, the proposed General Plan specifically calls for development of design guidelines to address the visual transition between areas of higher density and/or intensified development (i.e., along corridors such as Water and Soquel Streets) and adjacent existing developed neighborhoods with less intense development (CD2.1.3). The proposed Plan also indicates that development standards will be included in the Zoning Ordinance amendment to establish mixed use districts, which will ensure that siting, massing, and scale of infill and intensified development are sensitive to existing neighborhood and business districts (CD2.1.4).

The proposed General Plan does add new floor area ratios for the non-residential land use designations and eliminates residential densities in on-residential zones. The floor area ratios

would limit building mass, which is not currently regulated through floor area ratios in the existing General Plan.

Policy LU3.10 would allow community services facilities to be located in all land use designations, and its companion Action LU3.10.1 calls for amending the Zoning Ordinance to achieve this. This could result in incompatible land uses depending on what type of "community service facility" would be proposed, especially within residential districts. Currently public facilities are not permitted in R-1 or Residential Suburban districts. In RL, RM, and RH districts, educational, religious, cultural, public utility or public service buildings and uses are permitted, except for corporation yards, storage or repair yards, and warehouses. The General Plan does support development of a desalination plant (CC3.1.3), and Action LU3.10.2 calls for initial of a General Plan amendment when a specific site is selected. The proposed General Plan also calls for a potential transit center along the rail line in the Golf Club Drive area. Thus, the major public facilities that may be supported by the Plan are already addressed in other policies and actions. Furthermore, the existing zone districts generally allow other use or service establishments determined by the zoning board if they are in the same character as the permitted and allowed uses, subject special use permit approval.

TABLE 4-1-7
Proposed General Plan Policies and Actions that Avoid Incompatible Land Uses

Type of Measure / Action	Policies / Actions
ENSURE LAND USE COMPATIBILITY WITH EXISTING NEIGHBORHOODS	• Protect existing residential areas: LU3.9 • Ensure intensified development is sensitive to existing neighborhoods: LU4.1.2 • Design principles and new guidelines for transition between higher density corridors and adjacent development: CD 2.1.3, CD2.1.4 • Support more intensive commercial uses along commercial corridors, provided they are compatible with or transition to adjacent residential areas: EDD5.3.1 • Appropriate land uses adjacent to open spaces: LU3.11.2 • Compatible development within historic districts: HA1.9, 1.9.1-1.9.3 • Restrict uses that are incompatible with industrial uses within industrial areas: LU3.2.7 • Ensure appropriate land uses and development standards that do not adversely impact adjacent open spaces: LU3.11.2

Conclusion. The proposed *General Plan 2030* introduces three new mixed-use designations, which are applied to segments of the City's four major transportation corridors in areas where mixed-use development is currently permitted with applicable development standards. Thus, the new mixed use districts would not result in new land uses that could be considered incompatible with another land use, although the residential density could be increased in relation to existing adjacent uses in one area along Water Street. However, with implementation of the proposed general plan, siting of future development would not be permitted if it were potentially incompatible with existing uses. Therefore, the project would not result in a significant impact related to

introduction of incompatible land uses. As currently written, LU3.10 and LU3.10.1 are somewhat broad, and subject to future interpretation that may allow potentially incompatible facilities within a residential neighborhood. Community service facilities are not defined in the General Plan; Action LU3.10.2 references a desalination facility. For clarity and to avoid confusion, LU3.10 and LU3.10.1 would benefit from being rewritten to be more specific as to the type of community service facilities that would be envisioned or eliminated as there are specific policies and actions addressing facilities specifically supported in the Plan – a desalination facility and rail transit center.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* policies and actions are recommended to avoid confusion regarding location of community service facilities.

Recommended Revisions to the *Draft General Plan 2030*

Revise LU3.10 and LU3.10.1 to better define community service facilities OR delete as shown below.

~~LU3.10 Allow community services facilities to be located in all land use designations.~~

~~LU3.10.1 Amend the Zoning Ordinance to allow community service facilities and uses in all land use designations as of right. Cf. HA2.2.4.~~

Impact 4.1-3 Conflict with Applicable Land Use or Other Plans
Goals, policies and actions of the draft *General Plan 2030* would not conflict with other adopted plans. The plan consistency analysis has not found any plan inconsistencies with the Draft General Plan that would result in adverse physical impacts. Therefore, there would be *no impact.*

The following subsection provides a review of consistency of the proposed *General Plan 2030* with local plans and policies. In accordance with State CEQA Guidelines, Appendix G, the review focuses on policies or regulations adopted for the purpose of avoiding or mitigating an environmental impact. The City's existing adopted plans (see Table 3-5 in Chapter 3.0 of this EIR) are not part of the *General Plan 2030*, except for four plans (Downtown Recovery, Moore Creek Corridor, San Lorenzo Urban River, and Santa Cruz Harbor Development Plans). Review of consistency of the draft *General Plan 2030* with adopted plans is provided below. The focus will be on portions of those plans that serve to mitigate environmental impacts. Consistency with adopted Master Plans for the City's greenbelt lands is provided in the BIOLOGICAL RESOURCES (Chapter 4.8) section of this EIR.

Regional Plans

AMBAG has prepared "Envisioning the Monterey Bay Area – A Blueprint for Sustainable Growth and Smart Infrastructure" that is a blueprint for the future describing how the communities of the Monterey Bay area might grow in a sustainable fashion over the next 25 years. Regional and local agencies worked together to evaluate current trends regarding the distribution of population and employment in comparison to: 1) improving mobility; 2) reducing GHG emissions; 3) providing housing and employment opportunities; and 4) protecting natural and cultural resources. The study develops a preferred growth scenario that maximizes the achievement of these outcomes that will serve as the basis for SB 375's Sustainable Communities Strategy that will demonstrate how the region will reduce per capita greenhouse emissions by 5% from the automobiles and light trucks by 2035 (AMBAG, March 2011).

Under the "Sustainable Growth Patterns" scenario developed as an alternative to current growth patterns, the region's urban footprint would increase by 20,000 acres by 2035, which is less than half of the approximately 43,000 acres that are projected to otherwise be developed. Under this scenario, the majority of the region's forecast growth occurs within a comfortable walking distance to transit corridors and neighborhood centers within "Blueprint Priority Areas" identified in the study that are primarily higher density lands within cities in proximity to transit and walking opportunities. The City of Santa Cruz is as a "Blueprint Priority Area." Consideration of policies and specific actions to see this sustainable pattern become a reality would be within the purview of individual agencies.

The proposed *General Plan 2030* is consistent with the planning principles in included in the draft blueprint plan. The draft General Plan includes new mixed use designations along the City's major transportation corridors and supports infill and high density development.

City Plans

Generally, the City's adopted area and other land use plans provide guidance for land uses, development siting and design, and circulation, but do not include policies related to environmental issues. The Downtown Recovery Plan includes a land use plan and development and street design guidelines, but not policies. Similarly, the Eastside Redevelopment Plan addresses land use and business improvements with a focus on design guidelines for improvements to streets, parking and building facades. The San Lorenzo Urban River Plan also does not contain specific policies, but generally presents recommendations for land use and development design improvements, access, and urban interface connections for focus sites and improvements along specified reaches of the river.

While the Seabright Area Plan includes policies, they address primarily development design, circulation and housing issues. The proposed *General Plan 2030* policies and actions that seek to protect existing neighborhoods and heritage trees are consistent with policies in the Seabright Area Plan that also seek to protect heritage trees and to maintain a scale of development consistent with the existing neighborhood.

The Western Drive Master Plan provides road, access, land use, design, landscaping and drainage recommendations for both publicly- and privately-owned lands to preserve the rural character of the area, provide access to the canyon area and preserve existing trees. The

proposed *General Plan 2030* does not conflict with these goals and recommendations, does not change the land use density in this area, and includes policies and actions to maintain the City's Heritage Tree Ordinance and protect heritage trees.

The Santa Cruz Harbor Development Plan includes policies and programs that address environmental quality, design, land use, circulation and parking, and parks, recreation and public access. The Environmental Quality policies seek to avoid the adverse impacts on the marine habitat within the Harbor, including management of dredging and disposal and water quality controls to protect water quality. The proposed *General Plan 2030* does not specifically address Harbor issues and does not include any policies or actions that would conflict with those in the Harbor Development Plan. The proposed General Plan policies related to protection of water quality, including Implementation of stormwater quality & water pollution prevention programs, would support and complement Harbor policies.

The B/SOL Plan primarily provides policy guidance for land use, development, design and circulation issues. Proposed Policy LU3.4 seeks to give priority to uses that serve both visitors and residents in neighborhoods near visitor areas and support improved recreational and economic opportunities at the Municipal Wharf (LU3.5.3). The proposed *General Plan 2030* also supports protection of historical structures, which is also advocated in the B/SOL Plan. It is noted that the estimate buildout projections for the Beach Area show about one fifth of new commercial development envisioned in the B/SOL Plan (approximately 22,000 square feet compared to 125,000 square feet).

Therefore, there are no apparent conflicts between the proposed project and applicable plans, policies or regulations adopted for the purpose of avoiding or mitigating an environmental.

Conclusion. There are no apparent conflicts between the proposed project and applicable plans, policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect as discussed above. Therefore, the project would not result in an impact related to conflicts with local plans and polices.

Mitigation Measures

None are required as a significant impact has not been identified.

REFERENCES

City of Santa Cruz.

- Adopted October 1998. *City of Santa Cruz Beach and South of Laurel Comprehensive Plan.* Prepared by City of Santa Cruz Department of Planning & Community Development.
- As Amended Through October 2009. *City of Santa Cruz Downtown Recovery Plan.*

- 1981. *Seabright Area Plan.*
- 1979. *Western Drive Master Plan.*

City of Santa Cruz Redevelopment Agency. January 1996. *Eastside Business Area Improvement Plan.*

City of Santa Cruz San Lorenzo Urban River Plan Task Force. June 24, 2003 [Adopted by City Council]. *San Lorenzo Urban River Plan.*

Design, Community & Environment.

- October 29, 2009. "Methodology for General Plan 2030 Buildout Projections."
- December 11, 2006. "Land Use Background Report."

Santa Cruz Port District. 1996. *Santa Cruz Harbor Development Plan.* [Adopted by Port District, November 1992; Adopted by City of Santa Cruz, November 1993; Certified by the California Coastal Commission, March 1994; Readopted by Port District, February 1996]

WRT-Solomon E.T.C. February 2009. "City of Santa Cruz River/Front & Lower Pacific Design Guidelines & Development Incentives."

4.2 POPULATION & HOUSING

4.2.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regional Setting
- Regulatory Setting
- Population Trends & Forecasts
- Housing Trends & Forecasts
- Employment Trends & Forecasts
- UCSC Population and Housing

REGIONAL SETTING

Santa Cruz is the largest city within Santa Cruz County in terms of population, followed by Watsonville, Scotts Valley and Capitola. The City's current population represents approximately 22% of the total County population, and it also accommodates approximately 22% of the County's total housing stock (California Department of Finance, May 2008). According to AMBAG data, the City provides 20% of the jobs found within the County (AMBAG, June 11, 2008a).

REGULATORY SETTING

Regional Population, Housing and Employment Forecasts

There are no federal, state or local agency regulations regarding population. The Association of Monterey Bay Area Governments (AMBAG) prepares and updates population, housing and employment forecasts for the Monterey Bay region, which includes Santa Cruz, Monterey and San Benito Counties. These forecasts are used in other regional planning efforts, including but not limited to, air quality management plans and housing elements.

California Housing Element Requirements

Pursuant to State law (Government Code section 65580 et seq.), each city and county must prepare and adopt a Housing Element in its General Plan. The Housing Element must identify and analyze existing and projected housing needs and prepare goals, policies, programs and quantified objectives to further the development, improvement, and preservation of housing. Unlike other elements of the General Plan, Housing Elements are mandated by State law to be prepared for seven-year intervals (formerly 5-year intervals) and must include quantified objectives to meet identified housing needs.

State law requires that the housing element:

- Identify adequate sites to facilitate and encourage housing for households of all economic levels, including persons with disabilities;
- Remove, as legally feasible and appropriate, governmental constraints to housing production, maintenance, and improvement;
- Assist in the development of adequate housing for low and moderate income households;
- Conserve and improve the condition of housing, including existing affordable housing; and
- Promote housing opportunities for all persons.

The City's current Housing Element, which covers the period from 2007 to 2014, was updated and adopted in 2010 with final approval by the State and adoption by the City in 2011. It sets forth goals, policies, quantified objectives and programs for the production, rehabilitation and conservation of housing, and addresses affordable housing and special housing needs. The Housing Element includes objectives to construct 672 new housing units, rehabilitate 50-75 housing units for low income households, and conserve 594 affordable housing units between the years 2007 and 2014. The Housing Element indicates that the above housing production goal has almost been met by housing units constructed and approved since January 2007, except 170 additional housing units are needed for extremely low, low and moderate income households to fully meet the above housing production objectives once constructed and approved units are considered.

Regional Housing Needs Allocation

Housing Elements must also describe programs for meeting its "fair share" of regional housing needs based on seven-year projections developed by the State and AMBAG. The State of California requires the Department of Housing and Community Development (HCD) to identify housing needs for each region of the State in response to projected population and household, and state law (Government Code 65584) further mandates that each Council of Governments (COG) distribute the regional housing needs allocation (as determined by the State) to each jurisdiction within the COG's region. AMBAG is the COG charged with overseeing the Regional Housing Needs Allocation (RHNA) process for jurisdictions in Monterey and Santa Cruz counties, and is responsible for determining the "fair share" of regional housing need for each jurisdiction in Monterey and Santa Cruz counties (AMBAG, June 11, 2008b).

City of Santa Cruz Affordable Housing Provisions

The requirements provision of affordable housing to moderate, low or very-low income households as a part of new residential development are included in the City's Municipal Code, Chapter 24.16 – "Affordable Housing Provisions." The purpose of the inclusionary housing requirements is to enhance the public welfare by adopting policies to utilize remaining developable land in the city in a manner consistent with state and local housing policies and needs, meet the city's share of regional housing needs, implement the housing element's goals and objectives, improve the feasibility of rental housing development, assure compatibility

between market rate units and inclusionary units, and make housing available for households of all income levels. Chapter 24.16 also addresses accessory dwelling units, density bonuses for residential units, and fee waiver for affordable units.

POPULATION TRENDS & FORECASTS

Population and Household Trends

POPULATION TRENDS

As of January 1, 2009, the City of Santa Cruz supported a population of 58,982 (California Department of Finance (DOF), May 2009).[1] This is an increase of 9,271 City residents over the City's 1990 population of 49,711 residents when the existing *General Plan and Local Coastal Plan 1990-2005* was prepared. Overall, this population increase represents an annual average growth rate of approximately 1% (0.98) between 1990 and 2009. The City's 2009 existing population is slightly less than what was forecast by AMBAG and included in the City's existing General Plan for both the years 2005 (59,700 total forecast population) and 2010 (60,800 total forecast population).

Population increases and growth trends within the City have fluctuated over the years. Spurred in part by the establishment of the University of California Santa Cruz (UCSC) campus, the City's population increased 29% during the 1970s, which represented an annual average growth rate of approximately 2.9%. Growth slowed to an average annual rate of about 2% during the 1980s. Between 1990 and 2008, City population grew at an average annual growth rate of about 1%.

In comparison, the State of California grew at an average annual rate of approximately 1.4% during the 1990s and 1.5% between 2000 and 2006. City growth rates have been lower than the Bay Area Consolidated Metropolitan Statistical Area (CMSA, which includes Santa Cruz County), which grew 2.3% between 2000 and 2006 (Bay Area Economics, June 2006). Table 4.2-1 compares City, County and State population and growth trends.

The 2010 U.S. Census data became available during the preparation of this EIR. It shows the City's population in 2010 as 59,946, which is slightly higher than the City's population reported for January 1, 2009 by the California DOF. However, the EIR analyses utilize the City's population as of 2009 when the NOP was published.

[1] California CEQA Guidelines section 15125(a) requires that existing environmental conditions be described as they exist at the time the Notice of Preparation (NOP) is published. The NOP for this EIR was published in March 2009, and thus, population figures available from the State as reported by January 1, 2009, are used in this analysis.

TABLE 4.2-1
City, County, and State Population Growth

	CITY		COUNTY		STATE	
Year	Population	Average Annual Growth Rate	Population	Average Annual Growth Rate	Population	Average Annual Growth Rate
1960	26,600		84,200		15,720,860	
1970	32,100	2.06%	123,800	4.70%	19,957,304	2.69%
1980	41,500	2.92%	188,100	5.19%	23,668,145	1.85%
1990	49,711	1.97%	229,700	2.21%	29,473,000	2.452%
2000	54,593	0.98%	255,602	1.13%	33,873,086	1.49%
2009	58,982	0.9%	268,637	0.5%	38,292,687	1.45%

Source: U.S. Census 2000 and California Department of Finance, 2009

HOUSEHOLD TRENDS

The average household size in the City dropped slightly from 2.5 in 1990 to approximately 2.44 in 2000 (City of Santa Cruz, October, 2003). As of January 1, 2009, the City of Santa Cruz had a reported household size of slightly less than 2.4 (2.395) (California Department of Finance, May 2009). Based on California Department of Finance estimates, there were approximately 22,243 households within the City of Santa Cruz as of January 1, 2009.

The City of Santa Cruz, similar to many communities with large university campuses, has a higher proportion of non-family households (e.g., unrelated individuals) than the County or the region. In 2005, approximately 50% of the City's households were non-family, compared to 38% Countywide and just 36% for the region (Bay Area Economics, June 2006).

Demographic Trends

According to 2000 Census data, 72% of the City of Santa Cruz reported their ethnicity as white, followed by 17.5% reporting Hispanic ethnicity (Bay Area Economics, June 2006). Ethnic diversity has increased slightly in the City since 1990 when the proportion of white ethnicity was 79%.

The City's estimated median age in 2005 was slightly lower, at 34.1 years, than either the County or the region (Bay Area Economics, June 2006). The City also has a lower concentration of children age 0 to 17 (16.8%) than the County (22.7%) or the region (23.3%), and higher proportions of college-age residents from age 18 through 24 (17.4%) than the County (11.3%) or the region (8.4%). Additionally, the City also has a relatively high proportion of young adults age 25 to 34, with more than 17% of population in this age range, compared to 14% or less for the region and County. In every age cohort above age 35, the City has slightly lower proportions than the County or region, including seniors age 65 and over (Bay Area Economics, June 2006). In 2000, 30% of the City's population was between the age of 35 and 54 years, and 14.8% were 55 years and older. From 1990 to 2000 the City experienced a 2% population decline in 25 to 44 years of age group, but the age 45 to 64 population increased by 76% (City of Santa Cruz Department of Planning and Community Development, April 2004).

Residents of the City of Santa Cruz are highly educated, with more than 44% of the residents over age 25 having achieved a bachelor's degree or higher as of 2000. This level of educational attainment in the City of Santa Cruz is substantially stronger than countywide (34%) or regionally (just under 27%) (Bay Area Economics, June 2006).

The median household income for the City of Santa Cruz in 2005 was an estimated $60,273, compared to $63,919 for the County and $72,260 for the region. This somewhat lower median household income for the City reflects the younger population and smaller average household size. (Bay Area Economics, June 2006).

AMBAG projections indicate that decreases are anticipated in young children and school-age populations in Santa Cruz County, comprising a 5% loss countywide by 2035 (AMBAG, June 2008a). Population growth among working-age residents is also slow at about 8%. Similar to the regional projections, the fastest growth sector of the population are residents over 85 years, which is expected to more than double by 2035. The population of seniors between 65-84 years is also predicted to almost double to over 41,600 residents (Ibid.).

Population Forecasts

AMBAG prepares and regularly updates population, housing and employment projections for the cities and counties in its region. The forecasts are made in five-year increments. The current forecast was adopted by AMBAG in June 2008 and covers the years from 2005 to 2035.

Population projections for the City through the year 2030 are outlined in Table 4.2-2. Population is projected to increase to 65,884 in 2030. This represents an increase of 6,902 people between 2009 and 2030. AMBAG population projections reflect an average annual increase of about 0.7% between 2005 and 2030, and about 0.6% based on existing population estimates provided by the State (1-1-09). It should be noted that the AMBAG forecast includes population increases at UCSC based projections contained in the UCSC 2005 Long-Range Development Plan adopted by the UC Regents in 2006. UCSC population changes are discussed further below.

TABLE 4.2-2
Current Population Projections for City of Santa Cruz

Year	Population
2005	56,421
2010	58,919
2015	62,480
2020	63,265
2025	64,649
2030	65,884

Source: AMBAG, 2008a

Actual City population since 1990 has been below AMBAG projections as summarized in Table 4.2-3. The current AMBAG projections yield an anticipated average annual growth rate of slightly less than 0.6% between 2010 and 2030. This growth rate is less than AMBAG's former population projections which resulted in an average annual growth rate of 1.3% between 1990 and 2005. The average annual population growth rate based on current AMBAG projections is also slightly less than the actual rate of growth (0.9%) the City experienced between 1990 and 2009. Table 4.2-4 compares the average annual growth rates that the City experienced over 5- and 10-year increments since 1960.

TABLE 4.2-3
Comparison of Population Forecasts & Actual Population Increases

	AMBAG Estimate	Actual
1990	49,711	49,711
1995	54,300	51,373
2000	57,200	54,593
2005	59,700	56,394
Increase	*9,989*	*6,683*

BASED ON AMBAG PROJECTIONS INCLUDED IN THE CITY'S 1990 GENERAL PLAN/LCP

As previously indicated, the 2010 U.S. Census population data became available during the preparation of this EIR. It shows the City's population in 2010 as 59,946, which is slightly higher than AMBAG's current projection of 58,919 for 2010 as seen in Table 4.2-2. It is also noted that the 2010 Census population is slightly below the 2010 population forecast for the City by AMBAG in 1992, which estimated a population of 60,800 that is included in the City's existing General Plan (1990-2005).

TABLE 4.2-4
Historical City of Santa Cruz Growth Rates

Year	Population	For Years:	Actual Average Annual Growth Rate
1960	26,600		
1970	32,100	1960-1970	2.06%
1980	41,500	1970-1980	2.92%
1990	49,711	1980-1990	1.98%
1995	51,373	1990-1995	0.67%
2000	54,593	**1990-2000**	**0.98%**
		1995-2000	1.25%
2005	56,394	1995-2005	0.98%
		2000-2005	0.66%
2009	58,982	**2000-2009**	**0.89%**
		1990-2009	0.98%
2010	59,946	**1990-2010**	**1.0%**
		2000-2010	**0.98%**

HOUSING TRENDS & PROJECTIONS

As of January 1, 2009, the City of Santa Cruz had a total of 23,530 housing units within city limits (California Department of Finance, 2009). New housing units increased at an average annual rate of approximately 1.0% from 21,460 total housing units in 2000. The City's housing stock increased by 4,166 units from 19,364 units in 1990. This represents an average annual increase in housing units of approximately 1.1% between 1990 and 2009 or approximately 210 units per year.

AMBAG's long-term forecasts estimate that approximately 25,943 total housing units would be accommodated in the City in the year 2030 as summarized on Table 4.2-5 (AMBAG, June 2008). This represents an increase of 2,413 housing units between 2009 and 2030, which reflects an average annual growth rate of 0.5% per year or approximately 115 units per year. Similar to population growth, the average growth rate in new housing units between 2010 and 2030 (based on current AMBAG projections) is also less (0.5% per year) than the actual rate of growth (1.1%) the City experienced between 1990 and 2009.

TABLE 4.2-5
Housing Projections for City of Santa Cruz

Year	Total Housing Units
2005	23,133
2010	23,633
2015	24,133
2020	24,794
2025	25,390
2030	25,943

Source: AMBAG, 2008a

Based on AMBAG's projection of 25,943 housing units in 2030 and existing units in 2009, approximately 2,413 new units would be constructed. This would result in a population increase of 5,791 people in the year 2030 based on the City's average household size of 2.4. The City's total population is forecast to increase by 6,902 residents between 2009 and 2030 according to AMBAG's forecasts, which is higher than the population supported by the forecast housing unit increase. It is assumed that this difference would account for increased student population on the UCSC campus.

AMBAG's *Regional Housing Needs Allocation (RHNA) Plan* for 2007 to 2014 identifies the need for 672 new housing units during this timeframe for the specified income groups as identified below:

- Very Low Income (22%): 150 units
- Low Income (17%): 113 units
- Moderate Income (19%): 127 units
- Above-Moderate Income (42%): 282 units

EMPLOYMENT TRENDS & PROJECTIONS

According to U.S. Census information, there were 36,804 jobs within the City 2000, 42% of which (15,550 jobs) were held by City residents. Of the total employed residents within the City, 54% worked within the community. This results in an overall jobs-to-employed resident

ratio of 1.27 that shows a strong positive balance of jobs to employed residents (even if not all City residents held these jobs), and that without additional housing construction, in-commuting would need to occur to fill all existing jobs (Bay Area Economics, June 2006). According to information presented in the draft *General Plan 2030*, there were 38,604 jobs in Santa Cruz and 28,869 employed residents in 2007, which represents a ratio of 1.27 local jobs per employed resident.

As of 2004, jobs by sector within the City included:

▪ Retail / Lodging / Entertainment	10,962	30%
▪ Educational Services	6,494	18%
▪ Technology & Business Services	6,321	17%
▪ Health Care & Social Assistance	5,463	15%
▪ Logistics & Utilities	2,208	6%
▪ Manufacturing	2,171	6%
▪ Construction & Real Estate	2,039	5%
▪ Public Administration	941	2%
▪ Agriculture / Forestry	306	1%
TOTAL	36,981	100%

SOURCE: BAY AREA ECONOMICS, JUNE 2006

AMBAG's forecasts estimate employment growth to 41,548 jobs in the year 2030 as summarized on Table 4.2-6 (AMBAG, June 2008a). According to AMBAG data, this represents an increase of about 7,722 jobs between the years 2010 and 2030, which reflects an annual average growth rate of approximately 1.1%.

Table 4.2-6
Employment Projections for City of Santa Cruz

Year	Employment
2005	34,016
2010	33,826
2015	35,527
2020	37,411
2025	39,423
2030	41,548

Source: AMBAG, 2008a

Review of AMBAG data by City staff indicates that 45% of the new jobs created by the year 2030 will be in the service section, 27% in the public section, 12% in the retail sector, and 11% in the industrial section (City of Santa Cruz, November 2008). The remaining 5% of new jobs will be construction and agriculture related (Ibid.). Based on the AMBAG forecasts, in 2030, the City will have a ratio of approximately 1.6 jobs per housing unit. The existing ratio for 2010 is approximately 1.4 based on AMBAG forecasts. This projection follows the historic trend that the City provides more jobs than housing; more housing would be required to accommodate all of the Santa Cruz workers within city limits (Ibid.).

UCSC POPULATION AND HOUSING

The University of California Santa Cruz campus is partially located within the City of Santa Cruz and partially located in the unincorporated portion of the County. All of the developed campus is currently within City limits, except for a small portion of College 9/10 and the Crown Merrill Apartments. As such, campus population is included within City population counts and forecasts. For this reason, background on UCSC population and housing is provided separately.

In 2008-2009[2], UC Santa Cruz main campus three-quarter average enrollment[3] totaled 15,823 full-time equivalent (FTE) on-campus students (University of California Santa Cruz, October 14, 2008). Student population has grown at a faster rate than the City's overall population over the last 15 years. Student enrollment increased from approximately 9,750 students in 1994/1995 to 15,823 students in 2008/09. This represents an average annual growth rate of 4.5% compared to about 1.1% for the City during the same time period.

In 2007-08, UCSC supported a total on-campus residential population of 7,779 people in campus housing units, including students, faculty and dependents (University of Santa Cruz, California, July 2009). Approximately 380 students live in a small portion of UCSC's Colleges 9/10 and the Crown Merrill Apartment complex that are located within the unincorporated area of Santa Cruz County. Thus, approximately 7,400 residents live on-campus within City limits. Approximately 6,925 additional students, staff and faculty are estimated to reside in the City of Santa Cruz based on residency information provided in the University's 2005 Long-Range Development Plan EIR (Ibid.).[4] Therefore, it is estimated that approximately 14,325 UCSC-related people reside within the City, both on- and off-campus. This total is slightly higher than UCSC population forecasts of 12,100 for 2005 that were estimated in the City's existing 1990-2005 General Plan and Local Coastal Program. UCSC-related population (student, faculty, and staff households, excluding dependents) represents approximately 24% of the City's total population.

The University's adopted 2005 Long Range Development Plan (LRDP) forecast a student population of 19,500 in the year 2020. (See review of the 2005 LRDP in the "Cumulative Impacts" subsection (5.4) of the CEQA CONSIDERATIONS [Chapter 5.0] section of this EIR.) New on-campus residential population related to UCSC development and growth under the 2005 LRDP is estimated at approximately 3,340 new residents (including students, employees and dependents), who would be living on the UCSC campus by the year 2020 (City of Santa Cruz, July 2010). Of this amount, at least approximately 1,570 residents would be living in the Main Campus area within City limits. The remaining 1,770 residents may be expected to reside in the

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[2] California CEQA Guidelines section 15125(a) requires that existing environmental conditions be described as they exist at the time the Notice of Preparation (NOP) is published. The NOP for this EIR was published in March 2009. Thus, campus population and employment figures for the 2008-09 academic school year are used for this discussion.

[3] Enrollment at UC Santa Cruz varies each quarter. The Campus uses an average of the student enrollment levels in the three primary quarters (fall, winter and spring) to track changes in enrollment from one year to another. That average is referred to as the three-quarter average enrollment.

[4] 7,990 students live off-campus, of which approximately 5,325 live in the City of Santa Cruz (excluding dependents); 3,155 faculty/staff live off-campus, of which approximately 1,600 live in the City (excluding dependents) (University of California, July 2009).

North Campus area, which is currently outside City limits.[5] With both on- and off-campus projections, approximately 3,010 to 3,800 additional UCSC-related population are estimated to live in the City of Santa Cruz by 2020 with approximately 1,570 persons living within the City limits on campus (City of Santa Cruz, July 2010).

The AMBAG population forecasts include enrollment growth as envisioned by the 2005 LRDP. UCSC-related population represents approximately 44-55% of the City's population increase forecast by AMBAG between 2009 and 2030. The higher level assumes that all new employees would move to the area.

4.2.2 RELEVANT PROJECT ELEMENTS

The proposed *General Plan 2030* includes goals, policies and actions that address economic development. The proposed General Plan does not include goals or policies that address population or housing. Housing is addressed separately in the City's Housing Element. However, the draft General Plan does include a few policies and actions that support mixed use districts and/or intensified redevelopment, including residential development. Other policies and actions support residential densities to be exceeded for the following uses: single-room occupancy (SRO) units; small ownership units (SOU); accessory dwelling units (ADU); density bonus units; and residential uses within areas designated High-Density Overlay District (HD-O) (LU3.8). The plan also encourages a variety of housing types (LU3.1.1) and seeks to improve and protect housing and neighborhoods (CD2.4, LU3.9.2).

The draft *General Plan 2030* includes an ECONOMIC DEVELOPMENT chapter that sets forth six goals and associated policies and actions that address economic growth and development within the City. Some policies and actions seek to create a land use mix within the City that balances economic, housing, and other needs (LU3.1.3) and to improve the region's jobs/housing balance (LU3.1.3).[6]

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or intensified redevelopment.

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[5] Concurrent applications filed by the City of Santa Cruz and the UCSC are pending before the Santa Cruz County Local Agency Formation Commission (LAFCO) to amend the City's Sphere of Influence (City application) to include the 374-acre portion of the UCSC campus known as "North Campus" for the purpose of providing extraterritorial water and sewer services (UCSC application). The City has no plans, nor does it see any future need, to annex North Campus into City limits.

[6] The draft General Plan 2030 defines "jobs/housing balance or jobs/housing ratio as the availability of affordable housing for employees. The jobs/housing ratio divides the number of jobs in an area by the number of employed residents. A ratio of 1.0 indicates a balance. A ratio greater than 1.0 indicates a net in-commute; less than 1.0 indicates a net out-commute.

4.2.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

2a Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);

2b Result in removal of housing and/or displacement of residents.

IMPACT ANALYSIS

The following impact analyses address population growth inducement (2a) and potential removal of housing or displacement of residents (2b).

Potential Future Development & Buildout

The proposed General Plan would accommodate future development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030.[7] The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents (based on 2.4 persons per household). It is estimated that approximately 75% of the new residential units would be multi-family units and 25% would be single-family units based on existing trends and assumptions developed for the traffic and water demand analyses.

The buildout projections also estimate approximately 3,140,000 additional square feet of commercial, office and industrial uses by the year 2030. Based on the non-residential uses, it is estimated that approximately 8,665new jobs could be generated. This is based on an estimated 2.0 employees per 1,000 square feet of commercial and retail; 2.3 employees per 1,000 square feet for industrial space, and 3.3 employees per 1,000 square feet of office space, which results in approximately 4,460 commercial and industrial jobs and approximately 4,205 office jobs.

[7] The projections are based on the draft Land Use Map, taking into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels, assuming that not all development will occur at maximum density. On average it is assumed that all new development will occur at 80% of the permitted residential density or floor area ratio. See Appendix B for further discussion.

Based on buildout projections developed for the General Plan[8], the increased jobs compared to the potential increase in housing units would result in a ratio of 1.6, meaning there would be 1.6 jobs per residential unit. This is based on the AMBAG's job total for 2010, the city's existing number of housing units in 2009, and the potential increased employees and housing units estimated for the General Plan buildout as outlined above. Existing jobs would increase to 42,561 with the General Plan increased non-residential development, and the City's residential units would total 26,880 units in 2030. This is the same as the 1.6 ratio that is reflected by AMBAG in its population, housing and employment forecasts. However, it is slightly higher than the 1.4 ratio that has been estimated as currently existing in the City.

Impact 4.2-1 Population Growth Inducement
Adoption and implementation of the *General Plan 2030* could indirectly result in increased population associated with potential development that could be accommodated by the Plan. However, the estimated amount and rate of growth are consistent with historic population growth patterns and trends, and would not be considered substantial. Thus, this is considered a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population. However, the draft General Plan includes policies and a land use map that support additional development and areas of increased intensification and density, thereby removing some barriers to future development consistent with the updated General Plan. Based on estimates provided by the City's land use consultant as described in the LAND USE (Chapter 4.1) section of this EIR and in Appendix B, potential residential development that could be accommodated in the draft *General Plan 2030* could result in a population increase of approximately 8,040 residents between 2009 and 2030 based on a buildout estimate of 3,350 new residential units during this timeframe and an average household size of 2.4.

The estimated increase in population would result in a total City population of 67,022 in the year 2030 over 2009 population levels. This population is slightly higher (about 1,140 residents) than the AMBAG forecast of 65,884 residents in the year 2030. AMBAG projections would result in a population increase of 6,902 persons between 2009 and 2030 compared to a potential increase of 8,040 persons as a result of anticipated buildout to that year under the draft *General Plan 2030*.

The General Plan buildout projections represent a worst-case estimate. However, the estimated population growth resulting from the estimated *General Plan 2030* buildout represents an average annual growth rate of 0.65% between 2009 and 2030. This is slightly lower than historical growth rates of approximately 0.9-1.0% experienced in the City since 1990 as summarized on Table 4.2-4. Thus, while the actual population increase is slightly larger than

[8] The projections are based on the draft Land Use Map that take into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and assume that not all development will occur at maximum density; on the average it is assumed that all new development will occur at 80% of the permitted residential density or floor area ratio.

what is forecast by AMBAG, the average annual growth rate is lower than historical growth rates, and as such, the increase in population would not be considered substantial.

The regional population projections prepared by AMBAG are routinely updated to reflect population trends. Between 1990 and 2005, AMBAG projections were a bit higher than actual growth. As shown on Table 4.2-7, former regional population forecasts resulted in an average annual growth of a little more than 1% per year between 1995 and 2005. The actual average annual growth rates between 1995 and 2009 within the City have been approximately 0.9% (see Table 4.2-4), which is generally similar to the former AMBAG projections used in the City's 1990 General Plan/LCP update. AMBAG projections (adopted in 2008) also reflect a similar, but slightly lower average annual growth rate of 0.8% for the years 2000-2010, and an average annual growth rate of approximately 0.56% for the years 2010-2030. The variation and fluctuation of annual growth rates based on actual growth is shown on Table 4.2-4, and Table 4.2-7 summarizes the variation of average annual growth rates bases on adopted regional population forecasts over the last 15 years.

TABLE 4.2-7
Comparison of Population Forecasts' Growth Rates

Year	Population Estimate	For Years:	Forecast Average Annual Growth Rate
1995 [1]	54,270	1990-1995	1.8%
2000 [1]	57,170	1990-2000	1.5%
		1995-2000	1.1%
2005 [1]	59,670	1990-2005	1.34%
		1995-2005	1.0%
		2000-2005	0.87%
2010 [1]	60,841	2000-2010	0.64%
2015 [1]	62,221	2005-2015	0.43%
2005 [2]	56,421	1990-2005	0.9%
2010 [2]	58,919	2000-2010	0.8%
2015 [2]	62,480	2005-2015	1.1%
2020 [2]	63,265	2010-2020	0.74%
2025 [2]	64,649	2015-2025	0.35%
2030 [2]	65,884	2020-2030	0.41%
		2010-2030	0.6%

[1] AMBAG Estimates provided in City's 1990 General Plan/LCP.
[2] AMBAG 2008 Estimates through Year 2035.

Conclusion. The estimated General Plan buildout would result in a average annual population growth rate of 0.6%, which is slightly less than the historical rate experienced in the City since 1980 (0.9%), but only slightly higher than the AMBAG forecast rate (0.56%). These variations are not considered substantial, and the population increases supported by the proposed *General Plan 2030* would not be considered substantial. AMBAG projections are subject to updates every several years

at which time projected and actual growth can be compared, and forecasts adjusted if needed to reflect actual population growth trends. Therefore, the impact is considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.2-3 Removal of Housing and/or Displacement of People

Adoption and implementation of the proposed *General Plan 2030* could indirectly result removal of existing housing and/or displacement of residents due to redevelopment of underutilized parcels. As most mixed-use and redevelopment areas include predominantly non-residential structures, and with adherence to City regulations and *Housing Element* policies, this is considered a *less-than-significant* impact.

Future development, either on underutilized properties or as part of new mixed-use developments, may be constructed on properties with existing development. Future development accommodated under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[9] approximately 55% of all new housing, 45% of new commercial development and 52% of new office development would be located along these corridors. The existing land uses in these areas are primarily non-residential.

The proposed *General Plan 2030* calls for applying the Neighborhood Conservation Overlay District when necessary to preserve and maintain the area's housing stock (LU3.9.2). In the event that existing residential units are found on a site proposed for redevelopment, these units are typically rented and would be vacated in accordance with state and local law prior to demolition to avoid displacement of people. Additionally, the redeveloped site would be expected to result in a net increase in housing units. Furthermore, the City requires developers to replace affordable housing proposed for demolition or conversion to other uses. The basic requirements are as follows: 50% to 100% of low or moderate-income bedrooms lost must be replaced (depending on the zoning district), those displaced must receive relocation assistance, and the developer must also meet the City's 15% inclusionary requirement. As an alternative to replacement housing, a developer can pay in-lieu fees for up to 50% of the total eligible bedrooms lost. These requirements have helped preserve affordable housing from recycling to market-rate projects. However, the ordinance has had the unintended impact of making it financially difficult to demolish and replace substandard housing that contributes to neighborhood decline without significant public subsidies (City of Santa Cruz Housing Element,

[9] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

2011[10]). The City's current *Housing Element* includes a Housing Plan with Program 5.5-Housing Replacement. The first year objective is "to modify demolition/replacement ordinance to allow for the replacement of substandard housing which otherwise would lead to neighborhood decline."

Conclusion. Future development that would be accommodated by the proposed *General Plan 2030* would primarily occur on vacant infill sites, or on underutilized properties in areas where non-residential land uses are predominant, mostly along the City's major transportation corridors. In the event that existing residential units are found on a site proposed for development, these units likely would be vacated prior to demolition in accordance with state and local law to avoid displacement of people, and they are required to be replaced if the existing units are affordable units. Additionally, the redeveloped site would be expected to result in a net increase in housing units. Therefore, potential indirect impacts related to displacement of people and removal of housing due to development accommodated by the draft Plan would be less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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4.3.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Existing Visual Setting
- Natural and Open Space Features
- Scenic Views and Resources
- Community Aesthetic Character
- Existing Design Guidelines

The following sections draw from information contained in the "Community Design Background Report" that was prepared for the City as part of the draft *General Plan 2030* update process by Design, Community and Environment (November 16, 2006).

REGULATORY SETTING

Several City area and design plans include design guidelines, which are described later in this chapter. In addition, the City's Zoning Ordinance requires a "design permit" for most new construction in the City of Santa Cruz. This requires review of architectural and site development proposals to ensure the application of recognized principles of design, planning and aesthetics and qualities typifying the Santa Cruz community. Pursuant to the Design Permit requirements (Zoning Ordinance Section 24.08.430), findings must be made that address 17 identified criteria before the City issues a design permit. Chapter 24.12 of the Zoning Ordinance provides "Community Design Standards" that address general site design standards, parking, advertising and signs, underground utilities, historic preservation and other provisions for specific uses.

EXISTING VISUAL SETTING

The visual character of the City of Santa Cruz is influenced by a blend of natural features and historic neighborhoods. Key natural and open space features include the coastline and beaches, the San Lorenzo River and other watercourses, parks and open space, and the background view of the Santa Cruz Mountains. The community of Santa Cruz is strongly characterized by its coastal location along Monterey Bay, which defines the city's entire southern boundary. Open space areas, including those that make up the City's greenbelt, also are significant contributors to Santa Cruz's natural setting. The Santa Cruz Mountains and its foothills on the north provide a backdrop of open space views, and offer panoramic views of the City and ocean.

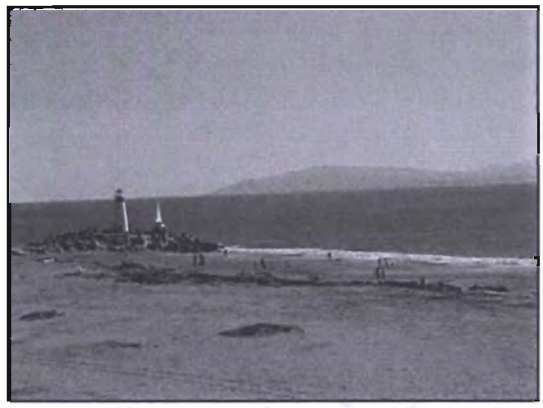
The developed portion of Santa Cruz is a mix of historic buildings and newer buildings. From its early origins as a Spanish settlement in 1866, Santa Cruz's community and visual character was shaped by its role as a port city and seaside resort. The City has retained a distinctive look and feel, with a mix of small-scale residential neighborhoods, a more intensely-developed downtown with high-quality, distinctive buildings, and automobile-oriented commercial corridors.

NATURAL AND OPEN SPACE FEATURES

The beauty of Santa Cruz's natural setting contributes significantly to the City's aesthetic and visual character. Key natural and open space features include:

- The coastline and beaches;
- The San Lorenzo River and other creeks;
- The Santa Cruz Mountains; and
- Open space lands that make up the City's greenbelt.

Santa Cruz has nearly four miles of coastline on the Monterey Bay, and much of the city sits above coastal cliffs, with beaches and a rocky shoreline below. A multi-use pathway extends along most of this distance along West Cliff Drive and portions of East Cliff Drive. City and state-owned beaches are prominent along the coastline, including from west to east: Natural Bridges State Beach, Lighthouse Field State Beach, the city's Main Beach, and Seabright Beach. Lighthouse Field State Beach also includes upland open space adjacent to West Cliff Drive, known as Lighthouse Field.



The San Lorenzo River is another important defining feature, serving as the dividing line between the City's Eastside and Westside areas. Most of the City's other creeks are not prominently visible, except for Branciforte Creek, which runs in a deep, narrow concrete channel (Design, Community & Environment, November 16, 2006).

The foothills of the Santa Cruz Mountains provide a backdrop of protected open space and afford panoramic views of the City and Monterey Bay. Santa Cruz's topography is influenced by the City's arroyos and steep coastal cliffs. Elevations increase from the coastal terraces north to the UCSC campus and Santa Cruz Mountains, and the City's varied topography creates striking views from many different locations. The City also has pronounced hills, most notably at Pogonip with smaller hills, such as Beach Hill and Mission Hill. Escalona Drive also marks a noticeable change in elevation, with steep hills to the north of the street.

The City's largest open spaces are those that make up its greenbelt, and generally include from west to east: Moore Creek Preserve, Pogonip, Delaveaga Park, and Arana Gulch (see Figure 1-2). Smaller neighborhood parks are distributed throughout the City. Additional open space

surrounds some of the creeks and ravines that cut through the foothills on their way to the coast. Prominent open space areas within the City that contribute to the visual character include:

- *University of California Santa Cruz*. The large expanses of open space provide a backdrop from certain viewpoints within the City, along the coastline, and from Highway 1. These views include some campus structural development.

- *Pogonip*. This hilly and wooded 614-acre area abuts UCSC, and forms part of the City's greenbelt. It also provides a visual backdrop from certain viewpoints in the City.

- *Moore Creek Preserve*. This 246-acre City-owned property forms part of the City's Greenbelt, defining Santa Cruz's western edge. The area has been preserved largely in its natural state, with wooded areas and creeks that run through steeply-sloped arroyos.

- *Arana Gulch*. Located in the far eastern edge of the City, this 67-acre, City-owned open space property, along with the adjacent Santa Cruz Small Craft Harbor, defines the City's southeastern border. However, Arana Gulch's visual prominence is limited to the immediately adjacent neighborhoods and the upper harbor area.

- *DeLaveaga Park*. This hilly and wooded City-owned park is on the northeast edge of Santa Cruz. The approximate 525-acre upper area provides a nearly uninterrupted forested backdrop from viewpoints on the eastern edge of the City, most notably from Morrissey Boulevard.

- *Neary Lagoon* is a City-owned 44-acre wetland and natural area situated in the central part of the City (see Figure 4.3-1). The 14-acre lagoon is adjacent to the City's wastewater treatment plant. The site provides a central open space area nearly within the center of the developed City, and views across the property. The wooded property is visible along Bay Street with panoramic background mountain and City views.

- *Santa Cruz Small Craft Harbor*. The Santa Cruz Small Craft Harbor, which was completed in 1964 and subsequently expanded in 1972, is a defining visual element along the City's southeastern border. The harbor, a major topographic and visitor-serving facility, encompasses approximately 38 acres of land and 52 acres of water, and functions as a gateway to the Monterey Bay National Marine Sanctuary.

SCENIC VIEWS AND RESOURCES

Prominent scenic views mostly are those that are oriented toward Monterey Bay and the Pacific Ocean or toward the Santa Cruz Mountains that frame the northern boundary of Santa Cruz. Some prominent public views are shown on the next page. There are no designated scenic highways or roads within the City. The draft *General Plan 2030* defines a scenic highway or scenic route as "a highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and man- made scenic resources and access or direct views to areas or scenes of exceptional beauty or historic or cultural interest." Until the mid-1980s, general plans in California were required to include a Scenic Highways element.

West Cliff Drive is a popular scenic route along the coast, and is a primary location that offers prominent and panoramic views of the Monterey Bay. In addition to West Cliff Drive, other coastal viewpoints with prominent ocean views include: the Municipal Wharf, East Cliff Drive and the Santa Cruz Harbor jetties. Prominent public ocean views from upper elevations are most predominant at locations on the UCSC campus, Moore Creek Preserve and segments of City roads, including the Arroyo Seco and Miramar/Alta Vista areas in the western portion of the City and limited areas along Delaveaga Road.

Varied topography shapes the City's character and creates many striking public views throughout the community. Some of these views are focused on particular places within the City, such as Holy Cross Church. Other views provide a sweeping panorama of the entire City or of the Monterey Bay. The UCSC campus and greenbelt lands at the City's northern edge and the Santa Cruz Mountains to the east provide a scenic backdrop from certain viewpoints in the City, most notably from the Municipal Wharf and segments along West Cliff Drive. The Wharf and West Cliff Drive offer panoramic views of the bay with the Santa Cruz Mountains as a backdrop overlooking the City. The northbound descent of East Cliff Drive towards downtown offers a sweeping view of the San Lorenzo River, Boardwalk area and the developed City with UCSC as a backdrop. From eastbound Highway 1 toward Highway 17, the forested UCSC campus offers another scenic background view, while segments of southbound Highway 1 near River Street (Highway 9) offer scenic background views of the forested open space of Pogonip.

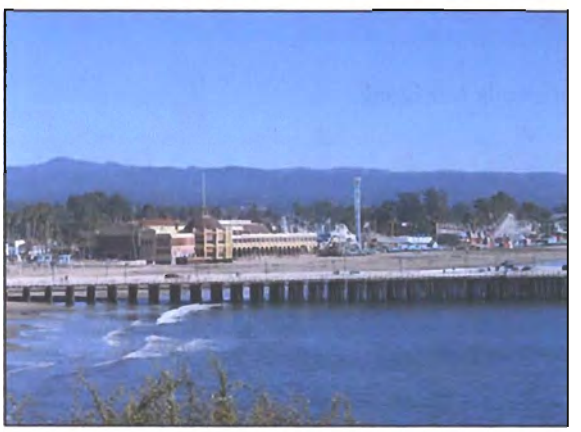
On the eastside, northbound Morrissey looks onto background views of the urban forest at DeLaveaga and surrounding area. Murray Street Bridge over the Santa Cruz Harbor offers views of the coast to the south and upland views of Arana Gulch to the north. Additionally, there are views of the Arana greenbelt site from Seventh Avenue, most notably from the intersection with Brommer Street at the northern entrance to the Harbor.

Landmarks are distinctive built and natural features that are highly visible or that help to define the identity of a particular place. In addition, to historical landmarks as discussed in the CULTURAL RESOURCES (Chapter 4.9) section of this EIR, the *General Plan 2030* defines "landmark" as a visually prominent or outstanding structure or natural feature that functions as a point of orientation or identification. The City has approximately 35 City-listed historic landmarks and approximately 600 listed historic structures, some of which may also be considered scenic resources depending on the visual prominence and the character of the building.

Because of the City's varied topography, Santa Cruz has few built landmarks that are visible from many different parts of town. The Holy Cross Church on Mission Hill is a notable exception; its tall, white steeple can be seen all over the City, even in low-lying areas such as the Harvey West District. The Santa Cruz Beach Boardwalk's brightly-painted roller coasters are even more distinctive, but since the Boardwalk is just a few feet above sea level, the roller coasters are not as widely visible. Other notable landmarks include the Santa Cruz Harbor, and the lighthouses at both Lighthouse Field and the Harbor.













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Because of the City's varied topography, Santa Cruz has few built landmarks that are visible from many different parts of town. The Holy Cross Church on Mission Hill is a notable exception; its tall, white steeple can be seen all over the City, even in low-lying areas such as the Harvey West District. The Santa Cruz Beach Boardwalk's brightly-painted roller coasters are even more distinctive, but since the Boardwalk is just a few feet above sea level, the roller coasters are not as widely visible. Other notable landmarks include the Santa Cruz Harbor, and the lighthouses at both Lighthouse Field and the Harbor.

COMMUNITY AESTHETIC CHARACTER

The City has retained a distinctive community character as a result of various historical periods, with a mix of small-scale residential neighborhoods of varied scales, styles and ages; widely-visited beaches; a more intensely-developed downtown with high-quality, distinctive buildings; and automobile-oriented commercial corridors, many of which provide connections to the highway (Design, Community & Environment, November 16, 2006).

Gateways are visual or physical elements that mark a transition from one place to another. Some of Santa Cruz's gateways are located at transitions between highways and City streets. For example, on both River Street and Ocean Street, special signs welcome visitors to the City as they leave the highway. Other gateways are created by pronounced changes in character from one area to another. For example, the Clock Tower acts as a gateway from North Pacific Avenue, which has relatively little character, to Pacific Avenue, which has a carefully designed streetscape and tall, distinctive buildings. The main entrance to the UCSC campus, at High Street and Bay Drive, is another notable gateway. On the Eastside, the entrance to Santa Cruz on Soquel Avenue is marked by a small sign that acts as a minor gateway. Gateways can also mark the entrance to a neighborhood, such as the sign at Riverside Avenue and Leibrandt Avenue welcoming people to Beach Flats (Design, Community & Environment, November 16, 2006).

Generally, the visual features of the developed City vary from area and neighborhood. Mixed use areas include the Westside industrial area, the Harvey West area, downtown and River Street, and the Beach/Boardwalk area. Four primary corridors contribute to the urban form and character of Santa Cruz: Mission Street Corridor, Ocean Street Corridor, Water Street Corridor, and Soquel Avenue Corridor. Mixed commercial and residential buildings are found in some of these areas, as well as in the downtown, where ground-floor retail and upper floor residential are the primary uses. There are also several SRO (single-room occupancy) buildings along Soquel Avenue and Water Street.

Neighborhoods are primarily residential areas that include few, if any, commercial or job-generating uses. A number of neighborhoods within the City are characterized by older, smaller

bungalow and historic structures, which contribute positively to the visual character in those areas. Neighborhoods are shown on Figure 2-3. Historic homes and older neighborhoods with visual interest include the following neighborhoods.

- *King Street Neighborhood.* The King Street neighborhood runs parallel to Mission Street to the north. The area's topography rises slowly and steadily toward Escalona Drive to the northwest.

- *California Street / Mission Hill Neighborhood.* The California Street/Mission Hill Neighborhood includes Mission Hill, Santa Cruz Mission and the current site of Holy Cross Church. While most parts of this area are relatively flat, Mission Hill is a prominent exception; its steep slopes set it apart from its surroundings. The Mission Hill Historic District is in this area. Holy Cross Church, with its tall steeple, white exterior and prominent hilltop location, is the most widely-visible landmark in Santa Cruz.

- *Downtown Neighborhoods.* The Downtown Neighborhoods include Downtown Santa Cruz's historic residential areas as well as more recently-built neighborhoods just west of Downtown. The City's Downtown Neighborhood Historic District is also part of a larger historic district designated in the National Register of Historic Places.

- *Beach Hill.* Beach Hill's buildings are a mixture of Victorian single-family homes and Mission Revival apartments, as well as an eclectic mix of more modern styles.

- *Seabright Neighborhood.* Most of the upper Seabright neighborhood was part of the town of Seabright until 1904, when Santa Cruz annexed the area. Buildings are a mixture of pre-WWII single-family, one- and two-story homes; post-WWII duplexes and multi-family dwellings; and newer, larger single-family homes. Structures built as summer homes are predominant in the lower Seabright neighborhoods. Notable features of these neighborhoods include the Santa Cruz City Museum, located in a 1915 Carnegie Library building, and the surrounding lawns and trees of Tyrrell Park.

Other areas of the City are mostly characterized by post-World War II ranch houses built on parcels that are generally larger than those in the City's older neighborhoods and newer development. The Lighthouse/The Circles Neighborhoods in the southernmost part of Santa Cruz are notable due to their proximity to West Cliff Drive and beaches. Paths and stairways link these neighborhoods with the beaches along West Cliff Drive. Notable buildings in these neighborhoods include a 1915 Carnegie public library in the Circles, designed by architect William Weeks, and the Shrine of St. Joseph on West Cliff Drive.

EXISTING DESIGN GUIDELINES

Mission Street Urban Design Plan

The Mission Street Urban Design Plan identifies redevelopment opportunities and creates design policies for the Mission Street commercial corridor, which is both a local street and a major

regional thoroughfare. Although most of the Plan's requirements are focused on issues related to community design, it recommends that the corridor retain its commercial mixed-use character and emphasize existing clusters of professional office, retail and service uses.

Beach / South of Laurel Design Guidelines

The "Design Guidelines", adopted by the City in October 1998, is both an appendix to the Beach/South of Laurel Area Plan (B/SOL Plan) and General Plan. The Plan includes a wide range of recommendations that are intended to define neighborhood character through distinctive structures and streetscapes (Design, Community & Environment, November 2006). The intent of the Design Guidelines is to assist the City and development community to achieve a "high quality of aesthetic and functional design." Design guidelines are presented for treatments for streetscapes and entries, landscaping, amenities and lighting, as well as for site layout, pedestrian, parking and circulation improvements, and architectural compatibility.

Downtown Recovery Plan

The Downtown Recovery Plan provides a framework for the public and private rebuilding of downtown Santa Cruz after the 1989 Loma Prieta earthquake. Recommendations are included to strengthen the pedestrian orientation of the area. Detailed design guidelines are included that address height, building mass and scale, materials and finishes, signage, awnings and lighting (Design, Community & Environment, November 2006).

Eastside Business Area Improvement Plan

The purpose of the Eastside Business Improvement Plan, which includes the Soquel Avenue and Water Street commercial corridors, is to bring beneficial change to the area through economic development and the creation of a distinctive physical environment. The plan includes urban design and architectural design guidelines. The urban design guidelines include development, street and landscaping guidelines for specific areas along Soquel Avenue and Water Street. The architectural guidelines provide additional recommendations for building facades and signage.

San Lorenzo Urban River Plan

The plan serves as a guide for restoring and managing natural resources, riverfront development, and public access improvements for the lower San Lorenzo River, Jessie Street Marsh, and Branciforte Creek. It includes conceptual ideas to promote river-oriented development, site specific recommendations for public areas along the river, and restoration recommendations. In particular, the Plan recommends a series of gateway plazas leading to improved multi-use nature trails and pedestrian bridges crossing the river. The Plan includes conceptual site plans for new development at several key locations near the river, but does not provide detailed design guidelines for private development.

Western Drive Master Plan

The Western Drive Master Plan, prepared in 1979, includes lands along Western Drive, generally between Arroyo Seco Creek on the east and Moore Creek on the west from Highway 1 to High Street. The Plan seeks to improve the Western Drive right-of-way; retain the rural character of the area, protect Moore Creek and Arroyo Seco Canyons; and provide public access to them. The Plan was adopted in concept. The Plan seeks to protect identified view corridors and the wooded character of the area, and establishes road, access, land use, design, landscaping and drainage recommendations for both publicly- and privately-owned lands to achieve these objectives.

4.2.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address community design, scenic views, and aesthetics. The COMMUNITY DESIGN chapter of the *General Plan 2030* addresses natural features, the built environment and linkages between the two, including neighborhood integrity. The chapter includes five goals and associated policies and actions that address: 1) preservation of natural features that visually define areas with a built environment in harmony with its natural setting; 2) diverse neighborhoods and business districts with well-defined character; 3) design and linkages between key areas; 4) attractive gateways, roadways and landscaping; and 5) walkable neighborhoods and districts with compatible uses and buildings.

The COMMUNITY DESIGN chapter sets forth the following four goals with 19 associated policies and accompanying actions that address scenic views, scenic resources, and visual qualities of the built environment. Goal CD5 seeks to achieve walkable neighborhoods and districts of compatible uses and buildings with associated policies and actions that mostly address providing pedestrian facilities and amenities, and achieving a pedestrian scale with new development.

GOAL CD1	*A built environmental in harmony with its natural setting.*
GOAL CD2	*Diverse neighborhoods and business districts with well-defined character.*
GOAL CD3	*High quality design that reinforces the community's unique characters.*
GOAL CD4	*Attractive gateways, roadways, and landscaping.*

Taken together, these policies and actions support preservation of natural features that visually define areas within the City (CD1.1), development that preserves important public scenic views and vistas (CD1.2) and sensitive design in accordance with natural features and open space (CD1.3, CD1.4). Specific policies and actions identify preparation of design guidelines, providing visual linkages throughout the City and providing attractive gateways and roadways. Additionally, some policies and actions in the LAND USE chapter seek to protect open spaces

that provide scenic be benefits (LU3.11) and prohibit land divisions that would degrade natural features (LU2.3.5).

Policy CD2.1 seeks to protect and enhance the "distinctive physical and design characteristics" of neighborhoods and districts throughout the City. CD2.1.3 and CD2.1.4 call for development of design guidelines and development standards to address the visual transition between areas of higher density and/or intensified development. A number of policies and actions also seek to ensure that development is sensitively designed in relation to open space and scenic resources, as well as existing development. In particular, LU4.1.2 seeks to ensure that intensified development is sensitive to existing neighborhoods.

POTENTIAL FUTURE DEVELOPMENT

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, some policies and actions also support other mixed use districts and/or intensified redevelopment, such as a Mixed Use River District (LU3.6), expansion of the High Density Overlay on Front and lower Pacific (LU3.6.1), continued mixed uses in the downtown area LU4.1.1) and support of live-work units (LU4.1.4). Higher and maximum density residential development is encouraged (LU3.7) with allowance of maximum densities to be exceeded for specified residential uses, such as single-room occupancy and accessory dwelling units (LU3.8). Revitalization of the lower Pacific Avenue area also is encouraged (ED5.5.7)

Land Use actions LU1.1.4 and LU1.1.5 address development and land use for specific sites: the Swenson property and the Golf Club Drive property, respectively. LU2.2.3 also includes addition of a 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center, but specific uses haven't been identified, although the site will not be used as part of expansion of the landfill disposal area. In addition, several specific types of development are supported in the draft Plan, including: development of a desalination plant as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (Policy CC3.1.3), although a specific site is not identified; a transit center along the rail corridor (LU4.5); including a potential location in the Golf Club Drive area (LU1.1.5), a downtown performing arts center or expansion of the Civic Center (HA2.2.5); and multi-story parking lots (ED5.4.1).

4.2.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

3a Eliminate or substantially adversely affect, modify or obstruct a visually prominent or significant public scenic vista, viewing area or view corridor, including views of the ocean, to and along the shoreline, and panoramic background mountain views;

3b Eliminate or substantially adversely effect significant scenic resources along a scenic highway or designated scenic roadway, including, but not limited to, visually prominent trees, rock outcrops or historic buildings, or visually prominent trees or historic-landmark buildings in other locations within the City;

3c Substantially degrade the existing visual character or quality of the surrounding area, i.e., be incompatible with the scale or visual character of the surrounding area or substantially detract from the integrity, character and/or aesthetic character of the neighborhood; or

3d Create a new source of substantial light or glare that would adversely affect daytime or nighttime views or activities in the area or pose a nuisance. This includes ambient nighttime illumination levels that would be increased beyond the property line or use of highly reflective building materials.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address scenic views (3a); scenic resources (3b); potential degradation of visual character of areas surrounding development (3c); and creation of a new source of substantial light or glare (3d).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized in subsection 4.3.2 above. Buildout projections indicate that potential new development accommodated by the draft general plan to the year 2030 could total 3,350 residential units, 3,140,000 square feet of commercial, office and industrial development and new hotel rooms, primarily on infill and underutilized lots, as described in the PROJECT DESCRIPTION (Chapter 3.0) and LAND USE (Chapter 4.2) sections of this EIR.

Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[1] approximately 55% of all new housing, 45% of new commercial development and 52% of new office development would located along these corridors.

[1] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development in specific areas in the City.

Impact 4.3-1: Scenic Public Views
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could adversely affect scenic public views. However, such development would be limited to infill sites and with implementation of the proposed policies and actions for protection of scenic public views, this is considered a *less-than-significant impact.*

The proposed *General Plan 2030* would accommodate future development pursuant to planned land use designations contained in the Plan. Future development accommodated by the draft plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan, more than half of the estimated new development would be along major transportation corridors. These areas are within the City's existing developed area and are not part of prominent scenic views (see Figure 4.3-1), but are part of urban views along streets.

The City of Santa Cruz is primarily developed, except for a few remaining vacant lots located within developed areas. The following three areas that would be subject to potential future development within the planning area are primarily undeveloped or underdeveloped: the Swenson Site adjacent to Antonelli Pond; the Golf Club Drive area adjacent to Pogonip Creek; and the area along Seventh Avenue that is within the City's Sphere of Influence (SOI), but outside City limits. The Golf Club Drive site is not highly visible from surrounding areas and is not a part of any scenic public views.

The 11-acre Swenson site located adjacent to the east of the UCSC Marine Science Campus and Shaffer Road. Future development on this site would be partially within scenic views of the Monterey Bay as seen from the lower portions of the Moore Creek Preserve and Wilder Ranch State Park, although existing tree cover partially screens the property from these public views. Future development would not be expected to be of the height or mass that would obstruct or block ocean views from these vantage points. Nonetheless, proposed Action LU1.1.4 sets forth specific development guidelines/parameters for the Swenson parcel, which indicates the height, scale, and bulk of development shall take into consideration the rural transition at the City's edge. The small addition to the landfill property is not highly visible from Highway 1.

At the corner of Seventh Avenue and Brommer Street in the existing SOI area along Seventh Avenue, views of the Arana Gulch greenbelt and wooded areas, as well as distant UCSC lands, are a prominent public view. This area is currently within the unincorporated area of Santa Cruz County and subject to County land use and zoning regulations. Future development could partially block scenic views in this location. However, the entrance to the Harbor and adjacent Port District property on the north would continue to provide a view corridor in this area. The draft *General Plan 2030* calls for working with the County to ensure that lands within the City's planning area are developed with appropriate uses (LU1.2.2)

Most of the future development accommodated by the *General Plan 2030* would not be in areas that are part of a scenic public view. For limited areas where new infill or intensified development may be proposed in the vicinity of scenic public views, the proposed *General Plan*

2030 policies and actions outlined in Table 4.3-1 will serve to protect scenic public views. The proposed plan seeks to preserve natural features that visually define areas within the City (CD1.1), including public views to and along the ocean (CD1.1.2), as well as to protect natural areas (CD1.1.3) and emphasize distinguishing natural features that strengthen the City's visual image (CD1.1.4). The plan also seeks to ensure that the scale, bulk, and setbacks of new development preserve important public scenic views and vistas and is compatible with the character of the area (CD1.2, CD1.2.1). Property along Seventh Avenue is currently within the unincorporated County jurisdiction and would be subject to County policies and regulations for future development unless annexed to the City.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the Plan could result in adverse impacts to scenic public views. However, these impacts would be limited in geographic scope, as most of the anticipated new development would be infill development that would not be located within panoramic scenic public viewsheds. Implementation of polices and actions to protect scenic views and require sensitive building designs would serve to mitigate potential impacts to scenic views with potential future development of the Swenson site and properties along Seventh Avenue. Additionally, implementation of the proposed *General Plan 2030* goals, policies and actions regarding scenic views and development siting and design would avoid and minimize adverse impacts on scenic public views as summarized on Table 4.3-1. Thus, the proposed *General Plan 2030*'s indirect impact on scenic views would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.3-2: Scenic Resources
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could adversely impact scenic resources. However, with implementation of the proposed policies and actions for protection of scenic resources, this is considered a *less-than-significant impact.*

As indicated above in the Impact 4.3-1 discussion, most of the future development that would be accommodated by the *General Plan 2030* would be along the City's major transportation corridors or would be infill and intensified development on existing developed sites. There are no state-designated highways within City limits nor are there locally designated scenic roads. Thus, there would be no impacts to scenic resources along designated state or local roads.

In limited areas where new infill or intensified development may be proposed in the future, there may be significant trees or historic buildings or landmarks that may be considered scenic resources and potentially directly or indirectly affected by future development. However, the proposed *General Plan 2030* policies and actions would minimize these impacts and protect

scenic resources, particularly heritage trees and landmark buildings as summarized on Table 4.3-1.

TABLE 4.3-1
Proposed *General Plan 2030* Policies & Actions that Avoid or Reduce Aesthetics Impacts

Type of Measure / Action	Policies / Actions

PROTECT SCENIC VIEWS	• Protect Scenic Views
	  ◦ Protect views to and along ocean: CD1.1.2
	  ◦ Develop siting & scale design guidelines to preserve important public scenic views: CD1.2.1
	• Emphasize distinguishing natural features – visual image: CD1.1.4
	• Minimize grading on coastal terraces: CD1.1.1
	• Encourage UCSC to blend with natural landscape: CD1.3.1

PROTECT SCENIC RESOURCES	• Preserve natural features & open space that visually define areas and provide scenic benefits: CD1.1, LU3.11, CD1.1.3
	• Protect significant vegetation and landscaping that provide scenic value: CD 4.3.3
	• Maintain heritage tree ordinance & protect heritage trees: CD4.3.4, NRC5.1
	• San Lorenzo River – develop designs to relate to river & enhance prominence: CD1,5m CD1.5.1, 1.5.2
	• Physical & visual linkages in key area: CD 3.1
	• Preserve public views of City landmarks: CD3.2, 3.2.1, 3.2.2 & maintain visual prominence of landmarks from major roads and public viewpoints: CD4.1.5
	  • Protect, restore, rehab historic or architecturally significant buildings, sites (HA1.8, HA1.8.1, HA1.8.2, HA1.8.3)
	  • Identify/preserve landmarks: CD2.3.2, HA1.8.5
	• Prohibit land divisions that degrade natural features: LU2.3.5

AVOID-REDUCE SUBSTANTIAL DEGRADATION OF EXISTING VISUAL CHARACTER OF NEIGHBORHOODS	• Development Design
	  ◦ Design guidelines: CD1.2.1, CD1.2.2
	  ◦ Protect distinctive design characteristics & landmarks of neighborhoods: CD2.1, CD2.3
	  ◦ Design principles and new guidelines for transition between higher density mixed-use corridors and adjacent development: CD2.1.2, CD 2.1.3, 2.1.4
	  ◦ Design guidelines for landmarks: CD3.2.2
	  ◦ Superior design for buildings at visually significant locations-gateways and major corridor intersections: CD3.5 and landmarks: CD3.5.1
	  ◦ Pedestrian scale development, building orientation & amenities: CD3.3 (along transit corridors-assembly of small parcels), C5.2, CD5.2.1, CD5.2.4
	  ◦ Encourage innovate commercial & industrial designs: ED6.5.1
	  ◦ Development design to blend with natural topo/veg: CD1.3, CD1.3.2-3 (development on slopes)
	• Visual connection between development and open space: CD1.4, 1.4.1, 1.4.2
	(CONTINUED TO NEXT PAGE)

TABLE 4.3-1
Proposed *General Plan 2030* Policies & Actions that Avoid or Reduce Aesthetics Impacts

Type of Measure / Action	Policies / Actions

	• Specific Areas:
	  ◦ Ocean Street – new development to contribute positively to aesthetic character of Ocean Street: CD2.1.9, CD 4.4, CD4.4.1
	  ◦ Develop plans for Harvey West & Westside industrial areas to define appropriate character: CD2.18
	  ◦ Update the Seabright Area Plan to address historic development patterns and future infill and intensification impacts: CD2.1.6
	• Reuse "architecturally significant" buildings: CD4.16
	• Ensure compatible development within historic districts: HA1.9
	• Protect and enhance historic street patterns, rail lines, walls, and pedestrian walkways to emphasize historic routes and help define districts and neighborhoods: CD4.1.4
	• Improve neighborhood quality with housing rehab: CD2.4
	• Attractive gateways & visitor routes CD4.1, CD4.1.1, CD4.1.3, ED1.8.2
	• Development to enhance visual quality of streetscapes: CD4.2, 4.2.1, 4.2.2, 4.2.3, 4.3.4
	• Parking lot landscaping and lighting: M1.6.2
	• Attractive landscaping & street tree plans: CD4.3, CD4.CD3.1, CD4.3.2, CD4.3.5, CD4.3.6, CD4.3.7, CD4.3.8
	• Prepare/update area plans: CD 2.1, 2.1.1, 2.1.2, 2.1.5, 2.1.6, 2.3.1
	• Signage plans: CD2.3.1, CD2.4.1
	• Underground utilities: CD4.2.3, M3.29 (along streets)
	• Other features (sound walls, fences): CD4.2.4; reduce visual clutter of wires, antennas : CC11.3

AVOID INTRODUCTION OF SUBSTANTIAL NEW SOURCES OF LIGHT OR GLARE	• Develop Street Lighting Plan CD 3.6 • Lighting standards and guidelines: HZ5.1, HZ5.1.2

The draft Plan seeks to preserve natural features that visually define areas and provide scenic benefits (CD1.1), as well as to protect significant vegetation that provides scenic value (CD 4.3.3). Other policies and actions call for maintaining the City's heritage tree ordinance and protecting heritage trees (CD4.3.4, NRC5.1). Additionally, the Plan seeks to ensure that the scale, bulk and setbacks of new development will be designed to preserve public views of City landmarks, where possible (CD3.2), with maintenance of the visual prominence of landmarks from major roads and public viewpoints (CD4.1.5). The plan also supports development that relates to and enhances the prominence of the San Lorenzo River (CD1.5, CD1.5.1), as well as overall physical visual linkages in key areas such as between Downtown, the Beach Area and San Lorenzo River (CD3.1, CD3.1.1).

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan could result in adverse impacts to scenic resources. However, these areas are somewhat limited as most of the new development would be infill development that

would not be located within panoramic scenic views. Additionally, implementation of the proposed *General Plan 2030* goals, policies and actions would avoid and minimize adverse impacts on scenic resources as summarized on Table 4.3-1. Thus, the proposed *General Plan 2030*'s indirect impact on scenic resources would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.3-3: Degradation of Visual Quality of Surrounding Areas
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in intensified structural development in some areas that could result in substantial degradation of the visual quality of surrounding neighborhoods. However, with implementation of the proposed policies and actions for siting of development to be sensitive to existing uses in concert with street landscaping, this is considered a *less-than-significant impact.*

As indicated above in the Impact 4.3-1 discussion, future development accommodated by the draft Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development that could occur under the proposed plan, more than half of the estimated new development would be along major transportation corridors. The new mixed use designations would not substantially change potential development characteristics, as current commercial zoning regulations allow residential uses in addition to specific commercial uses in buildings up to three stories in height (35-40 feet). Under existing regulations, building heights also can be increased with a Planned Development Permit. Future development within proposed mixed-use designations could result in more massive structures than adjacent residential areas along all of the identified road corridors proposed for new mixed use designations. The proposed floor area ratio (FAR) for the mixed-use designations is intended to help limit building mass. However, a FAR of 2.75 is proposed along Ocean Street and Soquel Avenue, which could lead to development of buildings taller than three stories, although as indicated above, variations to building height can also be considered and granted under current Planned Development regulations. Other areas in the City with identified mixed use potential, such as the Downtown and River areas, already have mixed use buildings, especially in the Downtown area, and/or are not located directly adjacent to residential areas.

In areas where new mixed-use, infill or intensified development may be proposed in the future, new buildings may result in substantial degradation of the visual character of the surrounding area if new buildings are overly massive, substantially taller or out of scale with adjacent areas, especially residential areas next to mixed-use areas. However, the implementation of the proposed *General Plan 2030* policies and actions would ensure that new buildings do not

adversely impact the visual character of adjacent areas as summarized on Table 4.3-1. Policy CD2.1 seeks to protect and enhance the "distinctive physical and design characteristics" of neighborhoods and districts throughout the City. The plan calls for development of design guidelines to address the visual transition between areas of higher density and/or intensified development (i.e., along corridors, such as Water Street and Soquel Avenue) and adjacent existing developed neighborhood with less intense development (CD2.1.3). The plan also calls for including development standards as part of Zoning Ordinance amendments to establish mixed use districts to ensure that "siting, massing and scale of infill and intensified development are sensitive to existing neighborhood and business districts" (CD2.1.4). Policy LU4.1.2 requires that the Zoning Ordinance be amended to ensure that infill and intensified development is sensitive to existing neighborhoods. Building height could be addressed as part of the massing and scale considerations, but the policy would be more explicit if height were also added. "Attractive" commercial development (including more intensive and higher quality ground floor retail) is encouraged along commercial corridors, provided the uses are compatible with, or transition easily to, adjacent residential areas (ED5.3.1). Policy CD3.3 encourages the assembly of small parcels along transit corridors to achieve pedestrian-oriented development that is compatible with neighborhood characteristics.

The proposed *General Plan 2030* references several specific areas. Redevelopment of the light industrial properties on Murray Street in Seabright is encouraged, including more land intensive commercial and/or mixed use development, provided that the uses are compatible with existing residential (ED5.3.2). The proposed Plan also calls for an update of the Seabright Area Plan, which would address historic development patterns and future infill and intensification impacts (CD2.2.6). Additionally, the draft Plan also seeks to improve the aesthetic character along Ocean Street (CD2.1.9) and to implement appropriate designs in the Harvey West and Westside industrial areas (CD2.1.8).

The limited specific types of facilities that are supported in the draft General Plan would also be subject to these guidelines, including a new rail transit center, performing arts center and mutli-story parking lots. Potential aesthetic impacts associated with construction of a desalination plant are addressed in the WATER SUPPLY (Chapter 4.5) section of this EIR.

Numerous other policies and actions seek superior designs for buildings in visually sensitive areas (CD3.5), including landmark buildings (CD3.5.1), attractive gateways and landscaped streetscapes, and visual connections between development and open space. Policy CD1.4 seeks to ensure that development is sensitively designed in relation to open space and scenic resources, as well as existing development. Goal CD5 seeks walkable neighborhoods and districts of compatible uses and buildings, and some of its supporting policies and actions require pedestrian scale elements and amenities in the design of new development (CD5.2, CD5.2.2, CD5.2.4).

In addition to proposed *General Plan 2030* policies and actions, existing and proposed plans and design guidelines would continue to provide design guidance in specified areas, including the Beach and Downtown areas, and proposed guidelines along the River corridor and lower Pacific area. Furthermore, the City's Zoning Ordinance requires a "design permit" for most new construction in the City of Santa Cruz. This requires review of architectural and site development proposals to ensure the application of recognized principles of design, planning and aesthetics and qualities typifying the Santa Cruz community. Pursuant to the Design Permit requirements

(Zoning Ordinance Section 24.08.430), findings must be made that address 17 identified criteria before the City issues a design permit.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan could result in adverse impacts to the visual character of surrounding areas due to the introduction of mixed or intensified use structures that are more massive than, or out of scale with, adjacent residential neighborhoods. However, with implementation of the proposed *General Plan 2030* goals, policies and actions that require the development of design guidelines and development standards for transitional areas as summarized on Table 4.3-1, in combination with continued application of existing and proposed design guidelines for specified areas and design review as part of Design Permit approvals, this would be considered a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* action is recommended to strengthen standards developed for new mixed use districts.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

CD2.1.4 As part of the Zoning Ordinance amendment to establish mixed use districts, establish development standards to ensure that siting, massing, height, and scale of infill and intensified development are sensitive to existing neighborhood and business districts.

Impact 4.3-4: Introduction of Light and Glare
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could introduce new sources of light or glare. However, given the infill nature of future development, it is not expected that new sources of substantial light or glare would be introduced. Implementation of the proposed policies and actions for minimizing lighting impacts would further reduce potential effects. Thus, this is considered a *less-than-significant impact.*

As indicated above in the Impact 4.3-1 discussion, most of the future development that would be accommodated by the *General Plan 2030* would be along the City's major transportation corridors or would be infill and intensified development. Infill buildings would have standard window and exterior lighting treatments, but would not be expected to result in new sources of substantial light or glare as future development projects would largely replace or redevelop

existing urban uses. Exterior lighting would be included as part of future development, but would be typical of residential and commercial lighting, and would not result in nighttime illumination levels beyond the property line. The proposed *General Plan 2030* policies and actions serve to minimize light and glare. Policy CD3.6 calls for development of a Street Lighting Plan. Policy HZ5.1 calls for reduction in "light pollution", and calls for development of lighting design guidelines to reduced light being generated upward or on to adjacent properties (HZ5.1.2). Additionally, section 24.14.266 of the City's Municipal Code prohibits direct or sky-reflected glare, whether from floodlights or from other processes, such as combustion or welding, so as to be visible at the points of measurement specified in the regulations for different land use zones.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan could result in potential sources of light and glare. However, given the type of infill development that would be expected, "substantial" new sources of light and glare would not be expected. Additionally, implementation of the proposed *General Plan 2030* goals, policies and actions would serve to avoid and minimize adverse impacts related to new sources of light and glare as summarized on Table 4.3-1 as would the Design Permit review that is required for most larger development projects. Thus, the proposed *General Plan 2030*'s indirect impact related to the introduction of new sources of light and glare would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

REFERENCES

Design, Community & Environment. November 16, 2007. "Community Design Background Report."

4.4 TRANSPORTATION & TRAFFIC

4.4.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Summary of Transportation Modes & Use
- Transportation Plans & Studies
- Road Network & Traffic Conditions
- Bicycle & Pedestrian Circulation
- Public Transit
- Rail Service
- Planned Improvements
- Transportation Management
- Parking

This section was prepared with assistance from Ron Marquez, traffic consultant to the City of Santa Cruz Public Works Department, and Jeff Waller of Hatch Mott MacDonald (formerly Higgins and Associates), who ran the TRAFFIX model and developed Level of Service calculations under the direction of City staff and consultants. A summary of the traffic analysis methodology is included in Appendix C. Traffic volumes and intersection level of service calculations are included in Technical Appendices F-5 and F-6, respectively. The technical appendices are available for review at the City of Santa Cruz Planning Department[1] and are also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

REGULATORY SETTING

A number of local, regional and state agencies are involved with transportation planning and implementation of transportation programs and improvements within the City of Santa Cruz. The City maintains local roadways and bike and pedestrian facilities. The California Department of Transportation (Caltrans) has jurisdiction over State highway segments that traverse the City, including portions of Highways 1, 9, and 17. To help fund local roadway and intersection improvements, the City has developed a "Traffic Impact Fee" (TIF) that is applied to new development at the time of issuance of building permits (see discussion below in the "Planned Transportation Improvements" subsection for more details), and the City is active in acquiring transportation funding from federal and state sources.

[1] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

The City's Zoning Ordinance includes a trip reduction program requirement for specified classifications of employers (Chapter 10.46-Citywide Trip Reduction Program). Key purposes are: to establish programs and requirements for new and existing employers that will help to reduce traffic congestion and to improve air quality; to assist employers in identifying and utilizing cost-effective programs and methods to reduce vehicle trips made by employees; and to ensure the City plays a significant role in promoting alternatives to the use of single-occupant vehicles. The Zoning Ordinance also provides regulations regarding parking and parking space requirements for different land uses in Chapter 12 that include provisions for reduced parking for specified shared parking opportunities.

In addition to the City and Caltrans, other local and regional agencies responsible for transportation services and/or transportation planning include:

- *The Association of Monterey Bay Area Governments* (AMBAG) addresses transportation problems and concerns through its regional transportation system management element and preparation of regional traffic forecasts related to local land use and population projections. AMBAG is the federally designated Metropolitan Planning Organization (MPO) for transportation planning activities in the tri-county Monterey Bay Region. It is the lead agency responsible for developing and administering plans and programs to maintain eligibility and receive federal funds for the transportation systems in the region. AMBAG works with regional transportation planning agencies, transit providers, the Monterey Bay Unified Air Pollution Control District (MBUAPCD), state and federal governments, and organizations having interest in or responsibility for transportation planning and programming. AMBAG also coordinates transportation planning and programming activities with the three counties and 18 local jurisdictions within the Monterey Bay Region. AMBAG develops the Metropolitan Transportation Plan (MTP) and the Metropolitan Transportation Improvement Program (MTIP). (AMBAG website; online at http://www.ambag.org/programs/met_transp_plann.html).
- *The Santa Cruz Metropolitan Transit District* (SCMTD) provides transit services throughout Santa Cruz County.
- *The Santa Cruz Regional Transportation Commission* (SCCRTC) oversees planning and funding programs for local and regional projects within Santa Cruz County using state and federal transportation funds. The City of Santa Cruz has one City representative on the 12-member SCCRTC board and many City transportation projects are funded through grant programs administered by the SCCRTC (Fukuji Planning and Design, July 2003).
- *The University of California at Santa Cruz (UCSC)* implements a transportation systems management and parking program that provides a comprehensive package of commute options, including carpools, bicycles, and transit; free bus passes; and shuttle buses serving all areas of the campus.

SUMMARY OF TRANSPORTATION MODES & USE

The movement of people and goods is provided via a range of transportation modes including private and shared auto on a network of local and regional roads and highways; public transit; bicycle; walking; and rail service that is currently used for freight movement and limited seasonal visitor use. Transportation modes provide access for work, shopping, recreation, and

personal and social purposes. The state highways through the City also carry regional and statewide traffic. Key activity centers in the City include:

- The Mission Street corridor in the Westside;
- Ocean Street;
- Soquel Avenue in the eastside; the downtown area; the beach-Boardwalk area;
- the Harvey West-River Street area; and
- UCSC (Fukiji Planning and Design, July 2003).

The joint City-UCSC "Master Transportation Study" (MTS) found that 70% of daily residential mobility within the City is for local trips. For peak-hour travel citywide, 50% is local and 50% is regional travel. Of regional trips, commute in and commute out trips are roughly split in half (Fukiji Planning and Design, July 2003). Surveys conducted as part of the MTS found that 30% of trips in Santa Cruz are for work compared to 25% for social purposes, 18% for personal purposes, 14% for school, and 13% for shopping (Ibid.).

Daily citywide residential trips were made by auto, bus, bicycle and walking. City resident travel patterns identified in the MTS are shown on Figure 4.4-1.[2] For the PM peak period (4 PM to 7 PM), 80% of all travel modes used a car (68% drove alone and 12% carpooled) and 20% bicycled, walked or rode transit. Of these travel groups, full and part-time employees comprised 84% of the trips, compared to 16% for students and retired persons (Fukiji Planning and Design, July 2003). The Santa Cruz County Regional Transportation Commission reports that the number of people per vehicle has remained fairly constant over the last 15 years at an average of 1.2 persons per vehicle in the morning and 1.3 in the evening based on annual vehicle occupancy counts for Highway 1 and Highway 17 (Santa Cruz County Regional Transportation Commission, June 2010).

LOCAL & REGIONAL TRANSPORTATION PLANS & STUDIES

City-UCSC Master Transportation Study

In April 2000, the City of Santa Cruz and the University of California at Santa Cruz initiated a partnership to jointly fund a community-based approach to planning the City's transportation future that resulted in the completion of "The Master Transportation Study" (MTS). The Mission Statement of the study is to *"Create a Transportation Plan for the City of Santa Cruz that is inspiring, innovative and implementable with broad-based community support."* The MTS integrates pedestrian, bicycle, transit and street transportation plans and programs as a foundation for updating the City's General Plan, City zoning ordinance, UCSC's Long Range Development Plan and other city and regional transportation planning documents (Fukuji Planning and Design, July 2003). The MTS is not an adopted plan, but was reviewed and accepted by the City Council.

The MTS recommends a series of City-initiated strategies, short-term transit strategies and long-term recommendations to reduce single-occupant trips, increase multiple-occupant vehicles,

[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

increase transit, bicycle and pedestrian modes, and improve traffic system efficiency. Elements of these recommendations include an emphasis on carpooling and recommended support of a Bus Rapid Transit (BRT) system. The recommended travel mode splits as envisioned in the MTS would shift as follows:

- SINGLE-OCCUPANT VEHICLES (SOV): Decrease by 13% for internal trips and 4% for external trips.
- MULTIPLE-OCUPPANT VEHICLES (MOV): Increase by 4% for internal trips and 3% for external trips.
- BUS USE: Increase by 2% for internal trips and 1% for external trips.
- BIKE USE: Increase by 3% for internal trips.
- PEDESTRIAN USE: Increase by 4% for internal trips (Fukuji Planning and Design, July 2003).

  (Fukuji Planning and Design, July 2003).

The following projects are identified as MTS high priority projects:

- Metrobase Transit District Consolidations Operations Facility,
- Right-of-Way Acquisition on rail corridor,
- Bike and pedestrian path on rail right-of-way,
- Local bike projects and expanded bus service.

Santa Cruz County Regional Transportation Plan (RTP)

The Santa Cruz County Regional Transportation Commission (SCCRTC) deals with transportation issues in Santa Cruz County. The purpose of the SCCRTC is to:

- Set priorities for major capital improvements to the County's transportation infrastructure, including highways, major roads, rail and alternative transportation facilities.
- Pursue and allocate funding for all elements of the County's transportation system.
- Adopt policies to improve mobility, access and air quality.
- Plan for future projects and programs to improve the regional transportation system.
- Inform businesses and the public about alternatives to driving alone and the need to better manage our existing transportation system.
- Conduct programs to encourage the use of alternative transportation modes (Santa Cruz County Regional Transportation Commission website: www.sccrtc.org).

The *Regional Transportation Plan* (RTP) is a state-mandated, long-range plan that serves as a blueprint to guide future transportation funding decisions. The RTP, prepared by the SCCRTC, outlines transportation challenges and establishes investment priorities for all of Santa Cruz County. The plan includes lists of transit, highway, local road, bike, and pedestrian needs in the region and estimates the amount of local, state and federal dollars that may be available for these projects over the next 25 years. The plan is updated to reflect the latest funding and project needs every four to five years (Santa Cruz County Regional Transportation Commission website, online at: http://www.sccrtc.org/rtp.html.)

The current version was adopted by the SCCRTC in June 2010. The "2010 RTP" is a minor update of the last version, completed in 2005, and provides guidance for transportation policy and projects through the year 2035. The 2010 RTP is the SCCRTC's comprehensive planning document, which identifies the goals, projects, and programs that will maintain and improve the County's transportation system over the next twenty-five years. Identified improvements and projects are categorized as either "Constrained", meaning there are foreseeable funds for the improvement or "Unconstrained", meaning new revenues would need to be generated or become available. Individual projects listed in the 2010 RTP must still undergo separate design and environmental processes, and can only be implemented as local, state and federal funds become available (Santa Cruz County Regional Transportation Commission, June 2010).

The 2010 RTP carries forward goals from the 2001 and 2005 RTPs, which are to:

- Preserve and maintain the existing transportation system, emphasizing safety and efficiency
- Increase mobility by providing an improved and integrated multi-modal transportation system.
- Coordinate land use and transportation decisions to ensure that the region's social, cultural, and economic vitality are sustained for current and future generations.
- Ensure that the transportation system complements and enhances the natural environment of the Monterey Bay region and reduce greenhouse gas emissions.
- Make the most efficient use of limited transportation financial resources.
- Solicit broad public input on all aspects of regional and local transportation plans. Santa Cruz County Regional Transportation Commission, June 2010).

The 2010 RTP assigns future transportation funds to a range of projects and programs designed to maintain the current transportation system, provide traffic congestion relief and broaden transportation options. Key proposals include:

- Maintenance of the existing transportation network including roads, highways, bike lanes, sidewalks, and transit.
- Safety and operational improvements to Highways 1, 9, 17, 129 and 152.
- Adding auxiliary lanes and High Occupancy Vehicle (HOV) lanes on Highway 1 between Aptos and Santa Cruz.
- Modifications to major arterial roads -- including bus, pedestrian and bicycle facilities.
- Expanded bus service, with additional Highway 17 Express buses and more Park and Ride lots to serve Silicon Valley, University of California Santa Cruz (UCSC), and south county commuters.
- Construction of the Monterey Bay Sanctuary Scenic Trail Network along the coast.
- Local bicycle and pedestrian projects designed to increase bicycle commuting, and provide safe bicycle and pedestrian routes to schools.
- Expansion of specialized transport services in response to projected increases in senior and disabled populations.

- Increased availability of information about road conditions, transit operations, and other transportation options.
- Landscaping and lighting improvements to make transportation corridors part of livable communities (Santa Cruz County Regional Transportation Commission, June 2010).

The 2010 RTP also includes a new discussion on greenhouse gas (GHG) emissions in relation to transportation planning. In the absence of tools to measure the effectiveness of specific RTC policies towards reducing GHGs and without having the specific GHG reduction targets from the state during development of the 2010 RTP, the new chapter introduces some of the best practices which could be included in a portfolio of strategies to meet future emission reduction goals in Santa Cruz County. The RTP includes many projects that pro-actively implement GHG reduction strategies such as: operating a Commute Solutions program to encourage ridesharing; funding freeway service patrols to remove incidents and improve traffic flow; adding high occupancy vehicle lanes in the Highway 1 corridor to encourage carpools, vanpools and transit use; acquiring the rail corridor for goods movement, bicycle and pedestrian access and possible passenger service; and supporting bicycle, pedestrian and transit projects (Santa Cruz County Regional Transportation Commission, June 2010).

Monterey Bay Area Metropolitan Transportation Plan (AMBAG)

AMBAG is the MPO (Metropolitan Planning Organization) for the Monterey Bay Area, and as the region's MPO, AMBAG is required to produce certain documents that maintain the region's eligibility for federal transportation assistance. The Metropolitan Transportation Plan (MTP) is the federally mandated long-range transportation plan for the Monterey Bay Area. This plan lays out a financially constrained list of transportation projects over the following 25 years that will enhance regional mobility (AMBAG website, "Metropolitan Transportation Plan", online at: http://www.ambag.org/programs/met_transp_plann/mtp.html).

Federal regulations require that this long-range transportation plan be both financially constrained and fall under the on-road motor vehicle emissions budget included in the Federal Air Quality Maintenance Plan. The MTP, referenced as *Monterey Bay Area Mobility 2035*, was approved by the AMBAG Board of Directors on June 8, 2010, and includes goals, policies, programs and projects to meet the stated objectives and meet the transportation needs and deficiencies. Programs and projects are taken from each county's RTP and first incorporated, in their entirety, into the MTP (AMBAG, June 2010).

As a region that meets federal standards for ozone precursors, the region is considered to be in 'attainment' for those standards. As an attainment region, the MTP is only required to be updated every five years. Because new state legislation, SB 375, calls for MPOs to prepare a Sustainable Communities Strategy (SCS) to be used to synchronize and coordinate both the metropolitan transportation planning process and the regional housing needs allocation process, AMBAG is treating this 2010 update of the MTP as a minor update. Beginning with the 2012 update, AMBAG is moving to a four-year update cycle to align regional planning efforts for transportation with an eight year housing planning cycle. (AMBAG website, "Metropolitan Transportation Plan", online at: http://www.ambag.org/programs/met_transp_plann/mtp.html).

Caltrans' Corridor System Management Plan

Caltrans is in the process of developing a "Corridor System Management Plan" (CSMP) for Highway 1 from the junction of Highway 68 in Monterey County to King Street/Mission Street in Santa Cruz to develop strategies to manage the corridor and sustain existing transportation investments (Caltrans, October 2010). The draft plan indicates that the following strategies will be used to manage State Route 1 over the next 20 years:

- Maintenance and preservation of the roadway.
- Support improvement of transit service, including new express bus service on the HOV lanes planned for the Santa Cruz corridor.
- Support land use and transportation planning efforts such as AMBAG's "Blueprint Plan".
- Reduce congestion by encouraging programs that increase the use of transit, improve bicycle and pedestrian programs and encourage programs such as carpools, ridesharing, telecommuting and park-and-ride facilities to reduce demand.
- Intelligent Transportation Systems/Traveler Information/Traffic Management to clear congestion after collisions.
- Operational Improvements, including auxiliary lanes, intersection improvements, ramp metering (Caltrans, October 2010).

ROAD NETWORK & TRAFFIC CONDITIONS

Road and Highway Network

LOCAL ROADWAYS

The City's road system consists of arterial highways and arterial, collector and local streets (see Figure4.4-2). These different classifications relate to different transportation functions and are classified in terms of access, mobility, design and use. Additionally, visitor/coastal access and truck routes have been designated to facilitate the movement of visitor traffic and commodities.

Highways and arterial streets carry the City's heaviest traffic flows and provide regional and inter-community access. State highways through the City are described in the following section. Major arterial streets within the City include:

- Ocean Street (the primary north-south arterial);
- Mission Street, Water Street, Soquel Avenue and Broadway Avenue-Laurel Street (the primary east-west arterials);
- Other designated arterial streets include Bay Street, Delaware Avenue, Morrissey Blvd., Murray Street-San Lorenzo Blvd., Seabright Avenue, Market Street, Beach Street, Second Street, Front Street, Pacific Avenue, Cedar Avenue, Center Street, Walnut Street, River Street and High Street.

Collector streets provide circulation within and between neighborhoods and commercial and industrial areas. These streets usually serve relatively short trips and are meant to collect traffic from local streets and distribute them to the arterial network. Examples of collector streets

include: California Street, Chestnut Street, Escalona Drive, Fairmount Street, Frederick Street, King Street, Swift Street, and West Cliff Drive.

Local streets provide direct access to abutting land uses, collectors, or arterials, and usually do not accommodate bus routes.

Visitor/coastal access routes are intended to be inviting to visitors and to provide convenient, clear access to and from visitor and coastal destinations. Highways 1 and 17, Ocean Street and Mission Street are key visitor routes into Santa Cruz and the City's beach areas. West Cliff Drive also provides a scenic route along the coast.

Truck routes are intended to channel trucks through the community and away from residential and other areas where they would be a nuisance. The truck routes in the City are Highway 1 – Mission Street, Highway 17, Bay Street north of Mission, Empire Grade west of Bay, Highway 9, Morrissey Boulevard, and Soquel Avenue.

STATE HIGHWAYS

State highways that go through the City of Santa Cruz include segments of Highways 1, 17, and 9. Though referenced as "state routes" in Caltrans documents, the more common term, "highway", is used in this EIR. Highways 1 and 17 serve regional traffic, including motorists who commute to jobs in the Santa Clara Valley and motorists who travel into Santa Cruz County for recreational opportunities offered in the county. A short segment of Highway 9 also is within city limits.

Highway 1 provides access to San Francisco to the north and Monterey to the south. Regionally, Highway 1 is the major inter- and intra-county route for Santa Cruz County. Within the City of Santa Cruz, it is oriented in an east-west direction, although the interregional alignment of Highway 1 is primarily north-south. It is a four-lane arterial along Mission Street from the west side of Santa Cruz to Chestnut Street Extension, a four-lane expressway between Mission Street-Chestnut Street and River Street, and a four-lane freeway east of River Street. The speed limit on Highway 1 is 25 miles per hour (mph) along Mission Street, 45 mph along the expressway section, and 55 and 65 mph on the freeway sections further east. Recurrent congestion results in queuing on Highway 1 that extends for several miles during peak hours. Accidents, events, and other incidents in the corridor can further increase congestion related delays in either direction, on any day, including weekends.

Highway 9 is a two-lane state highway that connects the City of Santa Cruz with the San Lorenzo Valley, and eventually, Saratoga and Los Gatos. Approximately 0.5 miles of Route 9 are located within Santa Cruz city limits.

Highway 17 connects Santa Cruz with Scotts Valley and San Jose and other Santa Clara County communities. It is a four-lane freeway north of the Highway 1/ Highway 9 intersection. Highway 17 is the primary route between the Santa Clara Valley and Santa Cruz County that serves as both a commute route for Santa Cruz County residents that work in Santa Clara County and for recreational visitors that come to Cruz County. Congestion occurs both during weekday commute times and on summer weekends. This winding, four-lane road has steep sections, frequent road crossings, and substandard median shoulders and outside shoulders for

most of its length. In addition to the challenging roadway configuration, weather-related conditions such as thick fog, heavy rains and mudslides affect roadway operations.

Existing Traffic Conditions & Level of Service

Traffic conditions are measured by average daily traffic (ADT), peak hour traffic volumes, and level of service (LOS), average delay, and volume to capacity (V/C) ration. Average daily traffic is the total number of cars passing over a segment of the roadway, in both directions, on an average day. Peak hour volumes are the total number of cars passing over a roadway segment during the peak hour in the morning (AM) or afternoon/evening (PM). In the City of Santa Cruz, the peak hour for weekdays occurs in the evening.

"Level of Service" (LOS) is used to identify the magnitude of traffic congestion and delay at intersections. Traffic flows along city streets are typically controlled by the volume and capacity of the nearest intersection (City of Santa Cruz, 1994). Intersections are rated based on a grading scale of LOS "A" through LOS "F", with LOS A representing free flowing conditions and LOS F representing forced flow conditions. The intermediate levels of service represent incremental levels of congestion and delay between these two extremes.

The signalized intersection LOS methodology addresses the capacity, LOS, and other performance measures for lane groups and intersection approaches and the LOS for the intersection as a whole. Capacity is evaluated in terms of the ratio of demand flow rate to capacity (v/c ratio), whereas LOS is evaluated on the basis of control delay per vehicle (in seconds per vehicle). Control delay is the portion of the total delay attributed to traffic signal operation for signalized intersections. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay as listed in the following table from the *Highway Capacity Manual 2000,* Transportation Research Board.

LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS	LOS Control Delay per Vehicle (seconds/vehicle)
A	≤ 10
B	> 10–20
C	> 20–35
D	> 35–55
E	> 55–80
F	> 80

Capacity analysis at two-way stop control (TWSC) intersections depends on a clear description and understanding of the interaction of drivers on the minor or stop-controlled approach with drivers on the major street. Both gap acceptance and empirical models have been developed to describe this interaction. LOS for a TWSC intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS is not defined for the intersection as a whole as shown in the following table.

LOS CRITERIA FOR TWSC INTERSECTIONS

LOS	LOS Control Delay per Vehicle (s/veh)
A	0–10
B	> 10–15
C	> 15–25
D	> 25-35
E	> 35-50
F	> 50

SOURCE: *Highway Capacity Manual 2000,* Transportation Research Board

The City of Santa Cruz has established LOS D as the minimum acceptable LOS for overall intersection operations during weekday AM and PM peak hours. However, the existing General Plan recognizes that some major regional intersections (which were once part of the "Congestion Management Program" – a formerly mandated state program[3]) as experiencing lower levels of service than the City's LOS D standard. Thus, the existing General Plan accepts a lower (i.e., worse) LOS at these intersections (listed below) per existing Circulation Policy 5.1.2 due to environmental, economic, and/or feasibility constraints with implementing improvements at these locations.

- Mission St. / Chestnut St.-Hwy 1 (F)
- Highway 1 / River St.-Hwy 9 (F)
- Ocean St. / Plymouth St. (F)
- Water St. / Ocean St. (F)
- Soquel Ave. / Ocean St. (F)
- Soquel Ave. / Water St. / Morrissey Blvd. (E)

Caltrans, which has jurisdiction over state highways, endeavors to maintain a target LOS at the transition between LOS C and D. 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 (Caltrans, December 2002). If an existing State highway facility is operating at less than the appropriate target LOS, the existing LOS should be maintained (Ibid.).

The critical volume to capacity ratio (V/C) is another measure of the operating conditions of an intersection as opposed to LOS. The ratio provided in the worksheets is a calculation of the volume to capacity for the critical movements at the intersection. It is not the average of all the movements at the intersection. V/C is not used as a measure to define the levels of service.

[3] The Code of Federal Regulations, Title 23 Volume 1, adopted in April. 2005 require Transportation Management Areas (TMAs) to prepare Congestion Management Programs. TMAs are defined as urbanized areas with a population over 200,000. There are eight such areas in California plus Santa Barbara that asked to be included.

LOCAL INTERSECTION LEVELS OF SERVICE

Weekday Peak Hour Traffic Conditions. In the City of Santa Cruz, the peak hour for weekdays occurs in the evening. The PM peak hour (roughly 4 PM to 7PM) generally has the highest number of trips compared to the AM peak hour (7 AM to 10 AM) or the midday peak hour (Fukuji Planning and Design, July 2003). Intersection traffic counts were collected during the weekday PM peak hour (4:00 – 6:00 PM) at nearly 80 intersections throughout the City. The counts were done in May 2006, November 2006 and February 2007. The intersection counts are included in Appendix F-5.

The City's consulting traffic engineer compared traffic counts taken for the General Plan traffic with counts taken in 2008 and 2009 that were obtained from the SCCRTC to ensure the validity of the counts for the General Plan EIR analysis. The review indicates that all but one of the counts the City made in 2006 were higher than those reported by the Commission (Marquez, March 2010; see Appendix C for details). Traffic counts were also compared to traffic volumes reported by Caltrans; overall the counts reported for 2006 are 8% higher than those reported in 2008 (Ibid.).

In Fall 2010, UCSC completed new traffic counts at intersections within the City. Of the 24 intersections that the City was able to compare, traffic volumes increased for about half of these and half decreased. Overall, on average, traffic has decreased by 5%. The increased traffic increases were at intersections along Mission Street, High Street, and at the River/Water, Bay/W. Cliff, Delaware/Swift and Front/Laurel intersections (see Appendix C). The increased traffic has been addressed in the City's traffic model. Traffic from projects that were being constructed and/or occupied after the General Plan traffic counts were taken have been added to the "Existing" baseline conditions (see Appendix C) as these projects would be generating traffic at the time the EIR NOP was released. As a result, the existing-baseline condition for this EIR is slightly higher overall than the 2010 counts (Marquez, personal communication, February 2011), except for three intersections – Bay/West Cliff, King/Storey, and Laurel/Front. However, overall, the City continues to see lower counts than were experienced four years ago. Thus, the traffic estimates made for the General Plan 2030 are conservatively high and represent a worst-case scenario for CEQA purposes.

Quantitative Levels of Service (LOS) analysis was performed for the study intersections based the *2000 Highway Capacity Manual* methodologies, prepared by the Transportation Research Board. Intersection operations were evaluated using the Traffix analysis software. Intersection traffic flow operations are evaluated using a level of service (LOS) concept. The technical LOS calculations are included in Technical Appendix F-6, which is available for review at the City of Santa Cruz Planning Department[4] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

Existing intersection PM peak hour levels of service are summarized in Table 4.4-1. All of the study intersections currently operate at an acceptable LOS except for the following 11 intersections, of which six intersections are signalized, and five intersections are unsignalized.

[4] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

For these intersections. Table 4.4-1 also identifies the delay (in seconds) and V/C ratio[5] for the intersections operating at unacceptable levels. For unsignalized intersections, the unacceptable LOS is usually due to delays on a minor leg of the intersection.

- Highway 1 / Highway 9-River Street (F)
- Highway 9-River / Street-Encinal (E)
- Ocean Street / San Lorenzo Blvd. -East Cliff Drive (E)
- Ocean Street / Water Street (E)
- Mission Street / Bay Street (E)
- Bay Street / Escalona Drive (F)
- Bay Street / California Street (F)
- Bay Street / California Avenue (F)
- Laurent Street / High Street (F)
- Western Drive / High Street (E)
- Seabright Avenue / Water Street (F)

Summer and Weekend Peak Hour Traffic Conditions. The City also experiences significant traffic during the summers and holiday weekends due to tourist traffic. A portion of the City's circulation system is affected by seasonal surges resulting from coastal access demands from all of northern California. Santa Cruz has recognized that it is not practical to build to accommodate this seasonal demand, and has considered beach access congestion to be acceptable as long as it does not divert traffic onto residential streets. The 2030 Plan has focused on addressing the congestion associated with the weekday travel of City residents, employees and customers.

STATE HIGHWAY TRAFFIC OPERATIONS & LEVEL OF SERVICE

Based on the most recent Caltrans traffic data (2009 counts), the average daily trips (ADT) on state highways within Santa Cruz is as follows:

- Highway 1, Morrissey Boulevard. ADT is approximately 88,000 to 97,000 trips with 6,300 to 6,900 trips occurring during the peak hour.
- Highway 17, between Santa Cruz and Scotts Valley. ADT is approximately 63,000 - 73,000 trips with 5,700 – 6,300 trips occurring during the peak hour.
- Highway 9 within Santa Cruz City Limits. ADT is approximately 5,000 trips with approximately 510-550 trips in the peak hour as measured at the City limits, north of Encinal.

[5] The V/C ratio is the average adjusted volume of vehicles for each movement over the serviceable capacity of each movement at the intersection. The volume for each approach is adjusted for percentage of trucks and buses, for peaking characteristics, and for abutting parking characteristics. The capacity of each movement is adjusted for lane width, grade, and green time available.

TABLE 4.4-1
Existing Intersection PM Peak Hour Levels of Service

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
SIGNALIZED INTERSECTIONS				
1	Hwy 1/Western	B		
2	Mission/Swift	B		
3	Mission/Miramar	B		
4	Mission/Almar-Younglove	B		
5	**Mission/Bay**	**E**	**55.8**	**0.944**
6	Mission/Laurel	B		
7	Mission/Walnut	B		
8	Mission/King-Union	C		
9	Mission/Chestnut-Hwy. 1	D		
10	High/Moore	A		
11	Bay-Coolidge/High	D		
12	Bay/Nobel-Iowa	B		
13	Bay/King	B		
14	California/Laurel	C		
15	Chestnut/Laurel	B		
16	Center/Laurel	B		
17	Center/Mission	B		
18	Pacific/Laurel	B		
19	Front/Laurel	C		
20	Front/Metro Center	A		
21	Front/Cathcart	A		
22	Front/Soquel	C		
23	Front/Cooper	A		
24	Front-Pacific/Mission-Water	B		
25	River/Water	C		
26	N. Pacific/River	B		
27	River/Potrero	B		
28	**River/Hwy. 1**	**F**	**83.9**	**0.942**
29	**River/Encinal**	**E**	**73.9**	**1.099**
30	San Lorenzo/Laurel-Broadway	B		
31	Riverside/San Lorenzo	C		
32	Riverside/Third	C		
33	Riverside/Beach	A		
34	**Ocean/San Lorenzo-East Cliff**	**E**	**64.7**	**1.061**
35	Ocean/Broadway	C		
36	Ocean/Soquel	D		
37	**Ocean/Water**	**E**	**73.6**	**1.081**
38	Ocean/Kennan-Washburn	A		
39	Ocean-Hwy.17/Ocean-Plymouth	C		
40	Market/Water	C		

TABLE 4.4-1
Existing Intersection PM Peak Hour Levels of Service

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
41	N. Branciforte/Water	D		
42	Branciforte/Soquel	C		
43	S. Branciforte/Broadway	B		
44	Seabright/Soquel	C		
45	Seabright/Broadway	B		
46	Seabright/Murray	D		
47	Morrissey/Water-Soquel	C		
48	Morrissey/Fairmount	A		
49	Frederick/Soquel	C		
50	Hagemann-Trevethan/Soquel	A		
51	Park/Soquel	B		
52	Capitola Rd./Soquel Ave.	C		
53	La Fonda/Soquel	B		
54	Riverside-Dakota/Soquel (new)	A		
55	River S./Soquel	B		
56	Seventh Ave./Soquel Ave.	C		
57	Seventh Ave./Capitola Rd.	C		
58	Seventh Ave./Eaton	D		
UNSIGNALIZED INTERSECTIONS				
59	**Bay/California St**	**F**	**434.0**	**1.704**
60	**Bay/California Ave**	**F**	**67.6**	**1.130**
61	West Cliff/Bay	C		
62	Beach/Pacific Ave	C		
63	Pacific Avenue/Center	B		
64	Storey/King	B		
65	River/Fern	B		
66	King/Laurel	B		
67	**Laurent/High**	**F**	**59.6**	**1.066**
68	Market/Isbel-Goss	B		
69	North Branciforte/Goss	B		
70	Highway 1/Shaffer Rd	B		
71	Cedar/Laurel	C		
72	**Bay/Escalona**	**F**	**782.2**	**2.015**
73	**Western/High**	**E**	**45.9**	**05.44**
74	Cliff/Beach	B		
75	Riverside/Second-Liebrandt	A		
76	**Seabright/Water**	**F**	**112.8**	**0.589**
77	Swift and Delaware	C		
78	Seventh Ave./Brommer	C		
79	Seventh Ave./E. Cliff	C		

SOURCE: Hatch Mott MacDonald

State Route 1 (Highway 1). The highest average daily traffic volumes along Highway 1 within Santa Cruz County occur in Capitola at the 41st Avenue interchange with 94,000 to 104,000 ADT (Caltrans, October 2010). The segment near the Morrissey Blvd. interchange carried the second highest volume of traffic. Highway 1 west of Morrissey Boulevard is currently operating at LOS D-E (Caltrans, October 2010). Congestion along Highway 1 extends for several miles during peak hours.

According to the *Transportation Concept Report* for Highway 1, the target level of service for State Highway 1 east of Morrissey Boulevard is LOS D (Caltrans, April 2006). Additionally, according to the *Caltrans Guide for the Preparation of Traffic Impact Studies (Caltrans, 2002)*, if an existing State Highway facility is operating at less than the target LOS, the guide states that the existing LOS should be maintained (Caltrans, 2002).

Caltrans is in the process of developing a "Corridor System Management Plan" (CSMP) for Highway 1 from the junction of Highway 68 in Monterey County to King Street/Mission Street in Santa Cruz to develop strategies to manage the traffic and congestion along the corridor and sustain existing transportation investments. According to the draft plan released in October 2010, a small segment of the City is located in Segment 4 (Larkin Valley to Branciforte Creek Bridge), with the remainder of the City being located in Segment 5 (Branciforte Creek Bridge to King Street). The draft CSMP indicates that between Branciforte Creek and King Street, traffic volumes are projected to increase from 54,000 average daily trips (AADT) in 2008 to 60,000 in 2025. Existing and future LOS along Highway 1 as identified by Caltrans in this draft plan is identified below (Caltrans, October 2010).

	Existing LOS (2007)	Future LOS (2030)
❑ Hwy 1, Larkin Valley Road to Branciforte Creek Bridge	E - F	F
❑ Branciforte Creek Bridge to King St.	D - E	E - F

The *Concept Report* for Highway 1 indicates that to achieve LOS D on Highway 1, added capacity, operational improvements, and investment in the multi-modal system will be required (Caltrans, April 2006). The Route Concept Report for Highway 1 includes the addition of High Occupancy Vehicle (HOV) lanes to Highway 1 in each direction to reduce congestion, encourage carpooling, expand express bus service, and improve safety from Morrissey Boulevard to San Andreas/Larkin Valley Road. Caltrans' draft *Corridor System Management Plan* for Routes 1 and 183 indicates that LOS along added Highway 1 HOV lanes during peak hours would range between B and C in the year 2035 (Caltrans, October 2010). While the overall LOS would remain unchanged in the other lanes with addition of an HOV lane, average speeds would be increased and delays and average travel time would be reduced (Ibid.).

In October 2008, Caltrans completed improvements to Highways 1 and 17 as part of the Route 1/17 Merge Lanes Project, which was designed to improve merging by adding additional merge lanes from Highway 1 to Highway 17. The project added merge lanes to the connection between northbound Route 1 and northbound Route 17 and to southbound Route 1 through the 1/17 interchange. Existing bridge structures were widened or replaced, soundwalls were constructed, and landscaping was installed.

State Route 17 (Highway 17). Highway 17 near Pasatiempo Boulevard is currently operating at LOS F (Caltrans, April 2006). According to the *Transportation Concept Report* for Highway 17, the target peak level of service for State Highway 17 between the Ocean Street and Scotts Valley is LOS E (Caltrans, January 2006). The Route Concept Report for Highway 17 indicates that widening is not envisioned and this segment of the highway is considered to be a four-lane freeway (Caltrans, January 2006).

Traffic Forecasts

The SCCRTC's *Regional Transportation Plan* (RTP) indicates that annual Vehicle Miles Traveled (VMT) throughout Santa Cruz County will increase over 2005 levels within the next 30 years. These VMT projections are made using AMBAG's Regional Travel Demand Model (RTDM). The current RTDM is developed and calibrated for 2005 and forecast for the year 2035.[6] Overall the RTP forecasts the following traffic conditions between the years 2005 and 2035 within Santa Cruz County:

- Daily person trips (trips per person) are projected to increase by 16%.
- Single-occupant auto travel for work trips is projected to increase by 13%.
- Daily vehicle miles of travel are projected to increase by 40%.
- The largest increases in vehicle miles traveled are projected to be on freeways (Santa Cruz County Regional Transportation Commission, June 2010, page 2-10).

According to the SCCRTC, there are three reasons why traffic congestion is a major issue in Santa Cruz County, as well as elsewhere in the state and nation. First, more people are driving more miles and per person vehicle registrations are at an all time high. Second, investment in transportation facilities and services has not kept pace with growing demands for road space and transportation alternatives due to decreases in the amount of transportation funding available for local projects. Third, there has been a lack of consensus on how to invest in the County's transportation system (Santa Cruz County Regional Transportation Commission, June 2010).

The joint City-UCSC "Master Transportation Study" (MTS) also made traffic projections for the years 2000 to 2020 based on AMBAG traffic model projections and population projections, which have now been superseded by more current projections as described in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR. The AMBAG projections at the time the MTS was prepared assumed a 15% increase in population growth within the City (from 67,900 to 78,100 people in 2020) and a 24% increase in employment growth (from 37,800 workers to 47,000 workers 2020) (Fukuji Planning and Design, July 2003). However, current adopted AMBAG forecasts show a lower level of forecast growth with estimated population at 65,884 in 2030 and 41,548 workers in 2030.

[6] The AMBAG model relies on land-use and socio-economic data from the AMBAG forecast and road and transit network information to estimate traffic volumes and determine trip generation rates by mode. Where possible, the model is calibrated using existing roadway data (Santa Cruz County Regional Transportation Commission, June 2010).

The MTS includes a goal of no net growth in traffic between 2000 and 2020 and examined two scenarios to substantially decrease single-occupant travel and increase use of other transportation modes. One scenario increases transit use moderately and carpooling substantially. The second scenario increases transit substantially and carpooling moderately. Both scenarios were based on implementation of regional transportation improvements of either the addition of a HOV lane on Highway 1 or development of a Bus Rapid Transit (BRT) corridor along the Union Pacific Railroad right-of-way (Fukuji Planning and Design, July 2003). In Scenario 1, to achieve no growth in the year 2020 traffic, single-occupant travel internal to Santa Cruz needs to be reduced by 29%, carpooling increased by 75%, transit use increased by 50%, and bicycling and walking modes increased by 38% and 100%, respectively (Ibid.). Without a change in travel patterns, the MTS predicted a 19% increase in vehicle miles traveled between the years 2000 and 2020.

BICYCLE & PEDESTRIAN CIRCULATION

Bicycle Circulation

The existing bikeway system in the City of Santa Cruz has developed over the last 35 years. The City of Santa Cruz' bicycle system is comprised of off-street multi-use paths (Class I), on-street bicycle lanes (Class II) and on-street bicycle routes (Class III). Class I and Class II bike facilities are shown on Figure 4.4-3. Class I bike paths are currently limited to West Cliff Drive, the San Lorenzo River levees, a new path under Highway 1 from the river levee, and a new path under Highway 1 at Lee Street, all of which are also shared by pedestrians. A Class I path also is provided on the UCSC campus.

Support facilities include different classes of bicycle parking facilities, which are required by City parking regulations, and shower facilities at major employment facilities. All of the SCMTD buses are equipped with front-mounted bicycle racks capable of carrying two bicycles (City of Santa Cruz, November 2008). The University of California operates a bike shuttle near the intersection of Bay/Mission Streets to transport bicycles to the University.

In October 2007, the City of Santa Cruz was awarded the Silver Level Bicycle Friendly Community by the League of American Bicyclists. According to data contained in the 2000 Census, approximately 4.7% of the commuters within the City of Santa Cruz are bicyclists (City of Santa Cruz, 2008). The City's existing Bicycle Plan, adopted in November 2008, forecasts a bicycling increase to 7% of the peak hour traffic within a 5-year period.

The emphasis of the 2008 Bicycle Transportation Plan shifted from earlier plans in 2000 and 2004 Plans, which were focused on completing large-scale bicycle projects on the major commute corridors. Many of those significant projects have been completed—Bay Street, Beach Street, Broadway-Laurel, High Street, Soquel Avenue, and major portions of the San Lorenzo River Path. The bicycling projects to be pursued in the next five years include completing those significant projects begun in the earlier Plans, as well as building the connector projects that can get bicyclists from origin to destination easily and safely. One new possibility for an east-west bicycle travel corridor is the Union Pacific rail right-of- way, which the SCCRTC has purchased and begun a planning process.

Pedestrian Circulation

The City has approximately 135 miles of sidewalks. Approximately 50 miles of sidewalk is missing from the existing system; predominate problem areas are the upper eastside and Westlake areas that have large continuous sidewalk links missing (Fukuji Planning and Design, July 2003).

The "Pedestrian System" chapter of the Master Transportation Study is considered the City's Pedestrian Plan. The MTS was accepted by the City Council on December 9, 2003. The MTS goals for Santa Cruz's pedestrian system are to:

- Provide multiple transportation modes thereby creating a flexible and adaptive transportation system throughout the City of Santa Cruz.
- Close all "gaps" in the pedestrian network and connect all major destinations and activity centers.
- Ensure that the City's diverse user groups have access to a sustainable and efficient mode of transportation / Create a system that is "scaleable" and responds to changing community needs, and provide flexibility and variety in the City's transportation network.
- Adopt design standards for the pedestrian system to assure a high level of user amenities, safety and quality.

Overall, priorities for the City's pedestrian system include completion and maintenance of the City sidewalk system, improve safety, adopt pedestrian-friendly street designs, enhance key pedestrian connections, and encourage walking (Fukuji Planning and Design, July 2003). .

PUBLIC TRANSIT

Transit service within Santa Cruz County is primarily provided by the Santa Cruz Metropolitan Transit District (SCMTD). Regional bus routes provide service to destinations in Santa Clara and Monterey Counties including daily weekday service via Highway 17 by the SCMTD. SCMTD buses provide service from the downtown Santa Cruz transit center to the San Jose Caltrain station, with connections to San Francisco, Sacramento, Stockton and other cities. Greyhound bus service also is provided from Downtown Santa Cruz to select destinations.

The City of Santa Cruz operated the Summer Beach Shuttle in the past when private donations were available. The Shuttle provided service to and from destinations within the City of Santa Cruz, such as the Downtown and the Santa Cruz Boardwalk. Use of the County Government Center parking lot was used in conjunction with the beach shuttle. Due to lack of funding, the Summer Beach Shuttle was discontinued over ten years ago. Recently the business sector has initiated a Beach-Downtown Shuttle for the summer of 2010. Budget constraints have prevented the City from continuing operation of a beach shuttle.

SCMTD Service

The Santa Cruz Metropolitan Transit District (SCMTD), also known as Santa Cruz Metro, provides transit service within Santa Cruz County. SCMTD provides the following types of service: regional (Highway 17 Express), intercity (8 routes), urban local-feeder (16 routes), UCSC (7 routes) and rural routes (7 routes) (Wilbur Smith Associates, December 2008). The Highway 17 Express Bus service was initiated after the 1989 Loma Prieta earthquake in response to an emergency need for transit over the Hill while Highway 17 was being repaired, and is currently a joint operation between the SCMTD, . Amtrak, and the Santa Clara Valley Transportation Authority (VTA). The route currently connects Santa Cruz (downtown METRO station) and San Jose (Diridon station); at the Diridon station, passengers can connect to the Santa Clara Valley Transportation Authority' transit system and Caltrain and Amtrak regional rail systems (Ibid.).

The District serves transit centers in Santa Cruz, Capitola, Felton, Scotts Valley and downtown Watsonville. SCMTD routes also meet Monterey-Salinas Transit (MST) routes at the Watsonville Transit Center. The two operators have provided reciprocal transfers since 1989. Additionally, SCMTD partners with the University of California, Santa Cruz (UCSC) to provide late night fixed route and demand response service in the general Westside Santa Cruz area (AMBAG, June 2010).

The SCMTD complements its regular fixed-route bus service with ParaCruz, a shared ride-door-to-door paratransit service that provides public transportation for persons who are unable to independently use fixed route buses due to a disability some or all of the time. It is provided by public transportation systems as part of the requirements of the Americans with Disabilities Act of 1990 (ADA). Rides are scheduled in advance and frequently include picking up and dropping off other customers along the way. ParaCruz operates a fleet of lift-equipped small buses and ramp-equipped minivans. On November 1, 2004, Santa Cruz METRO assumed direct operation of the ParaCruz (Santa Cruz Metropolitan Transit District, "METRO Para Cruz ADA Paratransit Service").

SCMTD's total ridership on fixed route service for Fiscal Year 2008-09 was 5,987,518; annual expenses for providing these transit services, including ParaCruz, were approximately $37 million (Santa Cruz County Regional Transportation Commission, June 2010). From 2003 to 2007, there had been a general increase in fare revenues and total operating cost, while ridership and hours of operation declined (Wilbur Smith Associates, December 2008). However, the SCCRTC noted a 7% increase in ridership since Fiscal Year 2004/05 due to rising gasoline prices, traffic congestion, and job market uncertainty (Santa Cruz County Regional Transportation Commission, June 2010).

Increasing congestion on highways and the local transportation network in Santa Cruz County is expected to generate more transit service demand (AMBAG, June 2010). However, the SCCRTC's RTP does not envision expansion of transit services without additional revenues. In order to increase transit service to levels needed to meet projected population growth, greenhouse gas emission reduction goals, and significantly increase the percentage of people using transit, bus service would need to be increased by 25% at an additional annual cost of approximately $11 million (Santa Cruz County Regional Transportation Commission, June 2010). To accommodate this demand, the SCMTD would like to increase service, but due to

ongoing funding shortfalls, SCMTD is struggling to maintain existing service (Ibid.). Due to declining sales tax and other non-fare revenue sources, the SCMTD reduced service in the fall of 2010. It is expected that transit service will continue with minor improvements without major route cuts or rate changes for about five years, however, additional funding will be necessary in the future for expansion of service (White, SCMTD, personal communication, August 2011).

In recent years, Metro has been working on upgrading its transit operations facilities in an effort to reduce operating costs, improve efficiency, and allow for future expansion of the transit system (Santa Cruz County Regional Transportation Commission, June 2010). In 2008, Santa Cruz METRO completed the compressed natural gas-CNG fueling station and conversion of 40 buses.

Bus Rapid Transit (BRT)

The joint City-UCSC "Master Transportation Study" (MTS) recommends "Bus Rapid Transit" (BRT) for long-term implementation as the technology with the highest potential to increase ridership and shift travel modes to transit. BRT is a rubber tire vehicle system operation on an exclusive transit way or dedicated busway with flexibility to operate on surface streets with mixed flow traffic. According to the MTS, a BRT system has significant potential to affect a regional commute shift away from SOV to transit for trips to and from the UCSC campus, downtown and the Harvey West area. A BRT busway could operate on a dedicated HOV lane along Highway 1 or on a shared bus/freight/bicycle lane using the Union Pacific rail corridor. Application to Soquel Avenue and Water Street was also considered (Fukuji Planning and Design, July 2003).

RAIL SERVICE

Freight Service

The former Union Pacific Railroad rail line forms a continuous, single-track, 32-two mile corridor from Davenport to the City of Watsonville. The Santa Cruz County Regional Transportation Commission is in the process of purchasing the right-of-way and is awaiting final approval from the state. This branch rail line extends from Watsonville Junction in Pajaro north to Davenport and passes through much of the county's urban area. For many years, freight deliveries to and from the CEMEX cement plant in Davenport occurred three times per week. As of 2010, CEMEX plant operations ceased due to the economic downturn. The rail line is currently operated by Sierra Northern. Sierra Northern Railway. Sierra runs trains twice per week to serve existing freight customers and stores empty rail cars in the unused northern section of the rail line. Sierra will be responsible for operations, maintenance and start-up costs associated with rail service (Santa Cruz County Transportation Commission, February 2011).

Recreational Service

The Santa Cruz Big Trees and Pacific Railway Company operates a tourist-oriented passenger service between Felton and the Santa Cruz Beach Boardwalk on its 9-mile track line from Santa Cruz to its current terminus at Roaring Camp. The service is provided daily during mid June through the end of August, and weekends and holidays in May, early June, September through

October, late November, and December. The trains run twice in each direction every day during regular operations, and partially use the Union Pacific Railway tracks that cross Pacific Avenue just north of the intersection of Pacific Avenue and Beach Street. The line is occasionally used for freight (AMBAG, June 2010). Historically the line crossed the Santa Cruz Mountains to Los Gatos, but was abandoned in 1939 past Olympia. The tunnel sections are now used as records storage for major corporations in the San Francisco Bay Area (Ibid.).

Passenger Service

The Santa Cruz Branch line has been the subject of a number of studies regarding its potential for passenger rail service. A 1996 study analyzed the potential viability of inter-city passenger rail service between Santa Cruz and Watsonville to San Jose. The 1999 Major Transportation Investment Study examined three options for passenger rail on the Santa Cruz Branch line along the Watsonville- Santa Cruz-UCSC corridor. Also in 1999, the Around-the-Bay Rail Study looked at the feasibility of partnering with Monterey County to bring passenger rail from the San Francisco Bay Area to both counties, as well as linking the two counties via a wharf-to-wharf type rail transit service.

On May 6, 2010, the SCCRTC unanimously agreed to acquire the Santa Cruz Branch Rail Line right-of-way, which is being finalized. Future transportation uses could include passenger rail service, transit, bicycle and pedestrian facilities, and freight rail service. This project was one of the selected outcomes for the Watsonville-Santa Cruz-UCSC corridor from the SCCRTC's 1999 Major Transportation Investment Study. The SCCRTC also intends to maintain the existing freight service on the rail line. The *2005 Regional Transportation Plan* (Policy 3.4.5) supports reserving areas adjacent to rail lines for future rail and bus facilities as part of new development adjacent to rail lines. Passenger service to from Santa Cruz to Davenport is currently being considered by the SCCRTC.

PLANNED IMPROVEMENTS

State Highways

STATE ROUTE 1

Beginning in 1986 the Santa Cruz County Regional Transportation Commission (SCCRTC), working with Caltrans and the Federal Highway Administration, conducted a series of studies to identify an affordable and appropriate response to the growing congestion problem on Highway 1, including feasibility studies for Highway Occupancy Vehicle Lanes (HOV) on Highway 1 and a toll lane feasibility study in 2002. The current Caltrans Route Concept Report for Highway 1 includes the addition of High Occupancy Vehicle (HOV) lanes to Highway 1 (California Department of Transportation, April 2006). This project will add a lane in each direction to reduce congestion, encourage carpooling, expand express bus service, and improve safety. The limits of this project extend from Morrissey Boulevard to San Andreas/Larkin Valley Road. Preliminary traffic performance data shows the anticipated shift in traffic volumes from local arterials to Highway 1 with the HOV Lane Alternative (Santa Cruz Regional Transportation Commission website, http://www.sccrtc.org/hov.html). Caltrans' draft *Corridor System Management Plan* for Routes 1 and 183 also supports HOV lanes on Highway 1 in

conjunction with other transportation demand management strategies (Caltrans, October 2010).Detailed project design and environmental data is in development and is expected to be available in the winter of 2012. Funding is not secured to advance the project beyond the current environmental study. The SCCRTC's *2010 Regional Transportation Plan* assumes adoption of a transportation sales tax measure to provide a significant amount of the funding needed to advance this project into the next development phase – final design, right-of-way, and construction (Santa Cruz Regional Transportation Commission website, http://www.sccrtc.org/hov.html).

In 2006, the Santa Cruz County Regional Transportation Commission initiated work on the preliminary design and environmental review phase of the Highway 1 Soquel to Morrissey Auxiliary Lanes Project spanning the busiest section of Highway 1 in Santa Cruz County (carrying 115,000 vehicles per day in 2006). An auxiliary lane connects an adjacent highway on-ramp with the next highway off-ramp thereby extending the weaving and merging distance between the ramps and improving traffic flow and safety on the highway. An auxiliary lane is not designed for use by through traffic, but to provide greater separation between vehicles entering and exiting the freeway from mainline traffic. The Soquel/Morrissey Auxiliary Lanes project proposes to add 12–foot wide auxiliary lanes northbound and southbound between Soquel Avenue and Morrissey Boulevard, respectively. This project includes reconstruction of the La Fonda Avenue overcrossing; the La Fonda Avenue overcrossing must be replaced to accommodate the auxiliary lanes under the bridge. The new La Fonda Avenue bridge will be wider to provide bike lanes and wider sidewalks for pedestrians. This project is designed to complement the work recently completed as part of the Highway 1/17Merge Lanes Project, by eliminating the proposed lane drop north of the La Fonda Avenue resulting from the Highway 1/Highway 17 Project. Design is nearly complete, and the final environmental documents were approved by Caltrans, although the project is contingent on approval by the California Transportation Commission.. Funding has been secured for the project. Construction could begin in 2012 or 2013.

STATE ROUTE 17

According to the Transportation Concept Report for State Route 17 in District 5 (Caltrans District 5, January 2006), the target level of service for State Highway 17 between the Ocean Street and Scotts Valley is LOS E. The Route Concept Report for Highway 17 indicates that the highway segment between Santa Cruz and Scotts Valley accommodates local and regional trips. Recognizing the existing policy of the Santa Cruz County Regional Transportation Commission, widening is not envisioned and this segment of the highway is considered to be a four-lane freeway (Caltrans, January 2006).

Reconstruction of the highway to meet current standards would be both exorbitantly expensive and environmentally destructive. Thus, over the past two decades, the Santa Cruz County Regional Transportation Commission (SCCRTC) has consistently opted to keep Highway 17 a four-lane highway, targeting funds for safety and operational improvements. Median barriers, acceleration-deceleration lanes, motorist call boxes and changeable message signs are improvements that have been installed over the past decade.

In the fall of 2000, Caltrans completed a Project Report that assessed the operational value and cost of constructing a 1.1-mile truck climbing lane on northbound Highway 17 at the

summit. As a result of the study, Caltrans recommended, and the Regional Transportation Commission concurred, not building the project ("No Build"), as the potential benefits of the project were not justified by the high cost and potentially significant environmental impacts. As an alternative, Caltrans continued to evaluate other potential safety and operational improvements on Highway 17. The products of this analysis were two safety improvement projects on Highway 17 at Laurel Curve and Glenwood Curve.

In response to the need for further safety and reliability improvements in this corridor, the *Highway 17 Transportation Improvement Study* was conducted to provide SCCRTC, Santa Clara Valley Transit Authority (VTA), and SCMTD to recommend safety and efficiency improvement projects with the following two main objectives: 1) recommend steps *to optimize* the Highway 17 Express Bus service reliability; and 2) *expand* Highway 17 Express Bus ridership in the corridor in order to reduce vehicle trips, miles traveled, and emissions. Recognizing that the roadway and traffic conditions along Highway 17 affect the operation of the Highway 17 Express Bus service, an additional objective was to recommend safety and operational improvements to add reliability, speed and functionality to the project corridor to benefit both the patrons of the Highway 17 Express Bus service and the motorists traveling along this route. A series of recommendations were made to support and expand the existing transit service on Highway 17, including provision of weekend service.

STATE ROUTE 9

The Highway 1/Highway 9 intersection, which is controlled by a signal, currently operates at LOS E during the both the PM and Design Day peak hours, which does not meet Caltrans standards. The City is working with Caltrans to implement lane modifications at this intersection. The improvements require Caltrans approval and an encroachment permit. With implementation of these improvements, the intersection would operate at LOS D during both the existing PM and Design Day peak hours.

The following improvements are included in the Highway 1/Highway 9 intersection planned improvement:

- Widen and add a left-thru turn lane from Highway 9 southbound.
- Improve the northbound River Street approach to modify the existing exclusive left-turn lane to a shared thru/left-turn lane.
- Widen and add a second left-turn lane from Highway 1 southbound onto Highway 9.
- Widen and add a second northbound lane on Highway 9.
- Modify signal.
- Add bike lane and shoulder

Currently, a Project Report, preliminary engineering, associated studies and environmental review are underway. The improvements are already required under existing conditions.

Planned City Improvements

The City faces an ongoing challenge to meet its capital needs with limited resources. Preparing and adopting a Capital Improvements Program (CIP) is an important part of the City's planning

process to identify and meet those needs. It is a multi-year schedule of projects with their associated costs and proposed funding sources. The CIP represents the best efforts to allocate available resources toward projects that provide the most benefit for the people of Santa Cruz. In addition to the Highway 1 / Highway 9 intersection improvement described above, other major improvements on the current CIP include: intersection improvements at Mission/Bay and Mission/Chestnut (design and environmental review); intersection signalization (Bay/West Cliff); installation of a roundabout at the Pacific/Beach intersection;

The City operates a "Traffic Impact Fee" (TIF) program based on future projected trips generated for each new project. The TIF program, adopted in June 2005, evaluated over 60 intersections and identified numerous projects within the City which were needed to address the effects of cumulative development, and fees established. The fees are used to fund planned improvements at those intersections and roadways included in the program. New development and redevelopment projects are required to pay traffic impact fees, which are calculated at the time of building permit issuance. The TIF includes highway intersections on Mission (Highway 1) and at the Highway 1 / Highway 9 intersection.

The City's TIF program includes both a City-wide TIF fee and a Beach/South of Laurel (B/SOL) TIF. New projects that are located in the B/SOL area are required to pay both fees. The fee program is updated annually in July. The fees are based on project trip generation and are calculated at the time the project applies for a building permit. By ordinance the City has identified the per trip fee, which was determined by dividing the total cost of all projects identified in the City's "Cumulative Development Traffic Study" by the total cumulative additional trips added by new development. The fee assumes the City will fund 25% of the cost of improvements as a result of existing capacity differences. In addition, 15% of the fee is dedicated to alternative transportation. The current City-wide fee is $405 per trip. The current B/SOL fee is $94 per trip.

Bicycle and Pedestrian Path Improvements

The City's adopted *Bicycle Transportation Plan* (2008) includes the following new paths: Arana Gulch path to connect Broadway with Brommer Street; Branciforte Creek Connection to complete the levee path under the Soquel Bridge; Monterey Bay Sanctuary Scenic Trail Network (as discussed below); and Spring Street Connection to UCSC. The Plan also includes numerous other improvements to existing bike lanes and facilities.

The Monterey Bay Sanctuary Scenic Trail Network (MBSST) is proposed to span the Monterey Bay from Lover's Point in Pacific Grove to Wilder Ranch in Santa Cruz. The SCCRTC is in the process of developing a more detailed plan for the Santa Cruz County portion of the trail. The MBSST efforts will ultimately result in a network of continuous multi-use recreational, interpretive and transportation pathways spanning the Monterey Bay that will also be an important piece of the 1,300 mile statewide California Coastal Trail (Santa Cruz Regional Transportation Commission, January 2008). If the SCCRTC is successful in its rail line acquisition efforts, part of the network may be built within the rail line right-of-way (Ibid.).

The SCCRTC is working on a comprehensive Master Planning process that will include: developing goals and objectives; identifying and assessing possible segments; setting design options; soliciting and incorporating input from interested parties and the community at large;

preparing cost estimates for segments; and conducting environmental analysis of the Plan. In addition to identifying new trails, the MBSST Network is intended to link together (and upgrade where needed) trail segments that already exist and to fill in gaps in the existing trail system (Santa Cruz Regional Transportation Commission, January 2008).

TRANSPORTATION MANAGEMENT

Transportation System Management

Transportation Systems Management (TSM) refers to methods to find optimum strategies to relieve, lessen or control traffic congestion with minimum roadway widening. These strategies can reduce vehicle travel time and enhance system accessibility with little impact on other modes (Fukuji Planning and Design, July 2003). Examples of TSM measures include signal synchronization, intersection modifications, access management, i.e., consolidation of driveways, railroad crossing modifications, highway ramp metering, preferential treatment for high occupancy vehicles, and signage and lighting upgrades.

Transportation Demand Management

Transportation Demand Management (TDM) refers to measures that can be implemented to encourage the use of alternative modes of transportation to single occupancy vehicles. TDM emphasizes the movement of people and goods rather than motor vehicles, and gives priority to public transit, ridesharing and non-motorized travel, particularly under congested conditions (Fukuji Planning and Design, July 2003). TDM is a demand side strategy with the purpose to change human travel behavior through incentives and disincentives in order to reduce the number of peak-hour vehicle trips, shift trips to non-peak times, and increase the percentage of people bicycling, walking, riding transit, carpooling and vanpooling (Ibid.). Examples include carpool and vanpool rideshare matching, employer outreach and assistance, emergency ride home programs, telecommuting, bike loan programs, bicycle parking subsidies, bicycle advocacy, and parking pricing and management strategies.

Existing agencies and programs that support and promote TDM in the city of Santa Cruz include the following as presented in the "Master Transportation Study":

- *Santa Cruz Regional Transportation Commission* (SCCRTC) serves many transportation roles in Santa Cruz County, including housing "Commute Solutions" and providing bicycle planning and funding to the region. Commute Solutions provides carpool and vanpool ride matching to commuters throughout Santa Cruz County, especially long-distance commuters.
- *Transportation Membership Services* is run by Ecology Action and offers programs that encourage member employees to use transportation modes other than driving alone to commute to and from work, including Emergency Ride Home Programs, 0% Interest Bicycle Loan Programs and Discount Metro Bus Passes.
- *Ecology Action* supports "Bike to Work," a 10-year old community-based effort that seeks to increase the number of people riding bikes. Ecology Action also receives funds for the Electric Bike Commuter Incentive Program.

- *Onsite Employer Programs.* Major employers within the City that implement TDM measures include: UCSC, SCMTD, the City of Santa Cruz, the County of Santa Cruz, the Seaside Company, the Santa Cruz Medical Clinic, and others.

Traffic Calming

Measures to reduce speeding and cutting through neighborhoods has been a focus over the years as these issues have been raised by residents. Measures include installation of traffic claming measures, signage, and improving the arterial street system.

PARKING

The City of Santa Cruz maintains both on-street and off-street public parking throughout the City, including the Downtown Parking District. Amendments to the State CEQA Guidelines, effective in March 2010, eliminated the environmental checklist question regarding adequacy of parking. Nonetheless, general background on existing conditions is provided below.

Downtown Parking District

Public parking in the downtown area is managed by the Downtown Parking District, which includes the most concentrated City ownership and operation of parking in the City and is the only parking district in the City. In 2007, there were 4,510 parking spaces available to the public, including 820 on-street spaces, 2,247 off-street spaces, and 1,443 private spaces ("Downtown Parking Study, 2007"). In 2010, there were 4,583 parking spaces available to the public, including 830 on-street spaces, 2,226 off-street parking spaces and 1,527 private parking spaces. In 2010, the parking supply (4,583 spaces) in the Downtown Parking District exceeded demand (4,504 spaces). However, by the year 2012 with new projects in place, the demand (4,731 spaces) is estimated to exceed supply (4,638 spaces) by 93 spaces.

The City-operated spaces include a wide variety of parking types dispersed throughout the District, including meters that have different time periods. The municipal parking garages have an average peak occupancy of approximately 85%, with the Cedar/Church garage almost 100% occupied at peak times (Fukuji Planning and Design, July 2003).

New businesses are exempt from typical parking requirements required elsewhere in the City. Business owners have the option of providing required parking or paying a Deficiency Fee that is used to fund, operate and maintain parking facilities. The District charges an annual deficiency fee.

Beach / South of Laurel Area

The Beach / South of Laurel area includes the area directly adjacent to the Downtown Parking District and stretching down to the Beach. It provides parking for both its own set of uses, though also experiences overflow demand from the Downtown and the Beach Areas. The Beach Area itself includes the largest supply of privately provided for-charge parking in the City, as well as a mix of publicly provided parking (Fukuji Planning and Design, July 2003).

The Beach / South of Laurel Area includes about 7,800 parking spaces with over 80% of which, about 6,300 space, are in the Beach Area. A total of 4,145 spaces, a little over 50% of the total, are available to the general public, independent of intended activity. A total of 3,562 of these spaces are in the in the Beach Area and 583 spaces are in the South of Laurel district. Unrestricted publicly available Beach Area spaces are dominated by the two Seaside Company lots, with a combined total of 1,771 spaces, and the City owned and operated 430-space Wharf lot. Other spaces include other City operated lots, on-street meters, and free curbside spaces. South of Laurel general public access spaces include small City operated lots, on-street meters, and free curbside parking spaces. The City operates 633 on-street meters in the Beach and South of Laurel areas (Fukuji Planning and Design, July 2003).

Residential Parking Permit Programs

Due to seasonal influx of visitors and UCSC students and encroachment into residential neighborhoods, the City implements a residential parking program in the following neighborhoods: beach area, downtown, Lighthouse/Cowell neighborhood, eastside, Seabright, and Westside. Residents in these areas must purchase permits to park on streets without citations. According to information on the City's Public Works Department website, the coastal permit programs are enforced seasonally from May 15th through September 30th, between the hours of 9 AM and 9 PM, everyday. The Westside permit program is enforced from September 15th through June 30th, Monday through Friday, during posted hours (excluding City holidays). Parking in these areas without a permit is subject to a citation and fine. The downtown and eastside area permit requirements are enforced all year.

4.4.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address transportation planning, management and traffic. The MOBILITY chapter of the draft *General Plan 2030* corresponds to the required circulation element. Its purpose is to set forth policies and ways to ease the ability of people and vehicles to move around, out of, and into the City in the long term, through 2030. This chapter looks at ways to facilitate transportation alternatives, keep transportation and road systems safe and efficient, and systematically interconnect bicycle and pedestrian ways. The proposals below aim to encourage greater use of alternative transportation modes and reduce automobile travel in concert with other parts of the Plan that foster supportive land uses, building types, and activities. The City Council accepted the following key principle with regard to Mobility:

> *We will provide an accessible, comprehensive, and effective transportation system that integrates automobile use with sustainable and innovative transportation options—including enhanced public transit, bicycle, and pedestrian networks throughout the community.*

The draft General Plan includes four goals and 19 associated policies with 94 accompanying actions that address transportation management and modes of travel. The four goals related to transportation are outlined below. Overall, the accompanying policies and actions Furthermore, proposed General Plan policies seek to maintain an acceptable LOS D or better at signalized intersections with acceptance of a lower LOS at major regional intersections (M3.1.3, M3.1.4) and promote transportation system management strategies (M2.5.2) and other alternative transportation modes.

GOAL M1	Land use patterns, street design, parking, and access solutions that facilitate multiple transportation alternatives.
GOAL M2	A safe, sustainable, efficient, adaptive, and accessible transportation system.
GOAL M3	A safe, efficient, and adaptive road system.
GOAL M4	A citywide interconnected system of safe, inviting, and accessible pedestrian ways and bikeways.

Other goals, policies and actions promote sustainable land use patterns, such as encouraging mixed-use development along the City's four major transportation corridors that have easy access to pedestrian, bike and transit facilities, and encouraging use of alternative transportation modes.

PROPOSED IMPROVEMENTS

The draft *General Plan 2030* includes several policies and actions that call for implementation of road, pedestrian, bicycle and transit improvements through the City's Capital Improvement Program and other sources (M2.1.3, M2.3.2, M3.2.2). The draft Plan supports regional funding and implementation of key regional projects "that can significantly benefit Santa Cruz and further the City's mobility policies" (M2.1.4). There are no specific road transportation improvements identified for specific locations, except for improvement of access to/from the Harvey West area, including a possible new approach to Highway 1 (M3.1.13), and that the circulation system of the specific plan for the Swenson parcel shall be from Shaffer Road (LU1.1.4).

Several policies address visitor traffic improvements. .Policy ED1.2.1 specifically encourages transportation improvements and pedestrian activity along Ocean Street to stimulate economic vitality. Policy ED1.8.4 directs the City to improve access to and routes between tourist and visitor designations and lodging facilities as part of the City's economic development policies. The proposed General Plan also calls for updating the Beach and South of Laurel Area Plan to reflect needed improvements along the Visitor/Beach Area travel corridors (M3.3.3) with improvement of access along these corridors through coordinated signs and street naming, protected turn lanes, remote parking/shuttle programs, and other strategies (M3.3.2).

The draft Plan promotes alternative transportation improvements with TSM strategies, road improvements and widening/expansion projects that can achieve an acceptable LOS (M2.32). Action M4.3.2 seeks to develop bike commute routes along the railroad right-of-way, West Cliff Drive, Broadway, King and other streets. The draft General Plan also includes a policy that prohibits approval or construction of an Eastern Access to the University without a citywide

vote (M2.1.5). No other specific road or alternative transportation projects are identified for specific support. The draft *General Plan 2030* also encourages passenger rail transit or other alternative transportation options along the existing rail corridor via the continued support, acquisition, and expansion of railroad rights-of-way (M2.2) and encourages the continuing transport of goods by rail (M2.2.1). Policy LU4.5 supports securing land for development of a transit center along the rail line, and evaluation of a rail transit stop is to be included in the Area Plan analysis for the Golf Club Drive area (LU1.15). Pedestrian and bicycle access to Pogonip and nearby employment areas are also to be included in this future area plan.

POTENTIAL FUTURE DEVELOPMENT

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Additionally, land use designation changes are proposed for three specified sites: Swenson, Golf Club Drive area, and an addition to the Dimeo Lane landfill site. The Swenson and Golf Club Drive sites are designated for residential uses. A 5.5-acre parcel immediately south of and adjacent to the City's Landfill and Resource Recovery Center on Dimeo Lane has been acquired by the City, and it is expected that future uses would be ancillary to the landfill and Resource Recovery Center uses. Specific uses have not yet been identified and will be determined in the future, however, the parcel is not planned for expansion of the landfill disposal operations (Arman, personal communication, April 2010).

Additionally, some of the *General Plan 2030* policies and actions also support mixed use districts and/or intensified redevelopment along transit and commercial corridors (Policies LU3.3.1 and LU4.1). In addition, the proposed *General Plan 2030* supports development of a downtown performing arts center or expansion of the Civic Center (Policy HA2.2.5).

4.4.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

4a 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 (see discussion of City standards below);

4b Change the level of service of a State Highway roadway segment from acceptable operation (LOS A, B, or C) to deficient operation (LOS D, E or F) based on Caltrans significance criteria[7];

4c 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;

4d Substantially increase hazards due to a design feature (for example, sharp curves or dangerous intersections) or incompatible uses (for example, farm equipment);

4e Result in inadequate emergency access; or

4f Conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities or otherwise decrease the performance or safety of such facilities.

The City of Santa Cruz considers "D" or better to be an acceptable intersection level of service for intersections, which is a policy in the City's existing General Plan as well as in the proposed General Plan. A significant impact would result if LOS dropped below a "D" level of service or where a project would contribute traffic increases of more than 3% at intersections currently operating at unacceptable levels (E or F), as further described below. The existing and proposed General Plans also account for accepting a LOS below "D" at major regional intersections where improvements would be prohibitively costly or result in significant, unacceptable environmental impacts. There are no other adopted plans, ordinances or policies that establish "measures of effectiveness" for the performance of the circulation system.

For City intersections that already operate at unacceptable levels of service (E or F), the City considers project impacts to be significant if congestion will measurably worsen at the intersection as a result of the project. "Measurably worse" is considered to be a 3% increase in trips at the affected intersection. The City has used the 3% significance criterion for project trip contribution at existing impacted intersections, in part based on directives in the City's existing General Plan to accept a certain level of congestion during peak hours at major intersections, as well as to reflect variations in daily traffic volumes. The 3% criterion has been used throughout the City and is based upon the likelihood that a project will result in an observable increase in congestion at a given intersection or road segment. This is based in part on information provided by Caltrans in the yearly "Traffic Volumes" reports that identifies the standard deviation expected with regards to reliability of traffic count data. The standard deviation ranges indicate a 12% deviation at 10,000 vehicle trips, meaning that if a traffic count totals 10,000 vehicles per day, then approximately 90% of the time, the actual traffic counts will lie within a range of 8,800 to 11,200 vehicles. Thus, the 3% reflects this variation in daily traffic conditions (California Department of Transportation, June 2006).

[7] Caltrans. December 2002. "Guide for the Preparation of Traffic Impact Studies."

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address potential impacts to the City's circulation system (4a); potential traffic impacts on state highways (4b); potential increase in hazards (4d); and potential conflicts with adopting policies, plans or programs that support alternative transportation (4f). There are no applicable congestion management programs in effect within the City of Santa Cruz (4c), and thus this is not an issue that needs discussion. Emergency access issues (4e) are addressed in the "Fire Protection" and "Police Protection" subsections of the PUBLIC SERVICES (Chapter 4.8) section of this EIR.

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. The proposed General Plan would accommodate future development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030.[8] The projections indicate the following level of new development by the year 2030:

- 3,350 residential units
- 1,087,983 square feet of commercial development and 311 hotel rooms
- 1,273,913 square of office space
- 776,926 square feet of industrial development.

The proposed *General Plan 2030* supports infill development along transportation corridors to promote alternative land use patterns to help reduce automobile travel. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[9] approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located along these corridors. Thus, new development would be concentrated in specific areas.

The proposed General Plan also includes other policies and actions that could result in development that supports year-round expanded performances, events, visitors that would result in potential traffic increases. These potential uses include:

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[8] The projections are based on the draft Land Use Map, taking into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels, assuming that not all development will occur at maximum density. On average it is assumed that all new development will occur at 80% of the permitted residential density or floor area ratio. See Appendix B for further discussion.

[9] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

- Supporting a downtown performing arts center or expansion of the Civic Center (HA2.2.5),
- Amending the Zoning Ordinance to allow development of arts and cultural facilities in a wide variety of districts (HA2.2.4),
- Supporting Santa Cruz as a year-round conference destination (Policy ED1.4), and supporting development of a new conference center (ED1.4.1) or developments that accommodate conferences (ED1.5.1),
- Encouraging development of new lodging facilities (ED1.5) and attracting top-end, full-service hotels (ED1.5.2),
- Supporting year-round events (HA3.2.4), and promoting Santa Cruz as a year-round arts destination, and
- Promoting Santa Cruz as a principal retail, cultural, recreational, entertainment and commercial destination in the region (ED1.1).

There are no specific locations or intensity of development anticipated for these types of uses. It is likely that development of such entertainment and/or visitor-serving uses would be within the total square footage of commercial development that has been estimated for the proposed *General Plan 2030* buildout. Adoption of Arts and Entertainment Districts also is supported in the draft plan (HA3.1.1), but most performances do not occur during peak commute hours.

Impact 4.4-1: Traffic Impacts on Intersections Levels of Service (LOS) Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic, resulting in changes in intersection levels of service to unacceptable levels or further deterioration of intersections currently operating at unacceptable levels of service. With implementation of proposed *General Plan 2030* policies and actions, including road improvements identified in an updated Traffic Impact Fee program, intersection operations would be improved and traffic levels would be reduced, except at eight intersections. This is considered a *significant impact.*

PROJECT TRIP GENERATION AND DISTRIBUTION

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized above. This potential development would generate an estimated 78,260 new daily trips with approximately 7,180 trips occurring during the PM peak hour. The Traffix model was used for the traffic impact analysis, which estimates the trip generation for all uses and distributes these new trips to the existing road network.

The trip generation is based on the new potential development expected with buildout under the *General Plan 2030*. Results of surveys conducted for the MTS indicate that 58% of all trips by City residents are made for shopping, work or personal purposes. In addition about 75% of

all trips made by residents remain within the City of Santa Cruz. If it is assumed that this distribution will remain relatively constant for all new residents in the City then approximately 44% of all trips made by new residents will be to commercial, office, industrial or personal service facilities within the City (Marquez, March 2010). Appendix C provides a full description of trip generation assumptions. A reduction was also included for trips generated along the new mixed-use corridors in which transportation modes other than vehicles would be used.

The traffic forecast includes assumptions regarding trip reduction due to mixed use and smart growth developments, which in part utilized information identified in the MTS regarding travel patterns, taking into account travel patterns identified in the City's "Master Transportation Study." See Appendix C for further discussion of these underlying assumptions and the details of determining trip generation rates.

INTERSECTION LEVEL OF SERVICE

Project traffic volumes were calculated by adding peak-hour project trips generated by the estimated General Plan buildout to the existing volumes, which are provided in Appendix F-5. The LOS calculations are included in Technical Appendix F-6, which is available for review at the City of Santa Cruz Planning Department[10] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

Intersection levels of service during the PM peak hour with addition of new development accommodated by the *General Plan 2030* are summarized on Table 4.4-2. A majority of the intersections would drop from LOS B or C to LOS C or D, but would remain within the City's acceptable LOS of "D". However, 21 intersections would operate at unacceptable levels of service. Of these, the following ten intersections would degrade from acceptable to unacceptable levels of service as follows, which include three unsignalized intersections:

- Mission / Laurel – from LOS B to **F**
- Mission / King-Union – from LOS C to **F**
- Mission / Chestnut – from LOS D to **F**
- Ocean / Broadway – From LOS C to **F**
- N. Branciforte / Water – From LOS D to **E**
- Branciforte / Soquel – From LOS C to **E**
- Seabright / Murray – From LOS D to **E**
- Beach / Pacific – From LOS C to **E**
- River / Fern – From LOS B to **F**
- Swift / Delaware– From LOS C to **F**

Five intersections would drop from an unacceptable "E" to "F" LOS s to include the following, of which only one is unsignalized (Western/High):

- Mission / Bay – From LOS **E** to **F**
- River / Encinal – From LOS **E** to **F**
- Ocean / San Lorenzo-East Cliff – From **E** to **F**

[10] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

- Ocean / Water – From **E** to **F**
- Western / High – From **E** to **F**

Six intersections would continue to operate at unacceptable levels of service E or F as identified below, which are unsignalized, except for the signalized River/Highway 1 intersection. For unsignalized intersections the delays are experienced on the minor approach.

- River / Highway 1 – Remain at **F** with further delays
- Bay / Escalona – Remain at **F** with further delays
- High / Laurent – Remain at **F** with further delays
- Seabright / Water – Remain at **F** with further delays
- Bay / California Ave. – Remain at **F** with further delays
- Bay / California St. – Remain at **F** with further delays

Improvements have been identified for the intersections forecast to operate at unacceptable levels of service as a result of future development accommodated by the *General Plan 2030*. Many of the impacted intersections can be improved to an acceptable LOS with signalization, turning restrictions, and/or other improvements. Table 4.4-3 summarizes these improvements and resulting LOS and delays for the impacted intersections. However, even with improvements, the following eight intersections would remain at an unacceptable LOS:

- Western / High – Would improve from **F** to **E**
- River / Highway 1 – Would remain at **F**
- Bay / Mission – Would remain at **E**
- Laurel / Mission – Would remain at **F**
- Chestnut / Mission – Would remain at **F**
- Ocean / Water – Would improve from **F** to **E**
- Seabright / Water – Would improve from **F** to **E**
- Seabright / Murray – Would remain at **E**

Intersections that are identified in the current TIF Program as requiring improvement in the future are those listed below. The proposed General Plan 2030 supports maintaining and updating the City's Traffic Impact Fee (TIF) program to implement road improvements (M3.1.5, M2.1.3). The TIF Program would be updated to reflect new intersections and/or new or revised improvements identified as a result of the EIR analyses and recommendations. Improvement costs and potentially revised impact fees would be calculated.

- Western/High (Extended two-way left turn lane)
- High/Laurent (Signalization)
- River-Hwy 9/Hwy 9
- Bay/Escalona (turn Restrictions
- Mission/Bay
- Mission/Chestnut
- Ocean/Water
- Bay/California Street
- Branciforte/Soquel
- Ocean/San Lorenzo-E. Cliff Dr
- Seabright/Murray
- Beach/Pacific

TABLE 4.4-2
Intersection PM Peak Hour Levels of Service with *General Plan 2030* Buildout

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
SIGNALIZED INTERSECTIONS				
1	Western/Hwy. 1	B		
2	Swift/Mission	D		
3	Miramar/Mission	C		
4	Almar-Younglove/Mission	C		
5	**Bay/Mission**	**F**	**164.1**	**1.347**
6	**Laurel/Mission**	**F**	**87.9**	**1.201**
7	Walnut/Mission	D		
8	**King-Union/Mission**	**F**	**90.5**	**1.143**
9	**Chestnut-Hwy. 1/Mission**	**F**	**121.8**	**1.228**
10	Moore/High	A		
11	Bay/High/Coolidge	D		
12	Bay/Nobel-Iowa	B		
13	Bay/King	C		
14	California/Laurel	C		
15	Chestnut/Laurel	C		
16	Center/Laurel	C		
17	Center/Mission	C		
18	Pacific/Laurel	D		
19	Front/Laurel	D		
20	Front/Metro Center	A		
21	Front/Cathcart	A		
22	Front/Soquel	C		
23	Front/Cooper	A		
24	Front-Pacific/Mission-Water	C		
25	River/Water	D		
26	N. Pacific/River	B		
27	River/Potrero	B		
28	**River/Hwy. 1**	**F**	**209.0**	**1.540**
29	**River/Encinal**	**F**	**198.7**	**1.715**
30	San Lorenzo/Laurel-Broadway	B		
31	Riverside/San Lorenzo	D		
32	Riverside/Third	D		
33	Riverside/Beach	A		
34	**Ocean/San Lorenzo-East Cliff**	**F**	**113.9**	**1.168**
35	**Ocean/Broadway**	**F**	**90.8**	**1.153**
36	Ocean/Soquel	D		
37	**Ocean/Water**	**F**	**169.4**	**1.454**
38	Ocean/Kennan-Washburn	B		
39	Ocean-Hwy.17/Ocean-Plymouth	D		
40	Market/Water	C		

TABLE 4.4-2
Intersection PM Peak Hour Levels of Service with *General Plan 2030* Buildout

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
41	**N. Branciforte/Water**	**E**	**73.7**	**1.117**
42	**Branciforte/Soquel**	**E**	**67.6**	**1.073**
43	S. Branciforte/Broadway	B		
44	Seabright/Soquel	D		
45	Seabright/Broadway	C		
46	**Seabright/Murray**	**E**	**62.7**	**1.013**
47	Morrissey/Water-Soquel	D		
48	Morrissey/Fairmount	B		
49	Frederick/Soquel	D		
50	Hagemann-Trevethan/Soquel	B		
51	Park/Soquel	B		
52	Capitola Rd./Soquel Ave.	C		
53	La Fonda/Soquel	B		
54	Riverside-Dakota/Soquel (new)	A		
55	River S./Soquel	B		
56	Seventh Ave./Soquel Ave.	C		
57	Seventh Ave./Capitola Rd.	C		
58	Seventh Ave./Eaton	D		
UNSIGNALIZED INTERSECTIONS				
59	**Bay/California St**	**F**	**OVRFLW**	**2.917**
60	**Bay/California Ave**	**F**	**150.3**	**1.429**
61	West Cliff/Bay	C		
62	**Beach/Pacific Ave**	**E**	**39.9**	**1.058**
63	Pacific Avenue/Center	C		
64	Storey/King	D		
65	**River/Fern**	**F**	**OVRFLW**	**1,251**
66	King/Laurel	D		
67	**Laurent/High**	**F**	**94.1**	**1.190**
68	Market/Isbel-Goss	C		
69	North Branciforte/Goss	C		
70	Highway 1/Shaffer Rd	C		
71	Cedar/Laurel	D		
72	**Bay/Escalona**	**F**	**OVRFLW**	
73	**Western/High**	**F**	**69.5**	**0.678**
74	Cliff/Beach	B		
75	Riverside/Second-Liebrandt	A		
76	**Seabright/Water**	**F**	**OVRFLW**	**2.963**
77	**Swift and Delaware**	**F**	**241.6**	**2.751**
78	Seventh Ave./Brommer	D		
79	Seventh Ave./E. Cliff	C		

SOURCE: Hatch Mott MacDonald

TABLE 4.4-3
Intersection PM Peak Hour Levels of Service with Recommended Improvements

Intersection	Existing		Buildout		Recommended Improvement	With Mitigation	
	LOS	Delay	LOS	Delay		LOS	Delay
Western Dr/High St	E	45.9	F	69.5	TWLTL	**E**	38.1
High/Laurent	F	59.6	F	94.1	Signalize	B	18.2
River-Hwy 9/Hwy 1	F	83.9	F	209	Ebnd 2l 3t 1r, wbnd 2l 3t 1r, nbnd 1tl 1t 2r, sbnd 2l 1tl 1t 1r	**F**	80.8
River/Fern	B	14.5	F	Ovrfl	Signalize no l esbnd	B	15.1
River/Encinal	E	73.9	F	198.7	Ebnd 1l 1tr 1r, wbnd 1l 1tr, nbnd 1l, 1t, 1r, sbnd 1l,1t, 1tr	D	37.9
Bay St/Escalona Dr	F	782.2	F	Ovrfl	Escalona right turns only	C	18.3
Bay/Mission	E	55.8	F	164.1	Ebnd 1l, 2t,1r, wbnd 1l,2t,1r,nbnd 1l,1t,1r, sbnd 2l,1t,1r	**E**	57.7
Mission/Laurel	C	24.9	F	87.9	Add Ebnd r	**F**	85.6
Mission/King	C	32.7	F	90.5	Ebnd no l, 2t, 1tr, wbnd 1l, 1t, 1tr,nbnd 1ltr, sbnd 2l 1ltr	D	50.8
Mission/Chestnut	D	42.9	F	121.8	Ebnd 2l, 2t, 1r, wbnd 1lt,1t, 1r, nbnd 1l, 1t, 1tr, sbnd 1l,2t, 2r	**F**	112.9
Ocean/Water	E	73.6	F	169.4	Ebnd 2l, 2t, 1r, wbnd 1l,2t, 1r, nbnd 1l, 2t, 1tr, sbnd 2l, 3t, 1r	**F**	130.7
Seabright/Water	F	112.8	F	Ovrfl	Extend TWLTL & add nbnd r	**E**	39
Water/Branciforte	D	36.6	E	73.7	Add ebnd 1, nbound r & sbnd r	D	53.6
California Ave/Bay	F	67.6	F	150.3	Allow nbnd t free	D	26.4
California St/Bay	F	434	F	Ovrfl	Allow sbnd t free	B	12.5
Branciforte/Soquel	C	23.6	E	67.6	Esbnd 1 l, 1t, 1 tr, wsbnd 1l, 1tr no splt phase	C	24.5
Ocean St/Broadway	C	34.3	F	90.8	Prohibit lfts from Ocean	D	36.5
Pacific/Beach	C	20.9	E	39.9	Roundabout	C	
Ocean St/San Lorenzo-ECliff Dr	E	64.7	F	113.9	Add sbnd r	D	53.2
Seabright/Murray	D	43.7	E	62.7	ADD wsbnd r, nbnd r & sbnd r	**E**	59.4
Swift/Delaware	C	23.9	F	241.6	Roundabout/Signal	C	20.1

The mitigation measure column reflects the recommended lane geometry where r = right turn lane, rt = right/through lane, l = left turn lane, lt = left/through lane, t = through lane, and twltl = two-way left turn lane.

SOURCE: Ron Marquez

IMPACT DISCUSSION

The proposed *General Plan 2030* strives to maintain LOS D or better at signalized intersections with acceptance of a lower LOS at major regional intersections if necessary improvements would be too costly or result in significant environmental impacts (Policies M3.1.3, M3.1.4). In conjunction with this directive, Policies M2.1.3, M2.1.4 and ED1.9.2 direct the City to implement pedestrian, bike, mass transit, and road system improvements through the Capital Improvements Program (CIP), and draft plan supports "regional funding and implementation of key regional projects that can significantly benefit Santa Cruz and further the City's mobility policies," although it is not clear what these projects may be. As most of the recommended improvements to impacted intersections are within the City's TIF Program or would be added with proposed updating of the TIF (M3.1.5), the needed improvements are expected to be implemented over time as projects are added to the City's CIP. Intersections along state highways would also come under the jurisdiction of Caltrans. Overall, intersection improvements would be constructed within existing developed rights-of way, and would not be expected to required construction on undeveloped land that would result in potential significant impacts. However, an appropriate level of environmental review would be required at the time a specific intersection improvement is proposed.

As shown on Table 4.4-3, eight intersections would remain at unacceptable levels of service even with implementation of identified improvements. These include four major intersections within the City that carry regional and visitor traffic: River-Highway 9/Highway 1; Mission/Chestnut, Mission/Bay and Ocean/Water. For these intersections, the proposed *General Plan 2030* accepts a lower LOS at major regional intersections (M3.1.4). These intersections would be considered major intersections, and are also included in the existing General Plan as deficient intersections for which a lower LOS would be accepted. However, while, the City may be willing to accept a lower LOS at the intersections along Highway 1- Mission Street, these intersections are within the jurisdiction of Caltrans and would not meet its desired C-D LOS. The recommended intersection improvements would improve delay to slightly less than what occurs under existing conditions even though an acceptable LOS still would not be achieved with the improvements at one of these intersections: River-Highway 9/Highway 1.

The other four intersections that would remain at unacceptable levels of service include: Mission/Laurel (Caltrans intersection), High/Western, Seabright/Water and Seabright/Murray. As shown on Table 4.4-3, delays would be reduced below existing levels with implementation of the recommended improvements at the High/Western and Seabright/Water intersections. The level of service calculation for these two intersections is based on the left turn movement from the minor stop controlled street. Overall both of these intersection operate well, despite the LOS. However, the Mission/Laurel and Seabright/Murray intersection would operate at an unacceptable level of service.

The Draft *General Plan 2030* includes goals, policies and actions that set forth comprehensive measures to reduce vehicle trips, increase vehicle occupancy, encourage use of alternative transportation modes, and promote alternative-sustainable land use patterns, all of which would help reduce vehicle trips, and avoid and minimize adverse impacts related to traffic. A summary of the proposed *General Plan 2030* policies that serve to reduce/mitigate impacts of increased traffic is presented in Table 4.4-4.

Policy M2.3 and its four accompanying actions seek to increase the efficiency of the City's multi-modal transportation system to design for and accommodate multiple transportation modes (M2.3.1), as well as TSM measures and road improvements to achieve an acceptable level of service (M2.3.2). Policies M3.1.1 and M3.1.2 direct the City to seek ways to reduce vehicle trip demand, reduce the number of peak hour vehicle trips, and encourage high occupant vehicle travel. A significant rise in vehicle occupancy from the existing average of 1.2-1.3 persons per vehicle would provide additional road capacity, increase the efficiency of the existing transportation and roadway system and reduce the need for costly improvement to the road system (Santa Cruz County Regional Transportation Commission, June 2010).

TABLE 4.4-4
Proposed General Plan Policies and Actions that Reduce Traffic Impacts

Type of Measure / Action	Policies / Actions

MAINTAIN LEVEL OF SERVICE STANDARD & IMPLEMENT TRANSPORTATION IMPROVEMENTS	• Maintain LOS D or better at signalized intersections; accept lower LOS at major regional intersections: M3.1.3, M3.1.4
	• Implement road improvements & alternative transportation to achieve acceptable LOS: M2.3.2
	• Manage, reduce congestion: M.3.1, M2.4.4 (work with UCSC)
	• Maintain road system with efficient arterial operations: M3.2.2, M3.3.6, M3.1.12 (coordinated signal timing)
	• Promote TSM strategies: M2.5.2
	• Improve access along the Visitor/Beach Area travel corridors: M3.3.2
	• Maintain/update Traffic Impact Fee and implement road improvements: M3.1.5; M2.1.3
	  ⅄ Implement pedestrian, bike, transit & road improvement through CIP: M2.1.3, ED1.9.2
	  ⅄ Support regional funding & implementation of key regional projects that benefit Santa Cruz: M2.1.4
	  ⅄ Transportation improvements on Ocean: ED1.2.1
	  ⅄ Visitor access improvements: ED1.8.4

REDUCE AUTO/VEHICLE TRIPS & INCREASE VEHICLE OCCUPANCY	• Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1.1, M3.1.2 • Encourage employment-related strategies (i.e., flex-time, telecommuting, parking management, ridesharing): M3.1.7, M3.1.8, M2.4.4
ENCOURAGE MULTI-MODAL SYSTEMS	• Design, accommodate & increase efficiency of multiple transportation modes: M2.3, M2.3.1, ED1.9.2 (alternative transportation), NRC4.4.2, M3.1.11 (studies to determine deficiencies) • Include pedestrian, bike, transit facilities in ROW acquisition, street design, bridge & road projects: M1.4.1, M1.4.2, M2.3.3 • Develop Depot Park as multi-modal center: LU3.5.2 • Multi-modal use of future rights-of-way: M1.4.2
ENCOURAGE ALTERNATIVE TRANSPORTATION MODES	• Encourage use of alternative transportation modes: M.2.1.2 • Promote alternative transportation with TSM strategies: M2.3.2, M2.5.2 • Connect activity centers with pedestrian & bike paths: M1.1.2 • Encourage hotels to provide bike/shuttle programs: M2.3.4 • Employment and parking-related strategies: M3.1.7, M3.1.8, M3.1.9

(CONTINUED ON NEXT PAGE)

TABLE 4.4-4
Proposed General Plan Policies and Actions that Reduce Traffic Impacts

Type of Measure / Action	Policies / Actions
➤ Bicycle Use	• Interconnected bike network & maintain/update Bike Plan: M4.2, M4.2.1, M4.2.2, M4.2.3 • Implement bicycle improvements: M2.1.3 • Bike lanes: M4.3.1, 4.5.4 • Bike commute routes: M4.3.2 (rail r-o-w, West Cliff, Broadway) • Support bicycle improvements, amenities & maintenance: M4.4 & actions, M4.2.6, M4.3, M4.5 & actions, PR1.6.4 (at parks); CC8.4 (at educational facilities)
➤ Pedestrian Use	• Connected street and pedestrian network: CD5.1, M1.1.2, M1.1.3, M4.1.5 (development dedication) • Implement pedestrian improvements: M2.1.3, M1.3.1 • Implement MTS pedestrian recommendations; update/implement Pedestrian Master Plan: CD5.1.1, M1.2, M4.1.1 • Encourage walking: M4.1, M4.1.3 and pedestrian access: CC8.4 • Neighborhood parking strategies & development designs to foster pedestrians: CD 5.2.3, M4.1.7
➤ Transit Use & Expansion	• Encourage transit options & increased transit service, capacity & ridership: M1.1.3, M2.1.1, M2.4, M2.4.2, M2.4.6, M2.4.7, M2.4.8 (commuter travel), M2.4.9 • Implement transit improvements: M2.1.3 • Consider giving priority to transit on City corridors: M2.4.5 • Conveniently located transit stops, centers & transit links: M.1.4, M2.4.11 and as part of new development: M2.4.12, M2.4.12 • Encourage maintenance/upgrading of transit infrastructure: M.2.4.10 • Encourage Beach shuttle: M2.4.1
➤ Rail	• Encourage/support passenger rail transit & other modes along rail ROW: M2.2, M2.2.1 • Rail Land Use Plan: LU4.2.4 • Rail Transit Center: LU4.5, LU4.5.2 • Condition development along rail-potential stops: LU4.5.2 • Encourage transport of good by rail: M2.2.2
LAND USES / PATTERNS TO REDUCE VEHICLE TRIPS	• Reduce auto use with pedestrian/transit-oriented activity centers & development centers (M1.1) • Expand neighborhood facilities (LU4.3, LU4.3.1) • Encourage land use changes that reduce auto use: LU4.2); locate community facilities within walking distance to residential areas and transit: (CC2.1.4) • Encourage home occupations & telecommuting: LU4.4, LU4.4.1 and live-work units: LU4.1.4, HA4.4 (artists) • Ensure optimum utilization of infill parcels (LU1.1, LU1.1.1) and Consolidation of Underutilized Parcels (LU1.1.2) • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU4.1.1, LU4.2.2 (new districts), LU4.2.3, LU4.1.3 • Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2

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TABLE 4.4-4
Proposed General Plan Policies and Actions that Reduce Traffic Impacts

Type of Measure / Action	Policies / Actions
	• Encourage higher/maximum densities: LU3.6.1 (Lower Front St), LU3.7, LU3.7.1, LU3.8 • Encourage higher densities along transit/commercial corridors: LU4.1, LU4.1.1 • Encourage University shopping/services on UC lands: LU4.2.5
REDUCE & DISCOURAGE THROUGH-TRAFFIC IN NEIGHBORHOODS	• Discourage, reduce, and slow through-traffic: M3.3 • Enhance neighborhood livability through road& transit design: M3.3.1 • New development to be designed to discourage through traffic and encourage bicycle or pedestrian connections: M3.3.5 • Reduce traffic in residential neighborhoods by improving arterial and collector streets: M3.3.6 • Develop neighborhood traffic control plans where necessary to minimize traffic impacts on local streets: M3.3.7

Policy M2.1.2 encourages use of alternative modes of transportation, and numerous policies and actions support expanded and improved bicycle and pedestrian facilities, a well as increased transit use. Several policies support higher land use densities along transit corridors (LU4.1, LU4.2, M1.1) to support land use patterns that reduce reliance on automobiles. Home occupations and telecommuting also are encouraged (LU4.4). The draft General Plan also directs the City to improve access to and routes between tourist and visitor designations and lodging facilities as part of the City's economic development policies ED1.8.4).

These policies would serve to help reduce project vehicular traffic and thus reduce traffic impacts in addition to proposed intersection improvements. Of the eight identified intersections that would remain at unacceptable levels of service with implementation of identified improvements, four are at major intersections where the City has historically accepted a lower level of service at major regional intersections where improvements would be too prohibitively costly or could result in unacceptable significant environmental impacts, and this policy is maintained in the proposed General Plan (M3.1.4), although the intersections within Caltrans' jurisdiction would not meet Caltrans LOS standards. Additionally, the delays at these intersections would be less than without the improvement, and at the Highway 1/Highway 9 intersection, the delay would be less than under existing conditions. The other four intersections that would remain at unacceptable levels of service, although delays would be reduced to levels below existing conditions at the Western/High and Seabright/Water intersections.

Roadway, as well as bicycle and other non-vehicular improvements, would be contingent on future funding. The potential growth estimated to result from implementation of the proposed *General Plan 2030* could generate nearly $32 million in impact fees at current rates that could be used for improvements, of which 15% would be for alternative transportation. However the TIF program, including improvements, costs and impact fees, would be updated pursuant to actions specified in the draft General Plan (M3.1.5). Improvements to intersections along state highways would be contingent on Caltrans approval and state and/or federal funding. Revenues for transportation, including road and other transportation mode improvements, have not kept pace with the multimodal needs of travelers in Santa Cruz County (Santa Cruz County

Regional Transportation Commission, June 2010). Given chronic state budget deficits, as well as reduced local revenues funding road, bicycle, and pedestrian improvements will continue to be a challenge. Additionally, the lack of community consensus on regional highway improvements and local multi-use paths further constrain the feasibility of either roadway or alternative transportation mode improvements being implemented (Santa Cruz County Regional Transportation Commission, June 2010).

Revenue issues and service cuts have reduced the SCMTD's level of service, affecting the ability to increase transit service. It is estimated that 1,500 to 2,000 additional transit passengers may need to be served with projected General Plan buildout. It is expected that service would continue along major the City's major transportation corridors and where high use is concentrated. However, additional funding will be necessary to expand transit service in the future and provide implementation of "Sustainable Community" strategies,[11] and such funding, is at this time uncertain (SCMTD, White, personal communication, August 2011).

Conclusion. Future development accommodated by the proposed *General Plan 2030* would generate traffic that would result in unacceptable levels of service at 21 intersections, all of which could be improved to acceptable levels with intersection improvements, except for four local intersections and four intersections on state highways. Therefore, these intersections could not be improved to an acceptable LOS to meet City or Caltrans' standards, and the resulting effects on these eight intersections would be considered a significant impact unavoidable impact as no feasible improvements have been identified. With implementation of the identified improvements and proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, the impact could be reduced to a less-than-significant level at the remaining impacted intersections. However, funding availability likely will remain constrained for major facility improvements and expansion of transit service into the foreseeable future. Thus, implementation of recommended improvements and alternative transportation facilities cannot be assured, and thus, the impact to the intersections identified as operating at unacceptable levels of service under the proposed *General Plan 2030* remains significant.

Mitigation Measures

With implementation of the proposed *Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, the impact could be reduced to a less-than-significant level at all but four intersections along state highways and the four local intersections. Impacts would remain significant and unavoidable. With uncertainly regarding funding and implementation of transportation projects for the other intersections, the impact remains

[11] Senate Bill 375 (SB 375) provides a means for addressing greenhouse gas (GHG) emissions by aligning regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation, thereby discouraging urban sprawl and reducing vehicle miles traveled, with an emphasis on increasing land use intensity along transit corridors. See the GLOBAL CLIMATE CHANGE (Chapter 4.12) section of this EIR for further discussion.

significant and unavoidable. However, revision of the following *General Plan 2030* action is recommended.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

M3.1.4 Accept a lower level of service and higher congestion at major regional intersections if necessary improvements would be ~~too~~ prohibitively costly or result in significant, unacceptable environmental impacts.

Impact 4.4-2: Traffic Impacts on State Highway Levels of Service (LOS) Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic on state highways in the regions (Routes 1, 17, and 9), which would further exacerbate existing unacceptable levels of service. This is considered a *significant impact.*

The proposed project would result in increased traffic on state highway segments. It is estimated that the proposed project would generate approximately 78,235 weekday daily trips. Based on the results of the TRAFFIX model, the distribution of project traffic to state highways is estimated as follows:

- Highway 1, southbound: 24.6% of all trips
- Highway 9, north of City Limits: 1.9% of all trips
- Highway 17, northbound: 20.5% of all trips

Based on this distribution, traffic resulting from future development accommodated by the proposed *General Plan 2030* would increase traffic on southbound Highway 1 by approximately 19,250 daily trips, on northbound Highway 17 by approximately 16,000 daily trips, and on northbound Highway 9 by about 1,500 daily trips. This represents an increase of approximately 20% on Highway 1 and 22% on Highway 17, which would be considered a substantial increase.

According to the Transportation Concept Report for state highways, the target level of service for State Highway 1 west of Morrissey Boulevard is LOS D, and the target level of service for State Highway 17 south of Pasatiempo is LOS E (Caltrans, April 2006, January 2006). However, according to the Caltrans Guide for the Preparation of Traffic Impact Studies (Caltrans, 2002), if an existing State Highway facility is operating at less than the target LOS, the guide states that the existing LOS should be maintained. Highway 1 between Morrissey and Branciforte Creek Bridge operates at a E-F LOS (Caltrans, October 2010), and Highway 17 operates at LOS F (Caltrans, January 2006).

The addition of project-related traffic would contribute to significantly worsened conditions. However, some of this traffic would be within projected future volumes estimated by Caltrans. According to Caltrans' studies, Highway 1 traffic near Morrissey-Branciforte Creek Bridge is expected to increase by 50,000 daily trips in 2030-2035 (Caltrans, October 2010). Future year traffic volumes were projected using growth rates from AMBAG's regional travel demand model, version April 2007, applied to 2007 counts (Ibid.). By incorporating trip reduction and smart growth design in the proposed General Plan policies and actions, the forecast of increased traffic on Route 1 as a result of potential development accommodated by the *General Plan 2030* is significantly less than that anticipated in Caltrans Corridor Systems Management Plan.

The Route Concept Report for Highway 1 includes the addition of High Occupancy Vehicle (HOV) lanes to Highway 1. This project will add a lane in each direction to reduce congestion, encourage carpooling, expand express bus service, and improve safety. The limits of this project extend from Morrissey Boulevard to San Andreas Road/Larkin Valley Road. Project environmental review and preliminary design are underway. Caltrans' draft "Corridor System Management Plan's" strategy for Highway 1 includes new express bus services on the planned HOV lanes, support of land use and transportation efforts to reduce traffic, and overall reduction of congestion by encouraging alternative transportation facilities and programs. The County and Caltrans are also working on design and environmental review for reconstruction of the La Fonda Avenue overcrossing as part of the Auxiliary Lane Project.

The Route Concept Report for Highway 17 identifies an increase of about 8,100 daily trips to the year 2023 (Caltrans, January 2006). The report acknowledges that Highway 17 will remain a 4-lane freeway without widening. Using the traffic forecast in the Corridor System Management Plan for Route 1 the increase in volume on Route 17 would range from 30,000 to 40,000 vehicles per day by the year 2035. Again this figure is well above the volume forecast for the general plan.

As discussed above in the Impact 4.4-1 analysis, the Draft *General Plan 2030* includes goals, policies and actions that set forth comprehensive measures to reduce vehicle trips, increase vehicle occupancy, encourage use of alternative transportation modes, and promote alternative-sustainable land use patterns, all of which would help reduce vehicle trips, and avoid and minimize adverse impacts related to traffic. The draft Plan encourages use of alternative modes of transportation, and numerous policies and actions support expanded and improved bicycle and pedestrian facilities, as well as increased transit use. Several policies support higher land use densities along transit corridors to support land use patterns that reduce reliance on automobiles. The draft Plan supports regional funding and implementation of key regional projects "that can significantly benefit Santa Cruz and further the City's mobility policies" (M2.1.4).

Caltrans is responsible for improvements along state routes and has proposed a series of improvements along Highway 1, which would improve transit and carpooling with addition of an HOV lane. While overall levels of service would remain unchanged if the additional lane were not an HOV lane, average speeds would be increased and delays reduced (Caltrans, October 2010). Similarly, Highway 17 is forecast to remain at an unacceptable LOS in the future with no potential improvements having been identified. Both the Highway 1 planned HOV lanes and Soquel/Morrissey auxiliary lanes are supported in the current Regional

Transportation Plan. The SCCRTC assumes that a half-cent, 30-year sales tax measure or similar local funding mechanism will be ultimately be approved (Santa Cruz Regional Transportation Plan, June 2010).

The increase of 1,500 vehicles per day on Route 9 will not result in a significant impact. The existing volumes on Route 9 range from 5,000 AADT to 5,600 ADT north of City limits during peak months. Traffic volumes have increased on this highway approximately 1,000 vehicles per day in the last 30 years. Route 9 is a conventional undivided two-lane highway which is classified as a major collector. No major improvements are planned in the corridor from Santa Cruz to Felton north of the City limits. (Transportation Planning Fact Sheet State Route (SR) 9 in Santa Cruz County, Caltrans).

Conclusion. Future development accommodated by the proposed *General Plan 2030* would generate traffic that would contribute to existing and future forecast unacceptable levels of service along Highway 1 and Highway 17. Project traffic represents a significant addition, although the estimated General Plan buildout traffic is less than the future forecasts estimated by Caltrans in its draft "Corridor System Management Plan." With implementation of the proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, and with future improvements along Highway 1 that are planned by Caltrans, traffic congestion along Highway 1 will be minimized. However, highway operations would continue to remain at unacceptable levels. Thus, the impact remains significant.

Mitigation Measures

None are known beyond those being considered for Highway 1 by Caltrans as discussed above.

Impact 4.4-3: Traffic Hazards
Adoption and implementation of the proposed *General Plan 2030* would not result in new roads that could potentially create hazards, and with implementation of proposed *General Plan 2030* policies and actions to ensure road safety, the project would not result in direct or indirect impacts related to increased hazards. Therefore, there is *no impact* related to road safety/hazards.

The proposed *General Plan 2030* does not include new roads or road alignments, and thus, would not create or increase hazards due to a road or intersection design. Action M3.1.13 does support an approach to Highway 1 to from the Harvey west area, but a specific location is not identified. If this option were to be considered in the future, it would require Caltrans' approval, and would be subject to project-level design and environmental review.

Furthermore, Policy M3.2 seeks to ensure road safety for all users. To this end, the plan proposes to maintain the condition of the existing road system (M3.2.1), ensure safe and

efficient arterial operations and designs (M3.2.2, M3.2.11), ensure adequate street widths and designs for emergency vehicles (M3.2.3), and improve traffic safety and flow, including at high collision and congested areas (M3.2.4, M3.2.5). Regular inspection and maintenance of street pavements is supported to help encourage bicycling (M3.2.6).

Conclusion. The proposed *General Plan 2030* does not include new roads or road alignments, and thus, would not create or increase hazards due to a road or intersection design. Implementation of the proposed *General Plan 2030* policies and actions would help to maintain road safety and prevent hazardous conditions due to future designs of roadway or intersection improvements. Therefore, there is no impact associated with creating or increasing hazards due a specific roadway design feature.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.4-4: Conflicts with Adopted Plans
Adoption and implementation of the proposed *General Plan 2030* would not result in conflicts with adopted plans, policies or programs that support alternative transportation, as the proposed goals, policies and actions directly support implementation and use of alternative transportation modes. Therefore, there is *no impact* related to potential conflicts with plans and policies.

Both the SCCRTC's *Regional Transportation Plan* and AMBAG's *Monterey Bay Area Mobility 2035* support and promote transit, bicycling, walking, carpooling and other alternative transportation modes. The proposed *General Plan 2030* directly supports these alternative modes as well. Action M2.1.2 encourages use of alternative modes of transportation, and numerous policies and actions support expanded and improved bicycle and pedestrian facilities, a well as increased transit use and passenger rail transit, as summarized on Table 4.4-4. Policy M2.3 seeks to increase the efficiency of the City's multi-modal transportation system. Several policies support higher land use densities along transit corridors (LU4.1, LU4.2, M1.1) to support land use patterns that reduce reliance on automobiles.

Conclusion. The proposed *General Plan 2030* directly supports regional plans and policies that support alternative transportation modes as it includes numerous policies and actions that encourage use of alternative modes of transportation, and support expanded and improved bicycle and pedestrian facilities, a well as increased transit use. Therefore, there is no impact related to potential conflict with adopted plans and policies that support alternative transportation.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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4.5 WATER SUPPLY

4.5.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- City Water Service Area
- Water Service System
- Water Demand in Service Area
- Water Supply Limitations
- Water Supply Planning & Adopted Plans

REGULATORY SETTING

State Regulations

Drinking water is regulated by a number of federal and state law. The federal government sets minimum standards for the protection of water quality, including for drinking water and environmental protection. The Safe Drinking Water Act (SDWA) of 1974 and subsequent amendments gave the EPA the authority to set standards for contaminants in drinking water supplies. The National Primary Drinking Water Standards establish the maximum contaminant levels (MCLs) allowed in public distribution systems. The National Secondary Drinking Water Standards establish the MCLs that apply to potable water supplies at the point of delivery to the customer. The EPA administers the SDWA at the federal level and establishes MCLs for bacteriological, inorganic, organic and radiological contaminants (U.S. Code Title 42, and Code of Federal Regulations Title 40). The California Environmental Protection Agency (Cal EPA) administers and enforces the drinking water program and has adopted its own SDWA, which incorporates the federal SDWA requirements, including some requirements specific only to California (California Health and Safety Code, Section 116350 and related sections).

The California Office of Environmental Health Hazard Assessment (OEHHA) has initiated evaluation for several chemicals for which new MCLs have been promulgated by the EPA, which triggers a requirement that OEHHA prepare a Public Health Goal (PHG) designed to define the level of pollutant at which no adverse health effect is expected to occur. PHG levels are concentrations of chemicals in drinking water that are not anticipated to produce adverse health effects following long-term exposures. These goals are advisory but must be used as the health basis to update the state's primary drinking water standards (MCLs) by the California Department of Public Health (DPH) (Health and Safety Code, Section 116365(b)(1). In addition, re-review, as required by Health and Safety Code Section 116365(e)(1), has been initiated for chemicals for which initial PHGs were published in 1997 and 1999. Risk assessments have been initiated for the chemicals, a few of which are listed below that are newly regulated:

- Bromate,
- Chlorite,

- Haloacetic acid, and
- Nitrosodimethylamine (NDMA).

Pursuant to State Water Code requirements, water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (approximately 980 million gallons) of water annually must prepare and adopt an urban water management plan (UWMP) and update it every five years. The Act requires water agencies to evaluate and describe their water resource supplies and projected needs over a 20-year planning horizon, and to address a number of related subjects including water conservation, water service reliability, water recycling, opportunities for water transfers, and contingency plans for drought events (City of Santa Cruz Water Department, February 2006). The City adopted its *2005 Urban Water Management Plan* (UWMP) in February 2006 as further discussed below in the "Water Supply Planning & Adopted Plans" subsection. In accordance with state law, the City is currently updating the UWMP, for planned adoption in Fall 2011.

In 2001, Senate Bill (SB) 610 amended California law regarding review of water availability for large projects (Section 10910 et seq. of the Water Code, Section 21151.9 of the Public Resources Code [CEQA] and Section 15155 of the State CEQA Guidelines). Pursuant to SB 610, the preparation of a "water supply assessment" (WSA) is required for projects subject to CEQA that meet specified criteria regarding project size (e.g., for projects of 500 or more residential units, 500,000 square feet or more of retail commercial space, 250,000 square feet or more of office commercial space, 500 or more hotel rooms, specified industrial uses, or a project that would result in a water demand equal to or greater than the amount needed to serve a 500-unit residential project). These assessments, prepared by "public water systems" responsible for service, address whether there are adequate existing or projected water supplies available to serve proposed projects over a 20-year period, in addition to existing demand and other anticipated development in the service area. Where a WSA concludes that insufficient supplies are available, the WSA must lay out steps that would be required to obtain the necessary supply. The content requirements for the assessment include, but are not limited to, identification of the existing and future water suppliers and quantification of water demand and supply by source in five-year increments over a 20-year projection for average normal, single-dry, and multiple-dry years. The absence of an adequate current water supply does not preclude project approval, but does require a lead agency to address a water supply shortfall in its project approval findings.

In February 2008, Governor Schwarzeneger introduced a comprehensive plan for improving the Sacramento-San Joaquin Delta with a key component intended to achieve a 20% reduction in per capita water use statewide by the year 2020. In November 2009, SB 7, The Water Conservation Act of 2009, was enacted, which directs urban water suppliers to calculate their baseline per capita water use and to set a 2020 water use target. Water agencies have until July 2011 to fulfill the mandate to calculate their baselines and reduction targets.

Pursuant to State law (Government Code section 56430), the Local Agency Formation Commission (LAFCO) is required to review all municipal services in the county once every five years. The Santa Cruz LAFCO completed and accepted its report in August 2005.

City Plans and Ordinances

The City of Santa Cruz has enacted several ordinances regarding water conservation. Title 16 of the City's Municipal Code addresses water, sewers and other public services. Chapter 16.01 identifies regulations and restrictions during declared times of water shortages. Chapter 16.02 sets forth water conservation provisions to prevent the waste or unreasonable use or method of use of water. Chapter 16.03 requires that plumbing fixtures be retrofitted with "low consumption plumbing fixtures"[1] in all residential, commercial and industrial buildings served by the City of Santa Cruz Water Department that use water in showers, toilets and urinals whenever a property is sold. Chapter 16.16 sets forth requirements for water-efficient landscaping and also is intended to comply with the California Government Code section 65591, et seq., the Water Conservation in Landscaping Act. The regulations are applicable to applicants for new, increased or modified water service within the City's water service area. On June 28, 2011, the City Council adopted Ordinance 2011-04 that amends the Municipal Code and adds a new section (16.08.065) to allow graywater use for irrigation. Graywater is wastewater that originates from showers, bathtubs, bathroom sinks and clothes washing machines.

Pursuant to Section 16.04 of the Municipal Code, the City currently imposes a "System Development Charge" (SDC) on all new connections or upsizing of existing meters, based on meter size. The charge is to pay for the new connection or additional demand's proportional share of the system expansion costs essential to provide water to the new or additional service. The fee is assessed at the time of connection to the water system, and is placed in a separate account that is used exclusively for:

(1) Payment for the City's future construction of specified facilities, or

(2) Reimbursement to developers who have been required or permitted to install such listed facilities which are oversized beyond that needed for the certain development and are subject to the terms of a reimbursement agreement with the City, or

(3) Payment for water conservation programs approved by the City Council which have the net effect of increasing the amount of water supply available for allocation to new connections.

CITY WATER SERVICE AREA

The City of Santa Cruz Water Department provides water service to an approximately 20-square-mile area that includes lands within existing City limits, the portion of UCSC that is within City limits, adjoining unincorporated areas of Santa Cruz County (including Live Oak and residential subdivisions along Graham Hill road), a small part of the City of Capitola and coastal agricultural lands outside City limits (City of Santa Cruz Water Department, February 2006). In November 2006, LAFCO adopted a water service boundary map for the City's service area that includes properties that are currently provided water service or are within the

[1] Section 16.03.030 defines "low consumption plumbing fixtures" as any showerhead rated to use a maximum of 2.5 gallons of water per minute, any toilet rated to use a maximum of 1.6 gallons per flush, and any urinal and associated flush valve rated to use a maximum of 1.0 gallon per flush.

City or County urban service areas (see Figure 4.5-1[2]). The City currently serves nearly 21,000 residential accounts, 2,200 commercial, industrial, institutional and municipal accounts, and 500 irrigation accounts (EKI, March 2011). In addition to domestic demand, the City supplies approximately 18 million gallons of water per year for agricultural uses along the North Coast outside of City limits.

The City of Santa Cruz Water Department is a municipal utility that is owned and operated by the City of Santa Cruz. The governing body for the Water Department is the City Council. A seven-member Water Commission advises the Council on policy matter involving operations and management of the water system. The Department operates financially as an enterprise in which all costs of running the system are paid by water rates, service charges, and related revenues. The Water Fund receives no tax or general fund revenues (City of Santa Cruz Water Department, February 2006).

WATER SERVICE SYSTEM

The City has four primary water sources that are described below. Major facilities include a 18-million-gallon per day (mgd) water treatment plant, several pump stations, 16 distribution reservoirs, and about 300 miles of water pipelines throughout the service area (City of Santa Cruz Water Department, February 2006).

Water Supply Sources

The City of Santa Cruz water system is comprised of four main sources of water supply:

- North Coast Sources;
- San Lorenzo River Diversions;
- Loch Lomond Reservoir; and
- Live Oak Wells.

NORTH COAST SOURCES

The North Coast sources consist of surface diversions from three coastal streams and a natural spring located approximately 6-8 miles northwest of downtown Santa Cruz. These sources are Liddell Spring, Laguna Creek, Reggiardo Creek and Majors Creek. The North Coast system has been in operation since the 1880s. The City has pre-1914 appropriative rights for surface diversion from Liddell Spring, Laguna Creek, Reggiardo Creek, and Majors Creek. As pre-1914 sources, the North Coast diversions are least affected by water rights limitations. Diversion from these sources is limited primarily by flows (City of Santa Cruz Water Department, February 2006), and more recently endangered species issues.

[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

SAN LORENZO RIVER DIVERSIONS

The San Lorenzo River is the City's largest water supply source, and the City diverts water from the San Lorenzo River at two locations: the Tait Street Diversion, near the City limits just north of Highway 1, and the Felton Diversion located about 6 miles upstream from the Tait Street Diversion. The City is the largest single user of water from the San Lorenzo River basin; however, three other water districts, several private water companies, and numerous individual property owners share the San Lorenzo River watershed as their primary source for drinking water supply (EKI, March 2011).

The main surface water diversion is located at Tait Street near the City limits just north of Highway 1. The Tait Street diversion is supplemented by two shallow, auxiliary wells located on the east side of the river, which are hydraulically connected to the river and tied to the City's appropriative rights for surface diversion. The other San Lorenzo River diversion is the Felton Diversion Station, which is an inflatable dam and intake structure built in 1974, located about six miles upstream from the Tait Street Diversion. Water is pumped from this diversion through the Felton Booster Station to Loch Lomond Reservoir. The facility is used to augment storage in the reservoir during dry years when natural inflow from Newell Creek is low (City of Santa Cruz Water Department, February 2006). Pursuant to current permits, this water must be diverted to the Loch Lomond Reservoir and cannot be sent directly to the Graham Hill water treatment plant. Thus, the City's ability to utilize water from the Felton Diversion is dependent on the volume of available storage in Loch Lomond Reservoir, and as a result, the Felton Diversion is operated only intermittently, as needed to augment storage in Loch Lomond Reservoir when natural inflow from Newell Creek to the reservoir is low. The Felton Diversion is typically is used during the winter months of dry years (EKI, March 2011).

The City has rights to divert up to 12.2 cubic-feet-per-second (cfs) year-round from the San Lorenzo River at the Tait Street Diversion and adjacent wells (State Water Resources Control Board [SWRCB] Permit 2738 and License 7200). During periods of high flow, water from the Felton Diversion Dam on the San Lorenzo River is pumped up to the Loch Lomond Reservoir for storage. Under the City's current SWRCB permits (Permit Nos. 16123 and 16601), the City may divert up to 977 MGY of water from the San Lorenzo River at the Felton Diversion between September and May (City of Santa Cruz Water Department, February 2006). The City's SWRCB permits for the Felton Diversion also restrict diversions based on minimum instream flow requirements. In order to protect fish habitat in the San Lorenzo River, diversions at Felton may occur only when instream flow exceeds the prescribed flow. These minimum average daily flow requirements for instream flow are 10 cfs in September, 25 cfs in October, and 20 cfs from November to May (Ibid.). After fish flow requirements are met, the City has rights to divert 7.8 CFS during September, and 20 CFS from October to May, to an annual maximum of 977 million gallons (Local Agency Formation of Santa Cruz County, June 2005).

LOCH LOMOND RESERVOIR

Loch Lomond Reservoir (also referred to as Newell Creek Reservoir in the City's operating permit) is located near the town of Ben Lomond in the Santa Cruz Mountains. Constructed in 1960, the reservoir collects water from the Newell Creek watershed and has a maximum capacity of 2,810 million gallons. In addition to the City, the San Lorenzo Valley Water District is entitled to receive a portion of the water stored in Loch Lomond (City of Santa Cruz Water Department, February 2006). The City and the San Lorenzo Valley Water District both have

rights to the water stored in the reservoir; the City's annual withdrawal limit is 1,042 million gallons.

LIVE OAK WELLS

Although groundwater constitutes only approximately 4% of the City's entire water supply, it has been a crucial component of the water system for meeting peak season demands and during periods of drought (City of Santa Cruz Water Department, February 2006). The groundwater supplies currently consist of four active wells in the unincorporated Live Oak area, referenced as the Beltz wells (No. 7, 8, 9 and 10). Beltz Wells No. 8 and No. 9 were installed in 1998 and began producing water for the City in 1999. Beltz Well No. 10 was installed in 2009. Beltz Well No. 7, installed in 1974, has poor yield. Well No. 4 is currently inactive.

Historically the City has produced groundwater in response to widely fluctuating hydrologic conditions with periods of little production during extremely wet years and periods of high production during drought conditions. Specifically, the City has operated its wells during a period of 150 to 200 days out of the year at a combined operational rate of about 1 mgd on average (City of Santa Cruz, February 2006). During the extended drought of 1987-1988, operation averaged a rate of 2 million gallons per day (mgd). In the City's Integrated Water Plan (IWP) Program DEIR, the City documented its planning goal of maintaining groundwater production into the future at the maximum rate of approximately 2 mgd (1,500 gpm) during drought conditions.

The City is actively pursuing replacement of Beltz Well 4. The loss of Beltz Well No. 4 has impacted the City's capacity to maintain a stable groundwater supply. The replacement for Well No. 4 (Beltz Well No. 12) is proposed on a vacant lot in Soquel to improve the reliability and flexibility of the City's groundwater well system and to locate the replacement well farther inland to protect the Purisima aquifer from the threat of saltwater intrusion (City of Santa Cruz, December 2010). Groundwater extracted from the proposed Beltz Well No.12 would be from the same zone of the Purisima aquifer as the existing Live Oak well field and Beltz Well No. 4 (Ibid).

The City's existing wells are located within the "West Santa Cruz Terrace Groundwater Basin" as defined by the California Department of Water Resources (EKI, March 2011). Water-bearing sediments within this basin consist of Pliocene Purisima Formation, Quaternary terrace deposits, and alluvium along the San Lorenzo River and other streams crossing the basin (Ibid.). Further description of the physical characteristics of the basin is included in Appendix D.

The water produced from the Live Oak Well system is derived from the Purisima Formation, which is the primary source of groundwater in the mid-Santa Cruz County region. Groundwater from the Purisima Formation is used by the City of Santa Cruz, the Soquel Creek Water District, Central Water District and numerous private wells. Total annual extraction from the Purisima aquifer by all pumpers is estimated at nearly 2,000 million gallons per year (MGY) of which the City produces approximately 167 MGY (8% of total) (City of Santa Cruz Water Department, February 2006). Groundwater level data collected over the past 15 years indicate that water levels across the Purisima Formation have been lowered by a combination of changes in recharge and the gradual increase in overall groundwater production from the aquifer. The City's adopted *Urban Water Management Plan* indicates that there is a potential

for saltwater intrusion to jeopardize the safe production of groundwater from the Purisima aquifer, but also notes that at this time, under normal operations, there appears to be no imminent threat of seawater intrusion and the State Department of Water Resources has not identified the basin as overdrafted or projected to be overdrafted (Ibid.).

The City has not prepared a groundwater management plan; however, a groundwater management plan was prepared by neighboring water districts (Soquel Creek Water District [SqCWD] and Central Water District [CWD]) that extract water from the Purisima Formation in adjacent groundwater basins in 1996 and updated in 2007. In 2005, the City entered into an agreement for groundwater management of the Soquel-Aptos area groundwater, along with the SqCWD, CWD, and the County of Santa Cruz). The goals of the agreement are to establish common basin management objectives, undertake joint research projects, and improve interagency coordination to assure the safe production and protect the quality of the underground resource (EKI, March 2011).

Facilities and Infrastructure

Major facilities include two water treatment plants, several pump stations and 16 distribution reservoirs storing approximately 15 million gallons of treated water. There are also about 300 miles of water pipelines throughout the service area (City of Santa Cruz Water Department, February 2006).

The City operates two water treatment facilities. All surface water is treated at the Graham Hill Water Treatment Plant, which currently has a capacity of approximately 18 million gallons per day (mgd). The 2-mgd Live Oak Water Treatment Plant treats groundwater to remove iron and manganese. Treated water from the Graham Hill plant flows to the Bay Street Reservoir and into the distribution system. Treated water from Live Oak is pumped directly into the distribution system (City of Santa Cruz, February 2006).

The City has 16 treated water storage reservoirs throughout the service area, with Bay Street Reservoir being the largest. In 2007, the City removed the former 35-million gallon reservoir due to age, deterioration, and safety issues. Two permanent 6-million gallon tanks will replace the former reservoir, constructed in two phases. . Temporary storage tanks are currently in place, and the first permanent tank is expected to be in operation sometime in the year 2013.[3]

The City's water system also includes: the 16-mile Coastal Transmission Main that pumps North Coast raw water to the Graham Hill treatment facility and the 9-mile Newell Creek Pipeline that carries water from Loch Lomond to the Graham Hill treatment plant. Additionally, the Felton Booster Pump Station is used to move water into and out of the Loch Lomond Reservoir. The Coast pump station, located next to the Tait Street Diversion, pumps raw water from the North Coast and San Lorenzo River sources to the Graham Hill Treatment Plant.

The City is in the process of implementing a long-term (10-20 year) rehabilitation and replacement program for its North Coast System pipelines and diversions. The 16-mile long

[3] The original reservoir design was significantly oversized for emergency purposes. The capacity has been downsized in order to meet water quality requirements (e.g., how long treated water can be stored), but still meets demand and safety requirements.

North Coast System (NCS) includes five distinct pipeline reaches, and over half of the conveyance pipeline is more than 40 years old. The project includes replacement of pipelines in their current alignments or in new alignments designed to avoid sensitive habitats. Rehabilitation also includes modifications to the 100±-year old diversion structures, which are located above the anadromous reaches of the creeks (i.e., above the locations where fish return to spawn). The City also recently completed construction of a new 24-inch, approximately 2-mile-long water transmission line that has been installed between the Bay Street Reservoir and Highway 1.

Water System Production and Operations

In general, the City's water supply system is managed to take advantage of the better quality and least expensive water sources as a first priority and to retain the maximum amount of water possible in Loch Lomond Reservoir to safeguard against future droughts. In addition to considerations for cost, water quality, and storage, there are legal constraints on the diversion of surface waters contained in the City's water rights that govern the operation of the water system.

Water supplies are generally dispatched to meet daily demands in the following order: North Coast, San Lorenzo River, Live Oak Wells, Loch Lomond Reservoir (City of Santa Cruz Water Department, February 2006). The North Coast sources are used to the greatest extent possible due to excellent water quality and the lowest production cost, and as previously indicated, these diversions are least affected by water rights limitations. Additional water needed to meet daily demands is pumped from the San Lorenzo River at Tait Street. During the summer and fall when the City's flowing sources are inadequate to meet peak season daily demands, supplemental water is brought in from the Live Oak Wells and Loch Lomond Reservoir (City of Santa Cruz Water Department, February 2006).

On average, about 79% of the City's annual water supply needs are met by surface diversions from the coastal streams (32%) and San Lorenzo River (47%), while approximately 17% is supplied by Loch Lomond Reservoir and 4% of the supply is derived from the Live Oak Well system (City of Santa Cruz, February 2006) as summarized in Table 4.5-1. With Loch Lomond production, limited by the City's water rights to a maximum of 1,042[4] MGY, existing water supply availability totals approximately 4,300 MGY (City of Santa Cruz Water Department, February 2006). However, the City recognized that the uncertain nature of groundwater conditions in the western portion of the basin is a serious issue and has limited future maximum extraction during all water years to 645 ac-ft/yr, or approximately 1 MGD (700 GPM) (City of Santa Cruz Water Department, December 2010). Water production has fluctuated over the past ten years; annual production has ranged from a high of approximately 4,400 MGY in 2000 (City of Santa Cruz Water Department, February 2006) to a low of approximately 3,200 MGY in 2009 (City of Santa Cruz Water Department, May 2011) as discussed further in the following subsection.

[4] Of this amount, 104 MGY or 10%, is technically available to the San Lorenzo Valley Water District, but it has taken no action in recent years and has no current plan to exercise its entitlement.

TABLE 4.5-1
Existing City Water Supplies

Source	Million Gallons Per Year (MGY)
Groundwater	187
Surface Diversions:	
▪ North Coast Sources	1,077
▪ San Lorenzo River	2,008
▪ Loch Lomond Reservoir	1,042
TOTAL	**4,314**
Source: City of Santa Cruz Water Department, February 2006	

The City's adopted UWMP indicates that current water supplies will remain relatively unchanged with a total net production capacity of approximately 4,300 MGY through the year 2030 assuming normal water conditions and no change to current operations or water rights. However, as further described below, existing water supplies may be reduced in the future as a result of other permit requirements and water rights issues, and the City is currently pursuing water conservation measures to reduce demand and construction of a desalination plant as a supplemental water source during drought conditions.

WATER DEMAND IN CITY WATER SERVICE AREA

Water use between 2000 and 2010 ranged between approximately 4,000 MGY at the beginning of the decade to approximately 3,200 MGY in 2009 and 3,100 MGY 2010 as summarized in Table 4.5-2 (City of Santa Cruz, May 2, 2011).

Table 4.5-2
Treated Water Production 2000-2010

Year	Gross Water Use (In MGY)
2000	3,987
2001	3,962
2001	3,909
2003	3,898
2004	3,895
2005	3,567
2006	3,570
2007	3,590
2008	3,565
2009	3,169
2010	3,103
Source: City of Santa Cruz Water Department, May 2011	

Water demand forecasts developed for the City in 1997 (Maddaus Water Management, March 1998) were utilized in the preparation of the City's *Integrated Water Plan* and *Urban Water Management Plan*. The forecasts estimated that water demand would increase to approximately 4,900 MGY by 2005 and up to approximately 5,300 MGY in the year 2030 (City of Santa Cruz Water Department, February 2006) based on population and employment trend information and forecasts provided by AMBAG at the time the forecasts were developed. Current City plans estimate that water demand under normal conditions will exceed water system capacity at some time between 2015 and 2020 (City of Santa Cruz Water Department, February 2006). However, actual total water use has been substantially lower than was predicted in these demand forecasts. Based on the treated water production shown on Table 4.5-2, average annual water demand was approximately 3,900 MGY from 2000 through 2004, compared to approximately 4,900 MGY predicted for the year 2005. Water demand has further decreased since 2005 to an average demand of slightly less 3,600 MGY between the years 2005 and 2008, with a low of approximately 3,200 MGY in 2009.

Based on actual use, the City's adopted 2005 *Urban Water Management Plan* (UWMP) indicates that it is more plausible that water use within the entire service area would likely increase at a rate of between approximately 0.4% and 0.8% per year through 2020 (City of Santa Cruz Water Department, February 2006). Based on these percentages, the UWMP estimated a water demand of about 4,365 MGY in the year 2020. These scenarios were not carried beyond the year 2020 in the UWMP.

As discussed below under the "Impacts and Mitigation Measures" subsection, the 2005 UWMP water demand projections for the City's water service area were reviewed and updated as part of the preparation of the Water Supply Assessment and project impact analysis conducted for this EIR. Total water demand in the City's water service area is now estimated as approximately 4,050 to 4,550 MGY in the year 2030 as further described below.

As required by state law, the City prepares updates to its Urban Water Management Plan every five years, which provides for continual review of water demand and supply trends and adjustment of water management strategies as may be needed. The City Water Department is in the process of updating its UWMP, in which water supply availability and water demand projections will be reviewed and revised according to the most recent information and data available.

WATER SUPPLY LIMITATIONS

The primary water reliability issue currently facing the City of Santa Cruz is the lack of adequate water supply during droughts due to the wide range in the yield of surface water sources from year to year and limited storage capacity. The City's water supply system is able to meet 100% of the existing water demand in about 7 out of every 10 years and at least approximately 90% of existing demand in about 9 out 10 years. A significant shortage occurs on average about 1 out of every 10 years (City of Santa Cruz Water Department, February 2006). During normal hydrologic years, the City's water supply totals approximately 4,300 MGY. The total water supply estimated to be available to the City in single dry years (i.e., 1994) is 3,800 MG or approximately 12% less than is available in normal years (Ibid.).

However, during an extreme two-year drought similar to the 1976-77 event, the estimated water supply available to the City in the second year of that event is 2,700 MG. The peak season is between April and October since this is the period that would be most affected by a supply shortage due to peak water demand.

Furthermore, the City's groundwater supply is near the coast and is particularly vulnerable to seawater intrusion. In normal and wet years, when rainfall and runoff are abundant, base flows in the coast watershed and associated river sources are restored by winter rains, and Loch Lomond Reservoir is typically replenished to full capacity with runoff from the Newell Creek watershed. The water system, however, is vulnerable to shortage in drought years when the San Lorenzo River and North Coast creeks and springs run low. In single dry years, the system relies heavily on water stored in Loch Lomond Reservoir to satisfy demand, which draws down the reservoir level lower than usual and depletes available supply in the event of a subsequent dry year. In multiple dry years, or drought conditions, very low surface water flows in the San Lorenzo River and North Coast creeks and springs, combined with depleted supply stored in Loch Lomond Reservoir, reduces the City's available supply to a level which cannot support water demand, even with an increase in groundwater production.

A basic assumption of the City's *Integrated Water Plan* and UWMP is that the City will continue to use its existing water supply sources in the future without change in current production levels. However, the City faces a series of ongoing challenges that potentially could lead to some loss of existing supply in the future, although it is uncertain at this time to what extent and which supplies might be affected. These considerations are summarized below, in part from the UWMP.

- **North Coast Streams and San Lorenzo River – HCP**. Continued access to the same amount of North Coast supply sources will depend on the outcome of a Section 10 "incidental take" permit application and accompanying Habitat Conservation Plan (HCP) that are being prepared pursuant to the federal Endangered Species Act for City activities designed to prevent take of a listed federal species. The permit and plan must be approved by the U.S. Fish and Wildlife Service and NOAA National Marine Fisheries Service (NMFS). The goal of the HCP is to minimize and mitigate to the maximum extent practicable the effects of City activities on listed and other sensitive species. The City entered into the HCP process in 2001, and over the past 6 years, the City has coordinated and met with U.S. Fish and Wildlife Service and NMFS on HCP-related issues and has conducted a number of studies. At the time of preparation and publication of this Draft EIR, however, a draft HCP has not yet been completed.

  The conservation measures associated with the HCP may result in changes in the City's operation and management activities and potentially affect the timing and use of this component of the City's existing water supply. On April 5, 2011, the Santa Cruz City Council authorized the Water Director to enter into negotiations with NMFS for completing the HCP and obtaining an Incidental Take Permit. At this meeting, City staff presented a proposed phased conservation strategy that improves instream flow for anadromous salmonids while recognizing that the limitations of the existing water supply system do not allow consistent achievement of optimal flows. Given the fact that there is an existing potential "take" of listed species to address, the strategy would result in less available water supply, resulting in a need to draw more heavily on the storage and Loch Lomond and that some augmentation of the City's existing water supply will be

necessary (City of Santa Cruz Water Department. March 28, 2001). Generally, the impacts would be greatest on the North Coast streams during the dry season and during dry water years (Ibid.).

A Draft Conservation Strategy was submitted to the NMFS in August 2011. The primary focus of the strategy is to avoid or minimize existing and potential effects of the City's activities to the maximum extent practicable as required by the Federal Endangered Species Act. A major element of the strategy is identification of minimum in-stream flows at City diversions to minimize the effect of diversions on habitat conditions for steelhead and coho salmon. Three alternatives, or tiers, of instream flow targets are specified which represent increasing levels of habitat protection. These targets vary by location, hydrologic year type and month. The three tiers represent increasing levels of habitat protection. The strategy guarantees minimum flows that ensure no further degradation of habitat (known as Tier 1). The strategy attempts to provide further protection of habitat by offering Tier 2 minimum flows under most hydrologic conditions, reverting to Tier 1 in dry years. With increasing water demand, the City will be able to provide Tier 2 flows less frequently. As the City moves toward augmenting its supply to include additional sources such as some mix of desalination, reclamation, conservation, or additional storage, over the course of the HCP further instream reservations will be possible (City of Santa Cruz, August 2011). Addition of new supply (2.5 mgd desalination, reclamation) would allow Tier 2 flows to be provided in 70% of years. Tier 3 flows would provide approximately 80% habitat value and could be provided in as much as 21% of years well into the future with the addition of 2.5 mgd of desalination.

With the Draft Conservation Strategy now submitted, negotiations can begin with NMFS. When a final strategy has been agreed upon, the Habitat Conservation Plan will be prepared. The HCP will be subject to environmental review, public review, and considered by City Council. The process could take more than two years.

- **Water Rights Conformance Proposal.** The City is in the process of developing and submitting filings to the State Water Resources Control Board (SWRB) to rectify a historical technical deficiency in the water rights on Newell Creek. Based upon the original filings, which were thought to be adequate due to the anticipated use of Loch Lomond Reservoir, these water rights actually allow only for diversion to storage and not for direct diversion, i.e., into the City's water supply distribution system. This circumstance makes the water supply technically unavailable as a source for City use during times when, for example, the reservoir is receiving more inflow from Newell Creek than is released downstream. The water rights filings by the City are intended to correct this historical deficiency and bring the City's legal water rights and current operations into conformance with each other. The proposed direct diversion rights are limited to the same volume of water, purposes and places of use as the existing rights such that they match the existing rights to the extent possible while allowing direct diversion, consistent with historic practice (City of Santa Cruz Water Department, February 2006).
- **Felton Diversion Water Rights Time Extension Project.** Pursuant to the City's permits to divert water at Felton for storage in Loch Lomond Reservoir, the City must put all 3,000 AFY (approximately 980 million gallons) of its entitlement to full beneficial use by

December 2006, in order to maintain its appropriative rights to the water. While the City has been diligently putting water from the Felton Diversion to beneficial use over the years, to date the City has used just half the permitted amount on an annual basis. In the future, however, the City expects to need the full 3,000 AFY and, therefore, has filed petitions with the SWRCB to extend the time allowed for putting the full 3,000 AFY to beneficial use. The water supplied from the Felton Diversion is considered critical to meeting the City's projected future demand, in particular during operational outages, changes in operations in response to environmental concerns, and during dry years (Santa Cruz, 2006).

Three different parties had filed protests to this application and to the City's petition for an extension of time to go to full appropriation on Felton Diversion: the Marine Corps Base, Camp Pendelton (CPEN); the California Department of Fish and Game (CDFG); and NMFS. The CPEN protest raised the legal issue of whether a water right holder or applicant may petition to the State Water Board to change an application, permit or license to allow for direct diversion when the current application, permit or license is for diversion to storage. The City appealed to the SWRCB that the public interest and the law support the use of the change petition process to add direct diversion to its San Lorenzo River and Newell Creek Water Rights. In December 2009, the SWRCB affirmed the legitimacy of the application for a change, finding that it has the authority to approve such a change, and denied the CPEN Petition for Reconsideration. The CDFG petition has been withdrawn.

Regarding the petition for the time extension to go to the full appropriation on the Felton Diversion, the City believes it is premature to conclude that it is unlikely to retain this water right. The City has been granted two other such extensions of time – in the mid-1980s and again in the mid-1990s after negotiations with CDFG and execution of a MOA that modified the manner in which the City operated the facility. The City also is working with DFG and NMFS to consider how the facility could possibly be used to aid the Coho Recovery Plan enhancement strategies.

- **Live Oak Wells System Reliability.** The City's ability to produce water from the Live Oak wells, in drought years and potentially all years, may be compromised by continued deterioration of the groundwater basin conditions due to region-wide over-pumping of the Purisima Formation. According to the City's 2005 UWMP, the threat of seawater intrusion to Purisima Unit A under the City's normal operations does not appear imminent (EKI, March 2011). However, if all users continue to pump groundwater at the present cumulative rate, the City's future use of the Live Oak Well System during peak times (as was done during the 1987-1992 drought) may potentially exacerbate conditions that could lead to seawater intrusion (City of Santa Cruz Water Department, February 2006). Although seawater intrusion does not appear to be an imminent threat to the City's groundwater supply under normal operating conditions, the potential for seawater intrusion exists and could potentially limit the City's future use of groundwater and ability to meet peak demands during dry years (EKI, March 2011). The City recognizes that the uncertain nature of groundwater conditions in the western portion of the basin is a serious issue and has limited future maximum extraction during all water years to 215 MGY or approximately 1 mgd (City of Santa Cruz Water Department, December 2010).

The SqCWD's "Well Master Plan" calls for the addition of the O'Neil Ranch well that will allow for more intense pumping of the western Purisima aquifer and allow SqCWD to decrease pumping from the Aromas Red Sands and coastal Purisima formation. The SqCWD's continued increase in pumping within the western Purisima, which has occurred since the early 1990s, has already noticeably reduced the availability of groundwater stored in the aquifer from which the City draws its water (EKI, March 2011). The City was advised by its consultants that production of up to 2 mgd from its coastal well field may no longer be viable during peak periods, and, as a result of this finding, the City identified sites for potential new wells further inland (EKI, March 2011). The SqCWD also included a mitigation monitoring program for potential impacts to the City's coastal well field. However, SqCWD only committed to mitigate for potential impacts from the Well Master Plan if the City did not exceed an average pumping rate of approximately 170 MGY (approximately 0.8 mgd over seven months) or a drought year production rate of215 MGY (approximately 1.0 mgd over seven months). The City continues to pursue completion of an inland well to supplement its diminished well capacity and maintain its ability to produce up to 1 mgd during peak periods and in drought conditions (Ibid.).

- **Global Climate Change.** There has been increasing attention paid to the issue of global climate change and its potential effects on existing water resources and supplies. However, studies prepared to date by the State of California do not provide sufficient or specific information with respect to predicted effects on coastal water supplies to allow the City to reach a reliable conclusion of how global climate change may affect the City's water supplies. These studies have instead focused on potential effects on the Sierra Nevada snowpack, and how a reduced snowpack could affect water supplies dependent on runoff from that snowpack (e.g., water supplies dependent on the operation of either the federal Central Valley Project or the State Water Project). Nor have specific studies been conducted by the City to address this issue.

  General studies prepared by the State of California indicate that climate change may seriously affect the State's water resources as a result of temperature increases, changes in timing and amount of precipitation, and sea level rise that could adversely affect coastal areas (California Department of Water Resources, July 2006). Trends in precipitation change are hard to determine, but worldwide precipitation is reported to have increased about 2% since 1990. Precipitation and stream flow records indicate an increase in precipitation, and increased precipitation could benefit water supplies and improve environmental conditions in some areas, especially where water supply diversions have significantly affected stream flow (California Department of Water Resources, July 2006).

  The *California Water Plan* provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan, which is updated every five years, presents basic data and information on California's water resources including water supply evaluations and assessments of agricultural, urban, and environmental water uses to quantify the gap between water supplies and uses. The Plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and projects to address the State's water needs. According to the California Department of Water

Resources ("California Water Plan Highlights"), more changes related to climate change can be expected by the year 2050 and on to the end of the century:

- California's mean temperature may rise 1.5 degrees to 5.0 degrees Fahrenheit by 2050 and 3.5 degrees to 11 degrees by the end of the century.
- Sierra Nevada snowpack may decrease by 25 to 40%.
- Average annual precipitation may show little change, but more intense wet and dry periods can be expected with more floods and more droughts,
- Flood peaks will become higher and natural spring/summer runoff will become lower.
- Global sea levels may rise by 4 to 16 inches by mid-century and 7 to 55 inches by the end of the century, which would increase salinity in California's delta region (California Department of Water Resources, 2009).

Global climate models vary considerably in projecting precipitation patterns, and climate change could potentially alter California's historical precipitation patterns. Simulations conducted by the State of California predict drier conditions in the future, although at the same time there is continued risk from intense rainfall events that can generate more frequent and/or more extensive runoff (California Natural Resources Agency, "2009 California Climate Adaptation Strategy"). While many of the state reports have focused on changes on Sierra snowpack and other major California water sources, recent reports indicate that warming temperatures, combined with changes in rainfall and runoff patterns will exacerbate the frequency and intensity of droughts. Although average annual precipitation may not change, more intense wet and dry periods are anticipated (California Department of Water Resources, October 2009). Regions that rely heavily upon surface water (rivers, streams, and lakes) could be particularly affected as runoff becomes more variable (California Department of Water Resources, October 2008).

It is possible that coastal watersheds such as the one above Santa Cruz could experience changes in frequency and amounts of precipitation (they currently don't receive much snow), which could affect the amounts of water available for diversion and storage in the City's existing facilities. Another study indicates that sea level is expected to rise an additional 22 to 35 inches by the end of the century (California Climate Change Center, July 2006). Generally, there are two ways it is thought that the Santa Cruz water supply system may be impacted: 1) sea level rise that would create greater likelihood of groundwater contamination from seawater intrusion; and 2) rainfall events that would likely be heavier and less frequent, thus affecting storage in Newell Creek Reservoir and stream flow.

The City has acknowledged that climate change may impact City water supplies that are largely dependent on surface water flows. To the extent that rain events are more intense but less frequent, the base flow in streams and rivers from which the City diverts could change. Predictions regarding the extent of climate change on water resources are dependent on many variables. Models are being developed to assist water utilities

in looking at climate change variables in their water planning efforts,[5] but the timing and quantification of potential climate changes effects are too speculative to try to predict with any certainty at this time. However, the City is working with other County water agencies to look at the models that are being developed and will consider new information as it becomes available.

WATER SUPPLY PLANNING & ADOPTED PLANS

Water Supply Alternatives

The City of Santa Cruz has been actively considering possible new water supplies for the past 20± years due to chronic, insufficient water supplies to meet existing demand during drought events (Gary Fiske & Associates, June 2003). The City's 1989 *Water Master Plan* identified alternatives to increase the City's water supply based on water demand projections developed at that time. Subsequently, nine projects were evaluated in a 1994 study (Camp Dresser & McKee, Inc., January 1994) that was overseen by a Technical Advisory Committee comprised of City Water Commission members, City Council members and Water Department staff. Of the evaluated projects identified below, the new wells at Thurber Lane and treatment of brackish groundwater in the Majors Creek area were selected as the highest ranking projects.

- Four new reservoir projects – two in the San Lorenzo River watershed and two on North Coast creeks;
- Three projects involving the expansion of Loch Lomond and treatment of brackish groundwater in the Majors Creek area;
- One groundwater project including new wells at Thurber Lane in Live Oak and treatment of brackish groundwater in the Majors Creek area; and
- One smaller reservoir project with groundwater wells at Thurber Lane and reclaimed water from the Scotts Valley Wastewater Treatment Plant.

In 1997, the City initiated an "integrated water planning" approach to consider all practical options for decreasing demand and increasing supply, which included preparation of studies related to water demand, water conservation, water curtailment, alternative water supplies, and evaluation of regional water supply alternatives. As part of this effort, a series of background studies were undertaken, including the following (City of Santa Cruz Water Department, EDAW, June 2005):

- Water Demand Investigation (Maddaus Water Management 1998
- Water Conservation Plan (Gary Fiske & Associates 2000)
- Water Curtailment Study (Gary Fiske & Associates 2001
- Alternative Water Supply Study (Carollo Engineers November 2000)
- Evaluation of Regional Water Supply Alternatives (Carollo Engineers March 2002)

[5] See Water Utility Climate Alliance. January 2010. "Decision Support Planning Methods: Incorporating Climate Change Uncertainties into Water Planning."

An Integrated Water Plan (IWP) was prepared utilizing the results of these studies and was adopted by the City Council an *Integrated Water Plan* in November 2005. As part of the IWP process, ten potential water supply alternatives were identified and evaluated (Carollo Engineers, November 2000). These included:

- **Groundwater Options**
  1. Brackish groundwater supply from wells in the San Lorenzo River Alluvial Plain near the mouth of the river.
  2. Fresh groundwater supply from wells in the San Lorenzo Alluvial Plain.
  3. Groundwater supply from the Purisima Aquifer near the Beltz wells.
  4. Groundwater supply from the Santa Margarita Aquifer.
  5. Groundwater supply near the Wilder Ranch gravel quarry.

- **Other Supplemental Sources**
  6. Seawater desalination.
  7. Wastewater reclamation.
  8. Reservoir storage in the Olympia Quarry in the San Lorenzo Valley.

- **Other Options**
  9. Maximized use of existing sources and storage in Loch Lomond Reservoir. This alternative includes increased capture and/or storage of surface water from existing north coast and San Lorenzo River supplies, in conjunction with optimized use of existing diversions.
  10. Conjunctive use with Soquel Creek Water District (SqCWD).

A screening of these alternatives was conducted as part of the 2000 Carollo Engineers study; screening criteria included whether the source would be reliable and sustainable during a multi-year drought and whether the alternative is feasible to be implemented, taking into account cost, environmental constraints and other public acceptance and regulatory concerns. A conceptual engineering analysis was then completed for each of the potentially viable alternatives. Table 4.5-3 summarizes the evaluated alternatives and associated constraints.

ALTERNATIVES DETERMINED NOT TO BE VIABLE

Based on this screening process, the following alternatives were determined not to be viable: brackish and fresh groundwater from the San Lorenzo River alluvial plain (Options 1 and 2), conjunctive use with SqCWD (Option 10), and reservoir storage in Olympia Quarry (Option 8) (Carollo Engineers, November 2000). The primary constraints on the brackish and fresh groundwater from the San Lorenzo River alluvial plain included: 1) potential impacts to riparian habitat or introduction of seawater into the aquifer as a result of pumping; 2) water rights issues since the brackish groundwater is likely hydraulically linked to the San Lorenzo River and may result in conflicts with the City's other water rights related to its Tait Street diversion; and 3) high treatment costs. In addition, the yield from these sources was expected to be limited (Ibid.). Conjunctive use with Soquel Creek Water District was not deemed viable due to limited surface water supplies potentially available to the City of Santa Cruz Water Department water

rights issues, and continued groundwater pumping. Lastly, numerous technical and institutional issues were identified that deemed the storage at Olympia Quarry to not be viable (Ibid.).

TABLE 4.5-3
City Water Supply Alternatives Summary

Alternative	Recommend Further Evaluation	Comment
Groundwater Options		
Fresh Groundwater from the San Lorenzo Alluvium	No	(1) Quantity limited (2) Potential conflict with existing water rights at Tait Street (3) Supply not reliable or sustainable during drought
Brackish Groundwater from the San Lorenzo Alluvium	No	(4) Quantity uncertain (5) Potential conflict with existing water rights at Tait Street (6) Supply not reliable or sustainable during drought
Groundwater Supply from Purisma Aquifer near Beltz Wells	No	(7) Existing users present institutional constraints (8) Quantity uncertain (9) Supply not reliable or sustainable during drought
Groundwater Supply from Santa Margarita Aquifer near Beltz	No	(10) Quantity uncertain (11) Supply not reliable or sustainable during drought
Groundwater from Santa Margarita Aquifer near Wilder Ranch	No	(12) Existing users present institutional constraints (13) Quantity uncertain (14) Supply not reliable during drought
Other Supplemental Sources		
Desalination	Yes	(15) Reliable or sustainable supply of needed capacity
Wastewater Reclamation	Yes	(16) Net supply may be limited and cost high; additional work required to quantify these elements
Reservoir Storage in Olympia Quarry	No	(17) Numerous technical and institutional issues to be addressed
Other Options		
Maximize Use of Existing Sources and Storage in Loch Lomond Reservoir	Yes	(18) Benefit in drought and nondrought years (19) Improves system reliability and operation
Conjunctive Use with Soquel Creek Water District	No	(20) Water rights constraint (21) Quantity uncertain (22) Supply not reliable or sustainable during drought
Source: Carollo Engineers, November 2000		

The other groundwater options ultimately were determined not to be viable because as groundwater sources they are also affected during drought conditions and storage is not readily replenished. The analysis also estimated that the maximum reliable yield from four combined groundwater sources was approximately 300 MGY or less during drought conditions (Carollo Engineers, November 2000b). Thus, while overall, groundwater is potentially available in a limited quantity, none of the groundwater resources could provide a significant portion of the projected drought demand shortfall (Ibid.). Additionally, there were other environmental,

regulatory and/or cost issues associated with some groundwater options that would affect overall feasibility for implementation. For example, the two biggest aquifers analyzed in the study (Santa Margarita aquifer near Wilder Ranch and Purisima aquifer) have existing users. The available (reliable) yield during a prolonged drought is also uncertain because the yield from the aquifers will likely decrease as other users increase their reliance on this supply (Carollo Engineers, September 2000).

Artificial groundwater recharge was considered as a means to improve reliability/sustainability during a drought, but was not found to be a viable alternative as there are no surplus water sources available for recharge. Even if the City's surface water supplies were available for recharge, a water rights change (from diversion for direct use to diversion for storage) would be required, which would effectively preclude all conjunctive use alternatives with surface water and groundwater (Carollo Engineers, September 2000).

Groundwater recharge with reclaimed water was also considered. However, state guidelines stipulate that approximately 50% of the recharge water be reclaimed wastewater, thus requiring other water sources to be blended with the reclaimed water. Additionally, as indicated above, groundwater availability would be limited. The analysis found that even in a favorable scenario, approximately 100 MG would be available for blending that would result in about 200 MG of groundwater supply during a drought, which was considered low. Furthermore, state guidelines require that reclaimed water for potable use remain in the ground 6-12 months prior to use depending on the level of treatment and method of discharge. Lastly, the City's wastewater treatment plant would need to be upgraded to produce the quality of reclaimed water required for recharge, along with construction of associated pipelines.

RECOMMENDED ALTERNATIVES

As a result of this screening and evaluation process, three alternatives were recommended for further review: desalination, wastewater reclamation, and maximizing use of existing sources and storage in Loch Lomond Reservoir. A refined regional analysis of desalination and wastewater reclamation as a potential joint project with the Soquel Creek Water District was conducted in 2002. The IWP identified seawater desalination as the most feasible alternative for a backup supply of drinking water during a drought. These alternatives are summarized below.

Desalination. The IWP identified seawater desalination as the most feasible alternative for a backup supply of drinking water in times of drought with a plant capacity of 2.5 mgd (City of Santa Cruz Water Department, February 2006). The plant would be for drought protection, and would only be used by the City intermittently during the dry seasons of dry and critically dry years when existing supplies fall short (Ibid.). The desalination facility could be expanded at a future time to provide additional supply up to 4.5 mgd in two increments of 1 mgd; the potential expansion is also intended for protection from drought conditions that could be exacerbated by future growth (Ibid.).

The City currently is planning to construct a seawater desalination facility as a backup water supply in times of drought. The proposed desalination facility is a joint partnership between the City of Santa Cruz and the Soquel Creek Water District (SqCWD), which is also looking for a long-term supplemental water source to reduce its reliance on well water and avert the threat

of seawater intrusion in local groundwater aquifers. Currently, the SqCWD obtains all its water from groundwater sources and operates 16 active production wells with an estimated capacity of over 14 million gallons per day. The current annual water use for the SqCWD exceeds the available water supply by 15% even during non-drought conditions. The SqCWD would use up to 1 mgd of the future plant's capacity when the City doesn't need it, and would share in the cost of building and operating the plant. In early 2006, the SqCWD adopted the Integrated Resources Plan (IRP) that identified a regional seawater desalination plant with the City of Santa Cruz as the preferred conjunctive use project to be investigated (City of Santa Cruz Water Department, 2008, desalination web site at: http://www.scwd2desal.org/).

A pilot desalination plant was in operation between March 2008 and April 2009 to gather information to establish the optimal design and operating parameters for the future construction and operation of a 2.5-mgd seawater desalination plant. The 13 months of testing provided a full range of performance information that will be used to plan the full-scale seawater desalination facility. Additional technical studies and design development are currently underway. The environmental review process was initiated with an EIR Notice of Preparation released in November 2010 in which three potential sites and different intake options will be analyzed in an EIR. A permanent facility is expected to be constructed and in operation by the year 2016, pending completion of project-level environmental review and regulatory permit approvals, e.g., approval of a coastal development permit from the California Coastal Commission.[6]

Recycled Water. The City of Santa Cruz owns and operates a regional wastewater treatment facility providing service to the cities of Santa Cruz and Capitola and parts of unincorporated Santa Cruz County. The City's treated wastewater is potentially suitable for some agricultural applications and for limited public access irrigation. However, the level of treatment is not sufficient for general irrigation or unrestricted use on playgrounds, parks, schoolyards, etc. Additional treatment above that currently provided would be needed to meet the state public health and safety requirements. In addition to the treatment upgrades, a distribution system, including pumps, meters, storage facilities, and separate piping, would be required to convey the recycled water to customers (City of Santa Cruz Water Department, February 2006).

The potential for using recycled water as a supplemental water supply was examined in the City's Alternative Water Supply Study (Carollo Engineers, 2000) and Evaluation of Regional Water Supply Alternatives (Carollo Engineers, 2002) during the IWP process. The following five project concepts for recycled water use were evaluated in the two reports (City of Santa Cruz Water Department, February 2008). The UWMP provides a description of these programs and indicates that a long-term water savings of nearly 300 MGY could be achieved.

- Recycled water for groundwater recharge,
- Recycled water for direct use,
- Recycled water from Scotts Valley
- Recycled water for landscape irrigation in the City, and
- Recycled water for North Coast agricultural application.

[6] Other potential permits, approvals and/or consultations for a permanent desalination plant and supporting infrastructure (i.e., intake facility and distribution pipeline) may be required from various agencies, including, but not limited to U.S. Fish and Wildlife Service, State Lands Commission, and California Department of Health Services.

Of these concepts, two were determined to be viable projects: recycled water for in-City landscape irrigation and recycled water for North Coast agricultural application. The other three projects were determined to be infeasible, unacceptable, or of too little benefit to pursue further. Even though these two recycled water concepts were carried forward in the water supply studies, only the one involving the use of recycled groundwater for agricultural irrigation was developed further. The use of recycled water for landscape irrigation was eliminated due to a number of reasons, including the limited yield and high cost. The potential users of the recycled water were determined to be parks, schools, cemeteries, golf courses, and UCSC, with an estimated outdoor irrigation demand of approximately 170 to 230 MGY. This amount was considered too small by itself to meet the City's drought-year needs and also had a high capital cost. The City also considered the high cost of investing in a recycled water system to maintain turf areas during times of drought versus instituting drought management measures and curtailing those same outdoor uses of water at a relatively low cost when supplies fall short. Coupled with the fact that the recycled water concept did nothing to add to the supply of potable water, curtailment was favored in developing alternative strategies for the City's IWP (City of Santa Cruz Water Department, February 2006).

The evaluation of the option to exchange groundwater with recycled wastewater (for agricultural irrigation on State Park lands north of the City) estimated groundwater availability of about 400 MGY. However, this concept ultimately proved to be infeasible for a number of reasons. The additional supply would have been limited given the estimated yield from the groundwater basin. Coupled with costs as high as desalination, this option was not considered the superior option. Additionally, the California Department of Parks and Recreation, the landowner of the agricultural lands to be irrigated with recycled water, opposed the exchange given legal and policy issues that could affect the entire state (City of Santa Cruz Water Department, February 2006). Some of the farmers, mostly organic growers, also opposed the concept of irrigation with reclaimed water.

Recycled water for landscape irrigation remains a potentially viable alternative that could be pursued in the future. However, currently it is not the City's preferred water supply strategy for the reasons outlined above. The 2005 UWMP indicates that the steps and actions to encourage and optimize recycled water will be defined in the future if and when recycling is selected and pursued to diversify the City's water supply portfolio (City of Santa Cruz Water Department, February 2006).

Recycled water as an option for both the City and Soquel Creek Water District was again investigated in 2010 (Kennedy/Jenks Consultants, January 2010). Current California regulations do not allow recycled water to be discharged directly into a potable/drinking water distribution system (otherwise known as direct potable use), and therefore would not meet the City's drought water supply needs. Current state regulations do allow recycled water to be used for indirect potable reuse whereby highly-treated wastewater is injected into the ground via percolation ponds or pumping, and extracted later for use. However indirect potable reuse is not practical for the City or SqCWD because: 1) it requires blending recycled water with surface or groundwater prior to injection and both surface and groundwater supplies are already limited; 2) injection wells are required to be located a prescribed distance away from any public or private drinking water well, which is difficult due to the thousands of wells within

Soquel-Aptos area groundwater basin; and, 3) local land limitations are not conducive to percolation/blending ponds (Ibid).

Recycled water for the City and SqCWD could potentially provide irrigation water for parks, sports fields, and/or golf courses during a drought, but would require a new dedicated distribution system that would be prohibitively expensive compared with the relatively small volumes of water delivered for appropriate use (Kennedy/Jenks Consultants, January 2010). Importing recycled water from a nearby producer is an alternative to producing recycled water at the City of Santa Cruz wastewater plant. The Scotts Valley Water District (SVWD) and the Pasatiempo Golf Course (Pasatiempo), which presently receives potable water from SCWD for irrigation, entered into a Memorandum of Agreement (MOA) expressing the intent to implement a "Pasatiempo Water Conservation Initiative" in cooperation with the City of Santa Cruz. However, this solution does not significantly offset potable water needs for SCWD during drought.

Improvements to Existing Facilities. Improvements to maximize use of existing water sources and storage were identified that collectively could provide approximately 600 MGY during a two-year drought. The upgrades could include additional treatment for turbidity on the North Coast supply; capacity upgrades of the North Coast pipeline; treatment and/or facility upgrades for turbidity at the Tait Street intake; capacity upgrades at the Coast pump station; and/or upgrading the hydraulic capacity of the Felton/Loch Lomond supply system. The upgrades would provide additional supply during drought and non-drought years and would also improve operational reliability and flexibility, but shortfalls during multiple dry year scenarios would continue to occur (Carollo Engineers, November 2000).

City-Adopted Water Plans

INTEGRATED WATER PLAN (IWP)

The purpose of the IWP is to:

> "to respond to the current drought-related crisis and plan for future growth. Specifically, it must help the City: 1) reduce near-term drought year shortages; and 2) provide a reliable supply that meets long-term needs while ensuring protection of public health and safety" (Gary Fiske & Associates, June 2003).

The IWP evaluated options for balancing water supply and demand that included conservation, curtailment, and new water supplies and infrastructure. Based on the water supply studies conducted since the mid-1980s, the water supply options considered in the IWP focused on the four following options:

- Seawater desalination was considered with construction of reverse osmosis, pretreatment and ancillary facilities. A specific location was not identified, although it was indicated that probable locations would be in the industrial area of Santa Cruz (southwest area of city) or on the University's Long Marine Lab site (now known as the Coastal Marine Science Campus). A sequence of desalination sizing increments was reviewed for three curtailment profiles and for a facility serving only the City of Santa Cruz and for a facility serving the City and Soquel Creek Water District

- Reclamation with a coast groundwater exchange arrangement was considered, which involved construction of a 4-5 mgd tertiary wastewater treatment plant, and associated facilities to deliver that water to North Coast farmers for irrigation purposes in exchange for City access to the groundwater supplies currently being used by the farmers.
- Development of the Santa Margarita Aquifer in Live Oak was also considered as a potential small source of supply. The aquifer is below the Purisima aquifer from which the current Beltz wells draw supply. However, little information was available regarding this supply when the IWP was prepared, although it assumed that this source will yield 100 million gallons annually (approximately 2,307 AF).

Based on evaluation of these options and combination thereof, under various drought curtailment options, the IWP determined that Strategies D-1 and D-2 (City-Only and Regional Desalination) at Curtailment Profile 2 (15% worst-year curtailment) as the preferred alternative. The final choice between the City-Only and Regional Desalination strategies was deferred to completion of the Environmental Impact Report on the IWP. For the desalination options, the IWP (and EIR) considered a 2.5-mgd desalination facility that could be upgraded by 1.0 mgd in two increments for a total capacity of 4.5 mgd.

In November 2005, the City Council certified the IWP EIR and unanimously adopted the IWP as the City's long-term water resource strategy that includes the following three components (City of Santa Cruz Water Department, February 2006):

- **Conservation.** Implementation of water conservation programs to maximize the use of the existing water resources.
- **Curtailment during a Drought.** The IWP calls for supplying 85% of normal demand in critical drought years (e.g., the 1976-77 event) with a corresponding reduction in peak season water use of up to 15%.
- **Desalination as a Supplemental Water Supply.** The IWP identified seawater desalination as the most feasible alternative for a backup supply of drinking water in times of drought that would be provided by a 2.5 mgd seawater desalination facility that would be expandable in 1.0 mgd increments up to 4.5 mgd, if needed in future years. A full-scale desalination facility site was proposed to be located in the industrial area along Delaware. The certified IWP EIR evaluates impacts of the construction of a desalination facility and associated pipelines on a programmatic level for the initial construction of a 2.5 mgd facility for drought protection and two subsequent expansions (3.5 and 4.5 mgd).

URBAN WATER MANAGEMENT PLAN (UWMP)

In 2006, the City adopted the *2005 Urban Water Management Plan* (UWMP) that was prepared in accordance with state law requirements. The plan evaluates and describes water resource supplies and projected needs over a twenty-year planning horizon, and addresses a number of related subjects, including water conservation, water service reliability, water recycling, opportunities, water transfers, and contingency plans for drought events.

As previously indicated, pursuant to state law, the City of Santa Cruz Water Department must prepare and adopt an urban water management plan and update it every five years. Thus, the City's water resource supplies and projected needs over a 20-year planning horizon will be assessed and updated every five years, which will enable the City to review water demand trends and review its water supply management and options. The City's existing 2005 UWMP is being updated and a draft is expected to be completed during the fall of 2011. The water demand projections will reflect the proposed *General Plan 2030*. As part of the UWMP update, the City Water Department will continue to review conservation and other strategies.

The UWMP provides a description of water conservation programs as the IWP calls for continued implementation of a broad set of conservation programs. Conservation programs include water survey programs, plumbing retrofits, water audits and leak detection and repair, large landscape conservation programs and incentives, high-efficiency clothes washer rebate program, and other public information programs. The UWMP indicates that a long-term water savings of nearly 300 MGY could be achieved. A savings of approximately 153 MGY had been achieved by 2005 (City of Santa Cruz Water Department, February 2006). The plumbing fixture retrofit and rebate program have produced the most water savings of any program, totaling about 136 MGY (Goddard, City of Santa Cruz Water Department, personal communication, August 2011.). As a result, conservation programs continue to offset new water demand from development and growth in new accounts, and then some, for the time being (Ibid.). It is estimated that approximately 250 MGY have been saved to date through conservation in part due to rate and price changes and restrictions in recent year (Goddard, personal communication, June 2011).

The IWP calls for supplying 85% of normal demand in critical drought years (e.g., the 1976-77 event), and for a corresponding reduction in peak season water use of up to 15%. This cutback would be achieved through temporary watering restrictions or rationing that target landscape irrigation and other outdoor uses.

The UWMP includes a "Water Shortage Contingency Plan" that was updated in March 2009. This plan was developed to fulfill two fundamental purposes:

- To establish the procedures and actions necessary to achieve the up-to-15% percent cutback in system-wide demand established in the City's Integrated Water Plan, and
- To describe how the City would respond if faced with much larger shortages in water supply ranging as high as 50%.

The updated Water Shortage Contingency Plan uses a staged approach that classifies a shortage event into one of five levels spanning a water shortage range from 5-50%. The overall concept is that water shortages of different magnitudes require different measures to overcome the deficiency. Because there is so little the City can do in the short run to increase the supply of water, the focus of this plan is primarily on measures that reduce demand. Each stage includes a set of demand reduction measures that become progressively more stringent as the shortage condition escalates. Normally, only one of these five stages would be put into effect early in the year at the recommendation of the Water Director and remain in force for the entire dry season (City of Santa Cruz Water Department, March 2009). These stages are outlined below:

Stage	Magnitude of Water Shortage Stage	Title
1	0-5%	Water Shortage Alert
2	5-15%	Water Shortage Warning
3	15-25%	Water Shortage Emergency
4	25-35%	Severe Water Shortage Emergency
5	35-50%	Critical Water Shortage Emergency

Stages 1 and 2 represent a level of curtailment that is envisioned as being necessary to balance water supply and demand from time to time under the City's Integrated Water Plan. Shortages of 15% or less, while inconvenient, do not directly threaten public safety or pose undue economic impact. Stages 3-5 are characterized as emergency water shortages since they result in more widespread hardships being felt throughout the community, may threaten public health and welfare, and cause more economic harm. Customer demand reduction goals were established for major water demand groups based on the following priorities: 1) health/safety, i.e., all domestic and sanitary uses, 2) business and industrial uses and, 3) irrigation and other outdoor uses) (City of Santa Cruz Water Department, March 2009).

The 2005 UWMP indicates that in addition to pursuing desalination, the City remains open to exploring other water supply alternatives that would not be feasible to develop in the short-term, but may be useful to consider over a 20-year or longer time frame. The UWMP identifies the possible longer term options as:

- Recycled water
- Groundwater recharge
- Reservoir expansion
- Aquifer storage and recovery
- Off-stream storage.

Other Water Planning Efforts

As indicated at the beginning of this chapter, the state of California enacted SB7 in 2009, which sets a goal of reducing urban per capita water use by 20% by December 31, 2020. Under the law, each urban retail water supplier must include a base daily water use, a 2020 urban water use target and an interim (2015) water use target in the UWMP. Technical methodologies have been prepared by the California Department of Water Resources (DWR) to ensure consistent implementation of the law throughout the state (City of Santa Cruz Water Department, May 2, 2011).

According to a February 2010 report issued by the DWR, the baseline water use value for California as a whole is 192 gallons per capita per day (gpcd); the value for the Central Coast Region, which encompasses the area from Santa Cruz to Santa Barbara, is 154 gpcd (City of Santa Cruz Water Department, May 2, 2011). Over the last 10-year period, per capita water use within the City of Santa Cruz service area has declined from about 126 gpcd in 2001 to 93 gpcd in 2010 (Goddard, personal communication, August 2011). The City's 10-year baseline (ending 2010), determined in accordance with the state's technical methodologies, is 113 gpcd; the 5-year baseline (2003-2007) is 116 gpcd (Goddard, personal communication, June 2011).

Water suppliers have a choice of four methods under the law for determining their 2020 urban water use target. City staff recommended using Method 3, which is based on 95% of the applicable hydrologic region's target, which would be 123 gpcd. .In accordance with state methodologies, the Water Department is recommending a 2020 target of 110gpcd, and the City would be in compliance with state law if it maintains its per capita demand at or below this level.

4.5.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address provision of public services and facilities. In general, Policies LU1.3 and LU1.4 seek to ensure that facilities and services required by future development are available and that new development pays its proportional share. The Plan also seeks to provide community services and facilities to meet the needs of the population (CC2.1) and update and replace facilities (CC2.1.1).

The CIVIC AND COMMUNITY FACILITIES chapter of the draft *General Plan 2030* includes one goal with 11 associated policies and nearly 50 accompanying actions that address water service. Goal CC3 seeks a reliable and adequate water supply.

GOAL CC3 A safe, reliable and adequate water supply.

Policy CC3.1 supports implementation of the City's Integrated Water Plan, and its three accompanying actions support reduction in long-term demand with conservation, periodic updates of the City's Water Shortage Contingency Plan, and development of a 2.5 mgd desalination plant for drought protection with the potential for incremental expansion to 4.5 mgd. Other proposed policies address water demand and conservation, water management, protection of water supplies, including groundwater supplies, development of new water sources and provision of adequate water facilities. Several policies and actions in other chapters of the proposed General Plan also pertain to the City's water supplies and/or demand. Water conservation and audits at park facilities are supported (NRC1.1.3), as well as water conservation education related to creeks and wetlands (NRC1.1.5).

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Some of the draft *General Plan 2030* policies and actions support specific types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment, as summarized in the LAND USE (Chapter 4.1) section of this EIR.

The *General Plan 2030* supports some specified new or improved community facilities. The draft plan supports development of a desalination plant (CC3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan*. A specific site is not identified in the proposed General Plan, although the plan does support amendment of the General Plan as needed for a new community facility with the selection of a desalination plant site (LU3.10.2). Other specific water system improvements are not identified, but the plan supports maintenance and improvement of water facilities (CC4.3.1) and adequate provision of pumping, treatment and distribution facilities for production of groundwater of 1 mgd during normal years and 2 mgd during droughts (CC3.3.9).

4.5.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

5a Have insufficient water supplies available to serve the project from existing entitlements and resources and/or require new or expanded entitlements to serve the project;

5b Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or

5c 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.

IMPACT ANALYSIS

The following analysis assesses impacts to the City of Santa Cruz water supplies as a result of the proposed *General Plan 2030* (5a) and potential impacts on groundwater supplies (5c). The City Water Department indicates that the proposed project will not result in the need to construct or expand its water treatment facility or other water infrastructure/facilities to accommodate future water demand resulting from the proposed project (5b) (Kocher, City of Santa Cruz Water Department, personal communication, June 2011).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized in the LAND USE (Chapter 4.1) section of this EIR, could result in development of 3,350 residential units, 3,140,000 square feet of commercial, office and industrial development and 300 new

hotel rooms. This level of development could result in an increased population of 8,040 residents and 8,665 new jobs by 2030. The proposed General Plan also includes other policies and actions that could result in development that supports Santa Cruz as a year-round conference and arts destination (ED1.4, HA3.2.4).

New development accommodated under the proposed General Plan will result in the demand for water services. The impacts associated with water demand and service are presented below.

Preparation of a Water Supply Assessment (WSA)

The City has voluntarily chosen to prepare a Water Supply Assessment (WSA) pursuant to Water Code Section 10910 et. seq. to inform the City's environmental review for the proposed *General Plan 2030*. The findings and conclusions of the WSA regarding project water demand and availability are summarized below. The WSA is intended to provide the kind of information required of a formal "water supply assessment" required by Water Code section 10910 et seq. (commonly known as SB 610), even though the City does not believe that SB 610 actually applies to a comprehensive general plan update. Rather, SB 610 applies to categories of "projects" subsidiary to city-wide general plan updates (e.g., specific plans or general plan amendments contemplating the construction of more than 500 dwelling units). The limited application of these Water Code requirements was very clear in the predecessor to SB 610, known as SB 901 (see former Water Code sections 10910, subd (a) and 10913.) When SB 901 was in effect (1996 through 2001), it was intended to complement the requirements of Government Code sections 65352, subdivision (b)(7), and 65352.5, which remain in effect and require cities and counties, in updating their general plans, to consult with "public water agencies" and to receive from them detailed information regarding water supply availability.

Even though the City believes that SB 610 was not intended to change the approach that was in effect during the lifetime of SB 901, the City has nevertheless undertaken preparation of a WSA with the intent of having it function as a de facto water supply assessment, despite the general nature of the project at issue and the unavoidably general nature of discussion included herein. It is important to acknowledge, however, that this document is not a substitute for the formal consultation required by Government Code sections 65352 and 65352.5.

The WSA was presented to the City Water Commission on April 4, 2011, and the Commission recommended that the assessment be forwarded to the City Council. The City Council considered and approved the WSA at a public hearing on April 26, 2011.

Impact 4.5-1 Water Supply
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in an increased demand for water supply in a system that currently has inadequate supplies during dry years and may have inadequate supplies in normal years in the future. This is considered a *potentially significant impact.*

Project Water Demand

Future development accommodated by the proposed *General Plan 2030* could result in construction of new residential units and non-residential square footage as described above. Based on water use rates developed by the City Water Department, development accommodated under the proposed general plan could result in a new water demand of nearly 240 MGY as summarized on Table 4.5-4.

TABLE 4.5-4
Estimated *General Plan* 2030 Water Demand

Type of Use	Amount	Water Demand Rate [2]	Total Demand (MGY)
Residential – SFD	840 [1]	194/gpd/unit	60
Residential -- MFD	2,510 [1]	70 gpd/unit	64
Commercial	1,087,983 sf	66 gp/sf/year	72
Hotel Rooms	311	93/gpd/room	11
Office	1,273,913 sf	18/gpsf/year	23
Industrial	776,926 sf	12gp/sf/year	9
		TOTAL	239 MGY

[1] Assume 75% MFD and 25% SFD of new dwelling units.
[2] Water Demand Rates developed by City of Santa Cruz Water Department

In developing water demand forecasts, the WSA also took into account municipal and irrigation water demands until 2030, which was estimated at approximately 12 MGY. Thus, the additional incremental water demand associated with development and growth under the proposed *General Plan 2030* by the year 2030 is estimated to be 251 MGY.

Effects of Project Water Demand within Service Area

Water demands in the 2005 UWMP were primarily based on estimates of population- and water account-growth through 2020 in a water demand investigation that was completed in 1998. The 2005 UWMP indicated that these projections significantly overestimated actual water demand within the City's service area, and the UWMP presented two plausible projections (i.e., scenarios) of potential water demand growth between 2005 and 2020. *Scenario 1* assumed that the City's accounts for the three largest customer classes (residential, business, and irrigation) would grow at an annual rate of 0.8% (i.e., in proportion to the amount of growth envisioned in existing housing elements and general plans and that water use at UCSC would increase by 2020 as predicted in the draft 2005 LRDP). *Scenario 2* assumed that

the City's accounts would increase at a lower annual rate of 0.4% (based on actual growth rates experienced since 1997), and that water use at UCSC would increase at half the rate predicted in the Draft 2005 LRDP. Neither of the 2005 UWMP scenarios extended beyond the year 2020, as the City considered these projections to be too speculative at that time.

The water demand estimates presented in the 2005 UWMP were further updated in the WSA prepared in 2009 for the City's proposed Sphere of Influence Amendment and Provision of Extraterritorial services EIR (City of Santa Cruz, July 2010). In order to extend the City's demand projection out to the year 2030, the City looked at the updated AMBAG (2008) population projection and multiplied this additional growth by the average per capita water use projected for 2010 through 2020 in the *UWMP Scenarios 1 & 2*. In addition to extending the UWMP scenarios by 10 years (i.e., to the year 2030), two additional modifications were made to the 2005 UWMP to include revisions to the UCSC 2005 LRDP EIR water demand projections pursuant to the 2005 LRDP Final EIR and the Settlement Agreement, and the inclusion of the full volume of the projected water use for UCSC for the lower-end scenario, instead of just half of the UCSC water demand, as was assumed in the 2005 UWMP. The updated water demands generally fall within the range of projected water demands presented in the UWMP.

The WSA prepared for this EIR develops new water demand projections and updates the UWMP projections based on the following methods:

- Land use changes and development estimated for the *General Plan 2030* buildout;
- Water demand for UCSC are based on its adopted 2005 LRDP and estimates of additional water demand after the LRDP's projected timeframe; and
- Estimates of population growth developed by AMBAG serve as the basis for water demand projections for the remainder of the City's water service area outside City limits.

The estimated demand is compared with two baseline existing waster use scenarios as described below. The two estimates are intended to bracket the upper and lower range of water demand that may reasonably be expected to occur in the future, and reflect long-term conservation reductions already realized by existing customers (EKI, March 2011). The estimated water demand outside of the City is further addressed in "Cumulative Impacts" subsection 5.4 of the CEQA CONSIDERATIONS (Chapter 5.0) section of this EIR.

- Existing Water Demand Estimate 1" (1999-2004). This time period represents an extended period of stable water use before the onset of several factors that have affected recent water use, such as economic downturn, drought conditions, and increase in billing rates.
- "Existing Water Demand Estimate" 2 (2007 through 2008). This time period reflects water usage after the economic downturn, drought conditions and increase in billing rates. This scenario does not consider water use in 2009 as water use restrictions were imposed during this period due to drought conditions (EKI, March 2011).

Based on these scenarios, the WSA models indicate that existing water demand within the City is 2,069 MGY under Estimate 1 and 1,843 MGY under Estimate 2. With addition of the

proposed project, water demand within City limits would increase by 251 MGY, resulting in a total city demand of 2,320 MGY in Estimate 1 and 2,094 MGY under Estimate 2.

NORMAL YEAR SUPPLY AND DEMAND WITH PROJECT

Based upon the updated water demand projections in the WSA, the City's water supply for a normal hydrologic year is sufficient to meet the existing water demand and the incremental water demand associated with development accommodated by the proposed General Plan through about the year 2020. Under normal years, the City's water supplies provide approximately 4,300 MGY of water. Existing estimated water demand within the entire service area with the addition of the proposed project water demand would total approximately 4,244 MGY under the "Estimate 1" water demand scenario and 3,773 MGY under the "Estimate 2" scenario in the year 2030 (EKI, March 2011). Water supplies would be adequate to serve buildout accommodated by the proposed General Plan without any other increased water demand in the City's service area.

With other growth and development, water demand within the City's entire service area in 2030 is estimated as 4,537 MGY under "Estimate 1" and 4,046 MGY under "Estimate 2". With other growth and development in the service area taken into account, the City's normal water supply may not be sufficient after the year 2020 under the Estimate 1 growth scenario, which is based on average water use between 1999 and 2004. However, there would be sufficient water supplies until the year 2030 under the Estimate 2 growth scenario in which average water use would continue along the same trend as experienced in the last few years (Ibid.). This does not take into account potential reductions in water supply that could reduce the City's estimated normal year capacity of approximately 4,300 MGY due to potential changes in North Coast or San Lorenzo River diversions resulting from federal and state agency decisions. Other growth in the City's water service area is addressed in the "Cumulative Impacts" subsection of the CEQA CONSIDERATIONS (Chapter 5.0) section of this EIR.

DRY YEAR SUPPLY AND DEMAND WITH PROJECT

The WSA concludes that the City does not have sufficient water to meet current or future projected water demand during dry years, irrespective of future development and growth accommodated by the proposed General Plan. As previously indicated, during a dry year, the City currently has is approximately 3,800 MGY available and approximately 2,700 MGY available during the second year of a drought (City of Santa Cruz, February 2006). An annual average deficit of 5% may exist between the City's water supply during a single dry year and the existing water demand. If development associated with the proposed *General Plan 2030* and elsewhere within the City's water service area is also considered, then an annual average deficit of 12% between 2010 and 2020, and up to 16% by 2030, may be experienced during a single dry year. Annual average deficits are greater for multiple-dry year periods. The annual average deficit between the City's water supply during a second dry year and existing demand is estimated to be 23% to 32%. This deficit increases to 33% to 40% by 2030 in a multiple-dry year if planned development also is taken into account. It is important to note that these deficits are annual average values that do not address peak season cutbacks, which can be significantly greater than the annual average deficits due to seasonal variations in demand and supply, and limitations on the City's water storage facilities (EKI, March 2011). These estimates also do not take into account potential reductions in water supply that could reduce the City's estimated normal year capacity of approximately 4,300 MGY (e.g., potential

changes in North Coast or San Lorenzo River diversions resulting from federal and state wildlife agency decisions discussed above).

CONCLUSION – SUPPLY AVAILABILITY

Water supplies are sufficient to serve the proposed project in a normal year with existing water demand until approximately 2020, or until 2030 if reduced water demand trends throughout the service area continue. If reduced demand trends do not continue, water supplies in a normal year may be insufficient after the year 2020 with other new development and growth in the City's water service area, which is further addressed in the "Cumulative Impacts" subsection (5.4) of the CEQA CONSIDERATIONS (Chapter 5.0) section of this EIR.

Water supplies are not sufficient under existing conditions in dry years. Due to existing insufficient water supplies during dry waters, additional demand from the proposed project would be considered significant. Furthermore, supplies in normal years may become inadequate between 2020 and 2030, and, thus, additional demand from the proposed project would be considered significant.

Reasonably Foreseeable City Water Supply Sources

As previously indicated, a basic assumption of the City's *Integrated Water Plan* and 2005 UWMP is that the City will continue to use its existing water supply sources in the future without change in current production levels. However, the City faces a series of ongoing challenges that potentially could lead to some loss of existing supply in the future, although it is uncertain at this time to what extent and which supplies might be affected. These considerations include the preparation of a HCP that could adjust diversions in some scenarios, water rights petitions, and reduction of groundwater production to protect against saltwater intrusion.

The HCP is being developed to prevent impacts to endangered fish, which are generally the greatest on the North Coast streams during the dry season and during dry water years, as well as wet season salmonid migration and spawning (City of Santa Cruz Water Department, April 2011). The proposed strategy consists of provision of specified instream flows during different periods and with and without water supply augmentation and other mitigation strategies. The proposed strategy consists of three tiers. The water supply implications of providing Tier 1 flows are minimal as these flows would maintain existing habitat levels by maintaining current status quo for operations to ensure no further degradation in habitat and can currently be met in most years (88% of years) with the City's current water supply system and without exacerbating the magnitude of dry weather shortages (currently about 35% shortage under 1977 drought hydrology) (Ibid). The situation gets worse over time as water demands grow with the frequency of dry weather shortages increasing and the magnitude of drought year shortages growing more severe. Tier 2 flows would provide better than existing habitat in North Coast streams and San Lorenzo Lagoon (with priority to Laguna Creek and San Lorenzo Lagoon due to their relatively greater habitat value for anadromous salmonids). While this magnitude of instream flows is possible in most years in the near term during wet and average water years, it results in a Critical Water Shortage Emergency (33 – 43% peak-season shortage) in dry years, which are 10% of years. By 2030, the Critical Water Shortage Emergency grows (42 – 50% peak-season shortage) and can occur in 28% of years without the development of 2.5 mgd of additional dry weather water supply (Ibid.).

The utilization of any one water source varies monthly and throughout the year and also during wet, normal and dry years. Thus, the City cannot confidently predict at this time, the actual amount of potential water supply reduction that may occur due to the HCP effort, which is an ongoing process that has not been completed. However, the City acknowledges the uncertainty of the future water supply capacity. The estimated demand and supplies presented in this EIR are based on estimates and updates of current adopted plans and existing known supply limits. The UWMP is being updated and is likely to be adopted in Fall 2011, and will present any new information that may be available regarding water supply availability.

As previously mentioned, the City is pursuing construction of a desalination plant to provide a reliable supplemental water supply in dry years, which is necessary even without the proposed project. This is part of the City's overall water supply strategy that also includes conservation and curtailment during droughts as set forth in the City's adopted *Integrated Water Plan* and *Urban Water Management Plan*. This water supply strategy is further described below.

DESALINATION

The City is actively pursuing construction of a desalination plant as the preferred supplemental water source identified in the City's adopted IWP and UWMP. The City's adopted IWP reviewed six alternatives and identified seawater desalination as the only feasible alternative for a backup supply of drinking water during a drought to meet demand with a 15% curtailment level set forth in the adopted IWP. The other alternatives would not provide the yield needed to accommodate existing and future drought demands during a multiple-dry year period. As currently envisioned, the desalination facility would initially provide 2.5 mgd for supplemental supply during a drought and could be expanded to 4.5 mgd.

As a preliminary step, the City recently completed operation of a "pilot project" to gather information to establish the optimal design and operating parameters for a permanent facility. Based on these results, the City is moving forward with design plans and environmental review for a permanent facility for drought protection, which is expected to be constructed and in operation by the year 2015, pending completion of project-level environmental review and regulatory permit approvals, including approval of a coastal development permit from the Coastal Commission.[7]

The City acknowledges some uncertainty related to the approval and timing of the permanent desalination plant construction and operation. The likelihood of construction of a permanent plant is currently uncertain as design plans have not been completed, and it cannot be predicted at this time whether the Coastal Commission and other agencies would issue the necessary approvals. For these reasons, the City concludes that it cannot "confidently determine" that this source is "reasonably likely," as spelled out in the guidance provided by the California Supreme Court in its decision in *Vineyard Area Citizens et al.* v. *City of Rancho Cordova* (2007) 40 Cal.4th 412. Nonetheless, the City has identified a desalination plant as its best option to alleviate supply

[7] Other potential permits, approvals and/or consultations for a permanent desalination plant and supporting infrastructure (i.e., intake facility and distribution pipeline) may be required from various agencies, including, but not limited to U.S. Fish and Wildlife Service, State Lands Commission, and California Department of Health Services.

shortages in drought conditions, and therefore has committed to pursuing this option with the intent of working diligently with the other agencies with regulatory and/or permitting authority over the plant to obtain all necessary approvals. Thus, the future desalination facility, which is planned and being pursued, is considered to be the most likely future water source, although it nonetheless remains somewhat uncertain until design, environmental review and regulatory approvals are completed.

Another consideration regarding whether a desalination plant is likely to be constructed and operated is the fact that the City and Soquel Creek Water District (SqCWD) are pursuing the desalination plant as a joint project. The SqCWD would use some or all of the future plant's capacity when the City doesn't need it to reduce SqCWD's reliance on groundwater and avoid potential seawater intrusion. The SqCWD would share in the cost of building and operating the plant. In 2006, the SqCWD Board adopted its updated Integrated Resource Plan, which identifies this regional desalination plant as its preferred use alternative, and SqCWD has provided assistance with funding for the pilot desalination plant.

POTENTIAL IMPACTS OF DESALINATION FACILITY

The desalination concept adopted by the City involves constructing a seawater intake system using an existing, abandoned wastewater outfall, building a new desalination plant and installing the associated pipelines and pump stations for delivering treated water to the Bay Street Reservoir and conveying seawater concentrate to the City's wastewater facilities, where it would be blended with municipal wastewater flows and disposed via a deep ocean outfall (City of Santa Cruz Water Department, February 2006). A desalination facility site was identified along the Delaware corridor. The certified IWP EIR evaluates impacts of the construction of a desalination facility and associated pipelines on a programmatic level for the initial construction of a 2.5 mgd facility for drought protection (Alternative D-1) and the same with participation of the SqCWD (Alternative 2) and two subsequent expansions (3.5 and 4.5 mgd) for each alternative. The EIR document, which consists of the following two documents, is hereby incorporated by reference in accordance with the provisions of the State CEQA Guidelines section 15150.[8]

- City of Santa Cruz Water Department. June 2005. *Draft Integrated Water Plan Program Environmental Impact Report.* State Clearinghouse #2003102140. Prepared by EDAW.
- City of Santa Cruz Water Department. October 2005. *Final Program Environmental Impact Report, Response to Comments Document.* State Clearinghouse #2003102140. Prepared by EDAW.

Construction of a desalination plant could have physical environmental effects, and the IWP EIR identified potentially significant impacts that could be mitigated to a less-than-significant level, except for temporary construction noise, which was found to be a significant unavoidable impact. Potentially significant impacts that could be mitigated are summarized in Chapter 1 of the Draft EIR and updated in Chapter 3 of the Final EIR and include the following: hydrology

[8] The EIR documents are available for review at the City of Santa Cruz Water Department, 809 Center Street, Room 102, Santa Cruz, California 95060; phone: 831-420-5200 and are also available for review online at: http://www.ci.santa-cruz.ca.us/.

and water quality, marine resources, land use, biological resources, air quality, noise, geology and soils, cultural resources, public services and utilities, visual resources, hazardous materials, and traffic. The identified impacts included both impacts of plant operation and construction. These are summarized below. It should be noted, however, that further project-specific environmental review will be conducted once permanent plant design plans are prepared.

Potentially significant desalination plant operational impacts include:

- *Water Quality Degradation* (5.1-2) due to discharge of seawater concentrate from the desalination plant and potential improper storage, use and disposal of chemicals at the desalination plant (5.1-3). The seawater concentrate produced from the desalination plant is proposed to be mixed with the effluent from the City's wastewater treatment plant. The analysis found that this combination would not exceed the City's wastewater plant discharge requirements and the salinity level would be lower than that of the ambient ocean water. With proper management, impacts would be reduced to a less-than-significant level. This includes construction of concentrate storage at the treatment plant for times when effluent flow is not adequate for mixing with the concentrate being generated by the desalination facility, and control of mixing with automatic and continuous monitoring. Chemicals would be required to be properly stored and disposed, and the facility would be designed to prevent unauthorized disposal of chemicals into the concentrate waste stream.
- *Impacts to Marine Resources* due to operation of the seawater intake which could entrap marine organisms (5.2-1). Construction of intakes, pumps and other facilities could result in disturbance to marine and/or nearshore habitat and species (5.2-4, 5.2-9). The impacts of the intake were determined to probably not be significant because the maximum daily intake is much lower than volumes that have been found to have significant adverse impacts on marine organisms, and because the intake would be designed to reduce losses. However, this issue would require more detailed studies and analyses for a 4.5 mgd facility. Construction of facilities would proceed after site-specific reviews determine that none are located in sensitive areas. According to the Initial Study and Notice of Preparation prepared for the project-level EIR that is being prepared, two types of intake systems are being evaluated: sub-seafloor intakes and screened, open-ocean intakes with a number of alternatives being considered for each of these types of intakes (scwd[2], November 2010).
- *Exposure to Flood* (5.1-4), *Seismic Hazards* (5.7-1), and/or *Soils Limitations* due to project siting (including distribution facilities) and operation that could be mitigated by implementation of recommended engineering and design measures to withstand and minimize damage from these hazards.
- *Impacts to Cultural Resources* due to inadvertent disturbance of potential or unknown cultural resources during (5.8-1, 5.8-2, 5.8-3) that can be mitigated by pre-construction and during construction surveys and protection.
- *Removal of Emergency Wastewater Discharge Pipeline* (5.9-4) with use of the wastewater plant's abandoned outfall line for the intake system that would be mitigated with upgrades to the treatment plant facilities.

- *Visual Impacts* (5.10-2, 5-10.3) that can be mitigated with proper design and vegetative screening.
- *Hazardous Exposure* to workers due to accidental spills and/or release of chemicals (5.11-1, 5.11-3) or disturbance of contaminated soils during construction (5.11-2) that can be mitigated with implementation of proper storage, containment, and emergency controls.

Construction impacts include:

- *Water Quality Degradation* (5.1-1) due to construction of the pipeline in locations close to surface water bodies and potential erosion during construction (5.7-2). These would be mitigated with implementation of construction controls and best management practices.
- *Impacts to Biological Resources* due to construction that may disturb sensitive habitat or special status species (5.4-1, 5.4-2, 5.4-3, 5.4-4, 5.4-5) or result in indirect impacts related to sedimentation (5.4-6). These impacts can be mitigated with standard pre-construction surveys, siting to avoid sensitive resources, establishment of construction buffer zones, and other construction controls and best management practices to prevent indirect impacts.
- *Air Emissions*, primarily related to air emissions during construction (5.5-2) that would be mitigated with standard dust control measures during construction.
- *Construction Traffic* for temporary periods during construction (5.12-1, 5.12-2) that can be mitigated with implementation of traffic control plans and measures.
- *Solid Waste Generation* (5.9-3) that would be mitigated with construction specifications regarding excavation reuse and recycling.
- *Construction Disturbance to Adjacent Land Uses* (5.3-1) due to construction noise, dust, etc. and potential interference with utility lines (5.9-1) that could be mitigated to some extent, although not to a less-than-significant level, with construction controls, such as limits on hours of operation.

The EIR also found that the first construction increment for both alternatives would have no growth-inducing impacts, and that the subsequent plant expansion increments would require further review of population projections and City/County land use planning documents prior to any expansion of a plant to ensure that development of an additional water supply is consistent with, but does not outpace, planned growth projections (City of Santa Cruz Water Department & EDAW, June 2005). In most cases, the EIR concluded that the CEQA significance level of impact between Alternatives D-1 and D-2 is similar (with D-1 being the City building a desal plant exclusively for its own use, and D-2 being a joint project between the City and the SqCWD), except for the impact on local and regional groundwater supply. For this environmental issue area, Alternative D-2 is likely to provide a beneficial impact on the groundwater basin. The delivery of desalinated water to SqCWD during normal and wet years would allow reduced pumping in the district and potentially contribute to additional groundwater in storage (Ibid.).

Based on the programmatic review conducted as part of the IWP, nearly all physical impacts are expected to be minimized or adequately mitigated. Expansion to provide additional

capacity for planned growth would involve minimal physical expansion to add additional filters, but would also be subject to additional environmental review to further analyze growth inducement potential based on review of City, County and Capitola General Plans.

Project-level environmental review is currently underway, concomitant with preparation of design plans for a permanent facility. An EIR is being prepared that will address potential impacts at two plant sites along Delaware Avenue with several intake options, and brine disposal. According to the EIR Notice of Preparation released in November 2010, the proposed desalination project would consist of: (1) a seawater intake structure, associated pump station, and conveyance piping; (2) a seawater desalination plant that would provide for pretreatment filtration, seawater reverse osmosis (SWRO), post-treatment conditioning and disinfection, and solids handling processes and their associated support facilities; (3) a brine disposal and conveyance system; and (4) water supply delivery system improvements. The EIR will provide comprehensive project-level analyses, including topics not included in the IWP EIR, such as greenhouse gas emissions and climate change. Global climate change is predicted to result in a sea level rise. The area in which a desalination plant is being considered is located approximately 20 feet above sea level, and not within areas that have been estimated to be affected by sea level rise within the City. Nonetheless, project design plans and future site-specific environmental reviews will need to assess and address this issue based on the most up-to-date information available.

ADDITIONAL CONTINGENT CITY WATER SOURCES

As previously discussed, several possible water supply options were carefully evaluated, including drilling more wells, upgrades to the North Coast system, and a water transfer involving exchange of groundwater with recycled wastewater for agricultural use on State Park lands north of the City. Both the wells and groundwater exchange concept ultimately proved infeasible, leaving seawater desalination as the only practicable solution available to the City (City of Santa Cruz Water Department, February 2006).

Recycled wastewater was determined to be potentially feasible for agricultural irrigation, but would produce high cost, limited yields that were too small to meet the City's drought-year needs (City of Santa Cruz Water Department, February 2006). Recycled water for landscape irrigation remains a potentially viable alternative that could be pursued in the future. However, currently it is not the City's preferred water supply strategy. The use of recycled water for landscape irrigation was previously rejected from further consideration due to a number of reasons, including the limited yield and high cost. The potential users of the recycled water (i.e., parks, schools, cemeteries, golf courses, UCSC) have an estimated outdoor irrigation demand of approximately 170 to 230 MGY. This amount was considered too small by itself to meet the City's drought-year needs and also had a high capital cost. Additionally, water recycling would be as expensive as desalination and would not provide a sustainable yield for a multiple-year drought scenario, and thus, would not be a reliable, cost-effective supplemental source.

The City's 2005 UWMP indicates that, in addition to pursuing desalination, the City remains open to exploring other water supply alternatives that would not be feasible to develop in the short-term, but may be useful to consider over a 20-year timeframe, such as water recycling, groundwater recharge, reservoir expansion, aquifer storage and recovery and off-stream storage. These potential alternatives have not yet been fully studied and consideration of such

sources would occur at some point further in the long-term, if the desalination project is not ultimately approved.

Proposed General Plan Policies & Future Plans

The Draft *General Plan 2030* includes goals, policies and actions that set forth comprehensive measures to avoid and minimize adverse impacts on water supply. These include: measures to reduce water demand and promote conservation; protect and manage existing water supplies; develop new water sources; provide watershed management and water management planning; and maintain water system facilities. A summary of the proposed *General Plan 2030* policies that serve to reduce/mitigate impacts of increased water demand on City water supplies are summarized in Table 4.4-5. The plan calls for implementation of the City's IWP and UWMP with annual status reports to the City Council on water demand and supplies and updates of the UWMP. The proposed General Plan seeks to reduce demand through continued and improved conservation, as well as to investigate new water sources (CC3.10).

Additionally, the proposed plan also seeks to coordinate major land use planning decisions in all three jurisdictions served by the City water system (CC3.6), including implementing the City's Urban Water Management Plan and updating it periodically as required by State law (CC3.6.1). The plan calls for provision of annual updates to the City Council on the status of remaining water supply (CC3.6.2) as part of a process to confirm or adjust the estimate of remaining supply to avoid oversubscribing the water system (CC3.6.3). As required by State law, the City is in the process of updating its 2005 UWMP, which will further review water supply availability and demands based on the most recent available information.

Conclusion. Future development accommodated by the proposed *General Plan 2030* would result in an increased water demand under a conservative, "worst-case" growth scenario that may exceed available water supplies after the year 2020 for normal year conditions, and would contribute additional demand in dry years for which supplies are currently inadequate. Estimated water demand associated with buildout accommodated by the proposed General Plan 2030 would not exceed existing supplies in a normal year, but supplies could become insufficient during the General Plan timeframe with consideration of all demand within the water service area. Thus, the increased water demand would be considered a significant impact. With implementation of the proposed *General Plan 2030* policies and actions to reduce water demand, promote additional water conservation, manage and protect water supplies, and develop a reliable, supplemental water source, such as desalination, the impact could be reduced to a less-than-significant level. However, despite the City's intent to pursue an additional water supply for dry-year conditions, there are some uncertainties associated with these future actions. The City acknowledges the inherent uncertainty about its ability to obtain all necessary approvals for, and completion of, the planned desalination facility. Furthermore, further reductions in surface water supplies due to implementation of wildlife protection strategies under an HCP may require that the City seek additional supplies and/or expansion of a desalination facility beyond that which is currently planned for drought supply. Therefore, the project impact on City water supplies during both normal and during dry year conditions is considered significant.

TABLE 4.5-5
Proposed General Plan Policies & Actions that Reduce Water Supply Impacts

Type of Measure / Action	Policies / Actions

WATER DEMAND MANAGEMENT AND/OR REDUCTION	• Reduce demand through Conservation: CC3.1.1 and promote conservation: CC3.11, CC3.11.1
	  ◦ Implement urban water conservation BMPs: CC3.5.1
	  ◦ Economic incentive with rates: CC3.9.1
	  ◦ Offer home audit programs: CC3.5.3
	  ◦ Financial incentives to install low-flow fixtures: CC3.5.4
	  ◦ Provide info on onsite water catchment systems: CC3.5.5
	• Updated landscaping guidelines and offer irrigation audits: CC3.11.2, CC3.11.3
	  ◦ Parks Irrigation Audits: NRC1.1.3
	  ◦ Offer water audit programs: CC3.5.3
	• Promote maximum water use efficiency & implement urban water conservation measures: CC3.5, CC3.5.7
	• Support gray water collection and reuse: NRC7.4.3
	• Require high efficiency fixtures in City projects: NRC7.4.1, NRC7.4.2
	• Audit water system to minimize losses: CC3.5.9
	• Administer retrofit & landscaping standards for new development: CC3.5.6
	• Regional collaborations and cooperation: CC3.5.10, CC3.5.11

WATER MANAGEMENT PLANNING	• Implement IWP: CC3.1 & actions (conservation, contingency, desalination) • Implement & update Urban Water Management Plan: CC3.6.1 • Provide annual updates to Council on status of water: CC3.6.2 • Confirm/adjust estimate of remaining supply to avoid oversubscribing the water system: CC3.6.3 • Complete Climate Risk Assessment: NRC4.5.1
LAND USE DECISIONS	• Coordinate land use planning between jurisdictions served by City: CC3.6 • No new North Coast connections: CC3.8 • Allow extension of water service area only if approved by City Council and/or LAFCO: CC3.7 • Consider developing significance criteria for development projects: CC3.6.4
MAINTAIN, PROTECT & MANAGE WATER SUPPLIES	• Ensure development does not lead to water source overdraft through environmental review process: LU1.2, LU1.2.1 • Secure and maintain water rights: CC3.3.3 • Safeguard existing surface and groundwater sources: CC3.3., CC3.3.4 • Meet or exceed regulatory drinking water standards: CC3.2 & actions
PROTECT & MANAGE GROUNDWATER SUPPLIES	• Safeguard existing surface and groundwater sources: CC3.3., CC3.3.4 • Manage City watershed lands to protect drinking water: CC3.3.1 • Monitor groundwater levels and quality: CC3.3.9 **CONTINUED ON NEXT PAGE)**

TABLE 4.5-5
Proposed General Plan Policies & Actions that Reduce Water Supply Impacts

Type of Measure / Action	Policies / Actions
	• Participate with the Soquel-Aptos Groundwater Management Alliance in cooperative efforts to assure the quality and production of groundwater resources: CC3.3.10
DEVELOP WATER SUPPLIES	• Develop desalination plant: CC3.1.3, LU3.10.2 (Initiate GP amendments when desal site selected) • Investigate new water sources: CC3.10 • Explore recycled water : CC3.10.1, CC4.3 • Provide adequate facilities for groundwater production: CC3.3.8
WATER FACILITY MAINTENANCE	• Provide adequate pumping, treatment, and distribution facilities for production of groundwater of 1 mgd in normal years and 2 mgd during droughts: CC3.3.8 • Update Water Shortage Contingency Plan to respond to water shortages: CC3.1.2 • Maintain and improve the water system., including for fire flow, treatment plants, storage & distribution facilities CC3.4, CC3.4.1, CC3.4.3

Mitigation Measures

Implementation of the proposed *General Plan 2030* policies and actions to reduce water demand, promote water conservation, and support development of reliable supplemental water supplies will not reduce this impact to a less-than-significant level due to uncertainties regarding funding and implementation of desalination or another adequate alternative water supply, which may be needed to serve future growth. Therefore, the conservative conclusion is that the project impact on City water supplies during both normal and during dry year conditions is significant and unavoidable, even with implementation of proposed *General Plan 2030* policies and actions.

Impact 4.5-2 Groundwater
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in an increased demand for water supply. However, the draft *General Plan 2030* plan does not propose expansion of groundwater supplies, and with implementation of proposed policies and actions, groundwater supplies would not be depleted, nor would development accommodated by the plan interfere with groundwater recharge. This is considered a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use

map that support additional development, as summarized above. As indicated in the "Environmental Setting" section above, groundwater constitutes only approximately 4% of the City's entire water supply, but it has been a crucial component of the water system for meeting peak season demands and during periods of drought. The groundwater supply consists of three production wells in the Live Oak area outside of the City. The average annual production is approximately 160 MGY, but the system was operated at its full 2 mgd capacity at times during the 1987-1992 drought, during which time annual production reached 430 MGY. A replacement well is currently proposed and undergoing project-level environmental review by the City However, the City recognizes that the uncertain nature of groundwater conditions in the western portion of the basin is a serious issue and has limited future maximum extraction during all water years to 215 MGY or approximately 1 mgd (City of Santa Cruz Water Department, December 2010 and Kocher, personal communication, June 2011).

Development that would be accommodated by the *General Plan 2030* is located within City limits, which is primarily developed, and would not be located in areas of groundwater recharge. The groundwater basin utilized as part of the City's water supplies is located outside city limits.

The Draft *General Plan 2030* includes goals, policies and actions that set forth comprehensive measures to protect groundwater resources as summarized on Table 4.5-5. Policy CC3.3 and its supporting actions seek to safeguard existing surface and groundwater sources. Action CC3.3.8 supports provision of adequate pumping, treatment, and distribution facilities for production of groundwater of 1 mgd in normal years and 2 mgd during droughts, which are the historical levels at which the City's groundwater supplies have been utilized, and thus, they do not represent an increase in use or expanded production of groundwater sources. However, as indicated above, the City has limited maximum extraction to 1 mgd.

The City's *Urban Water Management Plan* indicates that there is a potential for saltwater intrusion to jeopardize the safe production of groundwater from the Purisima aquifer, but also notes that at this time, under normal operations, there appears to be no imminent threat of seawater intrusion, and the State Department of Water Resources has not identified the basin as overdrafted or projected to be overdrafted. Proposed Policy LU1.2 and Action 1.2.1 seek to ensure that development does not lead to water source overdraft through evaluation during the environmental review process. Additionally, proposed Action CC3.3.9 proposes monitoring groundwater levels and quality, and continued participation with the Soquel-Aptos Groundwater Management Alliance in cooperative efforts to assure the quality and production of groundwater resources (CC3.3.10). The goals of the agreement are to establish common basin management objectives, undertake joint research projects, and improve interagency coordination to assure the safe production and protect the quality of the underground resource (EKI, March 2011).

> **Conclusion**. Future development accommodated by the proposed *General Plan 2030* would result in an increased water demand, but there are no plans to expand groundwater pumping. Similarly, development accommodated by the proposed plan would not be located within groundwater recharge areas and would have no effect on recharge capabilities. Therefore, the project would not 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. Implementation of

proposed policies and actions to monitor and protect groundwater resources would ensure that groundwater supplies are protected and not depleted in the future. Thus, this is a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* action is recommended.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

CC3.3.8 Provide adequate pumping, treatment, and distribution facilities for the reliable production of groundwater of 1 mgd in all ~~normal~~ years. ~~and 2 mgd during droughts~~.

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4.6 PUBLIC SERVICES & UTILITIES

4.6.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Overview
- Fire Protection Services
- Police Protection Services
- Parks and Recreation
- Schools
- Wastewater Treatment
- Solid Waste Disposal
- Electrical & Natural Gas Utilities

This section provide the environmental setting for each of the public services and/or utilities listed above. Section 4.6.3 of this chapter provides the impact analyses for each of these services.

REGULATORY OVERVIEW

There are a number of state laws and regulations governing the provision of specified services. These are discussed below under the applicable service topic.

Pursuant to State law (Government Code Section 54773 et seq.) a Local Agency Formation Commission (LAFCO) was established in each county to promote the orderly development of local government agencies and efficient provision of services, to guide development away from prime agricultural land and to discourage urban sprawl. Pursuant to State law, LAFCOs must adopt a Sphere of Influence (SOI) for each governmental agency (including special districts), which is the probable physical boundary and service area of a local government. LAFCO is required to review and approve or disapprove governmental boundary change proposals with regards to spheres of influence, annexation, detachment, reorganization and/or extending services of a local agency.

The California Government Code Section 56430 requires LAFCOs to conduct Municipal Services Reviews (MSRs) that describe the municipal services provided by the agencies that are subject to LAFCO authority. MSRs are comprehensive studies designed to collect and analyze information about the governance structures and efficiencies of service providers, to estimate their ability to meet current and future service needs, and to identify opportunities for greater coordination and cooperation between providers. The Santa Cruz LAFCO completed its report in August 2005, and LAFCO approved the countywide service review in December 2007 (Resolution No. 2007-9). The review is a comprehensive overview of public services within Santa

Cruz County and includes the four cities and over 80 special districts providing municipal-type services such as water, wastewater service, fire protection, police protection, recreation and parks and solid waste. Pertinent findings are provided below for each service.

FIRE PROTECTION SERVICES

Regulatory Setting

The Uniform Fire Code published by the International Fire Code Institute and the Uniform Building Code (adopted in California as the California Building Standards Code) published by the International Conference of Building Officials both prescribe performance characteristics and materials to be used to achieve acceptable levels of fire protection. Amendments to the California Building Standards effective in 2008 increased the requirements for defensible space and require more fire-resistant building materials and design than prior codes in areas identified as having severe fire hazards.

The Federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390), adopted by Congress in October 2000, requires state and local governments to develop hazard mitigation plans as a condition for federal grant assistance. The City of Santa Cruz adopted its "Local Hazard Mitigation Plan" in September 2007. The detailed five-year plan identifies potential natural and man-made hazards, assesses their likely risk, and includes mitigation methods to reduce risks. The potential hazards identified in the plan include wildfires. Mitigation measures proposed to address these risks generally include prioritized actions that include hazard event planning, emergency prepardedness coordination and education, facility upgrades, monitoring actions and other actions in response to specific hazards. The mitigation plan will be reviewed and updated every five years.

Existing Facilities, Staff and Operations

The City Fire Department provides fire protection and emergency response for all areas within the City limits and maintains mutual aid agreements with other fire districts in the County, UCSC and California Department of Forestry (CDF) to provide fire protection to areas surrounding the City. The City serves the Paradise Park subdivision through an annexation to the service area that was approved by the Local Agency Formation Commission (LAFCO) of Santa Cruz County.

The City of Santa Cruz Fire Department operates out of three fire stations and houses its administrative functions at an office downtown. The three existing City fire stations are: Fire Station #1 at 711 Center Street, Fire Station #2 at 1103 Soquel Avenue, and Fire Station #3 at 335 Younglove Avenue. All facilities meet current building codes, including seismic retrofitting, fire sprinklers, and new electrical systems. The Department also maintains a Marine Rescue Headquarters (Station Four) on the Municipal Wharf.

The Department has five fire engines, one fire truck, and other related vehicles and equipment. The Department addresses its equipment and facilities needs through its planning efforts and budgeting process. The City's Fire Department is funded through the City's General fund.

The Department currently is staffed by 18 full-time firefighters, 12 fire engineers, 13 captains, three battalion chiefs, one fire chief, one fire prevention inspector and one deputy fire marshall, two division chiefs, one EMS program manager, and two administrative staff. Each shift has 15 assigned firefighters. The current level of firefighters represents approximately 0.75 firefighter (less than one) per 1,000 residents. The Fire Department has a minimum staffing standard of 12 firefighters and one battalion chief on duty per day.

The number of service calls received by the fire department in 2009 was approximately 6,850 calls. The majority of the calls are for non-fire emergencies, with about 80% of the calls being for medical assistance. Average response times from each of the three fire stations is approximately 3 to 3½ minutes. The Department's goal is to respond to emergency medical calls in less than five minutes 90% of the time and to fire emergency calls within eight minutes 90% of the time.

The existing number of fire stations and equipment/facilities are considered adequate to provide service throughout the City, except that the Department does not have a Training Facility, the construction of which is included as a recommendation in the Department's "Three Year Strategic Plan, 2009-2011." The Plan also recommends improvements to apparatus bays at Stations One and Three to accommodate new equipment, and investigation of constructing a new fire station at the present Station Two location and relocation of Station Four (Marine Rescue Headquarters). In the long-term the Department would like to relocate its downtown station and administration facilities in a combined facility with a Training Facility (Oliver, Ramos, personal communication, April 2011).

Wildland Fire Hazard

In addition to fires within developed City areas, the City is subject to "wildfires" in open space preserves and parks adjacent to developed areas. Wildfires are typically caused by human activities and are affected by the type and amount of vegetation, weather, fuel and topography. Wildland fire may be defined as any unwanted fire involving outdoor vegetation. The wildland/urban interface refers to development that has occurred in or near open space areas (City of Santa Cruz, September 2007).

Wildland fires present a risk to open space areas within the City of Santa Cruz and to adjacent residential homes. There are five wildland/urban interface areas within the City, including three areas designated as mutual threat zones – Delaveaga Park, Pogonip, and the Arroyo Seco/Meder Canyon (City of Santa Cruz, September 2007). Additional areas of concern for these wildland/urban interface zones include the Arana Gulch greenbelt property and Moore Creek Preserve, as well as Lighthouse Field and other smaller wildland/urban interface areas throughout the City (Ibid.). Figure 4.6-1[1] identifies areas of the City that pose serious wildfire hazards due to vegetation type, vegetation build-up and topographic conditions.

Mutual threat zones are defined as areas where a wildfire would threaten property within the City of Santa Cruz fire service area, as well as property covered by another fire protection

[1] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

service. For major emergencies that require more resources than can be provided by a single agency, the City of Santa Cruz, Santa Cruz County, the University of California at Santa Cruz and the State of California have an extensive mutual aid and emergency coordination system. The mutual threat zones are delineated in the Wildland Pre-Suppression Plan, which is used to identify non-State responsibility areas in which any fire is considered a threat to adjacent State responsibility areas. These geographic areas are designated because of the urban development that has occurred along their canyons and the vegetation types that are considered to pose a significant wildfire hazard (City of Santa Cruz, September 2007).

Recent wildland fires in the City of Santa Cruz include the Meder Canyon Fire in 1990, which covered several acres and was consumed in 20 minutes. A number of other wildland fires in the Santa Cruz area including the Santa Cruz Mountains have been a long-standing concern to the City of Santa Cruz. Priorities in the event of a wildfire are life safety, preservation of property and resource conservation (City of Santa Cruz, September 2007). Despite the fact that there has not been a recent wildland fire within the city limits, areas targeted in the City's Hazard Reduction Plan as "likely" to have a wildland fire include the Arroyo Seco/Meder Canyon, DeLaveaga, Pogonip, Moore Creek area and Arana Gulch (Ibid.), although wildland fires can occur in other areas. Increasing use of these areas by residents, transient encampments with fires and young adults exacerbates the risks (Ibid.).

Most wildland fire areas are adjacent to residential or open space areas. Only a few public buildings are immediately threatened by wildland fires. Public buildings that are in threatened areas are the historic Pogonip clubhouse, DeLaveaga Golf Club and associated buildings, 35 schools and day care centers and some park structures. There are eight commercial or industrial structures in the threat zone (City of Santa Cruz, September 2007).

POLICE PROTECTION SERVICES

The City of Santa Cruz Police Department provides crime protection and prevention activities throughout the City, including patrols, response to calls, education and community outreach. Its range of services include patrol, investigations, traffic, parks unit, street crimes unit, gang unit, dive team, hostage negotiation team, tactical team and School Resource office. The Department recently initiated an application for mobile phones/IPADs that allows citizens to download Crime Alerts and crime tips. The City has mutual aid agreements with county law enforcement (Sheriff's Office, Capitola, Scotts Valley, Watsonville, California Highway Patrol, State Parks and UCSC Police Departments).

The Police Department operates out of one police station/headquarters, located in downtown Santa Cruz. The Department is currently staffed by 94 authorized sworn officer positions, of which 88 are filled, 24 non-sworn (civilian) positions, including four community service officers, and three administrative staff. The current staff level represents a per capita ratio of approximately 1.57 sworn police officers per 1,000 city residents. A ratio of 1.5 officers per 1,000 population has been a national accepted minimum standard (Vogel, personal communication, April 2011). The Department has lost approximately ten sworn officers since 2000, and currently is understaffed by at least six officers (Ibid.).

The Department has divided the City into five main beats, and handled 78,132 calls in 2008 and 85,774 calls in 2009. The average response time is four minutes, 22 seconds, which is under the Department's target of four minutes, 30 seconds. Dispatching services are provided through the Santa Cruz Consolidated Emergency Communications Center.

The City of Santa Cruz funds its Police Department through the City's General Fund, grants, fees and service charges. The City also has a special revenue fund to account for state and federal grants received for police programs. The Department' existing facility and vehicles are adequate for the existing population; major capital improvements including replacing the building HVAC with an energy efficient system (Vogel, personal communication, April 2011).

PARKS AND RECREATION

Santa Cruz offers residents and visitors a wide range of parks, open space, beaches, trails, and recreational opportunities. The City has responsibility for management, maintenance and operation of over 1,700 acres of parks and open space lands, and various community/recreational facilities, and oversees development of new parks and improvements within City-owned parks, open space, and community facilities. The City also manages the Heritage Tree Program, Urban Forest Program, as well as maintains street and median landscaping in public rights-of-way.[2] Within the City limits, open space and beaches are also provided on State-owned lands, including three State Park units and the University of California campus. Maintenance operations of existing City-owned parks and recreational facilities are funded from the City's General Fund.

Regulatory Setting

STATE REGULATIONS

The Quimby Act (California Government Code §66477) was passed in 1975 and authorizes cities and counties to pass ordinances requiring developers to set aside land, donate conservation easements, or pay fees for park improvements. This provision of the State Subdivision Map Act enables cities and counties to require the dedication of land and/or payment of in-lieu fees for parks and recreation purposes as a condition of approval of a tentative map or parcel map subdivision. AB 1600 amended the Quimby Act in 1982 to hold local governments more accountable for imposing park development fees. The AB 1600 amendment requires agencies to clearly show a reasonable relationship between the public need for the recreation facility or park land and the type of development project upon which the fee is imposed. Cities and counties are required to show a strong direct relationship, or nexus, between the park fee exactions and the proposed project. Local ordinances must include definite standards for determining the proportion of the subdivision to be dedicated and the amount of the fee to be paid by the developer. AB 2936 was adopted as an amendment to

[2] Heritage trees and urban forest policies and actions are addressed in the BIOLOGICAL RESOURCES (Chapter 4.8) and AGRICULTURAL, FOREST AND MINERAL RESOURCES (Chapter 4.15) sections of this EIR.

the Quimby Act in 2002, and allows counties and cities to spend up to 10% of their Quimby Act fees to prepare master plans for park and recreation facilities every three years.

LOCAL REGULATIONS

Parks and Recreation Facilities Tax. The City imposes a "Parks and Recreation Facilities Tax" (pursuant to Chapter 5.72 of the Municipal Code) on new residential development (including mobile homes) within the City, payable at the time of issuance of a building permit. The collected taxes collected are placed into a special fund, and "shall be used and expended solely for the acquisition, improvement and expansion of public park, playground and recreational facilities in the city" (section 5.72.100). The current fee is $3.00 per square foot of residential building. Projects that have dedicated land or fees in accordance with Municipal Code Chapter 23.28 (described below) are exempt from this tax.

Public Dedications Pursuant to the California Subdivision Map Act. Chapter 23.28 regulates public dedications, including parks and open space, enacted pursuant to the authority granted by the California Subdivision Map Act in accordance with the City General Plan. Land dedication shall be based on two acres/1,000 population for neighborhood parks and 2.5 acres/1,000 population for community parks. The current in-lieu fee is $3.00/square foot for each residential dwelling unit to be constructed in the subdivision. Where the residential dwelling unit square footage is not specified as part of the plans for the project, a fee of $4,780.00 per residential lot is required under the current regulations. Payment shall be at the time of the filing of the final subdivision or parcel map.

Pursuant to section 23.28.020.1 of the City's Municipal Code, dedication of land or payment of fee in lieu thereof, or both, may be a condition of approval of a final subdivision map or parcel map for park or recreational purposes. (Condominium conversions are exempt from dedication requirements.) The dedication shall be for usable open space that is composed of land that offers natural advantages for the type of facilities to serve the subdivision. A fee in lieu of such dedication shall be required, when no portion of the proposed usable open space is planned to be located within the limits of the subdivision. Only the payment of a fee may be required in the case of a subdivision of fifty or fewer parcels. Section 23.28.020.4 requires establishment of a permanent maintenance program for usable open space lands dedicated under these provisions of this title.

Pursuant to section 23.28.020.3, natural ravines and natural waterways or other natural areas within the boundaries of a subdivision shall be reserved for public purposes, such as recreation, stormwater disposal, etc., as provided by the General Plan and Coastal Land Use Plan through dedications or easements for public use. Pursuant to section 23.28.040 and in accordance with, the provisions of Article 3.5 of the Subdivision Map Act, the General Plan, and Coastal Land Use Plan, the city shall increase public access to the public natural resources in conjunction with the review of subdivisions of land.

Parks, Community Facilities, and Recreational Programs

The City of Santa Cruz offers a range of neighborhood parks, community/regional parks, community facilities, and recreational programs. Most of these parks, facilities and programs are operated and maintained by the City Parks and Recreation Department. Some facilities

and programs are operated and organized in partnership with community organizations. These parks, facilities and programs provide recreational opportunities for residents and visitors of all ages and interests.

NEIGHBORHOOD AND COMMUNITY/REGIONAL PARKS

Neighborhood Parks. Neighborhood parks serve the recreational needs of those living within the City's primarily residential neighborhood areas. Neighborhood parks provide recreational facilities such as children's play areas, playing fields, basketball and tennis courts, and picnic areas. Some of the City's community garden plots are also located within neighborhood parks. Community garden provide residents with a space to grow small scale vegetable gardens.

The City's standard is to provide neighborhood parks at a ratio of 2.0 acres per 1,000 people. The location of neighborhood parks is ideally within approximately one-half[3] mile of neighborhood areas. There are 23 existing neighborhood parks, as summarized on Table 4.6-1and shown on Figure 4.6-2, which total approximately 57 acres. There are approximately 45 acres of school playing fields, for a total of approximately 102 acres of neighborhood parks within the City. In accordance with the City's existing General Plan, neighborhood park acreages include both City and non-City managed lands such as public school playing fields. The City of Santa Cruz and City School Districts entered into a joint use agreement in 1963 that allow use of selected school playground facilities and indoor facilities to the City and use of City facilities by the school districts..

To meet increasing demand for off-leash dog use, the Parks and Recreation Department has also designated off-leash areas within neighborhood parks throughout the City. These areas may be fenced or designated through signage. The City has designated the following parks as being available to off-leash dog use:

- DeLaveaga Park (service road into Lower DeLaveaga Park): sunrise to sunset.
- Frederick Street Park: off-leash area from sunrise to sunset.
- Grant Street Park: within off-leash area from sunrise to sunset.
- Mitchell's Cove Beach: before 10AM and after 4PM.
- Pacheco Dog off-leash area: fenced area from sunrise to sunset.
- University Terrace Park: fenced off-leash area from sunrise to sunset.

Community Parks. Community Parks are designed to serve the entire community. They are generally larger than neighborhood parks and offer facilities such as athletic fields, group picnic areas, bike and skateboard parks, lawn bowling, bocce ball, community meeting/event facilities, swimming pools, and locations for outdoor special events. The City's standard for community/regional parks is 2.5 acres per 1,000 people. Ideally these parks are located within 1.5 miles of neighborhood areas.

[3] The draft General Plan 2030 indicates neighborhood parks should be within one-half of a mile (about five blocks).

There are six existing community parks, totaling approximately 366 acres within the City as summarized below and on Table 4.6-1, and shown on Figure 4.6-2.

- Depot Park (8.5 acres), which opened in 2005, presently features a full-size soccer field, a plaza/public art area, a wood ramp bike park, picnic areas, children's' play features, the rehabilitated historic Depot building used for community and recreational programs, a trail connection through the park to the beach area, restrooms, and parking lots. The Monterey Bay Marine Sanctuary Visitor Center will be developed within the southern portion of Depot Park, across the street from Monterey Bay and the Municipal Wharf. The Depot Park Master Plan also includes a future site for the Natural History Museum.
- Harvey West Park (55 acres) presently features ball fields, group picnic areas, a children's playground, two outdoor swimming pools, the Clubhouse/Scouthouse, Wagner and Kids cottages, a Park Rangers' facility, restrooms, and parking areas. The park also features trails through the woodlands, including a trail connection to the adjacent Pogonip trail system. In recent years the pool has been closed seasonally due to City budget constraints and most recently has been operated by a private entity on a limited basis.
- Lower DeLaveaga Park (35 acres) presently features two soft ball fields, a large turf area, a bocce ball court, a volleyball court, a children's playground, individual and group picnic areas, restrooms and parking lots. Branciforte Creek flows along the western edge of the park, with the forested hillsides of the DeLaveaga greenbelt property rising along the eastern boundary of the developed park. Trail entrances at the edges of the park connect to the trail system within the DeLaveaga greenbelt.
- DeLaveaga Golf Course (250 acres) is part of DeLaveaga Park and includes a golf course, clubhouse and other open space land used for passive recreation.
- San Lorenzo Park (13 acres) presently features an open turf area along the San Lorenzo River, a duck pond and stage, a lawn bowling facility, a children's' playground, paved trails, and a restroom. The turf area often serves as a location for outdoor special events.
- Ken Wormhoudt Skate Park AY Mike Fox Park (4 acres), located along the San Lorenzo River further to the south, features the Ken Wormhoudt Skate Park and a roller-hockey practice area. The 15,000 square foot concrete skate park includes a full pipe, bowls and street skating features.

Regional Parks. Regional parks serve the recreational needs of a regional population and are 150 acres in size or larger. They offer active and passive recreation with activities and amenities not found in neighborhood and community parks, such as large areas of open space, large picnic facilities, golf courses, lake boating, ball fields, multi-use trails. An accepted national standard for regional parks is 20 acres per 1,000 people. City residents are in close proximity to a number of regional parks, each offering an array of activities. These parks include: DeLaveaga Park (upper) and greenbelt preserves within the City, and nearby Henry Cowell and Wilder Ranch State Parks (see Figure 1-2). State and municipal beaches and the Yacht Harbor also offer recreational opportunities serving the regional community as further discussed below.

TABLE 4.6-1: City Parks and Open Space Lands

TYPE	FACILITY	SIZE (in acres)
Neighborhood Parks		
	▪ Beach Flats Park – 122 Raymond St.	0.3
	▪ Bethany Curve Greenbelt – Delaware to West Cliff	2.6
	▪ Central Park – 301 Dakota St.	0.2
	▪ Derby Park – 509 Woodland Way	3.8
	▪ Frederick Street Park – 168 Frederick Street	4
	▪ Garfield Park – 624 Almar Ave.	1.8
	▪ Grant Park – 150 Grant St.	2.4
	▪ John Franks Park – Marnell St.	0.3
	▪ Laurel Park – 301 Center St.	1
	▪ Lighthouse Neighborhood Park – Lighthouse Ave.	1.7
	▪ Mission Plaza – 103 Emmet St.	1
	▪ Moore Creek Overlook – Cypress St.	0.12
	▪ Lower Ocean Street Park – 258-262 San Lorenzo Blvd.	0.5
	▪ Ocean View Park – 102 Ocean View Ave.	2.5
	▪ Rincon Park – 601 Chestnut St.	0.1
	▪ Poets Park – 200 Raymond St.	0.13
	▪ Rincon Park – 601 Chestnut St.	0.1
	▪ Round Tree Park – 205 Nobel	0.13
	▪ Star of the Sea – Frederick St. & Darwin St.	2.1
	▪ Trescony – Trescony St.	2
	▪ Tyrell Park – Santa Cruz Museum	1.5
	▪ University Terrace – Meder Street	8.5
	▪ West Cliff	14.5
	▪ Westlake Park – Bradley Dr. @ Spring St.	6
	▪ School Playing Fields [1]	44.6
	TOTAL ACRES (rounded)	102
Community Parks [2]		
	▪ Depot Park	8.5
	▪ Harvey West Park	55
	▪ DeLaveaga Park – Lower	35
	▪ DeLaveaga Golf Course	250
	▪ San Lorenzo Park – 137 Dakota St.	13
	▪ Ken Wormhoudt Skate Park at Mike Fox Park	4
	TOTAL ACRES (rounded)	366
Greenbelts & Open Space Lands with Recreational Uses		
	❑ Arana Gulch – Agnes St.	68.9
	❑ Arroyo Seco Canyon – Meder St.	N/A
	❑ DeLaveaga Park – Upper (minus Golf Course)	275
	❑ Jessie Street Marsh	2.29
	❑ Moore Creek Preserve	246
	❑ Neary Lagoon – 100 California St.	44
	❑ Pogonip – 333 Golf Club Drive	640
	TOTAL ACRES (rounded)	1,276

CONTINUED ON NEXT PAGE

TABLE 4.6-1: City Parks and Open Space Lands

TYPE	FACILITY	SIZE (in acres)
City-Owned Beaches		
	❑ Main Street Beach	26.4
	❑ Cowell Beach	4.9
	❑ Wharf	8.2
	❑ Mitchell's Cove	0.4
	❑ Its Beach (west portions)	N/A
	TOTAL ACRES (rounded)	40

[1] School sites are given credit for ¾ of their field acreage at: Santa Cruz & Harbor High Schools; Branciforte and Mission Hill Middle Schools; Bay View, DeLaveaga, Loma Prieta, Gault, Branciforte & Westlake Elementary Schools; Pacific Collegiate School; Holy Cross
[2] Loch Lomond Park (100 Loch Lomond Way, Felton) provides recreational opportunities outside City limits.

Existing Park Deficiencies. The City's desired ratio for neighborhood parks is to provide 2.0 acres of parkland per 1,000 people. Given an estimated current population of 58,982 (California Department of Finance, May 2010), a total of 118 acres of neighborhood parkland would be required to meet this level of service. Presently the City has approximately 102 acres of neighborhood parkland (including school play grounds). Thus, the City would require 16 additional acres of neighborhood parkland to meet the current desired level of neighborhood parks. According to the Parks and Recreation Department, recreational programming of services currently meets the community's demand. However, like many local jurisdictions, Santa Cruz experiences a shortage of athletic fields. At this point, no plans or funding exists to increase the number of facilities. Currently one one-half acre neighborhood park (Lower Ocean) is scheduled for construction. No others are currently programmed.

The City's desired ratio for community parks is to provide 2.5 acres of parkland per 1,000 people. Given the current population, a total of 148 acres of community parkland would be required to meet this level of service. The City presently has approximately 366 acres of community parklands, which exceeds the City's desired ratio.

The City of Santa Cruz is not a regional park agency; therefore, the City does not have a desired ratio for regional parks. The City also does not have a desired ratio for open space, but City does, however, provide a substantial level of open space parkland. Together, Pogonip, Arana Gulch, Upper DeLaveaga, Moore Creek Preserve, and Neary Lagoon total approximately 1,500 acres. This represents a ratio of 27 acres of open space per 1,000 people. (Open space and greenbelt lands are discussed further below.)

COMMUNITY FACILITIES, RECREATIONAL PROGRAMS, AND EVENTS

Community facilities, recreational programs, and special events serve the needs and interests of individuals, neighborhoods, groups, and the community of Santa Cruz. Events, held at community facilities and park, attract both residents and visitors.

Community Facilities. Community Facilities provide locales for public events and reservable spaces for concerts, meetings, classes, and other events. In recent years, the City has

coordinated with community organizations regarding operation of some facilities due to City budget constraints. The City owns and maintains a number of community facilities that support social, recreational and special event programs as described below.

- The Civic Auditorium, dedicated in 1940, is located within downtown Santa Cruz. The auditorium provides space for concerts, expos, and meetings.
- Louden Nelson Community Center, located to the south of downtown adjacent to Laurel Park, serves as a multi-cultural center for classes, theatre, events, and recreational programs. The community center was originally constructed as an elementary school, but was later reopened as a City facility in the 1970s.
- The Beach Flats Community Center, presently operated by a community organization, provides programs and services for residents.
- The Harvey West Park Facilities include a community swimming pool and Clubhouse that offer reservable space for community and private events.
- The City-owned Natural History Museum in located within the Seabright neighborhood, on the edge of Tyrell Park overlooking Monterey Bay. The exhibits and programs are housed in the modified 1915 Carnegie library building. The Natural History Museum is presently operated by the Museum Association. A proposed new location for the museum is included in the Depot Park Master Plan.
- The Surfing Museum, also presently operated by the Santa Cruz Surfing Club Preservation Society, is located within the memorial lighthouse at Lighthouse Point.

A community/environmental education center is proposed for the historic Clubhouse in the Pogonip Master Plan but is presently unfunded.

Recreational Programs. Recreational Programs offered by the City Parks and Recreation Department are designed to be affordable and available to residents and nonresidents of all ages and interests. Activities include a variety of classes and outings, sports leagues, and programs for older adults. Classes and programs are held at various City parks, beaches, and community centers, and at other locations such as schools.

Community Events. Community Events offered by the City include a variety of cultural and recreational events attracting residents and visitors. Events sponsored by the City are often held in cooperation with organizations and private entities. Some of the events which have been sponsored by the Parks and Recreation Department over the years include music/art festivals, chowder cook-offs, and outrigger canoe races. The City Parks and Recreation Department also hosts cultural events in coordination with the Sister Cities Committee.

Community Gardens. Community gardens are public and privately owned lands used for small scale flower and vegetable gardens. These gardens—a specialized type of park—provide the community with food, greenery, and therapeutic and relaxing recreation. The gardens can be created on small, undevelopable parcels of land or as temporary uses on other parcels.

Greenbelt and Open Space Lands

Open space lands provide wildlife habitat, protect natural resources, and offer opportunities for recreation, scenic views, and outdoor/environmental education. The City owns and manages over 1,500 acres of greenbelt and open space lands. The greenbelt properties (Arana Gulch, DeLaveaga, Moore Creek Preserve, and Pogonip) provide large acreages of open space and natural areas encircling the City's urban core. Open space and wetland areas within the City's central area include the San Lorenzo River corridor, Neary Lagoon, and Jessie Street Marsh. Moore Creek (east branch) and Arroyo Seco feature undeveloped canyons within the northwestern area of the City.

Within the City limits, State-owned lands also provide open space and protect natural resources. State Park units featuring open space include Natural Bridges State Beach (SB) and Lighthouse Field SB. Beyond the City limits to the west and north, Wilder Ranch State Park and Henry Cowell Redwoods State Park provide vast areas of open space. State parks are described in the following "Coastal Recreation" subsection. The University of California campus lands also feature areas of undeveloped open space. Antonelli Pond, a wetland area within the Moore Creek corridor, is owned and managed by the Land Trust of Santa Cruz County.

Management of natural resources and public use within the City's open space areas is guided by master or management plans. These plans provide a long-term vision for each open space area, including guidelines for protecting and enhancing natural and historic resources, and developing trails and other recreational uses.

CITY-OWNED GREENBELT LANDS

In 1979, the City of Santa Cruz identified six properties along the City's boundaries as Greenbelt lands, totaling approximately 1,500 acres. With only DeLaveaga under City ownership at that time, the City embarked on an effort to acquire and protect 1,000 acres over the next 20 years. Today, the City-owned Greenbelt lands include DeLaveaga, Pogonip, Arana Gulch and Moore Creek Preserve. These sites and other natural areas are further described below.

DeLaveaga, located on the City's northeastern boundary, was donated to the City and County as a public park in the late 1800s by Jose Vicente DeLaveaga. Today, the 525-acre upper DeLaveaga is owned and managed by the City of Santa Cruz. (Some parcels, however, are under state ownership as part of the State Armory). Habitat areas within DeLaveaga include oak woodlands, redwood groves, grasslands, coastal prairie, and the west branch of Arana Gulch creek. A Park Master Plan was prepared for DeLaveaga in 1960, which includes a broad range of proposed uses. The plan was not been updated.

Upper DeLaveaga features the municipal DeLaveaga Golf Course and Clubhouse, a disc golf course, an archery range, an approximately 8-mile network of multi-use trails, and parking areas. A gun range, which had been in existence for approximately 50 years, was closed to public use, and the site was remediated after lead contamination was identified. A Golf Course Master Plan was adopted by the City Council in 2003 and identifies improvements to upgrade the existing golf course, including improvements to the golf course, drainage system, and landscaping, and future construction of a new clubhouse.

Pogonip is located approximately one mile north of downtown Santa Cruz between the University of California campus and the San Lorenzo River corridor. This 614-acre greenbelt was acquired by the City in 1989, and features coastal prairie, woodlands, creeks, springs and a reach of the San Lorenzo River known as Sycamore Grove. An adjacent 25-acre parcel, known as the Wavecrest "greenbelt" parcel, was later purchased by the City in 1997. Pogonip, once part of the Cowell Ranch landholdings, was extensively logged and features historic resources associated with the lime production industry (mid-to-late 18th century). The property also includes a rustic clubhouse, constructed in 1911 as part of the Casa del Rey Golf Course. The two-story Craftsman Bungalow style structure and meadow area were later used for polo grounds. Prior to City ownership, the clubhouse was also used as a private social club, but due to its deteriorated condition, the building has been closed since 1993.

The *Pogonip Master Plan,* adopted by City Council in 1998, addresses public access, recreational uses, historic resource rehabilitation and preservation, and natural resource management and protection. The Master Plan includes a trail system, rehabilitation of the historic clubhouse as a community facility, a permanent agricultural garden site for the Homeless Garden Project, and outdoor education areas. Limited parking within the lower and main meadow areas, minimal improvements to the one-lane access road to the clubhouse, and a Ranger facility are also addressed in the Master Plan. Dogs on-leash are allowed, but off-leash dog and off-trail use is prohibited. Specific uses identified in the plan include:

- A 9-mile trail system featuring both unpaved service roads and single-track trails open primarily to pedestrians.
- A multi-use trail (pedestrians, bicycles, horses) connector trail linking Henry Cowell Redwoods State Park, Pogonip and the University of California property.
- Rehabilitation of the historic clubhouse to serve as a staging area for educational programs, a meeting and retreat center, and a site for special events.
- Preservation and interpretation of the historic limekilns, roads and associated features.
- An outdoor education camp in the lower meadow and a nature/education area within Sycamore Grove.
- A permanent garden site for the Homeless Garden Project.

To date, the trail system has been implemented including a multi-use regional trail connection linking State Park lands, Pogonip, and the UC campus open space. Limited rehabilitation of the historic Clubhouse has occurred, but it remains closed to public access and complete rehabilitation for public use is presently unfunded. At present, the parking lots, outdoor education areas, and Homeless Garden agricultural garden have not yet been implemented.

Arana Gulch, totaling 67.7 acres, is situated along the City's eastern boundary, to the north of the Santa Cruz Harbor. Acquired by the City in 1994, this greenbelt property features coastal prairie, riparian and oak woodland, seasonal wetlands, and the lower reaches of Arana Gulch Creek. Historically the property was used for cattle grazing and dairy operations. The current unimproved trail system, much of which existed prior to City ownership as cattle trails or unpaved access roadways, provides pedestrian, bicycle, and on-leash dog use access.

The *Arana Gulch Master Plan,* adopted by the City in 2006 and pending Coastal Commission approval, includes a trail system featuring paved multi-use trails (wheelchair accessible), a new west entrance and bridge spanning Hagemann Gulch, unpaved pedestrian trails, interpretive displays and overlooks. Most of Arana Gulch would continue to remain undeveloped, with a focus on management and protection of the sensitive habitat areas. No on-site parking or restrooms are proposed within the greenbelt property. Specific public use guidelines contained in the Master Plan are outlined below. The Master Plan also identifies three resource management areas for coastal prairie/Santa Cruz tarplant (30.2 acres), riparian and wetland areas, and Hagemann Gulch riparian woodland; resource management guidelines are included in the Master Plan for each of these areas.

- Provide multi-use wheelchair accessible interpretive trails connecting the surrounding neighborhoods to the Upper Santa Cruz harbor.
- Establish a new west entrance at Hagemann Gulch to provide a trail connection between Arana Gulch and the Seabright neighborhood. Provide a multi-use trail and bridge crossing over Hagemann Gulch, featuring an interpretive overlook.
- Provide a pedestrian-only interpretive loop trail encircling the coastal prairie.
- Improve the existing pedestrian trail along the western edge of the Arana Gulch Creek management area.
- Allow dogs on-leash on designated trails. Prohibit off-leash dog use and off-trail use to avoid impacts to tarplant populations and other plant and animal species.

Moore Creek Preserve is located on the western edge of the City, north of Highway 1 and extending to the UCSC campus. This 246-acre natural area, acquired by the City in 1998, features the west branch of Moore Creek, coastal prairie, and oak woodlands. The State of California holds two conservation easements over the property. Numerous threatened and endangered plant and wildlife species have been documented within the Preserve. Historically the property was used for cattle grazing.

The *Moore Creek Preserve Interim Management Plan,* adopted by City Council in 2002, serves as a guide for management of the Moore Creek Preserve until preparation/approval of a long term Park Master Plan for the property. The State of California conservation easements include restrictions on various uses and activities. Existing interim uses include hiking trails (approximately 3 miles), cattle grazing, and study, preservation, enhancement and protection of native species and their habitat. Dogs are prohibited within the Preserve. The interim trail system is based primarily on trails and unpaved service roads which existed prior to City ownership and are largely a result of cattle grazing operations. No onsite parking, public access road, or restroom facilities are included in the Interim Plan. A coastal development permit was approved for construction of a bridge to mitigate existing trail impacts to Moore Creek. The *Interim Management Plan* also identifies three plant community resource management areas and addresses specific management of habitat areas for special status species.

CITY-OWNED WETLANDS AND OTHER OPEN SPACE

The City owns and manages several other open space and wetland areas in the central area of the City. These include the San Lorenzo River, Branciforte Creek, Jessie Street Marsh, and Neary Lagoon. In the northwest area of the City, Arroyo Seco and Moore Creek (east branch) canyons provide undeveloped open space areas through residential areas.

The San Lorenzo Riverway includes the lower reach of the River through central Santa Cruz, along the eastern edge of the downtown south to Monterey Bay. The river has been channelized since the late 1950s, with extensive native tree and shrub planting completed as part of the levee improvement project in the 1990s. Multi-use paved trails exist on the levee on both sides of the river, except for a short segment in the vicinity of the County Building north of Soquel Avenue.

Recreational opportunities include trail use, nature viewing, bird watching, and fishing. Public access is provided by a continuous paved pathway/service road, extending approximately 2.5 miles on each levee from Highway 1 southward, provides public access. A new pedestrian-bicycle path was developed that extends north from the northern edge of the western levee, under Highway 1 and connects to the Tannery Arts Project residences.

Improved public access is addressed in the *San Lorenzo Urban River Plan*. This document is the outcome of a planning process initiated by City Council in 1999 to update plans for the San Lorenzo River, Jessie Street Marsh, and Branciforte Creek. The plan serves as a guide for restoring and managing natural resources, riverfront development, and public access improvements for the lower San Lorenzo River. It includes conceptual ideas to promote river-oriented development, site specific recommendations for public areas along the river, and restoration recommendations.

Neary Lagoon is a City-owned wetland and natural area situated in the central part of the City. Acquired by the City in 1967, the 14-acre lagoon and surrounding riparian and woodland habitat within the management area total 44 acres. Neary Lagoon was originally an oxbow of the San Lorenzo River that was gradually isolated from the main river channel and reduced dramatically in size over the past century.

The Neary Lagoon Management Plan, adopted by City Council in 1992, is a comprehensive guide integrating previous documents prepared. The Management Plan addresses public access and use, hydrology, water quality, vegetation management and habitat restoration, and wildlife and fishery management. Public access includes an interpretive trail system, nature observation areas, interpretive exhibits, and recreational facilities within designated areas. The access is designed to encourage pedestrian use, including wheelchair accessibility. Most of the public use components of the plan have been implemented. Public use guidelines contained in the Management Plan discourage bicycle riding except on designated through trails, and dogs are prohibited within the management area.

Jessie Street Marsh is a City-owned wetland and open space located just to the north of the San Lorenzo River mouth. Historically, Jessie Street Marsh was part of a large tidal estuary open to the San Lorenzo River. After construction of the river levees, the tidal flows were blocked.

Freshwater continues to flow into the marsh area from storm water runoff and springs along the bluff.

The marsh area presently has informal unimproved pathways, with no developed site amenities. A developed trail descends down the bluff from Ocean View Park, along the southern Jessie Street marsh area, to East Cliff Drive. The *Jessie Street Marsh Management Plan*, adopted by the City Council in 1999, was prepared to provide a long-term plan to preserve and enhance the natural resources of the marsh, improve water quality, manage flood waters, and provide appropriate public access. This plan, not yet implemented due to budget constraints, includes recommendations for trails, interpretive signs, overlook and nature viewing areas and improved access to adjacent Ocean View Park to the northeast. An overview of proposed public access management actions:

- Construct a bridge over the marsh channel and a boardwalk adjacent to the marsh plain near Lemos Avenue and Jessie Street.
- Construct footpaths within the upper and lower marsh areas, including a connection to East Cliff Drive.
- Construct a new trail and steps to Ocean View Park and improve the existing trail connection to the adjacent park.
- Construct gates, fencing and install boulders to inhibit inappropriate public access.
- Install interpretive signs to create a nature walk experience.

Branciforte Creek flows along the boundary of Lower DeLaveaga Park and continues southward, under Highway 1, to its confluence with the San Lorenzo River at the southern end of San Lorenzo Park. The lower one-mile reach of Branciforte creek was channelized in a concrete flood control channel in the late 1950s. From approximately Market Street northward, Branciforte Creek remains a natural channel with native riparian vegetation on the stream banks.

Public trail access is provided along sections of the service access road along the channel. The confluence of the creek and the San Lorenzo River is recognized as an important bird watching area and overlook area. Much of the natural channel is located within private residential properties, though public access is provided along the natural creek channel within Lower DeLaveaga Park. The *San Lorenzo Urban River Plan* includes recommendations for enhancing the creek corridor, improving water quality, and providing interpretive signage.

Arroyo Seco Canyon extends from University Terrace Park/Meder Street southward to just north of Mission Street/Highway 1. An intermittent creek, City sewer line and utility access route extend along the bottom of the canyon. The access route, maintained by the City's Public Works Department, is also used as a trail by residents. Private residential parcels extend into the undeveloped canyon.

Moore Creek Canyon (East Branch) extends from the UC campus lands southward, paralleling Western Drive, to its confluence with the west branch of Moore Creek just north of Highway 1. This corridor features an intermittent creek flowing through a steep-sided canyon bordered by residential areas. The east branch corridor includes private and public parcels.

The *Moore Creek Corridor Access and Management Plan* (1987) includes recommendations for public access, land dedication, open space easements, and resource management. The plan's goal is to provide public access in a manner compatible with private property, existing development, and the constraints of the natural setting. Presently, there is limited public access within the eastern Moore Creek Canyon.

STATE-OWNED OPEN SPACE

Two State Park units, Lighthouse Field and Natural Bridges State Beaches, offer open space and recreational opportunities within the City limits. The UC campus also features large open space areas and trails accessible to the public. State Park General Plans are the primary management documents for State Park units.

Lighthouse Field State Beach (SB) is a 36-acre open space situated along Monterey Bay, featuring coastal terrace, ocean cliffs, and Its Beach. The open space features grassland (primarily non-native), willows, Monterey cypress trees, and eucalyptus groves. The State of California acquired the field area and coastline west of Lighthouse Point in 1978. A 30-year agreement between the State/City/County regarding local management and maintenance of Lighthouse Field SB expired and has not been extended. At present, this State Park unit is managed and operated by California State Parks.

The *Lighthouse Field State Beach General Plan* (1984) identifies two zones within the property. The 32-acre Field Zone is designated as a low intensity use area, featuring trails and open space. The Coastal Zone is designated as a moderate to high-intensity use area, featuring coastal access, the Surfing Museum, a restroom and maintenance facility, picnicking, and parking areas. Use is restricted to day use only, with no overnight parking or camping. The parking lots and restroom/maintenance facility that presently exist were developed further to the south, toward Lighthouse Point, than depicted in the General Plan conceptual development diagram. A parking area along Pelton Avenue that is identified in the Plan has not been constructed. This eucalyptus/cypress grove area is now recognized as overwintering Monarch butterfly habitat.

Natural Bridges State Beach (SB) is a 65-acre open space and wetland situated on Monterey Bay, on the western boundary of the City. Primary resources include the natural rock bridge, a beach, Monarch butterfly over wintering habitat, and the Moore Creek wetland. The initial state park acreage was established in 1933, with additional lands acquired later.

Public facilities identified in the *Natural Bridges State Beach General Plan* (1992) include a visitors' center, picnic areas, trails and walkways, restrooms, and day-use parking areas. The main entrance is presently located at the terminus of West Cliff Drive. The plan proposes developing a new main entrance off of Delaware Avenue, which is the location of the original entrance in the 1950s. Two preserves are designated within Natural Bridges State Beach: the Monarch Butterfly Natural Preserve and the Moore Creek Wetland Preserve.

UCSC – the University of California Santa Cruz is a 2,020-acre campus, of which approximately 53% is located within city limits. The campus offers amenities for active and passive recreation on the main campus, and the north and upper campuses currently are undeveloped and in open space. Active recreation facilities include playing fields and a swimming pool. The main campus and recreational facilities are open to the public during daylight hours for walking, bicycling,

and visiting campus facilities, such as the Arboretum and Chadwick Gardens. Trails throughout the campus, designed primarily to provide access to campus facilities, also provide recreational opportunities for walking and hiking. The "Cowell Wilder Regional Trail" (open to hikers, bicyclists and equestrians) is located on the north campus (outside city limits) and provides a connection to between Wilder Ranch State Park to the west and Pogonip and Henry Cowell State Park to the east (University of California Santa Cruz, September 2006 – DEIR, Volume Two).

Trails

Santa Cruz has an extensive trail network, featuring paved and unpaved pathways connecting open space, parks, the coast, downtown, and neighborhood areas. This network includes multi-use trails, some of which are wheelchair accessible, and hiking only trails. Together, the City-owned greenbelt lands, open spaces and coastal pathways provide over 50 miles of trails. In addition, State Parks, the UC campus lands, and the Santa Cruz Harbor offer many more miles of publicly accessible trails. The paths and trails support walking, jogging, hiking, and bicycling. The city and regional trail systems provide not only recreation, but access to and connections between various parks, recreation facilities, and natural and urban areas. Promenades and hiking trails (including those along the Beach/Boardwalk, San Lorenzo River Corridor, Downtown, and West Cliff Drive) provide opportunities to enjoy unique natural and historic areas. The network of walkways, bikeways, and trails will become increasingly important for

The Santa Cruz Circle Trail concept focuses on establishing a continuous trail route through the City's greenbelt lands, along the San Lorenzo River, the coastline and the harbor, to create a continuous pathway encircling the City and linking downtown. Santa Cruz also features several regional trail connections, including the California Coastal Trail and Henry Cowell Redwoods State Park/Pogonip/UCSC/Wilder Ranch State Park regional trail.

The Santa Cruz County Regional Transportation Commission (SCCRTC), in association with other regional agencies, envisions the planning and construction of a Monterey Bay Sanctuary Scenic Trail (MBSST). The MBSST Network will be a multi-use system of bicycle and pedestrian facilities that allows the public to enjoy and experience the Monterey Bay National Marine Sanctuary from the vantage point of the shoreline. The master planning process is in progress, and it is envisioned that some of the recent local coastal trail projects will be part of this network, such as the Wilder Ranch Bicycle and Pedestrian Path, the Watsonville Slough Trails, the Monterey Rail/Trail, and the Monterey Bay Sanctuary Scenic Trail. Specific alignments have not yet been developed in the City of Santa Cruz.

Coastal Recreation

The City's coastline along Monterey Bay, totaling approximately 4.6 miles, is a prime recreational destination for residents and over two-million visitors a year. Coastal recreation offers opportunities for a variety of activities, including: ocean and wildlife viewing; beach/coastside walking, jogging and bicycling; surfing, bodyboarding, swimming, and standup paddling; fishing; kayaking and boating; windsurfing/kiteboarding; sunbathing; and picnicking. Coastal facilities and visitors centers also offer educational opportunities about the coastal and marine environment.

Coastal recreation within the City of Santa Cruz includes City and State beaches, coastal pathways, the Municipal Wharf, Santa Cruz Surfing Museum, Santa Cruz Harbor, and the Boardwalk Amusement Park. Coastal-oriented environmental education facilities include the Seymour Marine Discovery Center at UCSC's Long Marine Laboratory and the future Monterey Bay National Marine Sanctuary Visitors' Center.

CITY BEACHES AND THE MUNICIPAL WHARF

City-owned and managed beaches include Main Beach, Cowells Beach, the western portion of Its Beach, and Mitchell's Cove. Main Beach is a broad expanse of sand extending from the San Lorenzo River mouth west to the Municipal Wharf. Volleyball courts are available on Main Beach. Cowells Beach lies to the west of the wharf, extending to the West Cliff Drive bluff. Both beaches are heavily used by visitors and residents during summer months for sunbathing, wading and swimming. Cowells Beach is also a popular surf break with access from the beach and a stairway along West Cliff Drive. The City of Santa Cruz provides seasonal life guard towers and service on Cowells and Main Beach. Dogs are prohibited by the City on Main Beach and Cowells Beach.

On the coastal bluff along West Cliff Drive, a pedestrian/bicycle path extends from Cowells Beach to Natural Bridges State Beach. Situated along West Cliff Drive, two smaller sandy beaches are accessible by stairways. Its Beach, located to the west of Lighthouse Point, is owned by the City and State. The access stairs are located on State Parks property. Further to the west is Mitchell's Cove, which is open to off-leash dog use during certain hours.

Stairways along the West Cliff Drive pedestrian/bicycle path also provide access to popular surfing breaks, including Steamer Lane and Mitchell's Cove. Stairs are located (east to west) at Pelton Avenue next to the Surfer Statute, Steamer Lane, Its Beach and Mitchells Cove. Other surfing breaks along West Cliff Drive are not accessible by constructed stairways.

Lighthouse Point, owned and managed by the City, features the Surfing Museum which is located within the Abbott Memorial Lighthouse. The Point offers an overlook of the Steamer Lane surfing area and opportunities for viewing sea lions, otters, migrating whales, and marine birds. A grassy area at Lighthouse Point is used for informal play and picnicking, and special events.

The Municipal Wharf, constructed in 1914, extends 2,700 feet into Monterey Bay and separates Main Beach from Cowells Beach. Popular with visitors and residents, the wharf features public walkways, overlooks, seating areas, interpretive exhibits, restaurants, shops, kayak and boat rentals, and parking areas. Nature viewing and fishing are also popular activities.

STATE BEACHES

Seabright Beach is part of the Twin Lakes State Beach park unit. This wide beach extends from San Lorenzo Point southward to the west jetty of the Santa Cruz Harbor. Access to the beach is provided at the end of Cypress Avenue, a stairway at Third Avenue, and from the Harbor. A restroom is located at the Cypress Avenue entrance. Portable lifeguard towers are installed seasonally. The *Twin Lakes State Beach General Plan* (1992) plan proposes a year-round lifeguard facility and a new restroom between Third Avenue and the jetty. Popular activities include sunbathing, wading and swimming, beach walking/jogging, picnicking, and fires within designated rings. Dogs are restricted to on-leash use only.

A sandy cove beach located within Natural Bridges State Beach is popular for sunbathing, wading and swimming, tide pool visitation and surfing. Its Beach (eastern portion) is part of Lighthouse Field State Beach. This small pocket beach varies in size depending on the season and tides. Popular activities include sunbathing, wading and bodyboarding. Dogs are restricted on on-leash use only. The sandy beach area along the Santa Cruz Boat Harbor is owned and managed by the Port District. To the east within the County, the Twin Lakes State Beach also includes smaller sand beaches.

SCHOOLS

Regulatory Setting

Local school districts are empowered under state law to impose school impact fees, which are collected by local governments at the time of building permit issuance. In 1998, the California State Legislature enacted SB 50, which made significant amendments to existing State law governing school fees. SB 50 prohibited state or local agencies from imposing school impact mitigation fees, dedications, or other requirements in excess of those provided in the statute. Government Code Section 65995(e) provides that where payment has been made to a school district in accordance with the school fee program that payment is considered full mitigation for school impacts. The legislation also prohibits local agencies from denying or conditioning any project (including a general plan) based on the inadequacy of school facilities.

Section 23.28.030 of the City's Municipal Code regulates dedication of land as a condition of approval of a final subdivision map in accordance with the provisions of Section 66478 of the Map Act.

Schools and Enrollments

Schools and educational services are provided to City residents by the Santa Cruz City Schools District (SCSD), as well as a number of private schools, for grades K through 12. SCSD is composed of two separate districts: the Elementary District (K-6) and the High School District (7-12), governed by a common board and administration. The Elementary District draws students from the city of Santa Cruz and includes four K-5 schools, one K-6 school and two 6-8 schools serving 2,624 students in grades K-6 (City of Santa Cruz Elementary and High School District, June 2010).

The High School District encompasses much of the northern portion of Santa Cruz County drawing its student population from the communities of: Davenport, Bonny Doon, Scotts Valley, Santa Cruz, Live Oak, Soquel and Capitola. The secondary District includes two middle schools (grades 6-8), three comprehensive schools, a continuation school, an independent studies program and a K-12 home study program with a combined enrollment of 4,217 students (City of Santa Cruz Elementary and High School District, June 2010).

Table 4.6-2 identifies school capacities and projected enrollments. It should be noted that Soquel High School and Delta Charter School are not located within the City. The Branciforte Small Schools campus includes the Alternative Family Education, Ark Independent Studies, Costanoa Continuation School, and Monarch Elementary School. The existing combined

enrollment for the Santa Cruz City Schools is 6,841 students based on data in the District's annual budget (Santa Cruz City Schools, June 2010). Delta Charter Show (grades 9-12, located outside City limits) serves 190 students (Ibid.). The enrollment numbers in Table 4.6-2 were provided by the School District during the preparation of this EIR.

TABLE 4.6-2
School Capacities & Projected Enrollments

School	Capacity	Projected Enrollment
Elementary Schools		
▪ Bay View Elementary	604	547
▪ Delaveaga Elementary	641	633
▪ Gault Elementary	480	450
▪ Westlake Elementary	604	584
SUBTOTAL	*2,329*	*2,214*
Middle Schools		
▪ Branciforte Middle	651	471
▪ Mission Hill Middle	690	606
SUBTOTAL	*1,341*	1,077
High Schools		
▪ Harbor High	1,155	995
▪ Santa Cruz High	1,362	1,137
▪ Soquel High	1,447	997
SUBTOTAL	*3,964*	*3,129*
Branciforte Small Schools	517	469
TOTAL ALL GRADES	**8,151**	**6,889**

SOURCE: Santa Cruz City Schools

The Santa Cruz City Elementary and High School Districts currently charge school impact fees. In justification studies conducted in 2006, it was indicated that enrollment in the Elementary School District had exceeded its facility capacity of 2,028 students for K-6 grades and would continue to exceed facility capacity through the 2015-16 school year. Similarly, the High School District also had exceeded its facility capacity of 4,638 students for 7-12 grades.

WASTEWATER TREATMENT AND COLLECTION

Regulatory Setting

FEDERAL AND STATE REGULATIONS/REQUIREMENTS

The Clean Water Act (CWA) regulates the discharge of pollutants to waters of the United States from any point source, enacted in 1972. The California State Water Resources Control Board (State Board) and the nine Regional Water Quality Control Boards (RWQCB) have the authority in California to protect and enhance water quality, including administration of the National Pollutant Discharge Elimination System (NPDES) permit program for discharges, storm water and construction site runoff. The discharge of treated wastewater is included in the NPDES program. Wastewater systems are closely regulated for health and environmental

concerns. The RWQCB regulates operations and discharges from sewage systems through the NPDES permit.

Federal, state and local regulations are enforced by the City of Santa Cruz through permitting, monitoring and inspections of Significant Industrial Users (SIU). SIUs are defined in accordance with the Code of Federal Regulations 40 CFR 403.3 (t) as:

- All industrial users subject to Categorical Pretreatment Standards, or
- Any other user that has any one or more of the following characteristics:
  - An average discharge flow of equal to or greater than 25,000 gallons per day of process wastewater to the wastewater treatment facility (WWTF),
  - Contributes a process wastestream which is 5% or more of the average dry weather hydraulic or organic capacity of the WWTF,
  - Has a reasonable potential to adversely affect WWTF operations, or
  - Violates any pretreatment standard or requirement (in accordance with 40 CFR 403.8 (f) (6)) (City of Santa Cruz website: "Industrial Waste Discharge Program").

LOCAL REGULATIONS/REQUIREMENTS

Chapter 16.08 ("Sewer System Ordinance") of the City of Santa Cruz Municipal Code regulates discharge to sanitary sewer and requires that all wastewater be discharged to public sewers, with the exception of graywater as allowed by Municipal Code Chapter 16.08. Septic tanks and cesspools are not allowed within city boundaries except as specified for limited conditions in Chapter 6.20 of the Municipal Code.

The Monterey Bay Unified Air Pollution Control District's Rule 216 requires any entity seeking to obtain an Authority to Construct or a Permit to Operate for a Wastewater or Sewage Treatment facility to obtain a permit from the District. The purpose of this Rule is to ensure that the projected served population of a Wastewater or Sewage Treatment facility is consistent with the Air Quality Plan as approved by the Monterey Bay Unified Air Pollution Control District for addressing the current State Implementation Plan requirements for maintaining federal and state ambient air quality standards.

Wastewater Treatment

OVERVIEW

The City of Santa Cruz owns and operates a regional wastewater treatment facility (WWTF), located on California Street adjacent to Neary Lagoon, that provides secondary level of treatment. The City treats sewage from domestic and industrial sources and discharges the treated effluent into the Pacific Ocean under the provisions of a waste discharge permit (NPDES No. CA0048194) issued by the California RWQCB, Central Coast Region (Order No. R3 - 2005 - 0003). Monterey Bay, into which the region's treated wastewater is disposed, was designated in 1992 as a National Marine Sanctuary. Wastewater influent and effluent characteristics are carefully monitored for compliance with state water quality requirements. The City also participates in a regional receiving water monitoring program with other dischargers in the Monterey Bay area (City of Santa Cruz Water Department, February 2006).

SERVICE AREA

The City of Santa Cruz WWTF serves a population of approximately 130,000 in the cities of Santa Cruz and Capitola and parts of unincorporated Santa Cruz County (see Figure 4.6-3). In addition to the City of Santa Cruz, the WWTF also serves the Santa Cruz County Sanitation District and Community Service Areas (CSA) 10 and 57 as further described below. The City also provides capacity for the City of Scotts Valley to discharge its treated wastewater into the Pacific Ocean via the City's discharge. The City of Santa Cruz accounts for its wastewater system as an enterprise activity, primarily relying on service charges for funding (Local Agency Formation Commission of Santa Cruz County, June 2005).

The Santa Cruz County Sanitation District provides wastewater collection service for the City of Capitola and the unincorporated communities of Aptos, Soquel and Live Oak. The District receives periodic inquiries regarding sewer service in the La Selva Beach area due to septic problems in that area, but that area lies outside its current sphere of influence (Local Agency Formation Commission of Santa Cruz County, June 2005).

County Service Areas 10 and 57 (Rolling Woods and Graham Hill) are also served by the City's WWTP. CSA 57 serves the Woods Cove subdivision off Graham Hill Road; the service area encompasses 0.1 square miles and has a current service population of 14 (7 connections). The area is expected to reach a population of 120 by 2015 as a result of buildout of the approved 60-lot Woods Cove subdivision.[4] CSA 10 serves a portion of the developed Rolling Woods subdivision also located off Graham Hill Road (Local Agency Formation Commission of Santa Cruz County, June 2005).

TREATMENT LEVELS AND PLANT CAPACITY

Treatment Process. The City's WWTF was upgraded in 1998 to provide secondary treatment in order to meet state and federal waste discharge requirements. The City's treatment plant currently produces wastewater of a quality that would be classified as Disinfected Secondary-23. The treatment process consists of a series of steps, including screening, aerated grit removal, primary sedimentation, trickling filter treatment, solids contact, secondary clarification, and ultraviolet disinfection.

The City's treated wastewater is potentially suitable for some agricultural applications and for limited public access irrigation. However, the level of treatment is not sufficient for general irrigation or unrestricted use on playgrounds, parks, schoolyards, etc. Additional treatment above that currently provided would be needed to meet the state public health and safety requirements for these uses. In addition to the treatment upgrades, a distribution system, including pumps, meters, storage facilities, and separate piping would be required to convey the recycled water to customers (City of Santa Cruz Water Department, February 2006).

[4] The Board of Supervisors approved the Tentative Map on November 27, 1996. Subsequent to that, the County did supplemental environmental review to consider the developer's request to change from onsite sewage treatment to a transmission main to the City of Santa Cruz. In September 1998, the County filed a negative declaration and the County approved the revised sewer option on October 20, 1998 (County Application Number 98-0121) (McCormick, Santa Cruz LAFCO, personal communication, October 2009).

Treatment Capacity. The WWTF has a permitted wastewater treatment capacity of 17.0 million gallons per day (mgd) (City of Santa Cruz, 2009). In 2009, the WWTP treated 2.84 billion gallons of wastewater effluent at an average daily rate of 9.2 mgd (Ibid.). Daily dry weather flow averaged 8.5 mgd for June, July and August. With the closure of businesses within the city over the last 10 years (including, Lipton, Wrigley, Salz Tannery, and Texas Instruments), the amount of wastewater treated at the facility has decreased over that time period. Approximately 150 acre-feet per year (0.2 mgd) of treated water is retained for use at the treatment plant (Local Agency Formation Commission of Santa Cruz County, June 2005). The plant also treats excess dry weather flow of approximately ½ mgd from Neary Lagoon, typically from April through October.

The Santa Cruz County Sanitation District has treatment capacity rights of 8 mgd at the City of Santa Cruz WWTF. The City contributes approximately 5.0 mgd with a remaining capacity of 4.0 mgd. The Sanitation District contributes 5.5 mgd with a remaining capacity of 2.5 mgd. Approximately 50% of the wastewater treated at the plant is generated within the City of Santa Cruz. The total remaining treatment plant capacity, therefore, is 7.5 mgd.

WWTF MAINTENANCE & IMPROVEMENTS

The agreement between the Sanitation District and the City stipulates that the District shall pay 8/17 (47%) of the project costs for treatment modifications, while operational and maintenance costs are split in proportion to the total flow, Biological Oxygen Demand (BOD) and Suspended Solids (SS) actually discharged[5] by each agency (Local Agency Formation Commission of Santa Cruz County, June 2005).

The WWTF has been upgraded several times since 1928 when the plant began operations (City of Santa Cruz, 2007-Annual Report). The WWTF was upgraded in 1998 to provide a secondary biological treatment system consisting of trickling filters/solids contact tanks to improve effluent quality and satisfy federal requirements and the California Ocean Plan. According to the City's website[6], other major accomplishments at the WWTF in the last five years include:

- Completion of a photovoltaic system.
- Integration of a 1.3-megawatt cogeneration system into the facility power grid.
- Completion of a Carbon Absorption Odor Control System.
- Implementation of staffing reorganization to optimize plant efficiency.

Treated Effluent Disposal

The treated effluent is disposed into the Monterey Bay via a deep ocean outfall constructed in 1987. The outfall extends 12,250 feet on the ocean bottom and terminates one mile offshore at a depth of approximately 110 feet below sea level. A 1,200-foot diffuser at the end of the

[5] Flows are measured daily and monthly averages are prepared. SS are measured daily and BOD is measured weekly.

[6] http://www.ci.santa-cruz.ca.us/pw/index.html, "Wastewater Treatment Facility."

pipe provides an initial dilution of greater than 139 parts seawater to one part wastewater (City of Santa Cruz Water Department, February 2006).

As previously indicated, the City of Scotts Valley discharges its treated effluent via the City's ocean outfall. The Scotts Valley Wastewater Treatment Plant has a permitted capacity of 1.5 million gpd and treats water to secondary and tertiary levels. Secondarily treated effluent that is not used for recycled water is transmitted via a main to Santa Cruz and discharged to the ocean through the outfall shared with the City of Santa Cruz.

Wastewater Collection

The City of Santa Cruz wastewater collection system serves approximately 15,000 connections. The collection system includes 23. The City maintains over 160 miles of sewer pipeline ranging in size from 6 to 54 inches in diameter. The City has a hydraulic model for the sewer system, and continues to focus on collections system projects that reduce infiltration and inflow into the system (Wolfman, personal communication, April 2011).

The City addresses infrastructure needs during the annual budgeting process. The City's proposed 2011-2012 Capital Improvement Program includes a number of projects for improvements to the wastewater system. In addition to rehabilitation and replacement projects, the CIP includes a number of projects where closed circuit TV will be used to identify problem areas and improve maintenance and repairs. The CIP also includes funding for replacing worn and obsolete equipment, and improving automation at the wastewater treatment plant. The CIP is reviewed and adopted annually (Local Agency Formation Commission of Santa Cruz County, June 2005).

Solid Waste Disposal

Regulatory Setting

The City's landfill operation is required to comply with the regulations, plans, and permits required by the California Integrated Waste Management Board and California Regional Water Quality Control Board, California Air Resources Board, and the Monterey Bay Unified Air Pollution Control District.

The California Integrated Waste Management Act of 1989 (AB 939) (Chapter 1095, Statutes of 1989, et seq.) was adopted in an effort to improve planning for solid waste facilities and reduce the volume and toxicity of solid waste that is disposed. The act requires each of the cities and unincorporated portions of counties throughout the State of California to divert 25% by 1995 and 50% by the year 2000 of the solid waste tonnage that was disposed in 1990. It also requires local governments to prepare and implement plans that would improve waste resource management by integrating solid waste management with source reduction, reuse, recycling, and composting measures.

City of Santa Cruz Solid Waste Collection and Disposal

Solid waste collection and disposal, including recycling services, are provided by the City of Santa Cruz to residents, businesses and institutions within the City's boundaries, is provided at the Resource Recovery Facility (RRF), which includes a sanitary landfill, recycling center, greenwaste drop-off area, and Household Hazardous Waste Drop-Off Facility. The City owns and operates this facility, including a Class III sanitary landfill, which is located approximately three miles west of the City off Highway 1 on Dimeo Lane. The site covers 100 acres with 67 acres available for disposal use (Local Agency Formation Commission of Santa Cruz County, June 2005). The City's Resource Recovery Facility (RRF) and Recycling Center is located at the landfill site. The RRF only accepts municipal solid waste and serves as a sorting facility to remove any recyclable or composting materials. The Recycling Center accepts a variety of recyclable materials.

The City's solid waste operations are in full compliance with federal, state, and local air, water and waste regulations for collection vehicles, processing operations, and landfill disposal operations. The City has implemented several best management practices to improve its solid waste services, including a landfill gas collection system that is used to run an engine to produce electricity and use of bio-diesel for collection and landfill equipment to reduce CHG emissions (Local Agency Formation Commission of Santa Cruz County, June 2005).

In the mid-1990s the permitted disposal area of the landfill increased from 40 to 67 acres. The additional acreage was designed with a liner system that meets EPA requirements for new municipal solid waste landfills. The new area replaced the former leachate evaporation ponds, which were cleaned and closed in 1997. The expansion increased the life of the landfill by approximately 30 years at that time, (City of Santa Cruz Department of Planning and Community Development, April 2004), but the lifespan has been increased through additional waste reduction as discussed further below.

Since 1990 the Public Works Refuse Division has focused on maximizing the capacity of the RRF, waste diversion, and implementing environmental improvements to minimize the impacts of the facility to public health and the surrounding environment (City of Santa Cruz Department of Planning and Community Development, April 2004). Major capital improvement projects that have been implemented at the RRF to minimize its impact to the environment include the following:

- Construction of two triple lined leachate collection impoundments.
- Construction of a three-mile leachate pipeline from the landfill to the City's sanitary sewer system.
- Construction of a groundwater cutoff wall downgradient of the landfill's lowest elevation.
- Construction of a freshwater bypass tunnel system to reroute two streams around the landfill.
- Construction of two of the four lined cells planned for the 27-acre expansion area.
- Expansion of the recycling processing facility and conversion to an automated, single-stream processing line.
- Construction of a gas trench wall to prevent offsite migration of landfill gas.

- Improvement of the landfill gas collection and power generation system.
- Improvement of leachate containment and erosion control methods.
- Expansion of environmental monitoring network, including groundwater, soil pore gas, surface water and air quality (City of Santa Cruz Department of Planning and Community Development, April 2004).

The City of Santa Cruz met has met the state-mandated waste diversion goals of 25% of their 1990 waste-streams from landfill disposal by 1995 and 50% by 2000 through community education regarding the three "R"s (i.e. reduce, reuse and recycle) and the implementation of expanded curbside recycling programs. The programs included the collection of most forms of clean paper (e.g. office, junk mail, newspaper, magazines, paper board, and card board), containers (e.g. glass, metal, aluminum, and plastic nos. 1-7), and yard waste materials. The programs also included the diversion and reuse of construction and demolition debris (e.g. concrete rubble, asphalt, and wood) and wastewater treatment plant sludge. In the year 2000, the City established a Zero-Waste goal with the ultimate intention of eliminating the City's need for a landfill (City of Santa Cruz Department of Planning and Community Development, April 2004). As of 2009, the City had achieved a diversion rate of 63-65%, which exceeds the state requirements.

Assuming growth trends similar to the past 10-15 years in the City of Santa Cruz, the RRF has more than adequate capacity to accommodate all municipal solid waste generated by City residents, visitors and businesses. Based on continued waste reduction, annual aerial surveys, and calculations, the landfill is estimated to have capacity through the year 2058 (Arman, personal communication, April 2011). State law requires that facilities begin planning for future waste disposal/reuse facilities at least 15 years in advance of existing landfill closure dates, which would be after the year 2030 and the proposed *General Plan 2030* planning horizon.

Planned programs and improvements include the following as outlined in the *General Plan 2030* Background Report City of Santa Cruz Department of Planning and Community Development, April 2004 include expansion of the waste diversion programs and continued pursuit of operational improvements and efficiencies to increase the life of the landfill. Several capital improvement projects are planned to promote waste diversion, improve the environment, and maintain the landfill's capacity. These include two additional lined landfill cells and improvements at the wastewater treatment plant to enable food wastes to be added to the digesters to generate gas for energy generation. The City recently acquired a 5.5-acre parcel adjacent to the landfill on the south, which will be used for support uses ancillary to the landfill and RRF uses. Specific uses have not been identified, but the property will not be used for landfill disposal operations.

ELECTRICAL & NATURAL GAS UTILITIES

Pacific Gas and Electric Company (PG&E) provides electrical and natural gas service to the City. Incorporated in California in 1905, PG&E is one of the largest combination natural gas and electric utilities in the United States. PG&E and other utilities in the state are regulated by the California Public Utilities Commission (Pacific Gas and Electric Company website, 2011). It currently provides service to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California from Eureka in the north to Bakersfield in the

south, and from the Pacific Ocean in the west to the Sierra Nevada in the east. The service area includes 141,215 circuit miles of electric distribution lines, 18,616 circuit miles of interconnected transmission lines. 42,141 miles of natural gas distribution pipelines and 6,438 miles of transportation pipelines. PG&E and other utilities in the state are regulated by the California Public Utilities Commission (Pacific Gas and Electric Company website, 2011).

The state's per capita electrical use in 2009 was 6,691 kilowatt hour per capita, the lowest of any state in the nation (California Energy Commission website, 2011). Within PG&E's service area, electrical use is projected to increase by approximately 1.22% between 2010 and 2020, which is a lower increase than experienced between 1990 and 2000, but slightly higher than between 2000 and 2010 (California Energy Commission, December 2009). Total efficiency/conservation electricity consumption savings are projected to reach 80,000 gigawatt hours in 2020; the majority of savings from building and appliance standards (Ibid.). State projections indicated that natural gas consumption will increase only minimally during the same time period (Ibid.).

State forecasts show a similar electrical and natural gas trend for the PG&E service area with a slightly higher rate of increase in electrical consumption between 2010 and 2020 (1.27%) (California Energy Commission, December 2009). However, the per capita electricity consumption is projected to slightly decline in PG&E's service area due to continued savings from energy efficiency programs (Ibid.). Forecasts show an overall decrease in natural gas consumption over 1990 levels by the year 2020 (Ibid.).

Data developed as part of the preparation of the City's draft "Climate Action Plan" reveals that approximately 290,000,000 kilowatt hours (kWh) of electricity were consumed within the City in 2008 and approximately 18,000,000 therms of natural gas was used. This accounts for municipal, residential and commercial/industrial uses. Nearly 8,000,000 kWh of electricity was generated by renewable sources.

Studies have demonstrated the value and cost-effectiveness of weather-stripping, replacing single pane windows, old appliances and lighting, and increasing insulation in reducing energy use and saving money. Significant energy and cost savings have already been achieved through the implementation of such measures throughout the City of Santa Cruz, although further savings could be achieved (City of Santa Cruz Climate Action Program, September 2010). Over the past 15 years, the combined influences of energy efficiency rebate programs, a public education campaign, and significant increases in energy prices have led to a 22% reduction in energy use within Santa Cruz homes. While this drop in energy use is significant, home energy use in Santa Cruz is again on the rise, but still far below 1996 levels (Ibid.).

In 2007, Santa Cruz became one of the first municipalities in the nation to require new construction to include the adoption of environmentally superior building materials and designs. Builders in Santa Cruz now use best practices for their construction projects that enhance building energy efficiency and water conservation as well as to improve air quality, waste reduction and recycling, and erosion and runoff control. The Green Building Program currently includes residential and commercial development (City of Santa Cruz Climate Action Program, September 2010). Reviews conducted as part of the preparation of the City's draft "Climate Action Plan" indicates that an "award-winning" home under the City's Green Building Program

produces a home that is more efficient than standard homes built in 2008 and almost twice as efficient as homes built in 1990 (City of Santa Cruz, September 2010).

The AMBAG Energy Watch Program is a partnership between AMBAG and PG&E, which seeks to reduce energy use in the Monterey Bay region by providing the resources listed below to eligible PG&E customers.

- Energy assessments and audits;
- Direct installation of energy efficient equipment;
- Technical assistance and financial incentives for energy efficient retrofits in municipal buildings;
- Energy efficiency seminars and training courses in the region; and
- nformation on other PG&E energy efficiency programs and services

Additionally, the Monterey Bay Regional Energy Plan was prepared by AMBAG to update goals and actions Program regarding energy use in the Monterey Bay region. A draft update to the 2006 Plan reported that the Energy Watch Program tracked and reported the following energy savings in 2008 throughout the region: 5,201,582 killowatt hours (kWh) for municipalities; 17,697,292 kWh the hospitality industry; and 1,293,653 kWh for residential uses (AMBAG, 2008).

4.6.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address provision of public services. In general, Policies LU1.3 and LU1.4 seek to ensure that facilities and services required by future development are available and that new development pays its proportional share. The Plan also seeks to provide community services and facilities to meet needs of the population (CC2.1) and update and replace facilities (CC2.1.1).

Goals, policies and actions in the following chapters also address specific public services.

- The CIVIC AND COMMUNITY FACILITIES chapter of the draft *General Plan 2030* includes the following four goals addressing public services:

  GOAL CC4 *A sustainable and efficient wastewater system.*

  GOAL CC6 *Minimal solid waste production.*

  GOAL CC7 *A safe and secure community.*

  GOAL CC8 *Excellent educational opportunities and resources.*

These goals address the following public services:

- Wastewater - one goal with three associated policies and eight specific actions;
- Solid Waste Management – one goal with four associated policies and 27 actions;
- Police Protection – one goal with six associated policies and 23 actions ; and
- Schools – two policies with four actions that address school sites and facilities and two additional policies and accompanying actions that address educational programs and safe access to schools.

- The HAZARDS, SAFETY & NOISE chapter of the draft *General **Plan** 2030* includes two policies and 13 specific actions related to fire protection and safety and provision of emergency access.

- The PARKS, RECREATION AND OPEN SPACE chapter of the draft *General Plan 2030* includes goals, policies and actions that address parks and recreational facilities, open space, trails and recreation programs. This chapter includes three goals with 16 associated policies and 38 specific actions that address parks, open space and recreational facility public services. A fourth goal with policies and actions address recreational programs, activities and events. These goals are identified below. Several policies and actions in other chapters of the proposed General Plan also seek to protect, preserve and/or manage open space and natural areas throughout the City (CD 1.1.3, LU 2.3, LU 3.11 NRC 1.1 river access]).

  GOAL PR1 *Ample, accessible, safe and well-maintained parks, open space, and active recreational facilities.*

  GOAL PR2 *High-quality, affordable recreational programs, activities, events, and services for all.*

  GOAL PR3 *Well managed, clean and convenient public access to open space lands and coastline.*

  GOAL PR4 *An integrated system of citywide and regional trails.*

  The draft plan also strives to maintain park service standards, which call for a neighborhood park at ratio of 2.0 acres per 1,000 population (PR1.3.2) and a community parks ratio of 2.5 acres per 1000 population (PR1.3.3). Service standards are not provided for other public services, although Action CC7.1.7 calls for updating and maintaining police response time standards, while Action CC9.4.2 seeks to provide emergency services at accident or disaster scenes within an average time of 4 minutes or less and within 5 minutes or less 90 percent of the time.

- The NATURAL RESOURCES AND CONSERVATION chapter of the draft *General Plan 2030* includes the following goal with four associated policies and 20 accompanying actions related to energy conservation. Its four policies and accompanying actions would promote reduction of electricity and natural gas consumption, use of renewable

energy sources, and use of energy-efficient lighting, vehicles, and water fixtures and appliances.

GOAL NRC7 *Reduction in energy use, and significant production and use of renewable energy.*

PROPOSED IMPROVEMENTS

The draft *General Plan 2030* includes several policies and actions that address specific improvements or general types of future improvements to public service facilities. Generally, the plan calls for updating and replacing facilities as appropriate (CC2.1.1) and providing community facilities to meet the needs of the City's population (CC2.1). Specific referenced service improvements include maintenance and upgrading the sewer system (CC4.1, CC4.1.1 - CC4.1.3, CC4.1.5); monitoring the wastewater treatment plant capacity to address future needs (CC4.1.8); and exploring the potential for recycling wastewater (CC4.3). The draft Plan the development of a new countywide Emergency Operations Center facility (HZ1.1.5), but a specific location within the City or elsewhere in the county is not identified.

Policy LU4.3 encourages the development and expansion of neighborhood facilities such as parks, schools, daycare centers, and neighborhood commercial services. However, there are no specifically designated new park or school sites. A number of policies promote provision of trails and access to open space lands and the coast (PR4.1 and accompanying actions) with enhancing the recreational value of the San Lorenzo River walkway and East and West Cliff Drive pathways (PR4.1.3) and creating a continuous pathway along the coast by enhancing the physical links between West Cliff and East Cliff Drives and the Beach Promenade (PR4.1.4).

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Some of the draft *General Plan 2030* policies and actions support specific types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment, as summarized in the LAND USE (Chapter 4.1) section of this EIR.

4.6.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

6a Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or need for new or physical altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

- Fire Protection
- Police Protection
- Schools

6b Increase the use of existing neighborhood and community parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

6c Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

6d Result in wastewater flows exceed sewer line or treatment plant capacity or contribute substantial increases to flows in existing sewer lines that exceed capacity.

6e Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

6f Result in the wasteful or inefficient use of energy.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address potential impacts to the City's fire and police services (6a); potential impacts on City park facilities (6b-c); potential impacts on school facilities (6a); potential impacts related to wastewater collection and disposal (6d); potential impacts on landfill capacity (6e); and potential impacts related to energy use (6f).

Potential Future Development & Buildout

Adoption and implementation of the proposed General Plan 2030 would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized in the LAND USE (Chapter 4.1) section of this EIR, could result in development of 3,350 residential units, 3,140,000 square feet of commercial, office and industrial development and 300 new hotel

rooms. This level of development could result in an increased population of 8,040 residents and 8,665 new jobs.

The proposed General Plan also includes other policies and actions that could result in development that supports year-round expanded performances, events, and/or visitors. These potential uses include:

- Supporting a downtown performing arts center or expansion of the Civic Center (HA2.2.5),
- Amending the Zoning Ordinance to allow development of arts and cultural facilities in a wide variety of districts (HA2.2.4),
- Supporting Santa Cruz as a year-round conference destination (Policy ED1.4), supporting year-round events (HA3.2.4), and promoting Santa Cruz as a year-round arts destination, and
- Promoting Santa Cruz as a principal retail, cultural, recreational, entertainment and commercial destination in the region (ED1.1).

New development accommodated under the proposed General Plan will result in the demand for public services. The proposed *General Plan 2030* includes goals, policies and actions that address provision of public services. In general, Policies LU1.3 and LU1.4 seek to ensure that facilities and services required by future development are available and that new development pays its proportional share. The Plan also seeks to provide community services and facilities to meet needs of the population (CC2.1) and update and replace facilities (CC2.1.1). The impacts associated with specific services are presented below.

Impact 4.6-1 Fire Protection
Adoption and implementation of the *General Plan 2030* could indirectly result in increased population associated with potential development that could be accommodated by the Plan that would result in increased fire protection and emergency service demands. However, future development and growth would not result in the need to construct new or expanded fire stations. This is considered a *less-than-significant impact.*

According to the City's Fire Department, there are adequate fire protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*. No new fire stations or facilities will be needed to maintain acceptable response times and service levels (Oliver, personal communication, April 2011). New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered fire protection facilities that could result in significant physical impacts.

The Department's current need for a Training Facility, however, will continue in the future, and the Department plans to investigate the possibility to consolidate administration and training facilities with future fire station improvements, including potential reconstruction of Fire Station Two and relocation of Fire Station One. No sites have been identified for potential relocation. Fire Station Two is located adjacent to a city-owned, paved, public parking lot. If future

expansion were to occur at this location, there no significant impacts are expected to occur, as the site is within a developed urban area.

The draft plan includes policies and actions that would serve to reduce impacts on the City's Fire Department. Draft Policy HZ1.2 seeks to respond to emergencies rapidly. Specific actions call for annual review of service calls (HZ1.2.1) and response times and making continuous operational improvements to arrive on emergency scenes within an average time of 4 minutes or less and within 5 minutes or less 90 percent of the time (HZ1.2.2). Additionally, Policy HZ1.4 and its five specific actions seek to continue to meet fire safety and firefighting needs with staff training and equipment maintenance (HZ1.4.1), promoting built-in fire extinguishing and alarm systems (HZ1.4.2), ensuring adequate fire flow to new uses (HZ1.4.3), and continued mutual aid services with other agencies (HZ1.4.4, HZ1.4.5). A number of actions also seek to ensure that new development is sited and designed to accommodate facility emergency access and response (HZ1.2.5, HZ1.2.6, HZ1.5.5) and that street widths are adequate to safely accommodate emergency vehicles (M3.2.3). These policies and actions (as summarized on Table 4.6-3) serve to maintain fire department operations and response time and reduce impacts on fire protection services.

TABLE 4.6-3
Proposed General Plan Policies & Actions that Avoid or Reduce Fire Protection Service Impacts

Type of Measure / Action	Policies / Actions
PROVIDE ADEQUATE EMERGENCY RESPONSE & PREPAREDNESS	• Adequate emergency response times: HZ1.2, HZ1.2.1, HZ1.2.2 • Ensure emergency preparedness: HZ1.1; HZ1.1.1 (annually update the Emergency Operations Plan.); HZ1.1.2 (City staff training) • New development design and access to maintain emergency response times with adequate access: HZ1.1.3, HZ1.2.5, HZ1.2.6 • Ensure that street widths are adequate to safely serve emergency vehicles: M3.2.3
PROVIDE ADEQUATE FIRE PROTECTION	• Meet fire safety & firefighting needs: HZ1.4, HZ1.4.1 (staff training and equipment maintenance) • Adequate emergency response times: HZ1.2, HZ1.2.1, HZ1.2.2 • Adequate fire flow: CC3.4.1, HZ1.4.3 • Pre-fire surveys of select buildings: HZ1.2.3 • Fire prevention: HZ1.4.2 (built-in extinguishing & alarm systems), HZ1.5.6 (abatement of hazardous buildings and conditions) • Adequate emergency access in new development: HZ1.2.5, HZ1.2.6, HZ1.5.5 • Promote fire safety & prevention programs: HZ1.5.8
REDUCE WILDLAND FIRE HAZARDS	• Reduce wildfire hazards: HA1.5, HZ1.5.1, • Regulate development siting/design to reduce wildland fires: HZ1.5.3 (setbacks), HZ1.5.4 (fire-resistant/retardant building materials), • Continued mutual aid with other agencies: HZ1.4.4, HZ1.4.5 • Promote fire safety & prevention programs: HZ1.5.8 • Maintain & update wildland interface zones: CD1.4.4

Future growth could result in an indirect increased risk of wildfires in the urban-rural interface and adjacent to the City's greenbelt areas. None of the major vacant sites are within identified fire hazard zones. The City does not have the resources to adequately police and protect greenbelt areas, which increases the frequency of illegal camping that can result in fires in limited access and canyon areas (City of Santa Cruz, September 2007). Despite the fact that there has not been a recent wildland fire within the city limits, residential development into or adjacent to wildland/urban interface areas increases the danger to life and property should a fire occur. Areas targeted as "likely" to have a wildland fire include the Arroyo Seco/Meder Canyon, DeLaveaga, Pogonip, Moore Creek area and Arana Gulch. Increasing use of these areas by residents, transient encampments with fires, and young adults looking for a place to gather exacerbates the risks (Ibid.).

Policy HZ1.5 seeks to reduce potential wildfire hazards through regulation of development in and adjacent to fire hazard areas (HZ1.5.2) with adequate siting, design, and emergency access provided by new development to reduce potential hazards and facilitate emergency response (HZ1.5.3, HZ1.5.4, HZ1.5.5). The City of Santa Cruz also has initiated a number of wildfire mitigation programs in recent years including vegetation management programs at DeLaveaga Park and at the Arroyo Seco Canyon areas (City of Santa Cruz, September 2007). The City continues to maintain cooperative agreements to work with the County, UCSC, the California Department of Forestry and other fire protection agencies to collaboratively avoid or minimize the threat from wild-land/urban interface fires. The City's adopted "Local Hazard Mitigation Plan" (City of Santa Cruz, September 2007) also includes the following mitigation strategy to avoid or reduce potential wildfires that have been included in the draft General Plan.

- Cooperative fire protection agreements with other agencies.
- Reduction of fire risk in wildland/urban interface areas through improved vegetation management and appropriate code enforcement.
- Promotion of built-in fire extinguishing and warning fire alarm systems.
- Creation of a proactive (not reactive) hazard abatement program.
- Land use planning to reduce incidence of human caused wildfire.
- Adequate staffing to meet needs of City population and development.
- Fire prevention programs in schools, institutions & commercial buildings.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in demands for fire protection services. However, there are adequate fire protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*, and no additional equipment or facilities will be needed to maintain acceptable response times and service levels (Oliver, personal communication, April 2011). New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered fire protection facilities that could result in significant physical impacts. Furthermore, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on fire protection services as summarized on Table 4.6-3. With implementation of these proposed policies and actions, as well as implementation of the City's "Local Hazard Mitigation Plan", the

proposed *General Plan 2030*'s indirect impact on fire protection services would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.6-2 Police Protection
Adoption and implementation of the *General Plan 2030* could indirectly result in increased population associated with potential development that could be accommodated by the Plan that would result in increased police protection service demands. However, future development and growth would not result in the need to construct new or expanded police stations. This is considered a *less-than-significant impact.*

According to the City's Police Department, there are adequate police protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*. No additional equipment or facilities personnel will be needed to maintain acceptable response times and service levels (Vogel, personal communication, April 2011). New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered police protection facilities that could result in significant physical impacts.

The draft plan includes policies and actions that would serve to reduce impacts on the City's Police Department. Policy CC7.1 and its specific accompanying actions seek to ensure adequate police training and resources. Specific actions seek to ensure appropriate police staff, stations, equipment and training to meet demands of increased population and tourism (CC7.1) and implement officer training and crime prevention programs (CC7.1.2, CC7.1.3). Additionally, the draft plan seeks to provide and rapid and timely response to emergencies (CC7.1.6, HZ1.2) with updating and maintaining police response time standards (CC7.1.7). Specific actions call for annual review of service calls (HZ1.2.1) and response times and making continuous operational improvements to arrive on emergency scenes within an average time of 4 minutes or less and within 5 minutes or less 90 percent of the time. (HZ1.2.2). A number of policies also seek to reduce police service demand through land use planning and project designs (CC72.5, CC7.2.7). Other actions promote cooperate with other County agencies on public safety and police issues (CC7.3, CC7.3.1, CC7.3.2). Taken together, these policies and actions (as summarized on Table 4.6-4) serve to ensure adequate police department operations and response time and reduce police protection service demand, and, thus, reduce potential impacts on police protection services.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in demands for police protection services. However, there are adequate police protection facilities to serve the projected growth increases associated with implementation of the proposed Draft *General Plan 2030*, and no additional

equipment or facilities will be needed to maintain acceptable response times and service levels. New development and growth accommodated by the draft plan would not reduce response times or require new or physically altered police protection facilities that could result in significant physical impacts. Furthermore, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on police protection services as summarized on Table 4.6-4. With implementation of these proposed policies and actions, the proposed *General Plan 2030*'s indirect impact on police protection services would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.6-4
Proposed General Plan Policies & Actions that Avoid or Reduce Police Protection Service Impacts

Type of Measure / Action	Policies / Actions
PROVIDE ADEQUATE EMERGENCY RESPONSE & PREPAREDNESS	• Adequate emergency response times: HZ1.2, HZ1.2.1, HZ1.2.2 • New development design and access to maintain emergency response times with adequate access: HZ1.1.3, HZ1.2.5, HZ1.2.6
PROVIDE ADEQUATE POLICE PROECTION	• Ensure appropriate staff (including training), stations, equipment to meet population demands: CC7.1, CC7.1.1, CC7.1.2 • Timely response: CC7.1.6, CC7.1.7, HZ1.2, HZ1.2.1, HZ1.2.2 • Update police response standards: CC7.1.7 • Reduce demand through land use planning & project designs: CC7.2.5, CC7.2.7 • Participate in crime reduction & prevention programs: CC7.1.3, CC7.2.2, CC7.2.3

Impact 4.3 Parks and Recreation
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in an indirect demand for parks and recreational facilities. However, the estimated growth would not increase use of parks or recreational facilities such that a substantial physical deterioration would occur. With implementation of proposed policies and actions, in combined with existing regulations, impacts to parks and recreational facilities is considered a *less-than-significant impact.*

The proposed *General Plan 2030* will result in additional development and population growth, resulting in increased demands for park and recreational facilities. The Plan seeks to provide neighborhood parks at a ratio of 2.0 acres per 1,000 residents and to provide community parks at a ratio of 2.5 acres per 1,000 residents. This is the same standard included in the

City's existing General Plan. As previously discussed, the City currently does not meet the desired level of service for neighborhood parks and is deficient by approximately 16 acres. Thus, existing developed neighborhood parks could be considered at capacity use, in general, based on the City's park service standards.

The projected population increase of 8,040 new residents would result in an additional need for 16 acres of neighborhood parks and 20 acres of community parks to meet the proposed park service standard. Under existing conditions and with future growth, a total of 32 additional neighborhood park acres would be required to meet the City's service standard.[7] The City currently has sufficient community park land as summarized on Table 4.6-1.

The *General Plan 2030* does not identify any specific new park and recreation facility sites. Thus, the increased population accommodated by the proposed General Plan would result in an increased use of existing parks and recreational facilities. The largest projected increases in population would be distributed along existing transportation corridors throughout the City and in downtown. Thus, it is anticipated that the increased use of parks and recreational facilities would be distributed throughout existing neighborhood and community parks. A geographically widespread increase in use would not likely result in substantial physical deterioration of specific parks and recreational facilities, although maintenance is an ongoing requirement, including school playgrounds and joint use facilities.

The proposed *General Plan 2030* does not include any goals or policies regarding construction or expansion of a specific park or recreational facility, the construction or expansion of which may result in potentially significant impacts. The draft plan does call for developing new or expanding existing athletic fields (PR1.2.2), and coordinating with local schools to expand park and recreation opportunities. However, specific sites or locations are not identified. As specific park and recreational facility expansion projects are proposed in the future, project-specific environmental analyses will be completed as required to analyze potential significant impacts and provide the appropriate project-level mitigation as may be needed.

The proposed *General Plan 2030* includes a number of policies that serve to mitigate potential impacts to existing parks and recreation facilities as a result of new residential development and population growth accommodated by the draft *General Plan 2030*. The policies, which are summarized on Table 4.6-5, address development of new parks which would lessen the projected increased use of existing parks, as well as, maintenance of existing parks and recreational facilities. The plan seeks to update and modify park system and services to accommodate changes in the population and its recreational need (PR1.1.1). A number of policies and actions seek to provide a system of parks and recreational facilities (PR1.1.1), planning for new parks and facilities (PR1.1.2, PR1.1.4), evaluating and acquiring parks (PR1.1.3, PR3.2 [parcels that provide access to City-owned open space lands]), developing new or expanding existing athletic fields (PR1.2.2), and coordinating with local schools to expand park and recreation opportunities (PR1.2.1, PR1.2.3). To this end, the plan establishes service standards (PR1.3, PR1.3.2, PR1.3.3), seeks to ensure that adequate park land is provided in conjunction with new development (PR1.3.1), and requires park dedication or payment of in-lieu fees from new development (PR1.7, PR1.7.1). Thus, while specific new park locations are not

[7] This is based on an existing population of 58,982 in 2009 and 102 existing acres of neighborhood parks and 366 acres of community parks as summarized on Table 4.6-1.

designated in the proposed *General Plan 2030*, the policies and actions set forth a strategy to plan and acquire additional park lands in the future.

The draft plan also seeks to ensure ongoing maintenance needs are addressed in the development and funding plans for any new or expanded parks, recreational facilities, or open space areas (PR1.3.4, PR1.10). Maintenance of the City's Parks and Facilities tax also is recommended (PR1.9, PR1.91, PR1.9.2).

A number of policies and actions also promote provision of trails and access to open space lands and the coast (PR1.4) with enhancing the recreational value of the San Lorenzo River walkway and East and the West Cliff Drive pathways (PR4.1.3) and creating a continuous pathway along the coast by enhancing the physical links between West Cliff and East Cliff Drives and the Beach Promenade (PR4.1.4).

TABLE 4.6-5
Proposed General Plan Policies & Actions that Reduce Parks Impacts

Type of Measure / Action	Policies / Actions
PLAN & PROVIDE FOR NEW PARKS	• Provide & manage parks: PR1.1 • Develop and maintain city Master Parks Plan: PR1.1.2, Pr1.1.4 (plan for adequate parks and recreation facilities) • Level of Service standards: PR1.3, PR1.3.2, PR1.3.3 • Evaluate lands for small parks: PR1.1.3 • Coordinate with schools to expand parks: PR1.2.1, PR1.2.3 • Examine developing new or expanding existing athletic fields: PR1.2.2 • Development park dedication or in-lieu fees: PR1.7, 1.7.1 • Maintain a Parks and Recreation Facilities excise tax on new construction: PR1.9, PR1.9.1, PR1.9.2 • Acquire parcels that provide access to City-owned open space lands and coast: PR3.2
ENSURE MAINTENANCE & MANAGEMENT	• Ensure ongoing maintenance: PR1.3.4 • Identify maintenance funding sources: PR1.10 • Protect & Manage open space: LU2.3 LU2.3.1, LU2.3.2, LU2.3.3, LU2.3.4 (UCSC), LU3.11 • Greenbelt Management: LU2.3.3, LU3.11.3, NRC6.3
PROVIDE ACCESS TO OPEN SPACE LANDS & COAST	• Assure access to open space lands and coast: PR1.6.5, PR3.1 • Coastal access: PR3.2, PR3.3, PR3.3.5 • Access to river & riparian: NRC1.1, NRC1.1.2
PROVIDE TRAILS	• Provide and maintain Integrated trail system: PR4.1, PR4.1.1 • Provide and maintain trails in parks: PR4.2, PR4.2.1, PR4.2.2 • Require development to dedicate trails or easements along planned trail routes: PR4.2.3

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development and increased population accommodated by the plan would result in demands for parks and recreational facilities. Increased use of existing parks and school playgrounds is

expected to be spread out throughout the City so that no substantial deterioration would occur at any one facility. With implementation of the proposed *General Plan 2030* goals, policies and actions that set forth measures to avoid and minimize adverse impacts on parks and recreational facilities as summarized on Table 4.6-5, as well as compliance with local regulations, the proposed *General Plan 2030*'s indirect impact on parks and recreational facilities would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.6-4 Schools
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would generate elementary school student enrollments that could exceed capacity of existing schools. This is considered a *potentially significant impact.*

Future residential development accommodated by the proposed *General Plan 2030* could result in construction of 3,350 new residential units. Based on student generation rates per dwelling unit of 0.273 for grades K-6 and 0.207 for grades 7-12[8], future development and growth could result in the addition of 915 students in grades K-6 and approximately 695 students in grades 7-12 for a total potential increase of 1,610 students by the year 2030.

The existing combined enrollment for the Santa Cruz City Schools is 6,841 students (Santa Cruz City Schools, June 2010). The addition of additional students in the next 20+ years could increase this total by approximately 1,610 students with approximately 915 elementary school students and 695 high school students. There would be adequate high school capacity to accommodate this growth. Elementary school enrollments could exceed school facility enrolments depending on the timing of growth. Discussions with the school district indicated that the level of enrollment likely could be accommodated within existing school facilities, including using Natural Bridges Elementary School, if needed, which is currently leased as a charter school. The School District collects school impact fees that can be used for facility expansion and/or installation of classroom modules. Such expansion, if required, would be located within existing development footprints and would not be expected to result in significant physical impacts.

The proposed *General Plan 2030* includes a number of policies that serve to mitigate potential impacts to existing school facilities as a result of new residential development and population growth accommodated by the draft *General Plan 2030*. The policies, which are summarized in Table 4.5-6, address ensuring and planning for adequate school sites (CC8.2, CC8.2.2) and cooperating with the school district to monitor impacts of housing on elementary school populations (CC8.1.1). The plan also encourages joint-use facilities that combine educational and community uses (CC8.2.1).

[8] Student generation rates were determined in the School Districts' "Developer Fee Justification Study" (October 5, 2006).

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but increased population resulting from development accommodated by the plan could increase student enrollments in grades K-12, which could exceed existing school facility capacities depending on the timing and rate of growth as the increase would not happen all at once. With required payment of school impact fees to fund necessary facility expansion and/or additions, in conjunction with potential reuse of the former Natural Bridges Elementary School if needed, the impact would be mitigated to a less-than-significant level. Potential addition or expansion of school classroom facilities is not expected to result in significant physical impacts due to the location of existing facilities within developed footprints. Implementation of the proposed *General Plan 2030* includes goals, policies and actions also set forth measures to avoid and minimize adverse impacts on school facilities as summarized on Table 4.5-6.

Mitigation Measures

No mitigation measures are required beyond payment of school impact fees that will be collected at the time of issuance of a building permit.

TABLE 4.5-6
Proposed General Plan Policies & Actions that Reduce School Impacts

Type of Measure / Action	Policies / Actions
PLAN FOR SCHOOL SITES	• Ensure and plan for adequate future sites for educational facilities: CC8.2, CC8.2.2 • Monitor impact of housing on elementary school populations: CC8.1.1 •
COORDINATE WITH SCHOOL DISTRICT	• Cooperate with school district : CC8.1.1
MAXIMIZE OPPORTUNITIES & ENCOURAGE JOINT-USE FACILITIES	• Encourage joint-use facilities for educational and community uses: CC8.2.1 • Maximize educational, developmental, and recreational opportunities: CC8.3

Impact 4.6-5 Wastewater Collection & Disposal
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in indirect generation of wastewater that could be accommodated by the existing wastewater treatment plant and collection system improvements, as needed and supported in the General Plan. This is considered a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development. As indicated above, anticipated development accommodated by the proposed plan could result in an increase in population and employees that would result in increases in wastewater generation.

Wastewater generation can be generally estimated based on water demand. Typically, wastewater flows are derived from water demand. The City Public Works Department generally estimates wastewater flows as a percentage of water use. Based on the water demand rates identified in Table 4.5-4 in the WATER SUPPLY (Chapter 4.5) section of this EIR, this would equate to an average daily wastewater flow increase of approximately 0.55 million gallons as summarized in Table 4.6-7. This amount is well within the remaining treatment plant capacity – both the permitted capacity as well as the City's remaining portion (4.0 mgd). No major sewer line problems or constraints have been identified (Wolfman, personal communication, April 2011), and sewer line replacement would be scheduled in the future as needed.

TABLE 4.6-7
Estimated Project Wastewater Flows

General Plan Use	Amount	Annual Water Demand (MGY)	Average Daily Water Demand (gpd)	Average Daily Wastewater flow (mgd)
Residential - SFD	840 units	60	165,385	0.124
Residential - MFD	2,510 units	64	175,345	0.158
Commercial	1,087,983 sq. ft.	72	197,260	0.158
Hotel Rooms	311 rooms	11	30,140	0.024
Office	1,273,913 sq. ft.	23	63,100	0.055
Industrial	776,926 sq. ft.	9	24,660	0.020
	TOTAL	**239**	**655,890**	**0.539**

Assumes 75% of total residential units (3,350) are multi-family units.
Wastewater generation assumed as 90% of multi-family residential water use, 75% of single-family residential water use, and 80% of non-residential water use.

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid provide adequate services. Goal CC4 and its three supporting policies and eight accompanying actions seek to maintain a sustainable and efficient wastewater system. These include maintenance and upgrade of the wastewater collection, treatment and disposal systems (CC4.1, CC4.1.1 and CC4.1.3). Periodic updates of wastewater master plans are supported (CC4.1.5), including monitoring treatment plant capacity and development of a plan to address future needs (CC4.1.8). The plan calls for exploring the potential for tertiary treatment and recycling wastewater (CC3.10, CC4.2, CC4.3). Table 4.6-8 summarizes policies that directly or indirectly address wastewater collection or treatment.

> **Conclusion.** Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in increased growth with resulting increases in wastewater generation. However, the City's wastewater treatment plant has adequate capacity to

serve anticipated growth, and with implementation of proposed policies and actions, the collection system will be maintained and upgraded as needed. Thus, there would a less-than-significant impact on wastewater treatment and collection facilities.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.6-8
Proposed General Plan Policies & Actions that Reduce Wastewater Impacts

Type of Measure / Action	Policies / Actions
ENSURE ADEQUATE PROVISION OF SERVICES	▪ Ensure that facilities and services required by a development are available: LU1.3 ▪ Report annually on the state of City facilities and services: LU1.3.2 ▪ Ensure that new development pays its proportional share of the costs of expanded infrastructure needed to serve new development: LU1.4
WASTEWATER	▪ Provide adequate, environmentally sound wastewater system: CC4.1 ▪ Maintenance, upgrade & planning sewer system: CC4.1, CC4.1.1 - CC4.1.3, CC4.1.5 ▪ Monitor wastewater treatment plant capacity to address future needs: CC4.1.8 ▪ Explore recycling wastewater: CC3.10.1, CC4.2, CC4.3

Impact 4.6-6 Solid Waste Disposal
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in indirect generation of solid waste that could be accommodated within the remaining landfill capacity. This is considered a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development. As indicated above, anticipated development accommodated by the proposed plan could result in an increase in population and employees that would result in increases in solid waste generation. The City's population is estimated to increase by approximately 8,040 residents due to development and growth accommodated by the proposed plan.

Development and growth accommodated under the proposed plan is estimated to result in a solid waste generation of approximately 20 tons per day based on a per capita rate of 5.0 pounds/day provided by City staff (Arman, personal communication, April 2011). This amount of solid waste could be accommodated within the remaining capacity of the City's landfill, which is on expected to have capacity through the year 2058 (Ibid.).

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to reduce solid waste generation and promote recycling as summarized on Table 4.6-9, which would further reduce the net increase in solid waste. In particular, Policy CC6.1 seeks to achieve a "zero waste" goal. The City has also achieved a solid waste reduction of 63-65%, which exceeds the state requirement of a 50% reduction by the year 2000. With increasing waste diversion, the landfill capacity has expanded (Arman, personal communication, April 2011).

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in increased growth with resulting increases in solid waste generation. However, the City's landfill has adequate capacity to serve anticipated growth. Thus, there would a less-than-significant impact on wastewater treatment and collection facilities.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.6-9
Proposed General Plan Policies & Actions that Reduce Solid Waste Impacts

Type of Measure / Action	Policies
REDUCE SOLID WASTE	• Zero Waste goal: CC6.1 • Reduce recyclable materials at landfill: CC6.4.4, CC6.1.13 (plastic bags), CC6.1.17 & HZ2.1.4 (ban polystyrene foam), CC6.4.4
PROMOTE / SUPPORT RECYLING	• Prepare & implement recycling and reduction plans and incentives to encourage recycling: CC6.1.1, CC6.1.2, CC6.1.3, CC6.1.7 (new development), CC6.1.14 • Provide efficient waste & recycling service: CC6.2, CC6.2.2 • Encourage use of recycled materials: CC6.1.9, CC6.1.10, CC6.1.12, CC6.1.19 (industrial uses) • Require commercial, industrial recycling & waste audits: CC6.1.4, CC6.1.5, CC6.1.6 (cement/asphalt recycling) • Develop food waste & composting program: CC6.1.15, CC6.1.16
LANDFILL MANAGEMENT & PLANNING	• Develop comprehensive operating plan for Resource Recovery Facility: CC6.3, CC6.3.1 • Develop waste management alternatives: CC6.1.18 • Efforts to extend landfill life: CC6.4, CC6.4.2

Impact 4.6-7 Energy Use
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development that would result in indirect energy demands, which would not be wasteful or an inefficient use with implementation of state and local regulations and proposed *General Plan 2030* policies and actions. This is considered a *less-than-significant impact.*

Future development would be accommodated by the draft *General Plan 2030* would result in consumption of electricity and natural gas lighting, heating and cooling of residences and other buildings. Energy use resulting from potential new development was factored into the greenhouse gas emissions calculations as discussed in Appendix E. The calculations show an energy demand of approximately 40,650 megawatt hours and 9,600 therms in 2030 without implementation of energy efficiency measures or standards. This estimated electrical use represents a per capita use of approximately 1,800 kwh per capita, which is below state projections for the PG & E planning area

Overall, the future consumption of electrical and natural gas resources would not represent unnecessary, inefficient, or wasteful use of resources given the implementation of proposed policies that address lighting and energy conservation measures. Several policies in the proposed General Plan promote energy conservation, which could minimize or incrementally reduce the consumption of these resources. Specifically, GOAL NRC7 seeks to reduce energy use with a significant production and use of renewable energy. Its four policies and accompanying actions would promote reduction of electricity and natural gas consumption, use of renewable energy sources, and use of energy-efficient lighting, vehicles, and water fixtures and appliances. A summary of the proposed *General Plan 2030* policies that serve to reduce energy and fossil fuel consumption is presented in Table 4.6-10.

In addition, new structures will be required to be constructed in accordance with specifications contained in Title 24 of the California Code of Regulations and the City's Green Building Regulations. Anticipated changes in state building and energy efficiency requirements to help reduce greenhouse gas emissions will also reduce the rate of energy consumption increases. Such measures have been factored into California energy forecasts which predict an overall reduction in per capita use of electricity due to energy efficiency standards and conservation.

In addition, new structures will be required to be constructed in accordance with specifications contained in Title 24 of the California Code of Regulations and the City's Green Building Regulations. Anticipated changes in state building and energy efficiency requirements to help reduce greenhouse gas emissions will also reduce the rate of energy consumption increases. However, future construction activities would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil, natural gas, and gasoline) for automobiles and construction equipment.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in increased demand for electric and natural gas services. However, with implementation of local and state regulations, as well as proposed

General Plan 2030 policies and actions, energy-efficient building designs, material and appliances would be incorporated into future developments and energy use would not be considered wasteful or inefficient. Thus, there would a less-than-significant impact related to energy use.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.6-10
Proposed General Plan Policies and Actions that Reduce Energy Use

Type of Measure / Action	Policies / Actions
ENERGY CONSERVATION AND EFFICIENCY	• Reduce electricity and natural gas use by 20%: NRC7.1.1 • Adopt Model Lighting Ordinance: NRC7.1.2 • Improve energy efficiency in parks: NRC7.1.10 • Continue to install energy efficient systems in park and recreational facilities: NRC7.1.11 • Install energy-efficient street lighting: MC.2.10
PROMOTE RENEWABLE ENERGY	• Increase local use and production of renewable energy:NRC7.1.3 • Require passive heating and cooling in new development: NRC7.1.4 • Require City facilities to increase green electricity: NRC7.1.5
PROMOTE ENERGY EFFICIENT TRANSPORTATION	• Reduce consumption of fuels: NRC7.3.1 • Purchase City vehicles with fuel efficient or alternative fuel systems: NRC7.3.2, NRC7.3.4 • Establish telecommuting for City staff: NRC7.3.3 • Investigate partnerships with UCSC for electric car use: NRC7.3.5 • SEE TABLE 4.4-4 in Chapter 4.4 for policies-actions to reduce auto use.
PROMOTE ENERGY EFFICIENT WATER PROVISION & USE	• Install energy and water efficient appliances: NRC7.4.1 • Require new development to use high efficiency fixtures: NRC7.4.2 • Support gray water collection and reuse: NRC7.4.2, NRC7.4.3
EDUCATION & COORDINATION	• Cooperate with other agencies: NRC7.1.7 • Educate public: NRC7.1.8 • Support legislation on renewable energy: NRC7.1.9

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4.7 HYDROLOGY, STORM DRAINAGE & WATER QUALITY

4.7.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Hydrological Setting
- Stormwater Drainage
- Water Quality
- Flood & Coastal Hazards
- Regional & Local Plans

REGULATORY SETTING

Federal Regulations

The Clean Water Act (CWA), enacted in 1972, regulates the discharge of pollutants to waters of the United States from any point source. Section 401 of the CWA requires water quality certification for any activity, including the construction or operation of a facility, which may result in any discharge into navigable waters (Title 33 CFR §1341). Section 404 of the CWA requires a permit for the discharge of dredged fill material into navigable waters at specified disposal sites (Title 33 CFR §1344). In 1987, amendments to the CWA added Section 402(p), which establishes a framework for regulating non-point source stormwater discharges under the National Pollutant Discharge Elimination System (NPDES). The NPDES stormwater program is further described below under the "State Regulations" subsection.

The Federal Emergency Management Agency (FEMA) – a former independent agency that became part of the new Department of Homeland Security in March 2003 – is tasked with responding to, planning for, recovering from, and mitigating against disasters. Formed in 1979 under an executive order by President Jimmy Carter to merge many of the separate disaster-related responsibilities of the federal government into one agency, FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers studies and approved agencies studies and for coordinating the federal response to floods, earthquakes, hurricanes, and other natural or man-made disasters and providing disaster assistance to states, communities and individuals. FEMA distributes the Flood Insurance Rate Maps (FIRMS), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas (SFHAs), including the 100-year flood zone.

Executive Order 11988 (Flood Plain Management) links the need to protect lives and property with the need to restore and preserve natural and beneficial flood plain values. Specifically,

federal agencies are directed to avoid conducting, allowing, or supporting actions on the base floodplain unless the agency finds that the base floodplain is the only practicable alternative location. Similarly, Department of Transportation (DOT) Order 5650.2, which implements Executive Order 11988 and was issued pursuant to the National Environmental Policy Act of 1969, the National Flood Insurance Act of 1968, and the Flood Disaster Protection Act of 1973, prescribes policies and procedures for ensuring that proper consideration is given to avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs, and budget requests.

State Regulations

The California State Water Resources Control Board (State Board) and the nine Regional Water Quality Control Boards (RWQCB) have the responsibility in California to protect and enhance water quality, both through their designation as the lead agencies in implementing the Section 319 non-point source program of the federal Clean Water Act, and through the state's primary water pollution control legislation, the Porter-Cologne Water Quality Control Act. The State Board establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. All projects resulting in discharges, whether to land or water, are subject to Section 13263 of the California Water Code (CWC) and are required to obtain approval of Waste Discharge Requirements (WDRs) by the RWQCBs. Land and groundwater-related WDRs (i.e., non-NPDES WDRs) regulate discharges of privately or publicly treated domestic wastewater and process and wash-down wastewater. WDRs for discharges to surface waters also serve as NPDES permits, which are further described below.

The Central Coast (Region 3) office of the RWQCB guides and regulates water quality in streams and aquifers throughout the central coast of California and the Monterey Bay region through designation of beneficial uses, establishment of water quality objectives, and administration of the NPDES permit program for stormwater and construction site runoff. The RWQCB is also responsible for providing permits and water quality certifications pursuant to CWA.

All dischargers of waste to waters of the State are subject to regulation under the Porter-Cologne Act and the requirement for WDRs is incorporated into the California Water Code. This includes both point and non-point source (NPS) dischargers. All current and proposed NPS discharges to land must be regulated under WDRs, waivers of WDRs, a basin plan prohibition, or some combination of these administrative tools. Dischargers of waste directly to state waters would be subject to an individual or general NPDES permit, which also serves as WDRs. The RWCQBs may issue individual WDRs to cover individual discharges or general WDRs to cover a category of discharges. WDRs may include effluent limitations or other requirements that are designed to implement applicable water quality control plans, including designated beneficial uses and the water quality objectives established to protect those uses and prevent the creation of nuisance conditions. Violations of WDRs may be addressed by issuing Cleanup and Abatement Orders (CAOs) or Cease and Desist Orders (CDOs), assessing administrative civil liability, or seeking imposition of judicial civil liability or judicial injunctive relief.

The 1987 amendments to the Clean Water Act (Section 402[p]) provided for the U.S. EPA regulation of several new categories of non-point pollution sources within the existing NPDES. The EPA has delegated management of California's NPDES stormwater permit program to the State Board and the nine RWQCB offices. In Phase 1, NPDES permits were issued for urban runoff discharges from municipalities of over 100,000 people, from plants in industries recognized by the EPA as being likely sources of stormwater pollutants, and from construction activities that disturbed more than five acres. Phase 2 implementation, effective March 10, 2003, extended NPDES urban runoff discharge permitting to cities of 50,000 to 100,000, and to construction sites that disturb between 1 and 5 acres. The State Board has developed several general permits for coverage under the Phase 2 NPDES stormwater permit program.

Construction activity on projects that disturb one or more acres of soil, or less than 1 acre but are part of a larger common plan of development that in total disturbs one or more acres, must obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ). Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of a facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Program (SWPPP). The SWPPP should identify stormwater collection and discharge points, drainage patterns across the project, and best management practices (BMPs[1]) that the discharger will use to protect stormwater runoff and the placement of those BMPs.

As mandated by Section 303(d) of the Federal Clean Water Act, the State Board maintains and updates a list of "impaired water bodies" (i.e., water bodies that do not meet State and Federal water quality standards). This list is known as the Section 303(d) list of impaired waters. The State is then required to prioritize waters/watersheds for development of Total Maximum Daily Load (TMDL) regulations. This information is compiled in a list and submitted to the EPA for review and approval. The State Board and Regional Boards monitor and assess water quality on an ongoing basis.

Local Regulations

STORMWATER MANAGEMENT PROGRAM

The City of Santa Cruz has developed a comprehensive Storm Water Management Program (SWMP) to fulfill the requirements for the Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4 General Permit) and to reduce the amount of pollutants discharged in urban runoff. The SWMP includes eight programs to achieve this goal, including runoff control policies, outreach and education efforts, site visits, and the implementation of BMPs.

[1] BMPs are either pollution prevention practices or structural controls designed to reduce or eliminate pollutant discharges. BMPs typically emphasize "good housekeeping methods," chemical handling procedures, spill prevention, and proper waste storage and disposal.

MUNICIPAL CODE REGULATIONS

Storm Water and Urban Runoff Pollution Control. In 1998, the City adopted an ordinance, entitled "Storm Water and Urban Runoff Pollution Control," which is Chapter 16.19 of the City's Municipal Code. The ordinance established the legal authority to prohibit illicit connections and pollutant discharges to the City storm drain system. The ordinance also provides the City with the legal authority to conduct inspections and sampling. In addition, the ordinance contains a provision requiring the implementation of BMPs, as published by the Public Works Department, by certain types of facilities. The City also has the authority to terminate illicit connections and discharges, and to initiate enforcement actions for violations of the code. Potential enforcement actions include written notices, citations, termination of discharge, and monetary penalties. The ordinance prohibits non-stormwater discharges to the storm drain system with a few exceptions (City of Santa Cruz, March 2010). The City revised the Storm Water Ordinance in July 2003 in order to update the ordinance and incorporate new Phase II stormwater regulations (Ibid.).

City Municipal Ordinance section 16.19.140 requires that any construction project, including those undertaken under any permit or approval granted pursuant to Titles 15 (Streets and Sidewalks), 18 (Buildings and Construction), and 24 (Zoning) of the City Code, shall implement best management practices including the City's mandatory BMPs as detailed in the latest BMP manual published by the City's Public Works Department. BMPs are required to be maintained in full force and effect throughout the life of a project.

In addition, the City's Ordinance 16.19.150 requires that all industrial/commercial facilities file a Notice of Intent (NOI) with the State Board and abide by the state regulations outlined in the general permit and implement best management practices to the maximum extent practicable listed in the guidelines published in the *California Storm Water Best Management Practices Handbook, Industrial/Commercial*, by the Storm Water Quality Task Force. The City's mandatory BMPs, as detailed in the latest BMP manual published by the City's Public Works Department, must also be implemented.

Zoning Ordinance Requirements for New Development. The Zoning Ordinance, Title 24 of the Municipal Code, currently contains provisions to ensure that new developments or remodeled sites are designed and constructed in a manner that limits alteration of drainage patterns, prevents erosion, and minimizes long-term impacts on water quality. Chapter 24.14 – Environmental Resource Management – contains a section on Conservation Regulations that includes general provisions for drainage and erosion controls. These provisions include requirements that a drainage plan be submitted for projects, both large and small, when existing drainage patterns would be altered by new construction. A drainage plan must be submitted and reviewed as part of the project approval. In addition, the ordinance requires that stormwater runoff resulting from project development be minimized, and if a proposed project includes the discharge of runoff into a natural watercourse, the drainage plan shall include methods to safeguard or enhance the existing water quality. Devices such as detention basins, percolation ponds, or sediment traps may be required by the City, where appropriate or as specified in an adopted plan or wetlands management plan. Provisions pertaining to erosion control include requirements that a site development be fitted to the topography and soil so as to create the least potential for erosion. Vegetation removal is limited to the amount necessary and according to the project's approved erosion control plans.

Flood Management. Section 24.14.400 ("Floodplain Management") sets forth requirements and procedures to protect properties against flood hazards and comply with National Flood Insurance Program requirements. The regulations set forth programs for floodplain management and specify circumstances in which floodproofing of structures may be required.

Grading Regulations. The Grading Ordinance is a subset of Title 18, Buildings and Construction, of the City's Municipal Code and is included in Chapter 18.45 – Excavation and Grading Regulations." It provides technical regulations of grading and excavation, in conjunction with the Environmental Resource Management provisions (Municipal Code, Title 24, Chapter 24.14), in order to safeguard life, health, safety and the public welfare; protect fish and wildlife, riparian corridors and habitats, water supplies, and private and public property, and to protect the environment from the effects of flooding, accelerated erosion and/or deposition of silt. The ordinance accomplishes this by providing guidelines, regulations, and minimum standards for clearing, excavation, cuts, fills, earth moving, grading operations (including cumulative grading), water runoff and sediment control. In addition, the ordinance includes provisions regarding administrative procedures for issuance of permits and approval of plans and inspections during construction and subsequent maintenance. The City revised the Grading Ordinance in April 2004 in order to strengthen the ordinance regarding implementation of BMPs, including those for erosion and sediment control (City of Santa Cruz, March 2010)

CITY-WIDE CREEKS AND WETLANDS MANAGEMENT PLAN

The City of Santa Cruz *City-wide Creeks and Wetlands Management Plan* (2006) (Management Plan) was adopted by the City Council to provide a comprehensive approach to managing all creeks and wetlands within the City. The Management Plan was certified as a LCP amendment by the California Coastal Commission in October 2007. The long-term goals of the *Management Plan* include protection and improvement of water quality.

HYDROLOGIC SETTING

The City of Santa Cruz encompasses approximately 12 square miles between the Monterey Bay and the Santa Cruz Mountains. A total of 39 miles of watercourses occur within the City, supporting riparian and wetland habitat and/or influencing stormwater conveyance and water quality (City of Santa Cruz Planning and Community Development Department, March 2008). Figure 4.8-2 illustrates major water courses in the City.

The San Lorenzo River, the major watercourse through the City, originates in the Santa Cruz Mountains, traverses through the center of the City and forms a major physical feature of the region. The City also supports four other major watersheds and several miscellaneous watercourses, ranging from numerous perennial, spring-fed streams on the west side of the City to intermittent streams located on the east side of the City. Table 4.8-1 in the BIOLOGICAL RESOURCES (Chapter 4.8) section of this EIR identifies the watersheds and watercourses within the City, which are summarized below. Watercourses and watersheds outside of the City from which the City obtains some of its municipal water supplies are discussed in the WATER SUPPLY (Chapter 4.5) section of this EIR.

San Lorenzo River Watershed

The San Lorenzo River Watershed is the largest watershed in the City, with the San Lorenzo River flowing adjacent to the center of the City's downtown area. The San Lorenzo River drains a 138-square mile watershed, featuring forested and urbanized areas within the City and Santa Cruz County. Within the City limits, the lower San Lorenzo River flows southward from the Sycamore Grove area of Pogonip, through the center of Santa Cruz, to Monterey Bay. This lower reach of the San Lorenzo River encompasses much of the river's historic floodplain. Branciforte Creek and Jessie Street Marsh are tributaries to the San Lorenzo River.

The watershed is comprised predominantly of open space lands (41%) in the northern portion, and residential neighborhoods (26%) and paved roads (13%) as the river flows south through the City. Other land uses include commercial businesses and a portion of the UCSC campus. The primary tributary streams within City limits include: Carbonera Creek, Branciforte Creek, Glen Canyon Creek, and Pogonip Creek (City of Santa Cruz, March 2010).

Over the last 50 years the San Lorenzo River has been impacted by increasing development within the watershed and the channelization of the lower 2.5 miles into a levee flood control structure following a damaging flood in Santa Cruz in 1955. This flood control project, developed in cooperation with the U.S. Army Corps of Engineers (ACOE), included rip-rap levee banks, removal of all vegetation from the banks, and dredging of the river channel bottom. During construction of the levee project, Jessie Street Marsh was filled and the lower Branciforte Creek was channelized in a cement culvert. The ACOE completed another levee improvement project in 2000 that improved and raised the levees. The design incorporated native vegetation concepts and a continuous bicycle and pedestrian path along the length of the levees.

Moore Creek Watershed

The Moore Creek watershed is located on the western side of Santa Cruz and drains directly into the Pacific Ocean at Natural Bridges State Park. The watershed is comprised primarily of open space (50%) and the UCSC campus (23%). Also within the watershed are residential areas, general industrial businesses, and parks. The primary resources located within this watershed are as follows: Younger Lagoon, Moore Creek, Antonelli Pond, Natural Bridges State Park, and Monterey Bay (City of Santa Cruz, March 2010).

Westside Watershed

The Westside Watershed is also located on the western side of the City, between the Moore Creek Watershed and the Neary Lagoon Watershed. The southern boundary of the Westside Watershed is the Pacific Ocean. A significant portion of the watershed is comprised of residential areas (53%) and paved roads (21%). Other land uses include open space, churches and schools, and industrial facilities. The primary resources are: Bethany Creek, Arroyo Seco Corridor, Lighthouse Field State Park, and Monterey Bay (City of Santa Cruz, March 2010).

Neary Lagoon Watershed

The Neary Lagoon Watershed is located in between the Moore Creek, Westside, and San Lorenzo River Watersheds. The watershed drains into Monterey Bay and the Pacific Ocean at Cowell Beach. The watershed drains the majority of the UCSC campus (44%) and residential neighborhoods (33%). Other land uses include roads, open spaces, churches and schools, and commercial businesses. Neary Lagoon is centrally located in the City's urban core and is comprised of approximately 44 acres of wetland, riparian and woodland habitats. The lagoon collects runoff and groundwater from approximately one half of the west side of the City, most of which is residential. A weir controls the lagoon water level. The lagoon outlets to Monterey Bay at Cowell Beach during the wet weather season via a gravity storm drain and one forced main storm drain. During the dry weather season, the lagoon's discharge is diverted to the Wastewater Treatment Facility. The primary resources are as follows: Donero Creek, Westlake Pond, Laurel Creek, Bay Creek, Neary Lagoon, Cowell Beach, and Monterey Bay (City of Santa Cruz, March 2010).

Arana Gulch Watershed

The Arana Gulch Watershed is located on the City's eastern border and is partially within the unincorporated residential areas of the County. The watershed drains into Monterey Bay at the Santa Cruz Yacht Harbor. The watershed, within City limits, is comprised predominantly of residential neighborhoods (34%) and open space (34%). Other land uses include paved roads, churches and schools, and the Santa Cruz Port District (Yacht Harbor). The primary resources include the following: Arana Creek, West Branch Creek, Hagemann Gulch, Woods Lagoon, the Santa Cruz Yacht Harbor, and Monterey Bay (City of Santa Cruz, March 2010).

STORMWATER DRAINAGE

The City's storm drain system is comprised of a wide variety of conveyance systems such as underground pipes, small open drainage channels, creeks, and the San Lorenzo River. The system includes numerous storm drain inlets and catch basins (approximately 1,450) throughout the City, and five pump stations that discharge stormwater directly into the San Lorenzo River. In addition, along both the east and west sides of the City, there are stormwater outfalls that discharge onto the beaches or cliffs, and into Monterey Bay (City of Santa Cruz, March 2010).

There is approximately 50 miles of underground storm drain system pipeline in the City. The majority of pipes are comprised of concrete. Old pipelines still remain that are comprised of clay, while new pipelines installed by the City are either made of PVC or high-density polyethylene (HDPE). The typical pipeline diameter is 12-15 inches although both smaller and larger pipelines, up to 72 inches, exist. Maintenance and repair of the City's storm drain system is conducted by the Public Works Department (City of Santa Cruz, March 2010).

In general, the City's downtown area drains to the San Lorenzo River. Although some stormwater reaches the river by absorption and gravity, the five pump stations along the river were installed in order to transfer the majority of the stormwater over (actually through) the river levees. There are three pump stations located on the west side of the river and two on the east side. The west side pump stations are located at Broadway and in Beach Flats area. The

east side locations pump stations are located at lower Ocean Street and at Water Street (City of Santa Cruz, March 2010).

In addition to the San Lorenzo River, there are numerous creeks traversing the City as indicated above, and summarized in Table 4.8-1 in the BIOLOGICAL RESOURCES (Chapter 4.8) section of this EIR. In certain areas of the City, natural spring water and stormwater flows through a network of conveyance systems, such as small creeks and underground piping. This is especially the case in the west side of Santa Cruz, particularly the upper west side. The upper west side is dotted by natural springs, which feed the small creeks that run through residential yards and cross streets via underground piping. These creeks drain either into Neary Lagoon or run through the storm drains system discharge from West Cliff Drive into Monterey Bay. As expected, the flow from some of these smaller creeks is seasonal or intermittent with the greatest flows occurring during the rainy season (City of Santa Cruz, March 2010).

WATER QUALITY

Urban development often results in the degradation of water quality due to the introduction of pollutants and erosion due to construction and development. Development and pervious pavement can result in increased runoff and higher velocities in creeks and streams. These changes can, in turn, cause erosion. Urban pollutants may include toxic metals, hydrocarbons, nutrients, suspended solids, and many other chemicals (City of Santa Cruz, March 2010).

The significant sources and examples of activities that may generate pollutants are listed below as summarized in the City's "Storm Water Management Plan" (March 2010):

- *Industrial facilities*: industrial chemical processes; chemical and waste storage; fleet maintenance and vehicle washing; and landscaping.
- *Commercial businesses* including food and vehicle service facilities: vehicle and equipment maintenance; food processing; vehicle washing; landscaping; and chemical and waste storage.
- *Residential dwellings*: vehicle washing; home vehicle repair; home painting and construction projects; chemical and waste storage; pet waste; and landscaping.
- *Construction and remodeling projects*: grading; vegetation removal; concrete washout; vehicle and equipment fluids; landscaping; and material and waste storage.
- *Municipal sewer system and private sewer laterals*: exfiltration from leaking, cracked, and debilitated pipelines; and overflows from blocked pipelines.

The City's "Storm Water Management Plan" (SWMP) is a comprehensive program to reduce the amount of pollutants discharged in urban runoff and to improve and protect water quality. The SWMP includes six required control programs and two recommended control programs for industrial and commercial facilities, and Best Management Practices (BMPs). The City's SWMP was approved by the Central Coast RWQCB on April 14, 2009, and thus, the City is granted coverage under the statewide NPDES Small Municipal Separate Storm Sewer Systems General Permit. The SWMP is described further in this chapter.

Pollutants of Concern

Stormwater pollutants generated by the sources described above are numerous and quite varied. These pollutants include: metals, solvents, paint, concrete, masonry products, detergents, vehicle fuels and fluids, oil and grease, pesticides and fertilizers (organic compounds and nutrients), debris and litter, bacteria, pathogens and oxygen demanding compounds, and sediment and silt. In general, all five of the City's watersheds contain most or all of these pollutants due to the various types of land uses that are distributed throughout the City rather than certain types being concentrated in specific watersheds. However, the San Lorenzo River watershed does have a higher level of commercial and tourist activity, and the Moore Creek watershed has very little commercial land use and the Neary Lagoon watershed has practically no industrial land use (City of Santa Cruz, March 2010).

The primary pollutants of concern in the City watersheds are sediment and silt and fecal indicator bacteria. The City has targeted these primary pollutants of concern in the SWMP because certain water bodies within the City are listed on the Clean Water Act Section 303(3) list as impaired for these specific pollutants as further discussed below (City of Santa Cruz, March 2010). The other pollutants of concern will also be addressed in the City's Storm Water Management Plan, as further described below, through the measures and BMPs detailed plan. Other identified water quality issues include:

- *Central Coast Ambient Monitoring Program* Toxicity:
  - sublethal effects observed in San Lorenzo River
  - one lethal effect observed in Arana Gulch
- *Monterey Bay Sanctuary Citizen Watershed Monitoring Network*
  - Copper and Zinc: observed at elevated levels in stormwater discharges during First Flush events
- *Fecal Indicator Bacteria from transients and homeless people* (City of Santa Cruz, March 2010).

On February 15, 2008, the Central Coast RWQCB notified the City that BMPs must be adopted for the development of hydromodification criteria to protect beneficial uses and promote the desired conditions of healthy watersheds including:

I. Maximize infiltration of clean stormwater, and minimize runoff volume and rate;
II. Protect riparian areas, wetlands, and their buffer zones;
III. Minimize pollutant loading; and
IV. Provide long-term watershed protection.

The City has joined with other surrounding jurisdiction and the RWQCB in a Joint Effort to cooperatively develop hydromodification control criteria. The City will derive municipality-specific criteria for controlling hydromodification in new and redevelopment projects using approved methodology developed through the Joint Effort. In addition, the City will develop and enact a strategy for implementing LID and hydromodification control for new and redevelopment projects. Water quality and runoff flow and volume can be addressed by individual development projects through incorporation "low impact development" (LID) concepts into the project design. There is a general understanding that LID is a type of site design that strives to protect the natural hydrology once the site is developed. However, there is a common misconception that LID is only about the use of structural practices such as rain gardens, pervious

pavements, and bioswales. In fact, a good LID design incorporates both site planning principles and structural practices to achieve site performance objectives. Neglecting to incorporate LID design principles throughout the site planning and design process often results in the designer attempting to fit LID structural practices to the site after all other site design has been defined. This can result in higher costs as well as a reduced ability to meet stormwater management objectives. LID design is often an iterative process that includes evaluating the stormwater benefits (e.g., reduced surface runoff, improved water quality) during the design and going back to the design to revise and then recalculate benefits.

Impaired Water Bodies

As indicated in the "Regulatory Setting", subsection, the Clean Water Act requires states to identify and prepare a list of water bodies that do not meet water quality objectives, and to establish Total Maximum Daily Loads (TMDL) for each water body to ensure attainment of water quality objectives. The City of Santa Cruz storm drain system (MS4) discharges into four water bodies that are currently on the 303(d) list of impaired water bodies. These water bodies and associated impairments are identified below.

- San Lorenzo River. The San Lorenzo River is listed for:
  - *Sedimentation/siltation* – potential sources are construction/land development, urban runoff, and non-point sources. There is an adopted TMDL for this impairment as discussed below.
  - *Pathogens* – the relative order of controllable sources, in descending order, is: 1) City of Santa Cruz sanitary sewer collection system spills and leaks (including private laterals connected to municipal sanitary sewer collection systems), 2) storm drain discharges to municipally-owned and operated separate storm sewer systems (MS4s), 3) pet waste in areas that do not drain to MS4s, 4) homeless person/encampment discharges in areas that do not drain to MS4s, 5) onsite wastewater disposal system discharges, and 6) farm animal and livestock discharges.
  - *Nutrients* – the potential sources being nonpoint sources and septage disposal, and pathogens. The potential sources of these are septage disposal and urban runoff/storm sewers.

- San Lorenzo River Lagoon. The San Lorenzo River Lagoon is listed for *pathogens*. The relative order of controllable sources, in descending order, is: 1) City of Santa Cruz sanitary sewer collection system spills and leaks (including private laterals connected to municipal sanitary sewer collection systems), 2) storm drain discharges to municipally-owned and operated separate storm sewer systems (MS4s), 3) pet waste in areas that do not drain to MS4s, 4) homeless person/encampment discharges in areas that do not drain to MS4s, 5) onsite wastewater disposal system discharges, and 6) farm animal and livestock discharges.

- Carbonera Creek.
  - *Sedimentation/siltation* – potential sources are construction/land development, and non-point sources. There is an adopted TMDL for this impairment as discussed below.

- *Pathogens* – the relative order of controllable sources, in descending order, is: 1) City of Santa Cruz sanitary sewer collection system spills and leaks (including private laterals connected to municipal sanitary sewer collection systems), 2) storm drain discharges to municipally-owned and operated separate storm sewer systems (MS4s), 3) pet waste in areas that do not drain to MS4s, 4) homeless person/encampment discharges in areas that do not drain to MS4s, 5) onsite wastewater disposal system discharges, and 6) farm animal and livestock discharges.
- *Nutrients* – the potential sources being nonpoint sources (septage disposal and urban runoff/storm sewers).

❑ Branciforte Creek.

- *Sedimentation/siltation* – the potential sources are nonpoint source, road construction, and silviculture (not applicable in the City). The City is currently addressing these issues under the Implementation Plan for the San Lorenzo River Sediment TMDL.
- *Pathogens* - the relative order of controllable sources, in descending order, is: 1) City of Santa Cruz sanitary sewer collection system spills and leaks (including private laterals connected to municipal sanitary sewer collection systems), 2) storm drain discharges to municipally-owned and operated separate storm sewer systems (MS4s), 3) pet waste in areas that do not drain to MS4s, 4) homeless person/encampment discharges in areas that do not drain to MS4s, 5) onsite wastewater disposal system discharges, and 6) farm animal and livestock discharges.

For these water bodies and impairments, the City's SWMP addresses the primary pollutants of concern through City measures and BMPs to the Maximum Extent Practicable. In addition, where there is an adopted TMDL, the SWMP targets these primary pollutants of concern due to their high priority. In some cases a TMDL has been adopted for these primary pollutants of concern by the RWQCB. To date, a "Total Maximum Daily Load" (TMDL) has not been established for all of the 303(d) listed water bodies/impairments identified above, although they are under development. A discussion of the adopted TMDLs for water bodies within the City of Santa Cruz is provided below.

TMDLs for Sediment. The San Lorenzo River and Carbonera Creek (along with Lompico Creek and Shingle Mill Creek, which are outside of the City's jurisdiction) were identified as impaired by sediment on the 1998 Clean Water Act Section 303 (d) list of impaired water bodies. On May 16, 2003, the RWQCB adopted a sediment TMDL (Resolution No. R3-2002-0063) for these water bodies and thereby incorporated the TMDL and associated Implementation Plan into the Basin Plan. Again, the sources of impairment are attributed to the following: land development, urban runoff, roads, non-point sources, and silviculture. In 2006, the State Board added additional water bodies that were on the 303(d) as impaired by sediment. Of these additions, Branciforte Creek is located within the City. Thus, the water bodies within the City included in the Implementation Plan are the San Lorenzo River, Carbonera Creek, and Branciforte Creek.

The *Implementation Plan for the San Lorenzo River Sediment TMDL* identifies the Cities of Santa Cruz and Scotts Valley, the County of Santa Cruz, and the owners and operators of construction sites of one acre and greater as Responsible Dischargers. Therefore, the City has and will take the following implementation actions within its jurisdiction:

a) Develop and implement the SWMP and Storm Water Pollution Prevention Plans (SWPPPs) consistent with NPDES Phase II Storm Water regulations.

b) Identify the San Lorenzo River Watershed as a priority for site inspection and enforcement of control measures in the SWMP and SWPPPs.

c) Incorporate sediment control programs/projects into the SWMP.

TMDLs for Fecal Indicator Bacteria. A TMDL for Fecal Indicator Bacteria has also been adopted for the San Lorenzo River, San Lorenzo River Lagoon, Branciforte Creek, and Carbonera Creek. Although the TMDL has been adopted by the RWQCB and the SWRCB it has not been adopted by the Office of Administrative Law and therefore an implementation schedule is not yet set. The implementation plan tasks to be performed by the City include:

1. Improved maintenance of the sanitary sewer system adjacent to the impaired bodies
2. Implementing BMPs as required by the City's SWMP.

The implementation plan also requires that the City address impacts from homeless persons and encampments.

FLOOD & COASTAL HAZARDS

Flood Hazards

OVERVIEW

Flooding and coastal storms present essentially the same risks and are frequently related types of hazards in the City of Santa Cruz. A flood is a natural event for rivers and streams. Coastal storms can cause increases in tidal elevations (called storm surge) wind speed and erosion as well as flooding Floodplains are lowlands adjacent to rivers, lakes and oceans that are subject to recurring floods (City of Santa Cruz, September 2007).

A flood occurs when a waterway receives a discharge greater than its capacity. Several factors determine the severity of floods, including rainfall intensity (or other water source) and duration. Floods may result from intense rainfall, localized drainage problems, tsunamis or failure of flood control or water supply structures such as levees, dams or reservoirs. Floodwaters can carry large objects downstream with a force strong enough to destroy stationary structures such as bridges and break utility lines. Flood waters also saturate materials and earth resulting in the instability, collapse and destruction of structures as well as the loss of human life. The City of Santa Cruz has lost bridges and other infrastructure during previous storms (City of Santa Cruz, September 2007).

Floods occur in relation to precipitation. Flood severity is determined by the quantity and rate at which water enters the waterway, increasing volume and velocity of water flow. The rate of

surface runoff, the major component to flood severity, is influenced by the topography of the region as well as the extent to which ground soil allows for infiltration in addition to the percent of impervious surfaces (City of Santa Cruz, September 2007).

Most of the known floodplains in the United States have been mapped by FEMA, which administers the National Flood Insurance Program (NFIP.) Information on Santa Cruz can be found in FEMA's most recent flood Insurance Study (FIS).

FLOOD HAZARDS IN CITY OF SANTA CRUZ

Within the City of Santa Cruz there are several areas subject to flooding. The San Lorenzo River runs through the downtown corridor and the majority of the downtown area is in the San Lorenzo floodplain. Flooding along the coast of Santa Cruz may occur with the simultaneous occurrence of large waves and storm swells during the winter. When storms occur simultaneously with high tides, flood conditions including flooding at the mouth of the San Lorenzo River are exacerbated.

There are several smaller creeks in the City that are subject to periodic flooding. Figure 4.7-1 shows FEMA-identified floodplains in the City. Flooding is a hazard on the lower reaches of Moore Creek where only shallow stream channels are present, the lower portion of Arana Gulch, north of Santa Cruz Yacht Harbor, and along portions of Branciforte and Carbonera creeks. In these areas there is minimal impact on public structures and facilities and only a few residential structures are within these flood zones (City of Santa Cruz, September 2007).

The City of Santa Cruz has been subject to floods along the San Lorenzo River throughout recorded history from the time the Mission was first built in 1793 to the "Christmas Flood" on December 22, 1955. Eighteen floods, eight of which have been considered severe, have occurred over the last hundred years in Santa Cruz (City of Santa Cruz, September 2007).

The City of Santa Cruz has worked to improve the flood capacity of the San Lorenzo River levees over the past twenty years. Significant flood improvements along the river were completed in 2000 as part of the U.S. Army Corps of Engineers' San Lorenzo River Flood Control and Environmental Restoration Project. This project raised the river levees and rehabilitated the three downtown bridges (over the San Lorenzo River) to increase flood flow capacity. Despite recent flood control projects and improved flood rating in much of the downtown and beach area, the risk of flooding is still a concern to the City. While the levee project has resulted in a more flood-resistant downtown, floods may still occur. The levee project did not impact areas along the San Lorenzo River above the Highway One bridge (City of Santa Cruz, September 2007).

The City of Santa Cruz Storm Water Management Utility is primarily a financing mechanism for flood control and stormwater programs. The City established a stormwater utility fee in May 1994 to fund the local share of the San Lorenzo River Flood Control and Environmental Restoration Project. The funds are used to maintain and retrofit surface water, stormwater, and flood control facilities and are generated as a property tax assessment.

FEMA RATINGS AND FLOOD INSURANCE

The Flood Insurance Rate Map (FIRM) is an official map of a community for which the Federal Insurance and Mitigation Administration has delineated the Special Flood Hazard Area (SFHA) and the risk premium zones applicable to the community. All known areas of the City subject to natural flooding hazards have been designated and mapped by the Federal Emergency Management Agency (FEMA), such as the 100-year floodplain boundaries which appear on FEMA's Flood Insurance Rate Maps, and are a source for the floodplain map included in this chapter (City of Santa Cruz, September 2007).

FEMA re-designated much of the downtown and beach area from A-11 to the A-99 Flood Zone designation in recognition of the significant flood improvements resulting from completion of the San Lorenzo River Flood Control and Environmental Restoration Project. Under the A-99 designation, new buildings and improvements are no longer mandated to meet FEMA flood construction requirements and flood insurance premiums are significantly reduced. The FEMA Community Rating System (CRS) class seven rating for the City of Santa Cruz further reduces the National Flood Insurance Program (NFIP) A-99 flood insurance rates by five percent. At present the combination of the CRS class seven rating and the A-99 designation reduces flood insurance by 45% (City of Santa Cruz, September 2007).

Dam Failure

Dam failure can occur as a result of earthquakes, seiches, structural instability, or intense rain in excess of design capacity. Timber, rock, concrete, earth, steel or a combination of these materials may be used to build the dam. Dams must have spillway systems to safely convey normal stream and flood flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams also have a drain or other water-withdrawal facility to control the reservoir level and to lower or drain the reservoir for normal maintenance and emergency purposes (City of Santa Cruz, September 2007).

The City of Santa Cruz owns and operates Newell Creek Dam (NCD) and Bay Street Reservoir (BSR). NCD is located near the town of Ben Lomond in the Santa Cruz Mountains and impounds Newell Creek to form Loch Lomond Reservoir. The reservoir was constructed in the early 1960s and has a maximum capacity of 2.9 billion gallons (BG). The Loch Lomond Reservoir is the City's primary raw water storage facility (City of Santa Cruz, September 2007). The Bay Street Reservoir, a former impoundment to store treated water, has been removed, and is being replaced with permanent water storage tanks.

The primary mitigation strategy is the continuation of monitoring protocols for structural integrity. These include the monitoring of the Newell Creek Dam as follows:

- Water pressures within the dam and seepage are monitored monthly and after established rainfall and earthquake triggers.
- Horizontal and vertical movement is monitored annually at Newell Creek Dam. California Department of Water Resources, Division of Safety of Dams, has just recently requested a similar monitoring protocol at BSR which will begin in the spring of 2007.

- Periodic seismic reviews are conducted at both dams to ensure stability with respect to current seismic standards.

Coastal Issues and Hazards

TSUNAMI HAZARD

A tsunami is a series of waves generated by an impulsive disturbance in the ocean or in a small, connected body of water. Tsunamis are produced when movement occurs on faults in the ocean floor, usually during very large earthquakes. Sudden vertical movement of the ocean floor by fault movement displaces the overlying water column, creating a wave that travels outward from the earthquake source. An earthquake anywhere in the Pacific can cause tsunamis around the entire Pacific basin. Since the Pacific Rim is highly seismically active, tsunamis are not uncommon (City of Santa Cruz, September 2007).

California is at risk from both local and distant source tsunamis. Eighty-two possible or confirmed tsunamis have been observed or recorded in California during historic times. Most of these events were small and only detected by tide gages. Eleven were large enough to cause damage and four events resulted in deaths. Two tsunami events caused major damage (City of Santa Cruz, September 2007).

There has been minimal damage and loss of life in Santa Cruz during recorded history of tsunamis (City of Santa Cruz, September 2007). However, a tsunami generated by a 9.0 magnitude earthquake in Japan in March 2011 reached Santa Cruz and caused substantial damage to the Santa Cruz Small Craft Harbor.

Even though the potential for a significant tsunami may be low or possibly uncertain, the potential outcome of such a tsunami could be significant damage and loss of life. Figure 4.7-2 illustrates tsunami inundation zones in Santa Cruz. Several active and potentially active earthquake faults are located within or near Santa Cruz. Even a moderate earthquake occurring in or near any of the nearby faults could result in local source tsunamis from submarine landsliding in Monterey Bay (City of Santa Cruz, September 2007). In the aftermath of the 1989 Loma Prieta Earthquake, several docks in the Harbor became stuck to the piers and had to be lifted manually, or were broken implying that the water level fell below the usual low tide level. A small tidal wave was observed rushing out of the harbor following the earthquake that continued for 15-20 minutes (Ibid.). Additionally, distant source tsunamis from the Cascadia Subduction Zone to the north, or Teletsunamis from elsewhere in the Pacific Ocean are also capable of causing significant destruction in Santa Cruz (Ibid.).

The US Army Corps of Engineers has looked at potential earthquake sources around the Pacific and modeled expected tsunami impacts on the coast of the Monterey Bay (US Army Corps of Engineers, 1975). The study estimated that a tsunami wave with a probability of occurrence of one every 100 years would be about 5.9 feet high. A tsunami with a probability of occurrence of one every 500 years is expected to be 11.5 feet high (City of Santa Cruz, September 2007).

CLIMATE CHANGE – POTENTIAL SEA LEVEL RISE

There has been increasing attention paid in recent years to the issue of global climate change and its potential effects on coastal resources. Over the past century, sea level has risen nearly eight inches along the California coast, and general model scenarios suggest very substantial increase in sea level due to climate change over the coming century (California Climate Change Center, March 2009). Specifically, a 1.4 meter sea-level rise has been estimated, which would place nearly 500,000 people in California at risk of a 100-year flood event (Ibid.). The City of Santa Cruz, built on the 100-year floodplain, and only 20 feet above sea level is at risk (California Climate Action Center, July 2006). Large sections of the Pacific Coast not vulnerable to flooding are highly susceptible to coastal erosion that could be accelerated by a rising sea level (Ibid.). Additionally, changes in precipitation patterns could lead to increased flooding. According to the California Climate Change Center:

- Sea level in California could rise between approximately10 centimeters to 90 centimeters (4 to 25 inches) above existing mean sea level by 2099 as a result of climate change, also increasing the frequency of 100-year event high tide peaks (California Climate Change Center, March 2006).

- Under medium to medium-high greenhouse-gas emissions scenarios, mean sea level along the California coast is projected to rise from 1.0 to 1.4 meters (about 3 to 4.5 feet) by the year 2100 (California Climate Change Center, March 2009).

Rising sea levels, storms of increasing intensity and an alternating series of floods and drought threaten the City of Santa Cruz in the coming decades. With funding from FEMA, the City is now in the process of drafting a "Climate Change Adaptation Plan". The objectives of this Plan are to identify and evaluate the potential impacts of climate change on the City of Santa Cruz, analyze the severity of the hazards that the City faces, and develop potential adaptation responses to reduce the risk and exposure of the City to these hazards. The first step identified potential risks in a "Vulnerability Study", prepared as a collaborative effort between the City's Climate Adaptation Team and UCSC scientists. The study identified potential facilities vulnerable to risks of sea level rise, including beaches, West Cliff Drive, the City's wastewater treatment facility and the Santa Cruz Harbor (Griggs and Haddad, January 2011). The study also addressed coastal storm and cliff erosions hazards, as well as the potential for increased precipitation and flooding. Based on this study, the City has developed action items with priorities to respond to specific risks and hazards related to climate change. that will build adaptive capacity into policies, programs and infrastructure. The Plan will include provide a range of goals, objectives and actions that will build adaptive capacity into policies, programs and infrastructure and will provide a framework to continually expand understanding of climate science, community vulnerabilities and new adaptation technologies to inform current and future decisions.

REGIONAL AND LOCAL PLANS

Basin Plan

The Central Coast RWQCB regulates water quality in the Monterey Bay area in accordance with the Water Quality Control Plan or "Basin Plan" (Central Coast RWQCB, 2009). The Basin Plan designates beneficial uses that the RWQCB has identified for local water bodies. The Plan also provides water quality objectives for waters of the state, including surface waters and groundwater. It also includes implementation programs to achieve water quality objectives. Table 4.7-1 identifies beneficial uses designated for selected water bodies in the City of Santa Cruz.

Table 4.7-1
Beneficial Uses of Surface Water Bodies within City of Santa Cruz

Water Body	Beneficial Uses in the Basin Plan
Younger Lagoon	GWR, REC1, REC2, WILD, COLD, WARM, SPWN, BIOL, COMM
Antonelli Pond	GWR, REC1, REC2, WILD, WARM, MIGR, SPWN, RARE, COMM
Moore Creek	MUN, AGR, GWR, REC1, REC2, WILD, COLD, WARM, SPWN, BIOL, FRESH, COMM
Neary's Lagoon	GWR, REC1, REC2, WILD, WARM, SPWN, RARE, COMM
San Lorenzo River Estuary	REC1, REC2, WILD, COLD, MIGR, SPWN, BIOL, RARE, EST, COMM
San Lorenzo River	MUN, AGR, IND, GWR, REC1, REC2, WILD, COLD, MIGR, SPWN, BIOL, RARE, FRESH, COMM
Branciforte Cree,	MUN, AGR, GWR, REC1, REC2, WILD, COLD, MIGR, SPWN, COMM
Carbonera Creek	MUN, AGR, IND, GWR, REC1, REC2, WILD, COLD, MIGR, SPWN, COMM

Source: Central Coast Regional Water Quality Control Board, July 2009

Beneficial Use Definitions: Municipal and Domestic Supply (MUN); Agricultural Supply (AGR); Industrial Service Supply (IND); Ground Water Recharge (GWR); Freshwater Replenishment (FRSH); Water Contact Recreation (REC-1); Non-Contact Water Recreation (REC-2); Commercial and Sport Fishing (COMM); Warm Fresh Water Habitat (WARM); Cold Fresh Water Habitat (COLD); Wildlife Habitat (WILD), Preservation of Biological Habitats of Special Significance (BIOL); Rare, Threatened, or Endangered Species (RARE); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and/or Early Development (SPWN).

The proposed *General Plan 2030* is consistent with provisions of the Basin Plan. The proposed general plan supports water quality protection through implementation of the City's Storm Water Management Plan and water quality prevention programs. Table 4.7-2 in subsection 4.7-3 below summarizes proposed policies and actions to support water quality programs and protection.

City Plans

STORMWATER MANAGEMENT PROGRAM

The City of Santa Cruz has developed a comprehensive Storm Water Management Program (SWMP) to fulfill the requirements for the Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4 General Permit) and

to reduce the amount of pollutants discharged in urban runoff. In compliance with the Phase II regulations, the City has developed a comprehensive SWMP that is designed to reduce the discharge of pollutants to the Maximum Extent Practicable (MEP) and to protect water quality. The SWMP includes eight programs to achieve this goal, including runoff control policies, outreach and education efforts, site visits, and the implementation of BMPs. The eight programs include:

- Municipal Operations/Pollution Prevention and Good Housekeeping
- Illicit Discharge Detection and Elimination
- Public Participation
- Public Education
- Construction Site Storm Water Runoff Control
- Post Construction Storm Water Management
- Industrial Facilities
- Commercial Facilities

BMPs will include both preventative measures, such as good housekeeping practices, and structural controls. BMPs that reduce pollutants in stormwater runoff will be implemented to the technology-based standard of Maximum Extent Practicable (MEP). Project development plans are required to include the details of any and all BMPs such as the location, size, and hydraulic calculations that show how the BMP meets City requirements. Project plans are also required to include a signed certification from a licensed civil engineer or architect registered in the State of California that the proposed structural or treatment control BMP(s) meet the design standards criteria established within the City's latest BMP manual.

In addition, since improper maintenance is one of the primary reasons a structural or treatment control BMP may cease to function properly, the City will take measures to ensure that any BMP devices or systems used or installed at a site will be adequately maintained in the long-term (regardless of property owner). To this end, a property owner would be made responsible for inspection and maintenance of the BMP by agreeing in a signed statement, entitled "Maintenance Agreement", to several conditions that define the schedule, responsibility, and proof of inspections and maintenance.

As indicated above, the City of Santa Cruz Storm Water Management Utility is primarily a financing mechanism for flood control and stormwater programs. The City established a stormwater utility fee in May 1994 to fund the local share of the Army Corps of Engineers San Lorenzo River Flood Control and Environmental Restoration Project (as described above). The stormwater utility also provides funds towards development and implementation of the SWMP including staffing to promote departmental and interagency coordination, Best Management Practice compliance, permitting and enforcement, and educational efforts. Lastly, funds are used to maintain and retrofit surface water, stormwater, and flood control facilities. The fee is included on the County Property Tax statements and is payable on a biannual basis. The City bills owners of parcels who do not pay property taxes (City of Santa Cruz, March 2010).

NEARY LAGOON MANAGEMENT PLAN

The Neary Lagoon Management Plan was developed as a comprehensive guide and directive for managing the lagoon area to ensure its viability as an ecosystem and its value as a unique resource for the community. Goals, objectives, and actions are designed with the purpose of preserving and enhancing the lagoon's environmental integrity and quality while satisfying other purposes for public use, flood protection, water quality, mosquito control and aesthetics. Many aspects of the management plan have been implemented. The Parks and Recreation Department is primarily responsible for the implementation of the management plan (City of Santa Cruz, March 2010).

SAN LORENZO URBAN RIVER PLAN

The *San Lorenzo Urban River Plan* is the outcome of a planning process initiated by City Council in 1999 to update previous plans for the San Lorenzo River, Jessie Street Marsh, and Branciforte Creek that guided flood control, vegetation restoration and public access improvements along the San Lorenzo River. (See also discussion in the BIOLOGICAL RESOURCES (Chapter 4.8) section of this EIR.)

The "Lower San Lorenzo River and Lagoon Management Plan" is included as an appendix in the San Lorenzo Urban River Plan and provides resource management and restoration recommendations within the constraints of providing flood protection. Management and restoration recommendations address:

- Annual vegetation and sediment management,
- Summer lagoon water level management,
- Streamflow standard for inflow into lagoon and maintenance of a low flow channel,
- Enhancement of streambed aquatic cover and substrate,
- Enhancement of riverbank shoreline habitat and riparian corridor vegetation, and
- Floodplain and marsh restoration.

CITY-WIDE CREEKS AND WETLANDS MANAGEMENT PLAN

The City-Wide Creeks and Wetlands Management Plan identifies and categorizes all watercourses in the city and establishes a riparian corridor, development setback area, and management area for each watercourse. Specific setback requirements were determined based on an evaluation of biological, hydrological, and land use characteristics, and are applied to all watercourse segments. However, setbacks for wetland areas would be subject to site-specific review. All projects must comply with the watercourse development standards, and a watercourse development permit is required unless specifically exempted or approval of a watercourse variance is obtained. The primary long-term goals of this Management Plan are to:

- Reduce and/or eliminate pollutants discharged to aquatic bodies;
- Improve water quality;
- Improve and restore natural habitat;
- Increase biodiversity;
- Lower water temperatures; and

- Increase public awareness of the value of watershed quality. (City of Santa Cruz, March 2010).

(See the BIOLOGICAL RESOURCES (Chapter 4.8) section of this EIR for further discussion of this plan.)

4.7.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The CIVIC AND COMMUNITY FACILITIES chapter of the draft *General Plan 2030* includes one goal related to management of the stormwater system that is identified below, one policy (CC5.1) and 12 accompanying actions that set forth measures to manage stormwater drainage and water quality.

GOAL CC5 *A sustainable and efficient stormwater system.*

Several policies and actions in other chapters of the proposed General Plan also seek to protect critical facilities and new development from flood hazards (HZ1 and HZ6 and actions) and hazards from tsunamis or dam failure (HZ6.6).

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, some of the *General Plan 2030* policies and actions also support mixed use districts and/or intensified redevelopment, such as a Mixed Use River District and expansion of the High Density Overlay on Front and lower Pacific.

Land Use actions LU1.1.4 and LU1.1.5 address development and land use for specific sites: the Swenson property and the Golf Club Drive property, respectively. LU2.2.3 also includes addition of 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center, but specific uses haven't been identified, although the site will not be used as part of expansion of the landfill disposal area. In addition, the proposed *General Plan 2030* supports development of a desalination plant as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (Policy CC3.1.3), but a specific site is not identified.

4.7.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

- 7a Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;
- 7b Substantially alter the existing drainage pattern of the site or area or result in offsite drainage or flood problems;
- 7c Substantially increase the rate or amount of surface runoff, which would exceed capacity of existing or planned storm drain facilities, cause downstream or offsite drainage problems, or increase the risk or severity of flooding in downstream areas;
- 7d Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality;
- 7e Result in construction of habitable structures within a 100-year floodplain as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map, which would expose people or structures to a significant risk of loss, injury or death due to flooding;
- 7f Locate structures within a 100-year flood hazard area that would impede or redirect flood flows;
- 7g Expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam or coastal flooding due to sea level rise and/or
- 7h Expose people or structures to a significant risk of loss, injury or death as a result in inundation by seiche, tsunami, or mudflow.

IMPACT ANALYSIS

Potential impacts related to groundwater (7a) are addressed in the WATER SUPPLY (Chapter 4.4) section of this EIR. The following impact analyses address alteration of drainage patterns and stormwater runoff (7b-c); water quality (7d); and exposure to flood and other hazards (7e-h).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized in subsection 4.7-2 above. Buildout projections indicate that potential new development accommodated by the draft General Plan to the year 2030 could total 3,350 residential units, 3,140,000 square feet of commercial, office and industrial development and new hotel rooms, primarily on infill and underutilized lots,

as described in the PROJECT DESCRIPTION (Chapter 3.0) and LAND USE (Chapter 4.1) sections of this EIR.

Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could be redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[2] approximately 55% of all new housing, 45% of new commercial development and 52% of new office development would be located along these corridors. The draft plan also supports a mixed use district and high density in the lower Front Street and Pacific Avenue areas east of the San Lorenzo River (LU3.6, LU3.6.1).

Impact 4.7-1: Alteration of Drainage Patterns and Stormwater Runoff Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development that could result in increased stormwater runoff. With implementation of the proposed policies and actions for stormwater management and adherence to other City's plans and regulations, there would be no alteration of drainage patterns and increases in runoff would be considered a *less-than-significant impact.*

The City is primarily developed, and future development accommodated by the proposed *General Plan 2030* would be considered predominantly infill development within developed areas on vacant infill sites, on underutilized properties, and in the new mixed-use districts along the City's four major street corridors. Based on the estimated development occurring under the proposed plan, approximately one-half of new development would be located along these transportation corridors. There are a few remaining vacant lots and underdeveloped properties located within developed areas (i.e., Swenson site and Golf Club Drive area). Future development could result in an increase in impervious surfaces and runoff, although in the mixed use corridors, most areas already are covered with impervious surfaces, so there would be no net increase in runoff from those sites.

The General Plan policies and actions outlined in Table 4.7-2 and existing City regulations will serve to manage stormwater runoff from future development accommodated by the proposed General Plan. New development would result in stormwater runoff, but proposed policies and actions require that new development maintain pre-development runoff levels (CC5.1.8). Furthermore, the proposed General Plan policies specifically seek to minimize alteration of streams (HZ6.48) and maintain drainage within each drainage basin (CC5.1.5).

Furthermore, Title 24 of the Municipal Code (Zoning Ordinance) currently contains provisions to ensure that new developments or remodeled sites are designed and constructed in a manner that limits alteration of drainage patterns, prevents erosion, and minimizes long-term impacts on water quality. Chapter 24.14 – Environmental Resource Management – contains a section on Conservation Regulations that includes general provisions for drainage and erosion controls.

[2] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

These provisions include requirements that a drainage plan be submitted for projects, both large and small, when existing drainage patterns would be altered by new construction. A drainage plan must be submitted and reviewed as part of the project approval. In addition, the ordinance requires that stormwater runoff resulting from project development be minimized, and if a proposed project includes the discharge of runoff into a natural watercourse, the drainage plan shall include methods to safeguard or enhance the existing water quality. Devices such as detention basins, percolation ponds, or sediment traps may be required by the City, where appropriate or as specified in an adopted plan or wetlands management plan.

TABLE 4.7-2
Proposed General Plan Policies & Actions that Avoid or Reduce Drainage, Water Quality and Other Hydrological Impacts

Type of Measure / Action	Policies / Actions
PREVENT ALTERATION OF DRAINAGES – DRAINAGE PATTERNS	• Minimize alteration of streams & floodplains: HZ6.4.8 • Strive to maintain drainage within each drainage basin: CC5.1.5, CC5.1.6
MANAGE STORMWATER & DRAINAGE SYSTEM	• Develop Stormwater Master Plan & Storm Drain Master Plan: CC5.1, CC5.13 • Conduct annual maintenance: CC5.1.4 • Require new development to maintain pre-development runoff: CC5.1.8
PROTECT WATER QULAITY	• Implement stormwater quality & water pollution prevention programs: CC5.1.1, CC5.1.9, CC5.1.10 • Discourage use of pesticides, herbicides, chemical fertilizers: NRC3.2 • Education efforts: CC5.1.12
PROTECT AGAINST FLOOD HAZARDS	• Manage/maintain San Lorenzo River floodway: CC5.1.7 • Evaluate critical facilities for ability to survive flood hazards: HZ1.1.8 • Strengthen bridges: HZ1.1.11 • Address effects of global warming in areas that may have increased sea level or flooding: HZ6.4.1, NRC4.5 & 4.5.1 • Prepare guidelines for construction in floodplains: HZ6.4.6 • Use restrictions in undeveloped flood areas: HZ6.4.7 • Control activities that may increase flood potential: HZ6.4.9 • Limit impervious surfaces in flood-prone areas: HZ6.4.10
PROTECT AGAINST DAM FAILURE & TSUNAMI	• Avoid or reduce risks from tsunami & dam failure: HZ6.6 & actions

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in increased runoff. However, with implementation of the proposed *General Plan 2030* goals, policies and actions that set forth measures to avoid and minimize adverse impacts to drainage patterns and stormwater systems (as summarized on Table 4.7-2) and adherence to City regulations regarding project-level drainage control and design, the proposed *General Plan 2030* would not result in substantial

alteration of existing drainage patterns and its indirect impact related to increased stormwater runoff would be less than significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.7-2: Water Quality
Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development that could result in increased stormwater runoff and potential urban pollutants that contribute to water quality degradation. With implementation of the proposed policies and actions for water quality protection and adherence to other City's plans and regulations related to drainage and water quality controls, this would be considered a *less-than-significant impact.*

As indicated above, the City is primarily developed, and future development accommodated by the proposed *General Plan 2030* would be considered predominantly infill development within developed areas on vacant infill sites, on underutilized properties, and in the new mixed-use districts along the City's four major street corridors. Based on the estimated development occurring under the proposed plan, approximately one-half of new development would be located along these transportation corridors. There are a few remaining vacant lots and underdeveloped properties located within developed areas that are also located adjacent to water bodies to include:

- The Swenson Site adjacent to Antonelli Pond;
- The Golf Club Drive area adjacent to Pogonip Creek; and
- Portions of the area along Seventh Avenue that is within the City's Sphere of Influence, but outside city limits; portions of which border Arana Gulch and the Small Craft Harbor area.

Runoff from future development could carry urban pollutants into city watercourses if not properly managed. None of the larger vacant or underdeveloped areas identified below are adjacent to existing impaired water bodies. However, land use intensification is supported in areas along San Lorenzo River. The proposed General Plan does not propose any new uses that would result in a potential violation of water quality standards or waste discharge requirements. The plan does support development of a desalination facility that could result in marine discharges. However, this facility is currently subject of a site-specific environmental review process; previous program-level impacts are summarized in the WATER QUALITY (Chapter 4.4) section of this EIR.

The General Plan policies and actions outlined in Table 4.7-2 and existing City regulations will serve to manage stormwater runoff from future development accommodated by the proposed General Plan and protect water quality. The plan supports development and maintenance of a Stormwater Master Plan (CC5.1) with implementation of the City's stormwater quality program

(CC5.1.1) and stormwater pollution prevention program (CC5.1.10). The plan also seeks to reduce stormwater pollution (CC5.1.9).

Furthermore, Chapter 16.19 of the Municipal Code (Stormwater and Urban Runoff Pollution Control) and the City's recently adopted "Storm Water Management Plan" include provisions and requirements for drainage controls and implementation of BMPs to protect the water quality, beneficial uses, marine habitats, and ecosystems of the receiving waters of the City, including the San Lorenzo River and Monterey Bay, from pollutants carried by urban runoff. As indicated above under the Impact 4.7-1 discussion, Chapter 24.14 includes general provisions for drainage and erosion controls, and if a proposed project includes the discharge of runoff into a natural watercourse, the drainage plan shall include methods to safeguard or enhance the existing water quality. Devices such as detention basins, percolation ponds, or sediment traps may be required by the City, where appropriate or as specified in an adopted plan or wetlands management plan. Provisions pertaining to erosion control include requirements that a site development be fitted to the topography and soil so as to create the least potential for erosion.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in increased runoff and potential water quality degradation. With implementation of the proposed *General Plan 2030* goals, policies and actions to protect water quality as summarized on Table 4.7.2, and adherence to City regulations regarding project-level drainage designs to protect water quality, the proposed *General Plan 2030* would not result in a substantial degradation of surface water quality.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.7-3: Flood Hazards
Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development that could result in exposure to flood hazards, including watercourse flooding, dam failure and/or tsunami. With implementation of the proposed policies and actions related to flood control and adherence to other City's plans and regulations, the project would not result in location of habitable structures within a floodplain or substantial risk of exposure of structures or people to flood hazards. This is considered a *less-than-significant impact.*

As indicated above, the City is primarily developed, and future development accommodated by the proposed *General Plan 2030* would be considered predominantly infill development within developed areas on vacant infill sites, on underutilized properties, and in the new mixed-use districts along the City's four major street corridors. Based on the estimated development occurring under the proposed plan, approximately one-half of new development would be located along these transportation corridors. The draft plan also supports a mixed use district

and high density in the lower Front Street and Pacific Avenue areas east of the San Lorenzo River (LU3.6, LU3.6.1).

Future development accommodated by the proposed general plan could be subject to flood hazards in limited areas. These include areas of the downtown that are located in the San Lorenzo River floodplain, although recent levee improvements have increased flood protection in these areas. Additionally there are a few remaining vacant lots and underdeveloped properties located within developed areas that are also located adjacent to water bodies that could be subject to 100-year flood hazards identified on Figure 4.7-1 to include:

- The Swenson Site adjacent to Antonelli Pond;
- The Golf Club Drive area adjacent to Pogonip Creek; and
- Portions of the area along Seventh Avenue that is within the City's Sphere of Influence, but outside city limits; portions of which border Arana Gulch and the Small Craft Harbor area.

Additionally, some areas would be subject to inundation in the event of a tsunami as shown on Figure 4.7-2, and potential inundation due to dam failure.

The General Plan policies and actions outlined in Table 4.7-2 and existing City regulations will serve to manage development and prevent exposure to flood hazards. The plan supports land use restrictions in undeveloped flood areas (HZ6.4.7) and control of activities that may increase flood potential (HZ6.4.9). The plan also seeks to manage and maintain the San Lorenzo River floodway (CC5.1.7) and evaluate critical structures for ability to survive a flood (CC5.1.7). Development and maintenance of a Stormwater Master Plan (CC5.1) with implementation of the City's stormwater quality program (CC5.1.1) and stormwater pollution prevention program (CC5.1.10). The plan also seeks to reduce stormwater pollution (CC5.1.9). The proposed plan seeks to avoid or reduce risks from tsunami and dam failure (HZ6.6).

Furthermore, Section 24.14.400 ("Floodplain Management") sets forth requirements and procedures to protect properties against flood hazards and comply with National Flood Insurance Program requirements. The regulations set forth programs for floodplain management and specify circumstances in which floodproofing of structures may be required. The City's adopted "Local Hazard Mitigation Plan" (City of Santa Cruz, September 2007) also includes the mitigation strategy to protect structures and people from damages or loss of life due to flooding, tsunamis or dam failures.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan could be subjected to flood hazards, including potential tsunami and dam failures. With implementation of the proposed *General Plan 2030* goals, policies and actions regarding flood management as summarized on Table 4.7.2, and adherence to City regulations and implementation of its hazard mitigation program, the proposed *General Plan 2030* would not locate structures in a 100-year floodplain or expose people to significant risk of loss, injury or death involving flooding. This is considered a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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4.8 BIOLOGICAL RESOURCES

4.8.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Habitat Characteristics
- Special Status Species
- Sensitive Habitat Areas
- Wildlife Dispersal Corridors
- Resource Management Plans

This section is summarizes the biological background report prepared for the City of Santa Cruz by EcoSystems West Consulting Group (January, 2009) as part of the General Plan update and for this EIR. The technical report is included in Appendix F-1, which is available for review at the City of Santa Cruz Planning Department[1] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department. The report provides information on special-status plant and wildlife species and sensitive habitats within the City's planning jurisdiction. The work effort included: review of all available documents; consultation with local experts; and conducting surveys of monarch butterfly habitat and coastal bird rookeries to update information on these resources. Additionally, a reconnaissance review was conducted on major vacant properties within the City. An accompanying geographic information system (GIS) database (geodatabase) provides spatial data created or updated as part of this work.

REGULATORY SETTING

Federal Regulations

The United States Fish and Wildlife Service (USFWS) is responsible for the protection of terrestrial and freshwater organisms through the federal Endangered Species Act and the Migratory Bird Treaty Act, while the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) is responsible for protection of anadromous fish (fish that live most of their adult life in saltwater but spawn in freshwater) and marine wildlife. The U.S. Army Corps of Engineers (ACOE) has primary responsibility for protecting wetlands and jurisdictional "other waters of the U.S." under Section 404 of the Clean Water Act.

[1] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

FEDERAL ENDANGERED SPECIES ACT

The federal Endangered Species Act (ESA) of 1973 (Title 16 United States Code, Section 1531 *et seq.*, as amended) prohibits federal agencies from authorizing, permitting or funding any action that would result in biological jeopardy to a species listed as Threatened or Endangered. Under the ESA, the USFWS's and NMFS's responsibilities include administering the ESA, which prohibits the "take" of federally listed endangered or threatened animal species without a permit. NMFS jurisdiction under the ESA is limited to the protection of marine mammals and fish and anadromous fish; all other species are within USFWS jurisdiction. ESA defines "take" to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Service regulations (50 CFR 17.3) define "harm" to include significant habitat modification or degradation which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. "Harassment" is defined by the Service as an intentional or negligent action that creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

Exemptions to the prohibitions against take may be obtained through coordination with the USFWS through interagency consultation for projects with federal involvement (i.e., funded, authorized, or carried out by a Federal agency) pursuant to Section 7 of the ESA; or through the issuance of an incidental take permit under Section 10(a)(1)(B) of the ESA if the applicant submits a habitat conservation plan (HCP) that meets statutory requirements including components to minimize and mitigate impacts associated with the take. Section 7 of the ESA requires all federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction of designated critical habitat. To ensure against jeopardy, each federal agency must consult with USFWS or NMFS, or both, if the federal agency determines that its action might affect a listed species. The ESA or its implementing regulations do not prohibit take of listed plant species. Designated "Critical Habitat" as published in the Federal Register as a formal rule, also receives protection under Section 7 of the ESA.

BIRDS OF CONSERVATION CONCERN

USFWS' *Birds of Conservation Concern* (BCC) (2008) was developed to fulfill the mandate of the 1988 amendment to the Fish and Wildlife Conservation Act (Public Law 100-653 (102 Stat. 3825) to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973" and to stimulate coordinated and proactive conservation actions among federal and state agencies and private entities (U.S. Fish and Wildlife Service, December 2008). The bird species included on the BCC lists include "nongame birds, gamebirds without hunting seasons, and Endangered Species Act candidate, proposed endangered or threatened, and recently delisted species".

MIGRATORY BIRD TREATY ACT

All migratory birds and their nests are federally protected under the Migratory Bird Treaty Act of 1918 (MBTA) (Title 16 United States Code, Section 703-712 as amended; 50 Code of Federal Regulations Section 21; and 50 Code of Federal Regulations Section 13) and by CDFG

codes that support the act. The MBTA makes it unlawful to "take" any migratory bird or raptor listed in the 50 Code of Federal Regulations Section 10, including their nests, eggs or products.

WETLANDS AND WATERS OF THE U.S.

The U.S. Army Corps of Engineers (ACOE) has regulatory authority for activities within wetlands under the Clean Water Act (CWA, 1977, as amended), which serves as the primary federal law protecting the quality of the nation's surface waters. Section 404 of the CWA establishes a program to regulate discharge of dredged or fill material into "waters of the United States," which is administered by the ACOE. The term "waters" includes wetlands and non-wetland bodies of water that meet specific criteria as defined in the Code of Federal Regulations. In general, a permit must be obtained before fill can be placed in wetlands or other waters of the U.S. The type of permit depends on the amount of acreage and the purpose of the proposed fill, subject to discretion of the Corps. Under Section 404, general permits may be issued on a nationwide, regional, or state basis for particular types of activities that will have only minimal adverse impacts. Individual permits are required for projects with potentially significant impacts.

Under section 401 of the CWA, the California Regional Water Quality Control Boards RWQCB) have regulatory authority over actions in waters of the U.S. through issuance of water quality certifications, which are issued in combination with permits issued by the ACOE under section 404 of the Clean Water Act. A 401 Certification is required from the RWQCB whenever improvements are made within Jurisdictional Waters of the U.S.

State Regulations

The California Department of Fish and Game (CDFG) administers the California Endangered Species Act and protects streams and water bodies through the Streambed Alteration Agreement under Section 1600 of the California Fish and Game Code (CFGC 2005).

CALIFORNIA ENDANGERED SPECIES ACT

The 1984 California Endangered Species Act (CESA) (Fish & Game Code, Section 2050-2098) declares that deserving plant or animal species be given protection by the State because they are of ecological, historic, educational, recreational, aesthetic, economic, and scientific value to the people of the State. CESA establishes 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 CDFG. Listed species are generally given greater attention during the land use planning process by local governments, public agencies, and landowners than are species that have not been listed.

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

The Habitat Conservation Planning Branch of the CDFG administers the State's rare species program. The CDFG maintains lists of designated Endangered, Threatened and Rare plant and

animal species as designated by the California Fish and Game Commission or under the California Native Plant Protection Act (NPPA). Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code; however, the CDFG has interpreted "take" to include the "killing of a member of a species which is the proximate result of habitat modification...."

Section 2081(b) and (c) of the CESA allows CDFG to issue an incidental take permit for a state-listed threatened and endangered species only if specific criteria are met. These criteria can be found in Title 14 CCR, Sections 783.4(a) and (b).

CDFG SPECIES OF SPECIAL CONCERN AND FULLY PROTECTED SPECIES

In addition to lists of designated Endangered, Threatened, and Rare plant and animal species, the CDFG maintains a list of animal "Species of Special Concern," most of which are species whose breeding populations in California may face extirpation. Although these species have no legal status under the CESA, the CDFG recommends considering these species during analysis of proposed project impacts to protect declining populations, and to avoid the need to list them as threatened or endangered in the future. These species may "be considered rare or endangered [under CEQA] if the species can be shown to meet the criteria". Additionally, the California Fish and Game Code contains lists of vertebrate species designated as "Fully Protected" (California Fish & Game Code 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], and 5515 [fish]. No Section 2081(b) permit may authorize the take of "fully protected" species and "specified birds." 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 CDFG cannot provide take authorization under CESA.

CDFG SENSITIVE HABITATS AND DESIGNATED ECOLOGICAL RESERVES

Sensitive habitats include: riparian habitat and corridors, wetlands, habitats for legally protected species and CDFG Species of Special Concern, areas of high biological diversity, areas providing important wildlife habitat, and unusual or regionally restricted habitat types. The California Natural Diversity Data Base (CNDDB), administered by CDFG, maintains a working list of "high priority" habitats for inventory (i.e., those habitats that are rare or endangered within the borders of California). CNDDB "high priority" habitats are generally considered sensitive habitats under CEQA.

Section 1580 of the Fish & Game Code presents the process and definition for Designated Ecological Reserves. Designated Ecological Reserves are significant wildlife habitats that are preserved in natural condition for the general public to observe and study.

CDFG STREAMBED ALTERATION AGREEMENTS

Jurisdictional authority of the CDFG over stream areas is established under Section 1600 of the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. Section 1602 of the Fish and Game Code stipulates that it is unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake without notifying the CDFG, incorporating necessary mitigation, and obtaining a Streambed Alteration Agreement. Typical activities that require a Streambed Alteration Agreement include excavation or fill placed

within a channel, vegetation clearing, structures for diversion of water, installation of culverts and bridge supports, cofferdams for construction dewatering, and bank reinforcement. The Wetlands Resources Policy of the CDFG states that the Fish and Game Commission will strongly discourage development in or conversion of wetlands, unless, at a minimum, project mitigation assures that there will be no net loss of either wetland habitat values or acreage.

NATIVE PLANT PROTECTION

The Native Plant Protection Act of 1977 (NPPA) and implementing regulations pursuant to Section 1900 et seq. of the Fish and Game Code designate rare and endangered plants, and provide specific protection measures for identified populations. It is administered by the CDFG. The NPPA was enacted to "preserve, protect and enhance endangered or rare native plants of this state." The NPPA defines a plant as endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes. A rare plant is defined as a plant species that, though not presently threatened with extinction, occurs in such small numbers throughout its range that it may become endangered if its present environment worsens. The NPPA prohibits the take or sale of rare and endangered species in California. However, the law includes broad exemptions to the prohibition of take, including emergency work necessary to protect life or property, agricultural operations, fire control measures, timber harvest operations authorized by a Timber Harvest Plan, removal of endangered or rare plants from a canal, lateral ditch, building site, road, or right-of-way, or the removal of endangered or rare plants by a public agency for the provision of public serves.

The California Native Plant Society has prepared and regularly updated an "Inventory of Rare and Endangered Vascular Plants of California." In general, the CDFG qualifies plant species on List 1B (Plants Rare, Threatened, or Endangered in California and Elsewhere) or List 2 (Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere) of the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* for consideration under CEQA. Species on CNPS List 3 (Plants About Which We Need More Information--A Review List) or List 4 (Plants of Limited Distribution--A Watch List) may, but generally do not, qualify for consideration under CEQA.

Local Plans & Regulations

CITY AND STATE MANAGEMENT PLANS

Numerous resource management and park plans have been adopted by the City for management of City-owned open space areas. These include: management plans for Arana Gulch, Moore Creek Preserve, Neary Lagoon, and Pogonip; and plans prepared in conjunction with the California Department of Parks and Recreation: Natural Bridges State Beach, Twin Lakes State Beach, and Lighthouse Field State Beach. In addition the *City-Wide Creeks and Wetlands Management Plan* was adopted by the City in 2007 and certified by the California Coastal Commission as a Local Coastal Plan amendment in October 2007. The *San Lorenzo River Urban Management Plan* was adopted in 2003 for the portion of the river south of Highway 1. These plans are summarized further below in this section.

MUNICIPAL CODE REGULATIONS

Section 24.14.080 of the City's Municipal Code includes provisions to protect wildlife habitat and protected species for areas specified in the City's existing General Plan (Maps EQ-8 and EQ-9). Section 24.08.21 also regulates development adjacent to city watercourses, consistent with provisions of the adopted *City-Wide Creeks and Wetlands Management Plan*, including requirements for issuance of a "watercourse development permit."

The City of Santa Cruz also regulates heritage trees and shrubs through a Heritage Tree Ordinance. Chapter 9.56 of the City Municipal Code defines heritage trees, establishes permit requirements for the removal of a heritage tree, and sets forth tree replacement requirements as adopted by resolution by the City Council. City regulations require tree replacement for removal of a heritage tree to consist of replanting three 15-gallon size trees or one 24-inch size specimen for each heritage tree approved for removal.

HABITAT CHARACTERISTICS

The City of Santa Cruz is largely developed, but supports habitat areas primarily within the City-owned and managed greenbelt and open space areas and along creeks. Native trees such as coast live oak and redwood are widespread in developed areas, where they have often been planted. The key habitat types and locations within the City are summarized below. The classification and mapping follows generalized classification systems used by the CDFG and professionally recognized classification standards that are fully described in the technical biological report (EcoSystems West Consulting Group, January 2009). Vegetation types within the City are shown on Figure 4.8-1.[2]

In addition to developed areas, ruderal/landscaped/ornamental vegetation is found throughout the City, including some areas that are dominated by non-native tree groves with a dense canopy. The most widespread non-native tree in these stands is blue gum eucalyptus; other dominant, non-native trees include Monterey pine (native to small areas on the coast, including northwestern Santa Cruz County, but naturalized in the vicinity of Santa Cruz), Monterey cypress (native to the Monterey area, but naturalized in the vicinity of Santa Cruz), and acacias.

The City of Santa Cruz is situated along the Monterey Bay, which was designated a national marine sanctuary by the federal government in 1992. The Monterey Bay National Marine Sanctuary stretches from Cambria to the south to Marin County on the north, encompassing 276 miles of shoreline. It extends seaward an average of 30 miles from shore—covering more than 5,000 square miles of ocean. The Sanctuary—administered by the National Oceanic and Atmospheric Administration (NOAA)—was established to promote resource protection, research, education, and public use. It boasts one of the most diverse marine ecosystems in the world, including the nation's largest kelp forest and one of North America's largest underwater canyons.

[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

Aquatic, Wetland and Riparian Habitats

There are 39 miles of watercourses and numerous wetland areas in the City that convey stormwater, protect water quality, and can support diverse natural habitats and aquatic and terrestrial resources. The *City-Wide Creeks and Wetland Management Plan* (described further below) includes 25 watercourses within five primary watersheds and four other watercourses. The primary watershed areas include: San Lorenzo River, Arana Gulch Creek, Neary Lagoon, Arroyo Seco, and Moore Creek. In addition there are several other miscellaneous drainages that do not fall within these primary watersheds, including Natural Bridges Creek, Lighthouse Drainage, Pilkington Creek and Bethany Creek. Table 4.8-1 summarizes the watercourses and wetlands addressed in the *City-Wide Creeks and Wetland Management Plan*, which is further described below. Figure 4.8-2 shows the major watercourses and wetlands in the City.

AQUATIC HABITAT

Aquatic habitats are areas of permanent fresh or brackish open water. The water may be either flowing (e.g. the San Lorenzo River) or ponded (e.g. Neary Lagoon, Antonelli Pond). Aquatic habitats generally lack vegetation other than algae except along the shorelines, where moisture-loving plant species may grow partially in the water.

The San Lorenzo River is the major aquatic habitat with flowing water within the city. Some segments of Branciforte Creek are also broad enough to be considered separately as aquatic habitat. Ponded or partially ponded aquatic habitats within the city include Younger Lagoon on the University of California, Santa Cruz (UCSC) Long Marine Laboratory site; Antonelli Pond and several other ponds and lagoons in the southwestern portion of the city, including Natural Bridges State Park and Neary Lagoon. The Santa Cruz Small Craft Harbor (formerly Woods Lagoon) also provides aquatic habitat, but it has been modified by construction and maintenance of the harbor.

WETLANDS

Wetlands are generally defined as areas that are permanently, or periodically, inundated by surface or groundwater and which support vegetation adapted to such hydrologic conditions. The specific criteria utilized to define wetlands vary depending on the agency. Wetlands are regulated by federal and state agencies, including the U.S. Army Corps of Engineers and the California Coastal Commission. Most recently, the California State Water Resources Control Board has proposed expanding wetland regulations.

Under the Federal Wetland Regulations (CFR33 Part 328.3(b)) the term "wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." The Army Corps of Engineers' *Wetlands Delineation Manual* (1987) and 2008 Regional Supplement for the Arid West Region are used to identify wetlands under the CWA Section 404 permit program. An area must meet the criteria for hydric soils, hydrophytic vegetation and wetland hydrology to be delineated as a wetland under ACOE jurisdiction.

TABLE 4.8-1: City Watercourses and Known Wetlands

Watershed - Watercourse	Watercourses Included	Known Wetlands Included
San Lorenzo River Watershed	San Lorenzo River	
	Branciforte Creek	
	Carbonera Creek,	
	Glen Canyon Creek	
	Redwood Creek	
	Pogonip Creek	Salz Pond
	Tick Drainage	
	Arroyo de San Pedro Regaldo	
	Wagner Seep	
	Pasatiempo Creek	
	Jessie Street Channel	Jessie Street Marsh
	Ocean Villa Creek	
Arana Gulch Creek Watershed	Arana Gulch Creek,	
	Hagemann Creek	
	Woods Creek	
Neary Lagoon Watershed	Laurel Creek	Westlake Pond
	Bay Avenue Creek	Neary Lagoon
	Bayona Creek	
	Chrystal Gulch	
	Dodero Spring Creek	Kalkar Quarry Spring
	Longview Creek	
	Ojos de Agua Creek	
Arroyo Seco Watershed	Arroyo Seco Creek	
Moore Creek Watershed	Moore Creek	Antonelli Pond
Other Watercourses	Natural Bridges Creek,	
	Lighthouse Drainage	
	Pilkington Creek	
	Bethany Creek	

The California Coastal Act, Section 30121, broadly defines a wetland as "lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, or fens." The California Coastal Commission (CCC) generally follows the CDFG's wetland definition and classification system for delineating wetlands. While all three wetland indicators (hydrophytic vegetation, hydric soils, and wetland hydrology) must be present for an area to be considered a wetland by the ACOE under the Clean Water Act, only one positive indicator must be present for an area to be delineated as a wetland according to CCC guidelines.

In April 2008, the State Water Resources Board adopted Resolution No. 2008-0026 that gave the Wetland Policy Development Team (State staff) direction to develop a statewide policy to protect wetland and riparian area. The Resolution indicates that due to recent U.S. Supreme Court rulings that have reduced the jurisdiction of the CWA over wetlands by limiting the definition of the "waters of the US," the State Water Board has acted to regulate wetlands under state law to "fill the gap" from the receding federal jurisdiction. As part of this effort, the State Water Board has been working to establish a new wetland protection policy. The Board has not yet formally adopted a new wetland definition.

The wetland types found in the City of Santa Cruz are described below.

Salt Marsh. Salt marshes occur in low-lying, relatively sheltered areas adjacent to the immediate coast that are subject to tidal inundation. Except around their uppermost margins, salt marshes are periodically inundated by salt water of variable frequency and duration. Salt marshes are dominated by salt-tolerant native herbs and subshrubs, including pickleweed, saltgrass, and alkali heath. The only mapped area of salt marsh in the city is within Natural Bridges State Beach on the west side of Moore Creek just inland of the beach. Topographic conditions suitable for salt marshes do not occur elsewhere in the City.

Freshwater Wetland. Freshwater wetland habitats are found on permanently or seasonally inundated sites. The water in freshwater wetland habitats is shallow enough to allow emergent vegetation to be rooted on the bottom. The species composition of freshwater wetlands is variable, in part due to variation in the length and depth of inundation. Where inundation is permanent or prolonged, the characteristic dominants of freshwater wetlands are tall perennial emergent plants, particularly cattails and tules.

Sizable freshwater wetland habitats occur in the extreme southwestern portion of the city (e.g. at Natural Bridges State Park and around the upper margins of Antonelli Pond) and at Neary Lagoon. Smaller, more localized freshwater wetlands occur at scattered locations elsewhere in the city; for example, in the small city park adjacent to Jessie Street, and in lower Hagemann Gulch near the upper end of the Small Craft Harbor.

RIPARIAN HABITAT

Riparian forest and scrub habitats are found on sites where the root systems of moisture-loving woody species (trees and shrubs) can obtain abundant subsurface moisture year-round. The largest and best developed riparian forest habitats are generally on floodplain alluvial terraces bordering permanent or intermittent streams. Riparian forest habitats are dominated by moisture-loving, mostly deciduous trees and large shrubs. The canopy is typically dense. In the Santa Cruz area, the most abundant and widespread dominant species in riparian forest stands is arroyo willow. Riparian scrub is generally relatively open with individuals of large woody species relatively well spaced.

Extensive riparian forests occur at and near the bottoms of larger canyons and along larger streams within the City, including Moore Creek and its tributaries; Meder Canyon and its tributaries; Carbonera Creek; Branciforte Creek; and Arana Gulch. Extensive riparian forests also occur adjacent to Neary Lagoon. Riparian forest stands along the San Lorenzo River occupy relatively narrow zones inside the levees along the river. The San Lorenzo River channel

also supports the only substantial areas of riparian scrub within the city. Smaller stands of riparian forest occur along smaller streams and drainages within the city, as well as at isolated upland locations.

Coastal Scrub

Coastal scrub is generally found on relatively exposed, coast-facing slopes. Coastal scrub habitats range from relatively dry to relatively moist, and are dominated by medium-sized to large, mostly evergreen shrubs. Species composition in coastal scrub stands varies considerably, largely in response to soil and moisture conditions and disturbance history. Shrub cover ranges from dense and more or less impenetrable to open. The most abundant and widespread shrub species in coastal scrub habitats in the Santa Cruz area is coyote brush. In addition to successionally stable coastal scrub habitats, scrub in which coyote brush is the only shrub species, or is overwhelmingly dominant, is widespread in and around Santa Cruz. This scrub type, which may be called "coyote brush scrub", appears to be early successional.

Within the city limits, successionally stable coastal scrub is largely confined to the western part of the City in and near the Moore Creek Preserve and in Meder Canyon. Elsewhere in the City, coastal scrub habitats are mostly small and fragmentary, and often represent the early successional "coyote brush scrub" type.

Forest and Woodland Habitats

REDWOOD FOREST

Redwood forest is the most extensive habitat type in the Santa Cruz Mountains. Redwood forests occur in areas that receive abundant summer fog, but generally do not occur along the immediate coast or on sites with direct coastal exposure. It should be noted that redwood forests intergrade so extensively with mixed evergreen forests in the Santa Cruz area that the boundaries between these habitat types are often indistinct. Where well developed, this habitat type is typically a dense forest, with the canopy closed or nearly so. The principal dominant tree is the coniferous species redwood (*Sequoia sempervirens*). All redwood forest stands within the Santa Cruz city limits are second-growth, having developed following heavy logging in the past. Individual old-growth redwood trees are, however, occasionally present.

Redwood forests occur only in the northern third of the city, on the lower slopes of the Santa Cruz Mountains. The most extensive redwood forest areas within the city limits are in the northern portion of the city in Pogonip, at DeLaveaga Park, Pogonip and upper Moore Creek. More limited, but still sizable, areas of redwood forest occur in the canyons of Branciforte and Carbonera creeks in the Isbel Drive-Carbonera Drive area and in DeLaveaga Park.

REDWOOD-DOUGLAS FIR / TANBARK OAK FOREST

This habitat type is an intermediate type between the redwood forest and mixed evergreen forest habitat types, and occurs on sites that are somewhat drier than those supporting typical redwood forests. Compared to typical redwood forest, the proportion of redwood in the forest canopy is lower and the proportion of Douglas-fir is higher. Broadleaved evergreen species

such as tanbark oak, coast live oak, Shreve oak, and California bay are also more abundant than in typical redwood forest.

The only mapped area of redwood – Douglas-fir/tanbark oak forest within the city limits is located in the northern portion of the Moore Creek Preserve. Other areas referable to this habitat type may occur in Pogonip and elsewhere in the northern portion of the City, mapped as redwood forest or mixed evergreen forest.

MIXED EVERGREEN FOREST

The mixed evergreen forest habitat type is developed on slopes, typically on drier sites than those supporting redwood forests. Mixed evergreen forests are more extensive on south- and west-facing slopes. They range from dense, closed-canopy forests to relatively open forest with large canopy gaps. The dominant trees are predominantly broadleaved evergreen species with coast live oak being the dominant species in Santa Cruz. In drier, more exposed areas, coast live oak may be essentially the only canopy species (see mixed evergreen forest [oak woodland] below). Shreve oak is also widespread in mixed evergreen forests in the Santa Cruz area, and locally replaces coast live oak in northern parts of the city, although the two species sometimes occur together. Other tree species that are often dominants or important associates in mixed evergreen forests, especially on relatively moist sites, include California bay, Pacific madrone, Douglas-fir, tanbark oak, and redwood. The shrub and vine component of mixed evergreen forests is typically similar to, but sometimes denser than, that of redwood forests. California hazelnut is frequent in the understory, and poison-oak, creeping snowberry, Pacific blackberry, and the woody vine hairy honeysuckle are widespread and often locally abundant.

Mixed evergreen forests are widespread in the northern portions of the City, especially in Pogonip, in the Isbel Drive-Carbonera Drive area, in DeLaveaga Park, and bordering Arana Gulch north of Highway 1. A large area of mixed evergreen forest extends southward from Pogonip into the area west of Harvey West Park and the Encinal Street area. Only fragmentary remnants of mixed evergreen forest occur elsewhere in the city.

MIXED EVERGREEN FOREST (OAK WOODLAND)

This habitat type is similar to mixed evergreen forest and may be regarded as a phase developed on relatively dry sites, often upper slopes. The tree canopy is overwhelmingly dominated by coast live oak, which may be virtually the only tree species present. Overall tree canopy density is typically less than in mixed evergreen forest with large openings between trees containing grassland species. The shrub, vine, and herb components of this habitat type are similar to that in mixed evergreen forest on moister sites, but is often less diverse.

A large area of mixed evergreen forest (oak woodland) is mapped on the slopes of a tributary canyon in the Moore Creek Preserve. Strips of coast live oak-dominated forest referable to this habitat type also occur bordering lower Arana Gulch and Hagemann Gulch.

Grassland

Grassland habitats within the City have two subtypes: coastal prairie and annual grassland/coastal prairie. Coastal prairie is characterized by dominance of native perennial

bunchgrasses with an assortment of native herb associates (non-native species are generally also present), while annual grassland is largely dominated by non-native, mostly annual grasses, although native grasses and herbs are often also present.

COASTAL PRAIRIE

Annual grassland (also referred to as California annual grassland and non-native grassland) is the predominant grassland type in the Santa Cruz area. It occurs on slopes and terraces and also occurs in nearly level upland areas and on coastal terraces. Coastal prairie is the original, native grassland type in the near-coastal areas of northern and central California. Coastal prairie is characterized by dominance of native perennial bunchgrasses, with a large suite of associated native annual and perennial herbs. However, grasses that are non-native and mostly annual have largely replaced the native perennial bunchgrasses in most of the remaining coastal grasslands. In the Santa Cruz area, the principal native perennial bunchgrasses are purple needlegrass and California oatgrass. A variety of native herbs are associated with these bunchgrasses, including, at Pogonip, the special-status species San Francisco popcorn flower, Santa Cruz clover, and Gairdner's yampah. Several areas of grassland in Pogonip are mapped as coastal prairie (also referred to as coastal terrace prairie).

ANNUAL GRASSLAND / COASTAL PRAIRIE

Most areas of grassland in the Santa Cruz area have been largely disturbed by heavy grazing at some time in the past. Large areas of grassland occur at Pogonip, Arana Gulch, Lighthouse Field, Delavega Park and the Moore Creek Preserve. The species composition of most of these grasslands has been greatly altered by grazing, other disturbances, and the introduction of weedy non-native species. Annual grassland is characterized by dominance of grasses that are primarily annual and non-native. In the Santa Cruz area, these include some combination of slender wild oat, Italian rye grass, soft chess, ripgut grass, rattlesnake grass, fescue, and others. A few non-native perennial grasses, such as Harding grass and tall fescue are occasionally dominant or abundant. Characteristic non-native herbs, found more or less throughout the grasslands in the Santa Cruz area, include hairy cat's-ear, filaree, English plantain, common vetch, wild radish, Italian thistle, black mustard, narrow-leaved clover and others.

The native perennial purple needlegrass and California oatgrass often occur in grassland areas mapped as annual grassland and annual grassland/coastal terrace prairie, and occasionally one or both of these grasses is dominant. Purple needlegrass is the more abundant and widespread of these native bunchgrasses. Areas dominated by one or both of these grasses may be regarded as remnants of the original perennial bunchgrass-dominated coastal prairie grassland or as degraded coastal prairie, especially if the diversity of native coastal prairie-associated herbs is high. Where the grasslands have less disturbance history, an assortment of native herb species, many of them more or less associated with coastal prairie, is often present. Characteristic native species, most abundant and most diverse in larger, less disturbed grassland areas, include California poppy, blue-eyed grass, checker bloom, sky lupine, sun cups, coast tarplant, Johnny-jump-up, and golden brodiaea.

Coyote brush frequently invades grasslands in the Santa Cruz Mountains, and there are many areas intermediate between grassland and the coyote brush scrub phase of coastal scrub. Some of these areas may be actively succeeding from grassland to scrub as coyote brush expands in

cover and density. This successional trend may be related to prolonged absence of fire, which would largely eliminate invading coyote brush.

Coastal Habitats

SANDY BEACH

Sandy beaches are often unvegetated. Where vegetated and if native species are present, the coastal strand habitat type is found. There is a nearly continuous strip of sandy beach over a mile long in the eastern portion of the city, on both sides of the mouth of the San Lorenzo River. This includes the main city beach adjacent to the Boardwalk area. Small, isolated sandy beaches (pocket beaches) occur interspersed with sea cliffs in the western portion of the City, most notably at Natural Bridges State Park. Many of the beach areas within the City are used heavily for recreation, and are typically unvegetated or support mostly weedy non-native species. Some areas do support characteristic native coastal strand species, including beach-bur, beach evening-primrose, beach morning glory, and verbena.

COASTAL CLIFF HABITAT

The cliff habitat type is used for coastal bluffs directly facing the ocean and for areas of thin, sometimes rocky soil immediately adjacent to the tops of the coastal bluffs. Many areas of this habitat type within the city have a long history of extensive disturbance, and are often dominated by weedy non-native species. The mat-forming non-native ice plant (*Carpobrotus edulis*) and sea fig (*Carpobrotus chilensis*) dominate extensive areas. Native species characteristic of undisturbed coastal bluff habitats, such as the shrub lizard tail (*Eriophyllum staechadifolium*) and herb species such as seaside daisy (*Erigeron glaucus*), yarrow (*Achillea millefolium*), and sea lettuce (*Dudleya caespitosa*), are also often present and are locally dominant, especially in areas protected from disturbance by the steep topography.

The only areas mapped as "cliff" within the city are along the coastal bluffs in the extreme western portion of the city. Other areas referable to this habitat type may occur within areas mapped as "developed" in the vicinity of West Cliff Drive in the western portion of the city and East Cliff Drive in the eastern portion of the city.

SPECIAL STATUS SPECIES

Special-status species include species listed as Threatened or Endangered under provisions of the federal ESA and species listed as Rare, Threatened, or Endangered by the state of California under provisions of the CESA and NPPA. Species formally proposed for federal listing by the USFWS are afforded limited legal protection under ESA.

Other special-status plant species are those on List 1A, List 1B, or List 2 of the California Native Plant Society (CNPS) *Inventory of Rare and Endangered Vascular Plants of California*. These species are subject to state regulatory authority under CEQA. Species included on List 3 and List 4 of the CNPS *Inventory* may also be considered special status species. These species are considered to be of lower sensitivity, and generally do not fall under specific state or federal

regulatory authority. Specific mitigation considerations are generally not required for species in these categories.

PLANTS

Eight special status plant species have been identified as occurring within City limits as summarized in Table 4.8-2 Three of these species are listed: robust spineflower (federally endangered); Santa Cruz tarplant (federally threatened and state endangered); and San Francisco popcornflower (state endangered). Most of the locations are within publicly protected lands (Pogonip, Arana Gulch, Delaveaga Park, and Moore Creek Preserve), although there are two known private sites that support the spineflower or popcornflower.

WILDLIFE

Thirty-nine special status wildlife species have been identified as occurring or potentially occurring within City limits as summarized in Table 4.8-3. Six of these species are listed: Ohlone tiger beetle (federally endangered); coho salmon (federally and state endangered); steelhead (federally threatened); tidewater goby (federally endangered and state "Species of Special Concern"); California red-legged frog (federally threatened and state "Species of Special Concern"); and brown pelican (state endangered). Most of the locations are within publicly protected lands, although there is one known private site that supports the Ohlone tiger beetle. The remaining 32 special status plant species are not federally or state listed species, but some are state "Species of Special Concern" or have a CNDDB rarity ranking. The remaining species are mostly bird species, except for five bat species and two mammal species (San Francisco dusky-footed woodrat and American badger). Most of the remaining non-bird species are identified due to potential habitat, although the woodrat has been found within City limits.

SENSITIVE HABITAT AREAS

Sensitive habitats are generally considered by local, state or federal agencies as those habitats that support special status species, provide important habitat values for wildlife, represent areas of unusual or regionally restricted habitat types, and/or provide high biological diversity. Habitat types considered sensitive include those listed on the California Natural Diversity Data Base (CNDDB) working list of working list as "high priority" habitats (i.e., those habitats that are rare or endangered within California). Generally, wetland and riparian communities are considered sensitive habitat due to their value to wildlife, limited distribution, and decreasing acreages statewide.

Four of the habitat types found within the City of Santa Cruz are recognized as sensitive habitat types: freshwater wetland, salt marsh, riparian forest and scrub, and coastal prairie portions of grassland habitats. Except for freshwater wetland, these habitat types correspond to habitat types that the CNDDB has designated as "high priority." In addition, coastal bird habitat is considered sensitive habitats because of high biological diversity.

Additionally, any area supporting a special status species would also be considered a sensitive habitat. Locally, the overwintering monarch butterfly habitat is considered sensitive due to its restricted range and CNDDB ranking as rare. Its habitat is also identified in the City's existing

General Plan as being a sensitive habitat. Existing known or potential monarch butterfly habitat is shown on Figure 4.8-3.

Freshwater Wetland

Wetlands are areas that are periodically or permanently inundated by surface or ground water, and support vegetation adapted to life in saturated soil. Wetlands are recognized as important features on a regional and national level because of their high inherent value to fish and wildlife, use as storage areas for storm and flood waters, and water recharge, filtration, and purification functions. Freshwater wetlands are recognized as sensitive habitats because they are wetlands subject to the jurisdiction of U.S. Army Corps of Engineers under Section 404 of the federal Clean Water Act and because they provide important wildlife habitat. In the classification scheme of CDFG (2003), the freshwater wetlands within the city mostly correspond to marsh habitat types that are not all designated as "high priority" by CNDDB. However, freshwater wetlands dominated by tules (bulrushes; *Scirpus* spp.) are referable to the bulrush alliance of CDFG (2003a), which is recognized as a CNDDB "high priority" habitat type.

Salt Marsh

The salt marsh located within the City corresponds mostly to the "pickleweed wetland" and is recognized as a "high priority" habitat type by CNDDB. The only mapped area of salt marsh in the city is within Natural Bridges State Beach, on the west side of Moore Creek just inland of the beach.

Riparian Forest and Scrub

The riparian forest and scrub habitats within the City mostly correspond to CNDDB "high priority" habitat types. The most widespread riparian forest type within the city, dominated by arroyo willow, is referenced in the CNDDB as "high priority" arroyo willow riparian forests and woodlands alliance. Depending on the dominant tree species, other riparian habitat includes mixed willow riparian forests and woodlands, black cottonwood riparian forests and woodlands, and red alder alliances. Riparian scrub within the city, which occurs mostly in the San Lorenzo River channel, corresponds to the central coast riparian scrub alliance of CDFG, which is not recognized as a "high priority" habitat type. Areas supporting riparian habitat as identified in the *City-Wide Creeks and Wetlands Management Plan* would also be considered sensitive habitat areas.

TABLE 4.8-2: Special-Status Plant Species Occurring in the City of Santa Cruz, California

Species Common Name[1]	USFWS Listing[2]	State Status[3]	CNPS Status[4]	Habitat Type[5]	Flowering Period	Occurrence
Arctostaphylos andersonii Santa Cruz Manzanita	None	None	2-2-3 List 1B	Chaparral; openings in and edges of broadleafed upland forest and north coast coniferous forest	November-April	Kalkar QuarryPogonip (P) Delaveaga (P)
Chorizanthe robusta var. *robusta* robust spineflower	Endangered	None	3-3-3 List 1B	Coastal dunes, coastal scrub, openings in cismontane woodland, in sandy or gravelly soil	April-September	Pogonip Private Parcel-Market St
Holocarpha macradenia Santa Cruz tarplant	Threatened	Endangered	3-3-3 List 1B	Coastal prairie, valley and foothill grassland, coastal scrub, often in clay or sandy soils	June-October	Arana Gulch Delaveaga Park
Perideridia gairdneri ssp. *gairdneri* Gairdner's yampah	None	None	1-2-3 List 4	Moist sites in coastal prairie, broadleafed upland forest, chaparral, valley and foothill grassland, vernal pools	June-October	Pogonip
Plagiobothrys chorisianus var. *chorisianus* Choris's popcorn-flower	None	None	2-2-3 List 1B	Moist places in chaparral, coastal prairie, coastal scrub	March-June	Lighthouse Field Arana Gulch
Plagiobothrys chorisianus var. *hickmanii* Hickman's popcorn-flower	None	None	1-2-3 List 4	Moist places in closed-cone coniferous forest, chaparral, coastal scrub, marshes and swamps, vernal pools	April-June	Arana Gulch
Plagiobothrys diffusus San Francisco popcornflower	None	Endangered	3-3-3 List 1B	Coastal prairie; valley and foothill grassland	March-June	Moore Creek Preserve Private Parcel- Meder St Pogonip
Trifolium buckwestiorum Santa Cruz clover	None	None	3-3-3 List 1B	Coastal prairie; margins of broadleafed upland forest, cismontane woodland	April-October	Pogonip

Notes:

[1] Nomenclature follows Hickman (1993), Tibor (2001), and California Native Plant Society (2006).

[2] U.S. Fish and Wildlife Service (2006a,b,c).

[3] Section 1904, California Fish and Game Code (California Department of Fish and Game 2006a).

[4] Tibor (2001) and California Native Plant Society (2006).
Top line: CNPS R-E-D (Rarity-Endangerment-Distribution) code.
Rarity: 1=Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; 2=Occurrence confined to several populations or to one extended population; 3=Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.
Endangerment: 1=Not endangered; 2=Endangered in a portion of its range; 3=Endangered throughout its range.
Distribution: 1=More or less widespread outside California; 2=Rare outside California; 3=Endemic to California.
Bottom Line: CNPS List. List 1B: Rare, Threatened, or Endangered in California and elsewhere. List 2: Rare, Threatened, or Endangered in California, more common elsewhere. List 3: Plants about which more information is needed. List 4: Plants of limited distribution: a watch list.

[5] Thomas (1960), Munz and Keck (1973), Hickman (1993), Tibor (2001), Morgan et al. (2005), California Native Plant Society (2006), and unpublished information.

SOURCE: EcoSystems West Consulting Group, January 2009

TABLE 4.8-3: Special-Status Wildlife Species Occurring in the City of Santa Cruz, California

Common Name *Scientific Name*	Status[1] Federal/State/Other	Habitat Requirements	Location[2]
Invertebrates			
Ohlone tiger beetle *Cicindela ohlone*	E/--/--	Coastal prairie and open grassland with barren areas for burrow construction.	Pogonip Moore Creek Preserve Private Parcels near Moore Creek Preserve and Meder St
Monarch butterfly (wintering sites) *Danaus plexippus*	--/--/S3	Eucalyptus, Monterey Pine, or Monterey Cypress tree groves.	Lighthouse Field Natural Bridges Lower Branciforte Creek
Fish			
Coho Salmon (Central CA ESU) *Oncorhynchus kisutch*	E/E/G4S2	Spends the first few years of its life in fresh water before migrating to the ocean. Adults will later return to the freshwater location where they were spawned to breed.	San Lorenzo River (H)
Steelhead (Central Coast DPS) *Oncorhynchus mykiss*	T/--/G5S2	Spends the first few years of its life in fresh water before migrating to the ocean. Adults will later return to the freshwater location where they were spawned to breed.	Carbonera Creek Branciforte Creek Arana Gulch San Lorenzo River
Tidewater goby *Eucyclogobius newberryi*	E/SC/G3S2S3	Coastal lagoons and creeks up to 3 miles with protected still water areas.	Moore Creek San Lorenzo River
North American green sturgeon (Southern DPS) *Acipenser medirostris*	FT/CSC/-	Spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Spawning and early life-history stages (less than 4 years old) occurs in fresh water.	HP, CHP
Amphibians and Reptiles			
California red-legged frog *Rana aurora draytonii*	T/SC/--	Requires the presence of surface water until mid to late summer for reproduction; occupies ephemeral and/or perennial water with standing or slow moving flows; upland habitat includes leaf litter and small mammal burrows; adults are known to travel up to 2 miles overland between aquatic sites.	Moore Creek (B) Antonelli Pond Natural Bridges Marsh
Southwestern pond turtle *Emmys [Clemmys] marmorata pallida*	--/SC/--	Found in ponds, marshes, rivers, streams, and irrigation ditches containing aquatic vegetation; usually seen sunning on logs, banks, or rocks. Moves up to 3-4 miles within a creek system, especially during "walk-abouts" before a female lays eggs; nests in burrows in upland areas up to several hundred feet away from aquatic habitat, in woodlands, grasslands, or open forest.	Antonelli Pond Neary Lagoon Moore Creek Natural Bridges Marsh Pogonip-San Lorenzo River
Birds (protected activity/habitat)			
Brown Pelican (communal roosts and rookeries) *Pelecanus occidentalis*	Delisted* /SE**, CFP/S1S2	Nest in large colonies mostly on small coastal islands. Preferred nesting sites provide protection from mammal predators, and sufficient elevation to prevent widescale flooding of nests (USFWS Division of Endangered Species 2007). The nests occur on the ground, in bushes, or in the tops of trees.	Cliffs from Lighthouse Point to Younger Lagoon Municipal Wharf San Lorenzo River
Double-crested Cormorant (rookeries) (*Phalacrocorax auritus*)	--/SC/G5S3	Marine and inland aquatic habitats, such as ponds, lakes, rivers, lagoons, estuaries, and open coastline.	San Lorenzo River(H) (Schwan Lagoon)

TABLE 4.8-3: Special-Status Wildlife Species Occurring in the City of Santa Cruz, California

Common Name *Scientific Name*	Status[1] Federal/State/Other	Habitat Requirements	Location[2]
Black-crowned Night Heron (rookeries) (*Nycticorax nycticorax*)	--/--/G5S3	Roosts among the dense foliage of trees (that are not always adjacent to water). It will also roost within fresh or brackish emergent wetlands, as well as on piers, and pilings (Grinnell and Miller 1944).	Branciforte Creek (H) Neary Lagoon (P)
Sharp-shinned hawk (nesting) *Accipiter striatus*	--/SC/--	Nests in deciduous riparian forest associated with dense stands of smaller conifers.	Arana Gulch(P) Meder Canyon(P) Pogonip (P)
Cooper's hawk (nesting) *Accipiter cooperi*	--/SC/--	Nests in deciduous riparian forest, live oak, or second growth conifers usually near stream courses with dense canopy cover and open understory.	Moore Creek Pogonip Harvey West Park DeLaveaga
Golden eagle (nesting & wintering) Aquila chrysaetos	--/SC, FP/--	Resident in open mountains, foothills, canyons, or plains. Nests in a mass of sticks on cliffs or in trees. Is frequently observed foraging over nearby open fields of UCSC and Moore Creek Preserve lands.	Pogonip Rincon Gorge(unconfirmed)
Ferruginous Hawk (wintering) (*Buteo regalis*)	BCC/SC/--	Grasslands, agricultural areas, sagebrush flats, low foothills, and desert scrub (Garrett and Dunn 1981).	Antonelli Pond
White-tailed kite (nesting) *Elanus leucurus*	--/FP/--	Nests in conifers on the margins of open areas including grasslands and sloughs containing a high abundance of small mammals and lizards.	Pogonip Natural Bridges
Merlin (wintering) *Falco columbarius*	--/SC/G5S3	Utilizes a wide variety of habitats, from annual grasslands to ponderosa pine and montane hardwood-conifer habitats. Also favors coastlines, lakeshores, and wetlands. Forages along shorelines in winter, to hunt for shorebirds (CDFG 2005).	Arana Gulch Lighthouse Field Meder Canyon Antonelli Pond
Black Oystercatcher (nesting) *Haemotopus bachmani*	BCC/--/G5S2	Rocky shores of marine habitats, and on adjacent islands. Requires cliffs, rock outcrops, offshore rocky islets, jetties and similar features of coastal rocky intertidal habitats for roosting at high tide.	Natural Bridges/De Anza
Long-eared owl (nesting) *Asio otus*	--/SC/--	Utilizes abandoned stick nests of other large birds or squirrel nests in a variety of wooded areas, including orchards and usually near aquatic and open areas for foraging; forages mostly on rodents.	Neary Lagoon (P) Pogonip[3] (P)
Burrowing Owl (burrow and wintering sites) *Athene cunicularia*	--/SC/G5S2	Open grassland habitats for foraging and nesting. Suitable habitat has low-growing vegetation interspersed with bare ground; and hillocks, berms, fence posts or other slightly elevated objects available for resting/perching.	Pogonip (P) Moore Creek (P) Private parcels adjacent to Moore Creek (P)
Vaux's swift (nesting) *Chaetura vauxi*	--/SC/--	Nest in hollow trees in forested environments. Nest made of conifer needles are glued together with salvia and attached to inside wall of hallow tree usually near the bottom. Post breeding flocks up to several hundred may roost together in chimney like tree hollows.	Residential neighborhoods near Natural Bridges, Spring Street and
Black Swift (nesting) *Cypseloides niger*	--/SC/G4S2	Breeds along coastal bluffs and mountains.	Mitchell's Cove (H) Lighthouse Point (H)

TABLE 4.8-3: Special-Status Wildlife Species Occurring in the City of Santa Cruz, California

Common Name *Scientific Name*	Status[1] Federal/State/Other	Habitat Requirements	Location[2]
Loggerhead shrike *Lanius ludovicianus*	--/SC/FWS	Grassland and shrub habitats with small reptiles and insects.	Pogonip (P) Moore Creek (P) Private parcels adjacent to Moore Creek (P)
California Horned Lark *Eremophila alpestris actia*	--/SC/G5T3S3	Open, level or gently-sloping California habitats, including sage scrub, grassland, chaparral, alkali playa, as well as agricultural and residential lands. (Grinnell and Miller 1944). Builds a grass-lined nest in a depression on the ground out in the open.	Pogonip Moore Creek (P) Private parcels adjacent to Moore Creek (P)
Oak Titmouse (nesting) *Baeolophus inornatus*	--/--/G5S3	Warm, dry oak, pine, or oak-pine woodlands. The breeding pair builds a nest of grass, moss, mud, hair, feathers, and fur (Harrison 1978) in a woodpecker hole, natural cavity, or nest box.	Lighthouse Field Neary Lagoon Garfield Park Westside residential areas lower Branciforte Creek Oceanview Park Jesse Street Marsh area San Lorenzo River (N of Hwy 1) Natural Bridges (unconfirmed)
Yellow warbler *Dendroica petechia brewsteri*	--/SC/--	Nests in deciduous riparian woodland with open canopy along streams or other watercourses; forages in dense understory of riparian woodland.	Arana Gulch Neary Lagoon Moore Creek Preserve Antonelli Pond Carbonera Creek Branciforte Creek Westlake Pond San Lorenzo River (H) (P)
Hermit Warbler (nesting) *Dendroica occidentali*	--/--/G4G5S3?	Mature stands of conifers (ie., Douglas-fir, redwood, and montane hardwood-conifer habitats), with open to dense canopy for breeding and other activities.	Pogonip
Saltmarsh Common Yellowthroat[38] *Geothlypis trichas sinuosa*	--/--/G5T2S2	Nests in overgrown fields with scrub, on the margins of woodlands, and freshwater and saltwater marshes. Builds well-concealed open-cup nests, typically near the ground in grasses, herbaceous vegetation, cattails, tules, and scrub (including coyote brush) (Gardali and Evens date).	Neary Lagoon San Lorenzo River (Younger Lagoon)
Yellow-breasted chat (nesting) *Icteria virens*	--/--/G5S3	Dense riparian vegetation 1-8 ft. above the ground, with a well-developed understory.	San Lorenzo River (H)
Chipping Sparrow (nesting) *Spizella passerina*	--/--/G5S3S4	Open wooded habitats with a sparse or low herbaceous layer and few shrubs. Prefers trees for nesting, resting, singing, and other cover, but will also utilize shrubs and ground herbage. Also known to breed or winter in orchards (Grinnell and Miller 1944, McCaskie et al. 1979, Garrett and Dunn 1981).	Moore Creek Pogonip
Grasshopper Sparrow *Ammodramus savannarum*	--/--/G5S2	Occurs in dry, dense grasslands, especially in those with a variety of grasses, tall forbs, and scattered shrubs (Grinnell and Miller 1944; McCaskie et al. 1979 and Garrett and Dunn 1981). Builds nests composed of grasses and forbs, located in a slight depression in ground at the base of an overhanging clump of grasses or forbs (Harrison 1978).	Moore Creek Pogonip

TABLE 4.8-3: Special-Status Wildlife Species Occurring in the City of Santa Cruz, California

Common Name *Scientific Name*	Status[1] Federal/State/Other	Habitat Requirements	Location[2]
Tricolored Blackbird (nesting colonies) *Agelaius tricolor*	BCC/SC/G2G3S2	Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Their nests are usually located near fresh water, and tend to be hidden on the ground among low vegetation (Orians 1960).	Neary Lagoon (H) Antonelli Pond (H)
Mammals			
Townsend's western big-eared bat *Corynorhinus [Plecotus] townsendii townsendii*	--/SC/HP	Roost sites are highly associated w/ caves and mines; buildings must offer "cave-like" features; known to roost in tree hollows and under bridges.	Pogonip Clubhouse undeveloped lands and open spaces (P)
Pallid bat *Antrozous pallida*	--/SC/HP	Roost sites are primarily associated with oak, redwood, ponderosa pine, and giant sequoia forests. Will also roost under bridges and in buildings and rock outcrops.	undeveloped lands and open spaces (P)
Western red bat *Lasiurus blossevillii*	--/**/HP	Roosts in foliage primarily in riparian and wooded habitats.	Arana Gulch undeveloped lands and open spaces (P)
Fringed myotis *Myotis thysanoides*	--/**/HP	Roosts sites in California are primarily in buildings ar mines; will also roost in large conifer snags and in caves.	undeveloped lands and apen spaces (P)
Lang-legged myotis *Myotis volans*	--/**/HP	Roosts primarily in large hollow tree snags, or live trees with exfoliating bark; also uses rock crevices, mines, and buildings.	undeveloped lands and open spaces (P)
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	--/SC/--	Associated with riparian, oak woodland and redwood forest habitats. Builds stick nests under or in buildings, hollow trees, or in tree canopy.	undeveloped lands and open spaces
American Badger *Taxidea taxus*	--/SC/--	Drier open stages of most shrub, forest, and herbaceous habitats, that are composed of friable soils. American badgers dig burrows in friable soil for cover, frequently reusing old burrows. They are also known to dig a new den each night (especially in summer) (Messick and Hornocker 1981).	undeveloped lands and open spaces (P)

Notes:

1 **Federal Status (USFWS 2007b, c, d; CDFG 2006)**

E = Endangered: Any species, which is in danger of extinction throughout all, or a significant portion of its range.

T = Threatened: Any species, which is likely to become an endangered species within the foreseeable future throughout all, or a significant portion of its range.

BCC = Considered by Fish and Wildlife Service as a 'Bird of Conservation Concern' with a high priority to study and take action to protect.

State Status (CDFG 2006)

E = Endangered: A native species or subspecies of animal which is in serious danger of becoming extinct throughout all, or a significant portion of its range, due to loss of habitat, change in habitat, over exploitation, predation, competition and/or disease.

T = Threatened: A native species or subspecies that, although no presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

SC = CDFG Species of Special Concern are taxa given special consideration because they are biologically rare, very restricted in distribution, declining throughout their range, or at a critical stage in their life cycle when residing in California or taxa that are closely associated with a habitat that is declining in California (e.g., wetlands)

FP = Fully Protected: This classification was the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.

(ONTINUED ON NEXT PAGE)

** = Included on preliminary list of revised CDFG Mammal Species of Special Concern (CDFG 1996)

Other
O = Protected by City and/or County ordinances
HP = Considered "High Priority" on the Western Bat Working Group's (WBWG) Western Bat Species Regional Priority Matrix (1998)

CNDDB Ranking (CDFG 2011):
G = Global (worldwide status of a full species): G1 to G5
T = Status of a subspecies throughout its range: T1 to T5
S = State (statewide status of a full species or a subspecies): S1 to S5
where:

1 = Extremely endangered
2 = Endangered
3 = Restricted Range, Rare
4 = Apparently secure
5 = Demonstrably secure: commonly found throughout its historical range

2 ( ) = Locations outside of the city limits.
H = Historical Observation

B = Breeding Habitat (except birds—locations correspond to protected activity only—listed by species name)
P = Potential Habitat

HP]- Habitat Present - habitat is, or may be present. The species may be present.
CH] - Critical Habitat - project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.

*On November 17, 2009 the brown pelican was removed from the Federal List of Endangered and Threatened Wildlife (USFWS 2009).
**On February 5, 2009 the Fish and Game Commission adopted the proposed changes to remove the brown pelican from the CESA list of endangered species. The Commission's decision to delist the brown pelican will now be reviewed by the Office of Administrative Law before the bird is officially removed from the state list (California Fish and Game Commission 2009).

SOURCE: EcoSystems West Consulting Group, January 2009

Coastal Prairie

Coastal prairie in the Santa Cruz area corresponds to the coastal terrace prairie alliance of CDFG, which is designated as a CNDDB "high priority" habitat type. The only areas within the city specifically mapped as coastal prairie by any previous study are those mapped in Pogonip (Santa Cruz Parks and Recreation Department 1998). Other coastal prairie areas may occur in grassland areas within the city, but have not been mapped. Distinguishing coastal prairie from annual grassland is often problematical because some local grassland areas may be partly dominated by native perennial bunchgrasses and contain other native coastal prairie species, but also be heavily invaded by non-native species. To be considered coastal prairie, a stand of grassland should be essentially dominated by native perennial bunchgrasses and have a predominance of native over non-native herb species.

Coastal Bird Habitat

The bluffs, cliffs, seastacks and rock outcrops, and small coastal islands along the shoreline from Cowell's Beach to Younger Lagoon provide roosting and perching, foraging, and breeding habitat for numerous coastal bird species. Structures on the Santa Cruz Municipal Wharf and Santa Cruz Yacht Harbor also provide communal roosting habitat, while other shorebirds nest in the trees and scrub that line the city's aquatic environments. These areas provide suitable breeding habitat because they lie beyond the reach of waves and high tide marks, offer protection from predators, and provide perches for resting and drying out. They are located near the biologically diverse surroundings of estuarine and riverine environments, lagoons and ponds, sandy beaches, and shallow ocean waters. A variety of food sources are available, including insects, fish, crustaceans, mollusks, and aquatic invertebrates, as well as amphibians, small birds and mammals.

A number of bird species are known to roost and breed within the coastal habitat of the City of Santa Cruz, including the following special-status birds: brown pelican, double-crested cormorant, black-crowned night heron, and black oystercatcher, as well as other cormorant and heron species, gulls, the great egret, the common merganser, and the pigeon guillemot. Table 4.8-4 summarizes birds known to use coastal habitat for breeding. The biological review identified 28 nest colonies and communal roost locations. Thirteen of the sites observed in 2006 support breeding seabirds. The remaining sites were observed to support roosting seabirds.

Wildlife Dispersal Corridors

Wildlife dispersal corridors, also called dispersal movement corridors, wildlife corridors or landscape linkages, are features whose primary wildlife function is to connect at least two significant or core habitat areas and which facilitate movement of animals and plants between two or more otherwise disjunct habitats. Many undeveloped or natural areas serve as core habitats for a variety of wildlife species. Providing functional connectivity between core habitats is essential to sustaining healthy wildlife populations and allowing for the continued dispersal of native plant and animal species.

In the urban/open space interface, corridors provide links between different types of habitat areas, including core habitat, supportive natural landscapes or habitat patches, and linear habitats. Core habitat areas are generally considered to support the viability of a special status plant or animal species or consist of exemplary natural communities. Providing functional connectivity between core habitats through corridors is essential to sustaining healthy plants and wildlife populations and allowing for the continued dispersal of native plant and animal species. Other areas may lack the requisite structural or spatial heterogeneity to be considered core habitat; but still provide habitat for rare plants as well as opportunities to wildlife for forage, cover, and shelter. These areas may be considered habitat patches or supportive natural landscapes. Links between core habitats and supportive natural landscapes also serve as dispersal corridors for plant species, through seed and vegetative dissemination or wildlife transport. Together, corridors, linear habitats, and supportive natural landscape areas help maintain ecological integrity and enhance core habitat (EcoSystems West Consulting Group, January 2009).

Riparian corridors and streamside buffers provide canopy cover, opportunities for foraging, refuge from predators, and, in addition, offer wildlife the opportunity to disperse. In these ways, creeks and creekside buffers serve as both linear habitats and corridors. Because riparian corridors support a disproportionate amount of biodiversity compared to other landscapes, retaining adequate riparian buffers enhances species richness by providing additional habitat with high quality habitat features. Often the boundaries between riparian corridors and buffers are ecotones or edge habitats, where two or more habitat types share a common boundary, potentially increasing available resources for wildlife. When riparian corridors and buffers serve to link core habitats (and thus allow movement among otherwise separate populations), the persistence of wildlife populations increases.

Core habitats within the City of Santa Cruz include the open, undeveloped, and natural areas, such as Moore Creek Preserve and Meder Canyon, Pogonip, Delaveaga Park, and Arana Gulch. Arana Gulch is considered a supportive natural landscape or habitat patch. Many of the undeveloped parcels within the City provide linear habitat or supportive natural landscapes for plants and animals and may fall within dispersal corridors. The City's watercourses serve both as linear habitats and provide dispersal to and from the core habitats listed above. Three main corridors were identified that could provide connectivity between core habitats within or adjacent to the city: western corridor (Moore Creek), central corridor (San Lorenzo River and major tributaries), and eastern corridor (Arana Gulch). These corridors, which are further described below, may or may not provide effective linkages for any one species. No studies have been conducted to determine which species utilize the linear habitats and dispersal corridors within the City, the frequency of wildlife movement through corridors, or the buffer width necessary to maintain corridor utility. More research would be needed to obtain this data.

TABLE 4.8-4
Birds Known to Utilize Coastal Habitat for Roosting and/or Breeding Within City of Santa Cruz

Common Name *Scientific Name*	Special-Status	General Location
Brown Pelican *Pelecanus occidentalis*	X	Shoreline from Lighthouse Point to Younger Lagoon Municipal Wharf San Lorenzo River
Pelagic Cormorant *Phalacrocoraxpelagicus*		Natural Bridges Younger Lagoon
Brandt's Cormorant *Phalacrocorax penicillatus*		Natural Bridges Lighthouse Point Are
Double-crested Cormorant *Phalacrocorax auritus*	X	Shoreline from Lighthouse Point to Natural Bridges Antonelli Pond Neary Lagoon Westlake Pond San Lorenzo River Arana Gulch Santa Cruz Yacht Harbor (Schwan Lagoon)
Great Egret *Ardea albus*		lower Branciforte Arana Gulch Santa Cruz Yacht Harbor
Great Blue Heron *Ardea herodias*		Pogonip lower Branciforte Creek Arana Gulch Santa Cruz Yacht Harbor
Green Heron *Butorides virescens*		Antonelli Pond lower Moore Creek San Lorenzo River lower Branciforte Creek
Black-crowned Night Heron *Nycticorax nycticorax*	X	Antonelli Pond Neary Lagoon lower San Lorenzo River Branciforte Creek Upper Santa Cruz Yacht Harbor
Common Merganser *Mergus merganser*		lower San Lorenzo River
Black Oystercatcher *Haemotopus bachmani*	X	Shoreline from Cowell's Beach to Younger Lagoon
Heerman's Gull *Larus heermanni*		Natural Bridges Lighthouse Point Area
Western Gull *Larus occidentalis*		Shoreline and private residences from Cowell's Beach to Younger Lagoon Municipal Wharf
Pigeon Guillemot *Cepphus Columba*		Shoreline from Cowell's Beach to Younger Lagoon Municipal Wharf

Notes: ( ) = Locations outside of the city limits.
SOURCE: EcoSystems West Consulting Group, January 2009

Western Corridor

Intact riparian vegetation along Moore Creek, along with adjacent intact grasslands and forests, could provide a link between core habitat areas on the western portion of the City, including habitat located on UC Santa Cruz campus, Moore Creek Preserve, Natural Bridges and Younger Lagoon (also a part of the UC Santa Cruz Campus). This nearly area includes a mosaic of largely intact vegetation located along the adjacent drainage east of the upper reach portion of Moore Creek. For some wildlife species, Highway 1 could present a barrier to migration, while other species might find this relatively narrow section of the Highway somewhat permeable.

Central Corridor

The San Lorenzo River and two of its main tributaries, Branciforte Creek and Carbonera Creek, create a potential wildlife corridor in the central portion of the City. Here, a relatively narrow strip of riparian habitat could provide opportunities for wildlife movement between the San Lorenzo River lagoon region and core habitat located within and adjacent Pogonip, UC Santa Cruz, and Henry Cowell (via the San Lorenzo River) and DeLaveaga Park, via Branciforte and Carbonera Creeks. The majority of this area occurs mostly near the western portion of DeLaveaga Park around Carbonera and Branciforte Creeks.

Eastern Corridor

Intact riparian, grassland, and other native forest along with dense eucalyptus groves located along Arana Gulch create a potential corridor for wildlife movement on the eastern portion of the city. For some species, such as birds, this corridor could link habitat near the mouth of the yacht harbor with core habitat on the eastern edge of DeLaveaga Park. Other species, including most mammals, are unlikely to be able to migrate between the northern and southern portions of this corridor, which is bisected by Highway 1—a two-lane highway that is currently being widened to three lanes in this region.

Resource Management Plans

Habitat Conservation Plan (HCP)

Federal agencies have requested that the City prepare a Habitat Conservation Plan (HCP) for all City activities or projects with the potential to "take" species listed under the Federal Endangered Species Act (ESA) in order to obtain federal permits (Section 10 "incidental take" authorization) for continued Citywide operations and maintenance needs. The permit and plan must be approved by the USFWS and NOAA's National Marine Fisheries Service (NMFS). The goal of the HCP is to minimize and mitigate to the maximum extent practicable the effects of City activities on listed and other sensitive species. The City entered into the HCP process in 2004, and over the past seven years, the City has coordinated and met with USFWS and NMFS on HCP-related issues. City departments involved with the HCP include Water and Public Works.

The species addressed include anadromous salmonids (coho and steelhead), Mount Hermon June Beetle (found at the Graham Hill Water Treatment Plant), California red-legged frog, and Pacific (formerly Western) pond turtle. Facilities include the City's water supply and facility sites, the Dimeo Lane landfill and Resource Recovery Facility, flood control and storm drainage maintenance projects and parks and recreational facilities. Many of the technical species' assessments are complete.

On April 5, 2011, the Santa Cruz City Council authorized the Water Director to enter into negotiations with NOAA Fisheries Service for completing the HCP and obtaining an Incidental Take Permit. At this meeting, City staff presented a proposed phased conservation strategy that improves instream flow for anadromous salmonids while recognizing that the limitations of the existing water supply system do not allow consistent achievement of optimal flows. Given potential existing take to study species, the strategy would result in less available water, resulting in a need to draw more heavily on the storage and Loch Lomond and that some augmentation of the City's existing water supply will be necessary (City of Santa Cruz Water Department. March 28, 2001).

A Draft Conservation Strategy was submitted to the NMFS in August 2011. The primary focus of the strategy is to avoid or minimize existing and potential effects of the City's activities to the maximum extent practicable as required by the Federal Endangered Species Act. A major element of the strategy is identification of minimum in-stream flows at City diversions to minimize the effect of diversions on habitat conditions for steelhead and coho salmon. Three alternatives, or tiers, of instream flow targets are specified which represent increasing levels of habitat protection. These targets vary by location, hydrologic year type and month. The three tiers represent increasing levels of habitat protection. The strategy guarantees minimum flows that ensure no further degradation of habitat (known as Tier 1). The strategy attempts to provide further protection of habitat by offering Tier 2 minimum flows under most hydrologic conditions, reverting to Tier 1 in dry years. With increasing water demand, the City will be able to provide Tier 2 flows less frequently. As the City moves toward augmenting its supply to include additional sources such as some mix of desalination, reclamation, conservation, or additional storage, over the course of the HCP further instream reservations will be possible (City of Santa Cruz, August 2011). Addition of new supply (2.5 mgd desalination, reclamation) would allow Tier 2 flows to be provided in 70% of years. Tier 3 flows would provide approximately 80% habitat value and could be provided in as much as 21% of years well into the future with the addition of 2.5 mgd of desalination.

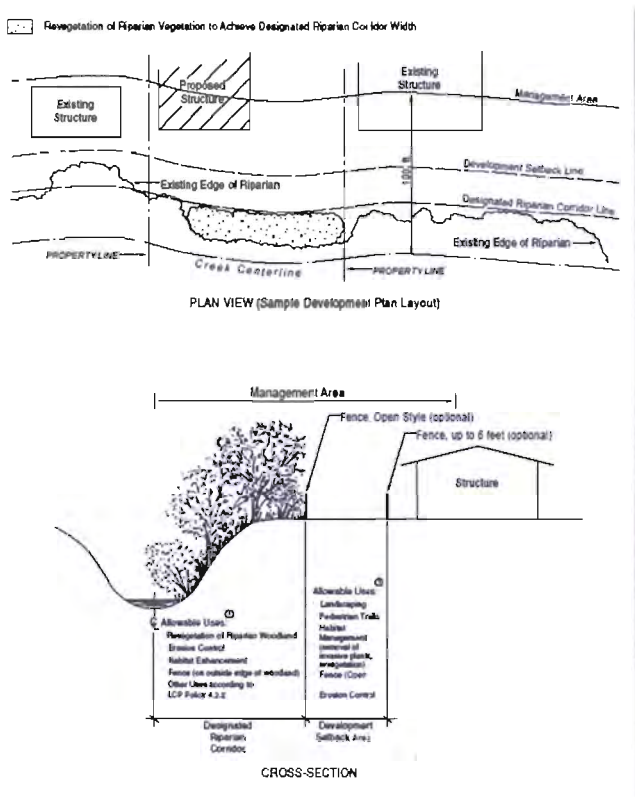
With the Draft Conservation Strategy now submitted, negotiations can begin with NMFS. When a final strategy has been agreed upon, the Habitat Conservation Plan will be prepared. The HCP will be subject to environmental review, public review, and considered by City Council. The process could take more than two years.

City-Wide Creeks and Wetlands Management Plan

The *City-Wide Creeks and Wetlands Management Plan* (Santa Cruz Department of Planning and Community Development 2006) was adopted by the City Council to provide a comprehensive approach to managing all creeks and wetlands within the City. The Plan was certified by the

California Coastal Commission in October 2007 as a LCP amendment. Long-term goals to manage these resources include:

- Reduce and/or eliminate pollutants discharged to aquatic bodies,
- Improve water quality,
- Improve and restore natural habitat,
- Increase biodiversity,
- Lower water temperatures,
- Increase public awareness of the value of watershed quality.



The *Management Plan* recommends specific setback requirements based on biological, hydrological, and land use characteristics for various watercourse types within the City. The recommended setbacks within a designated management area include a riparian corridor, a development setback area, and an additional area that extends from the outward edge of the development area. The riparian corridor[3] is adjacent to the watercourse and is the width of a riparian and/or immediate watercourse influence area and is measured from the centerline of the watercourse. The development setback area[4] is the area outward from the edge of the designated riparian corridor where development is restricted, providing a buffer between the riparian corridor and development. The management area, riparian corridor, and development setback area distances vary depending on the watercourse area and its categorization.[5] All distances are measured from the centerline of the watercourse outward as shown on the above schematic.

[3] The riparian corridor is intended to provide an adequate riparian width to maintain or enhance habitat and water quality values. Allowable uses within the riparian corridor are limited.

[4] The development setback width is intended to provide an appropriate water quality and habitat buffer between the riparian corridor and development within the remaining management area. New development generally would be limited in this area to landscaping and limited pervious surfaces.

[5] The 25 feet outward from the edge of the development setback is intended to provide an adequate area for permit review and to be consistent with the *Management Plan* goals and City of Santa General Plan/LCP policies to maintain or enhance water quality or riparian habitat values.

The *Management Plan* outlines a process for permitting development adjacent to watercourses. In order to determine the level of permit review required for the variety of watercourse types within the city, all watercourse reaches are categorized as an "A", "B" or "C" watercourse as further described below. These categories are based on the quality, continuity, and enhancement potential of the riparian habitat associated with the watercourse, the potential for the watercourse to support special status species, and the ability of the habitat to be expanded based upon existing development.

> CATEGORY "A" includes watercourses and/or watercourse reaches that support high quality riparian habitat, with a vegetated corridor that is continuous and with few gaps. Category "A" watercourses abut undeveloped lands or rural residential yard areas, and this category generally has the known presence of or high potential for a special status species. The goals of this category include protecting and restoring existing vegetated watercourses as wildlife movement corridors through removal of invasive non-native plant species and restoration of native vegetation, as well as protection and improvement of water quality with implementation of proper erosion control and best management practices, and planting of appropriate species. Category A watercourses include all segments of the San Lorenzo River, all segments of Carbonera, Glen Canyon, Moore, and Redwood Creeks, and a segment or segments of Arana Gulch, Arroyo Seco, Branciforte, Pasatiempo, and Pogonip Creeks.
>
> CATEGORY "B" includes watercourses and/or watercourse reaches that are located in urban areas and that function primarily as a drainage system. This category includes watercourses with limited riparian habitat that is generally confined by adjacent land uses which limits its ability for the corridor to expand. Issues of water quality and flow conveyance are the focus for this category. The goals of this category include improving habitat by voluntary removal of invasive, non-native plant species and improving water quality and flow with implementation of proper erosion control and best management practices, and planting of appropriate species. Most of the watercourse segments are within this category except for those identified above in Category A and below in Category C.
>
> CATEGORY "C" includes drainage channels that are concrete or man-made, above or below ground culverts with very low to no habitat value. The corridor is fragmented or non-existent, with little to no room for restoration without significant land acquisition or easements. Category "C" watercourses are exempt from these watercourse regulations. Category C watercourses include one or more segments of Arana Gulch, Arroyo de San Pedro Regaldo, Arroyo Seco, Dodero Spring, Laurel, Longview, Ojos de Agua, Pasatiempo, and Pogonip Creeks.

The *Management Plan* establishes the requirements for obtaining a Watercourse Development Permit, and specifies uses permitted within the designated management area, development setback area and riparian corridor. The *management area* is the area where the watercourse regulations would apply. Any development located outside of the *management area* would not be subject to watercourse regulations. Generally, Watercourse Development Permits would be

required for allowed uses within any *setback area* of a Category A watercourse and for allowed uses within the *riparian corridor* and *development setback* areas of a Category B watercourses. Development activities within Category C watercourses are exempt. Allowable projects or activities would be required to comply with the applicable Watercourse Development Standards, and management guidelines are identified that property owners will be encouraged to implement. The standards address the issues identified below.

- Use of permeable paving;
- Drainage and water quality protection;
- Use of suitable plant materials;
- Use of appropriate lighting;
- Habitat enhancement;
- Construction Best Management Practices;
- Management in High Fire Hazard Areas; and
- Erosion control and bank protection measures.

San Lorenzo Urban River Plan

The San Lorenzo River drains a 138 square mile watershed, featuring forested and urbanized areas within the City and Santa Cruz County. Within the City limits, the lower San Lorenzo River flows southward from the Sycamore Grove area of Pogonip, through the center of Santa Cruz, to Monterey Bay. This lower reach of the San Lorenzo River encompasses much of the river's historic floodplain. Branciforte Creek and Jessie Street Marsh are tributaries to the San Lorenzo River.

The *San Lorenzo Urban River Plan* is the outcome of a planning process initiated by City Council in 1999 to update previous plans for the San Lorenzo River, Jessie Street Marsh, and Branciforte Creek that guided flood control, vegetation restoration and public access improvements along the San Lorenzo River. The need for updated plans was a result of the river levee improvement project in the late 1990s, listing of steelhead and coho salmon as federally threatened species, and federal designation of the San Lorenzo River as critical habitat for these species. The plan, adopted by City Council in 2003, articulates a community vision for the corridor encompassing the lower Lorenzo River, Branciforte Creek and Jessie Street Marsh as both a wildlife area and as a community recreation and public open space amenity. It contains recommendations for habitat enhancement, as well as public access and ideas to promote river-oriented development. Recommendations regarding land use and public access are addressed in the LAND USE (Chapter 4.1) and PUBLIC SERVICES-Parks and Recreation (Chapter 4.6) sections of this EIR, respectively.

One of the key goals of the plan is to enhance and restore biotic values of the river, creek and marsh fish and wildlife habitat. The "Lower San Lorenzo River and Lagoon Management Plan" is included as an appendix in the San Lorenzo Urban River Plan and provides resource management and restoration recommendations within the constraints of providing flood protection. Management and restoration recommendations address: annual vegetation management; summer lagoon water level management; enhancement of the aquatic, shoreline and riparian habitats; and marsh restoration. Resource management recommendations for Branciforte Creek, the largest tributary to the River within the City limits, and Jessie Street

March are also included in the *San Lorenzo Urban River Plan*. These recommendations address vegetation management, native tree and riparian planting, and non-native tree removal.

Management Plans for City-Owned Land

ARANA GULCH MASTER PLAN

Arana Gulch is a City-owned greenbelt property situated along the City's eastern boundary, to the north of the Santa Cruz Harbor. This 67.7-acre open space site, purchased by the City in 1994, features coastal prairie, riparian and oak woodland, seasonal wetlands, and the lower reaches of Arana Gulch Creek. The *Arana Gulch Master Plan* was adopted by City Council in July 2006 as a Park Master Plan with certification of an accompanying EIR. In addition to public access and use recommendations, which are addressed in the PUBLIC SERVICES – Parks and Recreation (Chapter 4.6) section of this EIR, the *Arana Gulch Master Plan* identifies resource management areas and management guidelines for each of following areas:

- Coastal Prairie/Santa Cruz Tarplant (30.2 acres)
- Arana Gulch Creek Riparian and Wetland (34.5 acres)
- Hagemann Gulch Riparian Woodland (3.0 acres)

Arana Gulch also supports three types of Environmentally Sensitive Habitat Areas (ESHAs), as defined under the California Coastal Act. These areas include the tarplant habitat areas, riparian wetlands and seasonal wetlands.

The "Santa Cruz Tarplant Adaptive Management Program," which aims to enlarge the tarplant population by improving the quality of the coastal prairie habitat, is included as an appendix to the Master Plan. The Santa Cruz tarplant (*Holocarpha macradenia*) is a state listed endangered species and a federally-listed threatened species. In 2002, the Arana Gulch property was designated by the USFWS as critical habitat for Santa Cruz tarplant. Specific tarplant management strategies include mowing and raking, soil scraping, controlled burns, grazing, and removal/restoration of unauthorized pathways.

The Arana Gulch Creek Riparian and Wetland Management Area is limited in public access to minimize impacts to wildlife species. Management strategies focus on non-native vegetation removal, closure of unauthorized pathways, and further hydrologic analysis regarding bank erosion along the tidal reach of Arana Gulch Creek.

JESSIE STREET MARSH MANAGEMENT PLAN

Jessie Street Marsh is a City-owned wetland and open space site located just to the north of the San Lorenzo River lagoon that was purchased by the City as part of the mitigation for the City's wastewater treatment plant expansion project. The marsh area is bounded by a bluff to the east, residential properties to the west and north, and East Cliff Drive/San Lorenzo River levee to the south. Freshwater flows into the marsh area from stormwater runoff and springs along the bluff. Historically, Jessie Street Marsh was part of a large tidal estuary open to the San Lorenzo River. After construction of the San Lorenzo River levee system in 1955, river tidal flows and most saltwater circulation were blocked from entering the marsh. Water circulation was significantly limited and a cat-tail dominated freshwater marsh replaced a more

ecologically valuable salt marsh. The southern portion of the marsh was also filled and reduced to a small, narrow drainage channel. The habitat value was further reduced by the spread of non-native plant species.

The *Jessie Street Marsh Management Plan* was adopted by City Council in 1999 to provide a long-term plan to preserve and enhance the natural resources of the marsh, improve water quality, manage flood waters, and provide appropriate public access. The plan includes specific management actions for both City-owned lands and recommendations for adjacent privately-owned properties. In addition to public access and use recommendations, which are addressed in the PUBLIC SERVICES – Parks and Recreation (Chapter 4.6) section of this EIR, the Management Plan proposes to modify the marsh area to increase the tidal exchange with the San Lorenzo River and enhance salt/brackish marsh and freshwater marsh habitat areas. Both marsh and upland woodland habitats would also be enhanced by removing invasive, non-native plants and revegetation of degraded areas. The management approach is to maximize the biodiversity of the marsh areas and enhance the biotic resources.

MOORE CREEK CORRIDOR ACCESS AND MANAGEMENT PLAN

The Moore Creek corridor is located along the western boundary of the City, extending from the University of California campus lands southward to Monterey Bay. Moore Creek, an intermittent stream, includes two main branches (east and west) which flow through steep sided canyons before joining together just north of Highway 1. To the south of Highway 1, the main stem flows through Antonelli Pond, an artificially created pond, and Natural Bridges State Beach to Monterey Bay. The corridor includes private property and public lands, and a mix of land uses. Habitat types within natural areas include riparian, grassland, and woodlands. Antonelli Pond is an artificial freshwater pond that was created in the early 1900s as a holding basin for logs to be milled at a sawmill on the eastern shores of the pond that is currently owned by The Land Trust of Santa Cruz County. The City purchased the upper west branch 246-acre greenbelt property in 1998 (see Moore Creek Preserve discussion below).

The *Moore Creek Corridor Access and Management Plan* was adopted by City Council in 1987 and incorporated into the City's General Plan as an area plan. This management plan was prepared as a focused effort to bring together the then existing policies from the City's General Plan and Western Drive Plan into a comprehensive document. Recommendations are included for public access, land dedication and open space easements, and resource management. In 2002, the City approved the *Moore Creek Interim Management Plan* which more specifically addresses management of the 246-acre Moore Creek Preserve area of the corridor. The *Moore Creek Corridor Access and Management Plan* provides recommendations regarding management of vegetation, water quality, and soil erosion and sedimentation. Public access and use recommendations are addressed in the PUBLIC SERVICES – Parks and Recreation (Chapter 4.6) section of this EIR.

MOORE CREEK PRESERVE INTERIM MANAGEMENT PLAN

Moore Creek Preserve is a City-owned greenbelt property located on the western edge of the City, to the north of Highway 1. This 246-acre natural area was purchased by the City in 1998. The State of California holds two easements over the property. One of the easements (85 acres) encompasses the canyon and oak woodlands along the Moore Creek (west branch)

corridor. The second easement (160 acres) includes the uplands, featuring primarily coastal prairie. Numerous threatened and endangered plant and wildlife species have been documented within the Preserve.

The *Moore Creek Preserve Interim Management Plan* was adopted by City Council in June 2002 as an "Interim Management Plan", not as a Park Master Plan. The document is intended to guide management of the Moore Creek Preserve until preparation/approval of a long term Park Master Plan for the property. The Plan identifies three plant community resource management areas with specific management guidelines for habitat areas for three special status species as identified below. Resource Management Guidelines are included in the Interim Plan for each of these areas. Specific management strategies include cattle grazing, mowing, non-native plant species removal, installation of grazing fencing, monitoring trail use for impacts, and conducting annual surveys.

Plant Communities
- Coastal Prairie
- Riparian and oak woodland (Moore Creek canyon and Wilder Creek canyon)
- Mixed eucalyptus and Monterey cypress grove (Monarch butterfly over-wintering habitat)

Special Status Species
- Ohlone Tiger Beetle Habitat
- San Francisco popcorn flower habitat
- California red-legged frog habitat

NEARY LAGOON MANAGEMENT PLAN

Neary Lagoon is a City-owned wetland and natural area situated in the central part of the City (see Figure 4.6-2). Acquired by the City in 1967, the 14-acre lagoon and surrounding riparian and woodland habitat within the management area total 44 acres. The City's wastewater treatment plant is located adjacent to the lagoon. The outlet from the lagoon to Monterey Bay is located at Cowell Beach.

Neary Lagoon was originally an oxbow of the San Lorenzo River that was gradually isolated from the main river channel. During the 1850s, the lagoon covered approximately 75 acres extending to what is now Pacific Avenue in downtown. The property was used for farming with a small dairy in the late 1800s, and there were several attempts made to drain the lagoon. By the 1930s the lagoon was primarily a marsh with little open water. In the 1970s, the City designated the Neary Lagoon Park and Wildlife Refuge as a community facility.

The *Neary Lagoon Management Plan* was adopted by City Council in July 1992 and the Coastal Commission in August 1992 in fulfillment of a condition of Coastal Commission approval in 1975 of a coastal permit for the City to construct park and wildlife refuge improvements. The Plan is a comprehensive guide that addresses public access and use, hydrology, water quality, vegetation management and habitat restoration, wildlife and fishery management, cultural resources and aesthetics. Public access and use recommendations are addressed in the PUBLIC SERVICES – Parks and Recreation (Chapter 4.6) section of this EIR. The plan also addresses management of water lagoon levels, important for flood protection, water quality, management of vegetation and wildlife habitat, and mosquito control. Specific management

actions are included for each of these elements. The plan also identifies habitat types and Management Zones A through J. The habitat areas include:

- Freshwater Marsh
- Open Water
- Riparian and Mixed Oak Woodland
- Grassland, Recreational and Ruderal Areas

Habitat and wildlife/fisheries management actions include removal of non-native plant and wildlife species, maintaining a balance between freshwater marsh and open water habitat through removal of tules and cattails, establishing and enhancing islands within the lagoon for waterfowl, grassland restoration, and conducting annual surveys and monitoring.

POGONIP MASTER PLAN

Pogonip is a City-owned greenbelt property located approximately one mile north of downtown Santa Cruz between the University of California campus and the San Lorenzo River corridor. This property features coastal prairie, woodlands, creeks, springs and a reach of the San Lorenzo River known as Sycamore Grove. Pogonip was once part of the Cowell Ranch landholdings. The property was extensively logged and features historic resources associated with the lime production industry in the mid-to-late 18th century.

The *Pogonip Master Plan* was adopted by City Council in July 1998 as a Park Master Plan. This long-range plan addresses public access, recreational uses, historic resource rehabilitation and preservation, and natural resource management and protection. Public access and use recommendations are addressed in the PUBLIC SERVICES – Parks and Recreation (Chapter 4.6) section of this EIR. The *Pogonip Master Plan* identifies six resource management areas where sensitive habitat areas, plant communities, and plant and wildlife species occur. These areas include:

- Coastal Prairie
- Wetland/Freshwater Marsh
- Central Coast Cottonwood-Sycamore Riparian Forest
- Central Coast Riparian Scrub
- Robust Spineflower Habitat
- Ohlone Tiger Beetle Habitat

Resource Management Guidelines are included in the Master Plan for each of these areas. Specific management strategies include grazing, mowing, non-native plant species removal, prescribed burns, closure of unauthorized trails, monitoring trail use for impacts, and conducting annual surveys. Within the mixed evergreen forest, upland redwood forest, and coast live oak forest, the focus is to prevent future degradation due to invasive non-native species, visitor related impacts, and illegal uses such as camping. The Master Plan also includes a Fire Management Element, which addresses values at risk from fire, fire hazards, risk of ignition, methods of fuel management, and fire management actions.

State Park General Plans

LIGHTHOUSE FIELD STATE BEACH GENERAL PLAN

Lighthouse Field State Beach (SB) is a 36-acre open space situated along Monterey Bay, featuring coastal terrace, ocean cliffs, and its Beach. The open space features grassland (primarily non-native), willows, Monterey cypress trees, and eucalyptus groves. The State of California owns the field area and the western coastline, while the City owns Lighthouse Point and the eastern coastline. Lighthouse Field is classified as a State Beach, which consist of areas with frontage on the ocean, or bays, and are designed to provide beach-oriented recreational activities.

The *Lighthouse Field State Beach General Plan* was adopted in 1984 by the state. A general plan is the primary management document for a State Park unit. The plan evaluates and defines proposed land use, facilities, operations, and management of resources. In addition to public access and use recommendations, which are addressed in the PUBLIC SERVICES – Parks and Recreation (Chapter 4.6) section of this EIR, the Resource Management Plan component of the *Lighthouse Field State Beach General Plan* addresses hydrologic, geologic, plant, wildlife and aesthetic resources. An overview of some of the management recommendations includes:

- Convey stormwater primarily via existing surface channels and encourage established willows and other native species by allowing natural propagation.
- Remove invasive non-native vegetation and plant native vegetation where exotic species are removed.
- Maintain existing Monterey cypress and plant young cypress to replace declining trees.
- Allow the existing grassland to undergo natural succession.
- Prohibit the taking of marine or terrestrial life.
- Place additional rip-rap at the base of eroding coastal bluffs only when deemed necessary to reduce a severe erosion hazard. Plant native groundcover vegetation on bluffs.

NATURAL BRIDGES STATE BEACH PLAN

Natural Bridges State Beach (SB) is a 65-acre open space and wetland situated on Monterey Bay, on the western boundary of the City. Primary resources include the natural rock bridge, a beach, Monarch butterfly overwintering habitat and the Moore Creek wetland. Natural Bridges was formally classified as a State Beach in 1962.

The preliminary *Natural Bridges State Beach General Plan* was adopted by the State Parks Commission in 1988. The final general plan document, dated 1992, is the primary management document for this State Park unit. The Resource Element of the *Natural Bridges State Beach General Plan* addresses management of wetlands, riparian vegetation, Monarch butterfly habitat, paleontological resources, marine and animal life. An overview of some of the management recommendations includes:

- Prepare management plans for the Moore Creek wetland and Monarch Butterfly habitat.

- Remove invasive exotic vegetation, except eucalyptus trees used by Monarch butterflies, and replace with native species from local population sources.

TWIN LAKES STATE BEACH GENERAL PLAN

Twin Lakes State Beach (SB), totaling 91.6 acres, is located within the eastern portion of the City and the unincorporated area of Santa Cruz County. Within the City limits, the State Beach lands include Seabright Beach and San Lorenzo Point along the eastern mouth of the San Lorenzo River. The preliminary *Twin Lakes State Beach General Plan* was adopted by the State Parks Commission in 1988. The final general plan document is dated 1992.

The Resource Element of the *Twin Lakes State Beach General Plan* pertaining to Seabright Beach and San Lorenzo Point primarily address resource management of bluffs, paleontological resources, shoreline protection, and marine life.

4.8.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The NATURAL RESOURCES AND CONSERVATION chapter of the draft *General Plan 2030* includes the required conservation element. Three goals and 13 accompanying policies and associated actions address riparian and wetland habitat, special status species, sensitive habitat areas, wildlife movement, tree protection, and open space management. The three natural resources goals related to biological resources are:

NRC1	*Protected, enhanced, and sustainably managed creek systems, riparian environments, and wetlands*
NRC2	*Protected, enhanced, and sustainable native and natural plant and animal communities and habitats*
NRC3	*Conservation and stewardship of resources*

Several policies and actions in other chapters of the proposed General Plan also seek to protect, preserve and/or manage open space and natural areas throughout the City (CD 1.1.3, LU 2.3, LU 3.11), including the Monterey Bay National Marine Sanctuary. Biotic monitoring and fisheries conservation strategies are proposed to protect watersheds that supply water to the City (CC 3.3.6, CC 3.3.7).

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, some of the

General Plan 2030 policies and actions also support mixed use districts and/or intensified redevelopment, such as a Mixed Use River District, expansion of the High Density Overlay on Front and lower Pacific, and additional height and intensity along Pacific north of Cathcart.

Land Use actions LU1.1.4 and LU1.1.5 address development and land use for specific sites: the Swenson property and the Golf Club Drive property, respectively. LU2.2.3 also includes addition of a 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center, but specific uses haven't been identified, although the site will not be used as part of expansion of the landfill disposal area. In addition, the proposed *General Plan 2030* supports development of a desalination plant (Policy CC3.1.3), but a specific site is not identified.

The proposed plan further calls for evaluation and mitigation of potential impacts from new development (NRC2.2.1). Table 4.8-6 at the end of this chapter is taken from the proposed *General Plan 2030*. It summarizes assessment protocols to be used by the City to determine if a sensitive biological resource is present on a proposed development site, and identifies general avoidance or management strategies to be employed when sensitive biological resources occur.

4.8.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

8a 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 California Department of Fish and Game or US Fish and Wildlife Service;

8b 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;

8c Have a substantial adverse effect, either directly or through habitat modifications on; or substantially reduce the number or restrict the range of any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

8d 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;

8e Substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels or threaten to eliminate a plant or animal community;

8f Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or

8g Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat conservation plan;

IMPACT ANALYSIS

Based on the significance criteria identified above, there are no currently adopted or approved Habitat Conservation[6] or Natural Community Conservation Plans (8g) that apply to lands within the City planning area. The following impact analyses address riparian, wetland and sensitive habitats (8a, 8b); special status species (8c); wildlife movement and breeding (8d); wildlife habitat reduction (8f); and conflicts with local policies and ordinances protecting biological resources (8e).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized in subsection 4.8.2 above. Buildout projections indicate that potential new development accommodated by the draft general plan to the year 2030 could total 3,350 residential units, 3,140,000 square feet of commercial, office and industrial development and new hotel rooms, primarily on infill and underutilized lots, as described in the PROJECT DESCRIPTION (Chapter 3.0) and LAND USE (Chapter 4.1) sections of this EIR.

Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[7] approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located along these corridors.

[6] As discussed in the subsection 4.8.1, the City is in the process of developing a HCP, but a draft document has not been completed. See discussion on pages 4.8-25 and 26.

[7] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

Sensitive Habitats

Impact 4.8-1: Riparian and Wetland Habitats
Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development that could directly or indirectly impact riparian and/or wetland habitat areas within and adjacent to the City. With implementation of the proposed policies and actions for resource protection and adherence to other City's plans and regulations protecting these habitat areas, this is considered a *less-than-significant impact.*

The City is primarily developed, and as indicated above, new development would predominantly occur within developed areas. However, there are a few remaining vacant lots and underdeveloped properties located within developed areas that are also located adjacent to water bodies, watercourses and/or riparian habitat areas. These areas include:

- The Swenson Site adjacent to Antonelli Pond;
- The Golf Club Drive area adjacent to Pogonip Creek; and
- Portions of the area along Seventh Avenue that is within the City's Sphere of Influence, but outside City limits; portions of which border Arana Gulch and the Small Craft Harbor area.

Development in these areas or other parcels adjacent to streams and riparian habitats could result in impacts to sensitive riparian habitat areas with future development accommodated by the *General Plan 2030*. Riparian habitat and specific development setbacks are specified in the City's adopted *City-Wide Creeks and Wetlands Management Plan*. Future development, including the areas identified above, would be required to provide riparian setbacks and implement best management practices and development standards as set forth in this Plan, and included in the City's Zoning Ordinance (section 24.08, Part 12-Watercourse Development Permit). Requirements for allowed uses also are provided. Future development also would be reviewed for compliance with City policies and plans, in addition to being subject to site-specific environmental review under CEQA. Furthermore, Action LU1.1.5 sets for specific development/design directives for the Golf Club Drive area, which includes preservation of up to five acres of open space that include riparian corridors.

Known wetlands are identified in the City's adopted *City-Wide Creeks and Wetlands Management Plan*, and shown on Table 4.8-1. However, only known wetlands are mapped, and other wetlands may occur within future development areas. Of the major vacant sites, the Swenson property is located adjacent to Antonelli Pond. However, proposed Action LU1.1.4 sets forth specific development/design directives for the Swenson parcel, which include: wetland buffers, locating parking away from Antonelli Pond and preserving public access to Antonelli Pond.

In addition, to these specified properties identified for development, the proposed General Plan also includes some policies that support access and/or other passive uses in or near sensitive habitat areas. Action NRC1.1.2 does support access improvements in riparian areas, such as unpaved narrow trails, boardwalks, and vista points that could result in potential direct or indirect impacts on riparian and wetland resource. However, the action is qualified by

indicating these improvements be provided "where consistent with riparian and wetland protection,", and to this end ensures that the sensitive habitat would be protected. While trails and public access may result in indirect impacts, but the General Plan includes policies to protect riparian resources where access is provided. Similarly, the proposed Plan includes policies to encourage low-impact uses in areas upstream of City watercourses. (NRC1.2).

The General Plan policies and actions outlined in Table 4.8-5 and existing City regulations will serve to protect biological resources that may be present or encountered as part of future development accommodated by the proposed General Plan. The proposed *General Plan 2030* includes a number of policies that serve to protect riparian habitat areas, and thus, avoid or mitigate potential impacts to riparian habitat that may occur as a result of development under the General Plan. Policy NRC1.1 and its accompanying five actions seek to protect river and wetland areas. The General Plan policies and actions (summarized in Table 4.8-5) will protect riparian habitats through implementation of the *City-wide Creeks and Wetlands Management Plan* with specified development setbacks (NRC1.3.1), encouraging riparian revegetation and restoration efforts (NRC1.1.4), and protecting and managing natural and open space areas (CD1.1.3, LU2.3.3, LU3.11, LU3.11.3, NRC6.1, NRC6.3.).

The proposed plan further calls for evaluation and mitigation of potential impacts from new development (NRC2.2.1). Furthermore, the proposed *General Plan 2030* includes a table that identifies habitat assessment and management protocols for sensitive riparian and wetland habitats, including the type of reviews/studies that will be required as part of development/management of riparian habitat areas, including wetland delineations and buffer determinations, along with potential mitigation and/or management (see Table 4.8-6 at the end of this chapter). In addition to compliance with the City's Creek Management Plan and Watercourse Development zoning regulations, development adjacent to watercourses may also be subject to review and approval by the California Department of Fish and Game (CDFG) pursuant to section 1602 of the state Fish and Game Code that requires a Streambed Alteration Agreement with CDFG for any work within a creek channel.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development and increased population accommodated by the plan could result in adverse impacts to sensitive habitat areas. With implementation of the proposed *General Plan 2030* goals, policies and actions that set forth measures to avoid and minimize adverse impacts on sensitive riparian and wetland habitats as summarized on Table 4.8-5, as well as future environmental review of specific development projects and compliance with local regulations and plans, particularly the *City-Wide Creeks and Wetlands Management Plan*, the proposed *General Plan 2030*'s indirect impact on sensitive habitats would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.8-2: Other Sensitive Habitat Areas
Implementation of the proposed *General Plan 2030* would result in future development that could directly or indirectly impact sensitive habitat areas within and adjacent to the City (other than riparian and wetland habitats). Within implementation of the proposed policies and actions for resource protection, this is considered a *less-than-significant impact.*

In addition to sensitive riparian and wetland habitat areas, coastal prairie and coastal bird habitat along coastal bluffs would be considered sensitive habitat areas. The City of Santa Cruz is primarily developed; the majority of sensitive habitat (other than riparian and wetland) are protected within the City-owned and managed greenbelt and open space areas and along creeks and watercourses as depicted on Figure 4.8-2. Of the specific vacant sites identified for future development, the Swenson site contains potential coastal prairie habitat. Generally, there is no development that would be located along the coast that would affect coastal bird habitat, although some public works or infrastructure maintenance/repairs in the future may be located in this area.

The proposed *General Plan 2030* includes a number of policies that serve to protect sensitive habitat areas (other than riparian and wetland habitats that are addressed above in Impact 4.8-1), and thus, avoid or mitigate potential impacts to sensitive habitat that may occur as a result of development accommodated by the draft the *General Plan 2030*. These policies include protection of sensitive habitat areas; management of vegetation and grading within sensitive habitats; protection of tree groves that provide habitat for monarch butterflies; and review of future development proposals for impacts and mitigation. The General Plan policies and actions (summarized in Table 4.8-5) will protect sensitive habitat areas and important vegetation communities and wildlife habitat, particularly sensitive and edge habitats ("ecotones"), which specifically includes protecting coastal roosts and rookeries to prevent disturbance during breeding or loss of habitat due to construction, recreational activities or special events (NRC2.2.2). Additionally, the proposed plan seeks to minimize grading and control pests and non-native invasive species in sensitive habitat areas (NRC2.3.4, NC3.3.5). Revegetation and restoration of native plant areas also is supported (NRC2.2.3, NRC2.2.5). Policy NRC2.4 also seeks to protect, manage, and enhance tree groves and understory that provide sensitive habitat features, specifically calling for maintenance of a Monarch Butterfly Management Plan (NRC2.4.1).

The proposed plan further indicates that as part of the CEQA review process, future development projects will be required to evaluate and mitigate potential impacts to sensitive habitat (including special-status species) for sites located within or adjacent to these areas (NRC2.2.1). Furthermore, the proposed *General Plan 2030* includes a table that identifies habitat assessment and management protocols for sensitive habitat areas, including the type of reviews/studies that will be required along with potential mitigation and/or management (see Table 4.8-6 at the end of this chapter. In addition, compliance with Section 24.14.080 of the City's Municipal Code includes provisions to protect wildlife habitat and protected species for areas specified in the City's existing General Plan (Maps EQ-8 and EQ-9). (This section of the Zoning Ordinance will require updating to reflect new maps developed as part of the *General Plan 2030*.)

TABLE 4.8-5
Proposed General Plan Policies & Actions that Avoid or Reduce Biotic Resource Impacts

Type of Measure / Action	Policies / Actions
PROTECT RIPARIAN, WETLAND & OTHER SENSITIVE HABITATS	• Protect river and wetland areas: NRC1.1, NRC1.1.2, NRC1.3.1 • Conserve riparian & wetland resources in accordance with Creeks Plan and San Lorenzo River Plan: NRC1.3.1, CD3.1.2 (update San Lorenzo River Plan) • Require riparian & wetland setbacks set forth in City's Creek Plan: NRC1.1.1 • Encourage restoration and enhancement of riparian and wetland resources: NRC1.3, NRC1.1.4 (revegetation in buffer areas)
PROTECT OTHER SENSITIVE HABITATS	• Protect sensitive habitat areas: NRC2.2, NRC2.4 (tree groves that provide sensitive habitat features) • Vegetation, grading and pest control management in sensitive habitats: NRC2.2.3, NRC2.2.4, NRC2.2.5 • Protect coastal roosts and rookeries: NRC2.2.2 • Support protection of Monterey Bay National Marine Sanctuary & its environs: NRC6.2, CD1.1.2
PROTECT SPECIAL STATUS SPECIES	• Protect, enhance or restore special status species habitat: NRC2.1 • Maintain up-to-date list, map, inventory of special status species: NRC2.1.1, NRC2.1.2, NRC2.1.5 • Protect sensitive tree groves and maintain Monarch Butterfly Management Plan: NRC2.4.1 • Biotic monitoring & habitat protection in watersheds: CC3.3.6
NATIVE REVEGETATION	• Native revegetation in riparian & wetland setbacks: NRC1.1.4 • Encourage planting and restoration of native vegetation: NRC2.2.3 • Encourage eradication and control of non-native, invasive species: NRC2.2.5
PROTECT WILDLIFE DISPERSAL CORRIDORS	• Protect, enhance significant dispersal corridors: NRC2.3, NRC2.3.1
OPEN SPACE & RESOURCE PROTECTIN and MANAGEMENT	• Protect & manage open space / native habitat areas: LU2.3.3, LU3.11, LU3.11.3, CD1.1.3 (management plans), NRC6.1, NRC6.3. • Preserve/ manage woodland areas within open spaces: NRC3.2 • Encourage continued preservation of UCSC open space uses pursuant to LRDP: LU2.3.4
ENCOURAGE LOW-IMPACT USES & MITIGATE IMPACTS OF DEVELOPMENT	• Encourage Low-Impact Uses Upstream of City's River & Riparian Habitats: NRC1.2 • Evaluate & Mitigate new uses in watershed and riparian areas: NRC1.2.1, NRC1.2.2. • Evaluate & Mitigate Future Development Impacts: NRC2.1.3 (special status species), NRC2.2.1 (CEQA process), • Implement strategies to reduce impacts: NRC2.1.4 • Appropriate land uses & development standards that don't adversely impact open spaces: LU3.11.2
TREE PROTECTION	• Protect tree resources & heritage trees: NRC5.1, CD4.3.4 • Maintain & increase urban tree canopy & tree diversity: NRC5.1.2, NRC5.2, NRC5.2.1 (additional street trees) • Educational programs to promote urban forest: NRC5.1.1

The Monterey Bay could be deemed a sensitive habitat due to its designation as a federal marine sanctuary. The proposed *General Plan 2030* supports protection of the Monterey Bay National Marine Sanctuary and its environs (Policy 6.2), and numerous policies seek to protect water quality as further described in the HYDROLOGY, STORM DRAINAGE & WATER QUALITY (Chapter 4.7) section of this EIR. The draft general plan does support development of a desalination plant that could result in impacts to the marine environment due to intake systems and/or discharge into the ocean. Potential impacts associated with the construction and operation of a desalination facility are summarized in the WATER SUPPLY (Chapter 4.4.5) section of this EIR.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development and increased population accommodated by the plan could result in adverse impacts to sensitive habitat areas. With implementation of the proposed *General Plan 2030* goals, policies and actions as summarized on Table 4.8-5, as well as future environmental review of specific development projects and compliance with local regulations and plans, the proposed *General Plan 2030*'s indirect impact on sensitive habitats would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required, but revision of the following *General Plan 2030* actions are recommended to strengthen the identification of sensitive habitat areas that will be subject to project-level reviews in the future.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

NRC2.2 Protect sensitive habitat areas and important vegetation communities and wildlife habitat, to include riparian, wetland (salt marsh and freshwater wetland), coastal prairie, coastal bird habitat, and habitat that supports special status species, as well as, ~~particularly~~ sensitive and edge habitats ("ecotones").

NRC2.2.6 Amend Zoning Ordinance section 24.14.080 to provide an updated reference the sensitive habitats identified in the *General Plan 2030*.

Special Status Species

Impact 4.8-3: Special Status Species
Implementation of the proposed *General Plan 2030* would result in future development that could directly or indirectly impact special status species. With implementation of the proposed policies and actions for resource protection, this is considered a *less-than-significant impact.*

The proposed *General Plan 2030* would accommodate future development pursuant to planned land use designations contained in the Plan. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[8] approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located along these corridors.

The City of Santa Cruz is primarily developed, except for a few remaining vacant lots located within developed areas, the following three areas within the planning area are primarily undeveloped or underdeveloped. These areas are located adjacent to water bodies and/or watercourses.

- The Swenson Site adjacent to Antonelli Pond;
- The Golf Club Drive area adjacent to Pogonip Creek; and
- Portions of the area along Seventh Avenue that is within the City's Sphere of Influence, but outside City limits; portions of which border Arana Gulch.

Known locations of special status species have been incorporated into the City's GIS mapping system. According to the proposed General Plan assessment protocols, future species surveys and assessments will be required as part of the CEQA-review process in order to evaluate and mitigate potential impacts related to future development (see Table 4.8-6 at the end of this chapter). Additionally, the proposed *General Plan 2030* includes several policies, outlined below, that serve to protect special status species, and thus, mitigate potential impacts to sensitive habitat that may occur as a result of development under the General Plan. These policies include protection of sensitive habitat areas; management of vegetation and grading within sensitive habitats; protection of tree groves that provide habitat for monarch butterflies; and review of future development proposals for impacts and mitigation. Policy NRC2.1 and its five accompanying actions seek to protect, enhance, or restore habitat for special-status plant and animal species through maintaining up-to-date species list, map and inventory (NRC2.1.1, NRC2.1.2, NRC2.1.5) and evaluating and mitigating impacts associated with new development (NRC2.1.3, NRC2.1.4).

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development and increased

[8] See Table 2-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 3-2 for estimated distribution of new development per specific areas in the City.

population accommodated by the plan could result in adverse impacts to special status species if present at a particular development site. With implementation of the proposed *General Plan 2030* goals, policies and actions as summarized on Table 4.8-5, as well as future environmental review of specific development projects and compliance with local regulations and plans, the proposed *General Plan 2030*'s indirect impact on sensitive habitats would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Wildlife Movement & Breeding

Impact 4.8-4: Wildlife Movement & Breeding
Implementation of the proposed *General Plan 2030* would result in future development that could directly or indirectly interfere with wildlife movement and/or breeding. With implementation of the proposed policies and actions for resource protection, this is considered a *less-than-significant impact.*

The proposed *General Plan 2030* would accommodate future development pursuant to planned land use designations contained in the Plan. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties, and in the new mixed-use districts along the City's four major street corridors: The primary wildlife movement corridors are located along major watercourses and within City-owned open space lands, which would be protected from future development impacts. Projects adjacent to watercourses would be subject to setback requirements set forth in the City's Creeks and Wetlands Management Plan.

The proposed *General Plan 2030* includes several policies, as summarized on Table 4.8-5, that seek to protect, enhance and maintain significant wildlife dispersal corridors and buffers (NRC2.3, NRC2.3.1). The draft plan also calls for protection of coastal roost and rookeries (NRC2.2.2). Additionally, according to the proposed General Plan assessment protocols, future species surveys and assessments will be required as part of the CEQA-review process in order to evaluate and mitigate potential impacts related to future development (see Table 4.8-6 at the end of this chapter). Additionally, LU1.1.5 requires that future development in the Golf Club Drive area preserve up to five acres of open space as an urban wildlife interface zone, community garden and riparian corridor area.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated could interfere with wildlife movement or breeding. However, with implementation of the proposed *General Plan 2030* goals, policies and actions as summarized on Table 4.8-5, as well as future environmental review of specific development projects and compliance with local regulations and plans, the proposed *General Plan 2030*'s indirect impact on sensitive habitats would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Habitat Reduction

Impact 4.8-5: Habitat Reduction
Implementation of the proposed *General Plan 2030* would result in future development that would be considered urban infill development and would not result in significant reduction of wildlife habitat or cause a wildlife or plant population to drop below self-sustaining levels or become eliminated. Therefore, there is *no impact* related to substantial habitat reduction.

As previously indicated, future development accommodated by the *General Plan 2030* would primarily occur on vacant urbanized infill sites, on underutilized properties, and in the new mixed-use districts along the City's four major street corridors. Based on the estimated development occurring under the proposed plan, approximately one-half of new development would be located along these transportation corridors. The majority of significant habitat areas within the City are found within City-owned greenbelt and open space properties. Given that future development of infill sites is surrounded by other urban development, future development accommodated by the proposed general plan would not substantially reduce the habitat of a fish or wildlife species or cause a fish or wildlife species to drop below self-sustaining levels. The protection and enhancement of habitat areas within the greenbelt and open spaces within the City are further supported (NRC6.3). Furthermore, the proposed policies and actions support protection and management of open space and natural habitat areas (LU2.3,3 LU3.11), protection and management of woodland areas within open spaces (NRC3.1), and biotic monitoring and fishery protection in watersheds (CC3.6, CC3.3.7), as summarized on Table 4.8-5.

Conflicts with Local Policies or Regulations

Impact 4.8-6: Tree Protection
Implementation of the proposed *General Plan 2030* would result in future development that could directly or indirectly adversely affect heritage trees in conflict with local tree protection regulations. With implementation of the proposed policies and actions for resource protection, this is considered a *less-than-significant impact.*

Future development accommodated by the proposed plan could result in removal of trees. However, existing City regulations (Municipal Code Chapter 9.56) protect heritage trees. Removal of a heritage tree that is consistent with the criteria, provisions and requirements set forth in City ordinances is not considered a significant impact. Furthermore, the proposed *General Plan 2030* includes policies and actions to protect trees. Policy NRC5.1 and its two accompanying actions seek to protect and manage tree resources in the urban environment, with emphasis on significant and heritage trees, including maintenance and expansion of the City's

urban tree canopy (NRC5.1.2), planting additional street trees (NRC5.2), and continued educational programs to promote the City's urban forest (NRC5.1.1).

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated could result in removal of heritage trees. However, with implementation of the proposed *General Plan 2030* goals, policies and actions as summarized on Table 4.8-5, as well as compliance with local regulations and plans, the proposed *General Plan 2030*'s indirect impact on heritage trees would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.8-7: Conflicts with Local Plans and Policies
Adoption and implementation of the proposed *General Plan 2030* would not result in conflicts or inconsistencies with policies adopted to protect biological resources. Thus, there is *no impact* related to this issue.

The City has adopted a number of management plans for open space areas, as well a Creeks and Wetlands Management Plan. The existing open space and resource management plans include management guidelines for resource protection, as well as recommendations for land use development and provision of access, in some cases. These plans do not include specific policies to protect biological resources. The proposed General Plan does not include goals, policies or actions that would conflict with the management directives of these plans. The proposed General Plan supports development and maintenance of a master plan for the long-term preservation and maintenance of each of the City's greenbelt lands (LU2.3.3), and maintenance and protection of existing open space through management plans (LU3.11). Additionally, the draft *General Plan 2030* in some instances supports these plans and/or includes broad policies or actions consistent with recommendations in these plans as summarized below:

- ***City-wide Creeks and Wetlands Management Plan***. As previously indicated, this plan sets forth riparian setback requirements and development standards and guidelines for all watercourses in the City. The draft general plan Action NRC1.1.1 requires setbacks and implementation of standards and guidelines for development and improvements within the City and adjacent to creeks and wetlands as set forth in the *Citywide Creeks and Wetlands Management Plan*. Action NRC1.3.1 further affirms that creek, riparian, and wetland resources will be conserved in accordance with the adopted Creek Plan. Additional policies and actions summarized in Table 4.8-5 also serve to protect riparian and wetland protection. Thus, the proposed *General Plan 2030* does not result in conflicts with this plan.
- ***San Lorenzo River Urban Management Plan***. Action NRC1.3.1 indicates that that creek, riparian, and wetland resources will be conserved in accordance with the adopted the San Lorenzo River Plan. The maintenance, updated and implementation of

the San Lorenzo Urban River Plan is explicitly supported in the draft general plan (CD3.1.2). Thus, the proposed *General Plan 2030* does not result in conflicts with this plan.

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TABLE 4.8-6. Assessment and Management Protocols for Sensitive Species and Habitat

RESOURCE	REGULATORY AUTHORITY	ASSESSMENT (to determine presence)	MITIGATION/ MANAGEMENT* (if resource is present)
Sensitive Habitats			
Freshwater Wetland & Salt Marsh	City Ordinance & Plans CDFG Wetlands Resources Policy U.S. Army Corps of Engineers	Wetland Delineation	• Permit from Corps (for fill) • Avoidance and/or Mitigation, such as buffers, restoration or enhancement, and water quality protection
Riparian Habitat	City Ordinance & Plans CEQA Review	Citywide Creeks & Wetlands Management Plan or Habitat Assessment	• Comply with Creeks Plan setback requirements & development standards and guidelines • Streambed Alteration Agreement from CDFG if required
Coastal Prairie	CEQA Review	Habitat Characterization	• Avoid direct impacts and buffer • Mitigation for indirect impacts
Coastal Bird Rookeries	CEQA Review Division of Migratory Birds- MBTA (USFWS)	Habitat Characterization Breeding bird surveys	• Avoid direct impacts • Conduct construction activities outside of nesting season and/or establish appropriate buffers
Special Status Species			
Listed Special-Status Plant Species ▪ Robust spineflower ▪ Santa Cruz tarplant ▪ San Francisco popcornflower	CEQA Review CESA and NPPA (CFGC)	Botanical survey during flowering period	• Avoidance – design to avoid removal of individuals and habitat • Provide appropriate buffers to protect from indirect impacts • Mitigation and/or Management to protect from indirect impacts and maintain long-term viability of species • Consultation with and MOU from CDFG
Other Special-Status Plant Species ▪ Santa Cruz manzanita ▪ Gardner's yampah ▪ Cloris' popcornflower ▪ Santa Cruz clover ▪ Hickman's popcorn flower	CEQA Review	Botanical survey during flowering period	Avoidance and/or Mitigation – see above.

TABLE 4.8-6. Assessment and Management Protocols for Sensitive Species and Habitat

RESOURCE	REGULATORY AUTHORITY	ASSESSMENT (to determine presence)	MITIGATION/ MANAGEMENT* (if resource is present)
Listed Special-Status Wildlife Species ▪ Ohlone tiger beetle	ESA (USFWS)	Survey during emergence season	• Avoidance – design plans to avoid take of individuals and habitat • Mitigation and Management to protect from indirect impacts • USFWS Take permit through HCP process (no federal nexus) or Section 7 (federal nexus)
▪ Coho Salmon (Central CA ESU)	ESA (NOAA NMFS) CESA (CDFG)	Habitat assessment	• Consultation with NMFS • Avoidance of instream construction during migration period • Mitigation for indirect impacts
▪ Steelhead (Central CA ESU)	ESA (NOAA NMFS)	Habitat assessment	• Consultation with NMFS • Avoidance of instream construction during migration period • Mitigation for indirect impacts
▪ Tidewater goby	ESA (USFWS)	Habitat assessment Protocol level survey during sandbar formation (permit required)	• Consultation with USFWS • Avoidance and/or Mitigation
▪ California red-legged frog	ESA (USFWS)	Habitat Assessment Protocol Level Survey (USFWS 2005b) Pre-construction Survey	• Avoid take of individuals and impacts to aquatic habitat • USFWS Take permit through HCP process (no federal nexus) or Section 7 (federal nexus) • Mitigation to protect from indirect impacts
▪ Brown pelican (communal roosts and rookeries)	ESA (USFWS) CESA (CDFG)	Habitat assessment Communal roosting/ breeding bird survey	• Avoid take of individuals and impacts to roosting and nesting habitat • Consultation with USFWS through HCP process (no federal nexus) or Section 7 (federal nexus) • Conduct construction activities outside of nesting season
Other Special-Status Wildlife Species ▪ Monarch butterfly (wintering sites)	City Ordinance CEQA Review	Habitat Assessment Multi-year surveys during winter roosting season	• Avoidance – design plans to avoid take of individuals and habitat • Buffers to maintain suitable habitat conditions • Conduct construction activities outside of winter roosting season or develop appropriate mitigation such as buffers to avoid disturbance such as smoke and fumes

TABLE 4.8-6. Assessment and Management Protocols for Sensitive Species and Habitat

RESOURCE	REGULATORY AUTHORITY	ASSESSMENT (to determine presence)	MITIGATION/ MANAGEMENT* (if resource is present)
			Management to protect from indirect impacts
▪ Western pond turtle	CEQA Review (CDFG)	Habitat assessment Focused Surveys	• Avoid take of individuals in aquatic and upland habitat. • Mitigation to protect from indirect impacts such as barrier to movement
Breeding Birds ▪ Double-crested cormorant (rookeries) ▪ Black-crowned night heron (rookeries) ▪ Sharp-shinned hawk ▪ Cooper's hawk ▪ Golden eagle (nesting and/or wintering) ▪ Ferruginous hawk ▪ White-tailed kite (nesting) ▪ Merlin ▪ Black oystercatcher ▪ Long-eared owl ▪ Burrowing owl ▪ Vaux' swift ▪ Black swift ▪ Loggerhead shrike ▪ California horned lark ▪ Oak titmouse ▪ Yellow warbler ▪ Hermit warbler ▪ Saltmarsh common yellowthroat ▪ Yellow-breasted chat ▪ Chipping sparrow ▪ Tricolored blackbird	CEQA Review (CDFG)	Habitat assessment Breeding bird survey Wintering survey for golden eagle, ferruginous hawk, white-tailed kite, merlin, burrowing owl, saltmarsh common yellowthroat, grasshopper sparrow	• Avoid direct impacts to nesting birds, occupied nests, eggs and young • Conduct construction activities outside of nesting season or develop appropriate mitigation, such as buffers • Consultation with USFWS (golden eagle-unoccupied nest)
Special-status Bats	CEQA Review (CDFG)	Habitat Assessment Emergence and nighttime	Avoidance and/or Mitigation

TABLE 4.8-6. Assessment and Management Protocols for Sensitive Species and Habitat

RESOURCE	REGULATORY AUTHORITY	ASSESSMENT (to determine presence)	MITIGATION/ MANAGEMENT* (if resource is present)
		acoustic surveys	
San Francisco dusky-footed woodrat	CEQA Review (CDFG)	Habitat Assessment Nest survey	Avoidance and/or Mitigation
American Badger	CEQA Review (CDFG)	Habitat Assessment Focused survey (burrow, sign, and prey base)	Avoidance and/or Mitigation
Nesting Raptors & Birds	Division of Migratory Birds- MBTA (USFWS) Fish and Game Codes (CDFG)	Habitat assessment Breeding bird survey	Avoidance during nesting season and/or Buffer Mitigation
Dispersal Corridors	**City of Santa Cruz CEQA Review**	**Wildlife movement study. Determine buffer width for corridor utility.**	• **Comply with Creeks Plan setback requirements & development standards and guidelines** • **Buffer from disturbances such as noise land light,**

4.9 CULTURAL RESOURCES

4.9.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Historical Background
- Archaeological Resources
- Historical Resource
- Paleontological Resources

Cultural resources encompass paleontological, archaeological, and historic resources. Paleontology is the study of plant and animal fossils; paleontological resources generally are more than 10,000 years old. Archaeology is the study of prehistoric human activities and cultures. Historic resources are associated with the more recent past. In California, historic resources are typically associated with the Spanish, Mexican, and American periods in the state's history.

This section summarizes the cultural resources background report prepared for the City by LSA Associates (December 2006) as part of the General Plan update process to: describe the archaeological, ethnographic, historical, paleontological background of the City's General Plan Area; develop maps of archaeological and paleontological sensitivity; and make recommendations on proposed General Plan policies and programs. The section also summarizes the findings of a historical archaeological report prepared by LSA in August 2009, Both reports are included in Technical Appendix F-2, which is available for review at the City of Santa Cruz Planning Department[1] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com - Planning Department link.

This section also draws from the City's Historic Building Survey, Volumes I and II and "Historical Context Statement for the City of Santa Cruz" (Lehmann, October 2000) prepared for the City of Santa Cruz.

[1] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1to 5 PM.

REGULATORY SETTING

Federal Regulations

NATIONAL REGISTER OF HISTORIC PLACES

Federal regulations for cultural resources are primarily governed by Section 106 of the National Historic Preservation Act (NHPA) of 1966, which applies to actions taken by federal agencies. The goal of the Section 106 review process is to offer a measure of protection to sites that are determined eligible for listing on the National Register of Historic Places (NRHP). The criteria for determining NRHP eligibility are found in Title 36 Code of Federal Regulations (CFR) Part 60. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and affords the federal Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The Council's implementing regulations, "Protection of Historic Properties," are found in Title 36 CFR Part 800.

The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Authorized under the National Historic Preservation Act of 1966, it is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect the country's historic and archeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. Property owners must agree to such listing. The National Register includes:

- All historic areas in the National Park System;
- National Historic Landmarks that have been designated by the Secretary of the Interior for their significance to all Americans; and
- Properties significant to the nation, state, or community which have been nominated by state historic preservation offices, federal agencies, and tribal preservation offices, and have been approved by the National Park Service. (National Park Service website).

To be considered eligible, a property must meet the National Register Criteria for Evaluation, found in Title 36 CFR Part 60.4. This involves examining the property's age, integrity, and significance as follows:

- Age and Integrity. Is the property old enough to be considered historic (generally at least 50 years old) and does it still look much the way it did in the past?
- Significance. Is the property associated with events, activities, or developments that were important in the past? With the lives of people who were important in the past? With significant architectural history, landscape history, or engineering achievements? Does it have the potential to yield information through archeological investigation about our past?

Archaeological site evaluation assesses the potential of each site to meet one or more of the criteria for NRHP eligibility based on visual surface and subsurface evidence (if available) at

each site's location, information gathered during the literature and records searches, and the researcher's knowledge of and familiarity with the historic or prehistoric context associated with each site.

The American Indian Religious Freedom Act, Title 42 U.S. Code Section 1996, protects Native American religious practices, ethnic heritage sites, and land uses.

NATIONAL HISTORIC LANDMARKS

National Historic Landmarks are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. Today, fewer than 2,500 historic places bear this national distinction. National Historic Landmarks are places where nationally significant historical events occurred, that are associated with prominent Americans that represent those pivotal ideas that shaped the nation, that teach Americans about their ancient past, or that are premier examples of design or construction. While many historic places are important locally or at a state level, a lesser number have meaning for all Americans. National Historic Landmarks are places that "posses exceptional value or quality in illustrating and interpreting the heritage of the United States" (National Park Service website).

State Regulations

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (California Register) is a guide to cultural resources that must be considered when a government agency undertakes a discretionary action subject to CEQA. The California Register helps government agencies identify, evaluate, and protect California's historical resources, and indicates which properties are to be protected from substantial adverse change (Pub. Resources Code, Section 5024.1(a)). The California Register is administered through the State Office of Historic Preservation (SHPO) that is part of the California State Parks system.

A cultural resource is evaluated under four California Register criteria to determine its historical significance. A resource must be significant at the local, state, or national level in accordance with one or more of the following criteria set forth in the State CEQA Guidelines at Section 15064.5(a)(3):

1) It is associated with events that have made a significant contribution to the broad pattern of California's history and cultural heritage;
2) It is associated with the lives of persons important in our 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; or
4) It has yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time must have passed to allow a "scholarly perspective on the events or individuals

associated with the resource." Fifty years is used as a general estimate of the time needed to understand the historical importance of a resource according to SHPO publications. The California Register also requires a resource to possess integrity, which is defined as "the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association." Archaeological resources can sometimes qualify as "historical resources" (State CEQA Guidelines, Section 15064.5(c)(1)). In addition, Public Resources Code Section 5024 requires consultation with SHPO when a project may impact historical resources located on State-owned land.

Two other programs are administered by the state: California Historical Landmarks and California "Points of Interest." California Historical Landmarks are buildings, sites, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other historical value. California Points of Interest are buildings, sites, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other historical value.

NATIVE AMERICAN CONSULTATION

Prior to the adoption or amendment of a general plan proposed on or after March 1, 2005, Government Code Sections 65352.3 and 65352.4 require a city or county to consult with local Native American tribes that are on the contact list maintained by the Native American Heritage Commission. The purpose is to preserve or mitigate impacts to places, features, and objects described in Public Resources Code Sections 5097.9 and 5097.993 (Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property) that are located within a city or county's jurisdiction.

HUMAN REMAINS

Section 7050.5 of the California Health and Safety Code states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods. CEQA Guidelines Section 15064.5 directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

PUBLIC RESOURCES CODE SECTION 5097.5

California Public Resources Code Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site...or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having

jurisdiction over such lands." Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

State CEQA Guidelines Section 15064.5 defines a "historical resource," which is presented in subsection 4.9.3 below. CEQA requires that historical resources and unique archaeological resources be taken into consideration during the CEQA process (Public Resources Code, Section 21083.2). If feasible, adverse effects to the significance of historical resources must be avoided, or significant effects mitigated (CEQA Guidelines Section15064.5(b)(4)).

If the cultural resource in question is an archaeological resource, CEQA Guidelines Section 15064.5(c)(1)) requires that the lead agency first determine if the resource is a historical resource as defined in Section 15064.5(a). If the resource qualifies as a historical resource, potential adverse impacts must be considered in the same manner as a historical resource (California Office of Historic Preservation 2001a:5). If the archaeological resource does not qualify as a historical resource but does qualify as a "unique archaeological resource," then the archaeological resource is treated in accordance with Public Resources Code Section 21083.2 (see also CEQA Guidelines Section 15069.5(c)(3)). "Unique archaeological resource" means 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 any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In practice, most archaeological sites that meet the definition of a unique archaeological resource will also meet the definition of a historical resource (LSA, December 2006).

Treatment options under Public Resources Code Section 21083.2 include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a "unique archaeological resource").

Advice on procedures to identify cultural resources, evaluate their importance, and estimate potential effects is given in several agency publications such as the series produced by the Governor's Office of Planning and Research (OPR). The technical advice series produced by OPR strongly recommends that Native American concerns and the concerns of other interested persons and corporate entities, including but not limited to, museums, historical commissions, associations and societies, be solicited as part of the process of cultural resources inventory.

Local Regulations

The City, as part of its status as a Certified Local Government, has a historic preservation ordinance. The historic preservation ordinance (HPO) provides for the protection, enhancement, and perpetuation of significant cultural resources in the GP Area. The HPO provides the statutory framework for local preservation decisions, and contains sections governing the following topics:

- Historic District Designation (Part 2, Chapter 24.06);
- Historic Landmark Designation (Section 24.12.420);
- Archaeological Resource Procedures (Section 24.12.430);
- Procedure for Amending Historic Building Survey (Section 24.12.440);
- Procedure: New Construction in Historic Districts (Section 24.12.450);
- Historic Alteration Permit (Part 10, Chapter 24.08);
- Historic Demolition Permit (Part 11, Chapter 24.08); and
- Historic Overlay District (Part 22, Chapter 24.10).

HISTORICAL BACKGROUND

The following overview of prehistory and history is summarized from the Cultural Resources Background Report and Historical Archaeological Report prepared as part of the General Plan Update (LSA, December 2006). As previously indicated, both are included in Technical Appendix F-2.

Prehistory

The General Plan planning area is located within the Monterey Bay Area, a cultural-historical geographic region which spans the central California coastline from Big Sur northward to just south of the San Francisco Bay. This region generally corresponds to southern Costanoan language groups.

The prehistoric occupation of Central California is broken into three broad periods: the Paleoindian Period (10,000-6000 B.C.); the three-staged Archaic Period, consisting of the Lower Archaic (6000-3000 B.C.), Middle Archaic (3000-500 B.C.), and Upper Archaic (500 B.C.-A.D. 1000); and the Emergent Period (A.D. 1000-1800). An updated period sequence, includes the following periods: Paleoindian (9000-6500 B.C.), Millingstone (6500-3500 B.C.), Early (3500-1000 B.C.), Early/Middle Transition (1000-600 B.C.), Middle (600 B.C.-A.D. 1000), Middle/Late Transition (A.D. 1000-1200), Late (A.D. 1200-1500), Protohistoric (A.D. 1500-1769), and Historic (post A.D. 1769) periods.

Archaeological sites dating to the Paleoindian and Millingstone periods (3500 B.C. or earlier) in the Monterey Bay Area are rare, and the components are poorly defined. Sites from these periods, however, have been identified north of Santa Cruz in Scotts Valley and at Elkhorn Slough, and include crescent-shaped flaked tools, long-stemmed projectile points, cobble/core tools, and milling slabs and handstones. Archaeological evidence of the Late and Protohistoric periods (A.D. 1200-1769) is poorly represented in the Monterey Bay area, although sites

dating to this period have been identified in the Santa Cruz Mountains and within City of Santa Cruz limits. Sites dating to these periods include schist, clamshell, and abalone disc beads; small side-notched projectile points; hopper and bedrock mortars; millingslabs; pestles; and handstones.

For over a quarter century, Native American settlement and subsistence patterns in the Monterey Bay Area have been understood in terms of a forager-collector model that suggests that before 2,000 years ago, small mobile foraging groups characterized the area's settlement. Foraging groups established temporary residential bases near seasonally available resource patches and gathered food daily with no storage of food. Foragers were eventually displaced by "collectors" who occupied year-round or semi-permanent residential sites and did not relocate residential sites to seasonal resource patches. More recently, however, the validity of the forager-collector model for understanding the subsistence and settlement practices from the Monterey Bay Area has been questioned, and Native American settlement-subsistence patterns in the region are a research issue that future archaeological research may help to clarify.

Ethnography

Penutian groups settled around Monterey Bay at approximately 500 B.C., displacing earlier Hokan populations. The descendants of the native groups who lived between the Carquinez Strait and the Monterey area prefer to be called Ohlone, although they are often referred to by the name of their linguistic group, Costanoan. Linguists have identified eight Ohlone languages. *Awaswas* was the name of the language spoken in the Santa Cruz area. *Awaswas* speakers' territory basically encompassed the San Lorenzo River watershed.

The Ohlone, like most Native California groups, were organized according to politically independent land-holding groups referred to by anthropologists as "tribelets". There were approximately 40 Ohlone tribelets. The basic Ohlone social unit was the family household of about 15 individuals, which was extended patrilineally. Households grouped together to form villages, and villages combined to form tribelets. Tribelets exchanged trade goods such as obsidian, shell beads, and baskets; participated in ceremonial and religious activities together; intermarried; and could have extensive reciprocal obligations to one another involving resource collection. At the time of the arrival of the Spanish and establishment of Mission Santa Cruz in 1791, Santa Cruz was within the territory of the Uypi tribelet.

For the Ohlone, like other native Californians, the acorn was a dietary staple, eaten as mush or bread. The Ohlone used a range of other plant resources, including buckeye, California laurel, elderberries, strawberries, manzanita berries, goose berries, toyon berries, and wild grapes. Animals eaten by the Ohlone included large fauna such as black-tailed deer, Roosevelt elk, antelope, and marine mammals such as sea lion, and sea otter; smaller mammals such as skunk, racoon, rabbit, and squirrel; birds, including geese and ducks; and fish such as salmon, sturgeon, and mollusks.

Besides providing sustenance, the Bay Area's flora and fauna provided the Ohlone with raw materials to construct dome-shaped shelters and sweat houses. Animal bones, teeth, beaks, and claws were made into awls, pins, knives, and scrapers. Pelts and feathers became clothing and

bedding, while sinews were used for cordage and bow strings. Feathers, bone, and shells were crafted into ornaments.

History

The historic setting of Santa Cruz can be described under two periods. The first period began with the arrival of the Spanish and extended through the Mexican administration of the area, including the Mission period. The second period began in 1848 when California was ceded to the United States under the Treaty of Guadalupe Hidalgo.

SPANISH AND MEXICAN PERIOD

The first significant Spanish exploration through present-day Santa Cruz occurred in 1769 when Gaspar de Portola, the governor of Baja California, led an expedition from San Diego to locate Monterey Bay. Later in 1791, Mission Santa Cruz was established on the banks of the San Lorenzo River. The Mission soon absorbed the surrounding Native American Ohlone population.

In 1797, Villa de Branciforte was established on the east side of the San Lorenzo River, across from the Mission. The Spanish government established Villa de Branciforte to create a self-sufficient secular settlement populated by retired soldiers, craftsmen, and farmers who could mobilize and defend the coast of Alta California from foreign invasion. After the California missions were secularized in 1834, the Mission Santa Cruz lands came under the control of Villa de Branciforte.

AMERICAN PERIOD

Commercial development of Santa Cruz and the surrounding region's natural resources was well under way by the time California became part of the United States in 1848. Logging, lime production, and tanneries were three important industries in the early economy of Santa Cruz. The lime and logging industries thrived in response to the growing demand for building materials during San Francisco's post gold rush construction boom. By the mid-1860s, over 28 sawmills had been established in Santa Cruz County. By 1900, much of the useable timber had been logged, generating conservation efforts to save the remaining stands, including Big Basin Redwoods in 1902.

Massive production of lime from limestone found in the Santa Cruz area began in the mid-1850s when A.P. Jordan and Isaac E. Davis formed a partnership. By the 1880s, Henry Cowell had purchased both Jordan's and Davis's interest in the company. Lime quarrying and construction of lime kilns occurred within what is now Pogonip (City-owned greenbelt), the west entrance to the UC campus, and State Park lands within the County. In the 1890s, Santa Cruz's lime industry began to decline due to the depletion of fuel brought about by extensive logging of the region and the development of cement, which used a cheaper, less pure grade of limestone.

Tanneries were also important to the early economy of Santa Cruz. By1857, three tanneries were established in Santa Cruz (Kirby and Jones on Mission Hill, Porter, and C. Brown and Company on Laurel Street, and the Grove Tannery on River Street). The tanneries produced

skirting, harness, belting, bridle, and sole leather. As with the lime industry, however, the local tanneries' over-harvesting of local timber for barrel staves and fuel resulted in the industry's demise by the turn of the century.

These industries spawned the City's residential growth and infrastructure development during the 19th century. Beginning in the 1850s, Fred Hihn, who owned much of the area between Mission Hill and Beach Hill, developed land north of Lincoln Street. A water system began to develop in 1860, facilitating more residential and industrial growth. In the 1870s, housing and development expanded to the east side of the San Lorenzo River, the West Cliff area, Ocean View, and Riverside Avenue. Pacific Avenue also emerged as the business center for Santa Cruz and fostered the City's first Chinatown. In 1889, the Circles area, located southwest of Neary Lagoon, was laid out by Hihn as the first major geometric planned area in the City.

The economic focus of the City gradually shifted to tourism near the turn of the 19th century. The growth of local tourism was largely a result of railroad access to Santa Cruz County beginning in the late 1870s. Prior to this time, goods were transported and people accessed the area via ship or on narrow, rutted roads. Summer train traffic to Santa Cruz increased after 1894, when Santa Cruz received national attention in *Harper's Weekly* as a tourist destination.

Perhaps more than any other individual, Fred Swanton was responsible for developing Santa Cruz's tourism industry. Swanton, with investors including the Southern Pacific Railroad, formed the Santa Cruz Beach, Cottage, and Tent City Corporation. The corporation opened the Neptune Casino in 1904, but lost that enterprise to fire in 1906. The Casino was quickly rebuilt and reopened a year later. Swanton also built the Casa del Rey Hotel in 1910 across from the Casino to replace a "tent city," which had served as a popular tourist beach accommodation until that time. The Casa del Rey Hotel stood until the 1989 Loma Prieta earthquake, when it sustained extensive damage and was demolished soon after.

Swanton also helped establish the area's first telephone system in the 1880s and the Santa Cruz Electric Light and Power Company in 1890. Although the 1890s were an economically depressed time for the City, the street railroad was electrified and expanded during this period. Residences were also built along lines that stretched from downtown to Soquel Avenue and Seabright Avenue.

During the early 20th century, the popular beach attractions were built, including the Scenic Railway roller coaster in 1908 and the Giant Dipper Roller Coaster in 1924. World War II had a significant effect on the local economy. Tourism declined significantly in Santa Cruz due to travel restrictions and gasoline shortages. The Santa Cruz fishing economy, which was dominated by Italian immigrants, suffered as the result of Executive Order 9066, which established internment and relocation camps for Japanese, German, and Italian immigrants, including those who were United States citizens. Many Italian families were relocated inland from the waterfront and many of the fishing boats were abandoned or used in the war effort.

The commercial fishing industry never recovered after the war, although sport fishing remains a popular activity. The local tourist economy revived, with the Boardwalk undergoing major renovations in the 1950s and in 1981. The Boardwalk, which remains the focus of Santa Cruz's tourist industry, continues to operate with a mix of historic and modern amusement park attractions.

ARCHAEOLOGICAL RESOURCES

Pre-Historic Archaeological Resources

RECORDED RESOURCES

A records search identified a total of 27 documented archaeological sites in the General Plan planning area, of which 20 sites are prehistoric archaeological sites and seven sites are archaeological sites with both a prehistoric and historical component. The vast majority of these sites have not been systematically studied. Diocarbon and obsidian hydration data indicate that present-day Santa Cruz was occupied beginning in the Early Period, from at least 1750 B.C. and quite possibly earlier. Two sites are considered eligible for listing in the National Register of Historic Places based on the important information they contain for understanding the prehistory of the region.

The Native American Heritage Commission (NAHC) was contacted to request that the NAHC search their sacred lands file for any cultural resources in the General Plan planning area. The NAHC responded that the sacred lands file did not list cultural resources in the planning area.

NATIVE AMERICAN CONSULTATION

On behalf of the City of Santa Cruz, LSA contacted Native American tribes and tribal organizations pursuant to the requirements of California Government Code Section 65352.3 (implementation of Senate Bill 18). On September 12, 2006, LSA sent a letter to the Native American Heritage Commission (NAHC) in Sacramento requesting a Senate Bill 18 consultation list. On October 4, 2006, LSA sent letters to the tribes and tribal organizations identified by the NAHC to notify them of their opportunity to consult with the City regarding the General Plan Update. Two organizations, the Pajaro Valley Ohlone Indian Council and the Amah Mutsun Tribal Band, responded affirmatively to the letters and requested consultation with the City pursuant to Senate Bill 18. On November 3, 2006, representatives from the City and LSA met with representatives of the two tribal organizations: the Amah Mutsun Band of Ohlone/Costanoan Indians, represented by Mr. Valentin J. Lopez and the Pajaro Valley Ohlone Indian Council, represented by Mr. Patrick Orozco. Mr. Rob Edwards, Director of the Archaeology Technology Program at Cabrillo College, accompanied Mr. Orozco. The City, LSA, and tribal representatives discussed the nature of the project, the potential for impacts to cultural places, and outlined a process for continued consultation pursuant to Senate Bill 18 (LSA, December 2006).

ARCHAEOLOGICAL SENSITIVITY

LSA prepared an archaeological sensitivity map for the as part of the General Plan Update based. Three key factors were reviewed to determine areas that may be archaeologically sensitive: location of known recorded sites; proximity to water sources; and topography. The archaeologically sensitive areas also include: parcels on which previous studies identified (but did not formally record) archaeological materials; parcels within 65 feet of recorded archaeological deposits; and areas with concentrations of documented historical activity (e.g., the original Santa Cruz Mission lands and Mission Santa Cruz State Historic Park). Close sources

of water were a major factor that Native Americans took into account in locating habitation and resource processing sites, and was a key consideration in determining sensitivity zones.

Figure 4.9-1 illustrates archaeological sensitivity areas.[2] The "Highly Sensitive" areas are parcels with recorded archaeological deposits or confirmed archaeological sensitivity in which the property qualifies under any of the following three conditions: (1) the parcel contains all or portions of a recorded archaeological deposit; (2) the parcel lies wholly or partially within a 20-meter (65-foot) buffer around the boundaries of a recorded archaeological deposit;[3] or (3) the parcel contains unrecorded archaeological materials identified by an archaeologist during prior study. "Other Sensitive" designations apply to parcels that do not have recorded archaeological sites, but are located within sensitive areas based on the consultant's review and GIS analysis. Areas shown as "Discovery Requirement Only" are sites that have had professional archaeological investigations with negative results (i.e., no archaeological deposits were identified), but are located in sensitive areas. The remaining undesignated areas were determined not be archaeologically sensitive (LSA, December 2006).

Historic Archaeological Resources

BACKGROUND

The cultural resource review included characterization of the types of historical archaeological resources that may be associated with major historical periods in the project area. Historic development trends affect whether historical archeological deposits may be present. As previously indicated, two prominent historical periods occurred in Santa Cruz – the Mission Period and American Period. Mission Santa Cruz was established on the banks of the San Lorenzo River in September 1791, and quickly absorbed the surrounding Native American Ohlone population. Another colonial institution, Villa de Branciforte, was established on the other side of the San Lorenzo River across from Mission Santa Cruz in 1797. In 1834, the California missions were secularized, and Mission Santa Cruz lands came under the control of Villa de Branciforte.

Commercial development of Santa Cruz and the surrounding region was well under way by the time California became part of the United States in 1848 with redwood logging, sawmills, tanneries, and quarrying. By 1890 Santa Cruz's downtown business district and adjacent residential districts were built out. By 1925, areas west of the downtown and along the beach were developed, corresponding to the marketing of Santa Cruz as a popular seaside recreation destination. By 1940, Santa Cruz grew to most of the extent of its present area. After World War II, development occurred in the southwestern and northeastern portions of the city. Recent development has occurred along the City fringes, most closely associated with the founding of the UC campus in 1962.

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[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

[3] The buffer is provided to account for the possibility that unidentified portions of the recorded deposit may lie outside of its known boundaries and extend onto adjoining parcels.

Five historical archaeological property types are potentially found within the City's General Plan area. These include: residential, industrial, service/mercantile, social (saloons, theatres, etc.), and infrastructure/public space. Before the days of organized refuse collection, some of the properties may include features such as such as refuse pits, abandoned wells, cisterns, and outhouses (over privy vaults) which were used as receptacles of the by-products of everyday living such as discarded ceramics, food bones, containers of various materials, and other items. Properties may also contain architectural remains of structures, consisting of foundations, footings, platforms, and collapsed wood buildings.

Development of municipal water and sewage systems also affects whether historic archaeological deposits may be present. This an important factor in identifying sensitive areas in Santa Cruz because changes in the City's waste disposal and water service reduced the number of building occupants who relied on backyard privies and wells. These structures, often of great interest to archaeologists because of their contents, would not likely be constructed after the widespread availability of water and sewage facilities. Most of the General Plan Update area has the potential to contain vault privies and wells, although to a much lower degree in the extreme northeastern and western portions of the city.

HISTORIC ARCHAEOLOGICAL SENSITIVITY

Research conducted by LSA Associates indicates that most of the General Plan Update area has the potential to contain historical archaeological deposits. Some areas exceed this nominal potential and are categorized as sensitive, and other areas have heightened sensitivity due to the presence or proximity of recorded archaeological deposits. There are documented occurrences of archaeological deposits dating to the Spanish and Mexican periods in California. These eras are of high interest due to the relative paucity of intact, recoverable deposits associated with these periods. Sites associated with similar communities have had significant archaeological research value and have been found to be historically significant.

Figure 4.9-2 depicts those areas with sustained residential, institutional, industrial, and commercial activity during the Spanish and Mexican eras, including the Santa Cruz Mission and Villa de Branciforte. The second period began in 1848 when California was ceded to the United States under the Treaty of Guadalupe Hidalgo. Figure 4.9-2 also depicts the Historical American-Period Development Pattern at two points in time: 1866 and 1889. Figure 4.93 depicts the historical archaeological sensitivity areas in the City with both historic periods combined.

The following sites are included in the California Historical Landmarks: Site of Mission Santa Cruz, the site of Center of Villa Branciforte, and the Santa Cruz Beach Boardwalk (Office of Historic Preservation website).

HISTORICAL RESOURCES

As one of California's oldest settlements, founded in 1791, Santa Cruz has many historical buildings. As a result of the City's *Historic Preservation Plan*, adopted in 1974 as an element of the General Plan, the Historic Preservation Commission and the Historic Preservation Ordinance (Section 24.12.400 of the City's Zoning Ordinance) were established to protect the City's

historic resources. Historic districts may be designated pursuant to criteria and procedures in the Zoning Ordinance as further described below. The City of Santa Cruz has designated historic buildings and landmarks as further described below. Permits are required for alteration or demolition of listed historic buildings or landmarks pursuant to the City of Santa Cruz Municipal Code Chapter 24.08 requirements.

Historical Architectural Styles

Five styles—and several substyles—of architecture have been identified in the City:

- Spanish Mission and Spanish Colonial Style (1791-1846),
- Salt Box (c. 1850-1870),
- Romantic styles (c. 1850s-1920),
- Victorian styles (c. 1880s-1900), and
- Eclectic styles (1895-1975).

Mission period structures within the City consist of the Mission Adobe at Santa Cruz Mission State Historic Park and the Craig-Lorenzana Adobe on Branciforte Avenue. The oldest frame house in the City at 109 Sylvar was constructed circa 1850, and is an excellent example of the Salt Box-style homes scattered throughout the City. Several examples of Romantic architecture are found throughout the City, including on Mission, Washington, Cedar, Center, and Locust. Victorian is perhaps the most impressive historical architecture seen in the City, with the best examples downtown on Walnut Avenue and adjacent streets, Ocean View, and on Mission Street. Eclectic styled architecture draws its inspiration from Classical, Medieval, and Renaissance styles. Good examples of Eclectic styles, which include Colonial Revival, Mission and Spanish Colonial Revival, Bungalow, Craftsman, Moderne, and Vernacular, can be seen on Mission, Walnut, West Cliff Drive, Escalona, and King (LSA, December 2006).

Historic Districts

Historic districts may be designated pursuant to criteria and procedures in the Zoning Ordinance (Part 2 of Section 24.06). A proposed historic district must be a geographically definable area possessing a significant concentration or continuity of sites, buildings, structures, or objects unified by past events, or aesthetically by plan or physical development, and the collective value of the historic district taken together may be greater than the value of each individual structure. Additionally, Part 22 of Section 24.10 of the City's Zoning Ordinance sets forth parameters for establishing historic overlay districts within the City. The purpose of this district is to provide a means to preserve and enhance areas of historic, architectural, and engineering significance located within the city.

Existing and potential historic districts are shown on Figure 4.9-4. Currently there are designated local historic districts (Mission Hill and Downtown Neighborhood) and one National Register district (Cowell Limes Work District). Potential historic districts are located in the Beach Hill and Ocean View Street neighborhoods.

Historic Buildings and Landmarks

In 1976, the City completed a "Historic Building Survey," which identified and evaluated historic and architecturally significant buildings. The survey, conducted by the firm of Charles Hall Page and Associates, identified 306 properties, and structures were selected on the basis of historical and cultural, environmental and architectural significance. Volume I of the survey covered architectural development in the City from approximately 1850 to 1930. The Survey's evaluation of individual buildings considered historical and architectural significance, importance to the neighborhood, desecration of original design, and physical condition, and assigned each an overall rating of exceptional, excellent, good or fair. All properties in the 1976 survey were officially listed and protected under the City historic preservation policies and regulations (City of Santa Cruz, Historic Preservation Commission website).

In 1989, Volume II of the City Historic Building Survey was produced, which catalogues a total of 247 additional structures from three categories: significant buildings from 1930 to 1950; important structures not included in the first survey; and significant vernacular buildings from 1850 to 1910, the latter of which comprise approximately one half of the structures in Volume II. Neighborhood context was emphasized in Volume II, with a focus on contiguous rows of historic buildings. More than 90% of properties in Volume II of the Survey have been listed officially (City of Santa Cruz, Historic Preservation Commission website).

Currently, approximately 600 buildings are listed in the City's Historic Building Survey. Buildings of greatest historical and architectural significance have been designated "landmarks" pursuant to section 24.12.430 of the City's Zoning Ordinance. Currently there are 26 designated landmarks in the City as identified on Table 4.9-1. Fifteen properties are listed on the National Register of Historic Places, and one additional structure is listed on the California Register of Historic Places. The following sites are listed in the California Historical Landmarks: Site of Mission Santa Cruz, Site of Villa Branciforte.

PALEONTOLOGICAL RESOURCES

Paleontological resources are fossilized remains of plants and animals, and associated deposits. The Society of Vertebrate Paleontology has identified vertebrate fossils, their taphonomic and associated environmental indicators, and fossiliferous deposits as significant nonrenewable paleontological resources.

The cultural resources investigation conducted as part of the General Plan Update identified 48 vertebrate fossil localities within five miles of Santa Cruz. These localities have yielded 786 recorded vertebrate fossil specimens that have been found in the Santa Margarita Sandstone, Santa Cruz Mudstone, Purisima Formation, and from the Late Pleistocene terrace deposits in and near the General Plan planning area. Based on a literature review, four geologic units in the General Plan area are known to contain fossils: Late Pleistocene alluvium; the Purisima Formation; the Santa Cruz Mudstone; and the Santa Margarita Sandstone.

TABLE 4.9-1
City-Designated Landmarks and National Register Buildings (Updated June 2008)

ADDRESS	Volume*/Page	NAME/STYLE	DESINGATION
215 Beach	1/26	La Bahia Apartments	CLM
400 Beach	1/28	Roller Coaster & Carousel	NRHP
724 California	1/53	Thomas Weeks House	CLM
529 Chestnut	1/60	Hinds House	NRHP
401 Cliff	1/32	Cliffcrest	CLM
417 Cliff	1/34	H.S. Deming House	CLM
118 Cooper	1/89	Hall of Records/Octagon	CLM/NRHP
114 Escalona	1/104	Perry House	CLM
519 Fair	1/165	St. Elias Chapel/Shrine	CLM
844 Front	1/88	Veteran's Memorial	NRHP
850 Front	1/88	USPS	NRHP
333 Golf Club	na	Pogonip Club	Cal Landmark
123 Green	1/100	Reynolds-Hug-Sadler	CLM
1156 High	1/152-55	Cowell Lime Works	NRHP
203 Highland	1/105	McPheters House	CLM
1120 King	1/50	Byrne House	CLM
319 Laurel	1/76	Four Palms Apts	CLM
412 Lincoln	1/80	Cope Row Houses	CLM/NRHP
315 Main	na	Carmelita Cottages	CLM/NRHP
105 Mentel	1/139	Hagemann House	CLM/NRHP
207 Mission	1/92	Davis-Hasley House	CLM
1135 N. Branciforte	1/117	Dr. Carmean House	CLM
1351 N. Branciforte	1/118	Craig-Branciforte-Lorezana Adobe	NRHP
363 Ocean	1/129	Stick-Eastlake	NRHP
250 Ocean View	1/131	Captain Gray Home	CLM
1502 Pacific	1/86	Santa Cruz County National Bank	NRHP
1545 Pacific	2/58	Compass Rose Building	CLM
130 School	1/96	Neary-Rodriguez Adobe	CLM/NRHP
105 Sylvar	1/94	Willey House	CLM
109 Sylvar	1/95	Francisco Alzina House	CLM
924 Third	1/30	Golden Gate Villa	CLM/NRHP
304 Walnut	1/73	William Douglas Haslam House	CLM
101 Water	na	Town Clock	CLM
240 West Cliff	1/40	Period Bungalow	CLM
705 Woodrow	na	Garfield Park-Carnegie Library	CLM/NRHP

CLM – City Landmark NRHP – National Register of Historic Places

SOURCE: City of Santa Cruz

During the Pleistocene, 11,000 to 2.5 million years ago, the Coast Ranges of California were heavily uplifted, and locally, the sea carved a sequence of terraces into the hardened and uplifted Purisima and Santa Cruz Mudstone formations. The coastal cliffs represent the lowest and youngest terrace. These deposits along West Cliff Drive have yielded a whale vertebra and fossil shells (Perry, 1977). Paleontological resources also have been found within the City of Santa Cruz in a few other scattered locations near DeLaveaga Park and Moore Creek (Clark, 1981).

As shown on Figure 4.9-5, most sedimentary geological units in the General Plan planning area are highly sensitive for paleontological resources. Though Holocene alluvium is generally considered too young to contain paleontological resources, this geologic unit is moderately sensitive for paleontological resources because it is underlain by sedimentary geologic units that have a high paleontological sensitivity. The crystalline rocks that underlie the sedimentary rocks of the General Plan planning area have a low paleontological sensitivity because igneous and metamorphic rocks do not generally contain paleontological resources.

4.9.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address cultural resources. The draft *General Plan 2030* includes a HISTORIC PRESERVATION, ARTS & CULTURE chapter that sets forth two goals and 13 associated policies and actions that address archaeological, historic and paleonotological resources, as well as arts and cultural facilities. Two other goals address arts and cultural programs and the City's identity as an arts and culture community. The two goals related to cultural resources are:

GOAL HA1 *Protection and preservation of cultural resources:*

GOAL HA2 *Facilities for arts and culture.*

Policy HA1 seeks to protect cultural resources, including archaeological, paleontological and historical resources. Eleven supporting policies and action sets address these resources. The other goals and actions relate primarily to promotion of arts and cultural programs. Several policies and actions in other chapters of the proposed General Plan also seek to protect and preserve landmarks in the City (CD2.3.2 and CD3.5.1). The Draft General Plan also encourages the protection and preservation of traditional cultural properties (HA1.7), although this type of resource does not specifically fall under the definition of a historical resource under CEQA. Traditional Cultural Properties (TCP) are a special type of resource valued by living communities for culturally important reasons, especially if they embody or help reinforce that community's values, beliefs, and customs.

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except that three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street.

Land Use actions LU1.1.4 and LU1.1.5 address development and land use for specific sites: the Swenson property and the Golf Club Drive property, respectively. LU2.2.3 also includes addition of a 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center, but specific uses haven't been identified, although the site will not be used as part of

expansion of the landfill disposal area. Additionally, some of the draft *General Plan 2030* policies and actions support specific types of land uses and/or development. The draft plan supports development of a desalination plant as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (Policy CC3.1.3), but a specific site is not identified. See the WATER SUPPLY (Chapter 4.5) section of this EIR for further discussion regarding a potential desalination facility and impacts.

4.9.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

9a Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 or to a unique archaeological resources (see definition below);

9b Disturb any human remains, including those interred outside of formal cemeteries;

9c Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 (see definition below) to include physical demolition, destruction, relocation, or alteration of historic resources or of the immediate surroundings of historic resources, such that the significance of the resources would be materially impaired (see definition below); or

9d Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

CEQA defines a "*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:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information; or
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person (PRC §21083.2(g)).

State CEQA Guidelines Section 15064.5 defines a *historical resource* as:

- A resource listed in, or determined to be eligible for listing in, the California Register;
- A resource listed in a local register of historical resources.

- Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California…Generally, a resource shall be considered by the lead agency to be :historically significant." Generally a resource is considered historically significant if it meets criteria for listing in the California Register of Historical Resources, including:
  - Is associated with events that made a significant contribution to the broad patterns of California's history and cultural heritage.
  - Is associated with the lives of people important in our past.
  - 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.
  - Has yielded or may be likely to yield information important in prehistory or history; OR
  - A resource determined to be a historical resource by a project's lead agency.

CEQA Guidelines Section 15064.5(b) defines a "*substantial adverse change*" to a historical resource as: "physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired. The significance of an historical resource is *materially impaired* when a project demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register of Historical Resources or in registers meeting the definitions in Public Resources Code 5020.1(k) or 5024.1(g).

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address archaeological resources (9a, 9b); historical resources (9c); and paleontological resources (9d).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized in subsection 4.9.2 above. Buildout projections indicate that potential new development accommodated by the draft general plan to the year 2030 could total 3,350 residential units, 3,140,000 square feet of commercial, office and industrial development and new hotel rooms, primarily on infill and underutilized lots, as described in the PROJECT DESCRIPTION (Chapter 3.0) and LAND USE (Chapter 4.2) sections of this EIR.

Development under the proposed General Plan would primarily occur on remaining vacant infill sites, on underutilized properties that could be redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[4] approximately 55% of all new housing, 45% of new commercial development, and 52% of new office development would be located along these corridors.

Impact 4.9-1: Archaeological Resources and Human Remains
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could directly or indirectly disturb or alter archaeological resources, historical archaeological, and/or human remains. Even with implementation of the proposed General Plan policies and actions for cultural resource protection, this is considered a *potentially significant impact.*

The proposed *General Plan 2030* would accommodate future development pursuant to planned land use designations contained in the Plan. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could be redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan, more than half of the estimated new development would be located along major transportation corridors. Some segments along these corridors are located within mapped archaeological sensitivity areas as shown on Figure 4.9-1.

Although the City of Santa Cruz is primarily developed, except for a few remaining vacant lots located within developed areas, the following three areas within the planning area are primarily undeveloped or underdeveloped and would be subject to potential future development: the Swenson site adjacent to Antonelli Pond; the Golf Club Drive area adjacent to Pogonip Creek, and the area along Seventh Avenue that is within the City's Sphere of Influence (SOI), but outside city limits. The Swenson property and SOI area along Seventh Avenue are identified within potentially sensitive areas, and the Golf Club Drive area is within a sensitive area. The small addition to the landfill property is not within an archaeologically sensitive area.

Grading, trenching, and other subsurface construction activities associated with future development and buildout of the General Plan could have the potential to encounter undiscovered archaeological resources that could potentially be damaged or destroyed, especially in identified sensitive areas. The same development activities also have the potential to disturb or destroy burial sites if known or encountered in development areas. Additionally, historical archaeological resources representing different phases of Santa Cruz's history, including Spanish colonial, Mexican and American periods, may be encountered, especially with the sensitivity areas shown on Figure 4.9-3. Such deposits may be sufficiently intact to yield

[4] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development in specific areas in the City.

information important to the history of the City, which would qualify them for listing in the California Register, and thus, be considered historical resources.

The proposed *General Plan 2030* includes a number of policies and actions that serve to protect archaeological resources, and thus, mitigate potential impacts to archaeological resources and/or human remains that may occur as a result of development under the General Plan. These policies and actions seek to preserve, protect and manage archaeological sites and protect human remains. Additionally, Section 24.12.420 of the City's Municipal Code outlines procedures to be followed in the event that unknown archaeological resources are encountered during construction. This includes stopping work until the significance of the find is evaluated and appropriately mitigated, and/or appropriate contacts are made as specified in the event of discovery of human remains.

The General Plan policies and actions outlined in Table 4.9-2 and existing City regulations will serve to protect cultural resources that may be present or encountered as part of future development accommodated by the proposed General Plan. However, the proposed policies and actions do not provide guidance regarding when and how archaeological investigations should be implemented as part of future development proposals. Proposed Action HA1.2.1 calls for preparation of "informational materials for property owners regarding potential cultural resources and early development planning strategies", but the draft *General Plan 2030* does not include a process under which future development proposals would be screened for potential archaeological resources. Similarly, Policy HA1.5 requires that any archaeological work conducted within the City be performed by a qualified archaeologist, and companion Action HA1.5.1 calls for a review process for archaeological work and creation of guidelines for archaeological and historic reports, but the policy or action specifying when such reports would be required is absent.

The cultural resources background report prepared for the General Plan recommends that proposed development within designated "High Sensitivity" or "Sensitive" areas as shown on Figure 4.9-1 would be required to prepare an archaeological investigation prior to approval of development permits, except for exempt projects within "Sensitive" areas as further discussed below. The archaeological study would determine if a parcel contains archaeological deposits that meet the CEQA definition of historical or archaeological resources, and, if so, whether such deposits may be impacted by the permitted action. The study would also recommend ways to avoid or offset potential impacts.

No study would be required for those parcels outside the sensitive areas, including parcels identified on Figure 4.9-1 as "Discovery Requirement Only. For construction in these areas, as well as in areas not designated as "Highly Sensitive" or "Sensitive, the City's accidental discovery procedures (Municipal Code Section 24.12.430) would still apply for these parcels, should permitted construction encounter unidentified archaeological deposits. This regulation requires that construction be stopped if archaeological resources are encountered during construction, and that the Planning Director be notified and the discovery analyzed. If determined not be an archaeological resource, construction could proceed, but it is determined to be a resource, implementation of appropriate measures would be required.

TABLE 4.9-2
Proposed General Plan Policies & Actions
That Avoid or Reduce Cultural Resource Impacts

Type of Measure / Action	Policies / Actions
ARCHAEOLOGICAL SITE & RESOURCE PROTECTION	• Preserve archaeological sites: HA1.1, HA1.1.1 (Zoning regs), HA1.1.2 (sensitivity map updates) • Protect/manage archaeological resources in development: HA1.2, HA1.2.1 • Manage discovered archaeological sites: HA1.4 • Hold meetings with descendent communities for input on resource protection: HA1.3, HA1.3.1 • Archaeological review and report guidelines: HA1.5, HA1.5.1, HA1.5.2
DISTURBANCE TO HUMAN REMAINS	• Preserve archaeological sites: HA1.1 • Maintain & update Zoning Ordinance archaeological protection regulations & archaeological maps: HA1.1.1, HA1.1.2 • Protect human remains: HA1.4, HA1.4.1, HA1.4.2
HISTORICAL RESOURCE PROTECTION	• Protect, restore, rehab historic or architecturally significant buildings, sites, landmarks (HA1.8) through Zoning Ord regs and landmark status (HA1.8.1, HA1.8.2, HA1.8.3), information to property owners (HA1.8.4), incorporate historic features in public property (HA1.9.3), seek funding for preservation (HA1.11.4) • Identify/preserve landmarks: CD2.3.2, HA1.8.5 (for Nat'l & State Register properties) • Ensure compatible development within historic districts: HA1.9 • Historic building preservation guidelines: HA1.9, HA1.9.2 • Maintain & expand historic districts: LU3.9.4 • Consider historic preservation in City regulations: H1.11.6 • Incentives for listing, preservation and/or rehab of architecturally significant buildings, sites and landmarks: HA1.11, HA1.11.1, HA1.11.3, HA1.11.5 •
PALEONTOLOGICAL RESOURCE PROTECTION	• Preserve paleontological sites: HA1.1 • Maintain & update Zoning Ordinance for paleontological protection regulations & sensitivity maps: HA1.1.1, HA1.1.2 • Protect/manage paleontological resources in development: HA1.2, HA1.2.1

The cultural resources background report also recommends that small projects be exempt from requirements of an archaeological study within areas designated as "Sensitive". These projects generally include uses with minimal potential for impacting archaeological deposits, such as spot excavation to a depth of 12 inches or less below existing grade, or uses that have virtually no potential of resulting in significant impacts to archaeological deposits. Examples of possible exemptions include, but are not limited to: minor building additions, deck construction, excavation in soil that can be documented as previously disturbed. If development is within a "High Sensitivity" area, it was suggested that the City may elect to forego the archaeological

study and instead require that an archaeologist review initial ground clearance and excavation to identify archaeological deposits prior to extensive ground disturbance. Those uses that qualify for a small projects exemption would still be conditioned with the requirement to identify, evaluate, and, if necessary, mitigate impacts to accidental archaeological discoveries.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in construction that may result in impacts to buried archaeological resources. Implementation of the proposed General Plan policies and actions outlined above, as well as compliance with local and state regulations, would help reduce impacts. However, the proposed Plan does not specify a process for evaluating potential archaeological resources during the development process, and thus the impact is potentially significant.

Mitigation Measures

Implementation of Mitigation Measure 4.9-1 below, in conjunction with implementation of the proposed General Plan policies and actions and compliance with local regulations, will mitigate potential impacts of future development on archaeological resources to a less-than-significant level.

MITIGATION 4.9-1 Add Action HA1.2.2 that establishes a procedure for preparing archaeological investigations as follows:

HA1.2.2 Require preparation of archaeological investigations on sites proposed for development within areas identified as "Highly Sensitive" or "Sensitive" on the "Areas of Archaeological Sensitivity" and "Historical Archaeology Sensitivity" maps, except for exempt uses within "Sensitive" areas as described below, prior to approval of development permits. The investigation shall include archival research, site surveys and necessary supplemental testing as may be required, conducted by a qualified archaeologist. The significance of identified resources shall be ascertained in accordance with CEQA definitions, and impacts and mitigation measures outlined if significant impacts are identified, including, but not limited to recovery options and onsite monitoring by an archaeologist during excavation activities. A written report describing the archeological findings of the research or survey shall be provided to the City.

Allow minor projects with little excavation to be exempt from this requirement for preparation of an archaeological assessment within designated "Sensitive" areas, but not within the "High Sensitivity" areas. Minor projects generally involve spot excavation to a depth of 12 inches or less below existing grade, or uses that have virtually no

potential of resulting in significant impacts to archaeological deposits. Exempt projects may include: building additions, outdoor decks, or excavation in soil that can be documented as previously disturbed.

Impact 4.9-2: Historical Resources
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could directly or indirectly disturb or alter historical resources. With implementation of the proposed General Plan policies and actions for historic resource protection, this is considered a *less-than-significant impact.*

Future development accommodated by the proposed *General Plan 2030* could potentially damage, degrade, or destroy the historic integrity of historical resources, especially along the mixed-use corridors where historic buildings may be present. Redevelopment of existing developed sites may result in removal of or damage to historic structures. As indicated above, approximately one-half of the anticipated future development would occur along existing road corridors in which historic or older buildings may be located.

The proposed *General Plan 2030* includes a number of policies and actions that serve to protect historical resources, and thus, mitigate potential impacts to these resources that may occur as a result of development under the General Plan. These policies and actions are summarized in Table 4.9-2. In particular, Policies HA1.8 and HA1.9 and supporting actions, seek to protect, restore, and/or rehabilitate historic or architecturally significant buildings, sites, and landmarks; ensure compatible development within historic districts; and utilize historic building preservation guidelines. The draft plan also promotes incentives for listing and rehabilitation of significant buildings (HA1.11 and actions). Several policies in the Land Use and Community Design sections of the draft *General Plan 2030* (as noted on Table 4.9-2) also seek to maintain and expand historic districts and landmarks (LU3.9.4, CD2.3.2).

The General Plan policies and actions outlined in Table 4.9-2 will serve to protect cultural resources that may be present or encountered as part of future development accommodated by the proposed General Plan. Additionally, compliance with local regulations regarding historic alteration or demolition permits will also serve as the mechanism for review of projects that may alter existing historical resources. The draft Plan does call for updating the Zoning Ordinance to simplify and streamline the review process for a Historic Alteration Permit (HA1.11.2), although this shouldn't affect the basic intent of the regulations to protect historic resources.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in construction that may result in impacts to historic resources. Compliance with local regulations regarding protection of historic resources, and implementation of the proposed General Plan policies and actions outlined above, would reduce impacts to a less-than-significant level.

Mitigation Measures

No mitigation measures are required a significant impact has not been identified.

Impact 4.9-3: Paleontological Resources
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could directly or indirectly disturb or alter paleontological resources. Even with implementation of the proposed policies and actions for cultural resource protection, this is considered a *potentially significant impact.*

Potential development that could occur under the proposed General Plan is described above under the Impact 4.9-1 analysis. Excavation activities may also have the potential to damage or destroy paleontological resources if present.

The proposed *General Plan 2030* includes a number of policies and actions that serve to protect archaeological resources, and thus, mitigate potential impacts to paleontological resources as a result of development under the General Plan. In particular, Policy HA1.1 and associated actions seek to preserve, protect and manage paleontological resources. However, the proposed policies and actions do not provide guidance on how such protection and/or management would occur, especially as a result of development projects. The cultural resources review recommends that permit applicants within paleontologically sensitive areas (as shown on Figure 4.9-5) be provided notification of the potential for encountering paleontological resources during construction and procedures to follow if such resources are found.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in construction that may result in impacts to buried paleontological resources. However, with implementation of the proposed General Plan policies and actions outlined above, impacts would be reduced. However, the proposed plan does not specify a process for evaluating potential paleontological resources during the development process, and thus the impact is potentially significant.

Mitigation Measures

Implementation of the proposed General Plan policies and actions outlined above, and Mitigation Measure 4.9-2 identified below will mitigate potential impacts of future development to a less-than-significant level.

MITIGATION 4.9-2 Add Action HA1.2.3 that establishes a procedure for preparing archaeological investigations as follows:

HA1.2.3 The City shall notify applicants within paleontologically sensitive areas of the potential for encountering such resources during construction and condition approvals that

work will be halted and resources examined in the event of encountering paleontological resources during construction. If the find is significant, the City should require the treatment of the find in accordance with the recommendations of the evaluating paleontologist. Treatment may include, but is not limited to, specimen recovery and curation or thorough documentation.

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4.10 GEOLOGY & SOILS

4.10.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Geologic Setting
- Seismic Hazards
- Non-Seismic Geologic Hazards
- Soils & Erosion

This section summarizes technical geologic and soils conditions prepared in a report by Nolan Associates that is included in technical Appendix F-4, which is available for review at the City of Santa Cruz Planning Department[1] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com - Planning Department link..

REGULATORY SETTING

Federal Regulations

The Uniform Building Code (UBC) is published by the International Conference of Building Officials. It forms the basis of about half of the state building codes in the United States, including California's, and has been adopted by the California Legislature together with Additions, Amendments, and the Repeals to address the specific building conditions and structural requirements in California.

The UBC defines different regions of the United States and ranks them according to their seismic hazard potential. There are four types of these regions, which include Seismic Zones 1 through 4, with Zone 1 having the least seismic potential, and Zone 4 having the highest seismic potential. Further, the UBC provides guidance on foundation design and structural engineering for a variety of soils.

The Federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390), adopted by Congress in October 2000, requires state and local governments to develop hazard mitigation plans as a condition for federal grant assistance. The City of Santa Cruz adopted its "Local Hazard Mitigation Plan" in September 2007. The detailed five-year plan identifies potential natural and man-made hazards, assesses their likely risk, and includes mitigation methods to reduce risks. The potential hazards identified in the plan include earthquakes and liquefaction, wildfires, floods and associated coastal storms, coastal erosion, drought, tsunami, dam failure,

[1] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1to 5 PM.

and landslides. Mitigation measures proposed to address these risks include prioritized actions that include hazard event planning, emergency prepardedness coordination and education, facility upgrades, monitoring actions and other actions in response to specific hazards.

The City of Santa Cruz adopted its "Local Hazard Mitigation Plan" in September 2007. The five-year plan addresses earthquakes and liquefaction, coastal erosion and landslides.

State Regulations

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

The Alquist-Priolo Earthquake Fault Zoning Act was passed by the state of California in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The purpose of the act is to prevent the construction of buildings used for human occupancy over the surface trace of active faults. The Act requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps. Local agencies must regulate most development projects within the zones. Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (generally 50 feet), although local agencies can be more restrictive than state law requires (California Department of Conservation, 2007a). There are no state-delineated Alquist-Priolo fault zones in the City of Santa Cruz.

SEISMIC HAZARDS MAPPING ACT

The Seismic Hazards Mapping Act (SHMA) addresses non-surface fault rupture earthquake hazards, including strong ground shaking, liquefaction, and seismically induced landslides. The goal is to mitigate seismic hazards to protect public health and safety. Pursuant to the SHMA, the state Department of Conservation is directed to provide local governments with seismic hazard zone maps that identify areas susceptible to amplified shaking, liquefaction, and earthquake-induced landslides or other ground failures. Site-specific geotechnical hazard investigations are required by SHMA when construction projects fall within these areas. Neither the City of Santa Cruz nor any part of Santa Cruz County is located within a currently designated state-Seismic Hazard Mapping Program zone (California Department of Conservation, 2007b).

CALIFORNIA BUILDING CODE

Title 24 of the California Code of Regulations, formerly known as the California Building Code (CBC), sets forth minimum requirements for building design and construction in public buildings and a large percentage of private buildings. In the context of earthquake hazards, the CBC design standards have a primary objective of ensuring public safety and a secondary goal of minimizing property damage and maintaining function during and following a seismic event. The CBC prescribes seismic design criteria for different types of structures, and provides methods to obtain ground motion inputs. The CBC also requires analysis of liquefaction potential, slope-instability, differential settlement, and surface displacement due to faulting or lateral spreading for various categories of construction. Recognizing that the risk of severe seismic ground motion

varies from place to place, the California Building Standards Code seismic code provisions vary depending on location (Seismic Zones 0, 1, 2, 3, and 4—with 0 being the least stringent and 4 being the most stringent). The City of Santa Cruz is located in Seismic Zone 4.

CALTRANS SEISMIC SAFETY RETROFIT PROGRAM

The California Department of Transportation (Caltrans) Seismic Safety Retrofit Program was established by emergency legislation (SB 36X) after the October 17, 1989, Loma Prieta earthquake. The purpose of this program is to evaluate all publicly owned bridges in California and to take actions necessary to prevent their collapse due to earthquakes. The local component of the Seismic Safety Retrofit Program provides funding and other assistance to cities and counties for evaluating bridges and improving their resistance to seismic shaking. The City of Santa Cruz has completed seismic retrofits for all its bridges, except for the Murray Street Bridge, which is planned to commence construction in 2012-2013 .

Local Regulations

The City's Municipal Code Chapter 24.14 (Environmental Resource Management) includes "Conservation Regulations." Section 24.14.030 provides "Slope Regulations" to minimize risks associated with development in areas characterized by combustible vegetation and steep and/or unstable slopes. Generally, areas with 30+ percent slopes cannot be included in the density determination for a project and prohibits development in areas of 30+ percent slopes. The regulations also include setback requirements for buildings near 30-50+ percent slopes. Section 24.14.070 requires a site-specific geotechnical investigation for all development, except projects with less than four units, in areas identified in the General Plan as having a high liquefaction potential. Section 24.16.060 requires an erosion control plan for projects located within high erosion hazard areas as designated in the General Plan or for development on slopes greater than ten percent.

The Grading Ordinance is a subset of Title 18, Buildings and Construction, of the City's Municipal Code and is included in Chapter 18.45 – Excavation and Grading Regulations." It provides technical regulations of grading and excavation, in conjunction with the Environmental Resource Management provisions in Chapter 24.14, in order to safeguard life, health, safety and the public welfare; protect fish and wildlife, riparian corridors and habitats, water supplies, and private and public property, and to protect the environment from the effects of flooding, accelerated erosion and/or deposition of silt. The ordinance accomplishes this by providing guidelines, regulations, and minimum standards for clearing, excavation, cuts, fills, earth moving, grading operations (including cumulative grading), water runoff and sediment control. In addition, the ordinance includes provisions regarding administrative procedures for issuance of permits and approval of plans and inspections during construction and subsequent maintenance. The City revised the Grading Ordinance in April 2004 in order to strengthen the ordinance regarding implementation of BMPs, including those for erosion and sediment control.

GEOLOGIC SETTING

Physiographic Setting

The City of Santa Cruz lies on a narrow coastal plain at the mouth of the San Lorenzo River Valley on the northern shore of the Monterey Bay. The coastal plain is bounded landward by the Santa Cruz Mountains, rising to elevations over 2,600 feet. The San Lorenzo River flows southward from the Santa Cruz Mountains and is the largest drainage in the region, with an area of about 106 square miles. The central district of the City of Santa Cruz is situated on floodplain of the lower San Lorenzo River.

Most of the City lies on a relatively flat topographic bench to the east and west of the San Lorenzo River valley. This bench was formed by marine wave erosion at a time when the land was lower relative to sea level than at present. The bench, referred to as a marine terrace, was preserved by gradual uplift of the region. This terrace is separated from successively higher (older) terraces by steep slopes that mark ancient sea cliffs. The older terraces ascend stair-step like up the mountain front bordering the City to the north.

The lowermost of these terraces forms a broad, gently seaward sloping surface that terminates in a sea cliff at the modern shoreline. This modern seacliff, or coastal bluff, is a result of wave erosion that is cutting a new marine terrace offshore. The upper west side of the City and the Delaveaga Golf Course are situated on an older, higher marine terrace. The marine terrace surfaces are cut by a series of south flowing seasonal streams that occupy smaller stream valleys.

Regional Setting

REGIONAL GEOLOGIC SETTING

The City of Santa Cruz is situated on the southwestern slope of the central Santa Cruz Mountains, part of the Coast Ranges physiographic province of California. The northwest-southeast structural grain of the Coast Ranges is controlled by a complex of active faults within the San Andreas fault system. Southwest of the San Andreas fault, the Coast Ranges, including the Santa Cruz Mountains, are underlain by a large, northwest-trending, fault-bounded, elongated prism of granitic and metamorphic basement rocks. The granitic and metamorphic basement is Cretaceous in age, or older, and is overlain by a sequence of dominantly marine sedimentary rocks of Paleocene to Pliocene age and non-marine sediments of Pleistocene and Holocene age. The older sedimentary rocks are moderately to strongly deformed, with steep-limbed folds and several generations of faults associated with uplift of the Santa Cruz Mountains.

The Santa Cruz Mountains are cut by several active faults, of which the San Andreas is the most important (see Figure 4.10-1[2], Regional Seismicity Map). Along the coast, the ongoing tectonic activity is most evident in the gradual uplift of the coastline, as indicated by the series of uplifted marine terraces that sculpt the coastline.

[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

REGIONAL SEISMIC SETTING

California's broad system of strike-slip faulting has a long and complex history. Locally, the San Andreas, Zayante-Vergeles and San Gregorio faults and the Monterey Bay-Tularcitos fault zone present a significant seismic hazard to the City (see Figure 4.10-1). These faults are associated with Holocene activity (movement in the last 11,000 years) and are therefore considered to be active. The most severe historical earthquakes to affect the project site are the 1906 San Francisco earthquake and the 1989 Loma Prieta earthquake, with Richter magnitudes of about 8.3 and 7.1, respectively.

City of Santa Cruz Geologic Setting

GEOLOGIC UNITS & STRUCTURE

A geologic map of the City of Santa Cruz is depicted on Figure 4.10-2. The geology of the City and surrounding area displays over 100 million years of geologic history. Rock units in the City are separable into three major groups: granitic intrusive rocks of Late Cretaceous age, pre-Cretaceous metasedimentary rocks, and sedimentary rocks of Tertiary and Quaternary age. The granitic intrusive rocks form the core of Ben Lomond Mountain and underlie the City at depth. These rocks formed from molten rock (magma) that melted its way upward from deep in the earth's crust and then cooled underground, forming granitic rock. The metamorphic and granitic rocks are observed outcropping along the northwestern margins of the City.

The younger sedimentary rocks (Tertiary and Quaternary age) are draped over the older granitic and metamorphic bedrock. The Tertiary rock units include the Santa Margarita Sandstone, the Santa Cruz Mudstone, and sandstones of the Purisima Formation (see Figure 4.10-2). Surficial Quaternary deposits locally overly the Tertiary units. These units include marine terrace deposits, stream or river alluvium, and landslide deposits. The marine terrace deposits directly underlie much of the City, and generally range from a few feet thick to at most a few tens of feet thick. They consist of marine sands, including ancient beach sands, deposited while the marine terrace was being carved by the ocean, and colluvium deposited over the marine sands after the terrace was exposed by falling sea levels. Soil (residuum) derived from weathering of all the older geologic units is present in thicknesses up to a few feet throughout the area.

The older igneous and metamorphic rocks are highly deformed, with many cross-cutting faults and folds. The tectonic forces responsible for the deformation seen in these rocks, however, have long since dissipated and the faults are no longer considered active. The sedimentary rocks overlying the granitic and metamorphic basement, principally the Santa Margarita Sandstone, the Santa Cruz Mudstone, and the Purisima Formation, are younger Tertiary age rocks and, locally, have experienced only gentle uplift and very mild folding. In most exposures, the layering in these rocks is near horizontal.

The only fault mapped within the boundaries of the City is the Ben Lomond fault. This fault trends southward from its intersection with the Zayante fault down the San Lorenzo Valley towards Santa Cruz. The fault has only been confidently mapped as far south as Felton, several miles north of Santa Cruz, but Stanley and McCaffrey (1983) extended the fault

southward through the City into Monterey Bay, based largely on geophysical (indirect) evidence. Vertical movement on the fault, west side up, is thought to be responsible for uplift and tilting of the granitic rock mass that forms Ben Lomond Mountain. Most of the movement occurred on this fault prior to about six million years ago, and it is not presently considered to be active.

SURFACE PROCESSESS

Surficial geologic processes in the area include weathering, erosion, and mass wasting (landsliding). Weathering of surficial materials and erosion by wind and water are the principal processes active in developing natural landscapes. When erosion leads to the development of steep slopes, landsliding may occur. In turn, landsliding breaks up the rock formations on the slope, leading to additional weathering and erosion. Landslides from the County of Santa Cruz landslide map occurring within the City are depicted on Figure 4.10-3.

KARST TERRAIN

The northwest portion of the City is partially underlain by marble bedrock. Marble is distinct from other bedrock types in the area because it is soluble in water. Consequently, percolating ground water will gradually dissolve channels in the rock, resulting in underground conduits and caverns. Where these conduits or caverns intersect the ground surface, sinkholes result. Another aspect of areas underlain by marble is that the surface drainage system may be poorly developed or absent due to the capture of surface runoff by sinkholes. Where sinkholes intercept streams, they are known as swallow holes. A landscape that is dominated by features associated with soluble bedrock is known as karst terrain.

Karst terrain in the Santa Cruz area is of limited extent. Very large areas of the southeastern United States are underlain by karst terrain, and the sudden, spectacular collapse of large sinkholes is a potential hazard there. Most of the karst terrain in Santa Cruz lies on the University of California campus and in a few neighborhoods immediately south of the campus. Sinkholes associated with the karst terrain in the Santa Cruz area are not of great size, and they tend to develop gradually over time, rather than by sudden collapse. However, local sinkholes are often filled with fine grained sediment that has washed into the sinkhole from adjacent terrain. The sinkhole fill can prevent the sinkholes from being recognized. Soil settlement associated with filled sinkholes can damage buildings and other development.

Water flowing through the karst conduits in the marble emerges at the surface in form of springs where the downhill margins of marble outcrop are bounded by relatively impermeable rocks. The springs at Kalkar Quarry and the spring feeding Westlake are examples of such springs. Besides gradual settlement of sinkhole fill, there can also be problems associated with groundwater surfacing under buildings or roads in these areas, especially during the winter rains.

SEISMIC HAZARDS

The City of Santa Cruz is located in a seismically active region of California. Historical earthquakes along the San Andreas fault and its branches have caused substantial seismic

shaking in Santa Cruz County in historical time. The two largest historical earthquakes to affect the area were the moment magnitude (Mw) 7.9 San Francisco earthquake of April 18, 1906 and the Mw 6.9 Loma Prieta earthquake of October 17, 1989 (corresponding to Richter magnitudes of 8.3 and 7.1) . The San Francisco earthquake caused severe seismic shaking and structural damage to many buildings in the Santa Cruz Mountains. The Loma Prieta earthquake may have caused more intense seismic shaking than the 1906 event in localized areas of the Santa Cruz Mountains, although its regional effects were not as extensive. There were also major earthquakes in northern California along or near the San Andreas fault in 1838, 1865, and possibly 1890. Further description of regional faults and seismic hazards is provided below.

Faults

SAN ANDREAS FAULT

The San Andreas fault is active and represents the major seismic hazard in northern California. The main trace of the San Andreas fault trends northwest-southeast and extends over 700 miles from the Gulf of California through the Coast Ranges to Point Arena, where the fault passes offshore and merges with the Cascadia fault zone. Surface rupture during historical earthquakes, fault creep, and historical seismicity confirm that the San Andreas fault and its branches, the Hayward, Calaveras, and San Gregorio faults, are all active today.

Geologists have recognized that the San Andreas fault system can be divided into segments with "characteristic" earthquakes of different magnitudes and recurrence intervals. Two overlapping segments of the San Andreas fault system represent the greatest potential hazard to the City of Santa Cruz. The first segment is defined by the rupture that occurred from Mendocino to San Juan Bautista along the San Andreas fault during the great Mw 7.9 San Francisco earthquake of 1906; it has been suggested that this "1906 rupture" segment experiences earthquakes with comparable magnitudes about every 200 years. The second segment is defined approximately by the rupture zone of the Mw 6.9 Loma Prieta earthquake; it has been posited that earthquakes of Mw 7.0 on this segment of the fault have a recurrence interval of 138 years.

ZAYANTE-VERGELES FAULT

The Zayante fault lies southwest of the San Andreas fault and trends about 50 miles northwest from the Watsonville lowlands into the Santa Cruz Mountains (see Figure 4.10-1). The postulated southern extension of the Zayante fault, known as the Vergeles fault, merges with the San Andreas fault south of San Juan Bautista. Stratigraphic and geomorphic evidence indicates that the Zayante-Vergeles fault has undergone late Pleistocene and Holocene movement and is potentially active.

Some historical seismicity may be related to the Zayante-Vergeles fault. A magnitude 4.0 earthquake in 1998 in the Santa Cruz Mountains occurred on the Zayante fault. The Zayante-Vergeles fault should be considered active for design purposes, and is capable of generating an Mw 6.8 earthquake with a recurrence interval of almost 9,000 years.

SAN GREGORIO FAULT

The San Gregorio fault cuts the ocean floor seaward of Monterey Bay and skirts the Santa Cruz County coastline before coming on land at Point Año Nuevo. North of Año Nuevo it passes offshore, intersecting the coast again at Half Moon Bay (see Figure 4.10-1). North of Half Moon Bay, the San Gregorio fault lies offshore until it connects with the San Andreas fault near Bolinas. Southward from Monterey Bay, the San Gregorio fault intersects the coast at Point Sur and eventually connects with the Hosgri fault in south-central California.

The onshore segments of the San Gregorio fault at Point Año Nuevo and at Half Moon Bay show evidence of late Pleistocene and Holocene displacement. In addition to stratigraphic evidence for Holocene activity, the historical seismicity in the region is partially attributed to the San Gregorio fault. Due to inaccuracies of epicenter locations, the magnitude 6+ earthquakes of 1926, tentatively assigned to the Monterey Bay fault zone, may have actually occurred on the San Gregorio fault. The San Gregorio fault in the Santa Cruz County area has a recurrence interval of 400 years with the potential to generate a Mw 7.2 earthquake.

MONTEREY BAY-TULARCITOS FAULT ZONE

The Monterey Bay-Tularcitos fault zone is based on a postulated connection between the Tularcitos fault, located on land near the Monterey Peninsula, and the offshore Monterey Bay fault zone (see Figure 4.10-1). The Monterey Bay fault zone is 6 to 9 miles wide and about 25 miles long.

Both offshore and onshore fault traces in this zone have displaced Quaternary age rock layers and, therefore, are considered potentially active. One offshore trace, which aligns with the trend of the Navy fault, has displaced Holocene beds and is therefore considered active. Seismically, the Monterey Bay-Tularcitos fault zone may be historically active. The largest historical earthquakes tentatively located in the Monterey Bay-Tularcitos fault zone are two events, estimated at 6.2 on the Richter Scale, in October 1926. Because of possible inaccuracies in locating the epicenters of these earthquakes, it is possible that these earthquakes actually occurred on the nearby San Gregorio fault. Another earthquake in April 1890 might be attributed to the Monterey Bay-Tularcitos fault zone. An earthquake of Mw 7.1-7.3 may be expected on the Monterey Bay-Tularcitos fault zone, with an effective recurrence interval of 2,600-2,800 years, based on Holocene offsets noted on an offshore strand of the fault.

Seismic Hazards

Potential seismic hazards include fault rupture, strong seismic shaking, soil liquefaction and related types of seismically induced ground failure, and tsunami. These hazards are discussed individually, below.

GROUND SURFACE RUPTURE DUE TO FAULTING

Earthquakes are caused by slippage along faults, or cracks, in the earth's crust. Where the fault intersects the ground surface, this slippage causes offset of the ground surface that can damage or destroy structures placed over the fault. The only suspected fault trace crossing through the City is the southern extension of the Ben Lomond fault, but it is not considered to be

active and therefore any risk of ground surface rupture across the fault trace must be considered low. Ground surface rupture due to faulting is, therefore, not considered a significant risk in the City of Santa Cruz.

SEISMIC SHAKING HAZARD

For the purpose of evaluating seismic shaking potential in the City, this discussion focuses on the San Andreas, Zayante-Vergeles, San Gregorio, and Monterey Bay-Tularcitos fault systems (see Figure 4.10-1). These faults are considered active seismic sources by the State of California. While other faults in this region may be active, their potential contribution to seismic hazards in the City is overshadowed by these four larger or closer faults. The distances between these faults and the City center are listed in Table 4.10-1, as is the maximum expected earthquake size and the approximate time interval between major earthquakes on each fault. All of these faults are considered capable of magnitude (M) 6.5 or larger earthquakes.

Table 4.10-1
Distances and Directions to Local Faults

Fault	Distance from site (miles)	Maximum Expected Earthquake Magnitude (Moment Magnitude)	Approximate Time Between Major Earthquakes (years)
San Gregorio	9.9	7.2	400
Zayante-Vergeles	7.9	7.9	8821
Monterey Bay-Tularcitos	6.5	6.5	2841
San Andreas	11.2	7.9	210

Source: Nolan Associates

A qualitative measure of earthquake shaking intensity is provided by the Modified Mercalli Intensity Scale (Table 4.10-2). The Mercalli Scale (and other, similar qualitative scales) provides a way to gauge earthquake shaking intensity based on verbal or published descriptions of earthquake damage. It was the principal means of measuring earthquake size before the advent of seismograph arrays in the early 20th Century. Modified Mercalli Intensities of VIII (8) to IX (9) were measured in the City of Santa Cruz for the 1989 Loma Prieta and 1906 San Francisco earthquakes, respectively. Similar shaking intensities are expected in future earthquakes.

The principal factors which affect the severity of seismic shaking in a given area are the magnitude of the earthquake and the distance from the earthquake source to the location of interest. All of the listed faults, because of the size and proximity to the City, are significant potential sources of strong seismic shaking. Another factor which affects the intensity of shaking is the type of geologic materials underlying the site. Certain types of earth materials can amplify or dampen shaking.

There are two methods for estimating the intensity of seismic ground motions that may be expected at a site: "deterministic" and "probabilistic". A deterministic approach estimates the magnitude of the most severe shaking that can reasonably be expected at a particular site, without regard for the likelihood that such shaking will occur. In this type of analysis, the largest earthquake thought credible on each fault is assumed to occur on the portion of the fault nearest the site.

Table 4.10-2
Modified Mercalli Intensity Scale

The modified Mercalli scale measures the intensity of ground shaking as determined from observations of an earthquake's effect on people, structures, and the Earth's surface. This scale assigns to an earthquake event a Roman numeral from I to XII as follows:	
I	Not felt by people, except rarely under especially favorable circumstances.
II	Felt indoors only by persons at rest, especially on upper floors. Some hanging objects may swing.
III	Felt indoors by several. Hanging objects may swing slightly. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Felt indoors by many, outdoors by few. Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing automobiles rock. Windows, dishes, doors rattle. Wooden walls and frame may creak.
V	Felt indoors and outdoors by nearly everyone; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset; some dishes and glassware broken. Doors swing; shutters, pictures move. Pendulum clocks stop, start, change rate. Swaying of tall trees and poles sometimes noticed.
VI	Felt by all. Damage slight. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks and books fall off shelves; pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked.
VII	Difficult to stand. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary buildings; considerable in badly designed or poorly built buildings. Noticed by drivers of automobiles. Hanging objects quiver. Furniture broken. Weak chimneys broken. Damage to masonry; fall of plaster, loose bricks, stones, tiles, and unbraced parapets. Small slides and caving in along sand or gravel banks. Large bells ring.
VIII	People frightened. Damage slight in specially designed structures; considerable in ordinary substantial buildings, partial collapse; great in poorly built structures. Steering of automobiles affected. Damage or partial collapse to some masonry and stucco. Failure of some chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed pilings broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	General panic. Damage considerable in specially designed structures; great in substantial buildings, with some collapse. General damage to foundations; frame structures, if not bolted, shifted off foundations and thrown out of plumb. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground; liquefaction.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Landslides on river banks and steep slopes considerable. Water splashed onto banks of canals, rivers, lakes. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Few, if any masonry structures remain standing. Bridges destroyed. Broad fissures in ground; earth slumps and landslides widespread. Underground pipelines completely out of service. Rails bent greatly.
XII	Damage nearly total. Waves seen on ground surfaces. Large rock masses displaced. Lines of sight and level distorted. Objects thrown upward into the air.

A probabilistic analysis considers the likelihood that a certain earthquake will occur and includes other uncertainties, such as epicentral location, as part of the overall probability. The advantage of a probabilistic analysis over a deterministic analysis is that the probabilistic estimate specifies the intensity of ground motion that is likely to occur during the design life of a project, rather than the greatest intensity that is ever likely to occur. Using probabilistic ground motions, a building may be designed for the shaking intensity that has a reasonable likelihood of occurring during the building lifetime, rather than a maximum value that has very little likelihood of occurring. In most cases, the probabilistically predicted ground motion is lower than the deterministic ground motion. However, in Santa Cruz County, the San Andreas fault produces large earthquakes so often that the deterministic and probabilistic ground motion values tend to be very similar.

Ground motion probabilities are commonly expressed as the probability of exceedance in a given time period. In the past, ground motion with a probability of exceedance of 10% in 50 years has been considered appropriate for design for most residential and commercial development. This probability level means that there is only a 10% chance that the specified ground motion will be exceeded in a 50-year period. For more critical structures, such as hospitals, a much lower probability level (higher ground motion) is specified for design.

The U.S. Geological Survey and the California Division of Mines and Geology have prepared a probabilistic seismic hazard assessment for the state of California. Probabilistic ground motions with 10% in 50 years and 2% in 50 years probability of exceedance are summarized in Table 4.10-3. These numbers can be compared to ground accelerations measured during the Loma Prieta earthquake, Table 4.10-4.

Table 4.10-3
Predicted Seismic Ground Motions in Soft Rock

Probability	Mean Peak Horizontal Ground Acceleration, City Center (g)
10% probability of Exceedance in 50 years	0.41
2% probability of Exceedance in 50 years	0.63

Table 4.10-4
Seismic Ground Motions Measured During the Loma Prieta Earthquake

Measurement Site	Peak Ground Acceleration	Earth Material at Measurement Site
Corralitos	0.64	Landslide deposits
Capitola	0.54	Alluvium
UCSC	0.47	Marble

The expected ground motion values listed in Table 4.10-3 are based on average (soft rock) site conditions; actual ground motions during an earthquake may vary due to differences in the way portions of the earth's crust transmit seismic energy or because of unique site conditions, such as soil type, bedrock type, and topography. Sites underlain by very hard bedrock tend to produce the least damaging effects on buildings, other factors being equal; while relatively soft alluvial deposits can increase the amplitude of ground shaking that affects buildings.

The central district of Santa Cruz is situated on young alluvial deposits of the San Lorenzo River. This type of earth material will amplify the effects of seismic shaking on buildings. Other portions of Santa Cruz are primarily underlain by sandstone and shale that can be categorized as soft rock. The impact of seismic shaking in these areas will be less than on alluvial deposits. Seismic shaking is expected to have the least impact on portions of the City underlain by granitic or metamorphic rocks such as marble (see Figure 4.10-2).

SEISMICALLY INDUCED GROUND FAILURE

This section describes several types of ground failure that may accompany seismic shaking, including liquefaction and its related hazards of lurch cracking and lateral spreading, differential settlement, off-fault ground cracking, and landsliding.

Liquefaction, Lurch Cracking and Lateral Spreading. Liquefaction occurs in loose, cohesionless, granular materials that are saturated with ground water. The effects of seismic shaking can cause this type of sediment to loose strength and flow like a liquid. Liquefaction related ground deformation includes lurch cracking, fissuring, and lateral spreading.

Lurch cracking and fissuring occurs where a liquefied layer at depth is overlain by a surficial layer of relatively brittle, non-liquefied soil. In this situation, the surface layer may crack into individual blocks that can tip or rotate relative to each other. The resulting surface deformation can damage or destroy overlying buildings.

Lateral spreading occurs most often on level terraces or flood plains bounded on one side by a steep stream or river bank. When the sediments adjacent to the river liquefy, they flow into the stream or river channel. Lurch cracking and lateral spreading are potential hazards in areas susceptible to liquefaction.

There are four factors that help geologists and engineers estimate that likelihood that liquefaction will occur in a given area: 1) age of the underlying geologic materials, 2) type of geologic deposit, 3) depth to ground water, and 4) potential intensity and duration of seismic shaking. (See Appendix F-4 for further details.) Once a susceptibility to liquefaction is identified in an area, the risk posed to buildings and other structures by liquefaction depends strongly on the thickness and depth of the liquefiable layer. If the liquefiable layer is only six inches thick and is buried by 40 feet of non-liquefiable sediment, the actual hazard posed to a building at the surface may be relatively small. On the other hand, a 20-foot thick liquefiable layer buried by five feet of dry soil would be very likely to cause damage.

There is evidence for liquefaction in Santa Cruz during both the 1906 San Francisco and 1989 Loma Prieta earthquakes. Potential liquefaction hazard zones within the City are depicted on Figure 4.10-4 based on a ranking of mapped geologic units by liquefaction susceptibility according to age and type of deposit. This ranking draws on historical occurrences of liquefaction and previous liquefaction hazard studies. Susceptibility areas are divided into areas "A" and "B". Both areas are underlain by soils considered to be liquefiable, but the "B" areas are anticipated to have greater depth to groundwater, and therefore, a lesser susceptibility to liquefaction. This map is intended as a planning tool to identify areas where more in-depth analysis of liquefaction potential may be required. Not all of the liquefaction hazard zones showed evidence of liquefaction during the 1906 or 1989 earthquakes. Nevertheless, ground water levels fluctuate over time and different earthquakes can produce different effects.

Seismically Induced Differential Settlement. Seismically induced differential settlement may occur anywhere that soils are in a loose state. In the planning area, soils subject to this hazard will probably be limited to areas of improperly compacted artificial fill or areas of the most recently deposited sediments on the banks of the San Lorenzo River. In general, areas of natural soils that are potentially susceptible to differential settlement will be included in areas that are potentially liquefiable, as these soils are usually the type of soils that would liquefy if they were saturated. Areas of loose soil that could be subject to seismically induced differential settlement are of limited extent in the study area. This hazard can generally be mitigated by appropriate site-specific geotechnical investigations and proper foundation design. Any site screened for liquefaction hazard should also be evaluated for differential settlement potential.

Off-Fault Ground Cracking. During the 1989 earthquake, numerous ground cracks opened up along the crests and flanks of ridges. The ground cracks ranged from fractions of an inch to many feet wide and up to one-quarter mile long. Where the ground cracks crossed under buildings, the buildings were often severely damaged.

These ground cracks are considered to be co-seismic ground surface rupture; that is, they occur in response to severe ground shaking, but are not caused directly by offset of a fault. Ground cracking can also occur due to liquefaction, but such cracks are generally grouped with lurch cracking and are not included in this category. The co-seismic ground cracks may occur for a variety of reasons, but they are generally associated with steep topography, particularly ridge crests. With the exception of the crest of coastal bluffs, the topography within the City is generally not conducive to formation of co-seismic ground cracks and this hazard is therefore considered to be low throughout the City. Ground cracking is expected to occur in zones up to 50 feet wide landward from the crest of coastal bluffs, or anywhere there is a high, vertical or near-vertical cliff face.

Seismically Induced Landsliding. Seismically induced landsliding results when earthquake shaking adds extra stress to an already marginally stable slope. Landsliding that occurred in the Santa Cruz region as a result of the 1989 Loma Prieta earthquake included: 1) reactivation of existing landslides, including several very large, ancient landslide complexes that had previously been thought to be stable; 2) shallow slumps, calving, and toppling of natural cliffs and stream banks; and 3) slumping of steep cut slopes and embankments associated with grading for roads and development

Movement of the large, ancient landslides that took place during the 1989 earthquake involved incremental movements on the order of a few inches to a few feet. These landslides tended to move while the strong shaking was occurring, and then came to rest as soon as the shaking diminished. Because of the size and limited displacement of these landslides, damage to homes sited on the landslides was often remarkably light, except where the homes spanned the cracks around the landslide margins.

The other types of landsliding that occurred during the Loma Prieta earthquake were generally localized, affecting single homes or blocking roadways with loose soil and rock debris. There were extensive, but very shallow failures of sea cliffs around Monterey Bay and on very steep to vertical banks along creeks and rivers. There were also a number of landslides, mostly from cut slopes, that closed roads in the Santa Cruz Mountains, including State Highway 17. In most cases, the landslides were cleared within a few days, although permanent repair of the roadways took longer.

In terms of hazards posed to public safety, landslide hazards associated with the seismic shaking are similar to those occurring under static (non-seismic) conditions. Additional discussion of landslide hazard is provided below.

Tsunami Hazard. Tsunamis are giant ocean waves generated when uplift or down-dropping movement occurs over a broad area of the ocean floor. Ocean floor displacement may occur due to movement on submarine faults during large earthquakes, submarine landslides, or violent volcanic eruptions.

California is at risk from both local and distant source tsunamis, and tsunamis are a potential hazard to the City of Santa Cruz. There has been minimal damage and loss of life in Santa Cruz during recorded history (City of Santa Cruz, September 2007). However, a tsunami generated by a 9.0 magnitude earthquake in Japan in March 2011 reached Santa Cruz and caused substantial damage to the Santa Cruz Small Craft Harbor. Figure 4.7-2 identifies the potential tsunami inundation area in Santa Cruz, which is also further discussed in the HYDROLOGY, STORM DRAINAGE & WATER QUALITY (Chapter 4.7) section of this EIR.

Tsunamis can be generated locally, by movement on an offshore fault or by landsliding along the banks of the Monterey submarine canyon. The San Gregorio fault and the Monterey Bay fault zone are both considered active and capable of large earthquakes. However, these faults are not likely to produce large vertical offsets of the sea floor and therefore are probably not likely to generate significant tsunamis. Submarine landslides in the Monterey submarine canyon, however, are a more likely local source of tsunamis. Many large landslides have been mapped along the flanks of the canyon. A model of a landslide generated tsunami in the Monterey Bay predicted about 23 feet of runup along the Monterey Bay coastline. A particular hazard with a locally generated tsunami is that there is little warning time before the wave impacts the shoreline; a landslide generated tsunami in the Monterey Bay could strike the coastline in as little as 10 minutes from the time it was generated.

NON-SEISMIC GEOLOGIC HAZARDS

Geologic hazards that are not seismically induced include landslides, slope instability, and coastal cliff retreat.

Landslides and Slope Instability

Landslides are the rapid downward or outward movement of rock, earth or artificial fill on a slope. Factors causing landsliding include rock strength, the orientation of rock structure such as layering or fractures in the slope, erosion, weathering, high rainfall, steepness of slopes, and human activities such as the removal of vegetation and inappropriate grading.

Although landsliding is mostly a natural process that accompanies erosional downcutting and oversteepening of slopes, road building or other types of earth-moving can result in steep cut slopes and loose fill soils, both of which can be prone to landsliding. Roads can also collect naturally dispersed runoff and concentrate it into a rapidly flowing stream that can trigger erosion or landsliding.

A portion of the Santa Cruz County landslide map that covers the City is shown on Figure 4.10-3. This map should not be considered a complete catalogue of all existing landslides, especially where smaller landslides are concerned, but it shows in a general way the distribution of landslides in the City. The City is not as susceptible to landslides as are steeper areas of Santa Cruz County.

Because landslide hazard is associated primarily with steep slopes, landslide hazards in the City are confined to a few particular locations: 1) along the sea cliffs bounding the City to the south, 2) along the steeper banks of the San Lorenzo River valley and along the banks of smaller stream drainages, and 3) along the steep risers separating successively older marine terraces. In general, landsliding can be considered a potentially significant hazard where slopes exceed a gradient of about 50 percent (about 26½°). Slope instability can sometimes occur on less than 50 percent slopes, but the risk is typically much lower. Figure 4.10-5 shows slopes of 30 percent to 50 percent and slopes over 50 percent.

Coastal Bluff Retreat

The City of Santa Cruz is bounded to the south by the Pacific Ocean. Landward erosion by wind and wave action over time has created coastal bluffs along most of the City's coastline. The term bluff retreat is commonly used to describe the horizontal (landward) erosion of the shoreline along the coastline. Coastal erosion includes both cliff or bluff erosion and beach erosion, and is a result of both winter wave attack, as well as slowly rising sea level.

Coastal erosion includes both bluff erosion and beach erosion; wind, waves, and long-shore currents are the driving forces behind coastal erosion. Winter storm waves are larger, steeper and contain more energy, and typically move significant amounts of sand from the beaches to offshore bars, creating steep, narrow beaches. In the summer, lower, less energetic waves allow return of the sand, making for wider beaches. During the winter months when beaches are narrow, or absent altogether, the storm waves attack the cliffs and bluffs more frequently.

Bluff retreat is usually expressed in terms of a uniform rate, such as feet per year or cubic yards of eroded sediment per linear foot of shoreline per year. However, bluff retreat is mostly the result of specific events associated with major coastal storms, earthquakes, or landslides; many years' worth of retreat at a particular point may occur during the course of one particularly intense winter storm or may be due to a single landslide event. Therefore, while average retreat rates calculated over many decades may be accurate, actual retreat events may be much larger than average retreat rates would predict, although infrequent.

Bluff retreat rates are calculated by comparing older survey information along the coast that shows where the bluff was in the past with modern survey data as well as review of aerial photos. Human activities, such as construction of shore protection structures and dredging may also impact retreat rates. Another factor that is having an impact on the rate of bluff retreat is gradual sea level rise due to global warming. The precise impact of observed sea level rise on bluff retreat rates is not known, and uncertainty in the rate of future sea level rise compounds the difficulty in predicting the impacts of sea level rise.
Retreat rates are influenced by the orientation of the cliff relative to the prevailing storm wave direction, coastline geometry, rock type, and beach width and persistence. A number of studies have been done of coastal retreat rates in the Santa Cruz area including area-wide studies and site-specific studies for individual coastal development projects. Average retreat rates along the coastline within the City of Santa Cruz have been measured at 2.75 to 5.9 inches per year for the portion of the shoreline studied, although retreat rates were found that exceeded 23 inches per year for specific locations.

SOILS & EROSION

Soil Conditions and Constraints

Soils develop as a result of physical and chemical weathering of geologic materials at the earth's surface combined with biologic mixing due to plants and animals. Based on the Soil Conservation Service Soil Survey for Santa Cruz County (Soil Conservation Service, 1980), there are 57 soil types within the City. Table 4.10-5 lists the soil types found in the City, which are illustrated on Figure 4.10-6.

The many soil types within the City are broadly separable into three principal units: 1) soils developed on marine terraces and alluvial flats along streams, 2) soils on hills and mountains developed under forest canopy, and 3) soils on hills and mountains developed under brush vegetation. The soils developed on marine terraces and stream-side alluvial flats that underlie much of the City include the Watsonville, Watsonville-Tierra, Elkhorn, Pinto, Baywood, Cropley, Danville, and Soquel soil series. (Soil types found within the City are shown on Figure 4.10-6.) These soils cover the largest area out of the three principal units, amounting to 69% of the City. The Watsonville Series underlies broad areas of the City; it is generally poorly drained and causes ponding and shallow groundwater problems. The soils formed under forest canopy include the Ben Lomond, Lompico, and Nisene-Aptos series, which account for15.4% of the soil types within the City. Soils developed on brush covered slopes, primarily along the foot of Ben Lomond Mountain between the coastal plains and the forested uplands, include the Aptos, Los Osos, and Bonny Doon series. They occur mostly in small areas on the western portion of Santa Cruz, covering about 8.9%

of the City. Because of their occurrence on steeper slopes, the soils developed on hills and mountains will be more susceptible to erosion hazard.

Some soils may place constraints on development unless specific measures are implemented to mitigate poor soil conditions Typical constraints that may affect development include expansive soils, low density soils prone to settlement, low permeability soils that can cause ponding and poor drainage, and soils with high erosion potential.

Expansive soils shrink and swell depending on moisture level as the clay minerals in these soils expand and contract. Soils with moderate or high shrink-swell potential are a common cause of foundation deterioration, pavement damage, cracking of concrete slabs, and shifting of underground utilities as they expand and contract with seasonal variations in soil moisture. These soils are undesirable for use as engineered fill or subgrade directly underneath foundations or pavement, and must be replaced with non-expansive engineered fill or require treatment to mitigate their expansion. Although shrink-swell tendency presents a potentially serious hazard to development, it can be mitigated by a variety of standard engineering measures.

The impact of potentially weak or soft soils on development is generally manifested in two ways: as problems associated with low shear strength, affecting primary bearing capacity and slope stability; and as problems associated with loss of strength due to cyclic loading during seismic activity, affecting the potential for liquefaction, lateral spreading and seismically induced differential settlements. Soils with low strengths may fail on steep cut or fill slopes or natural slopes inclined at gradients of 30 percent or greater, and they may settle under the weight of new buildings. As with expansive soils, the hazards associated with weak soils can be mitigated with a series of standard engineering measures. Risks associated with low strength soils or expansive soils can be mitigated with appropriately scoped geotechnical investigations.

Erosion

Soil erosion potential is the susceptibility of the soil to erosion by water or wind. The risk of erosion depends upon the type of soil, slope of the land, slope length, rainfall amount and intensity, and vegetation cover. Removal of vegetation and the disturbance of the ground by mechanical grading or cattle grazing can accelerate the erosion process. Impervious surfaces from urban development can also concentrate runoff, causing gullying and other problems. The result may include not only the loss of valuable soils but also sedimentation of stream beds, habitat degradation, landslides and increased downstream flooding potential (City of Santa Cruz, 1994).

In general, erosion potential increases with the steepness of slope, but it is also affected by soil texture. Finer grained soils with strong cohesion tend to resist erosion better than loose, sandy soils. The Soil Conservation Service soil mapping program (1980) provides a ranking of erosion potential by soil type. These erosion hazard rankings were developed principally to address soil loss due to agriculture, and do not necessarily provide a useful measure of erosion potential with regard to urban planning and development.

The principal risk associated with erosion in an urban or semi-urban setting is due to *accelerated erosion*, is caused directly or indirectly by human activities or land management. Accelerated erosion is caused principally by grading for roads and other development and by land

clearing. Both these processes remove vegetative cover that protects soils from erosion and they change natural drainage patterns in a way that can concentrate runoff, increasing its erosive potential. Consequently, erosion hazards can be best mitigated by proper planning and implementation of erosion control measures on a site-specific basis during construction, and by implementation of permanent, fail-safe drainage systems post-construction.

Erosion potential is rated high to very-high on the Aptos, Ben Lomond, Bonny Doon, Elkhorn, Lompico-Felton, Nisene-Aptos, Pfeiffer, Sur-Catelli, Tierra-Watsonville, Watsonville, and Zayante soil types as shown on Table 4.10-5. Because of the difficulties in preventing erosion, development of these areas must be limited in accordance with soil conservation practices, including minimal grading and retention of existing native vegetation (City of Santa Cruz, 1994).

4.10.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The HAZARDS, SAFETY, AND NOISE chapter of the draft *General Plan 2030* includes two goals presented below that are related to geologic hazards, soils constraints, and/or emergency preparedness with several policies and accompanying actions.

GOAL HZ1 Emergency and disaster readiness.

GOAL HZ6 Protection from natural hazards.

Three policies support Goal HZ6 and address erosion hazards, unstable slopes, and seismic hazards.

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Land Use actions LU1.1.4 and LU1.1.5 address development and land use for specific sites: the Swenson property and the Golf Club Drive property, respectively. LU2.2.3 also includes addition of a 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center. Specific uses haven't been identified, although the site will not be used as part of expansion of the landfill disposal area. In addition, the proposed *General Plan 2030* supports development of a desalination plant (Policy CC3.1.3), but a specific site is not identified.

Table 4.10-5
Soil Classifications Within City of Santa Cruz

Map Symbol (SCS No.)	Soil Name	Slope (%)
100	Aptos loam, warm	15-30
101	Aptos loam, warm	30-50
103	Aguents, flooded	
104	Baywood loamy sand	0-2
105	Baywood loamy sand	15-30
106	Baywood loamy sand	15-30
109	Beaches	
110	Ben Lomond sand loam	5-15
113	Ben Lomond-Catelli-Sur complex	30-75
114	Ben Lomond-Felton complex	30-50
115	Ben Lomond-Felton complex	50-75
116	Bonnydoon loam	5-30
117	Bonnydoon loam	30-50
118	Bonnydoon-Rock outcrop complex	50-85
119	Clear lake clay, moderately wet	
123	Cropley silty clay	2-9
124	Danville loam	0-2
125	Danville loam	2-9
127	Diablo clay	15-30
128	Dune land	
129	Elder sandy loam	0-2
132	Elkhorn sandy loam	0-2
133	Elkhorn sandy loam	2-9
134	Elkhorn sandy loam	9-15
135	Elkhorn sandy loam	15-30
136	Elkhorn-Pfeiffer complex	30-50
139	Fluvaquentic Haploxerolis-Aquic Xerofluvents complex	0-15
142	Lompico-Felton complex	5-30
143	Lompico-Felton complex	30-50
144	Lompico-Felton complex	50-75
145	Lompico Variant loam	5-30
146	Los Osos loam	5-15
147	Los Osos loam	15-30
157	Nisene-Aptos complex	30-50
158	Nisene-Aptos complex	50-75
159	Pfeiffer gravelly sand loam	15-30
161	Pinto loam	0-2
162	Pinto loam	2-9
164	Pits-Dumps complex	
168	Santa Lucia Shaly clay loam	30-50
170	Soquel loam	0-2
171	Soquel loam	2-9
172	Soquel loam	9-15
173	Sur-Catelli complex	50-75
174	Tierra Watsonville complex	15-30
175	Tierra-Watsonville complex	30-50
176	Watsonville loam	0-2
177	Watsonville loam	2-15
178	Watsonville loam - thick surface	0-2
179	Watsonville loam - thick surface	2-15
180	Watsonville loam - thick surface	15-30
183	Zayante course sand	30-50
184	Zayante-Rock outcrop complex	30-50

Shaded Soils have a high to very high erosion hazard potential

Source: USDA Soil Conservation Service, Soil Survey of Santa Cruz County, 1980

4.10.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

10a Expose people or structures to potential substantial adverse effects including the risk of loss, injury, or death resulting from the rupture of a known earthquake fault, seismic ground shaking, landslides, or seismic-related ground-failure, including liquefaction, which cannot be mitigated through the use of standard engineering design techniques;

10b Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide or slope failure/ instability;

10c Result in substantial soil erosion or the loss of topsoil and subsequent sedimentation into local drainage facilities and water bodies; or

10d Be located on an expansive soil, as defined by the Uniform Building Code (1997) or subject to other soil constraints that might result in deformation of foundations or damage to structures, creating substantial risks to life or property.

IMPACT ANALYSIS

There are no active faults within the City of Santa Cruz, and thus, fault rupture (10a) is not a hazard. The following impact analyses address exposure to seismic hazards (10a); exposure to geologic and slope hazards (10b); erosion (10c); and soils constraints (10d).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized in subsection 4.82 above. Buildout projections indicate that potential new development accommodated by the draft general plan to the year 2030 could total 3,350 residential units, 3,140,000 square feet of non-residential uses, primarily on infill and underutilized lots, as described in the PROJECT DESCRIPTION (Chapter 3.0) and LAND USE (Chapter 4.1) sections of this EIR. Based on the estimated development occurring under the proposed plan,[3] approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located within new mixed use designations along the City's four major transportation corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street.

[3] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

Impact 4.10-1: Seismic Hazards
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could result in exposure of people and property to seismic hazards, including ground shaking, liquefaction, and ground settlement. With adherence to City regulations, the project would not result in increased risk of exposure to seismic hazards. This is considered a *less-than-significant impact.*

The City is primarily developed, and future development accommodated by the proposed *General Plan 2030* would be considered predominantly infill development within developed areas on vacant infill sites, on underutilized properties, and in the new mixed-use districts along the City's four major street corridors. Based on the estimated development occurring under the proposed plan, approximately one-half of new development would be located along these transportation corridors. There are a few remaining vacant lots and underdeveloped properties located within developed areas (i.e., Swenson site and Golf Club Drive area).

Future development and associated population growth could expose structures and people to seismic hazards, particularly seismic shaking and liquefaction. However, adherence to existing regulations and standards, including the CBC and various policies and actions established in the proposed *General Plan 2030*, would minimize harm to people and structures from adverse geologic events and conditions. Buildings will be required to be designed in accordance with the latest edition of the California Building Code, which sets forth structural design parameters for buildings to withstand seismic shaking without substantial structural damage. Conformance to the CBC as required by state law and the City would ensure the maximum practicable protection available for structures and their associated trenches, excavations and foundations. Project designs are required to include the application of CBC Seismic Zone 4 standards. The continuation of design review and code enforcement to meet current seismic standards is the primary mitigation strategy to avoid or reduce damage from an earthquake, and seismic safety standards are a requirement for all building permits (City of Santa Cruz, September 2007). It is also noted that since the 1989 Loma Prieta Earthquake, all commercial and public buildings have been seismically retrofitted, and as infrastructure is repaired or replaced, updated seismic safety standards are incorporated (Ibid.).

Most of the City's downtown area and areas along watercourses are subject to liquefaction, including the Golf Club Drive area and portion of the Swenson property. Typically, standard geotechnical engineering procedures, soil testing, and proper design can identify and mitigate liquefiable soils. By using the most up-to-date standards, potential damage related to liquefaction, including subsidence and settlement, can be reduced to levels that are generally considered acceptable. Section 24.14.070 of the City's Municipal Code requires preparation of a site-specific geotechnical investigation for all development, except less than four units, in areas identified in the General Plan as having a high liquefaction potential to assess the degree of potential liquefaction and recommend appropriate design/mitigation measures.

The general Plan policies and actions outlined in Table 4.10-6 also serve to reduce exposure to seismic hazards. Policy HZ6.3 seeks to reduce the potential for loss of life, injury and property damage due to earthquakes and liquefaction. The City will adopt new state-approved building

codes (HZ6.3.1), and the plan supports seismic retrofits (HZ6.3.2, HZ6.3.3) and utility design to withstand seismic hazards (HZ6.3.4).

TABLE 4.10-6
Proposed General Plan Policies & Actions that Avoid or Minimize Exposure to Seismic and Geologic Hazards

Type of Measure / Action	Policies / Actions
MINIMIZE RISK OF EXPOSURE TO SEISMIC HAZARDS	• Critical facilities to survive flood & seismic hazards: HZ1.1.8 • Strengthen bridges: HZ1.1.11 • Reduce seismic hazard risks: HZ6.3 • Adopt State building does: HZ6.3.1 • Support seismic retrofits: HZ6.3.2, HZ6.3.3 • Design utilities to withstand seismic shaking: HZ6.3.5
MINIMIZE EXPOSURE TO OTHER GEOLOGIC HAZARDS	• Minimize coastal bluff erosion hazard & building setbacks: HZ6.1.1, HZ 6.1.2 • Require geotech reports within 100 feet of coastal bluffs: HZ6.1.3 • Discourage development on unstable slopes & require geo reports if may be slope instability potential: HZ6.2, HZ6.2.1

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would be subjected to seismic hazards, including seismic shaking and liquefaction. With implementation of the proposed *General Plan 2030* goals, policies and actions and adherence to local regulations, buildings would be designed to minimize damages and reduce exposure of people or structures to significant risks associated with seismic hazards. Thus, this is a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* action is recommended to reference a potential liquefaction areas map, to be consistent with Zoning Regulations that require geotechnical investigations in areas of liquefaction identified in the proposed General Plan.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

HZ5.3.6.1 Require site specific geologic investigations by qualified professionals for proposed development in potential liquefaction areas shown on the Liquefaction Hazard Map[4] to assess potential liquefaction hazards, and

[4] The map is included in this EIR as Figure 4.10-4 as referenced on page 13 of this chapter.

require developments to incorporate the design and other mitigation measures recommended by the investigations.

Impact 4.10-2: Other Geologic Hazards
Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that could result in exposure to people and property to potential hazards associated with landslides, slope stability, and/or coastal bluff retreat. With adherence to City regulations and proposed *General Plan 2030* goals, policies and actions, the future development would not be located on unstable area related to landslides, slope instability or coastal bluff retreat. This is considered a *less-than-significant impact.*

As indicated above, the City is primarily developed, and future development accommodated by the proposed *General Plan 2030* would be considered infill development. Areas of known steep slopes and/or landslides are primarily located within managed open space areas, as well as portions of the west side of Santa Cruz in the Western Drive area and in the northeastern portion of the City in the Prospect Heights and Carbonera areas (see Figures 4.10-3 and 4.10-5). In general, landsliding can be considered a potentially significant hazard where slopes exceed a gradient of about 50 percent (about 26½°). Slope instability can sometimes occur on less than 50 percent slopes, but the risk is typically much lower. Construction on steep slopes can result in creation of unstable slopes if not properly designed. The areas subject to these constraints are limited within the City.

Section 24.14.030 of the City's Municipal Code regulates development on steep slopes and generally prohibits development on slopes greater than 50 percent with setbacks from 30+ percent slopes. The general Plan polices and actions outlined in Table 4.10-6 also serve to reduce exposure to landslide/slope stability exposure. Policy HZ6.2 discourages development on unstable slopes with preparation of engineering geology reports where excavation and grading have the potential to create unstable slopes or be exposed to slope stability (HZ6.2.1).

There are no major vacant or underutilized lands along the coast that would be subject to coastal bluff erosion, except for existing uses. However, the proposed plan seeks to minimize hazards posed by coastal bluff retreat, including requiring setbacks for buildings adjacent to coastal cliffs (HZ6.1.1, HZ6.1.2). The draft General Plan does include an action to allow construction that alters natural shoreline processes, but only when required to serve coastal-dependent uses or to protect existing structures or public beaches from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply (HZ6.1.3). Since the City is in the process of updating its Local Coastal Plan as a separate document from the General Plan, the issue of coastal erosion and protective devices will be reviewed in that document.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but some new development accommodated by the plan could be subjected to hazards associated with landslides,

slope stability, and coastal bluff retreat. With implementation of the proposed *General Plan 2030* goals, policies and actions and adherence to local regulations, buildings would be designed with appropriate setbacks, where needed, to minimize damages and reduce exposure to significant risks associated with unstable slopes and/or coastal bluff retreat. Thus, this is a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, deletion of the following *General Plan 2030* action is recommended as is pertains to issues in the coastal zone that will be subject to review as part of the Local Coastal Plan update.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

~~HZ6.1.3 Allow construction that alters natural shoreline processes only when required to serve coastal-dependent uses or to protect existing structures or public beaches from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply.~~

Impact 4.10-3: Soil Constraints
Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development that could result in exposure to soil constraints, such as expansive soils, that could lead to structural damages. With adherence to City regulations, the project would not result in increased risk of exposure to soils constraints. This is considered a *less-than-significant impact.*

Future development accommodated by the proposed *General Plan 2030* would be located on some soil types that may pose constraints to structural development. Expansive soils is one situation, in which soils with high clay content are prone to expansion and contraction, known as "shrink-swell," which can result in damage to building foundations, pavement, and underground utilities. These soils are undesirable for use as engineered fill or subgrade directly underneath foundations or pavement, and must be replaced with non-expansive engineered fill or require treatment to mitigate their expansion potential. Structural designs and construction implementation in accordance with standard geotechnical/soils investigations can mitigate impacts posed by expansive or other unstable soils, i.e. unconsolidated fill. The California Building Code (Chapter 18) requires preparation of a geotechnical report for most new structures, except geotechnical reports are not required for one-story, wood-frame and light-steel-frame buildings of Type II or Type V construction and 4,000 square feet or less in floor area, not located within Earthquake Fault Zones or Seismic Hazard Zones as shown in the most recently published maps from the California Geological Survey (CGS).

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but some new development accommodated by the plan could be subjected to soil constraints from expansive or other unstable soils. With adherence to local and state building codes, buildings would be designed in accordance with recommendations of required geotechnical reports to prevent foundation and other structural damages. Thus, this is a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.10-4: Erosion
Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development that could result in erosion and inadvertent sedimentation into storm drains or watercourses, if not properly controlled. With adherence to City regulations, the project would not result in substantial soil erosion. This is considered a *less-than-significant impact.*

Future development accommodated by the proposed *General Plan 2030* would be located on some soil types that have a moderate to high potential for erosion when soils are disturbed. These soils are identified in Table 4.10-5 and shown on Figure 4.10-6.

Section 24.16.060, part of the City's Municipal Code's Conservation Regulations, requires an erosion control plan for projects located within high erosion hazard areas as designated in the General Plan or for development on slopes greater than ten percent. It also addresses site development features to minimize erosion. The ordinance requires an erosion control plan for residential development of four or more units, grading in excess of one thousand cubic yards, and nonresidential development with a floor area greater than 10,000 square feet or constructed on slopes in excess of 10 percent. Chapter 18.45, Excavation and Grading Regulations," provides technical regulations for grading and excavation, in conjunction with Chapter 24.14. It establishes guidelines, regulations, and minimum standards for clearing, excavation, cuts, fills, earth moving, grading operations (including cumulative grading), water runoff and sediment control. In addition, the ordinance includes provisions regarding administrative procedures for issuance of permits and approval of plans and inspections during construction and subsequent maintenance. The City revised the Grading Ordinance in April 2004 in order to strengthen the ordinance regarding implementation of BMPs, including those for erosion and sediment control. Implementation of erosion control measures and BMPs during construction of future development would minimize the potential for erosion.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development could result in erosion without proper erosion control measures during construction. With adherence to

local regulations, erosion control plans will be required, and potential erosion during construction would be minimized. Thus, this is a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

REFERENCES

California Department of Conservation.

- 2007a. "California Geological Survey - Alquist-Priolo Earthquake Fault Zones." http://www.conservation.ca.gov/cgs/rghm/ap/Pages/Index.aspx
- 2007b. "California Geological Survey – Seismic Hazards Zonation Program Zones." http://www.conservation.ca.gov/cgs/shzp/Pages/Index.aspx

City of Santa Cruz.

- Adopted September 11, 2007. *Final City of Santa Cruz Local Hazard Mitigation Plan, 2007-2012.*
- October 25, 1994. *The City of Santa Cruz General Plan and Local Coastal Program 1990-2005.* Environmental Quality Element, section D – "Soils", page 47-53.

Nolan Associates. April 2009. "Geologic and Seismologic Discussion – City of Santa Cruz General Plan Update."

U.S. Department of Agriculture, Soil Conservation Service. August 1980. *Soil Survey of Santa Cruz County.*

4.11 AIR QUALITY

4.11.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Regional Setting & Climate
- Existing Air Quality Conditions
- Air Basin Plans

This section of the EIR evaluates the potential impacts on air quality resulting from the implementation of the proposed *General Plan 2030*. Air quality modeling was conducted by Donald Ballanti, certified meteorologist, and results used in this section are provided in Appendix E.

REGULATORY SETTING

Air quality within the Monterey Bay region is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy making, education, and a variety of programs. The agencies responsible for improving the air quality within the air basin are discussed below.

Federal Regulations

The federal Clean Air Act (CAA) and its amendments establish the National Ambient Air Quality Standards (NAAQS). These standards identify levels of air quality for "criteria" pollutants that are regarded as the maximum levels of ambient (background) air pollutants considered to have an adequate margin of safety needed to protect the public health and welfare. The "criteria pollutants" are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2 is a form of NO_x), sulfur oxides (SO_2 is a form of SO_x), particulate matter less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$, respectively) and lead. The U.S. Environmental Protection Agency (EPA) Region IX office oversees compliance with the FCAA.

State Regulations

CALIFORNIA CLEAN AIR ACT

The California Air Resources Control Board (CARB), a department of the California Environmental Protection Agency (CalEPA), oversees air quality planning and control throughout California. Its responsibility lies with ensuring compliance with the California Clean Air Act (CCAA) and its amendments, as well as responding to the FCAA requirements and regulating

emissions from motor vehicles sold in California. It also sets fuel specifications to further reduce vehicular emissions. The amendments to the CCAA establish California Ambient Air Quality Standards (CAAQS) and a legal mandate to achieve these standards by the earliest practicable date. These standards apply to the same criteria pollutants as the FCAA and also include sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride.

TOXIC AIR CONTAMINANTS

In addition to the California's Ambient Air Quality Standards, toxic air contaminants (TACs) are other pollutants that include carcinogens and noncarcinogens. California regulates TACs through its air toxics program and Air Toxics "Hot Spots" Information and Assessment of the Health and Safety Code. The CARB identifies TACs in conjunction with the State Office of Environmental Health Hazard Assessment (OEHHA). Air quality control agencies, including the Monterey Bay Unified Air Pollution Control District (MBUAPCD), must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by CARB.

Diesel particulate matter was identified as a toxic air contaminant (TAC) by the state of California in 1998. The CARB developed a comprehensive strategy to control diesel PM emissions, including preparation of the "Diesel Risk Reduction Plan." Once the Diesel Risk Reduction Plan was adopted, the CARB started developing emission regulations for a number of categories of in-use diesel vehicles and equipment. An important part of the Diesel Risk Reduction Plan is a series of measures for various categories of in-use on- and off-road diesel engines, which are generally based on the following types of controls:

- Retrofitting engines with emission control systems, such as diesel particulate filters or oxidation catalysts,
- Replacement of existing engines with new technology diesel engines or natural gas engines, and
- Restrictions placed on the operation of existing equipment.

Regional Regulations

Regulatory oversight for air quality in the North Central Coast Air Basin ("Basin"), in which the City of Santa Cruz is located, rests at the regional level with the Monterey Bay Unified Air Pollution Control District (MBUAPCD), the CARB at the State level, and the U.S. EPA Region IX office at the Federal level. The MBUAPCD is one of 35 air districts established to protect air quality in California. The North Coast Basin is comprised of Santa Cruz, Monterey and San Benito Counties.

The CCAA requires each nonattainment district in the state to adopt a plan showing how the State Ambient Air Quality Standard for ozone would be met. The CCAA required initial preparation of an Air Quality Management Plan (AQMP) in 1991, with subsequent updates every three years. The MBUAPCD adopted its first AQMP in 1991; the current plan was adopted by the Air District in August 2008.

The MBUAPCD has primary responsibility for local air quality by controlling air pollution from stationary sources of air pollution. The District has adopted a number of rules affecting both stationary and area-wide sources of emissions for the purpose of achieving the State and federal AAQS for ozone.

The MBUAPD also regulates TACs from new or modified sources under Rule 1000 and a Board approved protocol that applies to any source which requires a permit to construct or operate pursuant to District regulations and has the potential to emit carcinogenic or noncarcinogenic TACs. The District's Rule 1000 also requires sources of carcinogenic TACs to install best control technology and reduce cancer risk to less than one incident per 100,000 population. Sources of noncarcinogenic TACS must apply reasonable control technology. The District also implements Rule 1003, Air Toxic Emissions Inventory and Risk Assessments, which establishes and implements the Air Toxics Hot Spots Act. Rule 1003 also requires that any increased cancer risk resulting from an existing facility's emissions is less than one incident per 100,000 population (Monterey Bay Unified Air Pollution Control District, February 2008).

Local Regulations

The City of Santa Cruz addresses odors and pollutants in its Municipal Code. Section 24.14.264 prohibits emission of odorous gases or matter in quantities readily detectable. Section 24.14.272 prohibits emissions from any source that exceed permissible amounts or limits established by the Monterey Bay Unified Air Pollution Control District.

REGIONAL SETTING & CLIMATE

The North Central Coast Air Basin (NCCAB), which is just south of the San Francisco Bay Area Air Basin, covers an area of 5,159 square miles and consists of the counties of Santa Cruz, San Benito, and Monterey. Topography and meterology heavily influence air quality. In the project vicinity, the northwest sector of the basin is dominated by the Santa Cruz Mountains. In Santa Cruz County, coastal mountains exert a strong influence on atmospheric circulation, which results in generally good air quality. Small inland valleys such as Scotts Valley with low mountains on two sides have poorer circulation than at Santa Cruz on the coastal plain. In addition, Scotts Valley is downwind of major pollutant generating centers, and these pollutants have time to form oxidants during transit to Scotts Valley. Consequently, air pollutants tend to build up more at Scotts Valley than at Santa Cruz (Monterey Bay Air Pollution Control District February 2008).

The semi-permanent high pressure cell in the eastern Pacific is the basic controlling factor in the climate of the air basin. In the summer, the high pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement (Monterey Bay Air Pollution Control District February, 2008).

The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. Surface heating in the interior portion of the Salinas and San Benito Valleys creates a weak low pressure which intensifies the onshore air flow during the afternoon and evening. In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay area or the Central Valley into the NCCAB (Monterey Bay Air Pollution Control District February 2008).

During the winter, the Pacific High migrates southward and has less influence on the air basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito Valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the basin as a whole in winter and early spring. (Monterey Bay Air Pollution Control District February 2008).

EXISTING AIR QUALITY CONDITIONS

Ambient Air Quality Standards

Ambient air quality standards (AAQS) are set to establish levels of air quality that must be maintained to protect the public from the adverse effects of air pollution. State standards are established to protect public health, including the most sensitive members of the population. National standards include a primary standard to protect public health and a secondary standard to protect the public welfare including property, vegetation and visibility. However, the numerical values for both standards are the same (Monterey Bay Unified Air Pollution Control District, August 2008).

As indicated above, the federal and state governments have established AAQS for six "criteria" pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than or equal to 10 microns in diameter (PM_{10}) and 25 microns in diameter (PM_{25}), and (SO_2), particulate matter smaller than or equal to 10 microns in diameter (PM_{10}) and 25 microns in diameter (PM_{25}), and lead. As indicated above, the state standards also include sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. Current state and national AAQS are shown in Table 4.11-1.

TABLE 4.11.1
National and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[b]		National Standards[c]			
				Primary[d]		Secondary[e]	
		ppm	µg/m³	ppm	µg/m³	ppm	µg/m³
Ozone	1 hour	0.09	180	None[f]		None	
	8 hours	0.070	137	0.08[g]		0.08	
				0.075[h]		0.075	
Carbon Monoxide	8 hours	9.0	10,000	9	10,000	9.0	10,000
	1 hour	20	23,000	35	40,000	35.0	40,000
Nitrogen Dioxide[i]	Annual	0.030	56	0.053	100	0.053	100
	1 hour	0.18	338				
Sulfur Dioxide	Annual			0.03	80		
	24 hours	0.04	105	0.14			
	3 hours					0.5	1,300
	1 hour	0.25	655				
Respirable Particulate Matter (PM_{10})[j]	Annual		20		50		50
	24 hours		50		150		150
Fine Particulate Matter ($PM_{2.5}$)[l]	Annual		12		15		15
	24 hours				35		35
Lead	Calendar quarter				1.5		1.5
	30-day avg		1.5				
Sulfate	24 hours		25				
Hydrogen Sulfide	1 hour	0.03	42				
Vinyl Chloride	24 hours	0.010	26				
Visibility Reducing Particles	8 hours (10 a.m.- 6 p.m.)	In sufficient amounts to reduce prevailing visibility to < 10 miles when relative humidity of < 70% with equivalent instrument method					

[a] Standards first promulgated in ppm concentrations except where noted. Equivalent µg/m³ concentrations based on reference temperature of 25°C and reference pressure of 760 mm of mercury.
[b] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide, nitrogen dioxide, PM_{10}, and visibility reducing particles are values not to be exceeded.
[c] National standards, other than ozone and those based on annual averages, are not to be exceeded more than once a year.
[d] Designed to protect human health with an adequate margin of safety
[e] Designed to protect public welfare (i.e., prevent damage to vegetation, property, visibility)
[f] On June 15, 2005, EPA revoked the 1-hour standard in the NCCAB.
[g] 1997 Standard – The standard and related implementation rules remain in place during transition to the 2008 8-hour ozone standard.
[h] 2008 Standard - Adopted March 12, 2008.
[i] On February 22, 2007, the Air Resources Board approved staff recommendations to amend the State nitrogen dioxide standard.
[j] PM_{10} refers to respirable particulate matter less than 10 microns in size.
[l] $PM_{2.5}$ refers to respirable particulate matter less than 2.5 microns in size.

Source: Monterey Bay Unified Air Pollution Control District, August 2008

Criteria Air Pollutants

OZONE

Ozone, the primary constituent of smog, is not directly emitted but is formed in the atmosphere over several hours from combinations of various precursors in the presence of sunlight. Nitrogen oxides (NO_x) and volatile organic compounds (VOCs) are considered to be the primary compounds, or precursors, contributing to the formation of ozone. Ozone is viewed as both a secondary pollutant and a regional pollutant. The primary sources of VOC within the planning area are on- and off-road motor vehicles, cleaning and surface coatings, solvent evaporation, landfills, petroleum production and marketing, and prescribed burning. The primary sources of NOx are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes (Monterey Bay Unified Air Pollution Control District, August 2008). Short-term exposure to ozone results in injury and damage to the lung, decreases in pulmonary function, and impairment of immune mechanisms (Ibid.).

In 2008, daily emissions of VOC and NO_x in the NCCAB were estimated at 76 and 79 tons, respectively, with on-road mobile sources constituting 23% of VOC and 49% of NOx emissions (Monterey Bay Unified Air Pollution Control District, February 2008).

INHALABLE PARTICULATES

Inhalable Particulates refer to particulate matter less than 10 microns in diameter (PM_{10} and $PM_{2.5}$). In 1997, EPA adopted a fine particulate matter standard of 2.5 microns or less in diameter ($PM_{2.5}$), and CARB adopted an annual $PM_{2.5}$ standard in 2002. PM_{10} and $PM_{2.5}$ are respirable particulate matter that are classified as primary or secondary depending on their origin. Primary particles are unchanged after being directly emitted (e.g., road dust) and are the most commonly analyzed and modeled form of PM_{10}. Because it is emitted directly and has limited dispersion characteristics, this type of PM_{10} is considered a localized pollutant. In addition, secondary PM_{10} can be formed in the atmosphere through chemical reactions involving gases.

PM_{10} and $PM_{2.5}$ are respirable particulate matter and because of their small size, they can be inhaled deep into the lungs and are therefore a health concern. Key health effects categories associated with PM include: premature mortality; aggravation of respiratory and cardiovascular disease; changes in lung function and increased respiratory symptoms; and altered respiratory defense mechanisms (Monterey Bay Unified Air Pollution Control District, February 2008).

Major sources of primary particles include fugitive dust from roads and agricultural operations. Secondary particulates are formed in the atmosphere largely by chemical reactions involving gases, e.g., sulfate from directly emitted sulfur oxides. Natural sources of particulates include sea spray, forest fires, volcanic debris, etc. Man-made sources include fuel combustion, industrial processes and transportation. In 2005 daily emissions of PM_{10} were estimated at 102 tons per day. Of this, entrained road dust represented 35% of all PM_{10} emission, windblown dust 20%, ag tilling operations 15%, waste burning 17%, construction 4%, and mobile sources, industrial processes, and other sources made up 9%. Dust is termed "fugitive" when dust escapes into the atmosphere via a non-stack source. This includes wind blown dust from disturbed soil surfaces,

construction sites, agricultural tilling activities, aggregate processing operations and dust raised by vehicles traveling on paved and unpaved roads (Monterey Bay Unified Air Pollution Control District, February 2008).

CARBON MONOXIDE (CO)

Carbon monoxide (CO) is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. Because it is directly emitted from combustion engines, carbon monoxide can have adverse localized impacts, primarily in areas of heavy traffic congestion. Because it is emitted directly and has limited dispersion characteristics, CO is considered a localized pollutant (Monterey Bay Unified Air Pollution Control District, February 2008).

When carbon monoxide combines with hemoglobin in the blood, the oxygen-carrying capacity of the blood is reduced and the release of oxygen is inhibited or slowed. This condition puts the following at risk: patients with angina, persons with other cardiovascular diseases, chronic obstructive lung disease, or asthma; persons with anemia, and fetuses. At higher levels, CO also affects the central nervous system. Symptoms of exposure may include headaches, dizziness, sleepiness, nausea, vomiting, confusion, and disorientation (Monterey Bay Unified Air Pollution Control District, February 2008). At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause unconsciousness and death.

Carbon monoxide emissions in the NCCAB were estimated at 446 tons per day in 2005 with motor vehicles contributing approximately 47% of total emissions. Electric utilities, fires, and other mobile and miscellaneous sources contributed to the remainder (Monterey Bay Unified Air Pollution Control District, February 2008).

OTHER POLLUTANTS

Toxic Air Contaminants. Toxic air contaminants (TACs) are other pollutants that include carcinogens and noncarcinogens which may be expected to result in an increase in mortality or serious illness or pose hazards to human health. There are hundreds of different types of TACs, with varying degrees of toxicity. Additionally, some of the TACs may cause other health effects over short- or long-term exposure. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle engine exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset spill conditions. Health effects of TACs include cancer, birth defects, neurological damage and death. TACs can cause various cancers, depending on the particular chemicals, their type and duration of exposure.

Diesel Particular Matter. Diesel particulate matter was identified as a toxic air contaminant (TAC) by the state of California in 1998. Mobile sources (including trucks, buses, automobiles, trains, ships and farm equipment) are by far the largest source of diesel emissions. Following the identification of diesel as a TAC, the California Air Resources Board developed a comprehensive strategy to control diesel PM emissions. The "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles"—a document approved by ARB in September 2000—set goals to reduce diesel PM emissions in California by 75% by 2010 and 85% by 2020. This objective would be achieved by a combination of approaches

(including emission regulations for new diesel engines and low sulfur fuel program). An important part of the Diesel Risk Reduction Plan is a series of measures for various categories of in-use on- and off-road diesel engines, which are generally based on the following types of controls:

- Retrofitting engines with emission control systems, such as diesel particulate filters or oxidation catalysts,
- Replacement of existing engines with new technology diesel engines or natural gas engines, and
- Restrictions placed on the operation of existing equipment.

Once the Diesel Risk Reduction Plan was adopted, the ARB started developing emission regulations for a number of categories of in-use diesel vehicles and equipment. In July 2007, the ARB adopted regulations for in-use, off-road diesel vehicles that will significantly reduce particulate matter emissions by requiring fleet owners to accelerate turnover to cleaner engines and install exhaust retrofits.

Odors. Odors represent emissions of one or more pollutants that are a nuisance to healthy persons and may trigger asthma episodes in people with sensitive airways. Pollutants associated with objectionable odors include sulfur compounds and methane. Typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries. Odors are a complex problem that can be caused by minute quantities of substances (Monterey Bay Unified Air Pollution Control District, February 2008). Because people have mixed reactions to odors, the nuisance level of an odor varies.

Local Ambient Air Quality & Attainment Status

Ambient air quality is monitored at nine stations within the NCCAB. The network includes seven stations operated by the MBUAPCD, one station operated by the National Park Service at the Pinnacles National Monument and one station operated by an industry group in King City. The monitoring stations operated by the MBUAPCD are part of the State and Local Air Monitoring Systems (SLAMS) network, and are located in Salinas, Hollister, Santa Cruz, Watsonville, Scotts Valley and Carmel Valley. The stations operated at Davenport, King City and Pinnacles are referred to as Special Purpose sites because they provide information on the impact of specific sources, or to gauge air quality impacts on national resources, such as national Parks (Monterey Unified Air Pollution Control District, August 2008). The nearest monitoring stations to the city of Santa Cruz are the Davenport and Santa Cruz monitoring stations; the Santa Cruz station is located in Soquel.

Designations in relation to state standards are made by the CARB while designations in relation to national standards are mad by the EPA. State designations are updated annually while the national designations are updated when either the standards change or when an area requests re-designation due to changes in air quality. Designations are made by air basin and in some cases, designations are made at the county level (Monterey Unified Air Pollution Control District, August 2008). Designations are made for each criteria pollutant according to the categories listed below. Nonattainment designations are of most concern because they indicate that

unhealthy levels of the pollutant exist in the area, which typically triggers a need to develop a plan to achieve the applicable standards (Ibid.).

- **Attainment** – Air quality in the area meets the standard.
- **Nonattainment Transitional** – Air quality is approaching the standard (State only).
- **Nonattainment** – Air quality in the area fails to meet the applicable standard.
- **Unclassified** – Insufficient data to designate area or designations have yet to be made.

Table 4.11-2 summarizes the attainment status for criteria pollutions in the NCCAB. The Basin is currently in attainment for the federal PM_{10} standard and state and federal nitrogen dioxide, sulfur dioxide and carbon monoxide standards. The basin is considered attainment or unclassified for other national standards and non-attainment for the 1-hour state ozone standard and for the state PM_{10} standard. The NCCAB does not meet the State PM_{10} standard although it is in attainment for the state $PM_{2.5}$ standard.

TABLE 4.11-2
Attainment Status for the North Central Coast Air Basin – January 2009

Pollutant	State	Federal
Ozone (O_3)	**Nonattainment** [1]	Attainment [2]
Inhalable Particulates (PM_{10})	**Nonattainment**	Attainment
Fine Particulates ($PM_{2.5}$)	Attainment	Unclassified/Attainment [3]
Carbon Monoxide (CO)	Monterey Co. – Attainment San Benito Co. – Unclassified Santa Cruz Co. - Unclassified	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Unclassified/Attainment [4]

[1] Effective July 26, 2007, the ARB designated the NCCAB a nonattainment area for the State ozone standard, which was revised in 2006 to include an 8-hour standard of 0.070 ppm.
[2] On March 12, 2008, EPA adopted a new 8-hour ozone standard of 0.075 ppm, while temporarily retaining the existing 8-hour standard of 0.08 ppm. EPA is expected to issue new designations by March 2010.
[3] In 2006, the Federal 24-hour standard for PM2.5 was revised from 65 to 35 □g/m3. Although final Designations have yet to be made, it is expected that the NCCAB will remain designated unclassified/attainment.
[4] On October 15, 2008 EPA substantially strengthened the national ambient air quality standard for lead by lowering the level of the primary standard from 1.5 □g/m3 to 0.15 □g/m3. Initial recommendations for designations are to be made by October 2009 with final designations by January 2012.

SOURCE: Monterey Bay Unified Air Pollution Control District website: http://www.mbuapcd.org/programs/planning

In 1997, a federal 8-hour ozone standard of 0.08 ppm was adopted by EPA. This standard replaced the prior federal 1-hour standard. In 2004, the NCCAB was designated as an attainment area for the federal 8-hour standard with an obligation to develop a maintenance plan. Maintenance of the federal standard is addressed in the District's 2007 Federal

Maintenance Plan for the Monterey Bay Region, which was adopted in March of 2007 (Monterey Bay Unified Air Pollution Control District, August 2008), and is summarized further below in the "Regional Plans" subsection.

In 2006, the CARB revised the State AAQS for ozone to include an eight-hour average of 0.070 ppm, while retaining the existing one-hour standard at 0.09 ppm. This standard is more stringent than the federal standard both in terms of concentration and the level of precision. Both the one and eight-hour components of the State standard must be met in order for the standard to be achieved. The NCCAB is a nonattainment area for the State standard (Monterey Bay Unified Air Pollution Control District, August 2008).

The state 8-hour standard is more protective of public health than both the prior 1-hour standard and the national 8-hour standard. With natural background representing about half the level of the stringent 8-hour ozone standard, the introduction of the 8-hour average significantly increases the number of exceedances recorded at the District's monitoring stations (Monterey Bay Unified Air Pollution Control District, August 2008). Overall, there has been a declining trend in exceedances, although there can be considerable year–to-year variation, particularly for 8-hour exceedances. The year-to-year variations tend to be driven by year-to-year variations in weather, while the overall decline tends to be driven by a reduction in emissions across the region. The majority of the exceedance days (<80% based on 2003 to 2005 data) occur at Pinnacles (Ibid.).

As previously indicated, ozone is formed by a photochemical reaction between volatile organic compounds and the oxides of nitrogen in the presence of sunlight. Consequently, ozone tends to be seasonal pollutant which develops primarily in the summertime when the sunlight is strongest. Statewide, the "ozone season" is considered the months May through October. Most NCCAB exceedances follow the typical May through October pattern (Monterey Bay Unified Air Pollution Control District, August 2008). However, with the introduction of the 8-hour state standard, exceedances become much more frequent and start as early as April. While the seasonal exceedance patterns for both the 1 and 8-hour criteria are similar, the 8-hour standard greatly increases the number of exceedances and causes the ozone season to start earlier (Ibid.).

Sensitive Receptors

A sensitive receptor is generically defined as any residence including private homes, condominiums, apartments, and living quarters; education facilities such as preschools and kindergarten through grade twelve (k-12) schools; daycare centers; and health care facilities such as hospitals or retirement and nursing homes. Sensitive receptors include long-term care hospitals, hospices, prisons, and dormitories or similar live-in housing. The MBUAPCD's "CEQA Guidelines" include identification of sensitive receptors in the vicinity of a project site as part of the CEQA review with an analysis of whether a project would expose sensitive receptors to significant amounts of pollution as a part of the CEQA analysis for proposed projects. This includes sensitive receptors near roadways and intersections that could be significantly impacted by the project's traffic and carbon monoxide emissions.

As discussed in the LAND USE (Chapter 4.1) section of this EIR, nearly 40% of existing land uses within the city are residential, which would be considered sensitive receptors. Other sensitive

receptors include schools, daycare centers and health care facilities throughout the city. There are no hospitals located within city limits.

AIR BASIN PLANS

Air Quality Management Plan

The 1991 AQMP for the Monterey Bay Area was the first plan prepared in response to the California Clean Air Act of 1988 that established specific planning requirements to meet the ozone standard. The Act requires that the AQMP be updated every three years. The current AQMP, adopted in 2008, is the fifth update to the 1991 AQMP with the first four updates completed in 1994, 1997, 2000 and 2004, respectively.

The air basin is a nonattainment area for the State Ambient Air Quality Standards for both ozone and inhalable particulate matter (PM_{10}). The AQMP addresses only attainment of the State ozone standard. Attainment of the State PM_{10} standard is addressed in the District's plan Particulate Plan, which was adopted in December 2005 and is summarized further below. Maintenance of the national eight-hour standard for ozone is addressed in the District's "Federal Maintenance Plan for the Monterey Bay Region", which was adopted in March 2007 and also is summarized below.

The 2008 AQMP is a transitional plan shifting focus of the MBUAPCD's efforts from achieving the 1-hour component of the State AAQS to achieving the new 8-hour requirement. The plan includes an updated air quality trends analysis, which now reflects both the 1- and 8-hour standards, as well as an updated emission inventory, which includes the latest information on stationary, area and mobile emission sources (Monterey Bay Unified Air Pollution Control District, August 2008).

The AQMP's emission inventory, a key component of the plan, is an estimate of the amount of ozone precursors emitted into the air each day by man-made (anthropogenic) activities. The inventory represents emissions of VOCs and NOx (tons per day) on a typical weekday during the May through October ozone season. The inventory includes stationary sources, area-wide sources and mobile sources. Stationary sources include typically large facilities such as power plants or cement plants, while area-wide sources include an aggregate of individually smaller sources, which when grouped together have significant emissions such as consumer products or residential fuel consumption. Mobile sources consist of the numerous cars and trucks that travel the streets and highways of the NCCAB, as well as other mobile sources such as off-road agricultural and construction equipment, trains and aircraft (Monterey Bay Unified Air Pollution Control District, August 2008).

The emissions forecasts consider growth factors, such as population, housing, employment, industrial output, vehicle miles traveled, etc., developed by state and local agencies, such as AMBAG. These growth factors are used to estimate forces which increase emissions, while "control factors" estimate the offsetting effect of emissions controls (Monterey Bay Unified Air Pollution Control District, August 2008). The AQMP indicates that despite a significant overall increase in population of over 360,000 persons within the NCCAB between 1990 and 2030 (59% increase), emissions are expected to decrease by over 130 tons/day (55% decrease).

This demonstrates a major success for regional control strategies in that despite a significant increase in population, emissions are expected to decline significantly. This is largely due to reductions in tail-pipe emissions from motor vehicles as well as the application of clean air technologies on power plants (Ibid.).

The 2008 AQMP includes five control measures from the 2004 AQMP, whose development was put on hold pending our progress toward achieving the 1-hour standard. Since the introduction of the 8-hour standard the area has reverted to nonattainment, the 2008 AQMP proposes to follow through on development of these previously adopted measures. The five measures include:

- A1 - Solvent Cleaning Operations
- A2 - Degreasing Operations
- A3 - Spray Booths - Miscellaneous Coatings and Cleanup Solvents
- A4 - Adhesives and Sealants
- A5 - Natural Gas-Fired Fan-Type Central Furnaces and Residential Water Heaters

The 2008 AQMP also updates the description of the area's Transportation Control Measures (TCMs) and mobile source emission reduction programs. The AQMP further proposes to evaluate any co-pollutant benefits in terms of reducing ozone precursors achieved under climate change bill AB 32.

Federal Maintenance Plan

The "Federal Maintenance Plan" (May 2007) plan presents the strategy for maintaining the NAAQS for ozone in the NCCAB. It is an update to the 1994 Federal Maintenance Plan, which was prepared for maintaining the 1-hour NAAQS for ozone that since has been revoked and is superseded by the current 8-hour ozone standard. Effective June 15, 2004, the U.S. EPA designated the NCCAB as an attainment area for the 8-hour NAAQS for ozone. The plan includes an emission inventory for the years 1990 to 2030 for VOC and NO_X, the two primary ozone precursor gases as explained above. A contingency plan is included to ensure that any future violation of the standard is promptly corrected (Monterey Bay Unified Air Pollution Control District, May 2007).

Particulate Matter Plan

The purpose of the "Particulate Matter Plan" (December 2005) is to fulfill the requirements of Senate Bill 655, which was approved by the California Legislature in 2003 with the objective of reducing public exposure to particulate matter. The legislation requires CARB, in conjunction wit local air pollution control districts, to adopt a list of the most readily available, feasible and cost-effective control measures that could be implemented by air pollution control districts to reduce ambient levels of particulate matter in their air basins (Monterey Bay Unified Air Pollution Control District, December 2005). The Plan's proposed activities include control measures for fugitive dust, public education, administrative functions, and continued enhancements to the Air District's Smoke Management and emission reduction incentive programs.

The Plan includes review of the basin's air monitoring emissions data with characterization of sources that likely cause or contribute to monitored violations of the standard in the NCAAB. The major cause of exceedances in the NCCAB is naturally occurring sea salt, without which, three quarters of all exceedances in the NCCAB would not have occurred (Monterey Bay Unified Air Pollution Control District, December 2005). There are no planning requirements associated with sea salt, and the remaining exceedances are relatively infrequent and not substantially above the standard (Ibid.).

For the smaller group of exceedances which remain where sea salt was not a major contributor, the causes were likely related to fugitive dust from a variety of sources, including entrained road dust, especially from unpaved roads, wind blow dust from disturbed soil and unpaved surfaces, construction activities and agricultural sources and exposed agricultural lands (Monterey Bay Unified Air Pollution Control District, December 2005). Fugitive dust from cement manufacturing and handling, as well as smoke form wildland fires, also contribute to exceedances of the standard at times (Ibid.).

4.11.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address natural resources and several address air quality in particular. Policy LU1.2 seeks to prevent air pollution from new development, and Policy HZ2.1 strives to exceed air standards. Policy HZ2.2 and its associated actions address localized air quality issues, including indoor air quality, and sets forth directives to require air quality mitigations for new projects and major indirect sources of air pollution.

Goal NRC4 with its four polices and accompanying actions address climate change to attain greenhouse emissions reductions goals, which is reviewed in the GLOBAL CLIMATE CHANGE (Chapter 4.12) section of this EIR. Additionally, a number of policies are directed to reducing automobile trips and creating sustainable development and land use patterns, which would also result in reduction of automobile trips, and thus, emissions as reviewed in the TRAFFIC AND TRANSPORTATION (Chapter 4.4) section of this EIR.

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, land use designation changes are proposed for three specified sites: Swenson, Golf Club Drive area, and an addition to the Dimeo Lane landfill site. The Swenson and Golf Club Drive sites are designated for residential uses. A 5.5-acre parcel immediately south of and adjacent to the

City's Landfill and Resource Recovery Center on Dimeo Lane is proposed to be annexed to the City. It is expected that future uses would be ancillary to the landfill and Resource Recovery Center uses; specific uses have not yet been identified and will be determined in the future. However, the parcel is not planned for expansion of the landfill disposal operations (Arman, personal communication, April 2010).

The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development and/or intensified redevelopment. Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.4). Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. Action ED4.2.2 seeks to "preserve existing and seek new industries and businesses at the cutting edge of science and technology."

The *General Plan 2030* supports some specified new or improved community facilities. The draft plant supports development of a desalination plant (LU3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (see the WATER SUPPLY [Chapter 4.5] section of this EIR for further discussion of the planned desalination facility).

4.11.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

11a Conflict with or obstruct implementation of the air quality management plan;

11b Violate any air quality standards or contribute substantially to an existing or projected air quality violation;

11c Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;

11d Expose sensitive receptors (i.e. residents, schools, hospitals) to substantial pollutant concentrations, i.e. those that exceed the MBUAPCD standards identified above and/or toxic air contaminants that exceed health exposure rates; or

11e Create objectionable odors in substantial concentrations, affecting a substantial number of people, which could result in injury, nuisance or annoyance to a considerable number of persons or would endanger the comfort, health or safety of the public.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address potential conflicts with the air quality management plan (11a); pollutant emissions and potential violation of an air quality standard (11b, 11c); exposure of sensitive receptors to substantial pollutant concentrations (11d); and creation of objectionable odors (11e).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. The proposed General Plan would accommodate future development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030. The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents as discussed in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR. The buildout projections estimate 3,140,000 additional square feet of commercial, office and industrial uses by the year 2030.

Impact 4.11-1 Consistency with AQMP
Adoption and implementation of the General Plan 2030 could indirectly result in increased population associated with potential development that would be accommodated by the Plan. The increased population would exceed population estimates in the Air Quality Management Plan in 2030, and thus the project would be inconsistent and conflict with the AQMP. This is considered a *potentially significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not obstruct implementation of the region's "Air Quality Management Plan" (AQMP) as the AQMP is independently developed and implemented by the MBUAPCD. However, the State CEQA Guidelines §15125(d) requires that an EIR discuss consistency between a proposed project and applicable regional plans, including the AQMP. The MBUAPCD's "CEQA Guidelines" consider inconsistency with the AQMP to be a significant cumulative adverse air quality impact.

The AQMP is prepared to address attainment of the State ozone AAQS and maintenance of the federal ozone AAQS. The plan accommodates growth by projecting growth in emissions based on different indicators. For example, population forecasts adopted by AMBAG are used to forecast population-related emissions. Through the planning process, emissions growth is offset by basinwide controls on stationary, area, and transportation sources of air pollution (Monterey Bay Unified Air Pollution Control District, February 2008). Thus, population-related emissions have been forecast in the AQMP using population forecasts adopted by AMBAG, and population-changing projects which are consistent with these forecasts are consistent with the AQMP. Projects which are not consistent with the AQMP's population projections have not been accommodated in the AQMP and would have a significant cumulative impact on regional air

quality unless emissions are totally offset (Monterey Bay Unified Air Pollution Control District, February 2008).

Consistency of indirect emissions associated with a commercial, industrial or institutional projects intended to meet the needs of the population as forecast in the AQMP is determined by comparing the estimated current population of the county in which the project is to be located with the applicable population forecast in the AQMP. If the estimated current population does not exceed the forecasts, indirect emissions associated with the project are deemed to be consistent with the AQMP (Monterey Bay Unified Air Pollution Control District, February 2008).

As indicated above, the proposed *General Plan 2030* would not directly result in increased population. However, the draft General Plan includes policies and a land use map that support additional development. Based on estimates provided by the City's land use consultant as described in the LAND USE (Chapter 4.1) section of this EIR and summarized above, potential residential development that could be accommodated in the draft *General Plan 2030* could result in a population increase of approximately 8,040 residents between 2009 and 2030.[1] This would result in a total city population of 67,022 in the year 2030 over 58,982 residents in 1990. This population is slightly higher (about 1,140 residents) than the AMBAG forecast of 65,884 residents in the year 2030, but is less than AMBAG's projection of 67,807 residents in the City in 2035.

Estimated population growth indirectly resulting from the proposed *General Plan 2030* represents an average annual growth rate of 0.65%, which is slightly lower than historical growth rates experienced in the City since 1990 (0.9%), but similar to the AMBAG forecast growth rate forecast between 2010 and 2030 (0.56%) as discussed further in the POPULATION & HOUSING (Chapter 4.2) section of this EIR. The increase over AMBAG projected levels (approximately 55 additional persons per year averaged over the 20-year General Plan horizon) is not considered substantial. Nonetheless, at some point after 2020 or 2025, the City's population may exceed population projections developed by AMBAG and included in the AQMP.

AMBAG population projections and the MBUAPCD's emissions forecasts and AQMP are updated regularly to account for changes in population and air quality trends. Since potential inconsistencies with the AQMP's population projections would not occur for at least 10 years, there is an opportunity for subsequent updates to reflect the City's anticipated population associated with potential buildout of the *General Plan 2030*. The City has requested that the regional forecasts be updated to reflect growth envisioned in the draft General Plan, and the MBUAPCD has concurred with this approach.

During the preparation of this Draft EIR, the MBUAPCD approved a new consistency procedure in June 2011. The new procedure, which is effective September 1, 2011. uses AMBAG's adopted housing unit forecast instead of the population forecast, and the MBUAPCD has developed a spreadsheet to assist jurisdictions with developing calculations (Monterey Bay Unified Air Pollution Control District, July 2011).The AMBAG forecasts show an increase of 2,413 dwelling units between 2009 and 2030 as discussed in Chapter 4.2 of this EIR, whereas

[1] Based on an average household size of 2.4 people, as discussed in the POPULATION & HOUSING (Chapter 4.2) section of this EIR.

the projected buildout from the proposed *General Plan 2030* would result in development of 3,350 housing units. Under the new procedure, the proposed project would also be inconsistent with the AQMP, although the increase in housing units under the proposed plan represents an average annual growth rate of approximately 0.7%, which is less than the historic average annual rate of about 1.1% experienced between 1990 and 2009.

The proposed *General Plan 2030* also includes a number of policies and actions that serve to reduce vehicle emissions (30% by 2020 per NRC4.1.3), support alternative transportation, and support sustainable land use patterns, all of which would help contribute to a reduction in vehicle emissions. Table 4.11-3 summarizes policies that directly or indirectly avoid or reduce air pollutant emissions and impacts.

Conclusion. The estimated General Plan buildout could result in indirect population and housing unit increases that exceed current AMBAG forecasts used in the Monterey Bay Unified Air Pollution Control District's *Air Quality Management Plan*. Therefore, according to MBUAPCD's CEQA Guidelines, this inconsistency between growth forecasts of the proposed *General Plan 2030* and the current AQMP would be considered a significant impact. However, the population growth and housing unit increase exceedance would not occur for at least 10+ years, if it occurs at all, and the potential population accommodated under the *General Plan 2030* represents a growth rate of approximately 0.6% (approximately 55 additional persons per year), which is slightly less than the historical rate experienced in the City since 1990, but similar to the rate in AMBAG's current population forecast (0.56%). Similarly, the potential housing units accommodated under the *General Plan 2030* represents a growth rate of approximately 0.7% (approximately 45 additional residential units per year), which is slightly less than the historical rate experienced in the City since 1990 (1.1%). MBUAPCD has future updates to regional forecasts, and updates of the AQMP can be made to incorporate updated City population and housing unit projections. Furthermore, the *General Plan 2030* includes several policies and actions that, when implemented, would reduce vehicle miles traveled and thus, air pollutant emissions from vehicle trips, which is consistent with the goals of the MBUAPCD's AQMP.

Mitigation Measures

Implementation of the following mitigation measure will reduce the impact to a less-than-significant level.

MITIGATION 4.11-1 The City shall work with the MBUAPCD and AMBAG and request that AMBAG's next population and housing forecast for the city of Santa Cruz and MBUAPCD's next *Air Quality Management Plan* be updated to reflect potential growth that could be accommodated by the General Plan 2030.

TABLE 4.11-3
Proposed General Plan Policies & Actions that Reduce Air Emissions & Air Quality Impacts

Type of Measure / Action	Policies / Actions
MEET AIR QUALITY STANDARDS and DEVELOPMENT REVIEW & MITIGATION	• Strive to exceed air quality standards: HZ2.1 • Address air quality issues: HZ2.2 • Ensure development does not create air pollution through project-level environmental review process: LU 1.2, LU1.2.1 • Require project-development mitigation: HZ2.2.1, HZ2.2.2 • Encourage green, sustainable industries and businesses that don't pollute: ED6.2, ED6.2.1, ED6.2.2 • Recycle/eliminate Chlorofluorocarbons (HZ2.1.3) & strive to eliminate polystyrene foam (HZ2.1.4) • Implement Smoking Pollution Control Ordinance: HZ2.2.5
REDUCE AUTO / VEHICLE TRIPS & EMISSIONS	• Vehicle emissions reduced 30% by 2020: NRC4.1.3 • Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 • Encourage employment-related strategies (i.e., flex-time, telecommuting, parking management, ridesharing): M3.1.7, M3.1.8, M.2.1.9 • Encourage public education programs to reduce transportation-related emissions and pollutants: HZ2.2.4
PROTECT SENSITIVE RECEPTORS	• Locate sensitive receptors from major air pollution sources or require mitigation: HZ2.2.3
SUPPORT ALTERNATIVE TRANSPORTATION MODES TO REDUCE EMISSIONS	• Plan and support alternative transportation options, modes and strategies: NRC4.4.2. • Encourage use of alternative transportation modes: M.2.1.2 • See TABLE 4.4-4 IN THE TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list
SUPPORT LAND USE PATTERNS TO REDUCE VEHICLE TRIPS & EMISSIONS	• Reduce auto use with pedestrian/transit-oriented activity centers & development centers (M1.1), Expand neighborhood facilities (LU4.3, LU4.3.1), and Encourage land use changes that reduce auto use: LU4.2) • Encourage home occupations & telecommuting: LU4.4, LU4.4.1 and Live-work units: LU4.1.4, HA4.4 (artists) • Ensure optimum utilization of infill parcels (LU1.1, LU1.1.1) and Consolidation of Parcels (LU1.1.2) • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU3.10 & LU3.10.1 (commercial uses allowed in all districts), LU4.1.1, LU4.2.2 (new districts) & Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2 • See TABLE 4.4-4 IN THE TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list

Impact 4.11-2 Increased Emissions of Criteria Pollutants
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in emissions of criteria pollutants due to new development that would be accommodated by the Plan within an air basin that currently exceeds state standards for ozone and PM_{10}. However, emissions of criteria pollutants are expected to decrease in the future, and new emissions would not contribute to potential air quality violations. Additionally, with implementation of proposed *General Plan 2030* policies and actions and adherence to regional guidelines for future project-level reviews, indirect emissions resulting from buildout under the Plan would not be expected to substantially increase ozone precursors and particulate matter or result in air quality violations. This is considered a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized in subsection 4.11.2 above, could result in mobile sources of emissions associated with vehicle trips, as well as project-level construction-related emissions, as discussed below. The proposed General Plan does not identify or support any major new potential stationary emission sources.

Future Project-Level Stationary Emissions

Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment. The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.3). Depending on the specific use, some industrial uses can result in a stationary source of emissions. However, Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. Additionally, Policy ED6.2 encourages and supports "green" and environmentally-oriented businesses to locate in Santa Cruz. Furthermore, the draft plan supports "green" and sustainable commercial and industrial operating practices (ED6.2.2) and encourages businesses that "don't pollute" (ED6.2.3). Overall, the types of industries and businesses supported in the draft *General Plan 2030* are not significant sources of stationary emissions.

The draft plan supports specific land uses, such as directing large regional retail uses to the Harvey West area (LU3.2.8), encouraging a performing arts center downtown (HA2.2.5), attracting a "top-end" hotel (ED1.5.2), and encouraging development of neighborhood facilities, such as parks, schools daycare centers and neighborhood commercial services. None of these types of uses would be expected to result in significant stationary sources of emissions.

The draft plan does support development of a desalination plant (LU3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (IWP) (see the WATER

SUPPLY [Chapter 4.5] section of this EIR for further discussion of the planned desalination facility). A program EIR prepared for the IWP also reviewed potential impacts of a desalination facility, but did not identify stationary sources as a potentially significant air quality impact (EDAW, June 2005). This type of facility is not expected to be a source of stationary emissions, except for potential intermittent use of back-up generators in the event of a power outage. (See the WATER SUPPLY (Chapter 4.4) of this EIR for further discussion of potential impacts related to construction and operation of a desalination facility.)

The MBUAPCD regulates stationary emissions through its Rule 200. This rule applies to "any person who builds, erects, alters, or replaces any article, machine, equipment or other contrivance which may cause the issuance of air contaminants or the use of which may eliminate or reduce or control the issuance of air contaminants."

Future Project-Level Operational Emissions

The primary operational emissions associated with the proposed project are ozone precursors, particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO) and carbon dioxide (CO2), primarily emitted as vehicle exhaust for ozone precursors and CO. New development accommodated by the general plan could affect air quality by increasing ozone precursor and particulate matter emissions for an area that already exceeds ambient air quality standards.

As indicated above, the primary sources of the ozone precursor, VOC within the planning area, are on- and off-road motor vehicles, cleaning and surface coatings, solvent evaporation, landfills, petroleum production and marketing, and prescribed burning. Major sources of primary particles include fugitive dust from roads and agricultural operations. Secondary particulates are formed in the atmosphere largely by chemical reactions involving gases, e.g., sulfate from directly emitted sulfur oxides. Construction-related activities associated with future development projects would be the primary source of PM_{10} emissions.

Mobile source emissions would be associated with new vehicle trips. The estimated *General Plan 2030* buildout could result in an increase of 78,236 new average daily trips (ADT). However, vehicular emission rates are anticipated to lessen in future years due to continuing improvements in automobile and fuel efficiency programs implemented by the state of California (Monterey Bay Unified Air Pollution Control District, August 2008). Additionally, as previously indicated, the MBUAPCD's existing AQMP forecasts a substantial reduction in emissions over the next 20-year period.

Emissions were modeled as part of the preparation of this EIR. The URBEMIS model was run for part of the calculation of greenhouse gas emissions (carbon dioxide), and the results also include criteria pollutant emissions. The model was run for the project for both the baseline year and buildout year. The results show a substantial decrease in emissions, which supports the Air District's conclusion of expected reductions in emissions in the future.

The EMFAC 2007 program was used to generate emissions factors for Santa Cruz for vehicular emissions. The methodology involved developing estimates of Vehicle Miles Travelled (VMT) within city limits and multiplying by an annual average emission factor derived from the EMFAC-2007 program. The results are shown in Table 4.11-4. Ozone precursors (ROG and NO_x) and CO show substantial reductions by 2030 despite anticipated increases in VMT due to

reductions in per-mile emission rates for the 2030 vehicle fleet. (See summary in Appendix E for further details.) This decrease would have the effect of offsetting indirect emissions generated as a result of development accommodated by the proposed *General Plan 2030*. Thus, the project would not result in emission levels that would potentially contribute to air quality violations for ozone precursors.

TABLE 4.11-4
Criteria Pollutant Emissions

Year	Daily Average Emissions in Pounds/Day			
	ROG	CO	NO_x	PM_{10}
Citywide Emissions - 2008	328.6	6,854.1	1,194.6	40.0
Citywide Emissions - 2030	82.8	1,997.6	332.93	45.8
Change	-245.8	-4,856.5	-861.7	+5.8

Source: Donald Ballanti, August 2011

Future emissions, however, would result in a net increase in PM_{10} emissions with a potential to contribute to future air quality violations. However, the MBUAPCD's CEQA Guidelines include significance criteria for development projects so that daily thresholds are not exceeded. Future review and compliance with these standards (as discussed further below) would ensure that thresholds for PM_{10} are not exceeded.

Increased traffic also would result in a reduction of intersection levels of service (LOS) to unacceptable levels (below D) at 11 intersections or a significant worsening at 10 intersections currently operating at unacceptable levels of service if no improvements are made (as discussed in the TRANSPORTATION & TRAFFIC [Chapter 4.4] section of this EIR). This would contribute to localized carbon monoxide emissions. However, intersection improvements identified in the City's Traffic Impact Fee Program or identified in this EIR (see Chapter 4.4) would improve LOS to acceptable levels at 10 of these intersections and improve LOS or delays at most of the remaining intersections. Furthermore, proposed General Plan policies seek to maintain an acceptable LOS D or better at signalized intersections with acceptance of a reduced LOS at major regional intersections (M3.1.3, M3.1.4) and promotion of transportation system management strategies (M2.5.2) and other alternative transportation modes as summarized in Table4.4-4 in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR. Discussions with MBUAPCD staff indicate that high concentrations of localized CO emissions ("hot spots") are generally not a problem in the region, and future developments would need to address the potential for exposure of sensitive receptors to CO hot spots at the project level during environmental review (Getchell and Nunes, personal communication, February 2011).

Future Project-Level Construction-Related Emissions

Future development supported and/or accommodated by the proposed General Plan would result in construction-related emissions that could affect air quality by increasing ozone precursor and particulate matter emissions for an area that already exceeds California

ambient air quality standards for these pollutants. Construction activities include demolition, excavation, grading, vehicle trips (including workers, deliveries and hauling), and vehicle travel on paved and unpaved surfaces. Vehicle and equipment exhaust would generate pollutant emissions. Construction projects may also generate diesel particulate emissions from diesel-fueled equipment.

Particulate matter is the pollutant of greatest concern that is emitted from construction, particularly during site preparation and grading. Particulate matter emissions can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, type of equipment in operation, and weather conditions. Off-road construction equipment is also a large source of NO_X and diesel particulate matter, a state-designated toxic air contaminant (TAC). The scale and timing of construction is unknown, and construction activities would be variable throughout the day and overall construction period.

Proposed General Plan Policies & Future Project Reviews

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on air quality. These include: environmental review of future proposed development to address project-level emissions and air quality impacts resulting from development projects proposed in the future in accordance with the General Plan (LU1.2, LU1.2.1); requiring project-level mitigation measures (HZ2.2.1, HZ2.2.2); and actions to reduce vehicle trips and associated emissions (M1.1, M3.1, M3.1.1, M3.1.2, NRC4.1.3). Other goals, policies and actions promote sustainable land use patterns, such as encouraging mixed-use development along the City's four major transportation corridors that have easy access to pedestrian, bike and transit facilities, and encouraging use of alternative transportation modes. The proposed *General Plan 2030* also seeks to reduce vehicle emissions (30% by 2020 per NRC4.1.3), and includes a number of policies that seek to reduce single passenger vehicle trips, which would also reduce greenhouse gas emissions and other air pollutant emissions from vehicles (see Table 4.12-5 in the GLOBAL CLIMATE CHANGE [Chapter 4.12] section of this EIR). Table 4.11-3 summarizes policies that directly or indirectly address air quality issues or emissions.

As indicated in the MBUAPCD's response to the EIR "Notice of Preparation", future development projects constructed in accordance with the proposed *General Plan 2030* could have impacts on air quality, which would be evaluated when the projects are proposed. Projects with emissions below the District's significance threshold would not be considered to result in significant impacts. Under the District's current CEQA Guidelines, a project would result in a significant impact if the project would result in generation of emissions of or in excess of the following emissions levels:

- 137 pounds per day for VOC or NO_x, 550 pounds per day of carbon monoxide,
- 150 pounds per day of sulfur oxides (SO_x) for new operational sources, and/or
- 82 pounds per day of PM_{10} due to construction with minimal earthmoving on 8.1 or more acres per day or grading/excavation site on 2.2 or more acres per day for PM_{10}.

As indicated above, the proposed General Plan does include a policy and action requiring evaluation of air quality impacts as part of specific development proposals and implementation of project-level mitigation measures if required. Future projects proposed in accordance with provisions of the Draft *General Plan 2030* would be required to utilize the project-level significance thresholds for operations included in the MBUAPCD's "CEQA Guidelines," which would be considered during the environmental review process for future projects. The MBUAPCD's "CEQA Guidelines" also specify types of mitigation measures for operational and construction-related emissions. Projects will be required to implement control measures to ensure that emissions and construction-related PM_{10} emissions do not exceed MBUAPCD's daily thresholds. Additionally, land uses with stationary sources of emissions would be subject to review and approval by the MBUAPCD.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result primarily in mobile and construction-related emissions, and limited potential stationary sources of emissions. Future emissions of ozone precursor pollutants are projected to decrease, and thus, project-level emissions would not contribute to existing or potential future violations of ozone precursors or CO air quality standards. While, PM_{10} emissions would increase, compliance with MBUAPCD significance criteria at a project level would ensure that project emissions do not exceed daily standards. Vehicular emission rates are anticipated to lessen in future years due to continuing improvements in automobile and fuel efficiency and new regulations and programs adopted by the state of California that are scheduled to be phased in over the life of the proposed General Plan, and such reductions are factored into the air quality models used to estimate emissions. Furthermore, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on air quality, including environmental review to address project-level emissions, requiring project-level mitigation measures, and reduction of vehicle trips and emissions as summarized on Table 4.11-3. With implementation of these proposed policies and actions, as well as future project-level environmental review and compliance with MBUAPCD requirements and air quality control measures and adherence to permit requirements of the MBUAPCD, the proposed *General Plan 2030*'s indirect contribution to air emissions and air quality impacts would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* actions are recommended to strengthen support for MBUAPCD air pollution control strategies.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in <u>underlined</u> typeface.

HZ2.2.1 ~~Incorporate~~ <u>Require future development projects to implement applicable Monterey Bay Unified Air Pollution Control District control measures and/or</u> air quality

mitigations in the design of new projects as set forth in the District's "CEQA Guidelines".

HZ2.2.2 Permit major indirect sources of air pollution only if they provide transportation measures to reduce their impacts to ~~an in~~ a less-than-significant level, consistent with applicable MBUAPCD recommended mitigation and control measures as set forth in the District's "CEQA Guidelines".

HZ2.2.6 Support MBUAPCD air pollution control strategies, air quality monitoring and enforcement activities.

Impact 4.11-3 Exposure of Sensitive Receptors to Pollutants The increased population or development accommodated by the proposed *General Plan 2030* could indirectly result in exposure of existing or new sensitive receptors to pollutant concentrations which would not be considered substantial with implementation of the proposed *General Plan 2030* policies and actions and the regulation of stationary sources by the Monterey Bay Unified Air Pollution Control District. This is considered a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development that is consistent with the Plan. This potential development, as summarized in subsection 4.11.2 above, would primarily result in mobile sources of emissions associated with vehicle trips, as well as project-level construction-related emissions, as discussed under Impact 4.11-2 above. The proposed General Plan does not identify or support any major new potential stationary emission sources. The proposed plan does include continued industrial land use designations, but as discussed above under the Impact 4.11-2 discussion, the types of new businesses and industry supported in the draft *General Plan 2030* are not likely to be significant sources of stationary emissions.

Sensitive receptors within the proposed General Plan planning area include residential uses, schools, libraries and senior centers. Sensitive receptors could be potentially subject to stationary and/or vehicular emissions and pollutants such as toxic air contaminants from stationary sources, carbon monoxide (CO) emissions from vehicular traffic, and/or diesel emissions from construction-related emissions.

The proposed *General Plan 2030* requires that air pollution-sensitive land uses be located away from major sources of air pollution or require mitigation measures to protect residential and sensitive land uses from freeways, arterials, point source polluters, and hazardous material locations (HZ2.2.3). Additionally, any potential source of stationary emissions would be subject to MBUAPCD review and approval to ensure emissions do not create or substantially contribute to air quality violations. Stationary sources with potential toxic air contaminants would also be

subject to MBUAPCD review and approval to ensure that there are no significant impacts to adjacent residents, sensitive receptors and/or other land uses.

Vehicle emissions can result in concentrations of carbon monoxide at impacted intersections due to congestion and vehicle idling. The MBUAPCD thresholds for CO emissions require projects to perform localized CO modeling for intersections that operate with deficient levels of service. As discussed above under Impact 4.11-2, increased traffic would result in a reduction of intersection levels of service (LOS) to unacceptable levels (below D) at 11 intersections or a significant worsening at 10 intersections currently operating at unacceptable levels of service. This would contribute to localized carbon monoxide emissions. However, intersection improvements identified in the City's Traffic Impact Fee Program or identified in this EIR (see Chapter 4.4) would improve LOS to acceptable levels at 10 of these intersections and improve LOS or delays at most of the remaining intersections. Furthermore, proposed General Plan policies seek to maintain an acceptable LOS D or better at signalized intersections with acceptance of a lower LOS at major regional intersections (M3.1.3, M3.1.4) and promotion of transportation system management strategies (M2.5.2) and other alternative transportation modes as summarized in Table 4.4-4 in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR. Discussions with MBUAPCD staff indicate that high concentrations of localized CO emissions are generally not a problem in the region, and future developments would need to address CO emissions at the project level during environmental review (Getchell and Nunes, personal communication, February 2011).

Diesel particulate matter was identified as a toxic air contaminant (TAC) by the State of California in 1998. Following the identification of diesel as a TAC, the California Air Resources Board (CARB) developed a comprehensive strategy to control diesel PM emissions. The "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles"—a document approved by ARB in September 2000—set goals to reduce diesel PM emissions in California by 75% by 2010 and 85% by 2020. This objective would be achieved by a combination of approaches (including emission regulations for new diesel engines and low sulfur fuel program). An important part of the Diesel Risk Reduction Plan is a series of measures for various categories of in-use on- and off-road diesel engines, which are generally based on the following types of controls:

- Retrofitting engines with emission control systems, such as diesel particulate filters or oxidation catalysts,
- Replacement of existing engines with new technology diesel engines or natural gas engines, and
- Restrictions placed on the operation of existing equipment.

Once the Diesel Risk Reduction Plan was adopted, the ARB started developing emission regulations for a number of categories of in-use diesel vehicles and equipment. In July 2007, the ARB adopted regulations for in-use, off-road diesel vehicles that will significantly reduce particulate matter emissions by requiring fleet owners to accelerate turnover to cleaner engines and install exhaust retrofits.

Demolition, excavation, grading and project construction could involve the use of diesel trucks and equipment that will emit diesel exhaust, including diesel particulate matter, which is

classified as a TAC. Adjacent residents and businesses would be exposed to construction-related diesel emissions, but activities that would use diesel equipment would be of temporary and of short-term duration. CARB has identified diesel exhaust particulate matter as a TAC, and assessment of TAC cancer risks is typically based upon a 70-year exposure period. Project excavation and construction activities that would utilize diesel-powered equipment would expose receptors to possible diesel exhaust for a very limited number of days out of a 70-year (365 day per year, 24-hour per day) period. Because exposure to diesel exhaust will be well below the 70-year exposure period, and given the limited and short-term duration of activities that would use diesel equipment, construction-related diesel emissions are not considered significant. Furthermore, the State is implementing emission standards for different classes of on- and off-road diesel vehicles and equipment that apply to off-road diesel fleets and includes measures such as retrofits. Additionally, Title 13 of the California Code of Regulations (section 2485(c)(1)) prohibit idling of a diesel engine for more than 5 minutes in any location.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan could result in stationary, operational and/or construction-related emissions near sensitive receptors. However, with implementation of proposed General Plan policies to locate sensitive receptors away from major sources of air pollution, to reduce traffic (and thus traffic-related emissions), and to conduct project-specific environmental review when new development is proposed in the future, would avoid exposure of sensitive receptors to substantial pollutant concentrations. With implementation of these proposed policies and actions, as well as future project-level environmental review and compliance with MBUAPCD requirements and air quality control measures and adherence to permit requirements of the MBUPCD, the proposed General Plan 2030's indirect contribution to air emissions and air quality impacts would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.11-4 Odors
Adoption and implementation of the *General Plan 2030* would not directly or indirectly result in new uses that would be result in introduction of substantial odors with implementation of proposed policies and actions and adherence to City regulations. Thus, *no impacts* are expected related to odors.

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased population or new development. However, the draft General Plan includes policies and a land use map that support additional development. According to the MBUAPCD, objectionable odors include sulfur compounds and methane, and typical sources of odors include landfills, rendering plants, chemical plants, agricultural uses, wastewater treatment plants, and refineries (Monterey Bay Unified Air Pollution Control District, February 2008).

The proposed *General Plan 2030* does not specifically identify, designate or support any new stationary sources that would be considered likely significant odor-generating facilities. The proposed 5.5-acre addition to the landfill is not proposed for expansion of the landfill disposal operations. As previously indicated, the City of Santa Cruz Municipal Code Section 24.14.264 prohibits emission of odorous gases or matter in quantities readily detectable. Additionally, future proposed development will be subject to project-level environmental review (LU1.2, LU1.2.1) and mitigation (HZ2.2.1), if required, which would result in avoidance of potentially significant impacts related to odor.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development. New development accommodated by the plan would not be expected to result in generation of significant odors with implementation of proposed General Plan policies to ensure that new development does not result in unacceptable air pollution (including project-specific environmental review and mitigation) and with compliance with City regulations that prohibit odor emissions.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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4.12 GLOBAL CLIMATE CHANGE

4.13.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Overview
- Greenhouse Gas Sources & Effects
- Regulatory Setting
- California Emissions Inventory & Scoping Plan
- City & Regional Plans & Targets

OVERVIEW

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural factors and processes, and human activities that change the composition of the atmosphere and alter the surface and features of the land. Such changes vary considerably by geographic location. Over time, the earth's climate has undergone periodic ice ages and warming periods, as observed in fossil isotopes, ice core samples, and through other measurement techniques. Recent climate change studies use the historical record to predict future climate variations and the level of fluctuation that might be considered statistically normal given historical trends. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of greenhouse gas (GHG) emissions in the atmosphere (Office of Planning & Research, June 2008).

Greenhouse gases trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities (Office of Planning & Research, June 2008). The greenhouse effect helps to regulate the temperature of the planet. It is essential for life on earth and is one of earth's natural processes. It is the result of heat absorption by certain gases in the atmosphere (called greenhouse gases because they effectively 'trap' heat in the lower atmosphere) and re-radiation downward of some of that heat. Water vapor is the most abundant greenhouse gas, followed by carbon dioxide and other trace gases (U.S. Department of Commerce, February 2010).

Natural processes and human activities such as fossil fuel combustion, deforestation and other changes in land use result in the emission of GHGs such as carbon dioxide (CO_2) in the atmosphere. Atmospheric concentrations of both the natural and man-made gases have been rising over the last few centuries. As the global population has increased with reliance on fossil fuels (such as coal, oil and natural gas), emissions of these gases have risen. The emission of GHGs through the combustion of fossil fuels in conjunction with other human activities, appears

to be closely associated with global warming (Office of Planning & Research, June 2008). Pre-industrial levels of carbon dioxide (prior to the start of the Industrial Revolution) were about 280 parts per million by volume (ppmv), and current levels are greater than 380 ppmv and increasing at a rate of 1.9 ppm yr^{-1} since 2000 (U.S. Department of Commerce, February 2010). The global concentration of CO_2 in the atmosphere today far exceeds the natural range over the last 650,000 years of 180 to 300 ppmv (Ibid.). According to the Intergovernmental Panel on Climate Change (IPCC – see description below), by the end of the 21st century, carbon dioxide concentrations could be anywhere from 490 to 1260 ppm (75-350% above the pre-industrial concentration) (Ibid.).

The IPCC modeled several possible emissions trajectories to determine what level of reductions would be needed worldwide to stabilize global temperatures and minimize climate change impacts. Regardless of the analytic method used, global average temperature and sea level rise were predicted to rise under all scenarios (IPCC, 2007). In other words, there is evidence that emissions reductions can minimize climate change effects but cannot reverse them entirely. Emissions reductions can reduce the severity of impacts, resulting in lesser environmental impacts. For example, the IPCC predicted that the range of global mean temperature change from year 1990 to 2100, given different emissions reductions scenarios, could range from 1.1° C to 6.4° C.

This section of the EIR evaluates the potential impacts of global climate change resulting from the proposed General Plan update. It is now widely recognized that anthropogenic (human-caused) emissions of greenhouse gases and aerosols are contributing to changes in the global climate, and that such changes are having, and will have adverse effects on the environment, the economy, and public health. These are cumulative effects of past, present, and future actions worldwide. While worldwide contributions of greenhouse gases are expected to have widespread consequences, it is not possible to link particular changes to the environment of California or elsewhere to greenhouse gases emitted a particular source or location. When considering a project's contribution to impacts from climate change, it is possible to examine the quantity of greenhouse gases that would be emitted either directly from project sources or indirectly from other sources, such as production of electricity. However, that quantity cannot be tied to a particular adverse effect on the environment of California or elsewhere associated with climate change.

California's State's top scientists consider global warming to be a very serious issue requiring changes in resource, water supply, and public health management (California Climate Change Center, July 2006). In 2006, the State of California passed the Global Warming Solutions Act of 2006 (AB 32), which seeks to reduce GHG emission generated by California. AB 32 (which is further described below) states:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

GREENHOUSE GAS SOURCES & EFFECTS

Greenhouse Gases

The California Global Warming Solutions Act of 2006 includes the following Kyoto greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). These greenhouse gases are referenced in the international guidance on the development of national inventories provided by the IPCC, the authoritative scientific body on climate change (California Air Resources Board, November 2007). Three of these greenhouse gases, CO_2, CH_4, and N_2O, may be emitted naturally or through human activities (e.g., the combustion of fossil fuels). The other three, SF_6, HFCs, and PFCs, are synthetically produced for industrial purposes (Ibid.).

The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide (California Governor's Office of Planning and Research, June 2008). The primary contributors to GHG emissions in California (as of 2008) are transportation (about 37%), electric power production (24%), industry (20%), agriculture and forestry (6%), and other sources, including commercial and residential uses (13%) (California Air Resources Board, November 2007). Approximately 81% of California's emissions are carbon dioxide produced from fossil fuel combustion (California Air Resources Board, September 2010).

Further descriptions of greenhouse gases are provided below.

- *Carbon Dioxide (CO_2)*. The natural production and absorption of carbon dioxide (CO_2) is achieved through the terrestrial biosphere (through uptake by vegetation) and dissolution into the ocean. "CO_2 sinks" absorb, rather than produce, CO_2. Emissions related to human activity are mainly associated with carbon-bearing fossil fuel combustion with a portion of these emissions attributed to out-of-state fossil fuel used for electricity consumption within California (California Energy Commission, December 2006). Other activities that produce CO2 emissions include mineral production, waste combustion, and land use and forestry changes (Ibid.).
- *Methane (CH_4)*. Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane come from landfills, natural gas systems, and enteric fermentation. Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. Agricultural activities (enteric fermentation and manure management) and landfills are the major sources of these emissions (California Energy Commission, December 2006).
- *Nitrous Oxide (N_2O)*. Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. Agricultural soil management activities and mobile source fuel combustion compose the major sources of N_2O emissions in California (California Energy Commission, December 2006).

- *Hydrofluorocarbons (HFCs)*. HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum.
- *Perfluorocarbons (PFCs)*. Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semi-conductor manufacturing.
- *Sulfur hexafluoride (SF_6)*. Sulfur hexafluoride is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity.

Effects of GHG Emissions & Climate Change

Greenhouse gases are global in their effect. A primary element of global climate change has been a rise in average temperatures. According to the IPCC, "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level" (Intergovernmental Panel on Climate Change, 2007). At continental, regional and ocean basin scales, numerous long-term changes in climate have been observed to include: changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones (Ibid.) Furthermore, most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations, and warming of about 0.2°C per decade is projected for the next two decades (Ibid.).

Climate change models predict changes in temperature, precipitation patterns, water availability, and rising sea levels, and these altered coastal conditions can have impacts on natural and human systems in California (California Climate Action Team, April 2010). Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The state has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year (California Natural Resources Agency, 2009). Changes in temperature, precipitation, and sea levels can affect California's public health, habitats, ocean and coastal resources, water supplies, agriculture, forestry, and energy use (California Climate Action Team, April 2010), as well as result in increased droughts and flooding.

According to the California Department of Water Resources ("California Water Plan Highlights"), more changes related to climate change can be expected by the year 2050 and on to the end of the century:

- California's mean temperature may rise 1.5 degrees to 5.0 degrees Fahrenheit by 2050 and 3.5 degrees to 11 degrees by the end of the century.
- Sierra Nevada snowpack may decrease by 25 to 40%.

- Average annual precipitation may show little change, but more intense wet and dry periods can be expected with more floods and more droughts,
- Flood peaks will become higher and natural spring/summer runoff will become lower.
- Global sea levels may rise by 4 to 16 inches by mid-century and 7 to 55 inches by the end of the century, which would increase salinity in California's delta region (California Department of Water Resources, 2009).

According to the California Climate Change Center:

- Sea level in California could rise between approximately10 centimeters to 90 centimeters (4 to 25 inches) above existing mean sea level by 2099 as a result of climate change, also increasing the frequency of 100-year event high tide peaks (California Climate Change Center, March 2006).
- A subsequent study indicated that under medium to medium-high greenhouse-gas emissions scenarios, mean sea level along the California coast is projected to rise from 1.0 to 1.4 meters (about 3 to 4.5 feet) by the year 2100 (California Climate Change Center, March 2009).

Climate change could also have adverse effects on water quality, which would in turn affect the beneficial uses (habitat, water supply, etc.) of surface water bodies and groundwater. Changes in precipitation could result in increased sedimentation, higher concentrations of pollutants, higher dissolved oxygen levels, increased temperatures, and an increase in the amount of runoff constituents reaching surface water bodies.

Climate change is also expected to have effects on diverse types of ecosystems, from alpine to deep sea habitat. As temperatures and precipitation change, seasonal shifts in vegetation will occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "20 percent to 30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3°C (3.6 to 5.4°F) relative to pre-industrial levels." Shifts in existing biomes could also make ecosystems vulnerable to invasive species encroachment. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.

Finally, climate change may also increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects – malaria, dengue fever, yellow fever, and encephalitis. Cholera, which is associated with algal blooms, could also increase. While these health impacts would largely affect tropical areas in other parts of the world, effects would also be felt in California. Warming of the atmosphere would be expected to increase smog and particulate pollution, which could adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events would also be expected to occur with more frequency, and could adversely affect the elderly, children and the homeless.

Lastly, the water supply impacts and seasonal temperature variations expected as a result of climate change could affect the viability of existing agricultural operations, making the food supply more vulnerable.

REGULATORY SETTING

International Efforts

KYOTO PROTOCOL

Over a decade ago, most countries joined an international treaty – the United Nations Framework Convention on Climate Change (UNFCCC) – to consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable. A number of nations approved an addition to the treaty: the Kyoto Protocol; the goal of the Protocol is to achieve overall emissions reduction targets for six greenhouse gases by the period of 2008 to 2012. The six greenhouse gases regulated under the Protocol are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons. Each nation has an emissions reduction target for which they must reduce greenhouse gas emissions a certain percentage below 1990 levels; the average reduction target for nations participating in the Kyoto Protocol is approximately 5% below 1990 levels (Ibid.). To date, 192 parties have ratified the treaty (Ibid.); the United States has not ratified the Protocol (from the UNFCCC website; online at: http://unfccc.int/essential_background/items/2877.php).

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is the leading body for the assessment of climate change, established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), to provide the world with a clear scientific view on the current state of climate change and its potential environmental and socio-economic consequences. The IPCC is a scientific body; its main activity is to provide "Assessment Reports" at regular intervals of the state of knowledge on climate change. It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change, but does not conduct research or monitor climate-related data. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. The IPCC also produces special reports and technical papers. Review is an essential part of the IPCC process, to ensure an objective and complete assessment of current information. The IPCC seeks to reflect a range of views and expertise (Intergovernmental Panel on Climate Change website, "Organization" page).

The IPCC developed the Global Warming Potential (GWP) concept to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The reference gas used is CO_2, and GWP weighted emissions are measured in teragrams (or million metric tons) of CO_2 equivalent (Tg CO_2 Eq.) (U.S. EPA, February 2011). A million metric tons of CO_2 equivalent also is referenced as $MMTCO_2E$.

ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY

ICLEI – Local Governments for Sustainability – is an international organization that assists local governments in reaching their goals of sustainability and climate change mitigation. ICLEI was founded in 1990 as the International Council for Local Environmental Initiatives[1], when more than 200 local governments from 43 countries convened at the inaugural World Congress of Local Governments for a Sustainable Future at the United Nations in New York City. ICLEI is currently a membership association of over 1,200 local governments and their associations from over 70 countries that are committed to sustainable development. ICLEI works with hundreds of local governments through international performance-based, results-oriented campaigns and programs. ICLEI's mission is to build and serve a worldwide movement of local governments to achieve tangible improvements in global sustainability with special focus on environmental conditions through cumulative local actions. The organization provides technical consulting, training and information services to share knowledge and support local governments in the implementation of sustainable development at the local level (ICLEI website).

Federal Programs

The U.S. Environmental Protection Agency (EPA) is responsible for implementing federal policy to address global climate change. The federal government administers a wide array of public-private partnerships to reduce GHG intensity generated by the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO_2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. EPA prepares an annual emissions inventory that identifies and quantifies the country's primary anthropogenic[2] sources and sinks of greenhouse gases, in part, as a signatory in 1992 to the United Nations Framework Convention on Climate Change (UNFCCC). Pursuant to the UNFCCC, ratifying parties "shall develop, periodically update, publish and make available...national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases" (U.S. EPA, February 2011). The current inventory presents estimates of U.S. greenhouse gas emissions and sinks for the years 1990 through 2008.

In February 2002, the United States government announced a strategy to reduce the GHG intensity of the American economy by 18 percent over the 10-year period from 2002 to 2012. GHG intensity measures the ratio of GHG emissions to economic output. Meeting this commitment will prevent the release of more than 100 million metric tons of CO_2e emissions to the atmosphere (annually) by 2012 and more than 500 million metric tons (cumulatively) between 2002 and 2012. This policy has three basic objectives: slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation.

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[1] In 2003, ICLEI's Members voted to revise the organization's mission, charter and name to better reflect the current challenges local governments are facing. The International Council for Local Environmental Initiatives became ICLEI - Local Governments for Sustainability with a broader mandate to address sustainability issues (ICLEI website at: http://www.iclei.org/index.php?id=about).

[2] The term "anthropogenic" refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been affected by human activities.

In *Massachusetts v. Environmental Protection Agency,* decided in 2007, the U.S. Supreme Court held that the EPA has authority to regulate greenhouse gases, and the EPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the EPA should be required to regulate CO_2 and other greenhouse gases as pollutants under Section 202(a)(1) of the federal Clean Air Act (CAA).

In December 2010, the U.S. EPA issued its plan for establishing greenhouse gas (GHG) pollution standards under the Clean Air Act in 2011. The agency looked at a number of sectors and is moving forward on GHG standards for fossil fuel power plants and petroleum refineries—two of the largest industrial sources, representing nearly 40% of the GHG pollution in the United States (U.S. EPA, Press Release, 12/23/10).

State Regulations and Programs

California's first statute on climate change was enacted in 1988 when the state legislature ordered a report on the impacts of climate change and recommendations to avoid, reduce, and address them. In 2002 the state led the United States by becoming the first jurisdiction to require standards for greenhouse gas emissions from cars. In 2004, Senate Bill 1107 directed the Secretary of Environmental Protection to coordinate all climate change activities in the state. The Secretary chairs the Climate Action Team, which is made up of agency secretaries and department directors from throughout state government. With the passage of California Global Warming Solutions Act of 2006, also known as Assembly Bill (AB) 32, California became the first state to set a binding, economy-wide target for greenhouse gas emissions (California Climate Action Team, December 2010).

California's climate programs include the following primary initiatives, which are coordinated by the Climate Action Team, under the leadership of the Secretary for Environmental Protection:

- Research: State-specific research supports our understanding of the impacts of climate change in California and informs policymaking.
- Mitigation: The California Global Warming Solutions Act of 2006 establishes a limit on state greenhouse gas emissions in 2020, and recognizes the importance of substantial emission reductions by 2050. The state has a comprehensive set of policies and programs to cost effectively reduce emissions, while advancing new clean energy industries and green jobs.
- Adaptation: The state Adaptation Strategy is designed to reduce California's vulnerability to climate impacts and enhance the resiliency of the state's communities, infrastructure, resources, and people.
- Joint Action: California is leveraging its efforts through regional and international initiatives to expand emission reduction programs and to enable effective adaptation (California Climate Action Team, December 2010).

Key laws and programs are further described below.

ASSEMBLY BILL 1493 – GHG EMISSION STANDARDS FOR AUTOMOBILES (2002)

Assembly Bill 1493 (Pavley, Chapter 200, Statutes of 2002), enacted on July 22, 2002 by the State Legislature (amending Health & Safety Code, § 42823 and adding Health & Safety

Code, § 43018.5), required the California Air Resources Board (CARB) to set greenhouse gas emission standards for passenger vehicles, light duty trucks, and other vehicles determined to be vehicles whose primary use is noncommercial personal transportation in the State manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004, which phase in during the 2009 through 2016 model years. Compared to the 2002 fleet, the standards will result in an approximate 30% reduction in GHG emissions by 2016 (California Environmental Protection Agency, December 2010).

EXECUTIVE ORDER S-3-05(2005)

In June 2005, Governor Schwarzenegger established California's greenhouse gas emissions reduction targets in Executive Order S-3-05, which established the following goals:

- Greenhouse gas emissions should be reduced to 2000 levels by 2010;
- Greenhouse gas emissions should be reduced to 1990 levels by 2020; and
- Greenhouse gas emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various state agencies in order to collectively and efficiently reduce greenhouse gases. A biannual progress report must be submitted to the Governor and State Legislature disclosing the progress made toward greenhouse gas emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline and forestry and report possible mitigation and adaptation plans to combat these impacts.

The Secretary of CalEPA leads this Climate Action Team (CAT) made up of representatives from state agencies as well as numerous other Boards and Departments. The CAT members work to coordinate statewide efforts to implement global warming emission reduction programs and the state's Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the statewide greenhouse gas (GHG) targets that were established in the executive order and further defined under the Global Warming Solutions Act of 2006 (Assembly Bill 32). The first Climate Action Team Report to the Governor and the Legislature was released in March 2006, in which it laid out 46 specific emission reduction strategies for reducing GHG emissions and reaching the targets established in the Executive Order. The Climate Action Team Report to the Governor and Legislature will be updated and issued every two years thereafter; the most recent was released in December 2010.

ASSEMBLY BILL 32 – CALIFORNIA GLOBAL WARMING SOLUTIONS ACT (2006)

The State's Legislature enacted Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006 to further the goals of Executive Order S-3-05. (See Stats. 2006, ch. 488, enacting Health & Safety Code, §§ 38500–38599.) The Governor's Executive Order S-3-05 and AB 32 (Health & Safety Code, § 38501 et seq.) both seek to achieve 1990 emissions levels by the year 2020. Executive Order S-3-05 further requires that California's GHG emissions be 80 percent below 1990 levels by the year 2050. AB 32 defines GHGs to include the following, which are also addressed in the international Kyoto Protocol: carbon dioxide, methane, nitrous oxide, hydrocarbons, perfluorocarbons and sulfur hexafluoride.

The California Air Resources Board (CARB) has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. The foremost objective of CARB is to adopt regulations that require the reporting and verification of statewide greenhouse gas emissions and achieve GHG emissions equivalent to statewide levels of 1990 by 202 through an enforceable statewide emission cap, which will be phased in starting in the year 2012. Emissions reductions shall include carbon sequestration projects (projects that would remove carbon from the atmosphere), and best management practices that are technologically feasible and cost effective. AB 32 allows CARB to adopt market based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market based compliance mechanism adopted.

EXECUTIVE ORDER S-1-07(2007)

On January 18, 2007, California further solidified its dedication to reducing greenhouse gases by setting a new Low Carbon Fuel Standard for transportation fuels sold within the State. Executive Order S-1-07 sets a declining standard for greenhouse gas emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. The Low Carbon Fuel Standard applies to refiners, blenders, producers and importers of transportation fuels and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods. The Low Carbon Fuel Standard was approved by the CARB in April 2009 (California Climate Action Team, December 2010).

SENATE BILL 97 (2007) AND RELEVANT GUIDANCE

Senate Bill 97, enacted in 2007, amended the CEQA statute to clearly establish that GHG emissions and effects of GHG emissions are subject to CEQA. It also directed OPR to prepare, develop and transmit draft CEQA Guidelines to address GHG emissions to the Natural Resources Agency to certify and adopt these guidelines by January 1, 2010. The Natural Resources Agency adopted the amendments in January 2010, which went into effect in March 2010. The amendments do not identify a threshold of significance for GHG emission, nor do they prescribe assessment methodologies or specific mitigation measures. The amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

While the state has not yet adopted any formal significance thresholds, OPR did issue a guidance document on June 19, 2008, to provide interim advice to lead agencies regarding the analysis of GHG emissions in environmental documents. The technical advisory suggests three components for CEQA disclosure: quantification of GHG emissions from a project's construction and operation, determination of significance of the project's impact to climate change, and if the project is found to be significant, the identification of suitable alternatives and mitigation measures. The analysis contained herein follows this guidance.

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) released a white paper, entitled CEQA and Climate Change. The white paper contains the disclaimer that it is "intended as a resource, not a guidance document," and examines various threshold approaches available to air districts and lead agencies for determining whether GHG emissions are significant.

SENATE BILL 375- SUSTAINABLE COMMUNITIES & CLIMATE PROTECTION ACT OF 2008

Senate Bill 375 (SB 375), signed in 2008 (Chapter 728, Statutes of 2008), builds upon the principles set forth in AB 32 and provides a means for addressing climate change in CEQA documents. SB 375 aims to reduce greenhouse gas emissions by aligning regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation, thereby discouraging urban sprawl and reducing vehicle miles traveled. Among other things, SB 375 requires metropolitan planning organizations (MPOs), such as the Association of Monterey Bay Area Governments (AMBAG), to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS), as defined, in their upcoming, updated regional transportation plans (RTPs) to meet greenhouse gas reduction targets. SB 375 also aligns planning for transportation and housing, and creates specified incentives for smart growth development, in the form of streamlined review under CEQA for certain projects consistent with the SCS: transit priority projects (projects comprising at least 50% residential use, a residential density of at least 20 units per net acre and located within one half mile of a regional transit corridor) and residential or mixed use projects with a residential component requiring at least 75% of the total square footage.

SB 375 also details specific roles for MPOs and air districts in the setting GHG emissions targets for the region. ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012.

The law also extends the minimum time period for the regional housing needs allocation cycle from five years to eight years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

EXECUTIVE ORDER S-13-08 (2008)

Executive Order S-13-08 launched a major initiative for improving the state's adaptation to climate impacts from sea level rise, increased temperatures, shifting precipitation, and extreme weather events. It ordered a California Sea Level Rise Assessment Report to be requested from the National Academy of Sciences. It also ordered the development of a Climate Adaptation Strategy. The strategy, published in December 2009, assesses the state's vulnerability to

climate change impacts, and outlines possible solutions that can be implemented within and across state agencies to promote resiliency. The Strategy focused on seven areas: public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure (California Climate Action Team, December 2010).

Local Programs

CITY OF SANTA CRUZ

The City of Santa Cruz has been a member of ICLEI since 2001, and is one of over 400 U.S. members of the Cities for Climate Protection (CCP) campaign. The CCP campaign provides a framework for local communities to identify and reduce GHG emissions.

The City has been developing emissions strategies to reduce greenhouse gas (GHG) emissions to 1990 levels. In 2006, the Santa Cruz City Council adopted the Santa Cruz Climate Action Declaration, which established the City's commitment to respond to global climate change and now serves as the guiding framework for the City's climate protection programs. In June 2007, the City Council conditionally accepted a set of General Plan goals and policies on climate change, including reducing community-wide greenhouse gas emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels), and for all new buildings to be emissions-neutral by 2030. In 2007, the City's Climate Action Program also was established to create and implement a comprehensive plan to meet the City's community-wide greenhouse gas reduction goals. In August 2008, the City completed an Emissions Inventory, which provides information regarding municipal and community-wide emissions, and was updated in 2010. The City also completed a draft "Climate Action Plan" (CAP) in October 2010, but it has not yet been adopted. It is expected that a revised draft will be released in the fall of 2011.

CLIMATE ACTION COMPACT

In October 2007, the County of Santa Cruz, the City of Santa Cruz and the University of California Santa Cruz partnered to create a *Climate Action Compact (CAC)*. The goal of the CAC is to achieve meaningful and measurable progress towards lowering local greenhouse gas emissions through the implementation of cooperative programs. To that end, the CAC partners initiated a process to develop actions necessary to accomplish the goals outlined in the compact. The members pledged to support public, private and nonprofit partnerships and investments to reach quantifiable reductions in their institutions' GHG emissions (City of Santa Cruz, February 2010). In taking this leadership role, the Climate Action Compact partners pledged themselves to the following:

- Set and present a greenhouse gas (GHG) reduction goal for their organization;
- Identify specific inter-institutional cooperative projects that reduce GHG emissions, stimulate investment in the community and foster economic development;
- Present a comprehensive GHG reduction action plan for their organization; and
- Immediately invite others from the public, private, and non-profit sectors in the region to join in the effort. (City of Santa Cruz, "Climate Action Compact" website).

ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS (AMBAG)

AMBAG has developed regional emission targets in accordance with requirements of Senate Bill 375. In collaboration with Pacific Gas and Electric Company, AMBAG is also working with local governments to promote energy efficiency and climate action planning. This collaboration has included preparation of GHG emissions inventories.

CALIFORNIA EMISSIONS INVENTORY & SCOPING PLAN

Global and National GHG Emissions Background

California is the fifteenth largest emitter of greenhouse gases on the planet, representing about two percent of the worldwide GHG emissions (California Air Resources Board, December 2008). Anthropogenic GHG emissions worldwide as of 2005 totaled approximately 44,153 CO_2 equivalent million metric tons (MMT CO_2e) (World Resources Institute, July 2009). In 2009, total U.S. greenhouse gas emissions were 6,639.7 Tg CO_2 Eq (U.S. EPA, February 2011). While total U.S. emissions have increased by 7.4% from 1990 to 2009, emissions decreased from 2008 to 2009 by 6% primarily due to a decrease in economic output and energy consumption across all sectors and a decrease in the carbon intensity of fuels used to generate electricity as the price of coal increased and the price of natural gas decreased significantly (Ibid.). Since 1990, U.S. emissions have increased at an average annual rate of 0.4% (Ibid.).

California Emissions Inventory & Reduction Targets

The California Air Resources Board (CARB) is the lead agency for implementing AB 32. The CARB identified 36 "early actions to mitigate climate change in California" in April 2007 as required by AB 32. These actions relate to low carbon and other fuel standards, improved methane capture at landfills, agricultural measures, reduction of hydrocarbons and perfluorocarbons from specified industries, energy efficiency, and a variety of transportation-related actions. As previously indicated, the transportation sector contributes nearly 39% of California's gross GHG emissions, and is the largest contributor of GHG emissions in the State of California.

EMISSIONS INVENTORY

In accordance with provisions of AB 32, CARB[3] completed a statewide Greenhouse Gas (GHG) Inventory that provides estimates of the amount of GHGs emitted to, and removed from, the atmosphere by human activities within California. The inventory includes estimates for carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons. The emissions inventory covers seven sectors: transportation, electricity generation, industrial, residential, agriculture, commercial and forestry. The initial GHG Inventory covered the years 1990 to 2004. CARB recently updated the GHG emissions inventory to include the years 2005 through 2008 (California Air Resources Board, September 2010).

[3] In January 2007, AB 1803 transferred responsibility for developing and maintaining the state's greenhouse gas inventory from the California Energy Commission (CEC) to the CARB, which used the CEC GHG inventory as a starting point to develop 1990 GHG emissions.

In December 2007, CARB approved a greenhouse gas emissions target of 427 $MMTCO_2E$, which is equivalent to the state's calculated GHG emissions level in 1990 (California Air Resources Board, December 2008). The 2020 target requires the reduction of 169 $MMTCO_2E$ or approximately 30% from the state's projected 2020 emissions estimate of 596 $MMTCO_2E$ (business as usual) (Ibid.).

A review of statewide GHG emissions trends by the CARB indicates that 2008 saw a small decrease in statewide GHG emissions, driven by a noticeable drop in on-road transportation emissions and the beginning of the economic recession and fuel price spikes. California's gross emissions of greenhouse gas increased 4.3% from 458 $MMTCO_2E$ in 2000 to 477.7 million in 2008, with a maximum of 483.9 million in 2004. During the same period, California's population grew by 11.8% from 34.1 to 38.1 million people, and GHG emissions per person decreased from 13.4 to 12.5 metric tonnes of CO_2e per person (California Air Resources Board, May 2010).

CALIFORNIA CLIMATE CHANGE SCOPING PLAN

In accordance with requirements of AB 32, a Scoping Plan was released in October 2008 and adopted by CARB in December 2008. The Plan includes programs and measures t to reach the total emissions reduction of 173 million tons by the year 2020. Key elements for reducing the state's greenhouse emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation (California Air Resources Board, October 2008).

The Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 169 MMT., The Scoping Plan identifies 18 emissions reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related greenhouse gas targets, vehicle efficiency measures, goods movement, solar roofs program, industrial emissions, high speed rail, green building strategy, recycling, sustainable forests, water and air (California Air Resources Board, December 2008).

The measures would result in a total reduction of 174 $MMTCO_2E$ by 2020 (Ibid.). Table 4.12-1 summarizes the Scoping Plan measures and estimated emissions reductions. The Scoping Plan breaks down the amount of GHG emissions reductions ARB recommends for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO2e),
- The Low-Carbon Fuel Standard (15.0 MMT CO2d),
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO2e), and
- A renewable portfolio standard for electricity production (21.3 MMT CO2e).

The Scoping Plan identifies the role of local governments with the following language:

> "Local Government Targets: In recognition of the critical role local governments will play in the successful implementation of AB 32, ARB added a section describing this role. In addition, ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target."

Final CARB regulations are not due until January 1, 2011, and will not be operative until January 1, 2012. By the former date, CARB must adopt "greenhouse gas emissions limits and emissions reductions measures ... to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit[.]" (Health & Safety Code, § 38562(a).)

On March 18, 2011, Judge Ernest Goldsmith of the San Francisco Superior Court issued a ruling in a case brought by a citizens group against the ARB, challenging the agency's CEQA compliance for the approval of the cap and trade component of ARB's Scoping Plan. [*Association of Irritated Residents et al* v. *California Air Resources Board*, San Francisco Superior Court Case No. CPF-09-509562.] The court found substantive and procedural flaws in how ARB's CEQA compliance and enjoined ARB from any further implementation of the measures contained in the Scoping Plan, including the cap and trade program scheduled to go into effect on January 1, 2012 until after ARB "comes into complete compliance with its obligations" under CEQA. Specifically, the court found that ARB violated CEQA by failing to fully evaluate possible alternatives to the measures described in the Scoping Plan. The decision criticized the Scoping Plan CEQA analysis for failing to specifically discuss in detail a carbon fee alternative to cap and trade.

The ARB appealed the superior court's ruling, and the Court of Appeal for the First Appellate District issued an order on June 3, 2011, temporarily staying the enforcement of the superior court's writ of mandate, giving the parties some time to further brief the issues. (Court of Appeal Case No. A132165.) On August 25, 2011, the ARB adopted a revised environmental analysis while still affirming its original decision. The original plaintiffs asserted at the ARB's August 25, 2011, hearing that the revised analysis still failed to adequately consider other options. At the time of publication of this EIR, it was uncertain what effect this litigation

ultimately would have on ARB's implementation of its Scoping Plan, but at a minimum, it seems likely to slow California's efforts to adopt a cap and trade program. Originally scheduled for implementation next year, industry compliance with the cap-and-trade program will now take effect in 2013. (Online at: http://www.latimes.com/news/local/la-me-cap-trade-20110825,0,1958108,print.story.)

CITY & REGIONAL PLANS AND TARGETS

City of Santa Cruz

CITY OF SANTA CRUZ EMISSIONS INVENTORY

In August 2008, the City completed an Emissions Inventory, which provides information regarding municipal and community emissions. The inventory was updated in 2010 and includes emissions inventories for the years 1996, 2005 and 2008. Emissions levels have been quantified for each community sector (business, residential, municipal, and transportation) and by fuel source (natural gas, electricity, petroleum, other).

According to the City's emissions inventory, the City emitted 384,427 metric tons of carbon dioxide (CO_2e) in 1996 with an effective baseline inventory of 312,508 metric tons[4] (City of Santa Cruz, February 2010). The community of Santa Cruz has reduced annual GHG emissions below baseline levels by approximately 8% between 1996 and 2008 (City of Santa Cruz, September 2010). Most notably, residential home emissions have dropped 22% since 1996 (Ibid.). Recent updates provided by City staff indicate that the baseline year 1996 emissions estimates are 427,280 metric tons per year (Clark, City of Santa Cruz, personal communication, July 2011).

AMBAG also completed an emissions inventory for the City in early 2011 that developed a higher estimate for transportation and landfill (methane emissions) than the City's inventory and also includes UCSC. The City's emission inventory was updated by City staff during preparation of this EIR, concurrent with preparation of the City's draft "Climate Action Plan." The City's numbers differ from AMBAG's, as the City's numbers do not include UCSC and landfill emissions. City staff indicates that in 2008, City emissions totaled 351,321 metric tons (Clark, City of Santa Cruz, personal communication, August 2011) as summarized in Table 4.12-2.

[4] One metric ton = 2,204.62262 pounds.

TABLE 4.12.1
State Scoping Plan Recommended Greenhouse Gas Reduction Measures

Recommended Reduction Measures	Reductions Counted Towards 2020 Target ($MMTCO_2E$)	
ESTIMATED REDUCTIONS RESULTING FROM THE COMBINATION OF CAP-AND-TRADE PROGRAM AND COMPLEMENTARY MEASURES		**146.7**
California Light-Duty Vehicle Greenhouse Gas Standards • Implement Pavley standards • Develop Pavley II light-duty vehicle standards	31.7	
Energy Efficiency • Building/appliance efficiency, new programs, etc. • Increase CHP generation by 30,000 GWh • Solar Water Heating (AB 1470 goal)	26.3	
Renewables Portfolio Standard (33% by 2020)	21.3	
Low Carbon Fuel Standard	15	
Regional Transportation-Related GHG Targets[16]	5	
Vehicle Efficiency Measures	4.5	
Goods Movement • Ship Electrification at Ports • System-Wide Efficiency Improvements	3.7	
Million Solar Roofs	2.1	
Medium/Heavy Duty Vehicles • Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency) • Medium- and Heavy-Duty Vehicle Hybridization	1.4	
High Speed Rail	1.0	
Industrial Measures (for sources covered under cap-and-trade program) • Refinery Measures • Energy Efficiency & Co-Benefits Audits	0.3	
Additional Reductions Necessary to Achieve the Cap	34.4	
ESTIMATED REDUCTIONS FROM UNCAPPED SOURCES/SECTORS		**27.3**
High Global Warming Potential Gas Measures	20.2	
Sustainable Forests	5.0	
Industrial Measures (for sources not covered under cap and trade program) • Oil and Gas Extraction and Transmission	1.1	
Recycling and Waste (landfill methane capture)	1.0	
TOTAL REDUCTIONS COUNTED TOWARDS 2020 TARGET		**174**
Other Recommended Measures	**Estimated 2020 Reductions ($MMTCO_2E$)**	
State Government Operations	1-2	
Local Government Operations	TBD	
Green Buildings	26	
Recycling and Waste • Mandatory Commercial Recycling • Other measures	9	
Water Sector Measures	4.8	
Methane Capture at Large Dairies	1.0	

[16] This number represents an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. ARB will establish regional targets for each Metropolitan Planning Organization (MPO) region following the input of the Regional Targets Advisory Committee and a public consultation process with MPOs and other stakeholders per SB 375.

Source: California Air Resources Board, December 2008 (*Scoping Plan*, Table 2).

DRAFT CLIMATE ACTION PLAN

A draft "Climate Action Plan" (CAP) for the City of Santa Cruz was completed in September 2010, and a revised draft is expected to be released in the fall of 2011. A baseline greenhouse gas emissions inventory is presented for 1996, which sets the initial levels of emissions from which all reduction goals will be based. Although the international and state standard for a baseline inventory is 1990[5], the City of Santa Cruz did not have enough historical data for that year. Therefore, the City has set reduction goals of 30% below 1996 levels by 2020, and 80% below by 2050; State and county emissions data suggest that emissions between 1990 and 1996 were similar (City of Santa Cruz, September 2010). Furthermore, the baseline inventory was further reduced for the commercial/industrial sector due to closures of significant businesses in the area after 1996 and a corresponding reduction in GHG emissions as a result.

The draft CAP is written to achieve the draft General Plan goals to reduce community-wide greenhouse gas emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels), and for all new buildings to be emissions-neutral by 2030. The draft CAP available at the time this EIR was prepared calls for a reduction of approximately 65,640 metric tons of GHG emissions between 2008 and 2020, which represents an approximate 24% reduction over 2008 levels (City of Santa Cruz, September 2010). The Draft CAP identifies strategies to reduce emissions related to following sectors: energy, transportation and land use, water conservation and wastewater management, and locally generated renewable energy. The City of Santa Cruz Climate Reduction Strategy is based on three key activities: expansion of energy efficiency and conservation efforts; identification and selection of more sustainable products and services; and increased investment in local renewable energy.

TABLE 4.12-2
City Of Santa Cruz REVISED 2008 GHG Emissions

Sector	TOTAL
Residential	76,805
Commercial/Industrial	93,304
Transportation	160,762
Municipal	10,261
Waste	10,189
TOTAL	**351,321**

In metric tons CO_2e
Source: City of Santa Cruz Climate Action Program

[5] The year 1990 was set as a worldwide baseline for greenhouse gas emissions and codified in policy by the Kyoto Protocol of 1997. The State of California also set reduction goals based on 1990 levels (AB32) and has quantified state wide emissions for 1990 (City of Santa Cruz, September 2010).

Association of Monterey Bay Area Governments (AMBAG)

EMISSIONS INVENTORY FOR CITY OF SANTA CRUZ

The AMBAG Energy Watch completed a GHG emissions inventory for the City of Santa Cruz for the year 2005. The AMBAG Energy Watch program is a local government partnership between AMBAG and the Pacific Gas and Electric Company (PG&E). The goal of Energy Watch is to promote energy efficiency and climate action planning throughout the tri-county AMBAG region. AMBAG Energy Watch designed a three phase program to assist jurisdictions with what has become known as "climate action planning."

The inventory for Santa Cruz was developed using the "Clean Air and Climate Protection" (CACP 2009) software developed by ICLEI. The inventory examines emissions by community sector and includes direct and indirect emissions. The study also predicts that under a "business-as-usual" scenario, the City of Santa Cruz's GHG emissions are estimated to grow by approximately 9% by the year 2020, which represents an average annual rate of increase of about 0.6% per year with the total increase between 2005 and 2020.

SB 375 REGIONAL TARGET

Senate Bill 375 established a basis for establishment of regional reduction targets related to transportation and land use. It is one of the CARB's *Scoping Plan* strategies to reduce greenhouse gas emissions from the transportation sector. As shown on Table 4.12-1, the "regional transportation-related GHG targets" reduction measure is estimated to reduce statewide GHG emissions by 5 million metric tons, approximately 3% of the total statewide GHG emissions reduction identified in the strategies outlined in the *Scoping Plan*.

In order to achieve these reductions, SB 375 requires metropolitan transportation plans to include a "*Sustainable Communities Strategy*" (SCS) to meet GHG reduction targets for vehicle travel set by CARB. SB 375 requires that CARB certify that the SCS will reach these targets by decreasing GHG emissions per capita from automobiles and light trucks for 2020 and 2035. Ultimately, transportation projects that are part of the SCS will have state transportation funding priority and will be eligible for streamlined CEQA processes (AMBAG, August 2011).

In September of 2010, the CARB adopted regional per capita greenhouse gas targets for each of California's eighteen metropolitan planning regions as required under SB 375. The Monterey Bay Area's specific mandate is to reduce per capita greenhouse gas emissions from cars and light trucks to 2005 levels by 2020 and to reduce per capita levels to 5% below 2005 levels by 2035. This results in a regional per capita GHG emissions target of 14.1 pounds per day per capita for 2020 and 13.4 pounds per day per capita for 2035.

Under SB 375, the AMBAG is required to adopt a "Sustainable Communities Strategy" (SCS) in the next Metropolitan Transportation Plan. This strategy will build on information developed through "Envisioning the Monterey Bay Area" study (AMBAG, March 2011). "Envisioning the Monterey Bay Are – A Blueprint for Sustainable Growth and Smart Infrastructure" is a blueprint for the future describing how the communities of the Monterey Bay area might grow in a sustainable fashion over the next 25 years. Regional and local agencies worked together to evaluate current trends regarding the distribution of population and employment in comparison to: 1) improving mobility; 2) reducing GHG emissions; 3) providing housing and employment

opportunities; and 4) protecting natural and cultural resources. The study develops a preferred growth scenario that maximizes the achievement of these outcomes that will serve as the basis for SB 375's Sustainable Communities Strategy that will demonstrate how the region will reduce per capita greenhouse emissions by 5% from the automobiles and light trucks by 2035 (AMBAG, March 2011).

Under the "Sustainable Growth Patterns" scenario developed as an alternative to current growth patterns, the region's urban footprint would increase by 20,000 acres by 2035, which is less than half of the approximately 43,000 acres that are projected to otherwise be developed. Under this scenario, the majority of the region's forecast growth occurs within a comfortable walking distance to transit corridors and neighborhood centers within "Blueprint Priority Areas" identified in the study that are primarily higher density lands within cities in proximity to transit and walking opportunities. The City of Santa Cruz is as a "Blueprint Priority Area." Consideration of policies and specific actions to see this sustainable pattern become a reality would be within the purview of individual agencies.

4.12.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address climate change. The NATURAL RESOURCES AND CONSERVATION chapter includes one goal with four polices and19 accompanying actions that address climate change, including preparation and implementation of a "Climate Action Plan" to attain emissions reductions goals. The proposed climate change goal is:

NRC4 *Effective leadership and action in reducing and responding to global warming.*

Overall, the proposed *General Plan 2030*'s policies and actions seek to:

- Reduce community-wide GHG emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels);
- Require all new development be carbon neutral by 2030;
- Support initiatives, legislation, and actions for reducing and responding to climate change;
- Encourage community involvement and public-private partnerships to reduce and respond to global warming; and
- Minimize impacts of future sea level rise.

Additionally, policies in other chapters of the draft General Plan support local, state and federal actions to reduce carbon dioxide and GHG emissions (HZ2.1.1, HZ2.1.2) and efforts to improve local energy efficiency (NRC7.1), including a reduction in gas and electricity consumption (NRC7.1.1). A number of policies are also directed to reducing automobile trips and creating sustainable development and land use patterns, which would result in further reductions of automobile trips, and thus, emissions as reviewed in the TRAFFIC AND

TRANSPORTATION (Chapter 4.4) section of this EIR. LAND USE goal LU1 and supporting policies and actions seek sustainable land uses within the City.

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and would be applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, land use designation changes are proposed for three specified sites (Swenson, Golf Club Drive area, and an addition to the Dimeo Lane landfill site [for non-landfill uses]). Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or intensified redevelopment. In particular, infill, high density and mixed use development is encouraged and supported as summarized in Table 4.1-5 in the LAND USE (Chapter 4.1) section of this EIR.

4.12.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

12a Generate greenhouse gas emissions, either directly or indirectly, that in conjunction with other global greenhouse gas emissions that will make a cumulatively considerable contribution to substantial adverse physical effects on the environment related to global climate change; or

12b Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

An interpretation of these thresholds is described below.

AB 32, the California Global Warming Solutions Act of 2006, requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020 and 80 percent below 1990 levels by 2050. The 2020 reduction target equates to a decrease of approximately 30 percent below the 1990 GHG emissions. Under AB 32, the CARB published its Scoping Plan in 2008, which details measures that could achieve the reduction goals of AB 32. The reduction goals are derived from the IPCC's climate stabilization models, which predict the CO_2e concentrations needed to stabilize mean global warming at approximately 2°C rise from current global mean temperature. The Scoping Plan encourages local governments to reduce their GHG emissions by 15 percent as part of the overall statewide efforts to achieve reductions on the order of 30 percent.

To date, no state agency has adopted significance criteria for GHG emissions. As part of OPR's revisions to the CEQA Guidelines regarding GHG emissions in 2010, CARB was asked to provide technical recommendations for setting thresholds of significance for GHG emissions, and recommendations for establishing a threshold approach were released by CARB technical staff in October 2008. The recommendations set forth an approach for industrial, residential and commercial projects with a numeric threshold level recommended only for industrial uses. The recommendations have not been adopted or included in other state-adopted documents. On December 30, 2009, the Natural Resources Agency adopted the CEQA Guidelines Amendments addressing greenhouse gas emissions, but these amendments do not specify significance thresholds for GHG emissions. Instead, the regulations support the discretion of local agencies to develop their own thresholds based on credible substantial evidence. (CEQA Guidelines, section 15064.4.)

The project site is located within the jurisdiction of the Monterey Bay Unified Air Pollution Control District (MBUAPCD), which to date, has not adopted significance criteria or thresholds. In June 2010, the Bay Area Air Quality Management District (BAAQMD) in the San Francisco Bay area adopted its revised CEQA Guidelines, which include thresholds of significance for greenhouse gas emissions. The BAAQMD is the first regional air district to adopt numeric thresholds for greenhouse gas emissions for residential and commercial projects. These guidelines identify 6.6 MT CO_2e per year per capita (residents and employees) or a qualified GHG Reduction Strategy as a significance threshold for General Plans (Bay Area Air Quality Management District, June 2010). The per capita threshold was based on the state's emissions goal for 2020 divided by the state's estimate of total residents and employees in that year (Bay Area Air Quality Management District, May 2010).

The project site is located within the jurisdiction of the Monterey Bay Unified Air Pollution Control District (MBUAPCD), which to date, has not adopted significance criteria or thresholds. However, in June 2011, the MBUAPCD initiated a process to develop GHG emission thresholds for project and plan level impact analyses. District staff have recommended a threshold of 6.6 MT CO_2e /year per service population (residents/employees) for General Plans (Monterey Bay Unified Air Pollution Control District, May 2011), which is the same threshold adopted by the BAAQMD. As indicated above, this approach is based on the total emissions target for the state of California divided by the state's projected service population. GHG thresholds are under review by the MBUAPCD, but have not yet been adopted.

Therefore, a threshold of 6.6 MT CO_2e /year per service population (residents/employees) will be used for this EIR as it is being considered as such by the MBUAPCD and already has been adopted as a threshold for general plans in the Bay Area. Furthermore, it is based on the state's overall population and emission goals, and as such, is supported by substantial evidence.

As noted above, on a local level, in its draft Climate Action Plan, the City of Santa Cruz has set reduction goals of 30% below 1996 levels by 2020, and 80% below by 2050 (City of Santa Cruz, September 2010). The draft CAP is written to achieve the draft General Plan goals to reduce community-wide greenhouse gas emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels), and for all new buildings to be emissions-neutral by 2030. Because the City has not yet adopted the CAP, however, this plan does not yet have the force of law; however, it is presented to show the City is proposing to provide GHG reductions locally that will complement State and international efforts to stabilize climate change.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address: generation of greenhouse gas emission (12a) and potential conflicts with plans adopted for the purpose of reducing greenhouse gas emission (12b).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that may be expected to occur by the year 2030.[6] The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents as discussed in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR.

The buildout projections also estimate approximately 3,140,000 additional square feet of new commercial, office and industrial uses by the year 2030. Based on the non-residential uses, it is estimated that approximately 8,665 new jobs could be generated. This is based on an estimated 2.0 employees per 1,000 square feet of commercial and retail; 2.3 employees per 1,000 square feet for industrial space, and 3.3 employees per 1,000 square feet of office space, which results in approximately 4,335 commercial and industrial jobs and approximately 4,205 office jobs..

Development under the proposed General Plan would primarily occur on remaining vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[7] approximately 55% of all new housing, 45% of new commercial development and 52% of new office development would located along these corridors.

[6] The projections are based on the draft Land Use Map, taking into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels, assuming that not all development will occur at maximum density. On average it is assumed that all new development will occur at 80% of the permitted residential density or floor area ratio. See Appendix B for further discussion.

[7] See Table 3.3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development in specific areas in the City.

Impact 4.12-1 Generation of Greenhouse Gas Emissions
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased greenhouse gas emissions from development accommodated by the proposed plan. However, the emissions level would not be considered substantial compared to long-term forecasts and state and regional targets, and implementation of the proposed *General Plan 2030* policies and actions, as well as planned implementation statewide actions, would further reduce emissions. Therefore, this is considered a *less-than-significant impact.*

As indicated above, adoption and implementation of the proposed *General Plan 2030* would not directly result in new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized above, would result in an increase in GHG emissions related to transportation, energy use, and utilities and indirect emissions related to wastewater treatment and waste disposal.

A calculation of GHG emissions associated with potential development under the proposed General Plan was prepared by Donald Ballanti, Certified Consulting Meteorologist, and is included in Appendix E. The emissions were estimated using the BGM Model developed by the BAAQMD and the URBEMIS-2007 model. The URBEMIS model is a land use based model with land use and trip generation inputs. The trip rates were adjusted to account for interactivity between land uses and smart growth factors (enhanced mixed uses, local serving retail, transit/bike/pedestrian accessibility) included in the proposed General Plan, which were developed as part of the traffic impact analysis for this EIR. BAAQMD's Greenhouse Gas Model (BGM) is an Excel spreadsheet program that allows users to estimate operational greenhouse gas (GHG) emissions from land development projects. BGM reads URBEMIS-2007 project files to generate a portion of a project's GHG emission estimates.

The models were run for the estimated General Plan related development for the year 2030. A second URBEMIS-2007 and BGM run was made for the same land use/trip inputs but for the year 2008.[8] Comparison of the two sets of results revealed the BGM includes the effects of vehicle fleet changes and California fuel rules, as transportation emissions from the same land use inputs drop 30% between 2008 and 2030. The URBEMIS-2007/BGM results were further adjusted to reflect the State energy efficiency regulations and AB 32 programs based on the BAAQMD's estimated reductions due to implementation of state programs, which have also been applied to the proposed project. The results are summarized in Table 4.12-3.

The total GHG emissions generated in the City as a result of potential buildout under the General Plan to the year 2030 is estimated as 53,172 metric tons/year CO_2 equivalent (MT CO_2e), which would occur sometime between now and 2030. Emissions for the same level of development if it all occurred in 2008 are estimated at approximately 71,121 MT CO_2e. Thus, greenhouse emissions resulting from General Plan projected buildout would be reduced roughly by 25% with implementation of some of the expected statewide programs in effect (Ballanti,

[8] The year 2008 was used as the City has developed an emission inventory for 2008, and it is the closest available emissions inventory to when the EIR Notice of Preparation was released in March 2009.

2011). As indicated above, these results also indicate that the BGM model includes the effects of vehicle fleet changes and California fuel rules, as transportation emissions from the same land use inputs drop almost 30% between 2008 and 2030.

TABLE 4.12-3
General Plan 2030 Growth GHG Emissions (in CO_2e Equivalent Metric Tons/Year)

Source	2008	2030 [Based on New Travel in City Limits]
Transportation	39,805.84	28,208.41
Area Sources	2,918.54	2,918.54
Electricity	14,861.48	9,148.39
Natural Gas	6,809.85	6,162.91
Water & Wastewater Treatment	679.88	636.05
Solid Waste	6,045.40	6,061.82
Total	71,120.98	53,172.12

Source: Donald Ballanti, April 2011

Table 4.12-4 shows existing (2008) emissions and provides estimated community emissions in 2030 that were developed by City staff for this EIR, using AMBAG's recent 2011 emissions inventory for the City as updated by the City. The City's projection includes AMBAG's projections, but does not account for existing landfill operations, only future operations, and thus, are slightly lower than AMBAG's. These projections are based on historic growth patterns, and identify an increase of approximately 70,821 MT CO_2e between 2005 and 2030. The estimated *General Plan 2030* GHG emissions would result in a total City emissions of 404,493 MT CO_2e over 2008 levels (351,321 in 2005 + 53,172 = 404,493), which is close to, but less than, the 408,983 MT CO_2e forecast for 2030 for the residential, commercial/industrial and transportation sections. In this respect, the growth accommodated by the proposed General Plan would not result in a substantial increase in GHG emissions over what has been estimated.

TABLE 4.12-4
City Of Santa Cruz Projected Community GHG Emissions Projections

Sector	2008 [1]	2030 [2]	Annual Growth Rate
Residential	76,805	76,383	0.0046
Commercial/Industrial	93,304	142,292	0.0064
Transportation	160,762	190,248	0.0046
Municipal	10,261	10,313	0.0077
Waste	10,189	2,906	0.0077
TOTAL	**351,321**	**422,142**	

In metric tons Co_2e
[1] City of Santa Cruz Climate Action Team
[2] AMBAG Energy Watch Program as updated by the City of Santa Cruz

As indicated above, to date, no state agency has adopted significance criteria for GHG emissions, although the (BAAQMD in the San Francisco Bay area adopted revised CEQA Guidelines, which identify 6.6 MT CO_2e per year per capita (residents and employees) or a qualified GHG Reduction Strategy as a significance threshold for General Plans. Staff of the MBUAPD are also considering this standard as a significance threshold for General Plans. The City does not yet have an adopted GHG Reduction Strategy. Since the BAAQMD's significance threshold for general plans is directly linked to the State's reduction goals, and the MBUAPCD is currently the same standards, it is an appropriate method to gauge the overall significance of GHG emissions.

Based on the emissions data in Table 4.12-4, in 2008, the City had a 3.82 MT CO_2e per capita GHG emission rate (residents and employees[9]). Thus, the City's per capita emissions is already below the overall rate of 6.6 MT CO_2e per year per capita that is based on the state's reduction goals. With addition of the indirect General Plan emissions, the annual per capita would be about 3.72 MT CO_2e per year per capita, slightly less than the existing per capita rate and still less than the overall projected state rate as embodied in the GHG significance threshold for General Plans. Thus, under this approach, emissions resulting from the proposed general plan would not be considered substantial.

According to the Draft *General Plan 2030*, the City seeks to further reduce its contribution to greenhouse gas emissions through land use planning, program development, investment in energy efficient infrastructure, and increased use of renewable energy. Green building policies and actions will incorporate energy efficiency measures, water stewardship, use of sustainable building materials derived from renewable resources, reduction of waste through recycling and reuse, and smart growth and sustainable development practices. In addition to defining shorter-term strategies to address likely impacts of climate change on city infrastructure and resources, the City must also set planning goals to minimize future risks of sea level rise and climate change.

The proposed *General Plan 2030* includes a number of policies and actions that, if implemented, would reduce greenhouse gas emissions and the project's contribution to global climate change impacts as a result of development accommodated under the General Plan. In particular, the City seeks to achieve a 30% reduction in GHG emissions by 2020 and 80% by 2050 (NRC4.1.1) with all new development being carbon neutral by the year 2030. Other policies and actions seek to reduce vehicle emissions by 30% (NRC4.1.3) in addition with other transportation policies to reduce vehicle trips, and promote energy efficiency. Table 4.12-5 summarizes policies that directly or indirectly reduce greenhouse gas emissions and impacts. The current draft CAP does not extend to the year 2030 or specifically account for General Plan growth, but could be amended to do so. Additionally, implementation of the state's "Scoping Plan" will improve fuel, vehicle and energy efficiency, among other actions, that would also

[9] In 2008, the City had 58,125 residents (per California Department of Finance records) and approximately 33,925 employees (per AMBAG estimates, June 2008) for a total service population of 92,050. Buildout under the draft General Plan could result in 8,040 new residents and 8,665 new employees for an increase of 16,705 and total service population of 108,755.

result in reduced GHG emissions for General Plan buildout, although some reductions have been accounted for in the emissions modeling for the project growth.[10]

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in greenhouse gas emissions that contribute to global climate change impacts. However, the amount of estimated emissions are generally within future forecasts, and the addition of the project's emissions would not substantially change per capita emission rates within the City, and would in fact, slightly reduce them. Both the 2005 and 2030 per capita rates are below the per capita rate that has been determined necessary to successfully implement the State's AB 32 reduction goals statewide. Thus, indirect GHG emissions resulting from the project would not make a cumulatively considerable contribution to substantial adverse physical effects on the environment related to global climate change. Additionally, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to reduce GHG emissions as summarized on Table 4.12-5, including implementation of a Climate Action Plan with specified strategies for GHG emissions' reductions. Therefore, the proposed General Plan 2030's indirect generation of GHG emissions and contribution to global climate change impacts would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* action is recommended.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

NRC4.1.2 Revise *Climate Action Plan* to include projected *General Plan 2030* growth to the year 2030, and implement municipal, community, and business sections of the Climate Action Plan on energy efficiency and expanded use of renewable energy.

[10] Measures such as the Renewable Portfolio Standard, improvements in energy efficiency through periodic updates to Title 24, Solar Roofs program and other measures were determined to account for an estimated 9.5% reduction in natural gas GHG emissions and a 38.2% percent reduction in GHG emissions from electricity by 2020 according to BAAQMD studies These reductions were applied to the BGM emission calculations (Ballanti, April 2011). Future improvements related to wastewater, water efficiency and solid waste generation reductions would also reduce water/wastewater and solid waste emissions, but BGM cannot take this into account. Therefore, the emissions projections developed for this EIR are conservative.

TABLE 4.12-5
Proposed General Plan Policies & Actions that Reduce GHG Emissions & Global Climate Change Impacts

Type of Measure / Action	Policies / Actions
REDUCE GHG EMISSIONS & VEHICLE EMISSIONS	• 30% by 2020 and 80% by 2050, compared to 1990 levels: NRC4.1.1 • Vehicle emissions reduced 30% by 2020: NRC4.1.3 • Develop carbon dioxide emissions limits: HZ2.1.1 • Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 • Public outreach to reduce energy use by 30%: NRC4.3.1 • Implement Climate Action Plan, which addresses energy efficiency: NRC4.1.2, NRC4.3.3, NCR4.1.8 (tracking & reporting) • Develop City carbon dioxide budget: HZ2.1.2
PROMOTE ENERGY EFFICIENCY	• Expand municipal energy efficiency programs: NRC4.1.4. • Support solar energy, including solar generation on municipal buildings: NRC4.1.5, NRC4.3.4, NRC4.3.5. • Establish Energy Conservation Team & work with Santa Cruz Regional Compact on Climate Change for County-wide reduction of greenhouse gas emissions: NRC4.1.6, NRC4.1.7, NRC4.2.1 • Promote efficiency upgrades and renewable energy over use of carbon offsets to meet climate reduction goals: NRC4.1.9 • Energy reduction & efficiency: NRC7.1 & actions • Promote energy-efficient local transportation: NRC7.3 & actions
SUPPORT LEGISLATION & FUTURE PROGRAMS	• Support legislation and actions that reduce GHG emissions: NRC4.2, HZ2.1.1 • Implement future programs developed by the Regional Compact that meet city greenhouse gas reduction goals: NRC4.2.2 • Support & implement local, state, federal actions to reduce GHG emission: HZ2.1.2 • Community involvement and public outreach efforts to reduce energy use and GHG emissions: NRC4.3, NRC4.3.1, NRC4.3.2.
ALTERNATIVE TRANSPORTATION MODES TO REDUCE EMISSIONS	• Plan and support alternative transportation options, modes and strategies: NRC4.4.2. • Encourage use of alternative transportation modes: M.2.1.2 • See TABLE 4.4-4 in the TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list
SUPPORT LAND USE PATTERNS TO REDUCE VEHICLE TRIPS & EMISSIONS	• Reduce auto use with pedestrian/transit-oriented activity centers (M1.1) and Encourage land use changes that reduce auto use: LU4.2 • Encourage home occupations & telecommuting: LU4.4, LU4.4.1 and Live-work units: LU4.1.4, HA4.4 (artists) • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU3.10 & LU3.10.1 (commercial uses allowed in all districts), LU4.1.1, LU4.2.2 (new districts) & Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2 • SEE TABLE 4.4-4 in the TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list
PREPARE FOR CLIMATE CHANGE	• Early actions on issues (NRC4.4) and draft policies to address development in High Risk areas (NRC4.4.1) • Minimize impacts of future sea level rise (NRC4.5); complete City Vulnerability Study and Climate Change Risk Assessment (NRC4.51)

Impact 4.12-2: Conflicts with Applicable Plans
Potential development that could be accommodated in the draft *General Plan 2030* would result in increased greenhouse gas emissions, but the proposed project would not conflict with adopted plans. Therefore, there is *no impact.*

The project would not conflict with state plans adopted for the purpose of reducing greenhouse gas emissions. The City of Santa Cruz is in the process of preparing a Climate Action Plan to address citywide greenhouse emissions, but a final plan has not been completed or adopted. The City's draft "Climate Action Plan" is being prepared in accordance with the proposed *General Plan 2030* policies and actions, which call for preparation and implementation of such a plan.

The State's "Scoping Plan" includes strategies for transportation, energy, water and other sectors that are not directly applicable to the proposed General Plan, but nonetheless, the proposed General Plan includes several policies that are consistent with the State's strategies, and therefore, if implemented, would assist the State in meeting its reduction goals under AB 32. In particular, the draft *General Plan 2030* seeks to reduce emissions by 30% by 2020 and 50% by 2050 compared to 1990 levels, which is consistent with the goals set forth in the California Global Warming Solutions Act of 2006. The draft plan also includes new mixed-use land use designations and numerous policies that support higher density infill projects along transit corridors in conjunction with transportation policies to reduce auto trips. This is consistent with the intent of the Regional Transportation Target component of the Scoping Plan, which is being further defined by AMBAG and preparation of a Blueprint Plan in to achieve compliance with SB 375's Sustainable Communities Strategy.

Additionally, the California Attorney General Office (AGO) has developed a list of examples of policies to address climate change and sustainability in General Plans (California Attorney General, 1/22/10), as well as a list of project-level mitigation measures. This list was updated in 2010. In particular the AGO list references the top ten strategies recommended by CAPCOA[11] for local agencies to consider in General Plans. Table 4-12-6 summarizes these strategies with a cross reference to proposed *General Plan 2030* policies and actions that are consistent with these strategies. As shown, the proposed plan includes policies that address most of these key strategies.

Therefore, the project would not conflict with any adopted plans, policies or regulations of an agency adopted for the purpose of reducing greenhouse gas emissions.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not result in conflicts or inconsistencies with policies adopted to protect

[11] CAPCOA (California Air Pollution Control Officers Association). June 2009. "Model Policies for Greenhouse Gases in General Plans." Appendix E identifies ten strategies are widely applicable throughout California in varying degrees and are the recommended initial local government focus for future General Plan policies, Climate Action Plan development, and Blueprint Planning, while acknowledging that not all strategies will work equally within the diversity of cities and counties in California.

biological resources. Thus, there is *no impact* related to this issue as summarized on Table 4.8-5. Therefore, the project would not result in conflicts with adopted plans.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.12-6
Proposed General Plan Policies & Actions: Consistency with California Attorney General Recommendations

Recommended Strategy	Policies / Actions
1) Promote • Smart growth, • Jobs/housing balance, • Transit-oriented development, • Infill development through land use designations.	• Reduce auto use with pedestrian/transit-oriented activity centers: M1.1, M3.1, M3.1.1, M3.1.2 • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU3.10 & LU3.10.1 (commercial uses allowed in all districts), LU4.1.1, LU4.2.2 (new districts) & Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2 • Vehicle emissions reduced 30% by 2020: NRC4.1.3 • Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 • Ensure optimum utilization of infill parcels: LU1.1
2) Support for and funding of transit, bicycle, and pedestrian connections through transit and trail planning and regional cooperation.	• Plan and support alternative transportation options, modes and strategies: NRC4.4.2. • Encourage use of alternative transportation modes: M.2.1.2 • See TABLE 4.4-4 in the TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list of policies and actions that support transit, bicycle and pedestrian
3) Promotion of energy- and water-efficient buildings (e.g., LEED buildings) through green building ordinances, project timing prioritization, and other implementing tools.	• Energy reduction & efficiency: NRC7.1 & actions • Reduce electricity and natural gas use by 20%: NRC7.1.1 • Adopt Model Lighting Ordinance: NRC7.1.2 • Improve energy efficiency in parks: NRC7.1.10 • Continue to install energy efficient systems in park and recreational facilities: NRC7.1.11 • Install energy-efficient street lighting: MC.2.10 • Increase local use and production of renewable energy:NRC7.1.3 • Require passive heating and cooling in new development: NRC7.1.4 • Require City facilities to increase green electricity: NRC7.1.5 • Install energy and water efficient appliances: NRC7.4.1 • Require new development to use high efficiency fixtures: NRC7.4.2 • Support gray water collection and reuse: NRC7.4.2, NRC7.4.3
4) Promotion of green procurement and alternative fuel vehicle use through municipal mandates and voluntary bid incentives.	• Reduce consumption of fuels: NRC7.3.1 • Establish telecommuting for City staff: NRC7.3.3 • Investigate partnerships with UCSC for electric car use: NRC7.3.5 • SEE TABLE 4.4-4 in Chapter 4.4 for policies-actions to reduce auto use.

(CONTINUED ON NEXT PAGE)

TABLE 4.12-6
Proposed General Plan Policies & Actions: Consistency with California Attorney General Recommendations

Recommended Strategy	Policies / Actions
5) Support for alternative fuel facilities and infrastructure through land use designations, zoning, and public-private partnerships.	• Purchase City vehicles with fuel efficient or alternative fuel systems: NRC7.3.2, NRC7.3.4
6) Support for renewable energy generation (utility and residential) through feasibility evaluations, land use designations, and zoning.	• Expand municipal energy efficiency programs: NRC4.1.4. • Support solar energy, including solar generation on municipal buildings: NRC4.1.5, NRC4.3.4, NRC4.3.5. • Promote efficiency upgrades and renewable energy over use of carbon offsets to meet climate reduction goals: NRC4.1.9
7) Promotion of waste diversion, recycling, energy efficiency and energy recovery in cooperation with public services districts and private entities.	• Zero Waste goal: CC6.1 • Reduce recyclable materials at landfill: CC6.4.4, CC6.1.13 (plastic bags), CC6.1.17 & HZ2.1.4 (ban polystyrene foam), CC6.4.4 • Prepare & implement recycling and reduction plans and incentives to encourage recycling: CC6.1.1, CC6.1.2, CC6.1.3, CC6.1.7 (new development), CC6.1.14 • Provide efficient waste & recycling service: CC6.2, CC6.2.2
8) Support for urban and rural forestry through tree planting requirements and Programs.	• Protect tree resources & heritage trees: NRC5.1, CD4.3.4 • Maintain & increase urban tree canopy & tree diversity: NRC5.1.2, NRC5.2, NRC5.2.1 (additional street trees) • Educational programs to promote urban forest: NRC5.1.1
9) Community outreach and education to foster community involvement, input, and support for GHG reduction planning and implementation.	• Public outreach to reduce energy use: NRC4.3.1 • Community involvement and public outreach efforts to reduce energy use and GHG emissions: NRC4.3, NRC4.3.1, NRC4.3.2.
10) Regional cooperation to find cross-regional efficiencies in GHG reduction investments and to plan for regional transit, energy generation, and waste recovery facilities.	• Establish Energy Conservation Team & work with Santa Cruz Regional Compact on Climate Change for County-wide reduction of greenhouse gas emissions: NRC4.1.6, NRC4.1.7, NRC4.2.1 • Support legislation and actions that reduce GHG emissions: NRC4.2, HZ2.1.1 • Implement future programs developed by the Regional Compact that meet city greenhouse gas reduction goals: NRC4.2.2 • Support & implement local, state, federal actions to reduce GHG emission: HZ2.1.2 • Community involvement and public outreach efforts to reduce energy use and GHG emissions: NRC4.3, NRC4.3.1, NRC4.3.2.
Based on California Attorney General Recommendations for General Plans (1.22.10), which references the CAPCOA "Top Ten Actions" local governments can utilize in General Plans to address greenhouse gas reduction (CAPCOA, June 2009).	

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4.13 NOISE

4.13.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Noise Fundamentals
- Existing Noise Sources & Noise Levels
- Noise Compatibility Standards & Noise Attenuation

This section summarizes the noise background that was prepared or the City by Rosen, Goldberg, Der & Lewitz (November 2007) as part of the General Plan update process. The report provides background information on noise sources within the City, noise measurements that were made to document noise levels throughout the City, and development of noise contours for existing conditions. The firm also prepared a report identifying future noise conditions along key roadways (November 2010) based on the outcome of the traffic analysis, the results of which are also included in this chapter. The technical reports are included in Technical Appendix F-3, which is available for review at the City of Santa Cruz Planning Department[1] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

REGULATORY SETTING

There are no federal noise requirements or regulations applicable to local actions of the City of Santa Cruz. However, there are federal regulations that influence the audible landscape, where federal funding is involved. The Federal Highway Administration (FHWA) requires abatement of highway traffic noise for highway projects through rules in the Code of Federal Regulations (23 CFR Part 772), and the Federal Transit Administration (FTA) and Federal Railroad Administration (FRA) each recommend thorough noise and vibration assessments through comprehensive guidelines for any mass transit or high-speed railroad projects that would pass by residential areas. For housing constructed with assistance from U.S. Department of Housing and Urban Development, minimum noise insulation standards must be achieved (24 CFR Part 51, Subpart B).

California Government Code Section 65302(f) requires that each city and county general plan include a "noise element" that: "shall identify and appraise noise problems in the community"; "shall recognize the guidelines established by the Office of Noise Control"; and "shall analyze

[1] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1-4 PM.

and quantify, to the extent practicable, as determined by the [city or county] legislative body, current and projected noise levels for all of the following sources:

- Highways and freeways,
- Primary arterials and major local streets,
- Passenger and freight on-line railroad operations and ground rapid transit systems,
- Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation,
- Local industrial plants, including, but not limited to, railroad classification yards, [and]
- Other ground stationary noise sources, including, but not limited to, military installations, identified by local agencies as contributing to the community noise environment."

"Noise contours shall be shown for all of these sources and stated in terms of community noise equivalent level (CNEL) or day-night average level (Ldn). The noise contours shall be prepared on the basis of noise monitoring or following generally accepted noise modeling techniques for the various sources identified in paragraphs (1) to (6), inclusive." These "noise contours shall be used as a guide for establishing a pattern of land uses in the land use element that minimizes the exposure of community residents to excessive noise."

Finally, "[t]he noise element shall include implementation measures and possible solutions that address existing and foreseeable noise problems, if any. The adopted noise element shall serve as a guideline for compliance with the state's noise insulation standards."

The State of California Office of Planning and Research Noise Element Guidelines (Governor's Office of Planning and Research, October 2003) include recommended exterior noise level standards for different land uses to assure compatibility with ambient noise levels. The City of Santa Cruz' existing General Plan includes the state's standards that were recommended at the time the existing General Plan was prepared in 1990.

The State of California establishes minimum noise insulation performance standards for hotels, motels, dormitories, apartment houses and dwellings other than detached single-family dwellings. Interior noise levels attributable to exterior sources shall not exceed 45 db in any habitable room, measured in either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the General Plan, although Ldn is preferred as set forth in the California Building Code (Title 24, Chapter 12 Appendix Section 1207.11.2). The Day-Night Average Sound Level (DNL) is a descriptor established by the U.S. Environmental Protection Agency to represent a 24-hour average noise level with a penalty applied to noise occurring during the nighttime hours (10 p.m. - 7 a.m.) to account for the increased sensitivity of people during sleeping hours. Where exterior noise levels exceed 60 dBA Ldn, a report must be submitted with the building plans describing the noise control measures that have been incorporated into the design of the project to meet the noise limit.

Regulations within the City of Santa Cruz Municipal Code include performance standards regarding noise and vibration. Section 24.14 includes performance standards for the control of land uses to enable potential nuisance factors to be measured factually and objectively where possible and to protect the community as a whole from hazards and nuisances which can be prevented by methods of control and elimination. Sections 24.14.220 indicate that no land or

building in any district shall be used or occupied in any manner so as to create noise or vibration in such a manner or in an amount as to adversely affect the surrounding area or adjoining premises. Section 24.14.260 establishes the maximum sound level that shall not be exceeded as more than five dBA above the local ambient for residential uses and six dBA for commercial uses. Section 24.14.262 indicates that no vibration (other than from transportation facilities or temporary construction work) shall be permitted which is discernible without instruments at the points of measurement specified in the regulations. Chapter 9.36 regulates "offensive" and disturbing noise, which generally prohibits loud noise between the hours of 10 PM and 8 AM.

NOISE FUNDAMENTALS

Definitions of Noise and Effects of Noise

"Sound" is mechanical energy transmitted by pressure waves in a compressible medium such as air. "Noise" is generally defined as "unwanted or disturbing sound." Sound becomes unwanted when it either interferes with normal activities such as sleeping, conversation or disrupts or diminishes one's quality of life (U.S. EPA "Noise Pollution" website). For some people, the persistent and escalating sources of sound can often be considered an annoyance. Annoyance is the common issue regarding community noise. Studies have also shown that there are direct links between noise and health. Problems related to noise include stress-related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity (Ibid.).

Unlike many other environmental factors, noise is a subjective. Its effects often depend on the source, its loudness, and duration. Which sounds are considered noise varies from person to person and with the time of day and setting. Many factors influence people's response to noise, such as the character of the noise, sound level, and duration of the sound. When the noise level of an activity rises above 70 dBA, the chance of receiving a complaint is possible. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure.

Loudness is measured in decibels (dB) and is typically expressed in dBA, which approximates human hearing. The human ear can generally perceive noise from 0 to 140 decibels. Sounds as faint as 0 decibels are barely audible, and then only when there are no other sounds. Ordinary conversation is about 60 dB. People can tolerate some noise, but brief exposure to intense sounds of 120 to 140 dB can threaten physical or psychological well-being.

Measuring Noise

Noise levels are commonly measured with an instrument called a sound level meter. The sound level meter captures the sound with a microphone and converts it into a number called a sound level. Sound levels are expressed in units of decibels. To correlate the microphone signal to a level that corresponds to the way humans perceive noise, the A-weighting filter is used. A-weighting de-emphasizes low-frequency and very high-frequency sound in a manner similar to human hearing. The use of A-weighting is required by most local General Plans as well as federal and state noise regulations (e.g. Caltrans, EPA, OSHA and HUD). The abbreviation dBA

is sometimes used when the A-weighted sound level is reported (Rosen Goldberg Der & Lewitz, Inc., November 2007).

Because of the time-varying nature of environmental sound, there are many descriptors that are used to quantify the sound level. Although one individual descriptor alone does not fully describe a particular noise environment, taken together, they can more accurately represent the noise environment. The maximum instantaneous noise level (Lmax) is often used to identify the loudness of a single event such as a car passby or airplane flyover. To express the average noise level the Leq (equivalent noise level) is used. The Leq can be measured over any length of time but is typically reported for periods of 15 minutes to 1 hour. The background noise level (or residual noise level) is the sound level during the quietest moments. It is usually generated by steady sources such as distant highway traffic. It can be quantified with a descriptor called the L90 which is the sound level exceeded 90 percent of the time (Rosen Goldberg Der & Lewitz, Inc., November 2007).

To quantify the noise level over a 24-hour period, the Day/Night Average Sound Level (DNL or Ldn) or Community Noise Equivalent Level (CNEL) is used. These descriptors are averages like the Leq except they include a 10 dB penalty during nighttime hours (and a 5 dB penalty during evening hours in the CNEL) to account for peoples increased sensitivity during these hours (Rosen Goldberg Der & Lewitz, Inc., November 2007).

In environmental noise, a change in noise level of 3 dB is considered just a noticeable difference. A 5 dB change is clearly noticeable, but not dramatic. A 10 dB change is perceived as a halving or doubling in loudness (Rosen Goldberg Der & Lewitz, Inc., November 2007).

EXISTING NOISE SOURCES & NOISE LEVELS

The most widespread and dominant noise source in Santa Cruz is traffic. Other noise sources such as railroads, industry and the Boardwalk tend to be localized and limited to certain locations and times of the day or year. The following is a discussion of the most common noise sources in Santa Cruz.

Existing Sources of Noise

ROADWAY-TRAFFIC NOISE

The noisiest roadways are those with the greatest traffic volumes and highest travel speeds. For example, the highways (State Route 1 and State Route 17) generate noise which affects large areas. The noise from arterials affects the development that is directly adjacent but the affects are significantly reduced beyond the first row of buildings. Examples are Mission Street (State Route 1), Water Street, Soquel Avenue, Ocean Street, Broadway, River Street, Bay Street and Laurel Street.

Soundwalls along freeways and highways reduce noise levels at the land uses behind them. Typical noise reductions are in the 5 to 15 dBA range depending on the location of the noise receptor. Soundwalls have been installed along much of the length of the Highway 1 in Santa Cruz as part of the State Route 1/17 Widening of Merge Lanes project.

RAILROAD NOISE

The railroad tracks that cross the southern portion of the City in an east/west direction are used for limited freight transport and generally during daytime hours. During the summer (and limited days during the winter holidays) recreational trains access the Boardwalk along the tracks that cross the City in a north/south direction along Chestnut Street. There are generally two round trip excursions per day. The trains travel at relatively low speeds through the City and the major noises are the rumble from the locomotive and the whistles that must be sounded before and during each at-grade roadway crossing.

Locomotives typically produce maximum noise levels (Lmax) of 88 dBA at a distance of 50 feet and whistles produce an Lmax of 105 dBA at 50 feet2. If there are two round trips a day, this corresponds to an Ldn of 49 dBA. The Ldn would increase to 65 dBA near grade crossings since the train would be required to sound its warning horn (whistle).

AIRCRAFT NOISE

There are no airfields or airports in Santa Cruz and, therefore, airplane noise is limited to overflights. There is an emergency helipad at Dominican Hospital just outside of the northeast corner of the City Limits.

INDUSTRIAL NOISE

Much of the industrial land use in the City is located north of Highway 1 and west of River Street (State Route 9). Concrete production and distribution is a common noise source in this area. Measurements along Coral Street indicate that the steady noise level from machinery at the Graniterock facility is 65 to 67 dBA at a distance of 185 feet (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007).

OTHER SOURCES – THE BOARDWALK

The Santa Cruz Beach Boardwalk is the predominant noise source in the beach area during the summer months. Major noise sources include roller coasters, people screaming and outdoor concerts. Noise measurements conducted for the Beach Area/South of Laurel Master Plan EIR3 indicated that roller coasters generate maximum noise levels (Lmax) of 69 to 78 dBA at the residences and businesses across Beach Street. The DNL along Leibrandt Street was 68 dBA. Along East Cliff Drive, homes on the bluff overlooking the boardwalk, were exposed to an Lmax of 60 to 65 dBA from music at the bandstand and 65 to 70 dBA from the screams of people on the wooden roller coaster (Giant Dipper) (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007).

Existing Noise Levels

As part of preparation of the General Plan, a noise measurement program was conducted to quantify noise levels throughout the City. The program included measurements along the busiest roads in the city in November 2006. One continuous "long term" 24-hour noise measurement and one "short-term" 15-minute measurement were conducted at each of ten locations. The short-term noise measurement was conducted at the typical setback of the nearby land uses (typically residences) while the long-term noise monitor was mounted to an existing utility pole

or tree. The short-term measurement results were correlated with simultaneous measurements at the long-term monitoring location to determine the DNL at the typical setback of land uses in the vicinity of the long-term noise monitor. Table 4.13-1 shows the results of the short-term noise measurements and the correlated DNL.

TABLE 4.13-1
Short-Term Noise Measurement Results

LOCATION		Short-Term Noise Measurement Results				
		L_{eq}	L_{10}	L_{50}	L_{90}	DNL*
1	Swift Street at Jeter St.	65	69	62	51	66
2	West Cliff Drive at Woodrow Avenue	56	48	47	46	56
3	Barson Street at Canfield Avenue	60	65	54	48	62
4	Ocean Street south of Hubbard Street	71	74	69	62	73
5	Mission Street at Van Ness Avenue	70	69	67	84	75
6	Seabright Avenue at Windsor Street	63	67	60	48	66
7	Water Street at Benito Avenue	67	69	64	58	69
8	Morrissey Blvd. at Hammond Avenue	66	69	65	56	67
9	Highway 1 at High Street	70	73	69	59	73
10	Center Street at New Street	63	64	56	48	63

* DNL calculated by correlating with simultaneous measurement at 24-hbour noise monitor.
SOURCE: Rosen, Goldberg, Der & Levitz, Inc., November 2007

An existing noise contour map was developed and the contours are shown on Figure 4.13-1.[2] The contours are shown for DNL values of 60 and 65 dBA. Although some segments experienced noise levels above 70 dBA as shown on Table 4.13-1, these areas are quite limited and were not mapped due to the limited visibility with the scale of mapping. The traffic noise contours are based on calculations using the Federal Highway Administration's Traffic Noise Model (TNM 2.5), which includes inputs such as traffic volume, truck percentage and travel speeds. Traffic volume data developed by the City of Santa Cruz for the General Plan Update was supplemented by observations made in the field. The traffic data for the highways is based on counts published by Caltrans. The traffic noise contours do not take into account the acoustical shielding provided by buildings or fences along the roadways. However, along

[2] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

portions of Highway 1, the effects of recently constructed soundwalls are included. The soundwall locations are based on the environmental document for the highway widening project. The soundwalls are assumed to reduce the noise levels by 5 dBA (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007).

NOISE COMPATIBILITY STANDARDS & NOISE ATTENUATION

As previously indicated, the State of California Office of Planning and Research Noise Element Guidelines (Governor's Office of Planning and Research, October 2003) include recommended exterior noise level standards for different land uses to assure compatibility with ambient noise levels. These Guidelines describe the compatibility of various land uses with a range of environmental noise levels in terms of dBA CNEL. According to the State, a noise environment of 60 dBA or less CNEL is considered to be "normally acceptable" for residential uses. Additionally, more restrictive standards for quiet suburban and rural communities may be reduced by 5 to 10 dBA to reflect their lower existing outdoor noise levels in comparison with urban environments. Table 4.13-2 illustrates the State guidelines, which were originally established by the State Department of Health Services, for acceptable noise levels for each jurisdiction.

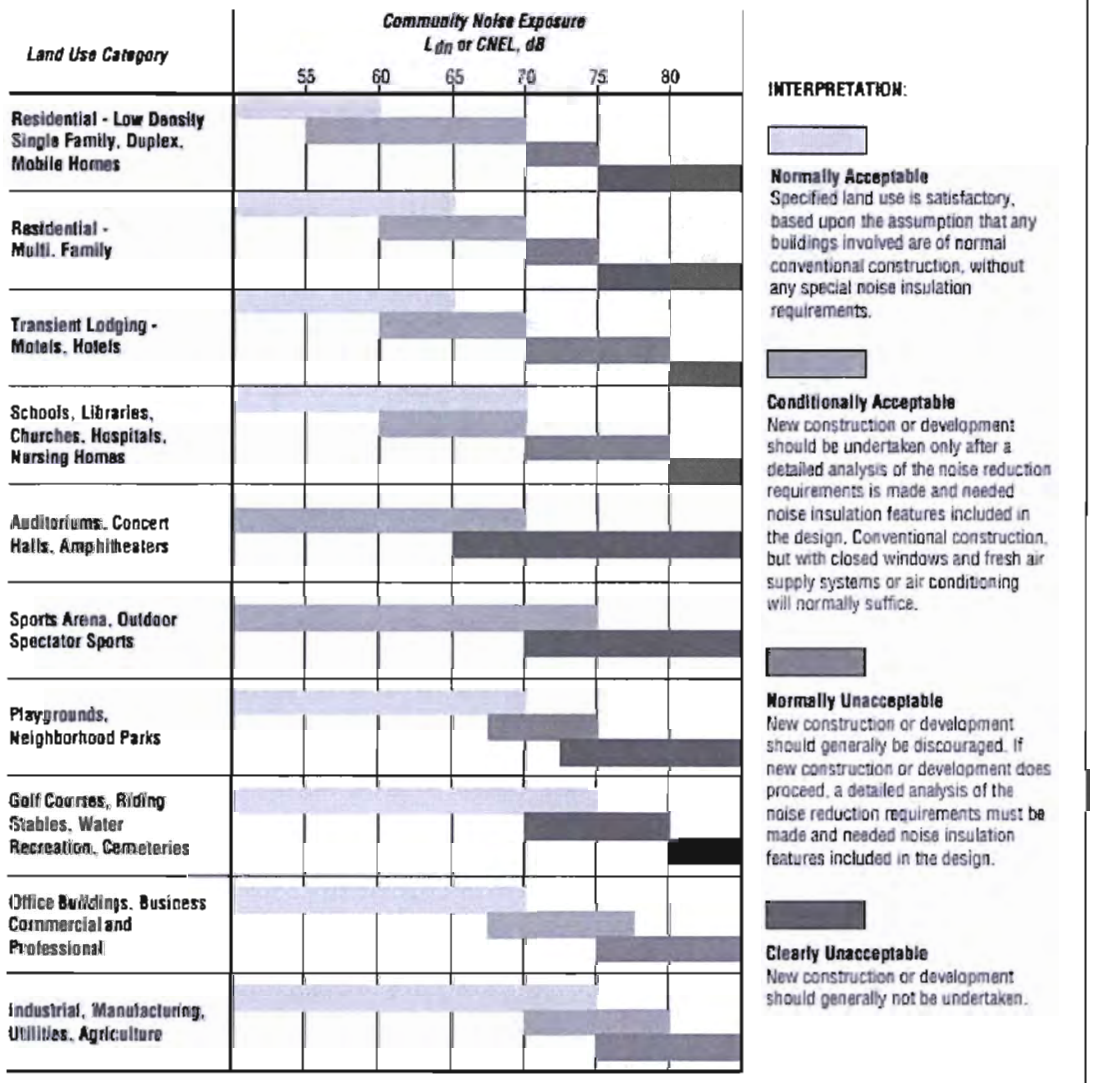
An interior CNEL of 45 dBA is mandated by the State of California Noise Insulation Standards (California Code of Regulations, Title 24, Part 6, Section T25 28) for multiple-family dwellings and hotel and motel rooms. Since normal noise attenuation within residential structures with closed windows is about 20 dBA, an exterior noise exposure of 65 dBA Ldn allows the interior standard to be met without any specialized structural attenuation (e.g., dual paned windows). A noise level of 65 dBA is also the level at which ambient noise begins to interfere with one's ability to carry on a normal conversation at reasonable separation without raising one's voice.

For typical residential construction (i.e., light frame construction with ordinary sash windows), the minimum amount of exterior to interior noise reduction is at least 20 dBA with exterior doors and windows closed and approximately 15 dBA with windows partially open for ventilation. Buildings constructed of stucco or masonry with dual-glazed windows and solid core exterior doors can be expected to achieve an exterior to interior noise reduction of approximately 25-30 dBA.

A solid barrier, such as a concrete masonry wall, located between a noise source and a receiver will typically provide about 5 dBA of noise reduction; additional reduction may be achieved by increasing the length and/or height of the barrier. A row of buildings located between a source and a receiver may provide 3 dBA of noise reduction with up to a 1.5-dBA reduction for each additional row up to a maximum reduction of approximately 10 dBA (California Department of Transportation, November 2009). The exact degree of noise attenuation depends on the nature and orientation of the structure and intervening barriers. Sound levels from a localized point source typically are reduced by 6 dBA for each doubling in distance, and sound levels from roadway traffic noise may be reduced by 3 dBA for each doubling in distance (Ibid). Ordinary landscaping along a highway accounts for less than 1 dBA of noise reduction, while dense landscaping (i.e., 100 feet wide) could attenuate traffic noise by 5 dBA (Ibid.).

TABLE 4.13-2
Land Use – Noise Compatibility Standards

FIGURE 2



SOURCE: California Governor's Office of Planning and Research

4.13.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The draft *General Plan 2030* includes a HAZARDS, SAFETY & NOISE chapter that sets forth one goal with two policies and 14 accompanying actions that address noise issues. The following goal HZ3 and its two policies seek to maintain or reduce existing noise levels and control excessive noise and ensure that noise standards are met in the siting of noise-sensitive uses.

GOAL HZ3 *Noise levels compatible with occupancy and use.*

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Land Use policies LU1.1.4 and LU1.1.5 address development for specific sites: the Swenson property and the Golf Club Drive property, respectively.

Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment. The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.3). Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. In addition, the proposed *General Plan 2030* supports development of a desalination plant (Policy CC3.1.3), but a specific site is not identified.

4.13.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

13a Expose persons to noise levels in excess of "normally acceptable" standards established in the State of California *General Plan Guidelines*' (2003) "Noise Element Guidelines" for compatible community noise levels;

13b Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project if it will expose outdoor activity areas of noise-sensitive land uses to:

- A 5 dB increase in noise where existing noise levels are below 60 dBA L_{dn}, or
- a 3 dB increase in noise where existing noise levels are above 60 dBA L_{dn}.

13c Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or

13d Expose persons to or generate excessive groundborne vibration.

IMPACT ANALYSIS

The following impact analyses address potential impacts related to exposure to noise levels that exceed standards (13a), permanent increases in ambient noise levels (13b), and temporary increases in noise due to construction (13c). There are no planned land uses that would be expected to result in generation of groundborne vibration. The potential for vibration (13d) is mostly associated with construction-related impacts, and is addressed in that impact discussion below (13c). There are no airports or airfields within the City or in the immediate vicinity that would cause noise-related impacts related to aviation.

Potential Future Development & Buildout

The proposed General Plan would accommodate future development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030. The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents (based on 2.4 persons per household). The buildout projections estimate 3,140,000 additional square feet of commercial, office and industrial uses by the year 2030. According to the traffic analysis, this potential development would generate an estimated 78,260 new daily trips with approximately 7,180 trips occurring during the PM peak hour.

Impact 4.13-1: Exposure to Noise
Implementation of the proposed *General Plan 2030* would accommodate future development that could be exposed to noise levels that exceed state standards for compatible noise levels for residential uses. With implementation of the proposed General Plan policies and actions for noise, this is considered a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized in subsection 4.13.2 above, could result in increased vehicular noise as discussed below, as well as project-level construction-related noise, which is discussed below under Impact 4.13-3.

The proposed *General Plan 2030* would accommodate future development pursuant to planned land use designations contained in the Plan. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan, approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located along these corridors.[3] Although the City of Santa Cruz is primarily developed, except for a few remaining vacant lots located within developed areas, the following three areas within the planning area are primarily undeveloped or underdeveloped that would be subject to potential future development: the Swenson site adjacent to Antonelli Pond; the Golf Club Drive area adjacent to Pogonip Creek, and the area along Seventh Avenue that is within the City's Sphere of Influence, but outside city limits.

Future noise levels adjacent to roadways were modeled by Rosen, Goldberg, Der & Lewitz, Inc. for this EIR, based on traffic data developed for the EIR, which was used as input to the Federal Highway Administration's TNM 2.5 model. This model calculates the traffic noise level based on input such as traffic volume, truck percentage and travel speeds. (See Appendix F-3 for further details). The resulting noise levels are shown on Table 4.13-3.

Based on the projected future noise levels, a future noise contour map was developed, which is shown on Figure 4.13-2. The noise contours are shown for DNL values of 60 and 65 dBA. Although some segments experienced noise levels above 70 dBA as shown on Table 4.13-3, these areas are quite limited and were not mapped due to the limited visibility with the scale of mapping. The traffic noise contours do not take into account the acoustical shielding provided by buildings or fences along the roadways. However, along the portions of Highway 1, the effects of recently constructed soundwalls are included; the soundwalls are assumed to reduce the noise levels by 5 dBA.

As shown on Table 4.13-3, land uses along a number of City streets would experience future noise levels in excess of 65 dBA at distances of 50 or more feet. As previously indicated, 65 dBA is the typical exterior noise level at which the state-mandated interior sound level of 45 dBA could be achieved without specialized structural noise attenuation. The streets include segments along:

- Bay Street
- Front Street
- King Street / Union
- Laurel Street / Broadway
- High Street
- Mission Street / Water Street
- Morrissey Blvd.
- Ocean Street
- River Street
- Riverside Avenue
- San Lorenzo/East Cliff/Murray
- Soquel Avenue
- Swift Street
- Seventh Avenue
- Highway1

[3] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

Some future development accommodated by the proposed *General Plan 2030* would be located along some of these roadways, especially along the proposed intensified mixed-use corridors along, Mission Street, Soquel Avenue, Water Street, and Ocean Street. The two major vacant properties – the Swenson site adjacent to Antonelli Pond and the Golf Club Drive area – would not be located in areas where future noise levels may exceed standards for noise-land use compatibility standards. However, some of the area along Seventh Avenue that is within the City's existing Sphere of Influence, but outside city limits, may experience unacceptable noise levels.

Certain land uses are particularly sensitive to noise, such as schools, hospitals, and rest homes. Residential areas are also considered noise sensitive, especially during the nighttime hours. There are no major hospitals within city limits. The City is predominantly residential with 12 public and private schools distributed throughout the City. Residential uses within new mixed-use developments along the major transportation corridors would be potentially exposed to noise levels that exceed noise-land use compatibility standards as future noise levels along Mission Street, Ocean Street, Soquel Avenue and Water Street would be at or near 70 decibels. The unincorporated area along Seventh Avenue that is within the City's existing Sphere of Influence is projected to experience a noise level of 65 decibels L_{dn} as a result of General Plan-related traffic. New residential development along segments of Bay Street, High Street, and Morrissey Blvd., as well as adjacent to Highways 1 and 17, could also be exposed to exterior noise levels above 65 dBA L_{dn}.

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on noise. In particular, noise-land use compatibility standards will be applied to all new residential, commercial and mixed-use projects (HZ3.2.1), and the proposed General Plan seeks to ensure that noise standards are met in the siting of noise-sensitive uses (HZ3.2). The policies also establish an interior noise level of 45 dBA for all residential uses, consistent with state law, and a target outdoor level of 65 dBA for activity areas associated with new multi-family development. However, the draft plan does not contain a table or graphic depicting what noise compatibility standards are for different land uses as exists in the City's current General Plan. Table 4.13-2 presents such standards as recommended by the state of California and currently included in the City's existing General Plan. Denotation of a land use as "normally acceptable" implies that the highest noise level in that band is the maximum desirable for existing or conventional construction that does not incorporate any special acoustic treatment. In general, evaluation of land use that falls into the "normally acceptable" or "normally unacceptable" noise environments should include consideration of the type of noise source, the sensitivity of the noise receptor, the noise reduction likely to be provided by structures, and the degree to which the noise source may interfere with speech, sleep, or other activities characteristic of the land use. The objective of the noise compatibility guidelines is to provide the community with a means of judging the noise environment it deems to be generally acceptable (California Governor's Office of Planning and Research, October 2003). In instances where new development may be exposed to unacceptable noise levels, acoustical studies would necessary to ensure that the building construction can meet state-required noise levels, as well as acceptable outdoor noise levels.

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Noise Levels Adjacent to City Streets						
Bay Street (Bay Dr.)						
-High to Nobel-Iowa	67	67	0.1	240	85	--
-Nobel-Iowa to Escalona	67	67	0.4	260	95	--
-Escalona to King	67	67	0.4	260	90	--
-King to Mission	65	67	1.5	240	85	--
-Mission to California St	65	65	0.2	160	50	--
-California St to California Ave	66	67	0.9	240	85	--
-California Ave to West Cliff	65	66	0.9	200	70	--
Branciforte Avenue						
-Goss to Water	64	65	1.0	160	50	--
-Water to Soquel	64	65	0.8	160	50	--
-Soquel to Broadway	61	62	0.8	90	--	--
California Street						
-Laurel to Bay	63	63	0.4	110	--	--
Front Street						
-Mission/Water to Cooper of	63	65	1.5	160	50	--
-Soquel to Cathcart	66	67	1.3	260	90	--
-Cathcart to Metro Center	65	66	1.2	220	70	--
-Metro Center to Laurel	65	66	1.2	200	70	--
Center Street						
-Mission to Laurel	63	64	0.7	140	--	--
-Laurel to Pacific	60	60	0.7	55	--	--
Seabright Avenue						
-Water to Soquel	60	60	-0.4	50	--	--
-Soquel to Broadway	63	64	0.7	140	--	--
-Broadway to Murray	63	64	0.8	130	--	--
Ocean Street						
-Ocean/Plymouth to Kennan/Washburn	68	70	1.4	320	160	50
-Kennan/Washburn to Water	69	71	1.3	360	190	60
-Water to Soquel	68	69	1.3	320	150	--
-Soquel to Broadway	66	68	1.8	280	120	--
-Broadway to San Lorenzo/East Cliff	65	66	1.4	220	70	--
Riverside Avenue						
-San Lorenzo to Third	66	67	1.1	240	85	--
-Third to Second	62	63	0.7	100	--	--

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Chestnut Street						
-Laurel to Mission	62	63	0.9	110	--	--
River Street						
-Encinal to Fern	66	69	2.6	300	140	--
-Fern to Rte 1	67	70	2.6	340	170	50
-Rte 1 to Potrero	66	68	2.1	280	120	--
-Potrero to N Pacific River	65	68	2.6	260	110	--
-N Pacific River to Water	64	67	2.3	240	75	--
-Water to Soquel	64	65	1.1	180	55	--
Pacific Avenue						
Mission to Laurel	60	62	1.5	80	--	--
-Laurel to Center	59	60	0.8	50	--	--
-Center to Beach	64	65	1.0	160	50	--
Market Street						
-Isbel-Goss to Water	62	64	1.5	140	--	--
High Street						
-Western to Bay	65	66	0.2	190	60	--
-Bay to Moore	66	66	0.3	200	70	--
-Moore to Laurent	66	66	0.3	200	70	--
Mission Street / Water Street						
-Shaffer to Western	65	65	0.4	180	55	--
-Western to Swift	65	66	0.9	200	70	--
-Swift to Miramar	67	69	2.0	320	150	--
-Miramar to Younglove	67	70	2.4	340	170	50
-Younglove to Bay	68	70	2.2	340	180	60
-Bay to Laurel	69	71	2.8	400	240	75
-Laurel to Walnut	68	71	2.9	360	190	60
-Walnut to King-Union	68	71	2.3	360	190	60
-King-Union to Chestnut-Hwy 1	70	72	1.8	400	240	80
-Chestnut-Hwy 1 to Center	65	67	2.2	260	90	--
-Center to N. Pacific	67	69	1.9	300	130	--
-N.Pacific to River	66	68	2.1	280	120	--
-River to Ocean	68	70	2.1	340	170	50
-Ocean to Market	68	70	1.7	340	180	55
-Market to N.Branciforte	69	70	1.4	340	180	55
-N.Branciforte to Seabright	68	69	1.1	300	130	--
-Seabright to Morrissey	69	70	0.7	320	160	50

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Walnut / Soquel Avenue						
-Mission to Front	63	63	-0.1	120	--	--
-Front to River	65	66	1.3	220	70	--
-River to Riverside-Dakota	66	67	1.4	260	95	--
Walnut / Soquel Avenue (con't)						
-Riverside-Dakota to Ocean	66	67	1.3	260	95	--
-Ocean to Branciforte	66	68	1.6	260	100	--
-Branciforte to Seabright	67	68	1.0	260	100	--
-Seabright to Morrissey	69	69	0.7	320	150	--
-Morrissey to Frederick	69	70	1.0	340	180	55
Frederick to Trevthan-Hagemann	70	71	1.0	360	190	60
Trevthan-Hagemann to Park	70	70	0.8	340	180	60
-Park to Capitola	69	70	0.8	340	180	55
-Capitola to La Fonda	66	67	0.5	240	85	--
Laurel Street / Broadway						
-King to Mission	60	62	1.8	90	--	--
-Mission to California	67	67	0.0	240	75	--
-California to Chestnut	66	68	1.5	260	110	--
-Chestnut to Center	66	68	1.5	260	100	--
-Center to Cedar	66	68	1.6	260	110	--
-Cedar to Pacific	66	68	1.3	260	110	--
-Pacific to Front	67	68	1.3	260	110	--
-Front to San Lorenzo	67	69	1.3	300	130	--
-San Lorenzo to Ocean	65	67	1.6	240	75	--
-Ocean to S.Branciforte	65	66	1.3	220	70	--
-S.Branciforte to Seabright	65	66	1.0	200	70	--
San Lorenzo/East Cliff/Murray						
-Laurel-Broadway to Riverside	64	65	0.9	160	50	--
-Riverside to Ocean	66	68	1.1	260	100	--
-Ocean to Seabright	67	68	0.6	260	100	--
West Cliff Dr. / Beach Street						
Swanton to Bay	62	63	0.3	100	--	--
-Bay to Pacific	64	65	0.8	160	50	--
-Pacific to Cliff	60	61	1.2	70	--	--
-Cliff to Riverside	59	61	1.9	70	--	--
King Street / Union						
-Bay to Laurel	63	63	0.6	120	--	--
-Laurel to Storey	62	63	0.8	120	--	--
-Storey to Mission	64	65	1.1	180	55	--

TABLE 4.13-3
Existing and Future Noise Levels Adjacent to Roadways

Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 50 ft from Center of Roadway (dBA)	L_{dn} at 50 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Western Drive						
-High to Hwy1	60	62	1.3	80	--	--
Swift Street						
-Mission to Delaware	62	65	3.0	180	55	--
Morrissey Blvd.						
-Fairmount to Soquel	66	67	0.5	240	85	--
Third Street						
Front to Riverside	64	64	0.3	140	--	--
Riverside to Beach	63	64	1.2	150	--	--
Seventh Avenue						
- Soquel to Capitola		64	NA	130	--	--
- Capitola to Brommer		65	NA	160	50	--
- Brommer to Eaton		65	NA	160	50	--
- Eaton to Cliff		65	NA	180	55	--
Noise Levels Adjacent to Highways						
Roadway Segment	Existing Condition	Future Condition				
	L_{dn} at 100 ft from Center of Roadway (dBA)	L_{dn} at 100 ft from Center of Roadway (dBA)	Increase in L_{dn} (dBA)	L_{dn} Contour Distances (feet)		
				60 dBA	65 dBA	70 dBA
Highway 1						
-Soquel to Morrissey	79	80	0.4	1050	650	400
-Morrissey to Emeline	74	75	0.4	650	400	240
-Emeline to Hwy 17	74	75	0.4	650	400	240
-Hwy 17 to Hwy 9	77	77	0.4	850	550	320
-Hwy 9 to Mission	76	76	0.4	750	480	300
Highway 17						
-Begin Freeway to Pasatiempo	78	78	0.4	900	550	340

SOURCE: Rosen, Goldberg, Der & Levitz, Inc., November 2007

As previously indicated, typical residential construction (i.e., light frame construction with sash windows) with closed windows and doors can result in an exterior-to-interior noise reduction of at least 20 dBA and approximately 15 dBA with windows partially open for ventilation. Buildings constructed of stucco or masonry with dual-glazed windows and solid core exterior doors can be expected to achieve an exterior to interior noise reduction of approximately 25-30 dBA. Further noise reduction could be achieved with mechanical air systems and/or other window designs for areas where the ambient noise level exceeds 65 dBA.

The draft General Plan also includes support of measures to attenuate noise exposure, such as soundwalls, berms and setbacks (HZ3.1.11) and includes policies to minimize and mitigate new sources of vehicular and stationary noise (HZ3.1, HZ3.1.1, HZ3.1.6, HZ3.1.8, HZ 3.1.9). In addition to these policies, numerous proposed policies address specific alternative transportation modes, and serve to encourage a reduction in vehicle traffic as discussed in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR. A summary of the proposed *General Plan 2030* policies that serve to reduce/mitigate impacts related to exposure to unacceptable noise levels are summarized in Table 4.13-4.

The *General Plan 2030* also encourages passenger rail transit or other alternative transportation options (M2.2) and continued transport of goods by rail (M2.2.2). At such time that passenger rail may be proposed, project-level environmental review would be required, including an assessment of noise as the existing rail right-of-way travels through residential neighborhoods.

TABLE 4.13-4
Proposed General Plan Policies & Actions that Avoid or Reduce Noise Impacts

Type of Measure / Action	Policies
AVOID OR MITIGATE EXPOSURE TO NOISE LEVELS THAT EXCEED STANDARDS	• Protect residents from excessive road noise: HZ3.1.7 • Mitigate noise impacts from roadways through setbacks, landscaping and other measures: M3.3.4 • Apply noise compatibility standards: HZ3.2, HZ3.2.1 • Require residential interior noise levels of 45 dBA: HZ3.2.3 • Establish outdoor noise targets of 65 dBA for activity areas in new mutli-family developments: HZ3.2.2 • Require soundwalls, berms, setbacks or other noise reduction techniques when necessary: HZ3.1.11 • Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 – See also Table 4.4-4in the TRANSPORTATION & TRAFFIC (Chapter 4.4) section of this EIR • Minimize impacts of intermittent urban noise: HZ3.1.4 • Limit truck traffic in residential and commercial areas to designated truck routes: HZ3.1.9
RESULT IN SUBSTANTIAL PERMANENT NOISE INCREASE	• Maintain or reduce existing noise levels and control excessive noise: HZ3.1 • Require land uses at noise levels that do not significantly increase ambient noise and minimize noise from new uses: HZ3.1.1, HZ3.1.2 • Require mitigation for substantial noise increases: HZ3.1.6 • Require environmental review & mitigation for roadway projects with significant noise increases: HZ3.1.8 • Install "quiet" pavement surfaces where beneficial: HZ3.1.10
RESULT IN SUBSTANTIAL TEMPORARY NOISE INCREASE	• Minimize & monitor construction noise: HZ3.1.3, HZ3.1.5

In addition, compliance with state regulations regarding maintaining interior noise levels of 45 dBA, in conjunction with implementation of the proposed General Plan policies and actions outlined above, will mitigate potential impacts of future development to a less-than-significant level. New development located within areas in which noise levels may exceed acceptable levels would be required to have a project-level acoustical/noise assessment conducted to

specify building and structural designs to attenuate noise levels and achieve the required interior noise level.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result increased traffic and exposure to vehicular noise. However, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize exposure to noise levels that exceed land use compatibility standards for noise exposure. With implementation of these proposed policies and actions, as well as future project-level environmental review, exposure to noise would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required, but revisions to the following *General Plan 2030* actions are recommended to specifically reference land-use noise compatibility standards.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

HZ3.2.1 Apply noise and land use compatibility table and standards to all new residential, commercial, and mixed-use proposals, including condominium conversions in accordance with the standards set forth in the "Land Use – Noise Compatibility Standards" table.

Impact 4.13-2: Increase in Permanent Ambient Noise Levels
Implementation of the proposed *General Plan 2030* would accommodate future development that would generate traffic and contribute to increased noise levels along City streets and highways, but would not exceed criteria of significance or substantially increase ambient noise levels. Thus, permanent increases in ambient noise levels due to increased vehicular traffic are considered a *less-than-significant impact.*

As discussed under the Impact 4.13-1 discussion above, future noise levels and noise contours were developed along City streets and highways based on the traffic data developed for this EIR. Table 4.13-3 shows existing and future noise levels along roadways. Most of the noise increases are less than 2 dBA as a result of traffic associated with future development accommodated by the General Plan. In some cases, noise increases are between 2 and 3 dBA, such as along some segments of River Street, Mission Street, and Swift Street.

As previously indicated, a change in noise level of 3 dB is considered just a noticeable difference. A 5 dB change is clearly noticeable, but not dramatic, and a 10 dB change is perceived as a halving or doubling in loudness (Rosen Goldberg Der & Lewitz, Inc., November 30, 2007). In areas where the ambient noise level without a project is below 60 dBA, an increase in the ambient noise level of 5 dBA or more would be considered significant. In areas were ambient noise levels are above 60 dBA, an increase in the ambient noise level of greater than 3 dBA would be considered significant.

All City streets and highway segments included within the future noise contours would experience noise increases of less than 3 dBA due to future estimated traffic volumes, except for one segment along Swift Street, which would reach a 3 dBA increase. Therefore, the increase in traffic would not result in significant ambient noise level increases (i.e., above 3 dBA) for existing or future residents. Noise levels along the segments of the following roads would exceed 65 dBA in the future (as well as under both existing conditions in some cases): Bay Street, Front Street, Ocean Street, River Street, Mission Street, High Street, Soquel Avenue, Morrissey Blvd., San Lorenzo-East Cliff-Murray, and Highways 1 and 17. However, the increase due to development accommodated by the proposed General Plan would be less than 3 dBA (and often less than 2 dBA), and thus, the increase would not be considered substantial.

The segment of Swift Street between Mission and Delaware Avenue would increase by 3 dBA to reach a projected ambient noise level of 65 decibels L_{dn}. New development would be subject to noise attenuation requirements as discussed in Impact 4.13-1. The existing development along this segment of Swift Street is primarily commercial and light industrial for which normally acceptable noise levels would be 70 decibels. For the few homes located along this segment, exterior noise levels would not exceed 65 decibels. Since normal noise attenuation within residential structures with closed windows is about 20 dBA, an exterior noise exposure of 65 dB ACNEL allows the interior standard to be met without any specialized structural attenuation (e.g., dual paned windows).

The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.3). Depending on the specific use, some industrial uses can result in a stationary source of emissions. However, Policy ED6.1.1 supports the establishment of industries and "lifestyle businesses" that draw on Santa Cruz's natural assets and environment. Additionally, Policy ED6.2 encourages and supports "green" and environmentally-oriented businesses to locate in Santa Cruz. Furthermore, the draft plan supports "green" and sustainable commercial and industrial operating practices (ED6.2.2) and encourages businesses that "don't pollute" (ED6.2.3). Overall, the type of industry and business supported in the draft *General Plan 2030* typically would not be heavy industrial or the type of business that would be significant source of noise.

The draft plan does support development of a desalination plant (LU3.1.3) as part of the actions outlined to implement the City's adopted *Integrated Water Plan* (IWP) (see the WATER SUPPLY [Chapter 4.5] section of this EIR for further discussion of the planned desalination facility). A program EIR prepared for the IWP also reviewed potential impacts of a desalination facility, but did not identify permanent generation of noise as a potentially significant impact (EDAW,

June 2005). (See the WATER SUPPLY (Chapter 4.4) of this EIR for further discussion of potential impacts related to construction and operation of a desalination facility.)

The Draft *General Plan 2030* includes goals, policies and actions that set forth measures to avoid and minimize adverse impacts on noise that include applying noise compatibility standards to new residential, commercial and mixed-used development (HZ3.2.1) and establishing indoor and outdoor noise level targets of 45 dBA and 65 dBA, respectively, for new multifamily residential developments (HZ3.2.2) as discussed above for Impact 4.13-1. The draft general plan also includes support of measures to attenuate noise exposure, such as soundwalls, berms and setbacks (HZ3.1.11) and includes policies to minimize and mitigate new sources of vehicular and stationary noise (HZ3.1, HZ3.1.1, HZ3.1.6, HZ3.1.8, HZ 3.1.9). Additionally, the proposed *General Plan 2030* also includes numerous policies that seek to maintain or reduce existing noise levels (HZ3.1), and require mitigation for uses that would substantially increase noise levels (HZ3.1.6). A summary of the proposed *General Plan 2030* policies that serve to further reduce potential impacts related to increases in ambient noise levels are summarized in Table 4.13-4.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in increased traffic that would increase ambient noise levels. The increases would not exceed three decibels and mostly would be below two decibels. Thus, permanent increases in ambient noise levels would not be significant, and permanent increases in ambient noise levels is considered a less-than-significant impact. Implementation of proposed *General Plan 2030* includes goals, policies and actions that set forth measures to minimize increases in ambient noise levels, as well as future project-level environmental review, would further reduce potential permanent ambient noise increases.

Mitigation Measures

None mitigation measures are required as a significant impact has not been identified.

Impact 4.13-3: Increase in Temporary Noise Levels Due to Construction
Implementation of the proposed *General Plan 2030* would accommodate future development that would generate temporary increases in ambient noise levels due to construction activities, although substantial generation of vibration would not be expected. Due to the temporary and short-term duration of construction with intermittent noise levels, this is considered a *less-than-significant impact.*

Future development accommodated under the proposed General Plan would result in temporary increases in ambient noise levels due to construction activities. Construction-related noise levels would vary throughout the day, depending on the type of equipment in use at any one time and the distance to the receptors, and noise impacts from construction may vary greatly depending on the duration and complexity of the project. However, construction-related noise impacts are temporary and often of a short-term duration. Noise generated during construction

could be considered a nuisance to some residents and/or employees in the proximity to such construction, and may seem intolerable during constructions phases with the loudest equipment/activities in operations.

Anticipated equipment includes, but is not limited to, equipment that would be used for excavation, site grading, and construction of structures. Construction equipment can operate in two modes – stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders), or to and from the site (trucks). As a result of the equipment mix for any given project, each phase has its own noise characteristics; some have higher continuous noise levels than others, some have high impact noise levels. Table 4.13-5 shows typical noise levels associated with different types of construction equipment. These noise levels would decrease with distance from the construction site at a rate of approximately 6 dBA per doubling of distance (California Department of Transportation, November 2009).

Groundborne noise and other types of construction-related noise impacts would typically occur during the initial site preparation, which can create the highest levels of noise. Generally, site preparation has the shortest duration of all construction phases. Activities that occur during this phase include earthmoving and soils compaction. High groundborne noise levels and other miscellaneous noise levels can occur during this phase by the operation of heavy-duty trucks, backhoes and other heavy-duty construction equipment. Sources of man-made vibration often result from the use of heavy-duty construction equipment. The effects of vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Ground-borne vibrations from construction activities rarely reach levels that damage structures.

The draft general plan addresses construction noise in that it seeks to minimize and monitor construction noise (HZ3.1.3, HZ3.1.5). In particular, the plan seeks to ensure that construction activities are managed to minimize overall noise impacts on surrounding land uses (HZ3.1.3). Development projects are reviewed on a case-by-case basis, and typical conditions of approval include limiting the day and times of day during which construction and/or heavy construction can be conducted, provision of notification to neighbors regarding construction schedules, and implementation of a process to receive and respond to noise complaints. These are some of the types of measures that would be implemented by the City to manage and minimize construction noise impacts per proposed General Plan Actions HZ3.1.3 and HZ3.1.5.

> **Conclusion**. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in construction of varying sound level and duration, which could be an annoyance to adjacent residents. With implementation of the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to minimize exposure construction noise levels, the increase in temporary noise levels from construction-related activities would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.13-5
Noise Levels of Construction Equipment Noise (in dBA)

Equipment	Typical Noise Level (dBA) 50 ft from Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rock Drill	98
Roller	74
Saw	76
Scraper	89
Truck	88

SOURCE: Transit Noise And Vibration Impact Assessment, May 2006, Federal Transit Administration, FTA-VA-90-1003-06

REFERENCES

California Governor's Office of Planning and Research. October 2003. *State of California General Plan Guidelines*. Appendix C – Noise Element Guidelines".

California Department of Transportation. November 2009. "Technical Noise Supplement." Prepared by ICF Jones & Stokes.

Rosen, Goldberg, Der & Lewitz, Inc..

- November 29, 2010. "Future Noise Contours for: City of Santa Cruz General Plan Noise Element Update, Santa Cruz, CA:"
- November 30, 2007. "Background Report for the City of Santa Cruz General Plan Noise Element Update."

United States Department of Transportation, Federal Highway Administration. August 2006. "Construction Noise Handbook."

United States Environmental Protection Agency website, "Noise Pollution;" online at: http://www. Epa.gov/air/noise.html.

4.14 HAZARDOUS MATERIALS

4.14.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Overview
- Regulatory Setting
- City Setting

This section addresses hazardous materials use in the City of Santa Cruz. The State CEQA Guidelines Appendix G also identifies proximity to airports and wildland fire areas as potential hazards. The City is not located within two miles of an airport or private airstrip, and thus, is not subject to potential hazards related to proximity to an airport. The nearest airport is approximately 15 miles to the south in the city of Watsonville. Potential wildland fire hazards are addressed in the "Fire Protection Services" subsections of the PUBLIC SERVICES (Chapter 4.6) section of this EIR. Emergency response also is addressed in the PUBLIC SERVICES section of this EIR.

OVERVIEW

According to the draft *General Plan 2030*, hazardous materials include toxic metals, chemicals and gases; flammable and/or explosive liquids and solids; corrosive materials; infectious substances; and radioactive materials. Hazardous materials pose a variety of potential dangers to public health and welfare related to transport, storage, handling, and disposal of these materials. Hazardous materials and hazardous waste can result in public health hazards if released into the soil, groundwater or air.

The California Health & Safety Code (Section 15501) defines hazardous material as "any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material that a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment." The California Code of Regulations (Title 22, Section 66260.10) defines "extremely hazardous material" as "a substance or combination of substances which, if human exposure should occur, may likely result in death, disabling personal injury or serious illness caused by the substance or combination of substances because of its quantity, concentration or chemical characteristics."

Hazardous waste is any hazardous material that is discarded or slated for disposal. The California Health & Safety Code (Sections 25517 and 25141) defines hazardous waste as a

waste that because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment, due to factors including, but not limited to, carcinogenicity, acute toxicity, chronic toxicity, bioaccumulative properties, or persistence in the environment, when improperly treated, stored, transported, or disposed of, or otherwise managed.

REGULATORY SETTING

The management of hazardous materials and hazardous wastes is regulated at federal, state, and local levels through programs administered by the U.S. Environmental Protection Agency (U.S. EPA), agencies within the California Environmental Protection Agency (Cal/EPA), such as the Department of Toxic Substances Control (DTSC), federal and state occupational safety agencies, Monterey Bay Unified Air Pollution Control District (MBUAPCD), and Santa Cruz County Environmental Health Services.

Federal Regulations

The U.S. EPA is responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. The federal regulations are codified primarily in Title 40 of the Federal Code of Regulations. The primary legislation includes the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) and the Emergency Planning and Community Right-to-Know (SARA Title III). These laws and associated regulations include specific requirements for facilities that generate, use, store, treat, transport, and/or dispose of hazardous materials.

The Hazardous Materials Transportation Act of 1975 (HMTA) is the major transportation-related statute regulating the transportation of hazardous cargo. The HMTA empowers the U.S. Department of Transportation (DOT) with regulatory and enforcement authority to provide adequate protection against the risks to life and property inherent in the transportation of hazardous material in commerce. For materials that are designated as hazardous, specific requirements pertaining to the packaging, labeling, and transportation apply to any person or business transporting a hazardous material.

The U.S. Department of Labor Occupational Safety and Health Administration (OSHA) is responsible for enforcement and implementation of federal laws and regulations pertaining to worker health and safety. OSHA requires training for hazardous materials operators, which includes personal safety, hazardous materials storage and handling procedures, and emergency response procedures.

Other relevant federal laws include the Hazardous and Solid Waste Amendments Act (HSWA) regarding hazardous waste management, the Toxic Substances Control Act (TSCA), pertaining to the tracking and screening of industrial chemicals, and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which controls pesticide distribution, sale and use.

Applicable federal regulations and guidelines are contained primarily in Titles 10, 29, 40, and 49 of the Code of Federal Regulations.

State Regulations

In California, the DTSC is authorized by the U.S. EPA and Cal/EPA to enforce and implement federal hazardous waste laws and regulations. Requirements place "cradle-to-grave" responsibility for hazardous waste disposal on the shoulders of hazardous waste generators. Generators must ensure that their wastes are disposed of properly, and legal requirements dictate the disposal requirements for many waste streams (e.g., banning many types of hazardous wastes from landfills).

California regulations pertaining to hazardous materials equal or exceed federal regulations. In January 1996, Cal/EPA adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program governing (1) hazardous waste generators and hazardous waste onsite treatment, (2) underground storage, (3) above-ground storage tanks, (4) hazardous materials release response plans and inventories, (5) risk management and prevention programs, and (6) Unified Fire Code hazardous materials management plans and inventories. The program is implemented at the local level by a designated local agency—the Certified Unified Program Agency (CUPA). The CUPA is responsible for consolidating the administration of the six program elements within its jurisdiction. The Santa Cruz County Environmental Health Services is the designated CUPA for the City of Santa Cruz.

State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. California's Hazardous Materials Release Response Plans and Inventory Law, sometimes called the "Business Plan Act," aims to minimize the potential for accidents involving hazardous materials and to facilitate an appropriate response to possible hazardous materials emergencies. The law requires businesses that use hazardous materials to provide inventories of those materials to designated emergency response agencies, to illustrate on a diagram where the materials are stored on site, to prepare an emergency response plan, and to train employees to use the materials safely.

Along with DTSC, the Regional Water Quality Control Board (RWQCB), which operates under the jurisdiction of Cal/EPA, is responsible for implementing regulations pertaining to management of soil and groundwater investigation and cleanup. RWQCB regulations applicable to hazardous materials are contained in Title 27 of the California Code of Regulations (CCR). Additional state regulations applicable to hazardous materials are contained in Title 22 of the CCR. Title 26 of the CCR is a compilation of those sections or titles of the CCR that are applicable to hazardous materials.

Transportation of hazardous materials and wastes is regulated by Title 26 of the CCR. The California Department of Transportation (Caltrans) is the primary regulatory authority for the interstate transport of hazardous materials and establishes safe handling procedures for packaging, marking, labeling, routing, etc. The California Highway Patrol and Caltrans enforce federal and State regulations and respond to hazardous materials transportation emergencies.

A "Uniform Hazardous Waste Manifest" is required by DTSC and must accompany most hazardous waste before transporting any waste off site. The manifest travels with the hazardous waste from the point of generation, through transportation, to the final treatment, storage and disposal facility. If a discharge or spill of hazardous waste occurs during transportation, the transporter is required to take appropriate immediate action to protect human health and the environment (i.e., notify local authorities, dike the discharge area), and shall be responsible for the discharge/cleanup, pursuant to Title 22 of the California Code of Regulations, Sections 66263.30 and 66263.31.

With respect to worker safety regulations at the state level, the California Department of Industrial Relations, Division of Occupational Safety and Health, formerly known as Cal/OSHA, is charged with enforcement of state regulations and supervision of workplaces in California that are not under direct federal jurisdiction. State worker health and safety regulations applicable to construction workers include training requirements for hazardous waste operations and emergency response, all of which equal or exceed their federal counterparts.

Although there are numerous state policies dealing with hazardous waste materials, the most comprehensive is the Tanner Act (Assembly Bill [AB] 2948) adopted in 1986. The Tanner Act governs the preparation of hazardous waste management plans and the siting of hazardous waste facilities in the state. The act also mandates the adoption of a Hazardous Waste Management Plan by every county in the state that must include provisions defining: (1) the planning process for waste management; (2) the permit process for new and expanded facilities; and (3) the appeal process to the state available for certain local decisions.

Local Regulations

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

Regarding hazardous air emissions, the MBUAPCD implements the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) and Maximum Achievable Control Technology (MACT) requirements through the federal operating permit program, pursuant to MBUAPCD Rule 218. In addition, MBUAPCD's permitting program includes a "Best Control Technology" (BCT) review under MBUAPCD Rule 1000, *Permit Guidelines and Requirements for Sources Emitting Toxic Air Contaminants.* This rule covers proposed new or reconstructed major sources of federal hazardous air pollutants, toxic air contaminants, and carcinogenic toxic air contaminants.

In compliance with state law, the MBUAPCD also administers the AB 2588 Air Toxics "Hot Spots" Program. Facilities must report their toxic air contaminant emissions and if the MBUAPCD determines the facility poses a potential public health risk, the facility must perform a health risk assessment (HRA). An HRA includes an analysis of toxic air contaminant emissions and characterizes human health risks as a result of the estimated exposures. If the estimated health risks exceed threshold levels, the public in the affected area must be notified and steps taken to reduce emissions.

CITY AND COUNTY REGULATIONS

The City's Hazardous Materials Ordinance regulates and enforces the proper storage and handling of hazardous materials. Santa Cruz City Municipal Code Chapter 6.50, Hazardous Materials, outlines procedures for any person or business that uses hazardous materials within the City. Each user is required to obtain and keep current a hazardous materials permit and is required to handle, control, and store hazardous materials in accordance with an approved Hazardous Materials Management Plan (HMMP). Depending on the quantity of solid, liquid and gaseous hazardous materials, a user would submit either a short or standard form HMMP. A standard form HMMP requires more detailed information be provided, including monitoring and inspections. In addition to the HMMP, the health officer may request additional information deemed necessary to protect the public health.

Santa Cruz County Environmental Health Services is designated by Cal/EPA as the Certified Unified Program Agency (CUPA) within the geographic boundaries of the County and is responsible for enforcing the local ordinance and state laws pertaining to use and storage of hazardous materials, including the issuance and administration of HMMPs. The City's Fire Department works in conjunction with County Environmental Health in responding to reports of hazardous materials spills and accidents, enforcing hazardous materials regulations and enforcing the City's fire code as it relates to the use and storage of hazardous materials.

CITY SETTING

Hazardous Material Use and Hazardous Sites

There are no current large-scale businesses that use significant quantities of hazardous materials or generate substantial amounts of hazardous waste within the City. Most hazardous materials relate to fuels, and chemicals/materials associated with small businesses, such as dry cleaners, gas stations, automotive businesses and similar businesses, as well as institutions, such as schools and universities.

Improper handling and/or storage of hazardous materials can lead to soil or groundwater contamination that requires removal or remediation (cleanup) prior to conversion to other uses. This is often encountered with uses such as underground fuel storage or historic uses that have used chemicals in manufacturing processes.

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the state of California, local agencies and developers to comply with CEQA requirements regarding provision of information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the Cal/EPA to develop at least annually an updated Cortese List with input from DTSC and other state and local government agencies. There are no sites within the City of Santa Cruz that are listed on the Cortese List; only one site within Santa Cruz County is listed, which is located in Scotts Valley.

The EnviroStor database is an online search and Geographic Information System (GIS) tool for identifying sites with known or potential contamination, and sites where DTSC's environmental oversight or review has been requested or required. A search conducted in May 2011

revealed that there are seven sites where cleanup activities are underway within the City. These include former industrial or transportation uses in the Harvey West and downtown area.

- The California Water Resources Board also maintains a database system known as "Geotracker", which is used by the State Board, regional boards, and local agencies to track and archive compliance data from authorized or unauthorized discharges of waste to land, or unauthorized releases of hazardous substances from underground storage tanks. This system consists of a relational database, on-line compliance reporting features, a geographical information system (GIS) interface and other features that are utilized by the State Board, Cleanup sites [formerly known as DoD non UST]);
- Land Disposal sites (Landfills); and
- Permitted UST facilities.

A search conducted in May 2011 revealed that there are about 50 leaking underground storage tank (LUST) cleanup sites and 13 other cleanup sites identified within the Geotracker database for the City of Santa Cruz. These sites are generally concentrated along Mission, Water and Ocean Streets, within the Harvey West industrial area, and in the downtown area.

Landfill Disposal

The City's landfill is classified as a Class III landfill, which can accept limited types of hazardous materials. T regional boards, local agencies, regulated industry and the public to input, manage, or access compliance and regulatory tracking data. GeoTracker was developed pursuant to a mandate by the California State Legislature (AB 592, SB 1189) to investigate the feasibility of establishing a statewide GIS for LUST sites (leaking underground fuel tank sites). In its pilot phase, Geotracker assembled public drinking water well and LUST data from two study areas, Santa Clara and Santa Monica. Now, Geotracker includes data for non-UST (underground storage tank) cleanup cases in addition to LUST cases. The database provides access to statewide environmental data and tracks regulatory data for the following types of sites:

- LUST cleanup sites;
- Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites);

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military he types of materials that can be disposed at Class, I, II and III landfills are specified in state regulations. Many common household products contain chemicals that can be harmful to humans, animals and the environment, and become "Household Hazardous Waste" when the products are no longer needed. Examples include paint, solvents, pesticides, house batteries, many cleaners, and auto care products. It is dangerous and illegal to dispose of household hazardous waste in the garbage, down the drain or on the ground. The City maintains a Household Hazardous Waste drop-off site at the Santa Cruz Resource Recovery Center.

Other hazardous wastes must be taken to other facilities outside the City that are permitted to accept certain types of hazardous wastes. The following is a partial list of hazardous items not accepted at the City's landfill:

- Chemicals or chemical sludges which are toxic, corrosive, irritants or a strong sensitizer
- Infectious wastes
- Radioactive wastes
- Asbestos wastes
- Tank cleaning sludges or sediments
- Contaminated soils or sand
- Wastes containing free liquid exceeding State regulatory limits

4.14.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The HAZARDS, SAFETY & NOISE chapter of the draft *General Plan 2030* includes one goal that addresses hazardous materials:

GOAL HZ4 *Reduced danger and impacts from hazardous materials.*

This goal includes four accompanying polices and 13 specific actions related to reducing impacts related to hazardous materials and regulating hazardous wastes

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, land use designation changes are proposed for three specified sites: Swenson, Golf Club Drive area, and an addition to the Dimeo Lane landfill site. The Swenson and Golf Club Drive sites are designated for residential uses. Action LU2.2.3 also includes addition of a 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center on the south, but specific uses have not yet been identified. However, the site will not be used as part of expansion of the landfill disposal area.

The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development and/or intensified redevelopment. Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.4).

4.14.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

14a Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

14b Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

14c Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment; or

14d Emit hazardous emissions or handle hazardous materials, substances or waste within one-quarter mile of an existing or proposed school.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address potential creation of hazards to the public through transport, use or disposal of hazardous materials (14a); potential release of hazardous materials (14b); and emissions near schools (14d). There are no sites within the City that are listed the Government Code section 65962.5 (Cortese) list of hazardous materials sites (14c).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), an estimate of the amount of development that is expected to occur by the year 2030 was developed, which includes 3,350 additional residential dwelling units and approximately 3,140,000 additional square feet of commercial, office and industrial uses.

Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or development, including new mixed-use use districts and/or intensified redevelopment. The *General Plan 2030* continues to include an industrial land use designation in the same areas currently designated industrial (Westside and Harvey West). Light industrial and "creative" industrial uses are encouraged in the Harvey West area (LU3.2.3), and "incubator" uses are specified for the Westside industrial area (LU3.2.3). Additionally, Policy ED6.2 encourages and supports "green" and environmentally-oriented businesses to locate in Santa Cruz. Overall, the type of industry and business supported in the draft *General Plan 2030* are not the type of

industry that would be significant sources of hazardous material use or generators of substantial amounts of hazardous waste.

Hazardous materials pose a variety of dangers to public health and welfare and include toxic metals, chemicals and gases, flammable and/or explosive liquids and solids, corrosive materials, infectious substances, and radioactive materials. The transport, distribution and storage of these materials is a concern of Santa Cruz residents.

Impact 4.14-1 Creation of Hazard with Transport, Use or Disposal of Hazardous Materials
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in creation of a hazard to the public or environment through the routine transport, use or disposal of hazardous materials. With implementation of proposed *General Plan 2030* policies and actions and adherence to federal, state and local regulations, a significant hazard would not be expected to result. This is considered a *less-than-significant impact.*

Potential future development accommodated by the proposed *General Plan 2030*, as summarized above, could result in land uses that use and/or dispose of hazardous materials. New development, particularly non-residential development, would be expected to use some hazardous materials and generate hazardous waste. Residential uses also would be expected to use and dispose of hazardous household products. As indicated above, the type of industry and business that currently exist within the City and which are supported in the draft *General Plan 2030* are not the type that would be significant sources of hazardous material use or generators of substantial amounts of hazardous waste. However, hazardous materials would be continued to be used by some businesses, including fuels, chlorine, dry-cleaning solutions, and substances used in some commercial and industrial businesses. The routine use of chemicals and materials used in small businesses could create a hazard to the public or environment if not properly transported, stored, used and/or disposed.

The transportation of hazardous materials and wastes is subject to strict federal and state regulations. Certain types of uses are regulated by the state. Chemicals stored in aboveground or underground storage tanks are regulated by the state as well, and storage and containment parameters are established to provide containment in the event of accidental release. City regulations require permits for businesses that use hazardous materials, and establish requirements for storage and containment of hazardous materials. The City Fire Department works in conjunction with County Environmental Health in responding to reports of hazardous materials spills and accidents and enforcing hazardous materials regulations.

The draft *General Plan 2030* also includes policies and actions that would serve to reduce impacts related to the transport, use or disposal of hazardous materials as summarized on Table 4.14-1. Policy HZ4.4 and its supporting actions call for reduction of the risk of exposure to hazardous materials, including regulating the siting and permitting of businesses that handle hazardous materials. Policies HZ4.1 and HZ4.2 call for regulation of hazardous wastes, and HZ4.3 calls for quick and proper response to emergencies. Furthermore, Policy NRC3.2 discourages the use of environmentally harmful pesticides and herbicides.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the Plan that utilizes hazardous materials or generates hazardous waste, would be regulated pursuant to federal, state and local laws to ensure proper transportation, handling and disposal. Furthermore, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to avoid impacts related to hazardous material use or disposal as summarized on Table 4.14-1. With adherence to local and state regulations, as well as implementation of these proposed policies and actions, the proposed General Plan 2030's indirect impact related to creation of hazards due to hazardous material transport, use or disposal would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.14-1
Proposed General Plan Policies & Actions that Avoid or Minimize Hazardous Materials Impacts

Type of Measure / Action	Policies / Actions
MINIMIZE EXPOSURE TO OR CREATION HAZARDOUS MATERIAL	• Reduce risk of exposure to hazardous materials: HZ4.4 • Regulate businesses that handle and use hazardous materials: HZ4.4.1 • Periodically review and update procedures for land uses that handle, store or transport specific hazardous materials: HZ4.4.2 • Reduce use of toxic materials in community: HZ4.1.4 • Safe use and disposal of hazardous/toxic materials: HZ4.1.7 • Require City staff to use nontoxic materials: HZ4.1.5 • Discourage use of harmful pesticides, chemical fertilizers: NRC3.2 • Locate sensitive land use away from hazardous materials locations: HZ2.2.3
REGULATE HAZARDOUS WASTE	• Regulate hazardous wastes: HZ4.1, HZ4.1.2 (hours, routes) • Ensure proper handling & disposal of hazardous materials: HZ4.2 • Maintain Hazardous Household Wastes facility: HZ4.2.1, HZ4.2.2 • Prevent illegal dumping of hazardous waste at the Resource Recovery facility: HZ4.2.3 • Work with pharmacies to provide drop-off for medications: HZ4.2.4 • Work with County to prepare & implement County Hazardous Materials Plan: HZ4.1.1
PROVIDE ADEQUATE EMERGENCY RESPONSE	• Ensure resources for quick response to hazardous waste emergencies: HZ4.3, HZ4.3.1

Impact 4.14-2 Exposure to Hazardous Materials
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in exposure to contaminated sites accidental release of hazardous materials. With adherence to federal, state and local regulations, a significant hazard would not be expected to be created. This is considered a *less-than-significant impact.*

Future development could expose the public to hazardous materials due to siting near contaminated soils or groundwater; airborne releases; or accidental releases. New development located within industrial areas or known areas of historic use of chemicals or hazardous materials would be required to prepare a Phase I Environmental Assessment to determine potential presence of soil or groundwater contamination and to conduct further monitoring with implementation of remedial actions if necessary, if sources of contamination are identified. This is typically completed as part of real estate transactions and the CEQA environmental review process.

Businesses that generate airborne toxic emissions would be subject to MBUAPCD Rule 1000, requirements for regulating sources of toxic air contaminants (TACs). This includes preparation of a health risk assessment in situations where TACs may exceed regulatory thresholds.

The redevelopment of existing development sites would result in demolition of buildings, some of which may contain asbestos and lead-based paint that could expose workers to a hazardous material release. All demolition activities would be required to be undertaken according to OSHA standards to protect workers from asbestos and lead based paint. Any demolition of buildings containing asbestos also would be required to comply with the MBUAPCD's Rule 306 that requires reporting and investigation of certain buildings with asbestos as established under federal law. The National Emissions Standards for Hazardous Air Pollutants (NESHAPS) as set forth in the Code of Federal Regulations—40 CFR Part 61--is designed to prevent "visible emissions" of asbestos when buildings are renovated or demolished. Under federal law, a building must be inspected for asbestos prior to demolition or renovation, and federal and state agencies must be notified prior to demolition. According to the State Air Resources Control board, removal and disposal of asbestos procedures and controls must be specified in the notification form.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the Plan could result in exposure to hazardous materials due to proximity to contaminated sites or accidental release of hazardous materials. With adherence to federal, state and local regulations, the proposed *General Plan 2030*'s indirect impact related to exposure to hazardous materials would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.14-3 Hazardous Materials Use or Emissions Near Schools
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in of school students to hazardous materials or emissions. With adherence to federal, state and local regulations, a significant hazard would not be expected to be created. This is considered a *less-than-significant impact.*

Future new development may be located within one-quarter mile of existing school facilities. As discussed in the "Schools" subsection of the PUBLIC SERVICES (Chapter 4.6) section of this EIR, there are 10 public schools and a number of private schools located within the City, as well as, the University of California campus. New development that use hazardous materials or emit TACs could result in exposure of students to these materials. However, as discussed above in Impacts 4.14-1 and 4.14-2, hazardous material use is regulated by a number of state and local agencies, and TACs are regulated by the MBUAPCD. With adherence to these regulations, exposure would be minimized as materials would be properly stored, used, and disposed pursuant to these regulations, and air emissions would be controlled to prevent exceedences of regulatory thresholds.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the Plan that is within one-quarter mile of a school facility could result in exposure of students to hazardous materials. With adherence to federal, state and local regulations, exposure to hazardous materials and emissions would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

REFERENCES

California Department of Toxic Substance Control.

- 2007. "DTSC's Hazardous Waste and Substances Site List – Site Cleanup (Cortese List)." online at: http://www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm
- 2007. "Site Cleanup." Online at: http://www.dtsc.ca.gov/SiteCleanup/index.cfm#Cleanup_Sites

4.15 AGRICULTURE, FOREST & MINERAL RESOURCES

4.15.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Regulatory Setting
- Agricultural Resources
- Forest Resources
- Mineral Resources

REGULATORY SETTING

State Regulations

AGRICULTURAL RESOURCES

The Farmland Mapping and Monitoring Program (FMMP) was established in 1982 by the state of California in response to a critical need for assessing the location, quality, and quantity of agricultural lands and conversion of these lands over time. The goal of the FMMP is to provide consistent and impartial data to decision makers for use in assessing present status, reviewing trends, and planning for the future of California's agricultural land resources (California Department of Conservation, 2007). The program produces "*Important Farmland Maps*", which are a hybrid of resource quality (soils) and land use information. The maps identify five farmland categories, as well as two non-agricultural categories that are described further below.

The California Land Conservation Act, also known as the Williamson Act, was adopted in 1965. This voluntary program provides a tax incentive to owners of agricultural properties who agree to maintain their land in agricultural preserves for agricultural use. The purpose of the Williamson Act is to encourage participating property owners to continue to farm their land, and to prevent the premature conversion of farmland to urban uses. The Williamson Act applies to both prime and non-prime agricultural lands.

FOREST RESOURCES

In 2010, the state CEQA Guidelines were amended in response to the Legislature's directive requiring the Resources Agency to adopt amendments prepared and developed by the Office of Planning and Research related to impacts and mitigation of greenhouse gas emissions (California Natural Resources Agency, December 2009). The amendments added an environmental checklist question regarding forestry primarily due to the direct link with greenhouse gas (GHG) emissions, as conversion of forest land may result in direct GHG

emissions and removal of potential further carbon sequestration (carbon is stored in vegetation), which is recognized as a key mitigation strategy in the Air Resources Board's Scoping Plan (Ibid.). The Resources Agency staff report on the amendments also found that forest conversions may result in aesthetic, biological resource and water quality impacts (Ibid.). It indicated that the Legislature has declared that "forest resources and timberlands of the state are among the most valuable of the natural resources of the state and that such resources furnish high-quality timber, recreational opportunities, and aesthetic enjoyment while providing watershed protection and maintaining fisheries and wildlife" (Public Resources Code, § 4512(a)-(b)) (Ibid.). Based on the State's reasoning for including of forest resources in the CEQA checklist, the consideration of forest resources (and resulting impact significance) should account for impacts related to greenhouse gas emissions, loss of commercial timberland, value for biological habitat and watershed protection, and aesthetics.

Commercial timber lands are afforded protection through the state's Forest Taxation Reform Act of 1976, which mandates the creation of timberland preserve zones (TPZ) to restrict and protect commercial timber resources. A TPZ is a 10-year restriction on the use of land, and will replace the use of agricultural preserves (Williamson Act contracts) on timberland. Land use under a TPZ will be restricted to growing and harvesting timber, and to compatible uses approved by a county (or city). In return, taxation of timberland under a TPZ will be based only on such restrictions in use.

MINERAL RESOURCES

The Mineral Resources and Mineral Hazards Mapping Program (MRMHMP) provides data about California's varied non-fuel mineral resources (such as metals and industrial minerals), naturally occurring mineral hazards (such as asbestos, radon, and mercury), and information about active and historic mining activities throughout the state (California Department of Conservation, 2007).

The California Surface Mining and Reclamation Act (SMARA) of 1975 requires the classification of land into Mineral Resources Zones (MRZs) according to known or inferred mineral potential of that area. The classification process is based on the underlying geology. The primary goal of the mineral land classification is to ensure that the mineral potential of the land is recognized by local government decision makers and is considered before making land use decisions that could preclude mining.

Local Regulations

Section 16.50.095 of the Santa Cruz County Code requires agricultural buffers of 200 feet for non-agricultural uses adjacent to specified agricultural lands within the County. The purpose is to prevent or minimize potential conflicts between either existing or future commercial agricultural and habitable land uses (i.e., residential, recreational, institutional, commercial or industrial). The buffer would be designed to provide a physical barrier to noise, dust, odor, and other effects which may be a result of normal commercial agricultural operations such as: plowing, discing, harvesting, spraying or the application of agricultural chemicals and animal rearing. All habitable uses are required to comply with this provision.

AGRICULTURAL RESOURCES

The Important Farmland Maps produced by the state of California under the FMMP identify five farmland categories: Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Grazing Land, as well as two non-agricultural categories: Urban and Built-Up Land and Other Land. The City of Santa Cruz is largely developed and all lands within City limits and the City's existing Sphere of Influence are designated as Urban and Built-Up Land and Other Land. Some adjacent lands outside City limits, but within the *General Plan 2030* planning area are designated Prime Farmland, Farmland of Statewide Importance, and Grazing Land. These agricultural lands are identified primarily west of the City, as well as limited small areas along Ocean Street Extension and in the Carbonera area. State-mapped agricultural lands are shown on Figure 4.15-1.[1]

FOREST RESOURCES

The City of Santa Cruz is primarily developed with open spaces within parks and City-owned greenbelt lands as shown on Figure 1-2. There are no designated TPZ lands within the City. Areas of mixed evergreen, redwood forest and oak woodlands occur within the City, primarily within the city-owned open space greenbelt lands. (See the BIOLOGICAL RESOURCES [Chapter 4.8] section of this EIR for further discussion.)

In addition to native woodlands, some areas within the City contain non-native tree groves with a dense canopy. The most widespread non-native tree in these stands is blue gum eucalyptus, primarily within DeLaveaga Park. Other dominant, non-native trees include Monterey pine (native to small areas on the coast, including northwestern Santa Cruz County, but naturalized in the vicinity of Santa Cruz), Monterey cypress (native to the Monterey area, but naturalized in the vicinity of Santa Cruz), and acacias. In some canyons in DeLaveaga Park, English elm is the dominant non-native tree species.

MINERAL RESOURCES

The City of Santa Cruz is primarily developed. There are no mines or areas of known mineral resources within the City, although there is a designated aggregate location west of the City within the General Plan planning area (California Department of Conservation, 2006). An approximate 360±-acre sand quarry adjacent to and surrounded by Wilder Ranch State Park. The site is located within the unincorporated area of Santa Cruz County and subject to County regulations. According to the County's online GIS mapping, the quarry is designated Mountain Residential (RM) in the County's General Plan and zoned "Special Use". Mining operations are regulated by the County via use permit approval and conditions. The quarry has an approved reclamation plan, and mining operations are expected to be completed within 10± years.

[1] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

Construction aggregate, which includes alluvial sand and gravel or crushed stone, is the largest non-fuel mineral commodity produced in California, as well as in the nation, and production plays a major role in the economy of California (California Department of Conservation, 2006). Demand for aggregate is expected to increase as the state's population continues to grow and infrastructure is maintained and improved. For the last 28 years, the California Geologic Survey has conducted on-going studies that identify and evaluate aggregate resources throughout the state (Ibid.).

4.15.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The LAND USE chapter of the draft *General Plan 2030* includes several policies and actions to prevent loss of prime agricultural lands (LU1.2, LU1.2.1), preserve agricultural land at the City's edge (LU2.3), and support County efforts to protect agricultural lands along the coast north of Santa Cruz (LU3.5). Action HZ4.1.6 seeks to emphasize the City's role as an organic agricultural center and work with appropriate agencies to develop demonstration projects on non-chemical pest control.

The NATURAL RESOURCES AND CONSERVATION chapter also addresses resource conservation and protection. Policy NRC3.4 seeks to conserve agricultural and known mineral resources in the planning area. Two goals address resource conservation and urban forests as set forth below. Goal NRC5 and its accompanying policies and actions seek protection and management of tree resources in the urban environment (NRC5.1) with maintaining and adding to the City's urban tree canopy and diversity (NRC5.2.1).

- GOAL NRC3 Conservation and stewardship of resources.
- GOAL NRC5 An enhanced and sustainable urban forest.

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and applied to the City's major transportation corridors. Land Use actions LU1.1.4 and LU1.1.5 address development and land use for specific sites: the Swenson property and the Golf Club Drive property, respectively. LU2.2.3 also includes addition of a 5.5-acre parcel adjacent to the Dimeo Lane landfill and Resource Recovery Center. Specific uses haven't been identified for the Dimeo Lane site, although it will not be used as part of any expansion of the landfill disposal area. In addition, the proposed *General Plan 2030* supports development of a desalination plant (Policy CC3.1.3), but a specific site is not identified.

4.15.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

15a Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance Farmland as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;

15b Conflict with existing zoning for agricultural use, or a Williamson Act contract;

15c Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use;

15d Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined in Public Resources Code section 4526);

15e Result in the loss of forest land or conversion of forest land to non-forest use;

15f Involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to nonforest use; or

15g 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 loss of availability of a locally-important mineral resource recovery site delineated on a local general plan.

In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and the forest carbon measurement methodology provided in the Forest Protocols adopted by the California Air Resources Board.

IMPACT ANALYSIS

The City is primarily developed, and future development accommodated by the proposed *General Plan 2030* would be considered infill development.

Forest Resources

There are no areas of protected timberland land within the City or its existing Sphere of Influence, and there are no protected timberlands within the *General Plan 2030* planning area. Thus, there would be no conflicts with zoning of forest lands (15d) or the conversion of timberland (15e-f). Furthermore, the proposed plan includes goals, policies and actions that seek maintenance and expansion of the City's urban forest as summarized in Table 4.15-1.

Mineral Resources

There are no designated mineral resources within the City, its existing Sphere of Influence or the *General Plan 2030* planning area, and therefore, the proposed General Plan would have no impact to mineral resources (15g). An existing quarry is located west of the City within the General Plan planning area. The site is located within the unincorporated area of Santa Cruz County and subject to County regulations. According to the County's online GIS mapping, the quarry is designated Mountain Residential (RM) in the County's General Plan and zoned "Special Use". Mining operations are regulated by the County via use permit approval and conditions, and the proposed *General Plan 2030* would not result in the loss of availability of this resource. Furthermore, the proposed plan includes policies that seek protection of any known mineral resources in the planning area as summarized in Table 4.15-1. The site is designated "Parks" in the proposed General Plan, but the completion of mining and reclamation of the site as well as future uses would be governed by the County.

Agricultural Resources

There are no designated agricultural lands within City limits or the City's existing Sphere of Influence. Thus, future development accommodated by the plan would not result in conversion of agricultural lands (15a) or conflict with existing agricultural zoning or Williamson Act contracts (15b). The lands adjacent to City boundaries on the west are identified agricultural lands in the State Farmland Mapping Program, and are also designated "Agriculture/Grazing" in the City's existing General Plan and in the proposed *General Plan 2030*. The only other identified agricultural property is outside city limits and Sphere of Influence on the west side of Ocean Street Extension. This property is identified as Prime Farmland in the state mapping program, but is designated as Very Low Density Residential in both the City's existing General Plan and in the proposed *General Plan 2030* based on County General Plan land use designations for this area. The property is not within city limits or the City's adopted Sphere of Influence, and any future proposed development would be subject to County land use plans and designations. Thus, the proposed *General Plan 2030* would not result conversion of farmland.

The following impact analyses address potential conflicts that may occur between future development under the proposed General Plan and adjacent agricultural lands (15c).

Impact 4.15-1: Conflicts with Agricultural Uses
Adoption and Implementation of the proposed *General Plan 2030* would accommodate future development which would not result in conflicts with agricultural uses of that could lead to conversion of farmlands to non-agricultural uses with implementation of proposed policies and actions. Therefore, there is a *less-than-significant impact.*

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development as summarized in subsection 4.15.2 above. The proposed plan includes lands to the west of the City within the General Plan planning area. These lands, located within the unincorporated area of Santa Cruz County, are designated

"Farmland of Statewide Importance" in the State Farmland Mapping Program, and lands designated "Prime Farmland" are found just east and south of this area. They are also designated as Agriculture/Grazing in the proposed General Plan.

Land use conflicts between agricultural and non-agricultural uses typically include noise, dust, odors and potential "drift" of pesticide application associated with agricultural operations. As development occurs near agricultural areas, farmers also are confronted with issues of theft, vandalism, and urban pest control in landscaped areas associated with urban development.

Establishment of buffers can help minimize conflicts between agricultural and urban land uses. The buffer setback is intended to minimize potential conflicts through the provision of distance as a physical barrier to noise, dust, odor and other effects of normal commercial agricultural operations such as plowing, discing, harvesting, application of agricultural chemicals or rearing of animals. The Santa Cruz County Code (section 16.50.095) requires a 200-foot buffer between commercial agricultural lands and habitable spaces within the unincorporated area of the County. For industrial uses, County regulations specify the setback be measured from structures and outdoor areas designed for public parking and intensive human use (i.e., outdoor patios). The County regulations require incorporation of vegetative or other physical barriers within the setback as necessary to minimize potential land use conflicts. A setback with a fence and densely planted row of evergreen trees at the edge of the setback provides further physical separation between agricultural and non-agricultural uses.

The potential for future development adjacent to agricultural lands is very limited. For agricultural lands to the west of the City, most lands bordering this area are either within the City's protected greenbelt (Moore Creek Preserve) in which no development would be permitted or within lands owned by the University of California, which are not subject to City land use regulations. A couple of private properties along the short segment of Shaffer Road south of Highway 1 are already developed or have approved permits. Agricultural buffers in this area range from approximately 10-20 feet to 200-300 feet for two existing and one approved industrial buildings in this area. Similarly, residential uses are located across the street from lands in agricultural production along Ocean Street Extension within unincorporated County areas. Lands within City limits do not directly abut these agricultural lands. Nonetheless, even if expanded development were proposed in the future, the proposed General Plan policies and actions outlined in Table 4.15-1 would serve to reduce potential conflicts with adjacent agricultural uses with support of County agricultural policies on the North Coast (LU2.3.5) and requiring or maintaining buffers for development adjacent to agricultural lands (CD1.4.3).

It is noted that landscaped buffers do not totally eliminate odors and noise. To minimize potential complaints from non-agricultural uses adjacent to agricultural uses, the County of Santa Cruz and other agencies require that buyers of properties adjacent to agricultural operations be advised of existing adjacent agricultural uses and operations during the real estate transaction process. Recordation of an acknowledgement of adjacent agricultural uses as part of the parcel deed is required at the time of property purchase or issuance of building permit. This "Buyer Beware" program, which has been in effect since 1979 within the county, requires landowners adjacent to designated agricultural lands to acknowledge through deed recordation that they are aware of adjacent agricultural uses, and are prepared to accept

potential occasional inconveniences and discomfort associated with adjacency to normal agricultural operations.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan could be sited adjacent to agricultural lands. However, the land potentially affected by adjacent agricultural lands includes only a very limited area along Shaffer Road at the western end of the City, as other lands adjacent to agricultural lands are in open space or state-owned. Furthermore, with implementation of the proposed *General Plan 2030* goals, policies and actions aimed at preventing conversion of agricultural lands and the maintenance and establishment of adequate buffers between adjacent land uses, there would be no conflicts between future development and agricultural uses.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.15-1
Proposed General Plan Policies & Actions that Avoid or Minimize Impacts to Agricultural Lands

Type of Measure / Action	Policies / Actions
PREVENT CONVERSION OF AGRICULTURAL LANDS	• Prevent loss of prime ag land through environmental review: LU1.2, LU1.2.1 • Preserve and conserve ag lands at City's edge: LU2.3, NRC3.4 • Support County ag policies on North Coast: LU2.3.5 • Conserve agricultural resources in planning area: NRC3.4
PREVENT OTHER CHANGES THAT COULD RESULT IN CONVERSION OF AG LANDS	• Require or maintain agricultural buffers: CD1.4.3
TREE PROTECTION	• Protect tree resources & heritage trees: NRC5.1 • Maintain & increase urban tree canopy & tree diversity: NRC5.1.2, NRC5.2 • Promote street tree planting: NRC5.2.1 • Educational programs to promote urban forest: NRC5.1.1
MINERAL RESOURCE PROTECTION	• Conserve known mineral resources in planning area: NRC3.4

REFERENCES

California Department of Conservation.

- 2007. "Farmland Mapping & Monitoring Program" Online at: http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx. Santa Cruz mapping (August 2010 - "Santa Cruz County Important Farmland 2008) online at: http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx
- 2007. "Mineral Resources" website; online at: http://www.conservation.ca.gov/cgs/mineral_resource/Pages/Index.aspx
- 2006. "Aggregate Availability in California." California Geological Survey. Map Sheet 52 (Updated 2006).

California Natural Resources Agency. December 2009. "Final Statement of Reasons for Regulatory Action – Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97."

5.0 CEQA CONSIDERATIONS

IN THIS SECTION:

5.1 Unavoidable Adverse Impacts
5.2 Significant Irreversible Impacts
5.3 Growth-Inducing Impacts
5.4 Cumulative Impacts
5.5 Project Alternatives

Section 15126 of the State CEQA Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. As part of this analysis, the EIR must also identify (1) significant environmental effects of the proposed project, (2) significant environmental effects that cannot be avoided if the proposed project is implemented, (3) significant irreversible environmental changes that would result from implementation of the proposed project, and (4) growth-inducing impacts of the proposed project. It should be noted that although growth inducement itself is not considered an environmental effect, it is a relevant issue if it could potentially lead to foreseeable physical environmental effects.

5.1 SIGNIFICANT UNAVOIDABLE IMPACTS

The State CEQA Guidelines require a description of any significant impacts, including those which can be mitigated but not reduced to a level of insignificance (section 15126.2(b)). Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described.

The EIR identified four significant unavoidable project impacts, as well as several significant cumulative impacts to which the project's incremental contribution would be cumulatively considerable, which are listed below. A brief explanation is provided as to why these impacts were found to be significant and unavoidable. Alternatives to reduce or eliminate significant impacts are reviewed in subsection 5.5 of this chapter.

TRAFFIC:

- Impact 4.4-1: Traffic Impacts on Intersection Levels of Service
- Impact 4.4-2: Traffic Impacts on State Highway Levels of Service

WATER SUPPLY:

- Impact 4.5-1: Inadequate Future Water Supplies during Dry Years and Potentially During Normal Years

CUMULATIVE IMPACTS:

- Population Growth
- Traffic

- Water
- Air Quality
- Noise

Traffic. Future development accommodated by the proposed *General Plan 2030* would generate traffic that would result in unacceptable levels of service at 21 intersections. All could be improved to acceptable levels or improved to an extent that delays would be reduced to existing or below project levels, except for eight intersections. These include four local intersections) and four intersections on state routes. These intersections could not be improved to an acceptable LOS to meet City or Caltrans' standards. Therefore, the resulting effects on these eight intersections would be considered a significant, unavoidable impact as no feasible improvements have been identified. Additionally, funding availability for intersection improvements at other impacted intersections, as well as funding for transit service expansion, likely will remain constrained into the foreseeable future. With implementation of the proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, traffic could be reduced, but it is likely it would not be reduced to a less-than-significant level at the remaining impacted intersections. Therefore, implementation of recommended improvements and support of alternative transportation facilities, particularly transit, cannot be assured. Thus, the impact to all the intersections identified as operating at unacceptable levels of service under the proposed *General Plan 2030* remains significant and unavoidable.

Future development accommodated by the proposed *General Plan 2030* would generate traffic that would contribute to existing and future forecast unacceptable levels of service along Highway 1 and Highway 17. Project traffic represents a significant addition, although the estimated General Plan buildout traffic is less than the future forecasts estimated by Caltrans in its draft "Corridor System Management Plan." With implementation of the proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, and with future improvements along Highway 1 that are planned by Caltrans, traffic congestion along Highway 1 will be minimized. However, highway operations would continue to remain at unacceptable levels, and funding constraints and controversy over proposed Highway 1 HOV lanes may delay or affect implementation of improvements. Thus, the impact remains significant and unavoidable.

Water Supply. As discussed in the WATER SUPPLY (Chapter 4.5) section of this EIR, City water supplies are currently insufficient to meet existing demand during dry years and could potentially become insufficient after the year 2020 in normal years with development and growth accommodated by the proposed General Plan and other demands in the City's water service area. (Estimated water demand associated with buildout accommodated by the proposed General Plan 2030 would not exceed existing supplies in a normal year, but supplies could become insufficient during the General Plan timeframe with consideration of all demand within the water service area.) Construction of a desalination facility, as planned by the City of Santa Cruz, will provide a sufficient supplemental water supply during drought conditions for both existing and future demand and could be expanded to accommodate future growth. The City has completed a pilot desalination plant and is proceeding with design and environmental review for a permanent facility. Despite the City's intent to pursue an additional water supply for dry-year conditions, there are some uncertainties with these future actions. The City acknowledges the inherent uncertainty about its ability to obtain all necessary approvals for,

and completion of, the planned desalination facility. Therefore, a conservative conclusion is that the project impact on water supply during dry year conditions and potentially during normal conditions is significant and unavoidable.

Cumulative Impacts. The following were determined significant cumulative impacts to which the proposed project's incremental contribution was found to be cumulatively considerable.

- **Population Growth**. Cumulative growth (City and UCSC) could result in an average annual growth rate of 1.3% if the North Campus area is annexed to the City in the next 20 years. This projected level of growth exceeds historical growth rates between 1990 and 2009 (0.9-1.0%), as well as AMBAG population forecast growth rate of 0.65% between 2009 and 2030. This is considered a significant cumulative impact due to the substantial population growth and resulting physical effects that such growth could lead to (such as increased traffic and water supply demand, to name a few) that would be cumulatively induced. The population accommodated by the proposed *General Plan 2030* is over half of the increase, and thus, the project's incremental contribution is considered to be cumulatively considerable. However, future population forecasts could be developed and/or adjusted periodically to account for actual growth that occurs during the planning horizon.
- **Traffic**. Cumulative development and growth would generate traffic that would result in unacceptable levels of service at 26 intersections, all of which could be improved to acceptable levels or improved operations, except at 11 intersections, including five along state routes. Cumulative traffic along state highways would contribute to existing and future unacceptable levels of service. Therefore, the cumulative traffic would result in significant cumulative impacts at seven intersections and along Highways 1 and 17. Funding availability for facility improvements and expansion of transit service will likely remain constrained into the foreseeable future. Thus, implementation of recommended improvements and alternative transportation facilities cannot be assured, and the impact under the cumulative conditions remains significant, at City intersections and along state highways this is a significant cumulative impact, and the project's incremental increase would be cumulatively considerable.
- **Water Supply**. Cumulative development and growth in the City's water service area would result in a significant cumulative water impact, as it results in additional demand in a system that does not currently have adequate water supplies to meet existing or future demands during drought conditions or potentially during normal years at some time after the year 2020. The City's supplies are sufficient to meet cumulative water demands in a normal year through to the year 2030 if overall water use remains at 2007-2008 levels. However, If water demand is consistent with historic water use between 1999 and 2004, the City's total demand will be approximately 223 MGY greater than the available normal year supply of 4,314 MGY in 2030 (EKI, March 2011). Thus, cumulative development and growth would result in a significant cumulative impact during dry years and potentially also during normal years. The demand resulting from development accommodated by the proposed *General Plan 2030* represents nearly half of the future cumulative water demand. The project's incremental contribution is therefore considered "cumulatively considerable" and thus significant in and of itself. The City has identified a desalination plant as its best, potentially feasible option to alleviate shortages in

drought conditions and as a potential additional normal-year water supply to serve new growth, and therefore has committed to pursuing this option with the intent of obtaining all necessary regulatory approvals. However, the City acknowledges the inherent uncertainty about its ability to obtain all necessary approvals for the planned desalination facility. Furthermore, surface water supplies may be reduced due to implementation of wildlife protection strategies under a future HCP, which may require that the City seek additional supplies and/or expansion of a desalination facility beyond that capacity that is currently planned for drought supply. Thus, the impact remains significant and unavoidable.

- **Noise**. Cumulative development and growth would result in noise increases associated with the traffic increases, but the increases would not exceed significance criteria (more than a 3 dBA increase), except for three road segments (Swift Street north of Delaware and Mission Street between Bay and Walnut) that would be considered significant for some existing residences along these segments.

5.2 SIGNIFICANT IRREVERSIBLE IMAPCTS

The State CEQA Guidelines require a discussion of significant irreversible environmental changes with project implementation, including uses of nonrenewable resources during the initial and continued phases of the project (section 15126.6(c)). The Guidelines indicate that use 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. Irreversible damage can also result from environmental accidents associated with the project. Section 15227 further requires this discussion only for adoption of a plan, policy or ordinance by a public agency; the adoption by a Local Agency Formation Commission (LAFCO) of a resolution making determinations; and projects which require preparation of an EIS under the National Environmental Policy Act (NEPA). Since the proposed project is adoption of a general plan, a discussion of significant irreversible changes is provided below.

The proposed project is an update of the City's existing *General Plan / Local Coastal Plan 1990- 2005* that was adopted in 1992 and subsequently amended, which when adopted, will supersede the 1990-2005 General Plan and its several amendments. The Plan includes elements required by state law as well as a land use map, which will accommodate future development and growth in the City. An updated Local Coastal Plan is being prepared as a separate document.

According to section 15126.2(c), a project would generally result in a significant irreversible impact if:

- The project would involve a large commitment of nonrenewable resources during initial and continued phase of the project;
- Primary and secondary impacts would generally commit future generations to similar uses;

- The project would involve uses in which irreversible damage could result from environmental accidents; or
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy).

The City is primarily built out, and future development will largely be infill development on some vacant and underutilized sites. These sites are already utilized for urban development or are surrounded by urban development. Although the General Plan land use map represents a commitment to a mix of land uses that will support future development, the City is already urbanized. Thus, the proposed Plan would not commit future generations to uses that do not already exist.

Future development would result in the permanent and continued consumption of electricity, natural gas, and fossil fuels. Development allowed under the proposed *General Plan 2030* would irretrievably commit nonrenewable resources to the construction and maintenance of buildings, infrastructure and roadways. Energy demands would result for construction, lighting, heating and cooling of residences, and transportation of people within, to and from the City. However, the consumption of these resources would not represent unnecessary, inefficient, or wasteful use of resources given the implementation of proposed policies that address water, lighting and energy conservation measures. Several policies in the proposed General Plan promote energy conservation, which could minimize or incrementally reduce the consumption of these resources. Specifically, GOAL NRC7 seeks to reduce energy use with a significant production and use of renewable energy. Its four policies and accompanying actions would promote reduction of electricity and natural gas consumption, use of renewable energy sources, and use of energy-efficient lighting, vehicles, and water fixtures and appliances. A summary of the proposed General Plan 2030 policies that serve to reduce energy and fossil fuel consumption is presented in Table 4.6-10 in the PUBLIC SERVICES (Chapter 4.6) section of this EIR for further discussion.)

In addition, new structures will be required to be constructed in accordance with specifications contained in Title 24 of the California Code of Regulations and the City's Green Building Regulations. Anticipated changes in state building and energy efficiency requirements to help reduce greenhouse gas emissions will also reduce the rate of energy consumption increases. However, future construction activities would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels (including fuel oil, natural gas, and gasoline) for automobiles and construction equipment.

Water resources are not considered nonrenewable, although during dry years, supplies may be constrained. As discussed above, the project would result in significant impacts on water supply during dry year conditions and potentially normal conditions. The City is in the process of developing plans for construction of a desalination facility to provide a supplemental water source during droughts due to insufficient water supplies during droughts under existing conditions. The proposed *General Plan 2030* supports implementation of the City's adopted *Integrated Water Plan*, which contemplates the construction of a desalination facility. While operation of a desalination plant may result in irreversible commitment of energy resources, the

City is currently studying measures to minimize energy consumption and greenhouse gas emissions as part of the desalination facility design and environmental review process.[1]

Indirect project impacts on the City's wastewater treatment facility (WWTF) were found to be less-than-significant. The WWTF is designed to handle the increase in wastewater that would be treated as a result of the project, and adequate capacity exists without the need to expand the plant or construct new improvements. The continued operation of the WWTF would not result in significant increases in fuel that could result in significant irreversible impacts.

Irreversible changes to the physical environment could occur from accidental release of hazardous materials associated with development activities. However, environmental accidents would be minimized adherence to federal, state and local regulations as discussed in the HAZARDOUS MATERIALS (Chapter 4.14) of this EIR. Future development accommodated by the proposed General Plan would be required to comply with all applicable federal, state and local laws regarding, transportation, storage, use and disposal of hazardous materials, which reduces the likelihood and severity of accidents that could result in irreversible environmental damage. Compliance with State and federal hazardous materials regulations would reduce the potential for accidental release of hazardous materials to a less-than-significant level.

No other irreversible changes are expected to result from the adoption and implementation of the proposed *General Plan 2030*.

5.3 GROWTH INDUCEMENT

CEQA requires that any growth-inducing aspect of a project be discussed in an EIR. Pursuant to the State CEQA Guidelines section 15126.2(d), this discussion should include ways in which the project could directly or indirectly foster economic or population growth or construction of new housing in the surrounding area. Projects which could remove obstacles to population growth (such as major public service expansion) must also be considered in this discussion as well as characteristics of the project that that may encourage and facilitate other activities that could result in significant impacts. According to CEQA, it must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment.

The proposed *General Plan 2030* would indirectly induce population, employment and economic growth by accommodating future development and growth and allowing for intensified development within some areas of the City. The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations have been developed and applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or intensified redevelopment.

[1] It should also be noted that the desalination facility is jointly proposed with the Soquel Creek Water District to provide supplemental water sources to that agency in order to manage groundwater resources and avoid seawater intrusion into the aquifers.

As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that is expected to occur by the year 2030. The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents (based on 2.4 persons per household). It is estimated that approximately 75% of the new residential units would be multi-family units and 25% would be single-family units based on existing trends and assumptions developed for the traffic and water demand analyses.

The buildout projections also estimate approximately 3,140,000 additional square feet of commercial, office and industrial uses by the year 2030. Based on the non-residential uses, it is estimated that approximately 8,540 new jobs could be generated. (See the POPULATION AND HOUSING (Chapter 4.2) section of this EIR for further discussion.)

The estimated General Plan buildout would result in a population growth rate of 0.6%, which is slightly less than the historical rate experienced in the City since 1980 (0.9%), but only slightly higher than the AMBAG forecast rate (0.56%). These variations are not considered substantial, and the population increases supported by the proposed General Plan 2030 would not be considered substantial. However, the proposed General Plan does foster and support economic growth. See the POPULATION AND HOUSING (Chapter 4.2) section of this EIR for further discussion.

It is also noted that the proposed General Plan 2030 supports infill development along transportation corridors to promote alternative land use patterns to help reduce automobile travel. Development under the proposed General Plan would primarily occur on vacant infill sites, on underutilized properties that could be redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[2] approximately 55 percent of all new housing, 45 percent of new commercial development and 52 percent of new office development would located along these corridors. Thus, new development would be concentrated in specific areas. The draft Plan would result in local and regional benefits by promoting land use patterns that reduce automobile dependence and support regional transit systems, which could reduce greenhouse gas emissions, as well as traffic and air quality impacts associated with population growth and nonresidential development.

The proposed General Plan 2030 does not include policies or actions that would result in construction or expansion of major infrastructure or public facilities that could remove obstacles to growth. While, the Plan does support construction of a desalination facility, the facility has been long-planned and is intended to primarily provide a supplemental water source during drought conditions for the City and a supplemental water source for the Soquel Creek Water District. The facility could be expanded to accommodate growth. However, according to the City's adopted *Integrated Water Plan* EIR (that evaluated a desalination facility at a program level), expansion would also be subject to additional environmental review that would be required to further analyze growth inducement potential based on review of City, County and Capitola General Plans. Growth inducement also will be reviewed in the project-level

[2] See Table 3-3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development per specific areas in the City.

desalination project EIR that is currently being prepared. (See the WATER SUPPLY [Chapter 4.5] section of this EIR for further discussion regarding a desalination facility and potential impacts.}

5.4 CUMULATIVE IMPACTS

CEQA REQUIREMENTS

The State CEQA Guidelines section 15120(a) requires that an EIR discuss cumulative impacts of a project "when the project's incremental effect is cumulatively considerable." As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. As defined in section 15065(a)(3), "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects.

An evaluation of cumulative impacts is required by CEQA when they are significant. When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. According to the California State CEQA Guidelines section 15130 (a)(1), there is no need to evaluate cumulative impacts to which the project does not contribute.

An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant, when for example, a project funds its fair share of a mitigation measure designed to alleviate the cumulative impact. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact. If a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact as provided in section 15183(j). Therefore, future projects that are determined to be consistent with the General Plan after it is adopted may rely on this analysis to streamline their environmental review.

CUMULATIVE PROJECTS

The State CEQA Guidelines provide that cumulative impacts be addressed either based on:

> (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, OR
>
> (B) A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

In the case of an area-wide planning document, such as a General Plan, cumulative effects occur from development accommodated by the General Plan within the City combined with impacts of cumulative development within the planning area. This EIR includes a review of "buildout" under the proposed General Plan, which is consistent with the "summary of projections" approach; thus this EIR includes the cumulative component for the City. Other cumulative development includes development and growth at the University of California, Santa Cruz (UCSC) facilities, which is in the exclusive control of the University of California, and development and growth within areas served by the City Water Department and/or City wastewater treatment facility. The approach to determining cumulative impacts for these other areas are described below.

UCSC 2005 Future Development and Growth

UCSC CAMPUS

On September 21, 2006, the University of California Regents adopted the *2005-2020 Long Range Development Plan* (2005 LRDP) for the UCSC campus after certification of the 2005 LRDP EIR. The 2005 LRDP identifies campus goals and development objectives and provides a map of proposed campus land uses. The 2005 LRDP is a physical development and land use plan framework to accommodate the academic, research and student/faculty services for a projected campus enrollment. The plan anticipates a campus enrollment of 19,500 students by academic year 2020-2021, provision of 9,556 on-campus housing units/beds for students, faculty and staff, and includes a building program that would allow a total of approximately 8,242,400 gross square feet of development by academic year 2020-2021, of which 3,175,000 gross square feet would be additional building space on the UCSC campus.

The 2005 LRDP also includes an 18-acre property on Delaware Avenue that was purchased by the University in 2004. The property includes three buildings with a total of 782 University employees and affiliates (University of California Santa Cruz, September 2006, Volume II: Draft EIR). Currently two of the three buildings are occupied with a total of 200 employees and affiliates.

The 2005 LRDP EIR was legally challenged by several entities, including the City of Santa Cruz. A ruling by the Santa Cruz County Superior Court in *City of Santa Cruz et al. v. Regents of the University of California et al.* (CV 155571, consolidated with Case No. CV155583) concluded

that additional analyses relating to water supply, housing, and traffic mitigation were required. In August 2008 a "Comprehensive Settlement Agreement" was executed by all the parties, which resolved the lawsuits. The Settlement Agreement was entered as a final judgment of the Court, thereby, superseding the previous court ruling. The Agreement limits enrollment to 19,500 in the academic year 2020-0201 and requires provision of additional on-campus housing for students, among other provisions.

This cumulative analysis conservatively assumes that some level of additional student enrollment growth would be expected between 2020 and 2030. The 2005 LRDP extends to 2020, after which time an updated LRDP likely would be prepared. It is unknown at this time what level of development or enrollment growth would be envisioned in the next LRDP. In accordance with provisions of the Settlement Agreement (section 5.1), UCSC agreed that the next major amendment to the 2005 LRDP will include a comprehensive analysis of potentially feasible alternative locations to accommodate proposed UCSC enrollment growth beyond that analyzed in the 2005 LRDP EIR (i.e., satellite campuses, remote-classrooms, etc.) as a means of assessing UCSC's ability to meet the state mandate for higher education while taking into consideration City of Santa Cruz infrastructure including, but not limited to, transportation, water and off-campus housing. However, UCSC's response to the EIR Notice of Preparation (NOP) indicates that enrollment has annually increased at an average rate of 320-350 students per year and requested that this amount be used for 2020-2030 projections. Thus, this EIR assumes 350 new students per year between 2020 and 2030 (3,500 total students) beyond the growth envisioned in the 2005 LRDP EIR for a worst-case cumulative analysis.

Development on the UC campus is controlled by the University of California, which, as a state agency, is not subject to local ordinances. Development in the North Campus was evaluated in the 2005 LRDP EIR. UCSC is responsible for implementation of mitigation measures identified in the certified 2005 LRDP EIR for significant impacts and adopted by the Regents when they approved the LRDP in 2006. Cumulative impacts are summarized and incorporated by reference from this document pursuant to the State CEQA Guidelines section 15150, as relevant to the cumulative analysis, unless other new information has been made available for the cumulative analysis as noted in the text.[3] Pursuant to the Comprehensive Settlement Agreement adopted as a stipulated judgment by the Superior Court for the County of Santa Cruz in Case Nos. CV155571 and CV155583, except for the issues of water supply and housing, the 2005 LRDP EIR analyses regarding University-growth-driven impacts that could contribute to cumulative impacts off-campus are deemed adequate by operation of law. The 2005 LRDP EIR is not used for the cumulative water supply and off-campus housing impacts addressed below.

UCSC MARINE SCIENCE CAMPUS

The University of California also owns 98 acres of coastal property that includes the original Long Marine Lab (LML) complex (about 16 acres), the Younger Lagoon Reserve (about 24 acres), and an area formerly known as Terrace Point (about 58 acres). In January 2009, the California Coastal Commission certified a "Coastal Long Range Development Plan" (CLRDP) for this property that is now known as the UCSC Marine Science Campus (MSC). The CLRDP, which

[3] The 2005 LRDP Final EIR documents are on file and may be reviewed at the City of Santa Cruz Planning Department, 809 Center Street, Room 106, Santa Cruz, CA, Monday through Thursday, 8 AM – 12 PM and 1 PM to 5 PM. The documents are also available online at: http://lrdp.ucsc.edu/final-eir.shtml

was approved by The Regents of the University of California in December 2008, guides development of this marine campus through 2020. Some development has occurred at the site; projected long-term development currently includes approximately 279,335 additional square feet of new facilities; approximately 50,000 square feet of new development is currently proposed, including, including Coastal Biology Building, improvements to the Nature Education Facilities and infrastructure improvements. Development at the Marine Science Campus was evaluated in the 2008 CLRDP EIR. UCSC is responsible for implementation of mitigation measures identified in this certified EIR for significant impacts and adopted by the Regents when they approved the CLRDP and certified the EIR. Cumulative impacts are summarized and incorporated by reference from this document pursuant to the State CEQA Guidelines section 15150, as relevant to the cumulative analysis, unless other new information has been made available for the cumulative analysis as noted in the text.[4]

Water Service Area Growth

In addition to serving the City of Santa Cruz and a portion of UCSC, the City Water Department also serves portions of the unincorporated Santa Cruz County area east of the City and a portion of the City of Capitola. The City considered the regional population forecasts adopted by AMBAG in June 2008 as the most reliable basis for the cumulative analyses related to growth in the City's water service area, which is shown on Figure 4.5-1.[5] The County of Santa Cruz is not currently planning to update its existing General Plan, and discussions with County Planning Department staff indicate that there are no major foreseeable development projects within the service area that would not be covered with projected population and employment growth (Previsich, personal communication, August 2011). There are some sites identified in the County Housing Element for higher density development. The City of Capitola is mostly developed, and is currently in the process of updating its General Plan.

Wastewater Treatment Plant Service Area Growth

In addition to the City and a portion of UCSC, the City's Wastewater Treatment Facility (WWTF) also serves portions of the unincorporated areas of Santa Cruz County, including Live Oak, Soquel, and Aptos, as well as the City of Capitola. The areas served by the City's WWTF are shown on Figure 4.6.3.

CUMULATIVE IMPACT ANALYSIS

Cumulative Impacts Found Not To Be Significant

For some issues, the proposed project would not result in an impact, and thus would not contribute to a potential cumulative impact. In each of the following instances, either a

[4] The CLRDP Final EIR documents are on file and may be reviewed at the City of Santa Cruz Planning Department, 809 Center Street, Room 106, Santa Cruz, CA, Monday through Thursday, 8 AM – 12 PM and 1 PM to 5 PM. The documents are also available online at: http://ppc.ucsc.edu/cp/projects/11407/.

[5] All EIR figures are included in Chapter 7.0 at the end of the EIR (before appendices) for ease of reference as some figures are referenced in several sections.

significant cumulative impact has not been identified or the proposed *General Plan 2030*'s incremental contribution does not rise to the level of being cumulatively considerable, as explained. Potentially significant cumulative impacts are addressed in the following subsection.

LAND USE AND DEVELOPMENT

Land Use. As discussed in the LAND USE (Chapter 4.1) section of this EIR, adoption and implementation of the proposed General Plan, including future development accommodated by the Plan, would not result in significant land use impacts related to division of an established community, introduction of incompatible land uses or conflicts with plans or policies adopted to mitigate an environmental impact. Potential cumulative development includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and Coastal LRDP, as well as other development within the planning area of the proposed General Plan 2030 as shown on Figure 2-1. Major developments are not planned within the County area that is within the City's planning area, and future development would be considered infill within existing developed areas.

Future development at the University facilities (UCSC campus, the Delaware Avenue facility and the Marine Campus) would be in accordance with the University's adopted plans for these areas and would not result in introduction of incompatible land uses or divide an established community. UCSC is not subject to local plans, policies and regulations, and thus, the issue of potential conflicts with such plans or policies is not applicable. Nonetheless, due in part to the fact that the Comprehensive Settlement Agreement between the City and County of Santa Cruz and the University adequately addresses issues of compatibility through the additional mitigation measures aimed at housing, traffic mitigation and water supplies, the development at the University facilities, in combination with the proposed General Plan, is not expected to result in any cumulative land use incompatibilities.

Development potential within the *General Plan 2030* planning area outside City limits is limited. The areas within the County that are within the City's existing Sphere of Influence (SOI), which include an area along Seventh Avenue and in the Carbonera area, have been included in the analyses for the proposed General Plan. Lands to the west (within the unincorporated County area) are generally in agricultural or state park use in which future development would be limited. An area located to the north of the existing City limits along Graham Hill road is not included within the City's SOI. This area is designated Very Low Residential in accordance with existing County of Santa Cruz land use designations. The area is mostly developed with residential uses, and future development could include limited additional residential development, subject to County approvals. Such development would not introduce incompatible land uses or divide a community, but would be considered infill within an existing developed area. Future development would be subject to County policies and regulations.

> **Conclusion.** Potential cumulative development and growth at UCSC and other areas within the *General Plan 2030* planning would not result in cumulative land use impacts.

Housing. This EIR found that future development accommodated by the *General Plan 2030* would not result in a significant impact related to displacement of residents or housing. Future UCSC campus development includes new on-campus housing to accommodate new students and

staff in accordance with LRDP projections and provisions of the Comprehensive Settlement Agreement.

The University's 2005 LRDP EIR evaluated the impact on the City's housing supply as a result of student and staff growth (University of California Santa Cruz, September 2006, 2005 LRDP Final EIR, Volume II: Draft EIR, pages 4.11-17 – 4.11-25); a revised analysis was provided in the EIR for the City's proposed Sphere of Influence Amendment and Provision of Extraterritorial Water & Sewer Service (To Part of the UCSC North Campus) (City of Santa Cruz, July 2010, pages 5-14 – 5-17). The proposed *General Plan 2030* would not contribute to the UCSC demand for off-campus housing impact, and thus, there would be no cumulative impact related to this issue. This EIR has evaluated potential impacts related to future development of 3,350 residential units accommodated by the General Plan, but does not make a distinction as to who would reside in these units. However, it is noted that UCSC-related off-campus population within the City of Santa Cruz as a result of growth accommodated by the 2005 LRDP is estimated to result in a housing demand of approximately 525 to 860[6] units in the City of Santa Cruz based on existing residency and household size trends[7] (City of Santa Cruz, July 2010). Student growth between 2020 and 2030[8] could result in an additional housing demand of 132 units for a total a total UCSC demand of approximately 660 to 990 housing units. This potential housing demand is within the 3,350 residential units estimated to be accommodated by the proposed *General Plan 2030* to the year 2030. This potential demand is also well as within AMBAG's projected increase of 2,413 new housing units in the City of Santa Cruz by the year 2030. Since AMBAG's projections are made in part to satisfy state requirements to determine regional housing needs for local jurisdictions to use in developing their state-mandated Housing Elements, it is presumed that the identified housing projections (needs) in local jurisdictions will be met.

> **Conclusion.** Potential cumulative development and growth at UCSC and other areas within the General Plan 2030 planning would not result in significant cumulative impacts regarding displacement of housing or residents. The proposed *General Plan 2030* would not contribute to the UCSC demand for off-campus housing impact, and thus, there would be no cumulative impact related to this issue.

Aesthetics. Potential cumulative development that could affect issues related to aesthetics includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and Coastal LRDP and other areas in the General Plan planning area that could affect scenic views or scenic resources. The areas within the County that are within the City's existing Sphere of Influence (SOI), which include an area along Seventh Avenue and in the Carbonera area,

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[6] Based on historical data, the 2005 LRDP EIR assumed that except for commuters, all new students would be new to the area. The lower number reflects the scenario in which most new employees already live in Santa Cruz County (32%) and the higher number reflects the scenario in which all move to the area.

[7] About 47% percent of students and 8% of UCSC employees live on campus; of the off-campus residents, approximately 35% of students and 47% of employees live in the City of Santa Cruz (University of California Santa Cruz, July 2009). Off-campus student household size averaged about 3 students. For employees, approximately 1.1 employees reside per unit, both on and off campus in addition to non-employee dependents (Ibid.).

[8] Estimated as 3,500 students with 2,345 (67%) residing on campus and 34% of the remaining students (395) living within the City of Santa Cruz further described below in the "Population Growth" subsection of the "Significant Cumulative Impacts" section.

have been included in the analyses in for the proposed General Plan. The other unincorporated areas within the General Plan planning area are either in open space use or not part of a scenic viewshed. The lands to the west of the City are in agricultural, open space and public park uses; there would be no future development that would affect scenic views or resources or result in aesthetic impacts. The unincorporated area along Graham Hill Road to the north of the City is largely wooded, mostly developed, and not within scenic public views available from City locations.

No significant impacts were identified related to scenic views, scenic resources, visual quality of surrounding areas or light and glare as a result of the proposed *General Plan 2030* due to the proposed policies and actions that seek to protect scenic views and encourage sensitive development designs. Future development at the UCSC facilities would be subject to its own adopted LRDPs aesthetic policies for the main campus and marine science campus (LRDP, pages 74-75; CLRDP, Chapter 5, pages26-30). The University's 2005 LRDP EIR did not identify significant off-campus aesthetic impacts that would result in a cumulative impact to scenic views of the Monterey Bay or Santa Cruz Mountains (University of California Santa Cruz, September 2006, 2005 LRDP Final EIR, Volume I: Draft EIR, pages 4.1-12 – 4.1-15 and Volume IV: Final EIR, pages 3-6 – 3-7). Thus, cumulative campus and City development would not result in cumulative aesthetics impacts.

Furthermore, future development at the University's Marine Science Campus in accordance with its CLRDP would not result in significant impacts to scenic views based photosimulations that show no obstruction of ocean or panoramic views (University of California Santa Cruz, January 2004, pages 4.1-31 to4.1-38). Potential development sites within the City are not within the public scenic viewsheds of UCSC's Marine Science Campus, except for the 11-acre, vacant Swenson site, located adjacent to the marine campus, east of Shaffer Road. Future development on this site would be partially within scenic views of the Monterey Bay as seen from the lower portions of the Moore Creek Preserve and Wilder Ranch State Park in which the marine campus is also visible, although existing tree cover partially screens the property from these public views. Future development would not be expected to be of the intensity and mass that would obstruct or block ocean views. Furthermore, policies and actions included in the proposed General Plan 2030 would ensure that scenic views of the ocean are protected with appropriate structural siting and design to preserve public scenic views as discussed in the AESTHETICS (Chapter 4.3) section of this EIR. Furthermore, the proposed General Plan specifically requires that the height, scale, and bulk of development take into consideration the rural transition at the city's edge (LU1.14).

> **Conclusion.** No significant cumulative impacts related to scenic views, scenic resources, visual quality of developed areas or light or glare have been identified for the proposed project and cumulative UCSC development.

PUBLIC SERVICES AND FACILITIES

Public Services. The City's Fire and Police Department serve City residents, and cumulative growth within the City has been evaluated in this EIR. Similarly, the City's landfill and Resource Recovery Facility only serve City residents. Thus, there would be no cumulative impacts related to these public services. Cumulative impacts related to wastewater treatment, parks and schools are discussed below.

Wastewater Treatment. The geographical area for the analysis of cumulative water impacts includes the area served by the City's wastewater treatment facility (WWTF). This includes the City of Santa Cruz, a portion of UCSC, lands within the Santa Cruz Sanitation District (south to Seascape) and two small county service areas. The City and County each have specified rights to treatment capacity. (See the "Wastewater Treatment and Collection" subsection of the PUBLIC SERVICES (Chapter 4.6) section of this EIR for a full description.)

Wastewater generated by the proposed project is estimated as approximately 0.55 mgd Cumulative wastewater flows for UCSC are estimated as between 0.2 and 0.45 mgd for the year 2010 (City of Santa Cruz, July 2010). This estimate represents an average per capita wastewater generation of 45-100 gpd, based on student enrollment levels. Using this per capita factor as a rough estimate for potential additional student enrollment of 350 students/year between 2020 and 230, an additional 0.154-0.350 mgd of wastewater flow could be generated. This would result in a potential additional flow attributable to UCSC of 0.35 to 0.80 mgd. As a result of City and UCSC cumulative development, up to approximately 1.35 mgd of additional wastewater flows may be generated by the year 2030. There is adequate remaining capacity within the City's treatment allocation (4.0 mgd remaining) to accommodate this cumulative increase.

Other areas served by the City's WWTF are within the county sanitation and/or service areas. Existing flows from the County total 5.5 mgd. In its review of countywide services conducted in 2005, LAFCO estimated a growth in wastewater flows within these sanitation districts as approximately 0.5% per year. This would result in an approximate 10% increase or about 0.55 mgd over existing flows of 5.5 mgd by the year 2030. This is within the remaining capacity of 2.5 mgd allocated to the County.

> **Conclusion.** Cumulative wastewater flows to the City's wastewater treatment facility are within remaining allocated capacities, and thus, there is no significant cumulative impact to the treatment facility capacity.

Parks. Potential cumulative development that could affect issues related to parks includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP. Cumulative population growth accommodated by the proposed *General Plan 2030* and UCSC 2005 LRDP would not result in significant cumulative impacts to parks. As discussed in this EIR, increased population and associated park use demand accommodated by the proposed General Plan would not be significant as increased use of existing parks is expected to be spread out throughout the City so that no substantial deterioration would occur at any one facility, and with implementation of the proposed *General Plan 2030* goals, policies and actions that set forth measures to avoid and minimize adverse impacts on parks and recreational facilities.

The University's 2005 LRDP EIR analyzed whether increased on-campus population under the 2005 LRDP would increase demand for recreational facilities in the City of Santa Cruz, thereby resulting in deterioration of existing recreational facilities or the need to construct new facilities that could result in significant environmental impacts. The EIR concluded that growth in on-campus daytime and residential population would not trigger the construction of new City parks and recreational facilities because the 2005 LRDP provides for new campus recreational facilities to serve the increased population (University of California Santa Cruz, September

2006, 2005 LRDP Final EIR, Volume II: Draft EIR, pages 4.13-11 to 4.13-12). The impact was therefore determined to be less than significant. The EIR also concluded that cumulatively, this impact would also be less than significant, but includes mitigation measures that require inclusion of children's recreational facilities in all new on-campus family housing developments and ensure that UCSC recreational facilities continue to be available to the public to further reduce the potential impact to recreational facilities in the City of Santa Cruz.

The 2005 LRDP EIR also includes a mitigation measures for collaboration with the City regarding Pogonip. Because of the proximity of the campus to Pogonip and because of the presence of trail connections between the campus and the park, the 2005 LRDP EIR found that the use of Pogonip trails would be expected to increase due to campus growth (University of California Santa Cruz, September 2006, 2005 LRDP Final EIR, Volume II: Draft EIR, page 4.13-12). Potential deterioration of trails could be reduced to a less-than-significant impact with implementation or LRDP EIR mitigation measures, including UCSC working with the City to ensure that Pogonip has adequate signage to inform users that bicycling is prohibited; providing campus maps that indicate the bicycle use policies in the park; working with campus outdoor activity groups to encourage trail stewardship, and coordinating with City efforts in recruiting volunteers for an annual or semi-annual trail maintenance day.

Conclusion. Cumulative impacts to City parks are less than significant.

Schools. Potential cumulative development that could affect school enrollments includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP. The LRDP EIR indicates that approximately 85 K-12 students would be generated by 2020. The estimated student enrollment between 2020 and 2030 could result in approximately 70 students for a total of 155 new students over the next 20 years. This would result in a total cumulative student generation of approximately 1,765 students over the next 20 years, including the proposed project. This could exceed existing school facility capacities depending on the rate of growth as the increase would not happen all at once. However, this is conservatively considered a potential significant cumulative impact to which the project's incremental contribution would be cumulatively considerable as the proposed project represents the majority of the student growth. However, with required payment of school impact fees to fund necessary facility expansion and/or additions, in conjunction with use of the former Natural Bridges Elementary School, the impact would be mitigated to a less-than-significant level. Potential addition or expansion of school classroom facilities is not expected to result in significant physical impacts due to the location of existing facilities within developed footprints. The School District has indicated this level of enrollment could be accommodated without construction of new schools, although some expansion of existing facilities may be necessary. It is not known which campuses may need to be expanded in the future to accommodate the additional enrollment.

Conclusion. Cumulative development and growth would increase enrollments in grades K through 12 by an estimated 1,765 students through 2030, and some schools may exceed capacity depending on the timing of growth, and thus, this is a potentially significant cumulative impact. The project's incremental contribution to this impact (approximately 2,010 students) is cumulatively considerable. However, the required payment of school impact fees and implementation of proposed General Plan policies

and actions would fully mitigate the project's cumulative contribution such that it would no longer be considered cumulatively considerable.

Storm Drainage and Water Quality. Potential cumulative development that could affect storm drainage and water quality includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP. The analyses included in this EIR found that future development accommodated by the draft *General Plan 2030* would have less-than-significant impacts on water quality, stormwater and flooding with implementation of existing City and state regulations and proposed General Plan policies and actions that require new development to maintain pre-development runoff levels and protect water quality. Impacts to the quality of water resources would be minimized by implementing Best Management Practices (BMPs) in accordance with the NPDES permit and other applicable regulations.

UCSC campus development under the 2005 LRDP would involve construction activities such as excavation, grading, and construction of new academic and housing facilities, as well as roadway and utility improvements. These activities could result in increased runoff and potential water quality degradation due to erosion and potential pollutants that could adversely affect water quality of downstream receiving waters, including the San Lorenzo River and Monterey Bay. UCSC campus development, in combination with potential development that could be accommodated by the draft *General Plan 2030*, could result in increased runoff and potential water quality impacts in the Moore Creek, Jordan Gulch, and San Lorenzo River watersheds. However, campus development would not result in substantial sources of runoff in off-campus watersheds, due to the mitigation measures the University is required to implement, and therefore would not have a substantial adverse effect on receiving water quality, except for potential erosion (University of California Santa Cruz, September 2006, Volume II: Draft EIR, pages 4.8-44 to 4.8-46). The potential for erosion of campus soils due to development, including tree removal, would be reduced to a less-than-significant level with implementation of mitigation measures and implementation of Best Management Practices in the campus *Storm Water Management Plan* that is part of the campus Storm Water Discharge Permit issued by the Regional Water Quality Control Board (University of California Santa Cruz, 2005 LRDP Final EIR, September 2006, Volume I, page 3-27 to 3-28).

Furthermore, a large amount of runoff from the UCSC campus is intercepted to the subsurface through sinkholes in the karst formation, including the above watersheds. Increased storm water runoff in the Jordan Gulch watershed does not leave the campus by way of surface runoff and is intercepted by the karst sinkholes. In the case of the Moore Creek watershed, it is possible that the sinkholes may fill with sediment, and runoff from new campus impervious surfaces would no longer enter the karst system and would instead leave the campus as stream discharge. However, implementation of mitigation measures adopted for the 2005 LRDP and compliance with the University's approved NPDES requirements would reduce erosion and sedimentation of sinkholes, such that the drainage system would continue to handle the runoff from the campus (University of California Santa Cruz, September 2006, Volume II: Draft EIR). Implementation of the 2005 LRDP EIR mitigation measures would avoid any increases in peak flows and would also avoid or minimize an increase in the volume of runoff that is discharged off site (University of California Santa Cruz, September 2006, Volume II: Draft EIR, pages 4.8-30, LRDP Mitigation HYD-3C and HYD-3D). Compliance with NPDES requirements for construction sites and the implementation of 2005 LRDP EIR mitigation measures would reduce the construction-phase storm water runoff impacts on water quality to a less-than-significant level (Ibid.).

The University's Marine Science Campus site is essentially a closed drainage system, with little influence from upgradient or crossgradient sites (University of California Santa Cruz, January 2004). With the exception of the drainage from the industrial areas to the north, drainage onto the site through overland flow from adjacent properties is minor (Ibid.). Runoff from the Marine Science Campus discharged runoff into the Younger Lagoon Reserve (YLR) and the Monterey Bay. Runoff from the areas north of the Marine Science campus flows onto the Marine Science Campus site via a culvert under the railroad tracks. There are no other vacant parcels in the project vicinity that drain into the YLR that could be developed in the future to result in increased runoff into the YLR. Therefore, any change in the volume and quality of runoff that is received in the YLR compared to existing conditions would be the result of the implementation of the CLRDP (Ibid.). Thus, there would not be a significant cumulative impact to which the proposed project would contribute.

A portion of the Marine Science Campus does drain to the Moore Creek watershed, which includes the existing vacant Swenson site within the City. Future development of this site would be subject to City regulations for stormwater management and water quality control. Development at both the Marine Science Campus and within the City would be required to comply with specified stormwater collection and discharge requirements, including NPDES requirements, which will offset and reduce the overall potential cumulative contribution to water quality degradation of the ocean and bay resulting from the cumulative development in the region. Within implementation of drainage and water quality protection measures required by the City and for UCSC development, cumulative stormwater drainage in the Westside with UCSC development at its Coastal Marine Science Campus would not result in a significant cumulative impact.

> **Conclusion.** Cumulative development and growth would result in increased runoff and potential water quality degradation. However, with implementation of existing City regulations and proposed policies, as well as state and UCSC regulations and requirements, including compliance with approved NPDES measures within the City and at UCSC, the increased runoff would not result in a significant cumulative impact to storm drain systems or water quality of receiving waters.

RESOURCES AND HAZARDS

Biological Resources. Potential cumulative development that could result in potential cumulative impacts to biological resources includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and CLRDP, as well as development accommodated by the proposed General Plan. Future UCSC development and limited sites within the City could cumulatively affect sensitive coastal prairie, riparian and wetland habitats and some special status species, including California red-legged frog, special status bird and bat species and the San Francisco dusky-footed woodrat. However, most of the sites within the City that would support sensitive habitat areas and special status species are protected in publicly owned and managed park and greenbelt lands, and implementation of proposed General Plan policies and actions, as well as implementation of other City plans, such as the *City-wide Creeks and Wetlands Management Plan,* would prevent significant impacts to biological resources. Future development would be subject to site-specific environmental review, and the proposed General Plan includes protocols for biological assessment regarded sensitive

habitats and special status species that will be required as part of the CEQA-review process in order to evaluate and mitigate potential impacts related to future development. Similarly, campus growth will be guided by the 2005 LRDP, which includes goals and policies to protect biological resources. Mitigation measures are also included in the 2005 LRDP EIR regarding to mitigate potential significant impacts related to sensitive habitats (northern maritime chaparral, coastal prairie, wetlands, riparian), special status species, and interference with wildlife breeding or movement. Future potential development accommodated by the proposed *General Plan 2030* would not contribute to potential biological impacts on the UCSC campus, as most new development would be located within existing urban areas.

Future development at the Swenson parcel adjacent to the University's Marine Science Campus, in combination with development at the marine campus, could result in potential cumulative impacts to wetlands and wildlife movement. However, with implementation of the proposed *General Plan 2030* goals, policies and actions that set forth measures to avoid and minimize adverse impacts on sensitive wetland habitats and to protect, enhance and maintain significant wildlife dispersal corridors and buffers, significant impacts would be avoided. The proposed General plan also includes Action LU1.1.4 that sets forth specific development/design directives for the Swenson parcel, which include: wetland buffers, locating parking away from Antonelli Pond and preserving public access to Antonelli Pond.

> **Conclusion.** With implementation of measures required by the City and UCSC for review and mitigation of potential biological resource impacts associated with new development, potential site-specific impacts would be less than significant. Thus, there would be no significant cumulative impacts related to biological resources, particularly sensitive habitats, special status species and wildlife movement.

Agriculture, Forest & Mineral Resources. Potential cumulative development that could affect agriculture, forest or mineral resources includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and CLRDP. Future development accommodated by the proposed General Plan would not result in conversion of agricultural or forest resources or contribute to any cumulative impacts related to conversion of these resources. Future development at UCSC could result in removal of forest resources, but the City's forested lands are largely located within existing public greenbelt and open space areas. Thus, the adoption and implementation of the *General Plan 2030* would not contribute to cumulative removal of trees/potential forest resources. There are no mineral resources within the City. The designated mineral resource (quarry adjacent to Wilder Ranch) to the west of the City is within the General Plan planning area, but is located within the unincorporated County jurisdiction. As discussed in the AGRICULTURE, FOREST & MINERAL RESOURCES (Chapter 4.15) section of this EIR, this quarry is currently regulated by the County of Santa Cruz, and mining is expected to be completed within the next 10± years. A reclamation plan has been approved for the site.

> **Conclusion.** Cumulative development and growth would result in conversion of agricultural or mineral resources. The adoption and implementation of the *General Plan 2030* would not result not contribute to potential conversion of forest resources on the UCSC main campus. Thus, there would be no cumulative impacts to which the proposed project would contribute.

Cultural Resources. Potential cumulative development that could result in potential cumulative impacts to cultural resources includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and CLRDP. Impacts to cultural resources are site-specific. There are no areas where City and potential UCSC development would overlap. Both the proposed General Plan 2030 and the University's adopted 2005 LRDP and certified EIR include policies and measures to conduct appropriate review for cultural resources and provide site-specific mitigation as may be required.

> **Conclusion.** With implementation of measures required by the City and UCSC for review and mitigation of potential cultural resource impacts associated with new development, potential site-specific impacts would be less than significant. Thus, there would be no significant cumulative impacts related to cultural resources.

Geology and Soils. Potential cumulative development that could result in or be affected by geology or soils hazards and constraints includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and CLRDP. Impacts related to exposure to geological hazards and/or soils constraints are site-specific impacts that affect individual development projects and that are adequately mitigated on an individual basis. As discussed in the GEOLOGY AND SOILS (Chapter 4.10) section of this EIR, state and local building code requirements for seismic shaking and preparing and implementing recommendations of a geotechnical report serve to reduce geologic and seismic risks to acceptable levels. Project design and building standards avoid the aggregation of individual effects into a significant combined impact. Therefore, there would be no cumulative impact.

> **Conclusion.** Site-specific project design and building standards avoid the aggregation of individual effects into a significant cumulative geologic or soils impact. Therefore, there would be no cumulative impact related to geology and soils.

Air Quality. Cumulative development and growth would result emissions of criteria pollutants. However, as overall emissions are projected to decrease, and based on estimates include in this EIR (see Chapter 4.11, there would be a net decrease in emission of ozone precursors. Potential PM_{10} emissions would be reviewed on a project level to ensure that Air District daily significance thresholds are not exceeded. Thus, cumulative development would not be expected to contribute to violations of air quality standards, and there would not be a significant cumulative impact related to air emissions.

According to MBUAPCD CEQA Guidelines, "A consistency analysis and determination serve as the project's analysis of cumulative impacts on regional air quality. Project emissions which are not consistent with the AQMP (Air Quality Management Plan) are not accommodated in the AQMP and will have a significant cumulative impact unless offset." The analysis of potential buildout under the proposed General Plan 2030 found that development could exceed growth projections included in the AQMP, and therefore, the project would be inconsistent with growth projections in the AQMP, even though overall emission levels are forecast to decrease in the future. The development potential under the 2005 LRDP EIR was found to be potentially inconsistent with the AQMP, but with revised AMBAG population forecasts in 2009, the LRDP growth was found consistent with the AQMP (City of Santa Cruz, July 2010 [DEIR Volume]). Therefore, there is no cumulative impact related to consistency with the AQMP.

Conclusion. The projected decrease in emissions in the future will offset cumulative emissions. Thus, cumulative emissions of criteria pollutants would not be significant.

Global Climate Change Quality. Cumulative development in the region, as well as throughout the state and globally, would contribute to generation of greenhouse gas (GHG) emissions with resulting effects on global climate change. Both the City and UCSC have developed emission reduction targets and are preparing Climate Action Plans. The UC Policy on Sustainable Practices addresses: green building design, clean energy standards, climate protection practices, sustainable transportation practices, sustainable operations, recycling and waste management and environmentally preferable purchasing practices. The State has also adopted reduction targets with a plan that identifies specific strategies (Scoping Plan) as discussed in the GLOBAL CLIMATE CHANGE (Chapter 4.12) section of this EIR.

The proposed project GHG emissions were found to be below the overall per capita level of 6.6 metric tons/year CO_2 equivalent (MT CO_2e) per year that would be achieved at the State level given the State's emission target and total service population (residents and employees). This is the significance threshold that also is being considered by the Monterey Bay Area Unified Air Pollution Control District in evaluating impacts of long-range plans, such as general plans.

UCSC's estimated campus emissions for 2009 were 73,086 metric tons of $CO2_e$ (University of California Santa Cruz, May 2011). The total GHG emissions resulting from campus development are estimated as a maximum of 21,777 MT CO_2e (City of Santa Cruz, July 2010), for a UCSC cumulative total of 94,864 MT CO_2e. With the addition of emissions from the proposed General Plan 2030, cumulative GHG emissions represents a per capita level of 4.1 CO_2e, which continues to be below the 6.6 MT CO_2e threshold. Although this estimate is only to the year 2020, it would be expected that continued implementation of actions and strategies by the State, UC and the City would continue to keep GHG emission levels below significance thresholds.

Conclusion. Cumulative development and growth within the City and at UCSC would result in GHG emissions, but are estimated to fall below per capita thresholds proposed by the MBUAPCD for long-range plans. Thus, the proposed project would not make a cumulatively considerable contribution to a significant cumulative impact.

Hazardous Materials. Hazardous materials are project and site-specific and can be mitigated with adherence to federal, state, and local laws and regulations as discussed in the HAZARDOUS MATERIALS (Chapter 4.14) section of this EIR. The proposed *General Plan 2030* would result in additional development within the City, which could increase the potential for exposure to hazards and hazardous materials. Cumulative development at the UCSC Main Campus and Marine Science Campus could also include use of and exposure to hazardous materials and other hazards. However, cumulative development would have a localized effect on the exposure of residents to these hazards. This type of exposure would not be compounded by additional exposure in other parts of the region. Additionally, the University's 2005 LRDP and EIR include measures to ensure that all hazards and hazardous materials are managed appropriately and according to federal, State and local regulations in order to ensure public safety.

Conclusion. Cumulative development would be required to comply with applicable local, state and federal regulations regarding hazardous materials that would avoid the aggregation of individual effects into a significant cumulative impact. Thus, cumulative growth and development would not result in a significant cumulative impact related to hazardous materials.

Potentially Significant Cumulative Impacts

LAND USE AND DEVELOPMENT IMPACTS

Population Growth. Potential cumulative development that could affect population growth within the City of Santa Cruz includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP. The areas within the County that are within the City's existing Sphere of Influence (SOI), which include an area along Seventh Avenue and in the Carbonera area, have been included in the analyses in for the proposed General Plan. The other unincorporated areas within the General Plan planning area are not proposed to be included in the City's SOI or annexed, and population growth in this area would be outside the City and would not affect City population growth. (It is noted that the draft General Plan supports annexation of a 5±-acre property to the City's Dimeo Lane landfill, but this would not result in residential uses or population growth.)

New on-campus residential population related to UCSC development and growth under the University's adopted 2005 LRDP is estimated at approximately 3,340 new residents (including students, employees and dependents), who would be living on the UCSC campus by the year 2020 (City of Santa Cruz, July 2010). Of this amount, at least approximately 1,570 residents would be living in the main campus area within City limits (Ibid.). The remaining on-campus residents may be expected to reside in the North Campus area, which is currently outside City limits, but proposed to be included within the City's SOI.[9] With both on- and off-campus projections, a total of approximately 3,015 to 3,800[10] residents making up the UCSC-related population are estimated to live in the City of Santa Cruz by 2020 with approximately (Ibid.).

The City's total estimated population in 2030 with development accommodated by the draft *General Plan 2030* is estimated at 67,022 residents as discussed in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR. With cumulative development and growth at UCSC under the 2005 LRDP, the City's population could range between 70,040 and 70,820 residents. This would represent a population of approximately 4,150 to 4,940 residents above AMBAG's forecast population of 65,884 residents within the City of Santa Cruz in 2030. This cumulative level of growth represents an average annual growth rate of approximately 0.9% between

[9] Concurrent applications filed by the City of Santa Cruz and the UCSC are pending before the Santa Cruz County Local Agency Formation Commission (LAFCO) to amend the City's Sphere of Influence (City application) to include the 374-acre portion of the UCSC campus known as "North Campus" for the purpose of providing extraterritorial water and sewer services (UCSC application). The expansion of the SOI was analyzed in an EIR certified by the City of Santa Cruz in August 2010. The City has no plans, nor does it see any future need, to annex North Campus into City limits. The proposed General Plan supports inclusion of the North Campus in the City's Sphere of Influence (LU2.2.).

[10] The higher number assumes that all new staff would move to the Santa Cruz area, whereas the lower number assumes that most staff already reside in the City.

2009 and 2030. This is consistent with actual growth rates that have primarily occurred since 1990 (see Table 4.2-4 in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR), and would not be considered a significant cumulative impact related to population growth as growth would be within historic levels and not considered substantial. Furthermore, some or all of the off-campus UCSC-related population that would reside within the City may be included population growth estimated for the General Plan 2030 buildout as the analysis does not specifically include or exclude UCSC-related population, and thus, the average annual growth rate would be less.

Additional UCSC population growth between 2020 and 2030 could result in an increased enrollment of 3,500 students, of which it could be expected that at least 67% would reside in on-campus housing, consistent with provisions of the Settlement Agreement, which would result in approximately 2,345 campus residents. It would be expected that most of this new on-campus population would be within the new development areas identified in the 2005 LRDP EIR, which is the North Campus area that is located outside of City limits. Of the remaining 1,155 new students, approximately 34% would be expected to reside within the City based on off-campus residency patterns (City of Santa Cruz, July 2010). This would result in a total of approximately 395 students living within the City. As indicated above, some or all of the off-campus UCSC-related population that would reside within the City may be included population growth estimated for the General Plan 2030 buildout as the analysis does not specifically include or exclude UCSC-related population, and thus, the average annual growth rate would be less. However, even with the addition of 395 residents within the City, the total cumulative growth would represent an average annual growth rate of approximately 0.9%, which has been the historical rate within the City.

It should be noted that the estimated UCSC growth between 2020 and 2030 is somewhat speculative, as the University would be required to update and adopt a new LRDP in or before 2020, as the current adopted 2005 LRDP governs campus planning up to the year 2020. However, the projection is consistent with historic UCSC growth rates, and for the purpose of CEQA analysis, this would be a worst-case assumption. Such growth may also result in an increase in faculty and staff, although no estimates have been provided.

Cumulative population growth would not be considered a significant cumulative impact based on existing jurisdictional boundaries. However, the North Campus area of UCSC is proposed to be included in the City's Sphere of Influence, which is supported by the proposed General Plan. If the Sphere amendment is approved by LAFCO, there may come a time at which annexation is proposed, although there are no plans or proposals by the City to do so at this time. As explained in the EIR prepared for the SOI expansion, neither the City nor UCSC, believes annexation is necessary since the University already maintains many of its own public services such a police and fire that would normally result from an annexation. However, if the North Campus were to be annexed, the City's population could further increase by approximately 4,115 residents to the year 2030. This would result in a total City population of o approximately 74,155 to 74,935 in 2030. This additional UCSC, growth when added to other cumulative population growth described above, would represent an average annual population growth rate of 1.3%. This level of growth would exceed historical rates that have ranged between approximately 1.0 and 0.7% since 1990 (see Table 4.2-4 [page 4.2-6] in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR).

Conclusion. The estimated General Plan buildout would result in a average annual population growth rate of 0.6%, which is slightly less than the historical rate experienced in the City since 1980 (0.9%), but only slightly higher than the AMBAG forecast rate (0.56%). With cumulative UCSC growth to 2020, an average annual growth rate of 0.9% would be experienced, which is higher than the growth rate under the AMBAG estimates (0.66% per year), but consistent with historic rates, and thus, would not be considered substantial. However, if portions of the campus outside existing City boundaries are included in the City Sphere of Influence, potential future annexation could occur, and the resulting cumulative population growth would represent an average annual growth rate of approximately 1.3%. This exceeds historic rates, as well as annual average growth rates based on AMBAG forecasts for the year 2030. Although the 1.3% growth rate is only slightly higher than the historic 0.9-1.0% growth rate, it does represent a 20-30% increase and could be considered substantial. Therefore, this is considered a significant cumulative impact due to the substantial population growth and resulting physical effects that such growth could lead to (such as increased traffic and water supply demand) that would be cumulatively induced. The population accommodated by the proposed *General Plan 2030* is over half of the increase, and thus, the project's incremental contribution would be cumulatively considerable. However, future population forecasts could be developed and/or adjusted periodically to account for actual growth that occurs during the planning horizon.

PUBLIC FACILITIES & SERVICES

Transportation and Traffic. Potential cumulative development that could affect traffic includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and Coastal LRDP. The areas within the County that are within the City's existing Sphere of Influence (SOI), which include an area along Seventh Avenue and in the Carbonera area, have been included in the analyses in for the proposed General Plan. The other unincorporated areas within the General Plan planning area are designated for agricultural or recreational uses or very low residential densities (along Graham Hill Road), and would not be expected to generate significant amounts of traffic.

The Traffix model was used for the traffic impact analysis, which estimates the trip generation for all uses and distributes these new trips to the existing road network. Cumulative traffic volumes were calculated by adding peak-hour project trips generated by UCSC cumulative growth to the estimated General Plan buildout and existing volumes, which are provided in Appendix G. Cumulative UCSC trips were based on existing traffic in 2009 when the EIR Notice of Preparation was released and provisions of the Comprehensive Settlement Agreement, signed by the City, County, UCSC and other entities. These assumptions are outlined below:

- UCSC CAMPUS GROWTH: The Comprehensive Settlement Agreement limits traffic to an increase of 3,900 new daily trips over LRDP baseline conditions, not to exceed 28,700 average daily trips (ADT) to the main campus. The UCSC count in Spring 2009 was a total of 22,725 vehicles per day to the UCSC campus during which time 16,284 students were enrolled. This level of traffic represents an overall student generation rate of about 1.4 trips per student. Based on the 28,700 vehicles per day limit, the cumulative increment would be 5,975 vehicles per day. However, based on the trip generation rate and with the addition of approximately

3,500 students between 2020 and 2030, total cumulative campus trip generation was estimated at 9,187 new trips. The peak hour ratios and distribution will remain constant.

- MARINE SCIENCES CAMPUS: Cumulative traffic from the Marine Sciences Campus was based on the Coastal LRDP EIR and review with UCSC staff. Increased long-term terms were determined to be 1,804 daily trips with 198 PM peak hour trips. The Comprehensive Settlement Agreement limits total trips at this facility to 3,120 daily trips.
- 2300 DELAWARE: The Comprehensive Settlement Agreement indicates a limit of 2,068 ADT from the Delaware Avenue facilities assuming no change in office uses with 1,145 ADT associated with existing occupied facilities. This results in net cumulative increase of 923 ADT with 161 PM peak hour trips.

Intersection levels of service during the PM peak hour with cumulative development (including the proposed project) are summarized on Table 5-1. The level of service (LOS) calculations are included in Technical Appendix H-4, which is available for review at the City of Santa Cruz Planning Department[11] and is also included on the Draft EIR CD and on the online version of the Draft EIR on the City's website at www.cityofsantacruz.com, Planning Department.

The 21 intersections that would operate at unacceptable levels of service with buildout accommodated by the *General Plan 2030* would experience increases in delays with cumulative development and growth. In addition, the following five intersections would drop to an unacceptable LOS under cumulative conditions; all but one intersection is along routes that serve UCSC.

- Swift / Mission – from D (with project) to **E**
- Bay-Coolidge / High – from D (with project) to **F**
- Storey / King – from D (with project) to **F**
- King / Laurel- from D (with project) to **F**
- Frederick / Soquel – from D (with project) to **E**

Improvements have been identified for these 26 intersections that are forecast to operate at unacceptable levels of service as a result of future cumulative growth. Many of the impacted intersections can be improved to an acceptable LOS with signalization, turning restrictions, and/or other improvements. Table 5-2 summarizes these improvements and resulting LOS and delays for the impacted intersections. However, even with improvements, the following 11 intersections would remain at unacceptable levels.

- Western / High – Would improve from **F** to **E**
- River / Highway 1 – Would remain at **F**
- Bay / Mission – Would remain at **F**
- Laurel/Mission Would remain at **F**

[11] Located at 809 Center Street, Room 107, Santa Cruz, California during business hours: Monday through Thursday, 8 AM to 12 PM and 1 to 5 PM.

- King/Mission – Would improve from **F to E**
- Chestnut / Mission – Would remain at **F**
- Ocean / Water – Would remain at **F**
- Seabright / Water – Would improve from **F** to **E**
- Bay/California Ave. – Would improve from F to **E**
- Seabright / Murray – Would remain at **E**

Cumulative development would contribute to existing and future forecast unacceptable levels of service along Highway 1 and Highway 17. Traffic associated with UCSC development growth would add nearly 2,700 additional daily trips along Highway 1 and approximately 2,100 trips along Highway 17 (University of California, Santa Cruz, September 2006, Volume III: Recirculated DEIR, pages2-13 and Figure 2-3)). Project traffic represents a significant addition, although the estimated General Plan buildout traffic is less than the future forecasts estimated by Caltrans in its draft "Corridor System Management Plan." With implementation of the proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, and with future improvements along Highway 1 that are planned by Caltrans, traffic congestion along Highways 1 will be minimized. The proposed General Plan also includes an action to work with the University to develop and implement strategies to reduce congestion along travel corridors (M2.4.4).

Conclusion. Cumulative development and growth would generate traffic that would result in unacceptable levels of service at 26 intersections, all of which could be improved to acceptable levels or improved operations (i.e., delays reduced to existing levels), except at 11 intersections, including five along state routes. Improvements would reduce delays below the level generated by cumulative traffic, but LOS would not be improved to meet City or Caltrans' standards at 11 intersections. Similarly, cumulative traffic along state highways would contribute to existing and future unacceptable levels of service. Therefore, the cumulative traffic would result in significant impacts at 11 intersections and along Highways 1 and 17. Funding availability for major facility improvements and expansion of transit service will likely remain constrained into the foreseeable future. Thus, implementation of recommended improvements and alternative transportation facilities cannot be assured, and thus, the impact to all intersections identified as operating at unacceptable levels of service under the cumulative conditions remains significant. Additionally, highway operations could continue to remain at unacceptable levels, and funding constraints and controversy over proposed Highway 1 HOV lanes may delay or affect implementation of improvements. With implementation of the proposed *General Plan 2030* policies and actions to reduce vehicular traffic, increase vehicle occupancy and support/encourage use of alternative transportation measures, the impact could be reduced, but likely not to a less-than-significant level at the remaining impacted intersections and along state highways. Thus, cumulative traffic increases at City intersections and along state highways is a significant cumulative impact, and the proposed project's incremental contribution to the increases would be cumulatively considerable.

TABLE 5-1
Intersection PM Peak Hour Levels of Service with Cumulative Growth

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
SIGNALIZED INTERSECTIONS				
1	**Western/Hwy. 1**	C		
2	Swift/Mission	**E**	**72.2**	**1.142**
3	Miramar/Mission	D		
4	Almar-Younglove/Mission	C		
5	**Bay/Mission**	**F**	**222.5**	**1.515**
6	**Laurel/Mission**	**F**	**119.1**	**1.315**
7	Walnut/Mission	D		
8	**King-Union/Mission**	**F**	**155.4**	**1.313**
9	**Chestnut-Hwy. 1/Mission**	**F**	**164.8**	**1.380**
10	Moore/High	A		
11	**Bay/High/Coolidge**	**F**	**103.3**	**1.264**
12	Bay/Nobel-Iowa	B		
13	Bay/King	D		
14	California/Laurel	C		
15	Chestnut/Laurel	C		
16	Center/Laurel	C		
17	Center/Mission	C		
18	Pacific/Laurel	D		
19	Front/Laurel	D		
20	Front/Metro Center	A		
21	Front/Cathcart	A		
22	Front/Soquel	C		
23	Front/Cooper	A		
24	Pacific/ Water - Mission	C		
25	River/Water	D		
26	N. Pacific/River	B		
27	River/Potrero	B		
28	**River/Hwy. 1**	**F**	**244.5**	**1.540**
29	**River/Encinal**	**F**	**202.7**	**1.715**
30	San Lorenzo/Laurel-Broadway	B		
31	Riverside/San Lorenzo	D		
32	Riverside/Third	D		
33	Riverside/Beach	A		
34	**Ocean/San Lorenzo-East Cliff**	**F**	**120.8**	**1.55**
35	**Ocean/Broadway**	**F**	**95.1**	**1.728**
36	Ocean/Soquel	D		
37	**Ocean/Water**	**F**	**172.7**	**1.464**
38	Ocean/Kennan-Washburn	B		
39	Ocean-Hwy.17/Ocean-Plymouth	D		
40	Market/Water	C		

TABLE 5-1
Intersection PM Peak Hour Levels of Service with Cumulative Growth

	Intersection	PM Peak LOS	Delay [in seconds]	V/C Ratio
41	**N. Branciforte/Water**	**E**	**76.1**	**1.129**
42	**Branciforte/Soquel**	**E**	**67**	**1.071**
43	S. Branciforte/Broadway	B		
44	Seabright/Soquel	D		
45	Seabright/Broadway	C		
46	**Seabright/Murray**	**E**	**64.8**	**1.022**
47	Morrissey/Water-Soquel	D		
48	Morrissey/Fairmount	B		
49	**Frederick/Soquel**	**E**	**55.7**	**1.090**
50	Hagemann-Trevethan/Soquel	B		
51	Park Way/Soquel	C		
52	Capitola Rd./Soquel Ave.	C		
53	La Fonda/Soquel	B		
54	Riverside-Dakota/Soquel	A		
55	River S./Soquel	B		
56	Seventh Ave./Soquel Ave.	C		
57	Seventh Ave./Capitola Rd.	C		
58	Seventh Ave./Eaton	D		
UNSIGNALIZED INTERSECTIONS				
59	**Bay/California St**	**F**	**OVRFLW**	**3.540**
60	**Bay/California Ave**	**F**	**188.5**	**1.567**
61	West Cliff/Bay	D		
62	**Beach/Pacific Ave**	**E**	**44.8**	**1.093**
63	Pacific Avenue/Center	C		
64	**Storey/King**	**F**	**93.2**	**1.259**
65	**River/Fern**	**F**	**OVRFLW**	**1,259**
66	**King/Laurel**	**F**	**55.6**	**1.121**
67	**Laurent/High**	**F**	**196.3**	**1.190**
68	Market/Isbel-Goss	C		
69	North Branciforte/Goss	C		
70	Highway 1/Shaffer Rd	C		
71	Cedar/Laurel	D		
72	**Bay/Escalona**	**F**	**OVRFLW**	**2.193**
73	**Western/High**	**F**	**227.7**	**1.062**
74	Cliff/Beach	B		
75	Riverside/Second-Liebrandt	A		
76	**Seabright/Water**	**F**	**OVRFLW**	**3.234**
77	**Swift / Delaware**	**F**	**407.5**	**2.458**
78	Seventh Ave./Brommer	D		
79	Seventh Ave./E. Cliff	C		

SOURCE: Hatch Mott MacDonald

TABLE 5-2: Cumulative Intersection PM Peak Hour Level of Service with Recommended Improvements

Intersection	Existing		Cumulative		Recommended Improvement	With Mitigation	
	LOS	Delay	LOS	Delay		LOS	Delay
High St/Western Dr	E	45.9	F	227.7	TWLTL	**E**	40.7
Bay-Coolidge/High	D	35.4	F	103.3	Add wsbnd 1	D	50.1
High/Laurent	F	59.6	F	196.3	Signalize	B	13.3
River-Hwy 9/Hwy 1	F	83.9	F	244.5	Ebnd 2l 3t 1r, wbnd 2l 3t 1r, nbnd 1tl 1t 2r, sbnd 2l 1tl 1t 1r	**F**	104.3
River/Fern	B	14.5	F	Ovrfl	Signalize no l esbnd	B	14.3
River/Encinal	E	73.9	F	202.7	Ebnd 1l 1tr 1r, wbnd 1l 1tr, nbnd 1l, 1t, 1r, sbnd 1l,1t, 1tr	D	37.9
Bay St/Escalona Dr	F	782.2	F	Ovrfl	Escalona right turns only	C	24.9
King/Laurel	B	15	F	55.6	Add ebmd	D	34.1
King/Storey	B	15	F	93.2	Add sbnd l	D	29.3
Swift/Mission	B	19.1	E	72.2	Add nbnd r overlay	C	31
Bay/Mission	E	55.8	F	222.5	Ebnd 1l, 2t,1r, wbnd 1l,2t,1r,nbnd 1l,1t,1r, sbnd 2l,1t,1r	**F**	81.2
Laurel/Mission	C	24.9	F	119.1	Add Ebnd r	**F**	109
King-Union/Mission	C	32.7	F	155.4	Ebnd 21, 2t, 1r, wbnd 1l, 2t, 1r, nbnd 1l, 2t,1r, sbnd 2l,2t, 1r	**E**	65.9
Chestnut-Hw. 1/Mission	D	42.9	F	164.8	Ebnd 2l, 2t, 1r, wbnd 1lt,1t, 1r, nbnd 1l, 1t, 1tr, sbnd 1l,2t, 2r	**F**	164.6
Ocean/Water	E	73.6	F	172.7	Ebnd 2l, 2t, 1r, wbnd 1l,2t, 1r, nbnd 1l, 2t, 1r, sbnd 2l, 2t, 1r	**F**	135.1
N. Branciforte/Water	D	36.6	E	76.1	Add ebnd l, nbnd r & sbnd r	**E**	57.2
Seabright/Water	F	112.8	F	Ovrfl	Extend TWLTL & add nbnd r	**E**	40.4
Frederick/Soquel	C	28.6	E	55.7	Add nbnd t free	D	38.5
Bay/California Ave	F	67.6	F	188.5	Allow nbnd t free	**E**	38.3
Bay/California St.	F	434	F	Ovrfl	Allow sbnd t free	B	13.9
Branciforte/Soquel	C	23.6	E	67	Esbnd 1l, 1t, 1 tr, wsbnd 1l, 1tr no splt phase	C	24.8
Ocean /Broadway	C	34.3	F	95.1	Prohibit lfts from Ocean	D	38.2
Beach/Pacific Ave	C	20.9	E	44.8	Roundabout	C	
Ocean/San Lorenzo-E Cliff	E	64.7	F	120.8	Add sbnd r	D	49.1
Seabright/Murray	D	41.1	E	64.8	ADD wsbnd r, nbnd r & sbnd r	**E**	64.5
Swift/Delaware	C	23.9	F	407.5	Roundabout/Signal	C	25.1

The mitigation measure column reflects the recommended lane geometry where r = right turn lane, rt = right/through lane, l = left turn lane, lt = left/through lane, t = through lane, and twltl = two-way left turn lane.

SOURCE: Ron Marquez

Water Supply. Potential cumulative development includes water demand within the City's water service area, including UCSC and other areas outside City limits. As discussed in the WATER SUPPLY (Chapter 4.5) section of this EIR, the buildout accommodated under the draft *General Plan 2030* could result in an increase in water demand of approximately 251 MGY by 2030.

Cumulative Water Demand. Cumulative water demand within the remainder of the City's water service area was developed as part of the Water Supply Assessment prepared for this EIR (see Appendix D). Future water demand at UCSC to the year 2020 was determined as part of a Water Supply Assessment for the EIR for a proposed Sphere of Influence Amendment and Provision of Extraterritorial Water & Sewer Service to the North Campus of UCSC (SOI EIR) (City of Santa Cruz, July 2010).[12] The total net increase in UCSC water demand to 2020 was estimated as 126 MGY (EKI, March 2011).

As indicated above, the University's 2005 LRDP extends through 2020, and any further development plans beyond 2020 are unknown. To calculate water demand from 2020 through 2030 for UCSC, a demand factor was calculated by the City Water Department from historical water usage data between 1987 and 2008. Based on the assumed student growth (350 students per year) and demand factor, it is estimated that water demand for the UCSC campus will increase by 10 MGY from 2020 to 2030 (EKI, March 2011). Thus, the total UCSC water demand to 2030 is estimated as 136 MGY over existing water use.

Water demand in the remainder of the City's water service area was estimated based on population growth forecast by AMBAG (2008) for those areas served by the City Water Department other than UCSC. The population growth for the City's water service area outside of the City is estimated to be approximately 8.2% over the next 20 years (i.e., 0.4% growth per year; AMBAG, 2008). As discussed in the WATER SUPPLY (Chapter 4.5) section of this EIR, the City selected two time periods from which to estimate 2010 water demand: (1) 1999 through 2004 (Existing Water Demand Estimate [EWD])1) and (2) 2007 through 2008 (Existing Water Demand Estimate [EW]) 2). Projected water demand within the service area outside the City and excluding UCSC is estimated to be 1,525 MGY based on EWD Estimate 1 and 1,297 MGY based on EWD Estimate 2. Increased water demand is estimated as approximately 98 MGY (EWD 2) to 116 MGY (EWD 1) to the year 2030.

As shown on Table 2 in Appendix D, the existing water demand for the entire City's water service area with the proposed project is estimated to be 3,993 MGY based on EWD Estimate 1 and 3,522 MGY based on EWD Estimated 2. The projected water demand by 2030 for the entire City's water service area is estimated as 4,537 MGY based on EWD Estimate 1 and 4,046 MGY based on EWD Estimate 2, including miscellaneous water uses and system losses (EKI, March 2011).

[12] Concurrent applications filed by the City of Santa Cruz and the UCSC are pending before the Santa Cruz County Local Agency Formation Commission (LAFCO) to amend the City's Sphere of Influence (City application) to include the 374-acre portion of the UCSC campus known as "North Campus" for the purpose of providing extraterritorial water and sewer services (UCSC application). The City has no plans, nor does it see any future need, to annex North Campus into City limits.

Cumulative Impacts. Based cumulative water demand projections, the City's water supply for a normal hydrologic year is sufficient to meet cumulative demand through about the year 2020. After 2020, the City's normal year water supply may not be sufficient to meet the water demand projected for the development envisioned in the *General Plan 2030* and other development expected to occur within the City's water service area. If water demand is consistent with the EWD Estimate 1 (that reflects historic water use between 1999 and 2004), the City's total demand will be approximately 223 MGY greater than the available normal year supply of 4,314 MGY in 2030 (EKI, March 2011). This unmet demand would represent an average annual deficit of approximately 5%. However, if water demand is consistent with EWD Estimate 2 (that reflects lower overall water use in 2007 and 2008), the City will have sufficient normal year supply to meet the projected demand in 2030.

The City does not have sufficient water to meet current or future projected water demand during single or multiple dry years. This finding is consistent with the 2005 UWMP findings and the conclusions presented in the 2003 Integrated Water Plan ("IWP"), which states that the City's water system is inadequate to meet current demand under drought conditions (EKI, March 2011). An annual average deficit of 5% may exist between the City's water supply during a single dry year and the existing water demand (EKI, March 2011). With cumulative water demand, an annual average deficit of 12% between 2010 and 2020, and up to 16% by 2030 may be experienced during a single dry year (Ibid.). Annual average deficits are greater for multiple dry year periods. The annual average deficit between the City's water supply during a second dry year and existing demand is estimated to be 23% to 32% (Ibid.). This deficit increases to 33% to 40% by 2030 if planned development also is taken into account. It is important to note that these deficits are annual average values that do not address peak season cutbacks, which can be significantly greater than the annual average deficits due to seasonal variations in demand and supply, and limitations on the City's water storage facilities.

Supplemental Water Sources. As discussed in the WATER SUPPLY (Chapter 4.5) section of this EIR, the City has been actively considering possible new water supplies for nearly 20 years due to insufficient water supplies to meet existing demand during drought events (City of Santa Cruz Water Department, June 2005). Over 30 water supply options have been considered and evaluated as part of these efforts, culminating with the City adopting the *Integrated Water Plan* (IWP) in 2005 and the *2005 Urban Water Management Plan* (UWMP) in 2006.

The WATER SUPPLY (Chapter 4.5) section of this EIR fully describes the water supply options considered by the City, as well as other planning efforts and plans, and summarizes the IWP and UWMP. As indicated, the IWP and UWMP support conservation, 15% water use curtailment during a drought, and construction of a desalination plant. The City is actively implementing water conservation programs with good results and is pursuing construction of a desalination plant to provide a supplemental water source in drought conditions, with the potential for expansion to accommodate future growth.

The City's current plans support a supplemental water supply for drought protection to be provided by a 2.5 million-gallon-per-day (mgd) desalination plant (expected to be constructed and in operation by 2015) with a potential expansion of up to a total of 4.5 mgd in increments of 1 mgd as further needed. The proposed desalination facility is a joint partnership between the City of Santa Cruz and the Soquel Creek Water District (SqCWD), which is also looking for

a long-term supplemental water source to reduce its reliance on well water and avert the threat of seawater intrusion in local groundwater aquifers. The City recently completed a pilot desalination plant to gather information to establish the optimal design and operating parameter for the future construction and operation of a 2.5-mgd seawater desalination plant. Additional technical studies are currently underway, and design and environmental review for a permanent facility is in progress. A permanent facility is expected to be constructed and in operation by the year 2016, pending completion of project-level environmental review and regulatory permit approvals, i.e., approval of a coastal development permit from the California Coastal Commission.[13] At this time, it is not known when or if the plant would be further expanded to serve future planned growth.

The certified IWP EIR evaluates impacts of the construction of a desalination facility and associated pipelines on a programmatic level for a potential site located along the Delaware Avenue corridor in the City's Westside industrial area. Construction could have physical environmental effects, and the EIR identified potentially significant impacts (as summarized in Chapter 4.5 of this EIR) that could be mitigated to a less-than-significant level, except for temporary construction noise. The IWP EIR also includes a mitigation measure to require further review of population projections and City/County land use planning documents prior to undertaking environmental review of any expansion of a desalination plant in ensure that development of an additional water supply is consistent with planned growth projections (City of Santa Cruz/EDAW, June and October 2005).

The IWP EIR also evaluated cumulative impacts related to a construction and operation of a desalination plant in combination with other known development projects, road and infrastructure projects, and regional water programs and projects. Significant cumulative impacts that were identified include the following. All other cumulative impacts were found to be less than significant or less than significant with compliance and adherence to required regulations and mitigation standards. The project-level environmental review that is currently being conducted will further review and analyze cumulative impacts.

- *Groundwater Impacts:* Continued impacts to the groundwater basin with potential saltwater intrusion for the alternatives that did not include Soquel Creek Water District use of the desalination plant and rely on continued groundwater pumping.
- *Biological Resources:* Potential impacts to sensitive habitats and special status species as a result of project siting, construction and/or operation could be mitigated with pre-construction surveys, establishment of buffer zones and other construction controls.
- *Construction Traffic:* Potentially significant cumulative traffic impacts were identified if the desalination plant construction coincided with other major infrastructure improvements, especially the Highway 1/17 Merge Project. The EIR includes mitigation to coordinate construction schedules. However, as of the writing of this EIR, the desalination construction would occur after the completion of the Highway 1 project.

[13] Other potential permits, approvals and/or consultations for a permanent desalination plant and supporting infrastructure (i.e., intake facility and distribution pipeline) may be required from various agencies, including, but not limited to U.S. Fish and Wildlife Service, State Lands Commission, and California Department of Health Services.

The City's adopted IWP and UWMP identified seawater desalination as the only feasible alternative for a backup supply of drinking water during a drought. Several possible options were carefully evaluated, including drilling more wells, upgrades to the north coast system, recycled water and a water transfer involving exchange of groundwater with recycled wastewater for agricultural use on State Park lands north of the City. Both the wells and groundwater exchange concept ultimately proved infeasible. The maximum yield from four combined groundwater sources was found to yield 300 MGY or less during drought conditions (Carollo Engineers, November 2000). Overall, groundwater is potentially available but in a limited quantity, but none of the potential groundwater resources can provide a significant portion of the projected drought demand shortfall (Ibid.). Additionally, there were other environmental, regulatory and/or cost issues associated with some groundwater options that would affect overall feasibility for implementation.

Three alternatives were recommended for further review: desalination, wastewater reclamation, and maximizing use of existing sources and storage in Loch Lomond Reservoir. Recycled wastewater was determined potentially feasible for irrigation, including agricultural irrigation, but would produce limited yields (approximately 230 MGY) that were considered too small to meet the City's drought year needs and at a high cost. Improvements to maximize use of existing water sources and storage were identified, that collectively could provide approximately 600 MGY during a two-year drought. The upgrades would provide additional supply during drought and non-drought years and would also improve operational reliability and flexibility, but shortfalls during multiple-dry-year scenarios would continue to occur (Carollo Engineers, November 2000).

Thus, seawater desalination was the only practicable solution available to the City to meet drought and future demands. The WATER SUPPLY (Chapter 4.1) section of this EIR also discusses other supplemental water supplies that have been evaluated over the past 20± years and found to be not viable at the present time. These include several groundwater pumping options, conjunctive use with Soquel Creek Water District, and reservoir storage at the Olympia Quarry in the San Lorenzo Valley. The City's UWMP indicates that in addition to pursuing desalination, the City remains open to exploring other water supply alternatives that would not be feasible to develop in the short-term, but may be useful to consider over a 20-year timeframe, such as water recycling, groundwater recharge, reservoir expansion, aquifer storage and recovery and off-stream storage.

In addition to the IWP programs the City is pursuing, the City provides an annual review of water use and trends, and is required to update the UWMP every five years. Through these efforts, water demand trends and needs can be effectively monitored to ensure that other water supply options can be considered and planned as may be needed.

> **Conclusion.** Cumulative development and growth in the City's water service area would result in a significant cumulative water impact, as it results in additional demand in a system that does not currently have adequate water supplies to meet existing or future demands during drought conditions or potentially during normal years at some time after the year 2020, depending on the actual rates of growth and water demand rates experienced up to that time. The City's supplies are sufficient to meet cumulative water demands in a normal year through to the year 2030 if overall water use remains

at 2007-2008 levels. However, If water demand is consistent with historic water use between 1999 and 2004, the City's total demand will be approximately 223 MGY greater than the available normal year supply of 4,314 MGY in 2030 (EKI, March 2011). Thus, cumulative development and growth would result in a significant cumulative impact during dry years from now through 2030 without supplemental supplies and potentially during normal years after the year 2020. The demand resulting from development accommodated by the proposed *General Plan 2030* represents nearly half of the increase in the future cumulative water demand. The project's incremental contribution is therefore considered "cumulatively considerable" and thus significant in and of itself.

The incremental project water demand would be minimized with implementation of the proposed *General Plan 2030* policies and actions to reduce water demand, promote additional water conservation, manage and protect water supplies, and develop a reliable, supplemental water source, such as desalination, the impact could be reduced to a less-than-significant level. However, despite the City's intent to pursue an additional water supply for dry-year conditions, there are some uncertainties associated with these future actions.

The City's adopted IWP calls for conservation, curtailment during droughts and a supplemental water supply at a new desalination plant. The facility would provide a supplemental water supply during periods of drought and could be expanded in the future to provide additional water to accommodate growth planned within the City's water service area. As indicated above, the City acknowledges some uncertainty related to the approval of and timing for the construction of the permanent desalination plant construction and operation as design plans have not been completed, as well as uncertainty as to whether the Coastal Commission would issue the necessary approvals. The project is currently undergoing a project-level design and environmental review. For these reasons, the City concludes that it cannot "confidently determine" that this source "reasonably likely," as spelled out in the guidance provided by the California Supreme Court in its decision in *Vineyard Area Citizens for Responsible Growth, Inc., et al. v. City of Rancho Cordova* (2007) 40 Cal.4th 412. Nonetheless, the City has identified a desalination plant as its best, potentially feasible option to alleviate shortages in drought conditions and as a potential additional normal-year water supply to serve new growth, and therefore has committed to pursuing this option with the intent of obtaining all necessary regulatory approvals. Thus, the future desalination facility, which is planned and being pursued, is considered to be the most likely future water source, although it nonetheless remains somewhat uncertain until design, environmental review and regulatory approvals are completed. Furthermore, to provide capacity for additional growth, the plant would eventually need to be expanded, which would require additional design and engineering, environmental review and permit approvals.

The City acknowledges the inherent uncertainty about its ability to obtain all necessary approvals for the planned desalination facility. Furthermore, surface water supplies may be reduced due to implementation of wildlife protection strategies under a future HCP, which may require that the City seek additional supplies and/or expansion of a desalination facility beyond that capacity which is currently planned for drought supply.

RESOURCES AND HAZARADS

Noise. Potential cumulative development that could result in or be affected by noise includes development and growth at UCSC as set forth in the University's adopted 2005 LRDP and CLRDP. Future site-specific development at UCSC would not be in proximity to other development within the City, and thus, there would be no cumulative impact related to new development being sited in locations that could exceed standards for compatible noise or for construction-related noise impacts. The 2005 LRDP EIR found that traffic resulting from UCSC campus development could increase noise levels along arterial roads serving the campus by about to 1.0 to 2.5 decibels above estimated existing noise levels (University of California Santa Cruz, September 2006 – Volume II: Draft EIR, page 4.10-18 to 4.10-19). The addition of UCSC-related traffic noise to the City's model noise contours shows that potential noise increases along the major roads serving the University (Mission, High, Western, Delaware) would not exceed significance criteria (i.e., an increase of 3 or more decibels) or result in a significant cumulative impact.

Traffic-related noise increases from future development at UCSC's Marine Science Campus would result in increases of less than 0.5 dBA on most streets within that area with higher increases projected along Delaware in the vicinity of the marine campus. However, noise levels along Delaware would not be above 61 dBA with background traffic and would not exceed conditionally acceptable land use compatibility standards for residential uses (University of California Santa Cruz, January 2004, page 4.11-13).

Review of cumulative traffic conditions was conducted by the City's noise consultant with a review of cumulative noise levels based on cumulative traffic volumes identified in this EIR. It was found that nearly all study road segments would experience a traffic noise increase of less than 3 dBA under cumulative conditions (Goldberg, Rosen, Goldberg, Der & Lewitz, personal communication, August 2011). However, cumulative traffic could result in ambient noise levels exceeding 65 dBA with an increase exceeding 3 dBA along three segments: Swift Street north of Delaware (3.6 dBA increase); Mission Street between Bay and Laurel (3.2 dBA increase), and Mission Street between Laurel and Walnut (3.3 dBA increase). For these road segments, cumulative increase in ambient noise levels would be significant.

The impacted road segments are generally characterized by commercial development. However, there are older existing residences along Mission Street, particularly between Laurel and Walnut Streets and approximately 12 existing homes along Swift Street north of Delaware. New development projects along these road segments would be required to provide building designs to attenuate noise levels. Mitigation measures for existing homes would include construction of sound barriers, which may not be completely effective due to the gaps created at driveways, or soundproofing existing homes with measures such as window replacement. The area along Swift Street, however, is designated for industrial uses, even though some homes currently exist in the area. Additionally, the lands along Mission Street are designated commercial with a segment designated for mixed uses. Although, the impacted segments are designated for non-residential uses, in which a higher ambient sound level typically would be acceptable, the increased cumulative noise effect on existing residents is considered a significant impact to which the project's incremental contribution would be cumulatively considerable. Implementation of proposed *General Plan* 2030 policies and actions to reduce

vehicle trips and overall traffic, as well as travel demand management measures implemented by UCSC, could reduce traffic such that noise increases would be below significance criteria. However, in the event that such trip reductions do not occur, the impact would be considered unavoidable.

> **Conclusion.** Cumulative development and growth would result in noise increases associated with the traffic increases, but the increases would not exceed significance criteria, except for three road segments (Swift Street north of Delaware and Mission Street between Bay and Walnut). Thus, the cumulative noise impact is considered significant, and the project's incremental contribution would be cumulatively considerable.

5.5 PROJECT ALTERNATIVES

CEQA REQUIREMENTS

According to the State CEQA Guidelines (section 15126.6), an EIR shall describe a range of reasonable alternatives to the project or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of potentially feasible project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.

Because an EIR must identify ways to mitigate or avoid the significant effects that the project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. An agency may evaluate on-site alternatives, off-site alternatives or both. (*Mira Mar Mobile Community* v. *City of Oceanside* (2004) 119 Cal.App.4th 477, 489.) However, neither the CEQA statute nor the Guidelines require analysis of off-site alternatives in every case. An agency should consider whether any previous documents sufficiently analyzed alternative locations. If a previous document has evaluated a range of reasonable alternatives for a project with the same basic purpose, the EIR may rely on that document if relevant circumstances have not changed.

The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those potentially feasible alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of

the project. An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative.

It is important to understand that the EIR's analysis of alternatives constitutes the City staff's and consultants' advice and suggestions to the agency's ultimate decision-makers, here, the City Council. The ultimate determination of the actual feasibility of any of the alternatives considered in the EIR is left to the City Council, which may consider a broad range of factors in making its determination. (CEQA Guidelines, § 15091(a)(3).) These factors may include "specific economic, legal, social, technological, or other considerations." (Pub. Resources Code, § 21081(a)(3); see also *City of Marina v. Bd. of Trustees of the California State University* (2006) 39 Cal.4th 341, 369; *City of Del Mar v. City of San Diego* (1982) 133 Cal.App.3d 401, 417 ["the concept of 'feasibility' under CEQA encompasses 'desirability' to the extent that desirability is based on a reasonable balancing of the relevant economic, environmental, social, and technological factors"].)

Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

This section evaluates alternatives to the proposed project as required by CEQA. The State CEQA Guidelines (Section 15126.6) requires that an EIR describe and evaluate the comparative merits of a range of reasonable alternatives to the project, or to the location of the project, which could feasibly attain most of the basic objectives of the project. The guidelines further require that the discussion focus on alternatives capable of eliminating significant adverse impacts of the project, or reducing them to a level of insignificance even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. The alternatives analysis should also identify any significant effects that may result from a given alternative.

SUMMARY OF SIGNIFICANT IMPACTS & PROJECT OBJECTIVES

Significant Project Impacts

This EIR identified seven significant project impacts and four significant cumulative impacts to which the project's contribution is cumulative considerable as summarized below.

- **Transportation & Traffic -** *Impact 4.4-1: Traffic Impacts on Intersections Levels of Service (LOS).* Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic, resulting in changes in intersection levels of service to unacceptable levels or further deterioration of intersections currently operating at unacceptable levels of service. With implementation of proposed *General Plan 2030* policies and actions, including road improvements identified in an updated Traffic Impact Fee program, intersection

operations would be improved and traffic levels would be reduced, except at eight intersections.

- **Transportation & Traffic** - *Impact 4.4-2: Traffic Impacts on State Highway Levels of Service (LOS).* Adoption and implementation of the proposed *General Plan 2030* would accommodate future development that would result in increased vehicle trips and traffic on state highways in the regions (Routes 1, 17, and 9), which would further exacerbate existing unacceptable levels of service.

- **Water Supply** - *Impact 4.5-1 Water Supply:* Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would result in an increased demand for water supply in a system that currently has inadequate supplies during dry years and may have inadequate supplies in normal years in the future.

- **Public Services & Utilities** - *Impact 4.6-4 Schools:* Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased development and population growth that would generate elementary school student enrollments that could exceed capacity of existing schools.

- **Cultural Resources** - *Impact 4.9-1: Archaeological Resources and Human Remains.* Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could directly or indirectly disturb or alter archaeological resources, historical archaeological, and/or human remains. Even with implementation of the proposed General Plan policies and actions for cultural resource protection, this is considered a potentially significant impact.

- **Cultural Resources** - *Impact 4.9-3: Paleontological Resources.* Adoption and implementation of the proposed General Plan 2030 would accommodate future development that could directly or indirectly disturb or alter paleontological resources. Even with implementation of the proposed policies and actions for cultural resource protection, this is considered a potentially significant impact.

- **Air Quality** - *Impact 4.11-1 Consistency with AQMP.* Adoption and implementation of the General Plan 2030 could indirectly result in increased population associated with potential development that would be accommodated by the Plan. The increased population would exceed population estimates in the Air Quality Management Plan in 2030, and thus the project would be inconsistent and conflict with the AQMP.

- **Cumulative Impacts:**
  - Population Growth
  - Traffic
  - Water
  - Noise

Project Objectives

The primary project objective is to update the City's General Plan, consistent with state law, and guided by the City's vision. This vision and guiding principles for *General Plan 2030* have been distilled into the following project objectives for the purposes of CEQA.

1. *Protect the unique environmental setting of the City, its natural and established open space, and the sustainable use of its natural resources.*
2. *Maintain the identity and vitality of existing neighborhoods, while actively pursuing affordable housing for a diversity of households and promoting compatible livability and high quality design in new buildings, major additions, and redevelopment.*
3. *Seek a mutually beneficial relationship with UC Santa Cruz, one where the City supports the University within the context of City responsibilities, community priorities, and the constraints of City infrastructure and resources; and one in which the University reciprocally supports the City by comprehensively addressing all of its needs to the greatest extent possible on the campus itself, and by fully mitigating whatever off-campus community impacts occur.*
4. *Provide an accessible, comprehensive, and effective transportation system that integrates automobile use with sustainable and innovative transportation options—including enhanced public transit, bicycle, and pedestrian networks throughout the community.*
5. *Ensure a sustainable economy for the community, actively encouraging the development of employment opportunities for residents of all levels and ages, and actively protecting from elimination current and potential sources of sustainable employment.*
6. *Encourage diverse technology, visitor serving, industrial, home business and commercial business enterprises, and strategic redevelopment.*
7. *Maintain the community's longstanding commitment to shared social and environmental responsibility, fostering a balance between employment, housing affordable to persons of all income levels, transportation, and natural resources.*
8. *Support education through the City's schools, educational systems and programs, library system and facilities, life-long learning community programs, and active communication/information network.*
9. *Support the City's arts community, unique historic areas and landmarks, cultural heritage and resources, and recreational facilities and community programs.*
10. *Offer high-quality social services and improve and maintain City infrastructure, community safety, and emergency preparedness.*
11. *Encourage citizen participation in government, respectful cooperation and mutual regard among residents, workers, students, and visitors, and shared responsibility for community well-being.*

ALTERNATIVES CONSIDERED

Section 15126.6(c) of the State CEQA Guidelines indicates that the range of potential alternatives shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are:

- failure to meet most of the basic project objectives,
- infeasibility, or
- inability to avoid significant environmental impacts.

Alternatives were considered that would result in a substantial reduction or elimination of identified significant unavoidable traffic, water and cumulative impacts, as well as the five identified significant impacts that could be reduced to a less-than-significant level with mitigation measures outlined in this EIR. In addition to the required No Project Alternative, these alternatives include a reduced growth rate alternative (Alternative 2) and a reduced land use density or intensity alternative (Alternative 3).

Due to the comprehensive nature of the proposed *General Plan 2030* policies and actions, the City did not identify any particular alternative policy strategy or strategies that could provide a feasible alternative under CEQA's criteria. Rather, the City focused on potentially feasible alternatives aimed at achieving different levels or patterns of growth across the City as a whole, consistent with the broad scope of the General Plan. Alternatives that would shift development to other areas also were reviewed, and it was concluded that such alternatives would result in increased localized impacts without reducing water demand or substantially reducing traffic. Consideration of expansion of the City limits and accompanying future development to the west or north was rejected due to long-standing policies and directives to protect agricultural and open space lands in the area to the west, as well as policies to maintain the City's greenbelt and current compact urban form. Additionally, expansion to the west would not reduce, but would further increase, traffic along Mission Street-Highway 1 and would not reduce or eliminate the significant unavoidable impacts related to traffic. Furthermore, the area to the north is mostly developed with little area for future development and has environmental constraints related to slopes and biological resources that could result in significant impacts.

Intensification of land use in the City's existing Sphere of Influence along Seventh Avenue also was eliminated from further consideration as this area is within the unincorporated County jurisdiction, and it is uncertain as to whether future development would annex and thus, be subject to City policies. Intensification of development at this location would not result in changes to water demand, and while there may be some shift of traffic impacts from the Westside of Santa Cruz, it likely would not substantially change traffic levels of service on impacted streets and could result in new significant impacts along Seventh Avenue.

ALTERNATIVES ANALYSIS

ALTERNATIVE 1: No Project

Section 15126.6(e) of the State CEQA Guidelines requires that the impacts of a "no project" alternative be evaluated in comparison to the proposed project. The Guidelines indicate that the EIR should discuss the existing conditions at the time the notice of preparation is published, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

PROJECT CHARACTERISTICS

Under the "No Project" Alternative, the City's existing 1990-2005 General Plan would remain in effect. As a result, the new mixed-use land use designations along the City's main transportation corridors and changes in land use designations at the Swenson and Golf Club Drive sites would not occur. Existing policies would be retained.

Since the existing General Plan would be retained under the No Project Alternative, some level of future development would be accommodated by the plan. As described in the LAND USE (Chapter 4.1) section of this, buildout projections to the year 2030 under the City's existing General Plan were estimated as 1,816 residential units and approximately 2,860,000 square feet of non-residential uses. This amount of development would result in a population increase of approximately 4,360 residents, based on the City's existing average household size, and approximately 7,565 employees. Table 5-3 summarizes key differences between the proposed project and the project alternatives with regards to potential development, population, and major impacts.

Under this alternative, residential development would be about half the amount that is projected under the proposed *General Plan 2030*. Total commercial and office development would be about the same as the proposed project, and industrial development would be slightly higher. Generally, the changes occur along the City's major transportation corridors (Mission, Ocean, Soquel and Water) as well as in the Harvey West and Golf Club Drive areas. The elimination of the proposed mixed-used land use designations would result in a decrease in housing units with a slight increase in commercial square footage along these corridors. The reduction in housing units also is attributed to maintaining existing residential densities in the Golf Club Drive area and fewer units at the Swenson site (80 maximum per the existing General Plan). Industrial uses are projected to increase in the Harvey West area without a potential large regional retail use as supported in the proposed *General Plan 2030*.

IMPACTS

Land Use and Development. Overall, land use development would be reduced under this alternative. No significant land use, population, housing or aesthetics impacts were identified for the proposed *General Plan 2030*. No changes in the less-than-significant land use impacts would be expected as development would continue to be infill and no land use incompatibilities would be generated. The No Project Alternative would result in reduced development and growth, and thus, population growth would be further reduced. Although the

mixed-use land use designations would be eliminated, mixed-use projects could still be developed within commercial zones under existing General Plan designations and Zoning Ordinance regulations. Typically, these types of projects would be developed under the Planned Development regulations that include design review and require Design Permits. Thus, potential impacts to the visual quality of the surrounding area would not be expected to change.

TABLE 5-3
Comparison of Alternatives

	PROPOSED PROJECT GP 2030 Buildout	ALTERENATIVE 1 NO PROJECT Existing GP	ALTERNATIVE 2 AMBAG Growth	ALTERNATIVE 3 Reduced Density
Dwelling Units	3,350	1,816	2,413	2,750
Total Non-Residential Square Footage	3,145,000 SF	2,870,000 SF	3,000,00 SF	3,125,000 SF
Commercial	1,090,000 SF & 310 Hotel Rooms	1,050,000 SF & 310 Hotel Rooms	Reduced by 50,000 SF from Proposed GP 2030 OR	970,000SF
Office	1,275,000 SF	940,000 SF	Reduced by 30,000 SF from Proposed GP 2030	1,275,000 SF
Industrial	780,000 SF	880,000 SF	Same as Proposed Project	880,000 SF
POPULATION INCREASE [From 2009]	8,040	4,360	5,790	6,600
EMPLOYEE INCREASE [From 2009]	8,665	7,565	8,082 [2010-2030]	8,645
TRAFFIC	21 intersections impacted; all can be improved to acceptable LOS except for 8 intersections.	20 intersections impacted; 5 improved over project levels. All Can be improved to acceptable LOS except for 5 intersections.	Impacts estimated to be between the No Project and Project levels.	Same as or similar impacts to Proposed Project
WATER DEMAND	239 MGY	174 MGY	200-203 MGY	210 MGY
SCHOOLS Elementary Students	915	495	660	750

Public Facilities and Services. As indicated above, the No Project Alternative would result in a reduced level of development than under the proposed *General Plan 2030*. Overall, traffic and public service demands would be reduced. The LOS for the majority of the study intersections remain at the same acceptable levels of service as with the proposed project (see Appendix C). Table 5-4 identifies the intersections in which there are changes in PM peak hour intersection levels of service (LOS) with the No Project Alternative. Overall, 14 intersection levels of service would improve to a better level. However, 20 intersections would continue to operate at unacceptable levels of service under this alternative, compared to 21 with the proposed project, although four intersections would improve from F to E (Mission/Laurel, Mission/King-Union, Ocean/Broadway, and Branciforte/Water). The Branciforte/Soquel intersection would improve from an unacceptable E LOS to D. Under project conditions, it was found that eight intersections would continue to operate at deficient levels of service even with improvement. Under the No Project Alternative, three of these intersections could be improved to an acceptable LOS: Bay/Mission, Western/High and Seabright/Water. Thus, this alternative would result in five intersections that could not be improved to an acceptable LOS. Traffic along state highways also would be reduced under this alternative, but would continue to contribute traffic to existing and future projected impacted segments along Highways 1 and 17. While traffic increases would be reduced, the No Project Alternative would not eliminate the significant unavoidable project and cumulative traffic impacts related to intersection LOS and traffic along state highways.

Water demand also would decrease to approximately 174 million gallons per year (MGY) under the No Project Alternative. This represents a reduction in demand of approximately 65 MGY compared to the proposed project. Under this alternative, total water demand within the City's water service area in 2030 would range between approximately 3,980 and 4,470 MGY. With a current estimated normal year supply of approximately 4,300 MGY, the No Project Alternative would continue to create a demand that could potentially exceed normal year supplies if future demand proceeds at historic rates. The demand would also exceed currently available dry year supplies of 3,800 MGY under a single-dry year and 2,700 MGY under a multiple dry year condition. Thus, while overall water demand would be reduced, the No Project Alternative would not eliminate the significant unavoidable project and cumulative water demand impacts under existing and future drought and potential future normal year conditions.

The No Project Alternative would result in reduced development and population growth, and thus, would result in incremental reductions in public service demands, wastewater generation, solid waste disposal, student generation, and energy use. These impacts were identified as less-than-significant, and would be further reduced. However, one significant impact was identified related to elementary school student generation and the potential for school enrollments to exceed capacity depending on the rate and timing of enrollments. Under the No Project Alternative, elementary school student enrollments would be reduced by nearly half the amount identified for the proposed *General Plan 2030*, thus substantially reducing future elementary school enrollments as compared to the proposed project and reducing the impact to a less-than-significant level.

TABLE 5-4
Intersection PM Peak Hour Levels of Service
Changes with *NO PROJECT*

	Intersection	PM Peak LOS with Project	PM Peak LOS with No Project
SIGNALIZED INTERSECTIONS			
4	Almar-Younglove/Mission	C	B
5	**Bay/Mission**	**F**	**F**
6	**Laurel/Mission**	**F**	**E**
7	Walnut/Mission	D	C
c	**King-Union/Mission**	**F**	**E**
9	**Chestnut-Hwy. 1/Mission**	**F**	**F**
18	Pacific/Laurel	D	C
c	Front/Laurel	D	C
28	**River/Hwy. 1**	**F**	**F**
29	**River/Encinal**	**F**	**F**
31	Riverside/San Lorenzo	D	C
34	**Ocean/San Lorenzo-East Cliff**	**F**	**F**
35	**Ocean/Broadway**	**F**	**E**
37	**Ocean/Water**	**F**	**F**
41	**N. Branciforte/Water**	**E**	**E**
42	**Branciforte/Soquel**	**E**	D
45	Seabright/Broadway	C	B
46	**Seabright/Murray**	**E**	**E**
UNSIGNALIZED INTERSECTIONS			
59	**Bay/California St**	**F**	**F**
60	**Bay/California Ave**	**F**	**F**
62	**Beach/Pacific Ave**	**E**	**E**
63	Pacific Avenue/Center	C	B
64	Storey/King	D	C
65	**River/Fern**	**F**	**F**
66	King/Laurel	D	C
67	**Laurent/High**	**F**	**F**
71	Cedar/Laurel	D	C
72	**Bay/Escalona**	**F**	**F**
73	**Western/High**	**F**	**F**
76	**Seabright/Water**	**F**	**F**
77	**Swift and Delaware**	**F**	**F**

Shaded areas denote intersections with improved LOS compared to the proposed *General Plan 2030* levels of service.

With the overall reduction in development under this alternative, there would be less of an increase in impervious surfacing with a reduced volume of stormwater runoff and associated storm drainage facility and water quality issues. Since most of the reduction in potential development is concentrated along the road corridors and Harvey West area, exposure to flood hazards would not substantially change or could be slightly reduced. However, all identified impacts related to hydrology, storm drainage and water quality were identified as being less than significant, but could be further reduced under this alternative.

Resources and Hazards. No significant impacts were identified related to biological resources. This alternative would result in a reduction in development potential, primarily within the urbanized areas. Areas in which potential biological impacts could occur would be the vacant and underutilized Swenson site and Golf Club Drive area. Existing land use designations would be retained on these sites, and existing General Plan policies and other City plans would continue govern future development siting so that significant biological impacts would not be expected.

Potentially significant impacts related to cultural resources (archaeology and paleontology) were identified with regards to lack of definition of a process to review such resources as part of future development proposals. These impacts would be eliminated under the No Project Alternative as the existing General Plan does provide a policy to guide this review (Cultural Resources 1.2, 1.2.2, 1.2.2.1).

This alternative would result in reduction of overall buildout, and thus, would result in reduced traffic-generated noise and criteria pollutant and greenhouse gas emissions, all of which were identified as less-than-significant impacts. The No Project Alternative would eliminate the significant impact related to consistency with the Air Quality Management Plan as the total population would be within the plan's forecasts, and thus, consistent with the plan.[14]

Exposure to geologic, seismic and soils hazards and constraints would generally remain unchanged, although overall development potential would be reduced. Similarly, exposure to hazardous materials would generally remain the same as with the proposed project as the overall commercial square footage is similar. However, industrial uses within the Harvey West area would increase slightly, with a potential slight increase in exposure to hazardous materials. However, with implementation of state and local regulations that regulate use and disposal of such materials, the impact would continue to be expected to be less-than-significant.

Cumulative Impacts. As indicated, the No Project Alternative would not eliminate significant, unavoidable impacts related to traffic and water supply, and the project's incremental contribution to significant cumulative traffic and water impacts would continue to be cumulatively considerable. The significant cumulative population growth impact associated with the proposed project would be reduced and would not be a significant cumulative impact, as cumulative population would be within historic growth rates (0.7%), even if the North Campus area of UCSC were annexed to the City at some point in the future. With a reduction in development and resulting traffic decreases, the cumulative noise increase along a portion of

[14] The No Project Alternative would add 4,360 residents to the City's existing (2009) population of 58,982 for a total of 63,342 which is less than AMBAG's forecast population for 2030 of 65,884 residents within the City.

Mission Street and Swift Street could be reduced to a less-than-significant cumulative impact as the noise increases that were found to be significant only slightly exceeded the 3 dBA increase significance criteria.

ABILITY TO MEET PROJECT OBJECTIVES

This alternative would meet the basic project objectives to protect the City's environment (#1) and neighborhoods (#2) and provide an accessible transportation system (#4), as well as the existing General Plan includes policies and programs in support of these objectives. The No Project Alternative partially meets the objective of fostering a reciprocal relationship with UCSC (#3). The existing General Plan includes Goal UC1 in Volume II of the 1990-2005 plan summary of the LRDP that states: "Work with UCSC to minimize and mitigate the adverse effect of its growth on the community, while encouraging active cooperation on jointly beneficial projects." Thus, the existing General Plan contains similar policy direction regarding UCSC, but it is not as strong as the guiding principles in the proposed *General Plan 2030*. The remaining project objectives (#5 through 10) generally addressed economic and social visions for the City, not environmental or land use objectives.

This alternative would not support the "sustainable" land use patterns that are promoted and emphasized in the proposed *General Plan 2030* policies as the new mixed-use land use designations would be eliminated under this alternative, and thus, would not fully meet transportation (#4) or affordable housing (#2) objectives. In considering alternative land use designations for the draft *General Plan 2030*, both the General Plan Advisory Committee and Planning Commission recommended the *General Plan 2030*'s land use map to the City Council. In doing so, both advisory bodies preferred that future residential growth be accommodated along the major corridors of the City through the assembly of parcels that could be redeveloped with mixed use development. To encourage such development, nodes were identified along the major corridors where larger sites could be created through the assembly of individual parcels. This approach is used in most cities that are near buildout. Development would encourage transit use by residents and also support the sustainability of transit by increasing ridership. The objective is to move toward higher density land uses that support transit instead of lower density auto centric development. This type of land use would also encourage affordable work force housing in the upper floors while maintaining commercial uses on the ground floor (#2, #4, and #5). The need for the development of new affordable workforce housing and sustainable economic development are mutual actions identified to carry out the goals of the proposed *General Plan 2030*.

ALTERNATIVE 2: Reduced Growth

PROJECT CHARACTERISTICS

This alternative assumes that growth would occur as forecast by AMBAG under which 2,413 new housing units are projected between 2009 and 2030, which would result in a population increase of 5,790 residents. Under AMBAG forecasts, the City would experience an increase of approximately 8,080 new employees between 1990 and 2030, which is slightly lower than, but similar to, the estimates of 8,175 employees under the proposed *General Plan 2030*. This reduction represents approximately 95 employees, which would generally correspond to approximately 50,000 square feet in commercial use or approximately 30,000 square feet of

office space. This alternative represents a reduction of housing by approximately one-third, as compared to the proposed project, with a similar, but slightly lower level of non-residential development. It is assumed that the reduction in housing would occur throughout the City without any concentration in one particular area. Alternative 3 reviews a reduced land use density/intensity scenario for specific areas. Table 5-3 summarizes key differences between the proposed project and the project alternatives with regards to potential development, population, and major impacts.

IMPACTS

Land Use and Development. Overall, residential development would be reduced under this alternative. No significant land use, population, housing or aesthetics impacts were identified for the proposed *General Plan 2030*. Development under this alternative would continue to be infill, and would not result in division of an established community. The impact related to potential land use incompatibilities due to allowing "community service facilities" in all districts would remain, although it was found to be less than significant, with a recommendation that the General Plan text be modified to delete this language.

This alternative would result in a reduced level of population growth (5,790) compared to the proposed project (8,040). The City's population in 2030 would be 64,772, which is within AMBAG's adopted forecast of 65,884 in the year 2030. Since this alternative includes development of housing units consistent with AMBAG's projections, this alternative also results in a population increase similarly consistent with these forecasts.

There would be no changes to aesthetic impacts, as scenic views and resources would be continue to be protected with proposed General Plan policies and actions. A reduced level of development could potentially reduce impacts related to degradation of the visual quality of a surrounding area as structural development would be reduced. However, with implementation of proposed policies and actions, this was not determined to be a significant impact of the proposed project.

Public Facilities and Services. Overall, traffic and public service demands would be reduced with the reduction in growth (and accompanying development) considered under this alternative. However, while traffic would be reduced, it is not expected that it would be reduced to a level that would eliminate all significant unavoidable project or cumulative impacts. Development under this alternative would result in residential development that is about midway between the proposed project and the no project alternative levels although non-residential development is similar to the proposed project. The No Project Alternative resulted in five intersections remaining at an unacceptable LOS compared to eight under the proposed project. It is expected the intersection LOS under this alternative would generally be somewhere between the No Project and Project levels. Traffic along state highways also would be reduced under this alternative, but would continue to contribute traffic to existing and future projected impacted segments along Highways 1 and 17. Thus, while traffic increases would be reduced, this alternative would not eliminate the significant unavoidable project and cumulative traffic impacts related to intersection LOS and traffic along state highways.

Water demand also would decrease to approximately 200-203 million gallons per year (MGY) under this alternative. This represents a reduction in demand of approximately 35-39

MGY compared to the proposed project, depending on whether non-residential use reductions occur within the commercial or office sector. Under this alternative, total water demand within the City's water service area in 2030 would range between approximately 4,010 and 4,500 MGY. With a current estimated normal year supply of approximately 4,300 MGY, this alternative would continue to create a demand that could potentially exceed normal year supplies after the year 2025, if future demand proceeds at historic rates. The demand would also exceed currently available dry year supplies of 3,800 MGY under a single-dry year and 2,700 MGY under a multiple-dry year condition. Thus, while overall water demand would be reduced, the No Project Alternative would not eliminate the significant unavoidable project and cumulative water demand impacts under existing and future drought and potential future normal year conditions.

The Reduced Growth Alternative would result in reduced development and population growth, and thus, would result in incremental reductions in public service demands on parks, fire and police services, wastewater generation, solid waste disposal, student generation, and energy use. These impacts were identified as less-than-significant, and would be further reduced. However, one significant impact was identified related to elementary school student generation and the potential for school enrollments to exceed capacity depending on the rate and timing of enrollments. Under this alternative, elementary school student enrollments would be reduced by nearly one-third the amount identified for the proposed *General Plan 2030* with 660 estimated elementary school children under this alternative compared to 915 with the proposed project. Thus, the project would reduce future elementary school enrollments by 30% as compared to the proposed project. The existing school capacity of 2,329 students is currently exceeded by approximately 295 students. Depending on the rate of growth and development, student enrollments under this alternative would be reduced, but the level of impact may remain at significant. Payment of school impact fees would continue to be required.

With the overall reduction in development under this alternative, there would be less of an increase in impervious surfacing with a reduced volume of stormwater runoff and associated storm drainage facility and water quality issues. However, all identified impacts related to hydrology, storm drainage and water quality were identified as being less than significant, but could be further reduced under this alternative.

Resources and Hazards. No significant impacts were identified related to biological resources. This alternative would result in a reduction in development potential, primarily within the urbanized areas. Implementation of the proposed General Plan policies and other City plans would continue to govern future development siting so that significant biological impacts would not be expected.

Potentially significant impacts related to cultural resources (archaeology and paleontology) were identified with regards to lack of definition of a process to review such resources as part of future development proposals. These impacts would not be eliminated under this alternative as there would be no change in the General Plan text or policies. The recommendations to modify the proposed policies to better articulate future review processes would continue to be warranted.

This alternative would result in reduction of overall buildout, and thus, would result in reduced traffic-generated noise and criteria pollutant and greenhouse gas emissions, all of which were

identified as less-than-significant impacts. This alternative also would eliminate the significant impact related to consistency with the Air Quality Management Plan as the total population would be within the plan's forecasts, and thus, consistent with the plan.[15]

Exposure to geologic, seismic and soils hazards and constraints would generally remain unchanged, although overall development potential would be reduced. Similarly, exposure to hazardous materials would generally remain the same as with the proposed project as the overall non-residential square footage is similar to t he proposed project. However, with implementation of state and local regulations that regulate use and disposal of such materials, the impact would continue to be expected to be less-than-significant.

Cumulative Impacts. As previously indicated, this alternative would not eliminate significant, unavoidable impacts related to traffic and water supply, and the project's incremental contribution to significant cumulative traffic and water impacts would continue to be cumulatively considerable. The significant cumulative population growth impact associated with the proposed project would be reduced and would not be a significant cumulative impact, as cumulative population would be within historic growth rates (0.7%), even if the North Campus area of UCSC were annexed to the City at some point in the future. With a reduction in development and resulting traffic decreases, the cumulative noise increase along a portion of Mission Street and Swift Street could be reduced to a less-than-significant cumulative impact as the noise increases that were found to be significant only slightly exceeded the 3 dBA increase significance criteria.

ABILITY TO MEET PROJECT OBJECTIVES

This alternative would meet the basic project objectives to protect the City's environment (#1) and neighborhoods (#2) and foster a reciprocal relationship with UCSC (#3). The remaining project objectives (#5 through 10) generally addressed economic and social visions for the City, not environmental or land use objectives, and could be met with the reduced development described in this alternative.

This alternative supports the "sustainable" land use patterns that are promoted and emphasized in the proposed *General Plan 2030* policies as there is no change in mixed-use land use designations, however, a lower level of growth would occur under this alternative. While the growth rate is consistent with AMBAG's projections (approximately 0.6% average growth per year), this level is not consistent with historic growth rates in the City. Since 1990, the City has experienced about a 0.9-1.0% average annual growth rate. Thus, this alternative may not adequately account for the level of development that could reasonably be expected within the General Plan's timeframe.

As a result of reduced growth, this alternative would not fully meet the transportation objective (#4) or affordable housing objective (#2 as it would potentially provide a lesser opportunity for mixed-use redevelopment along the City's major corridors as overall development and growth would be reduced throughout the City. As indicated in the "Alternative 1 – No Project

[15] The No Project Alternative would add 4,360 residents to the City's existing (2009) population of 58,982 for a total of 63,342 which is less than AMBAG's forecast population for 2030 of 65,884 residents within the City.

Alternative" discussion above, both the General Plan Advisory Committee and Planning Commission recommendations preferred that future residential growth be accommodated along the major corridors of the City with the objective is to move toward higher density land uses that support transit and also encourage affordable workforce housing in the upper floors while maintaining commercial uses on the ground floor (#2, #4, and #5). The need for the development of new affordable workforce housing and sustainable economic development are mutual actions identified to carry out the goals of the proposed *General Plan 2030* that would not be fully supported with this alternative.

ALTERNATIVE 3: Reduced Land Use Density/Intensity

PROJECT CHARACTERISTICS

This alternative assumes a reduction in land use density or intensity in the following areas:

- Reduce density along transit corridors and/or eliminate specified segments of mixed use designations to include removal of a mixed use segment along Mission between Bay Street and Walnut Avenue and changing the proposed mixed-use high density designated along Soquel Avenue to a mixed-used medium density designation.
- Maintain existing General Plan land use designations (and density) at Swenson site and Golf Club Drive area, both of which are currently designated for low density residential uses.
- Eliminate support of large retail commercial in Harvey West area.

These changes result in the reduction of residential uses by approximately 600 dwelling units. It assumes a reduction of approximately 85 units along Mission Street and 310 units along Soquel Avenue with the above changes in the mixed-use land use designations. The change from mixed-use high density to medium density along Soquel would also reduce the overall floor area ratio (FAR) and dwelling unit density. Maintaining existing land use designations of Low Density Residential at both the Swenson site and Golf Club Drive area would further reduce potential residential units by 205 units. The elimination of policy support for a large regional commercial use in the Harvey West area would reduce commercial square footage by approximately 120,000 square feet with a corresponding increase in industrial square footage; the total number of employees would be similar to the proposed project. Table 5-3 summarizes key differences between the proposed project and the project alternatives with regards to potential development, population, and major impacts.

IMPACTS

Land Use and Development. Overall, residential development would be reduced under this alternative. No significant land use, population, housing or aesthetics impacts were identified for the proposed *General Plan 2030*. Development under this alternative would continue to be infill, and would not result in division of an established community. The impact related to potential land use incompatibilities due to allowing "community service facilities" in all districts would remain, although it was found to be less than significant, with a recommendation that the General Plan text be modified to delete this language. This alternative would result in a reduced level of population growth (6,600) compared to the

proposed project (8,040). The City's population in 2030 would be 65,582, which is within AMBAG's adopted forecast of 65,884 in the year 2030.

The reduction of density and land use intensity along two mixed-use segments could potentially reduce impacts related to degradation of the visual quality of a surrounding area as structural development would be reduced. However, with implementation of proposed policies and actions, this was not determined to be a significant impact.

Public Facilities and Services. Overall, traffic and public service demands would be reduced with the reduction in development considered under this alternative. While traffic would be reduced, it is not expected that it would not be reduced to a level that would eliminate significant unavoidable project or cumulative impacts, as even the No Project Alternative (with substantially lower estimated development), did not result in a substantial improvement to intersection or highway conditions. Thus, while traffic increases would be reduced, this alternative would not eliminate the significant unavoidable project and cumulative traffic impacts related to intersection LOS and traffic along state highways.

Water demand also would decrease to approximately 210 million gallons per year (MGY) under this alternative. This represents a reduction in demand of approximately 29 MGY compared to the proposed project. Under this alternative, total water demand within the City's water service area in 2030 would range between approximately 4,015 and 4,500 MGY. With a current estimated normal year supply of approximately 4,300 MGY, the No Project Alternative would continue to create a demand that could potentially exceed normal year supplies if future demand proceeds at historic rates. The demand would also exceed currently available dry year supplies of 3,800 MGY under a single-dry year and 2,700 MGY under a multiple-dry year condition. Thus, while overall water demand would be reduced, the No Project Alternative would not eliminate the significant unavoidable project and cumulative water demand impacts under existing and future drought and potential future normal year conditions.

The No Project Alternative would result in reduced development and population growth, and thus, would result in incremental reductions in public service demands on police, fire and parks, wastewater generation, solid waste disposal, student generation, and energy use. These impacts were identified as less-than-significant, and would be further reduced. However, one significant impact was identified related to elementary school student generation and the potential for school enrollments to exceed capacity depending on the rate and timing of enrollments. Under this alternative, elementary school student enrollments would be reduced by approximately 150 students compared to the proposed *General Plan 2030*. While this would be a reduction, a significant impact on school capacity could still occur, although payment of school impact fees would continue to be a required mitigation measure that would reduce the impact to a less-than-significant level.

With the overall reduction in development under this alternative, there would be less of an increase in impervious surfacing with a reduced volume of stormwater runoff and associated storm drainage facility and water quality issues. However, all identified impacts related to hydrology, storm drainage and water quality were identified as being less than significant, but could be further reduced under this alternative.

Resources and Hazards. No significant impacts were identified related to biological resources. This alternative would result in a reduction in development potential along two mixed-use segments and at the Swenson and Golf Club Drive sites. Implementation of the proposed General Plan policies and other City plans would continue to govern future development siting so that significant biological impacts would not be expected.

Potentially significant impacts related to cultural resources (archaeology and paleontology) were identified with regards to lack of definition of a process to review such resources as part of future development proposals. These impacts would not be eliminated under this alternative as there would be no change in the General Plan text or policies. The recommendations to modify the proposed policies to better articulate future review processes would continue to be warranted.

This alternative would result in reduction of overall buildout, and thus, would result in reduced traffic-generated noise and criteria pollutant and greenhouse gas emissions, all of which were identified as less-than-significant impacts. This alternative also would potentially eliminate the significant impact related to consistency with the Air Quality Management Plan as the total population would be within the plan's forecasts, and thus, consistent with the AQMP. However, oncampus population growth at UCSC would account for some of the population increase, and when this is factored in, it is still possible that population would exceed AQMP forecasts. The development and growth under this alternative would result in construction of 2,750 housing units, which exceeds the AMBAG projection of 2,413 units for the City by the year 2030. As the unit method for evaluating consistency with the AQMP relies on consistency with housing unit forecasts, this alternative would continue to result in a significant impact.

Exposure to geologic, seismic and soils hazards and constraints would generally remain unchanged, although overall development potential would be reduced. Similarly, exposure to hazardous materials would generally remain the same as with the proposed project as the overall non-residential square footage is similar to t he proposed project. However, with implementation of state and local regulations that regulate use and disposal of such materials, the impact would continue to be expected to be less-than-significant.

Cumulative Impacts. As previously indicated, this alternative would not eliminate significant, unavoidable impacts related to traffic and water supply, and the project's incremental contribution to significant cumulative traffic and water impacts would continue to be cumulatively considerable. The cumulative population growth impact associated with the proposed project would be reduced, but the cumulative impact would continue to be significant as cumulative population would represent an average annual growth rate of approximately 1.2% if the North Campus area of UCSC were annexed to the City at some point in the future. This would exceed historic City growth rates or 0.9% per year. With a reduction in development and resulting traffic decreases along Mission Street with elimination of one mixed-use segment, the cumulative noise increase along a portion of Mission Street and Swift Street could be reduced to a less-than-significant cumulative impact as the noise increases that were found to be significant only slightly exceeded the 3 dBA increase significance criteria.

ABILITY TO MEET PROJECT OBJECTIVES

This alternative would meet the basic project objectives to protect the City's environment (#1) and neighborhoods (#2), and foster a reciprocal relationship with UCSC (#3). The remaining project objectives (#5 through 10) generally addressed economic and social visions for the City, not environmental or land use objectives, and could be met with the reduced development described in this alternative.

This alternative partially supports the "sustainable" land use patterns that are promoted and emphasized in the proposed *General Plan 2030* policies as there is no change in mixed-use land use designations. As a result of a reduction of mixed-use land designations and density, this alternative would not fully meet the transportation objective (#4) or affordable housing objective (#2) as it would potentially provide a lesser opportunity for mixed-use redevelopment along the City's major corridors. As indicated in the "Alternative 1 – No Project Alternative" discussion above, both the General Plan Advisory Committee and Planning Commission recommendations preferred that future residential growth be accommodated along the major corridors of the City with the objective is to move toward higher density land uses that support transit and also encourage affordable workforce housing in the upper floors while maintaining commercial uses on the ground floor. To encourage such development, nodes were identified along the major corridors where larger sites could be created through the assembly of individual parcels. It was also recognized that increased density were necessary in order to create the opportunity for the nodes to be developed. The need for the development of new affordable workforce housing and sustainable economic development are mutual actions identified to carry out the goals of the proposed *General Plan 2030* that would not be fully supported with this alternative.

Environmentally Superior Alternative

According to CEQA Guidelines section 15126.6(e), if the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Furthermore, Sections 21002 and 21081 of CEQA require lead agencies to adopt feasible mitigation measures or feasible alternatives in order to substantially lessen or avoid otherwise significant adverse environmental effects, unless specific social or other conditions make such mitigation measures or alternatives infeasible. Where the environmentally superior alternative also is the no project alternative, CEQA Guidelines in Section 15126(d)(4) requires the EIR to identify an environmentally superior alternative from among the other alternatives.

In the present case, none of the alternatives, including the No Project Alternative (Alternative 1) would eliminate significant unavoidable project and cumulative impacts related to traffic and water supply, although all alternatives would result in a reduced level of traffic and water demand. The No Project Alternative would, however, reduce the other four identified significant impacts to less-than significant levels. Alternative 2 – Reduced Growth would also reduce the identified significant impact related to consistency with the Air Quality Management Plan to a less-than-significant level, although under the Alternative 3—Reduced Density/Land Use Intensity, this would remain significant and less-than-significant with mitigation. Potentially significant impacts on schools and cultural resources would remain significant under Alternatives 2 and 3, but could be mitigated. Table 5-5 provides a comparison of impact significant

between the proposed *General Plan 2030* and the alternatives evaluated in this section. Alternatives 2 and 3 could attain some of the objectives (#1 and #3) and partially attain others (#2 and #4).

Excluding the No Project Alternative (Alternative 1), Alternative 2 – Reduced Growth, is considered the environmentally superior alternative of the alternatives considered. Although it would not eliminate significant unavoidable impacts, it could result in the greatest reduction of traffic and water demand impacts and reduce some of the other identified significant impacts. However, it would not fully meet project objectives.

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TABLE 5-5: Comparison of Impacts of Project Alternatives

Environmental Issue	PP	ALT 1	ALT 2	ALT 3
LAND USE & DEVELOPMENT				
LAND USE				
• 4.1-1 – Divide Established Community	NI	NI	NI	NI
• 4.1-2 – Incompatible Land Uses	LS	NI	LS	LS
• 4-1-3 – Conflict with Plans	NI	NI	NI	NI
POPULATION & HOUSING				
• 4.2-1 – Increased Population	LS	LS-	LS-	LS-
• 4.2-2 – Displace Residents or Housing	LS	LS	LS	LS
AESTHETICS				
• 4.3-1 – Scenic Views	LS	LS	LS	LS
• 4.3-2 – Scenic Resources	LS	LS	LS	LS
• 4.3-3 – Degrade Visual Quality of Area	LS	LS-	LS-	LS-
• 4-3-4 – Create Light or Glare	LS	LS	LS	LS
PUBLIC FACILITIES & SERVICES				
TRANSPORTATION & TRAFFIC				
• 4.4-1 – Intersection Traffic	**SU**	**SU-**	**SU-**	**SU-**
• 4.4-2 – Highway Traffic	**SU**	**SU-**	**SU-**	**SU-**
• 4-4-3 – Create Traffic Hazards	NI	NI	NI	NI
• 4.4-4 – Conflict with Plans	NI	NI	NI	NI
WATER SUPPLY				
• 4.5.1 – Water Demand	**SU**	**SU-**	**SU-**	**SU-**
• 4.5.2 – Groundwater Impacts	LS	LS	LS	LS
PUBLIC SERVICES & UTILITIES				
• 4.6.1 – Fire Service	LS	LS-	LS-	LS-
• 4.6.2 – Police Service	LS	LS-	LS-	LS-
• 4.6.3 – Parks and Recreation	LS	LS-	LS-	LS-
• 4.6.4 – Schools	**S**	LS	**S-**	**S-**
• 4.6.5 – Wastewater	LS	LS-	LS-	LS-
• 4.6.6 – Solid Waste	LS	LS-	LS-	LS-
• 4.6.7 – Energy Use	LS	LS-	LS-	LS-
HYDROLOGY, DRAINAGE, WATER QUALITY				
• 4.7-1 – Drainage and stormwater runoff	LS	LS-	LS-	LS-
• 4.7-2 – Water Quality	LS	LS-	LS-	LS-
• 4.7-3 – Exposure to Flood Hazards	LS	LS-	LS-	LS-
RESOURCES & HAZARDS				
BIOLOGICAL RESOURCES				
• 4.8.1 – Riparian & Westland Habitats	LS	LS	LS	LS
• 4.8.2 – Other Sensitive Habitats	LS	LS	LS	LS
• 4.8.3 – Special Status Species	LS	LS	LS	LS
• 4.8.4 – Wildlife Movement	LS	LS	LS	LS
• 4.8.5 – Habitat Reduction	LS	LS	LS	LS
• 4.8.6 – Tree Protection	LS	LS	LS	LS
• 4.8.7 – Conflicts with Plans & Policies	LS	LS	LS	LS
CULTURAL RESOURCES				
• 4.9-1 – Archaeological Resources	**S**	LS	**S**	**S**
• 4.9-2 – Historical Resources	LS	LS	LS	LS
• 4.9-3 – Paleontological Resources	**S**	LS	**S**	**S**

(CONTINUED ON NEXT PAGE)

TABLE 5-5: Comparison of Impacts of Project Alternatives

GEOLOGY & SOILS				
▪ 4.10-1 – Exposure to Seismic Hazards	LS	LS	LS	LS
▪ 4.10-2 – Exposure to Other Geologic Hazards	LS	LS	LS	LS
▪ 4.10-3 – Soils Constraints	LS	LS	LS	LS
▪ 4.10-4 – Erosion	LS	LS	LS	LS
AIR QUALITY				
▪ 4.11-1 – Consistency with AQMP	**S**	LS	LS	**S**
▪ 4.11-2 – Criteria Air Pollutant Emissions	LS	LS	LS	LS
▪ 4.11-3 - Sensitive Receptors	LS	LS	LS	LS
▪ 4.11-4 - Odors	LS	LS	LS	LS
GLOBAL CLIMATE CHANGE				
▪ 4.12-1 – Greenhouse Gas Emissions	LS	LS	LS	LS
▪ 4.12-2 – Conflict with Adopted Plans	LS	LS	LS	LS
NOISE				
▪ 4.13-1 – Exposure to Noise	LS	LS	LS	LS
▪ 4.13-2 – Permanent Noise Increase	LS	LS	LS	LS
▪ 4.13-3 – Temporary Construction Noise Increase	LS	LS	LS	LS
HAZARDOUS MATERIALS				
▪ 4.14-1 – Creation of Hazards	LS	LS	LS	LS
▪ 4.14-2 – Exposure to Hazardous Materials	LS	LS	LS	LS
▪ 4.14-3 – Hazards Near Schools	LS	LS	LS	LS
AGRICULTURE, FOREST & MINERAL RESOURCES				
▪ 4.15-1 – Conflicts with Agricultural Uses	LS	LS	LS	LS

Notes:

PP = Proposed Project
ALT1 = No Project Alternative
ALT2 = Reduced Growth Alternative
ALT3 = Reduced Density and/or Land Use Intensity Alternative

Impact without Mitigation / Impact with Mitigation
NI = No Impact
LS = Less than significant impact
S = Significant
SU = Significant unavoidable impact
\+ = Greater adverse impact than proposed project
\- = Lesser adverse impact than proposed project

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IN THIS SECTION:

6.1 Agencies and Persons Contacted
6.2 References
6.3 EIR Preparation

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California Department of Transportation: Jennifer Calate

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- Fire Department: Ron Oliver [Director], Mark Ramos
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- Planning and Community Development Department: Juliana Rebagliati [Director], Lupita Alamos, Ross Clark, Michelle King, Don Lauritson, Ken Thomas
- Police Department: Kevin Vogle [Director]
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Santa Cruz Metropolitan Transit District: Les White [Director], Erich Friedrich

University of California Santa Cruz: Dean Fitch [Interim Planning Director], Alisa Klaus, Sally Morgan

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6.3 EIR PREPARATION

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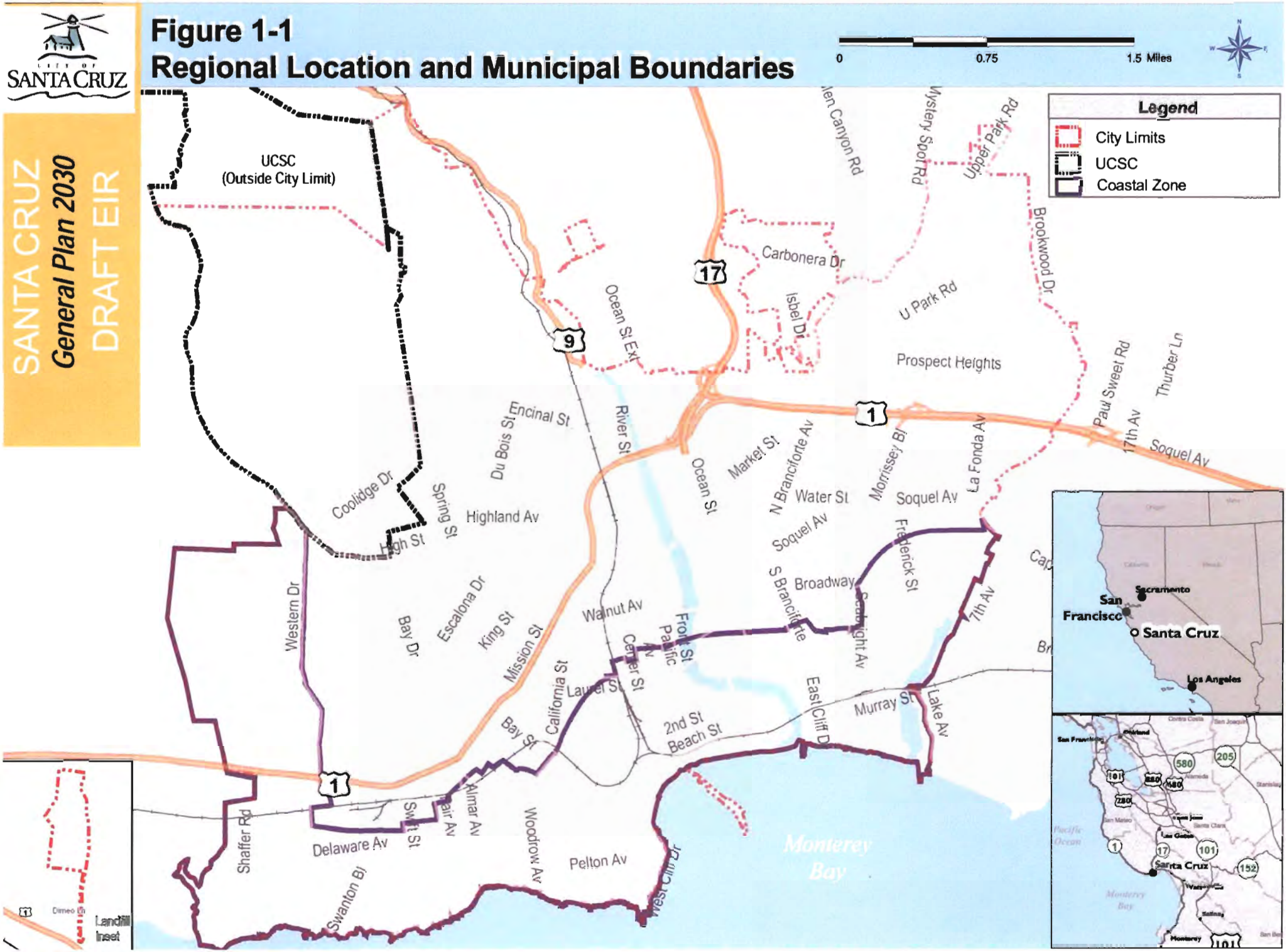
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- Design, Community & Environment, Background Reports & Buildout Estimates
- EcoSystems West Consulting Group, Biological Resources
- EKI - Erler & Kalinowski, Inc
- LSA Associates, Cultural Resources
- Rosen, Goldberg, Der & Lewitz, Inc., Noise
- Ron Marquez, Traffic
- Hatch Mott MacDonald, Traffic Modeling

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4.15-1 State Farmland Mapping

SANTA CRUZ
General Plan 2030
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Figure 1-1
Regional Location and Municipal Boundaries



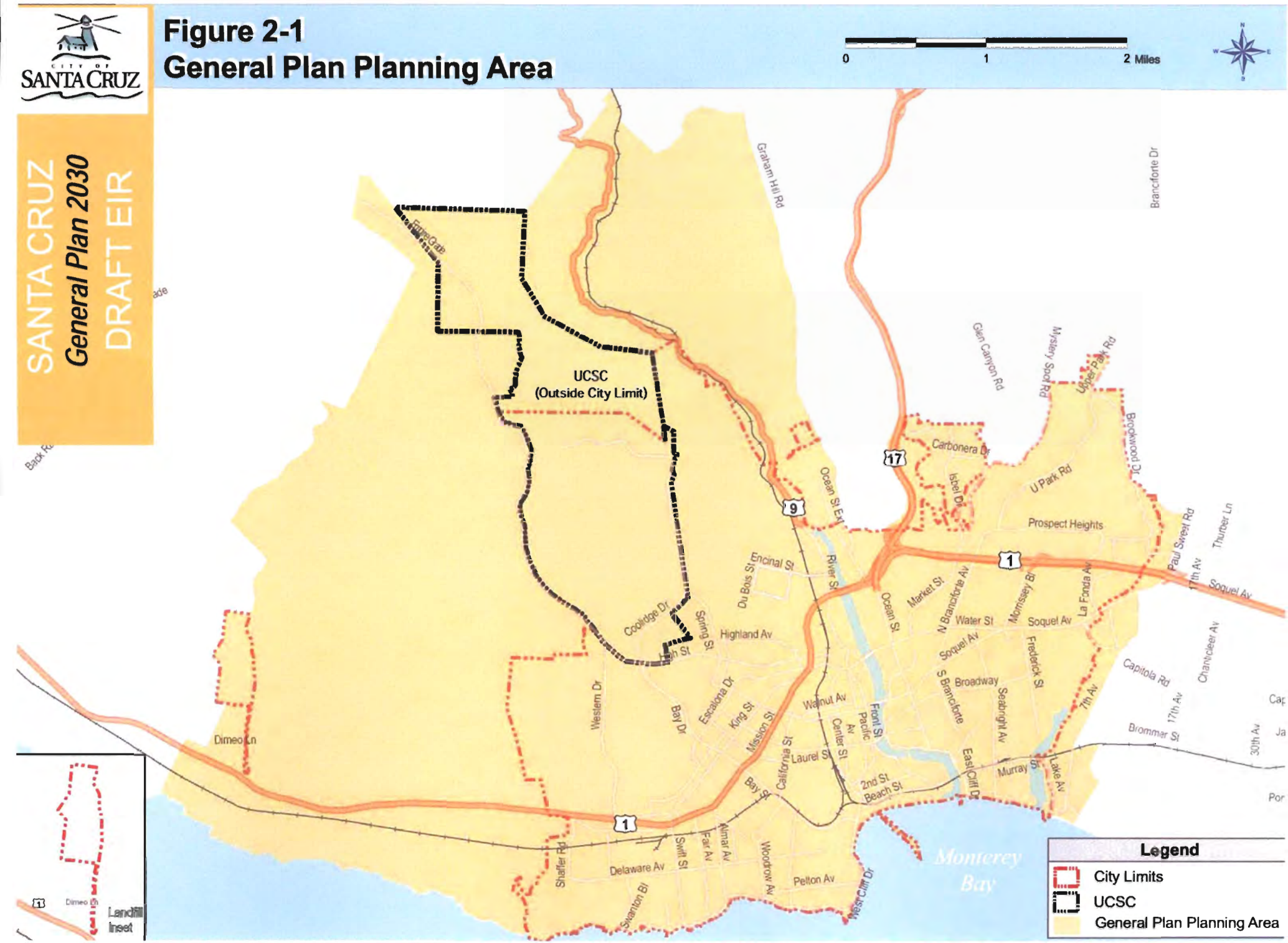
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Figure 1-2
Greenbelt and Open Space Lands



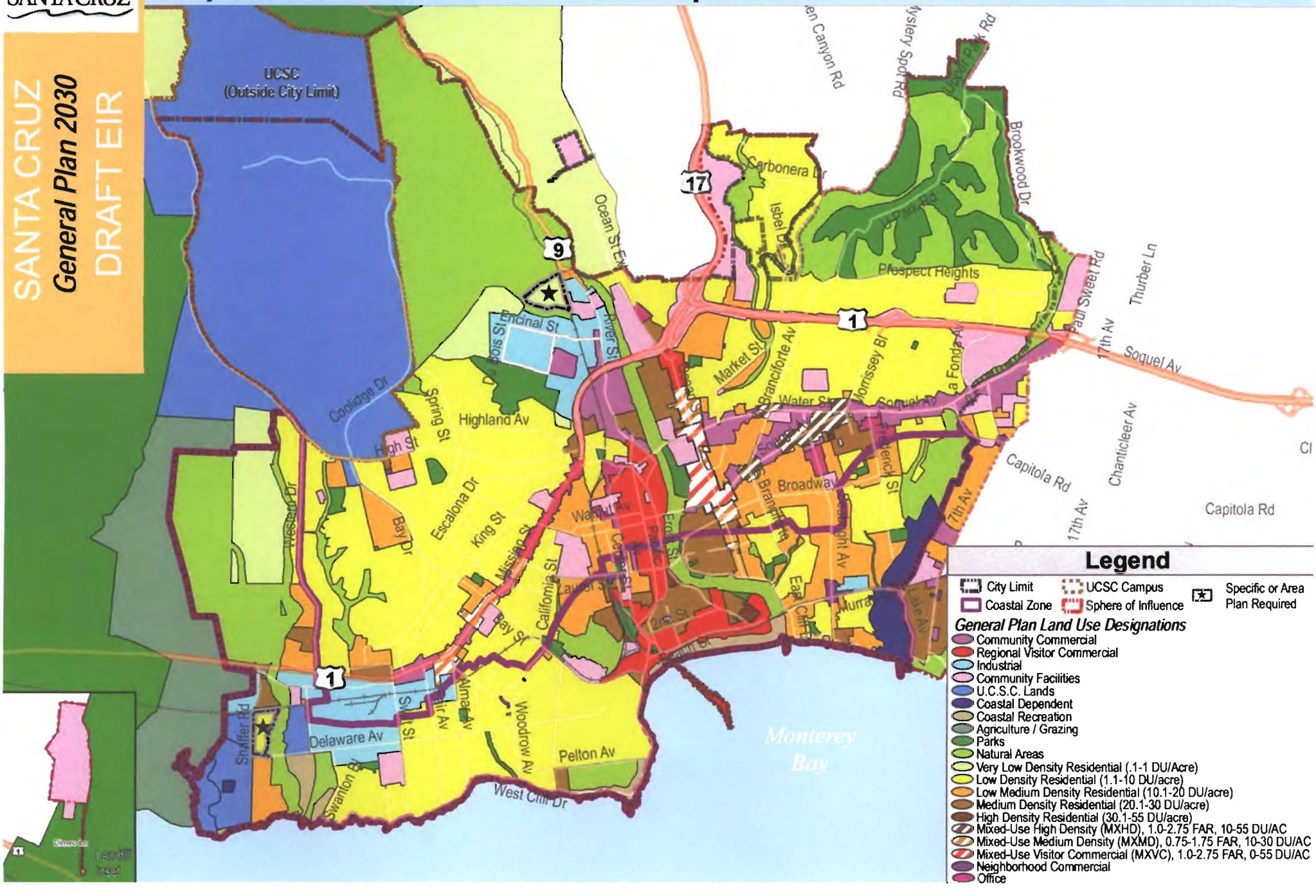
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Figure 2-1
General Plan Planning Area



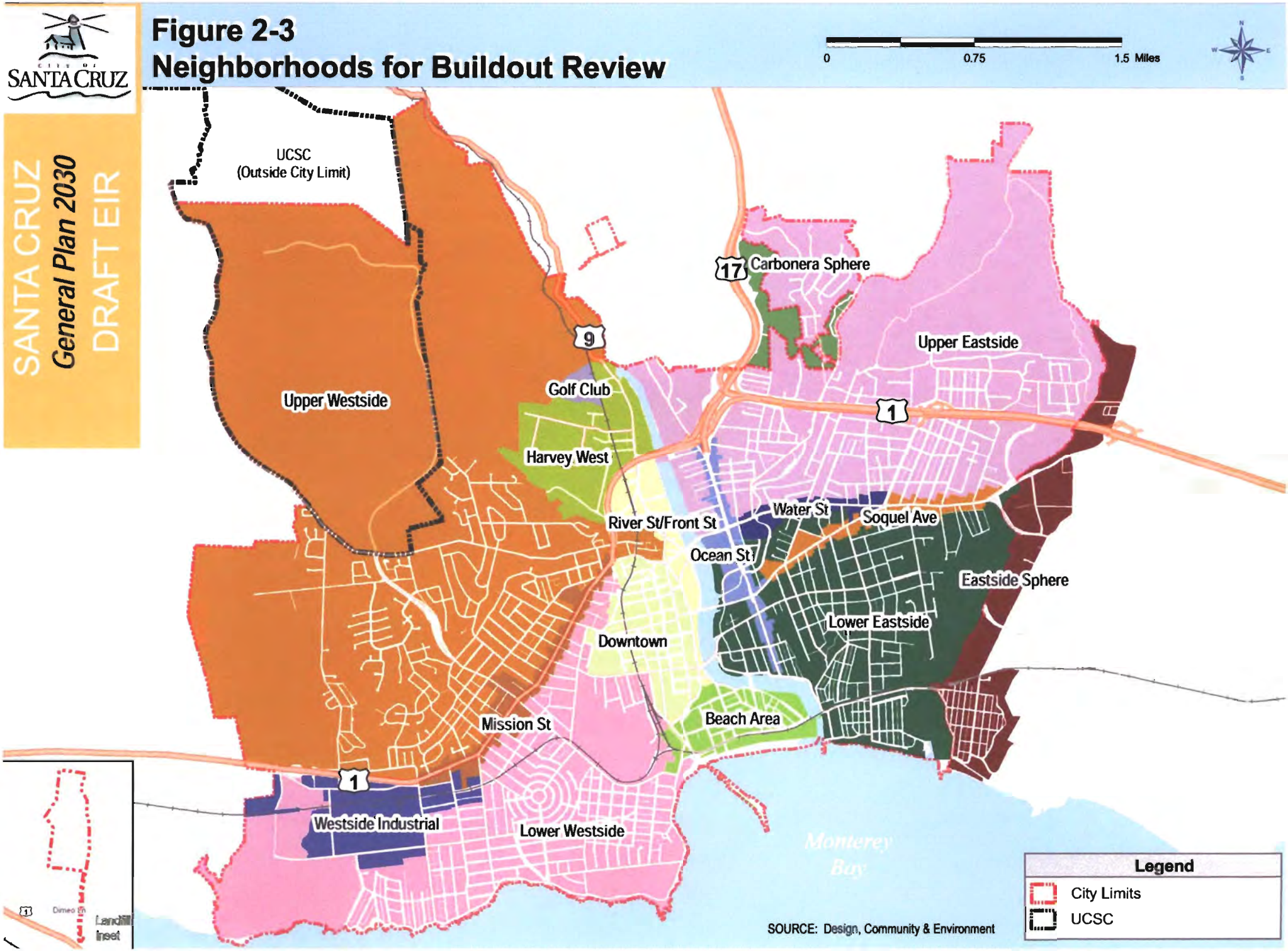
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Figure 2.2
Proposed General Plan Land Use Map



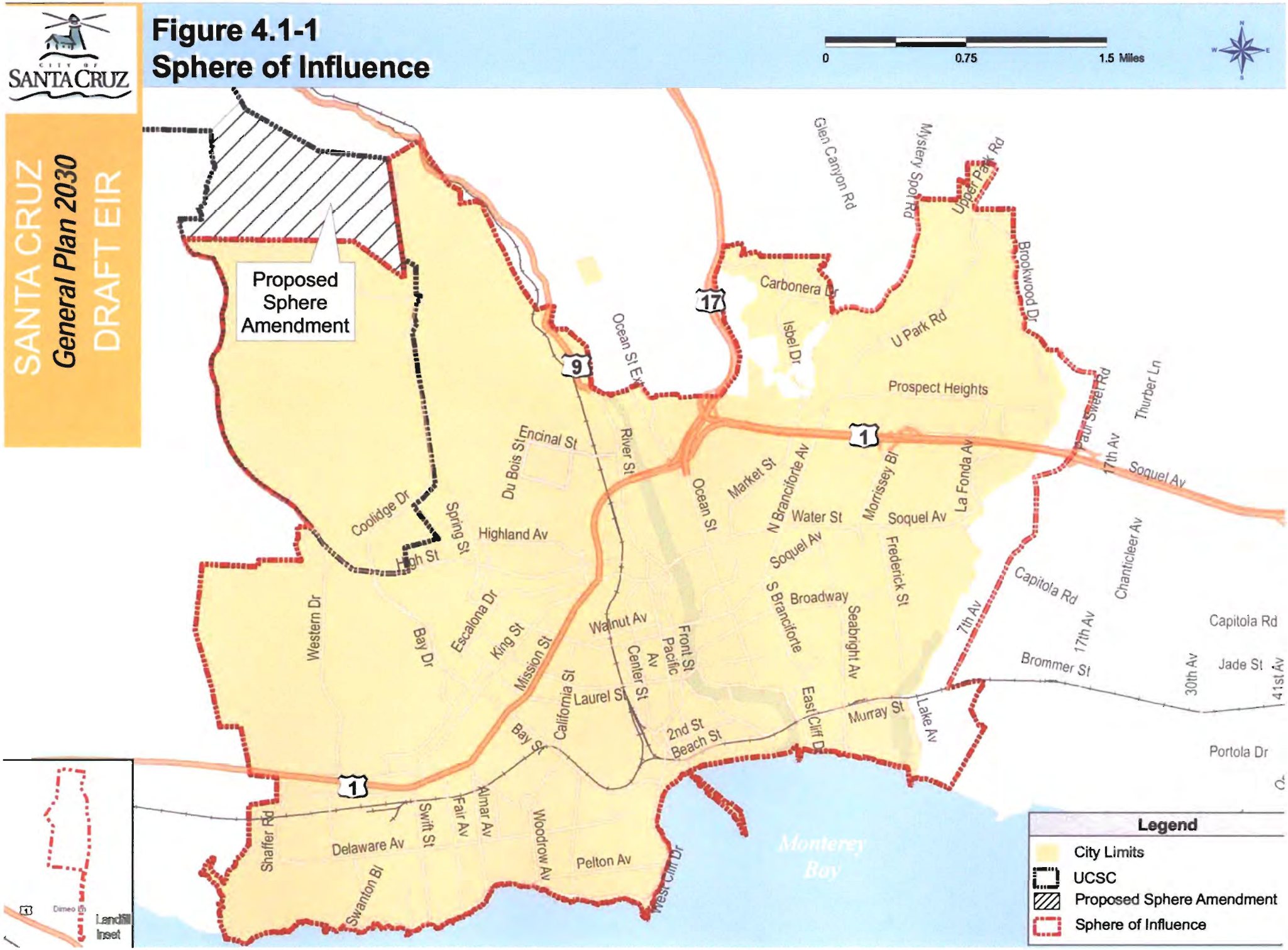
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Figure 2-3
Neighborhoods for Buildout Review



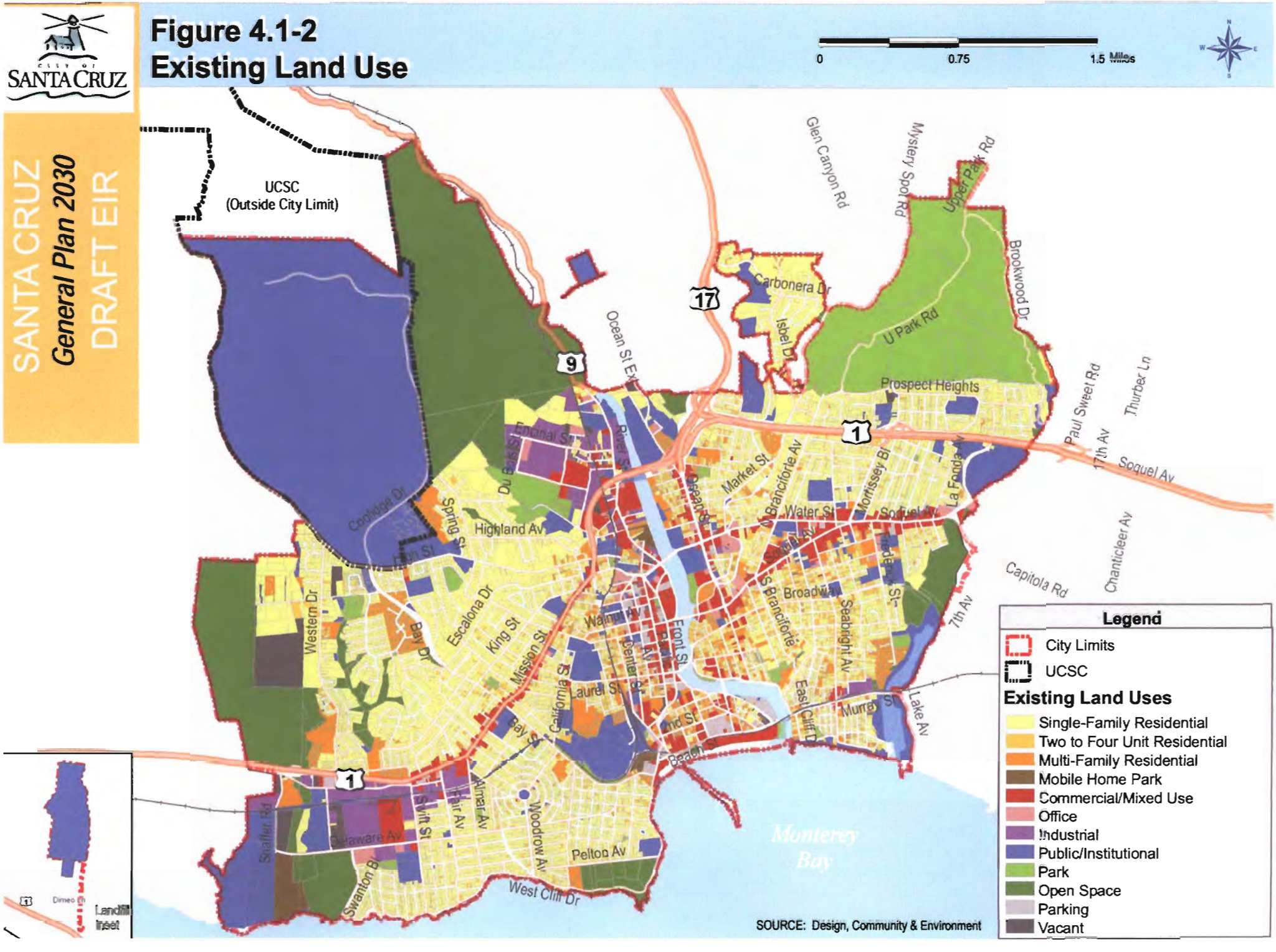
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Figure 4.1-1
Sphere of Influence



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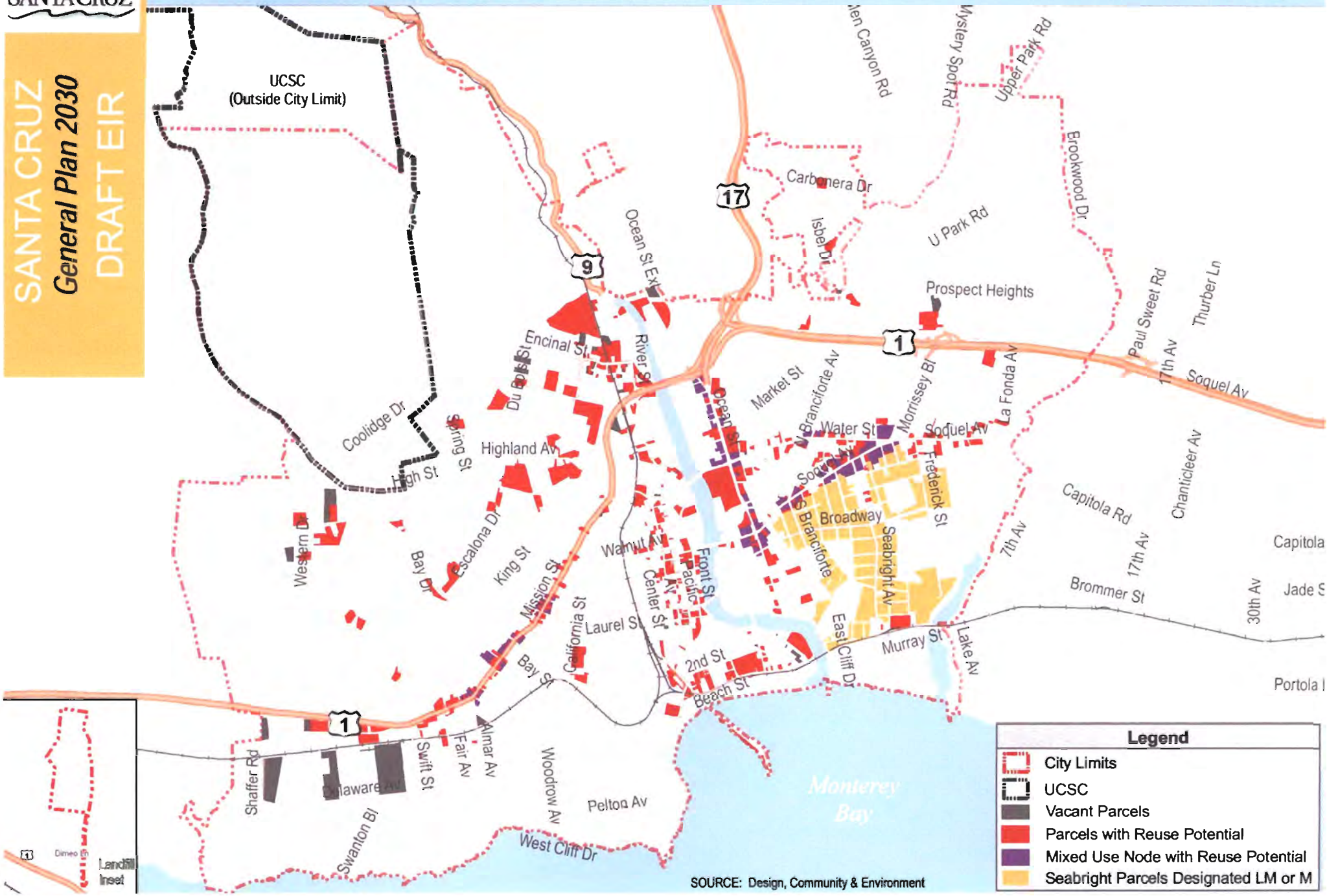
Figure 4.1-2
Existing Land Use



SOURCE: Design, Community & Environment

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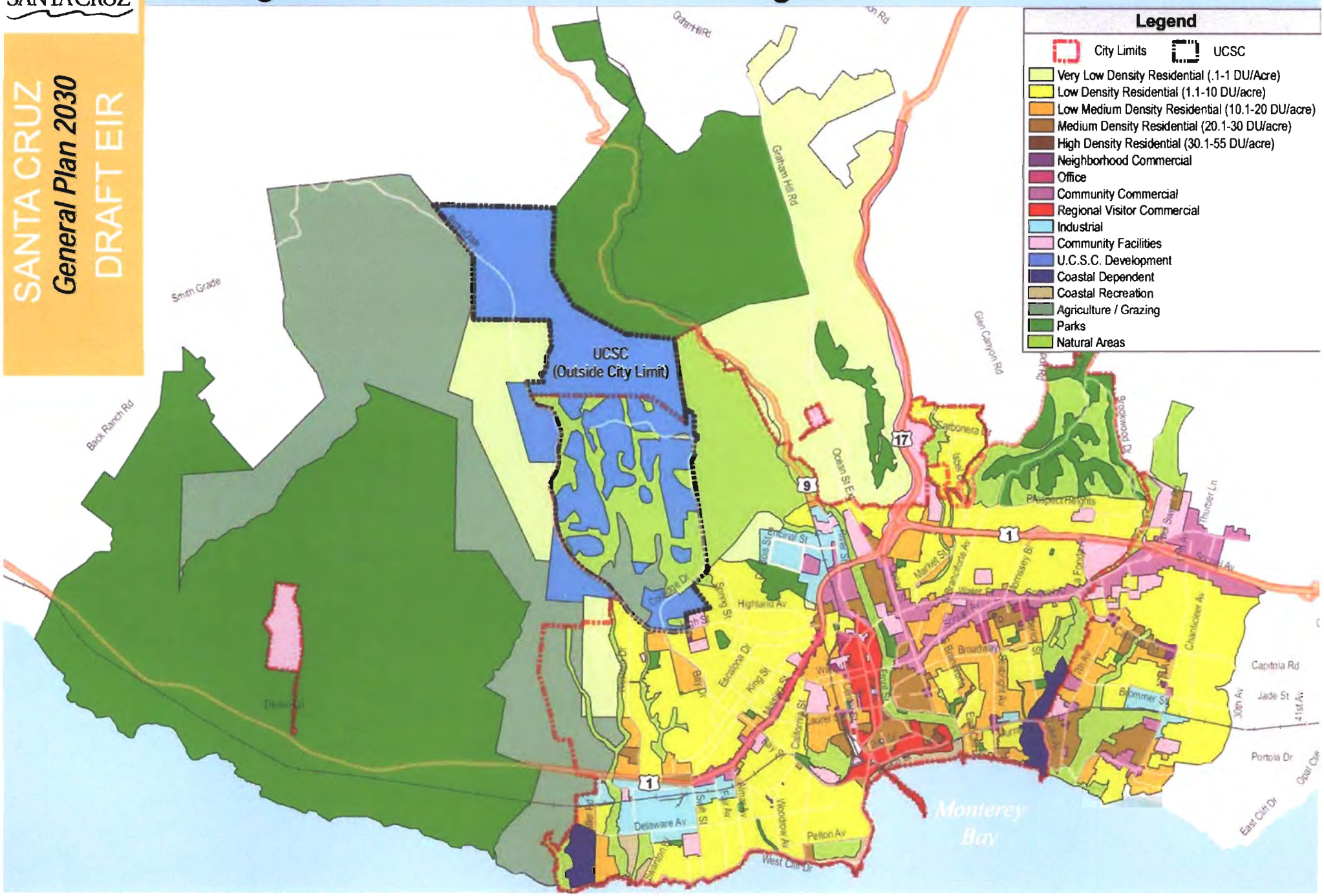
Figure 4.1-3
Vacant and Reuse Parcels



SOURCE: Design, Community & Environment

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Figure 4.1-4
Existing General Plan 2005 Land Use Designations

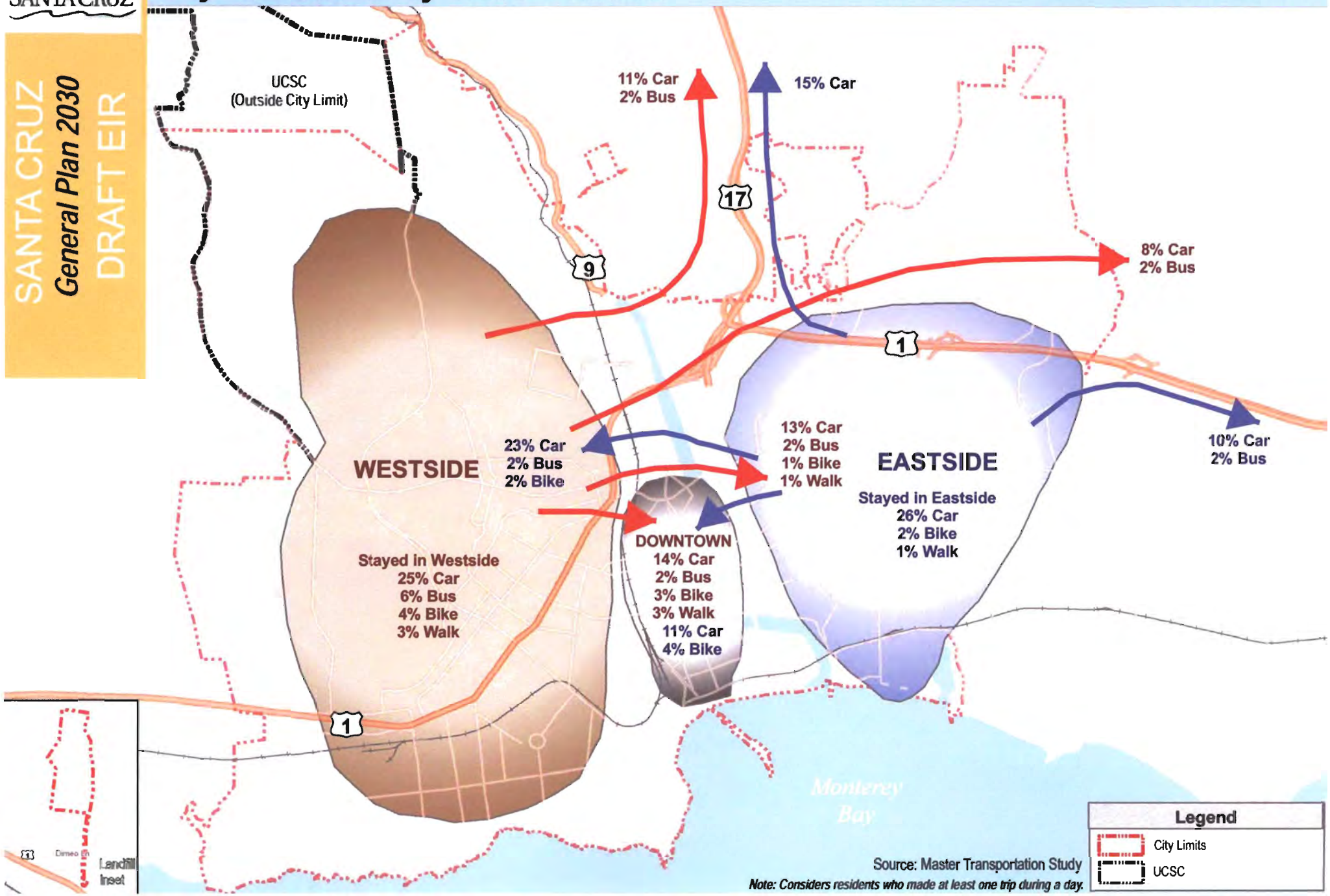


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Figure 4.3-1
Significant Views/Features

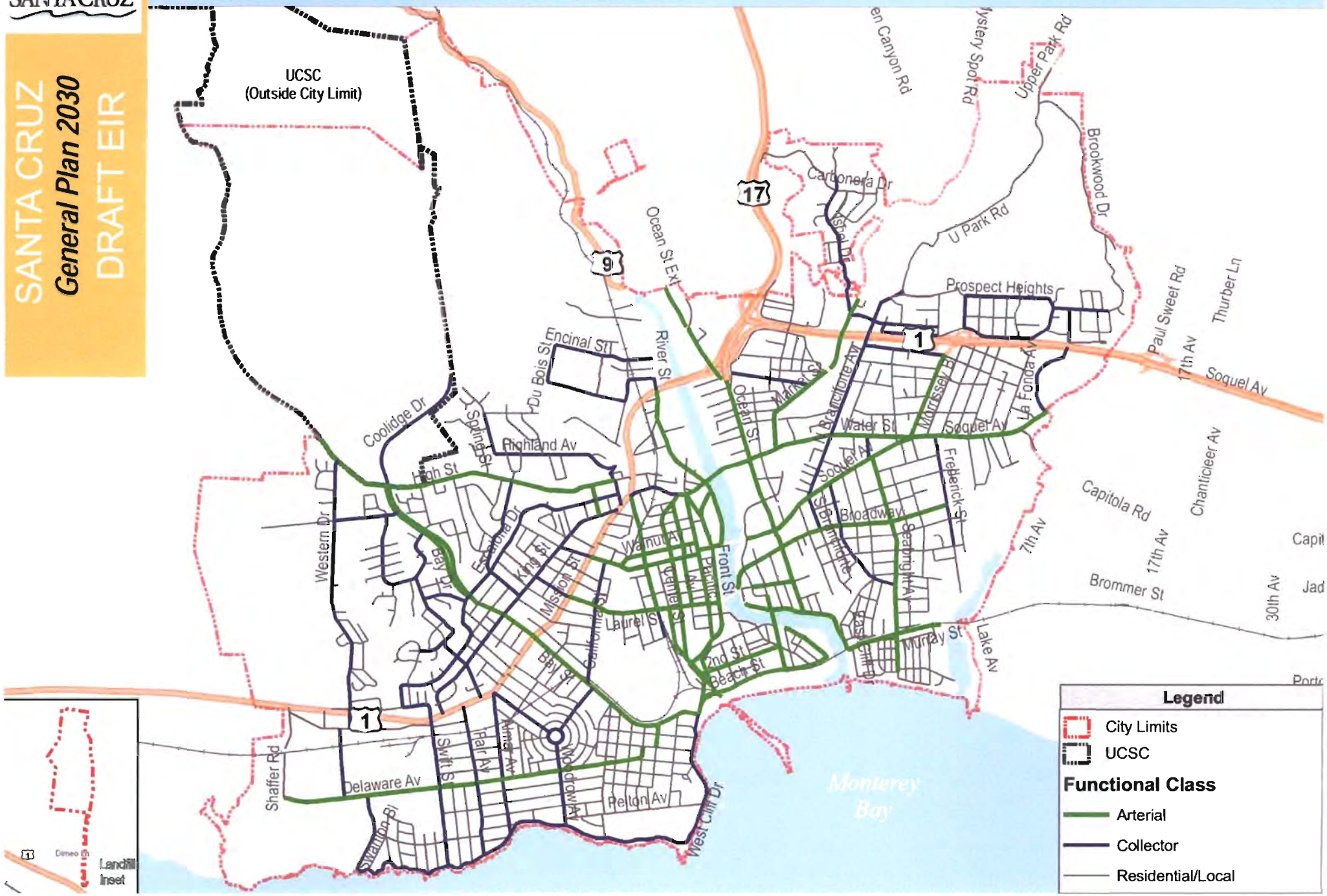


Figure 4.4-1
City Resident Daily Travel Patterns



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Figure 4.4-2
Functional Classification of Streets



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Figure 4.4-3
Bicycle and Pedestrian Paths



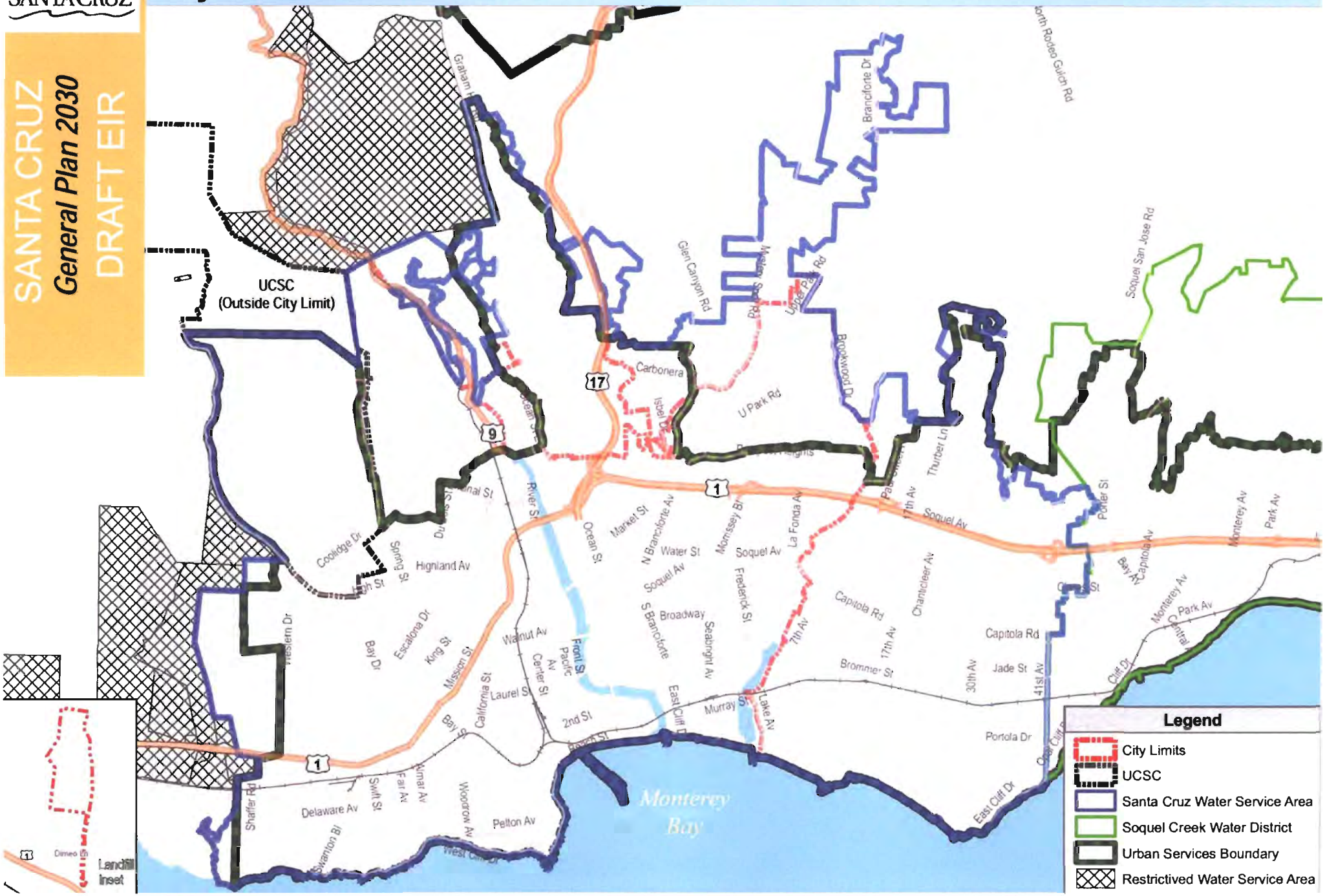
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Figure 4.4-4
Railway System



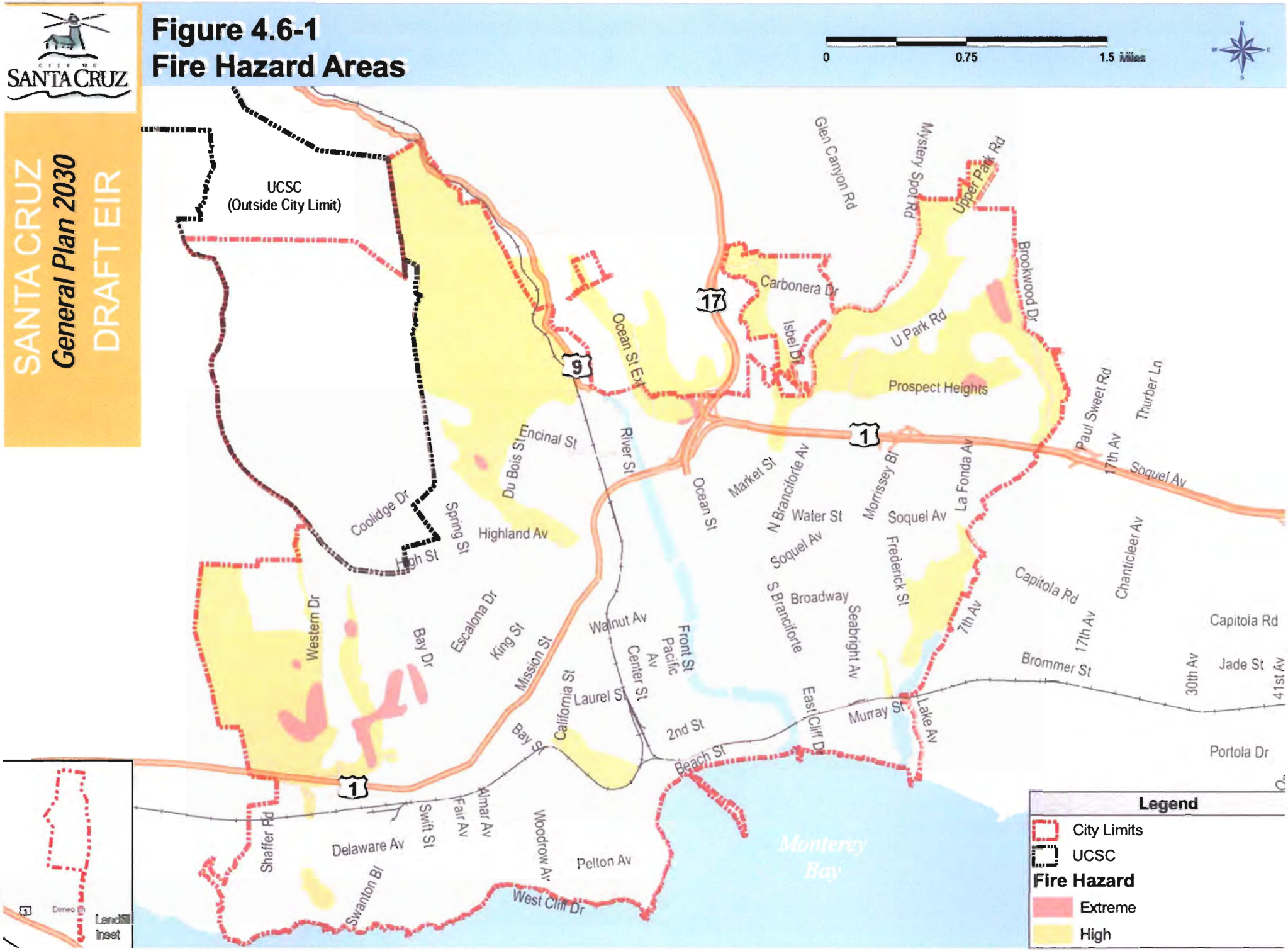
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Figure 4.5-1
City Water Service Area



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Figure 4.6-1
Fire Hazard Areas



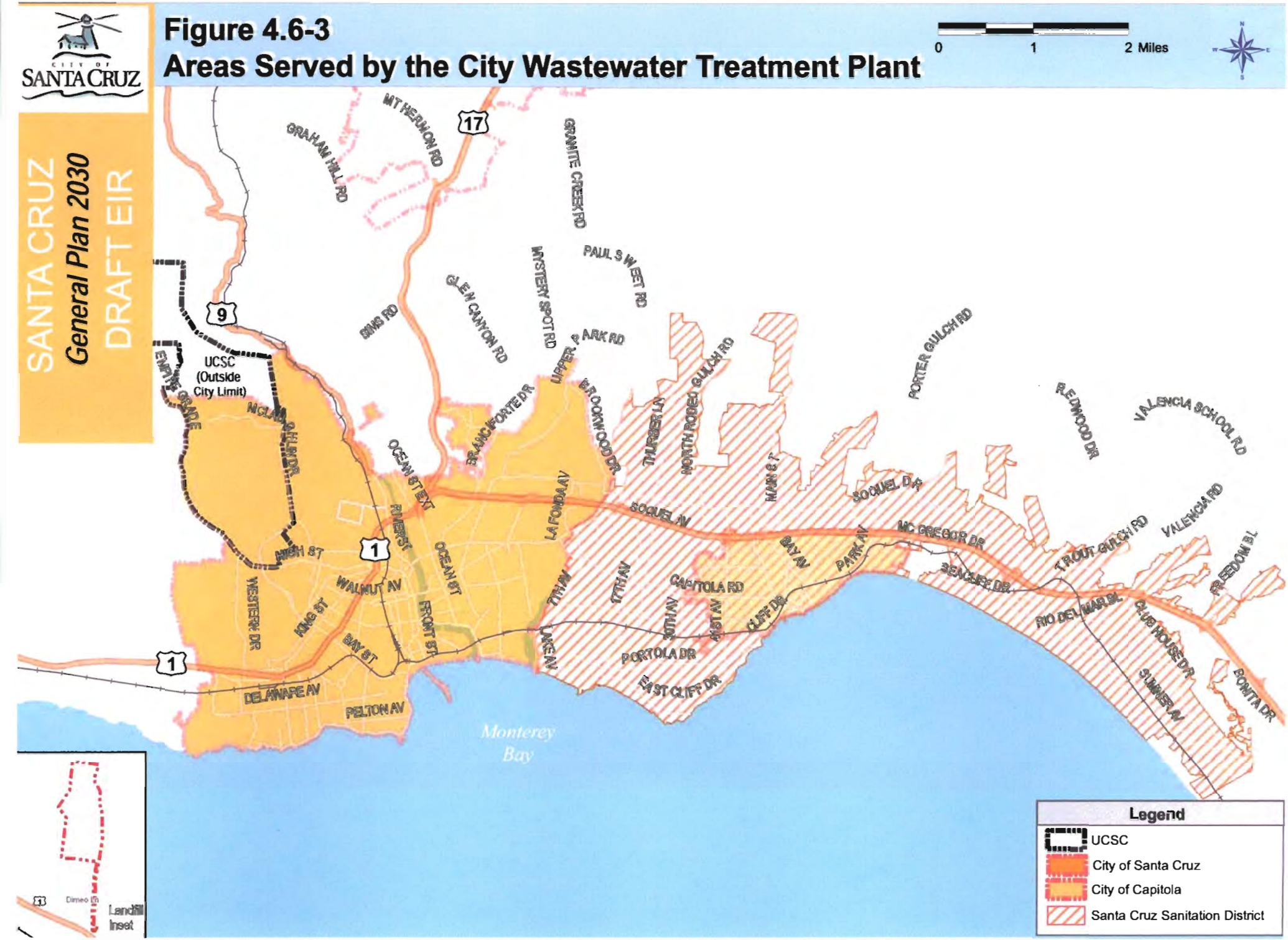
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Figure 4.6-2
City Parks, Greenbelt and Open Space Lands



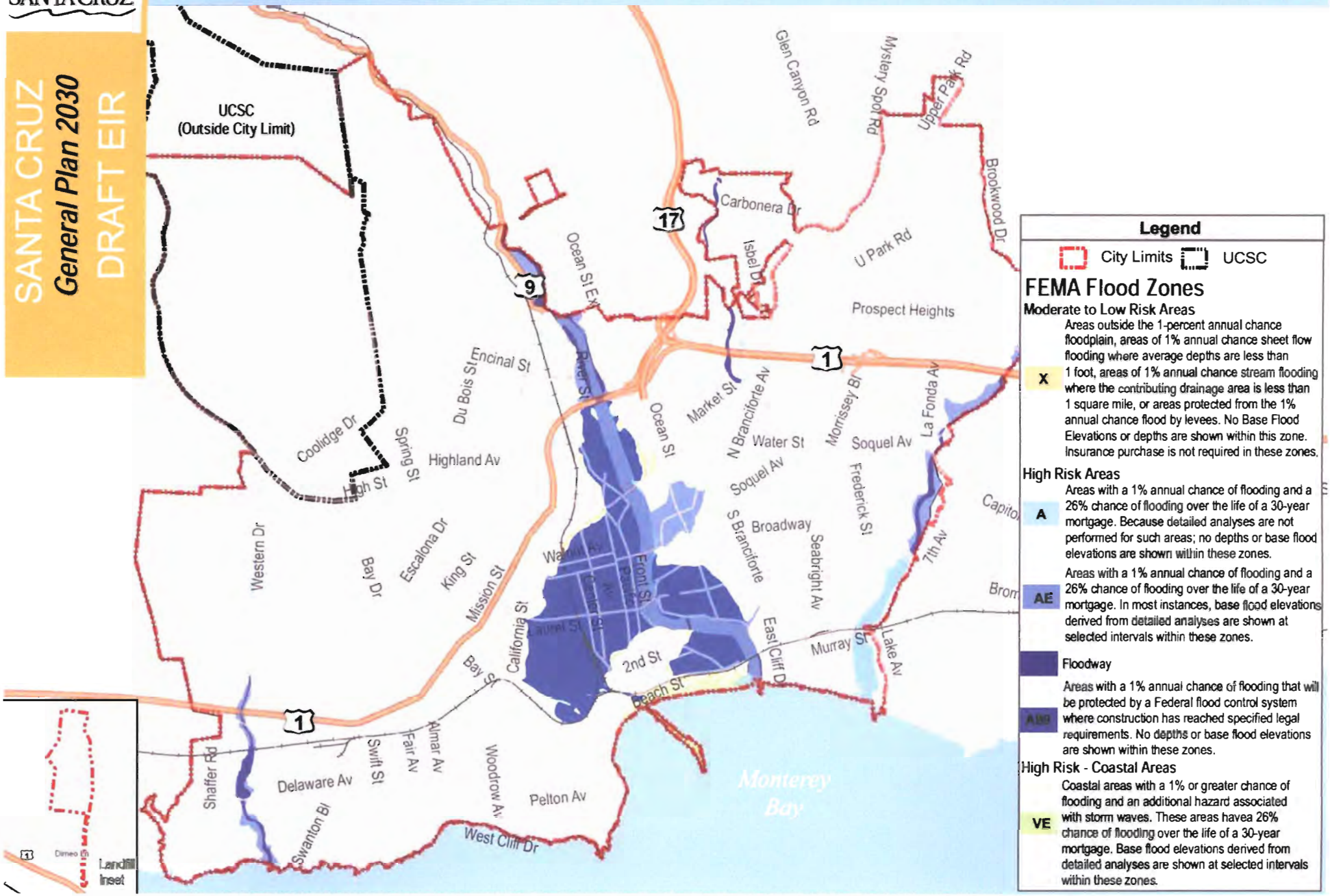
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Figure 4.6-3
Areas Served by the City Wastewater Treatment Plant



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Figure 4.7-1
FEMA Flood Zones



Legend

City Limits UCSC

FEMA Flood Zones

Moderate to Low Risk Areas

X — Areas outside the 1-percent annual chance floodplain, areas of 1% annual chance sheet flow flooding where average depths are less than 1 foot, areas of 1% annual chance stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 1% annual chance flood by levees. No Base Flood Elevations or depths are shown within this zone. Insurance purchase is not required in these zones.

High Risk Areas

A — Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.

AE — Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. In most instances, base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

Floodway

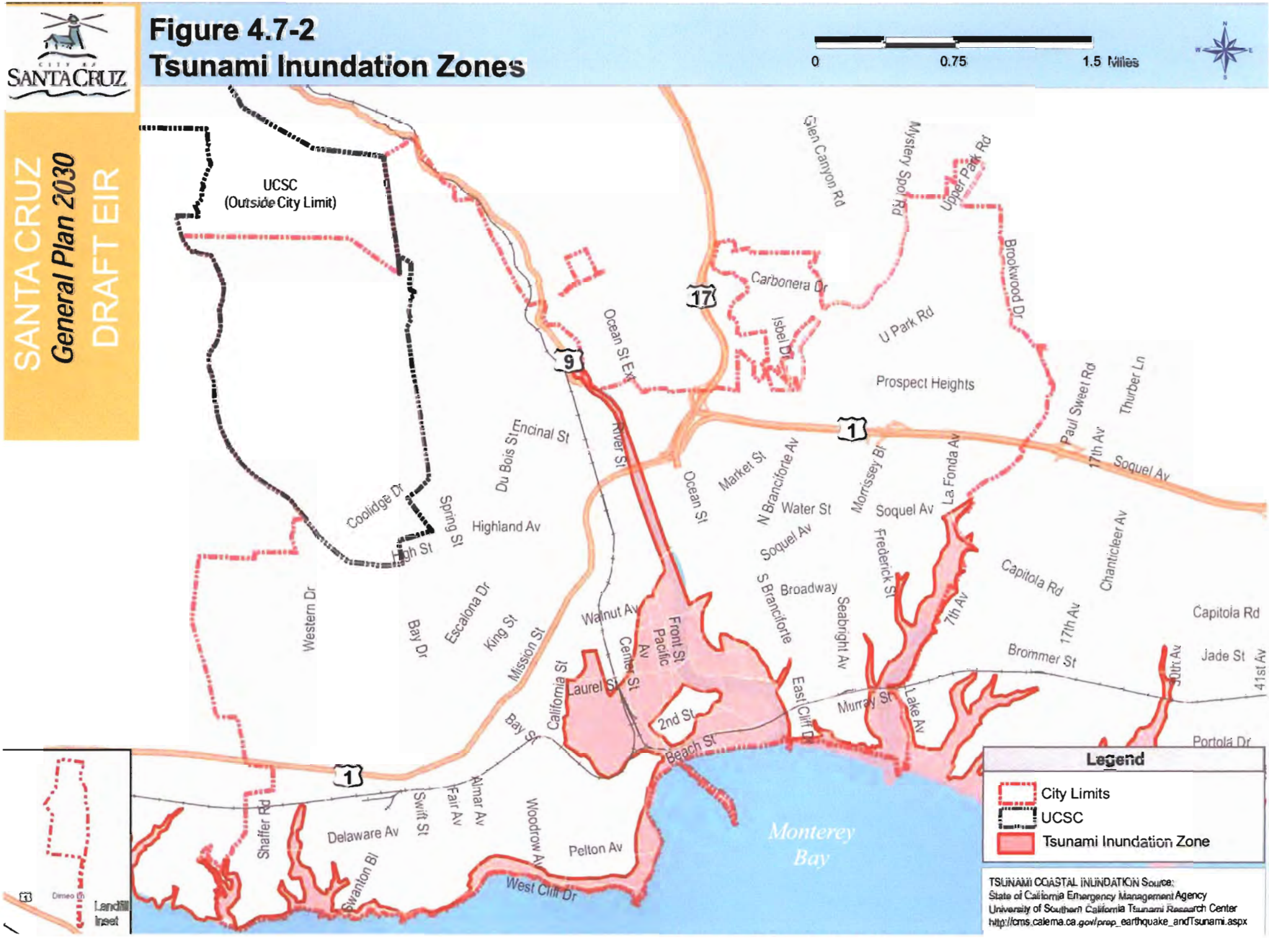
AEF — Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.

High Risk - Coastal Areas

VE — Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas havea 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

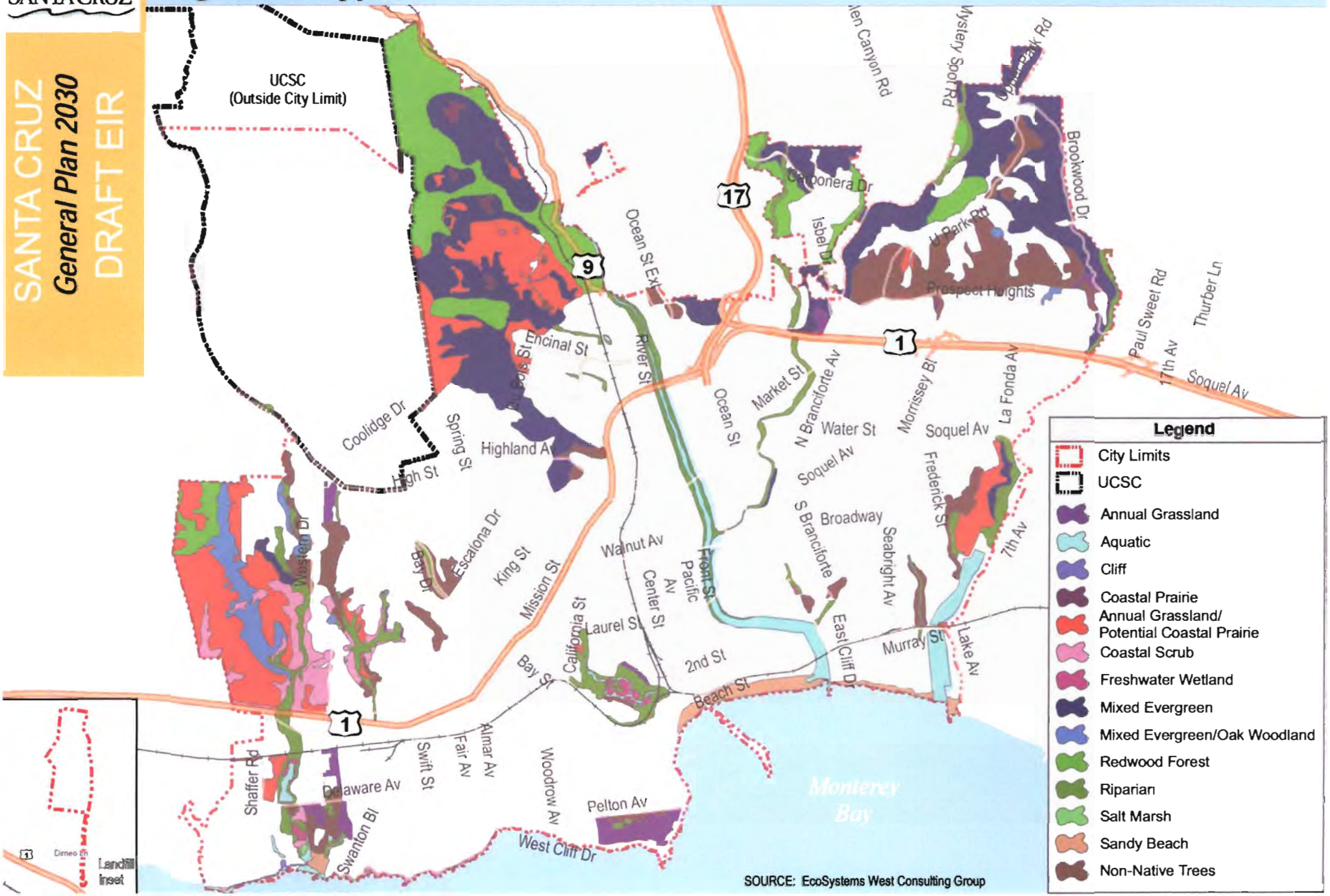
SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.7-2
Tsunami Inundation Zones



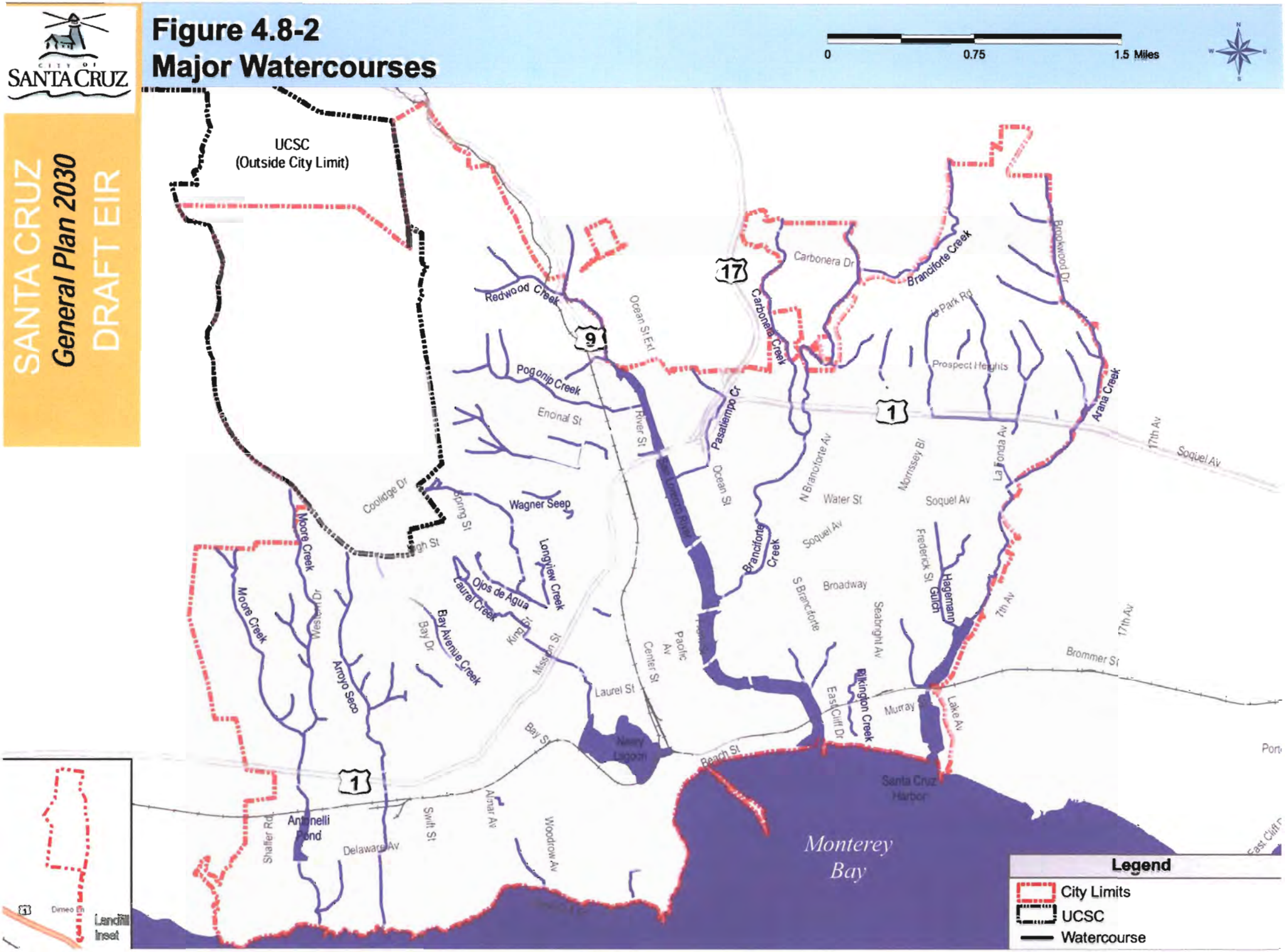
SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.8-1
Vegetation Types



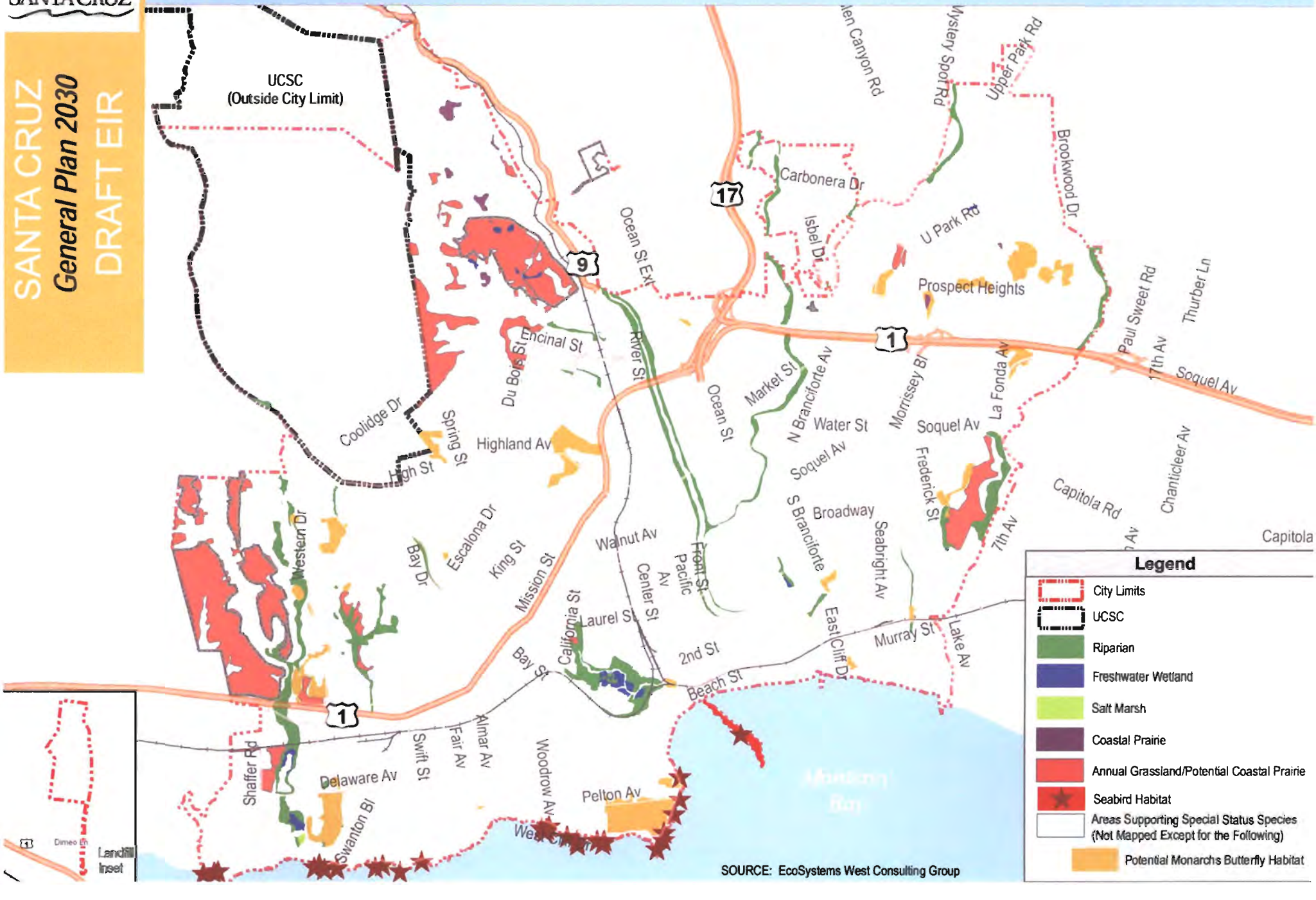
SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.8-2
Major Watercourses



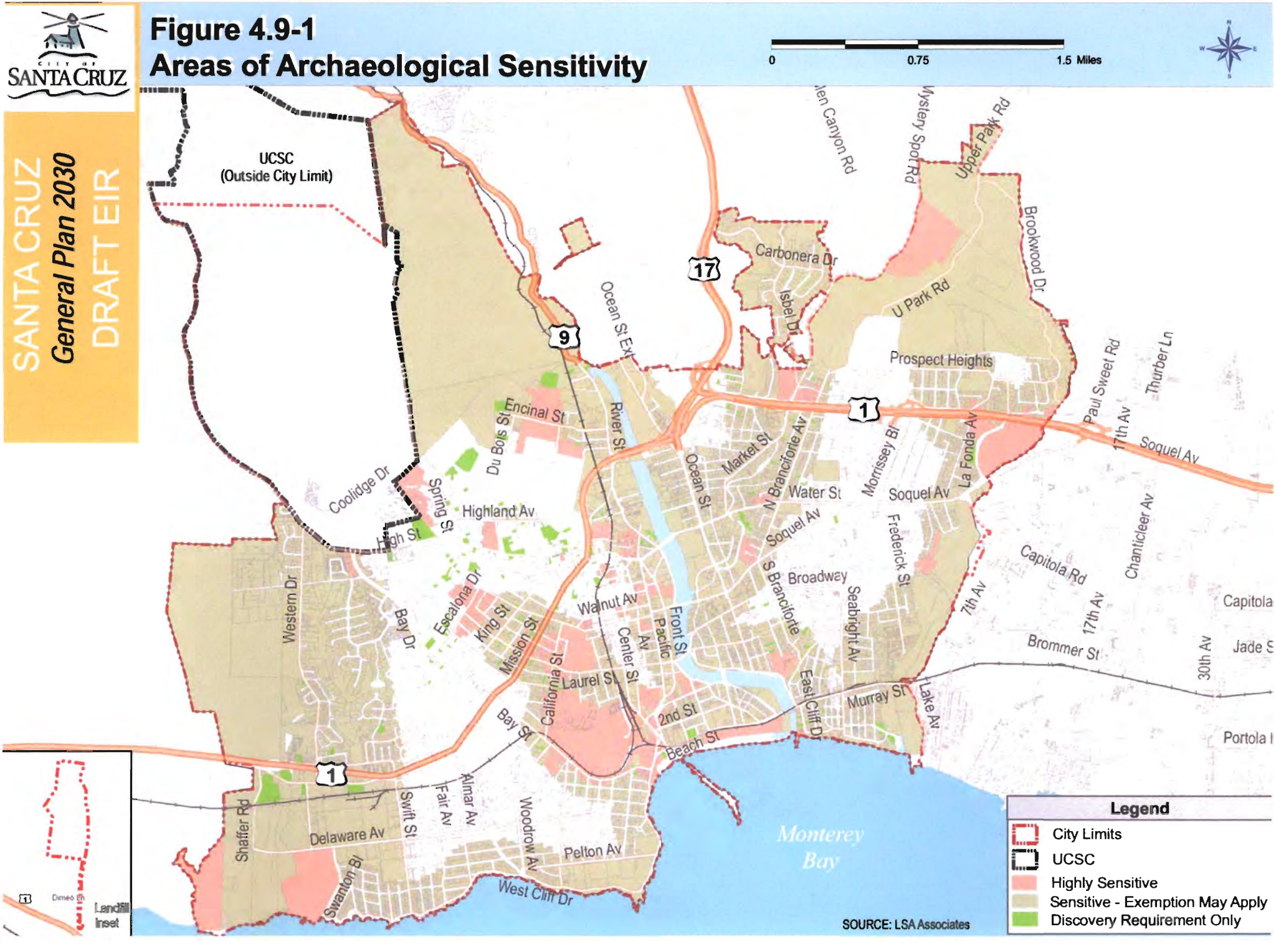
SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.8-3
Sensitive Habitat Areas



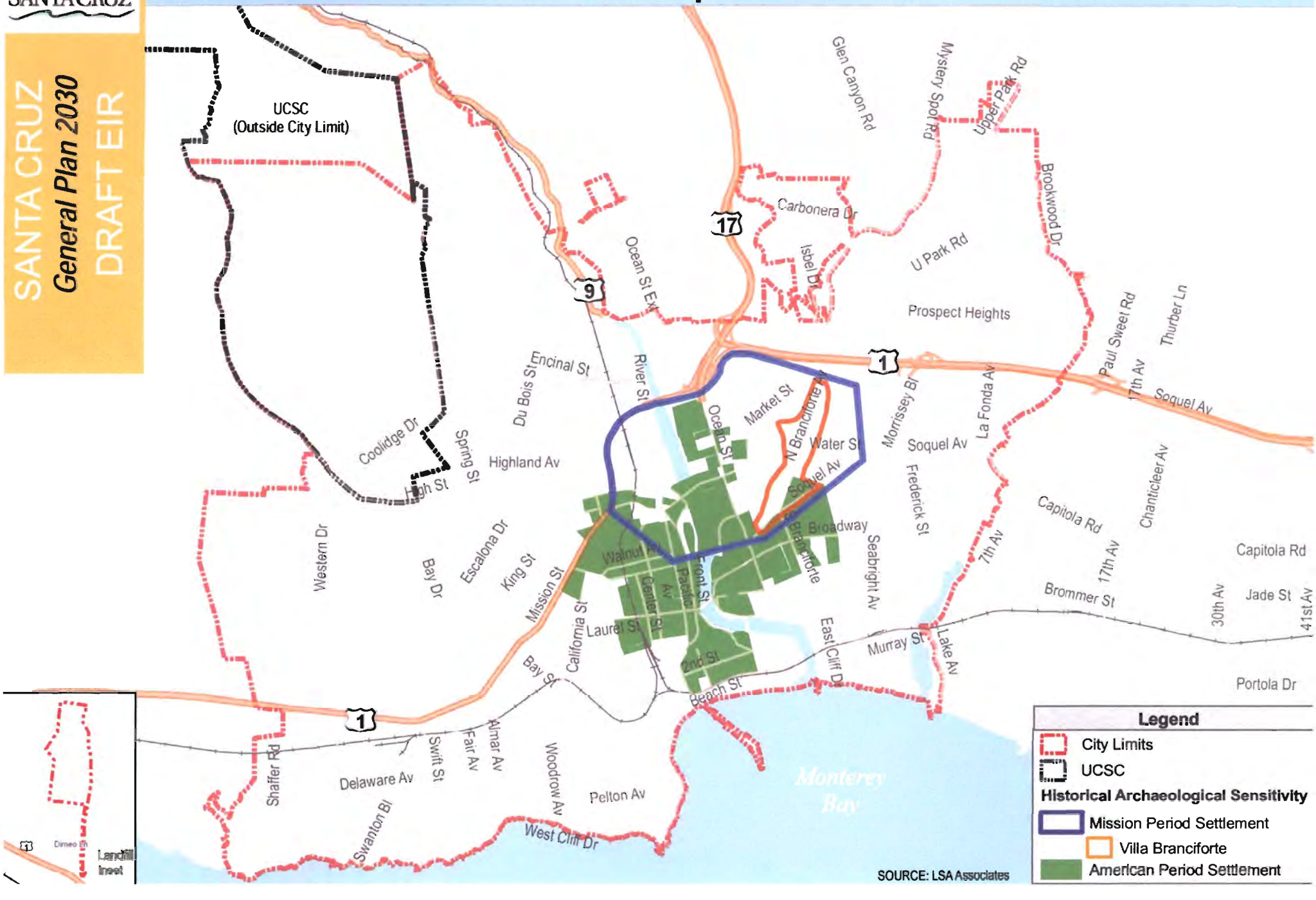
SANTA CRUZ
General Plan 2030
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Figure 4.9-1
Areas of Archaeological Sensitivity



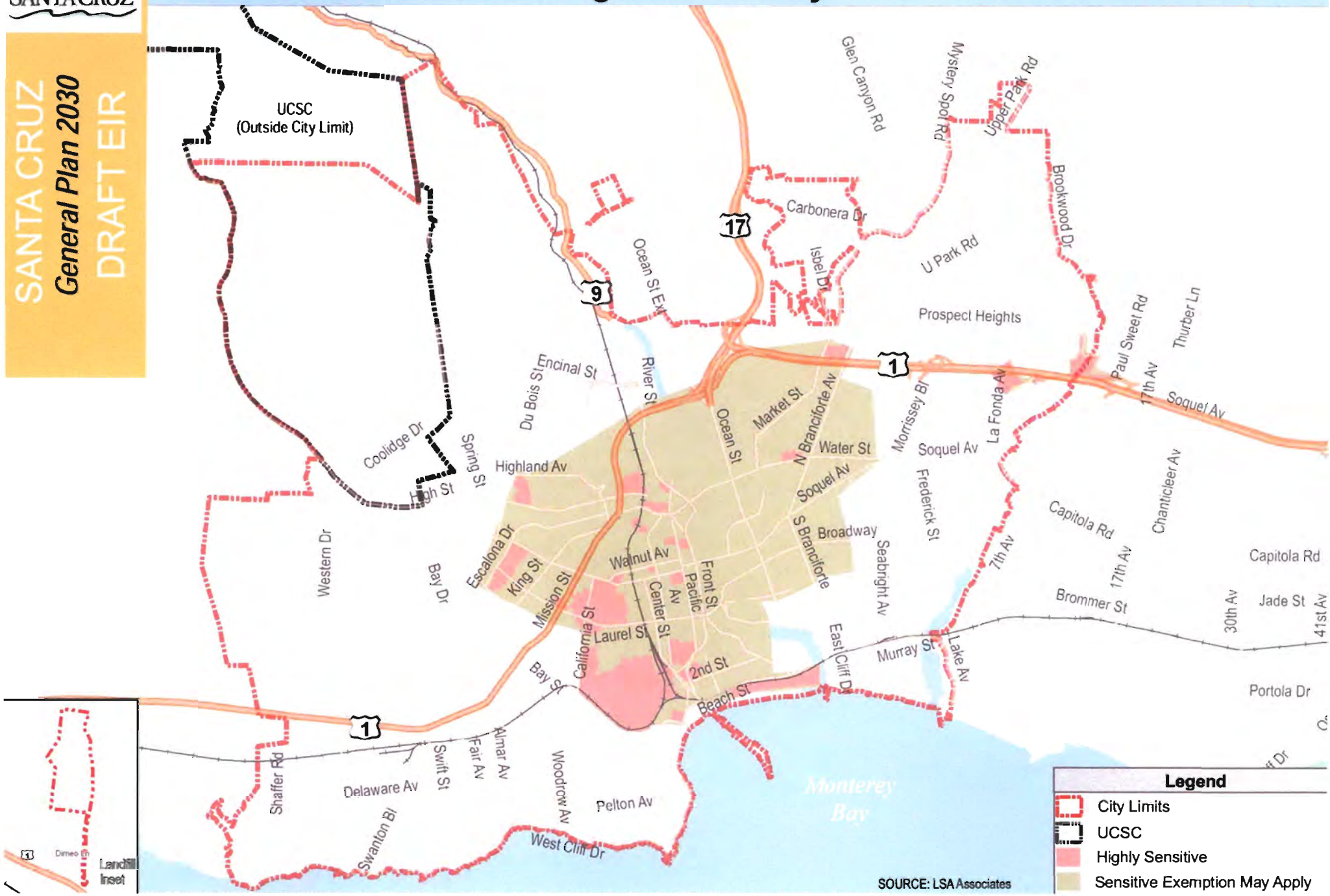
SANTA CRUZ
General Plan 2030
DRAFT EIR

Figure 4.9-2
Mission and American Period Development Patterns



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General Plan 2030
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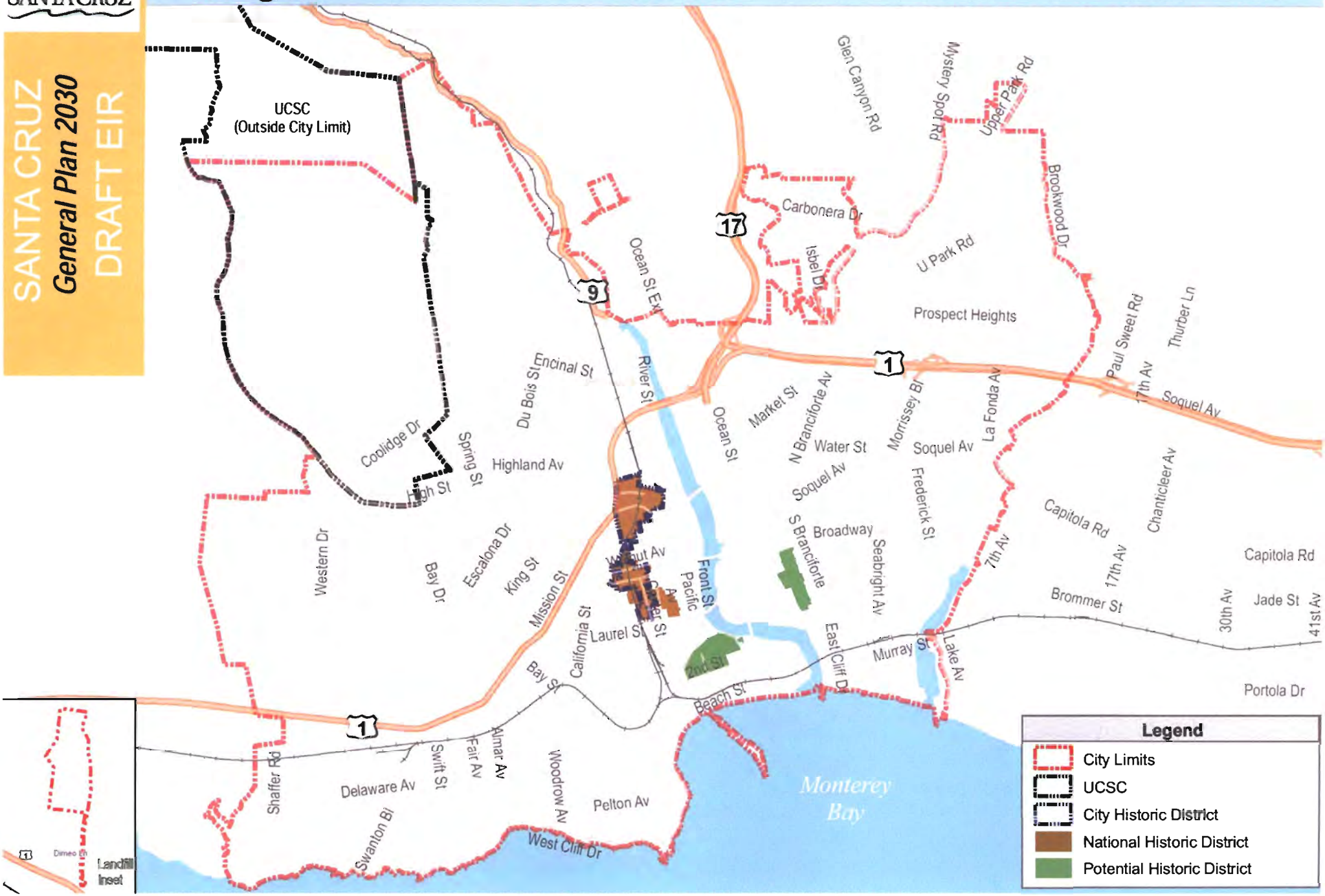
Figure 4.9-3
Areas of Historical Archaeological Sensitivity



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General Plan 2030
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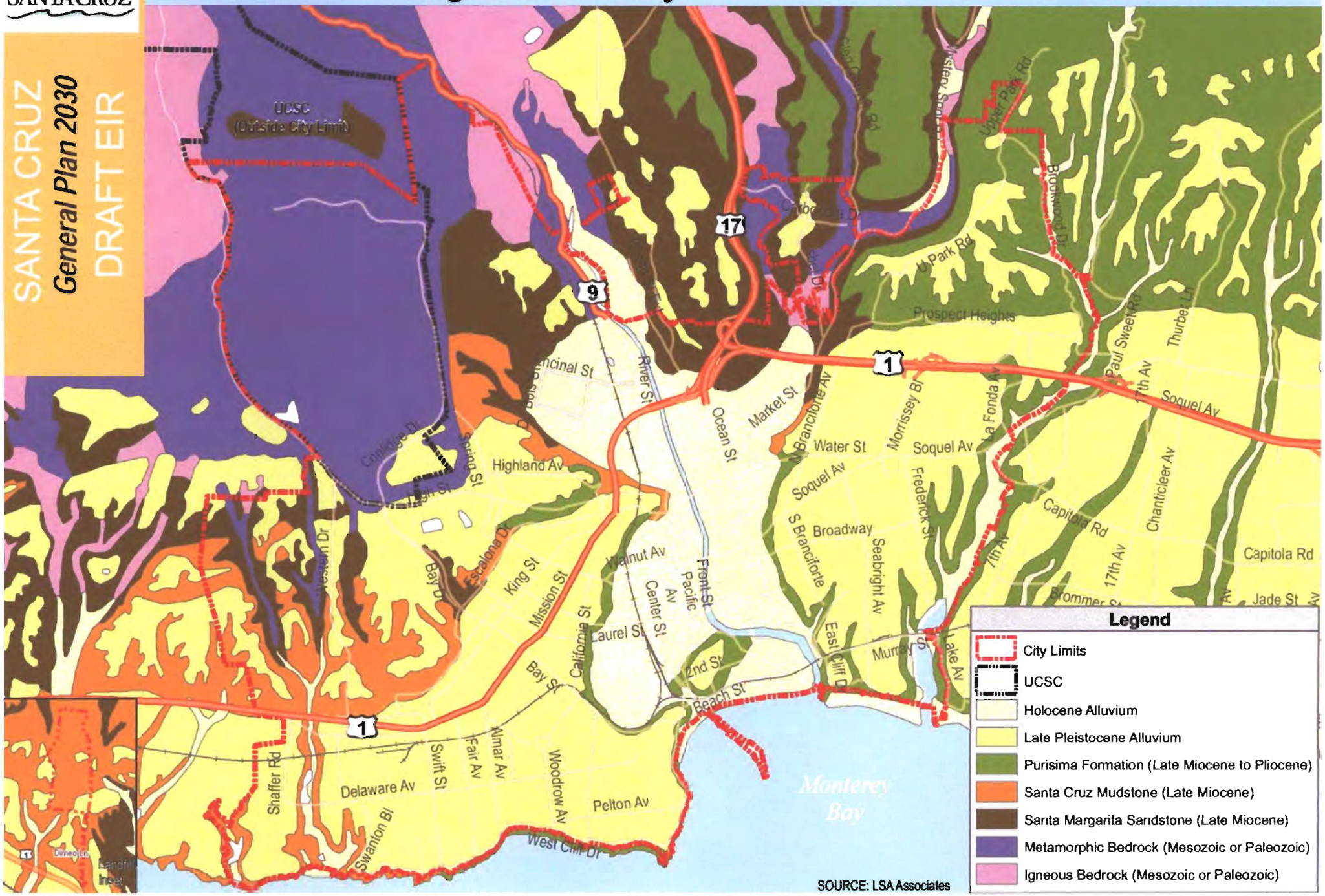
Figure 4.9-4
Existing and Potential Historic Districts

0 0.75 1.5 Miles



SANTA CRUZ
General Plan 2030
DRAFT EIR

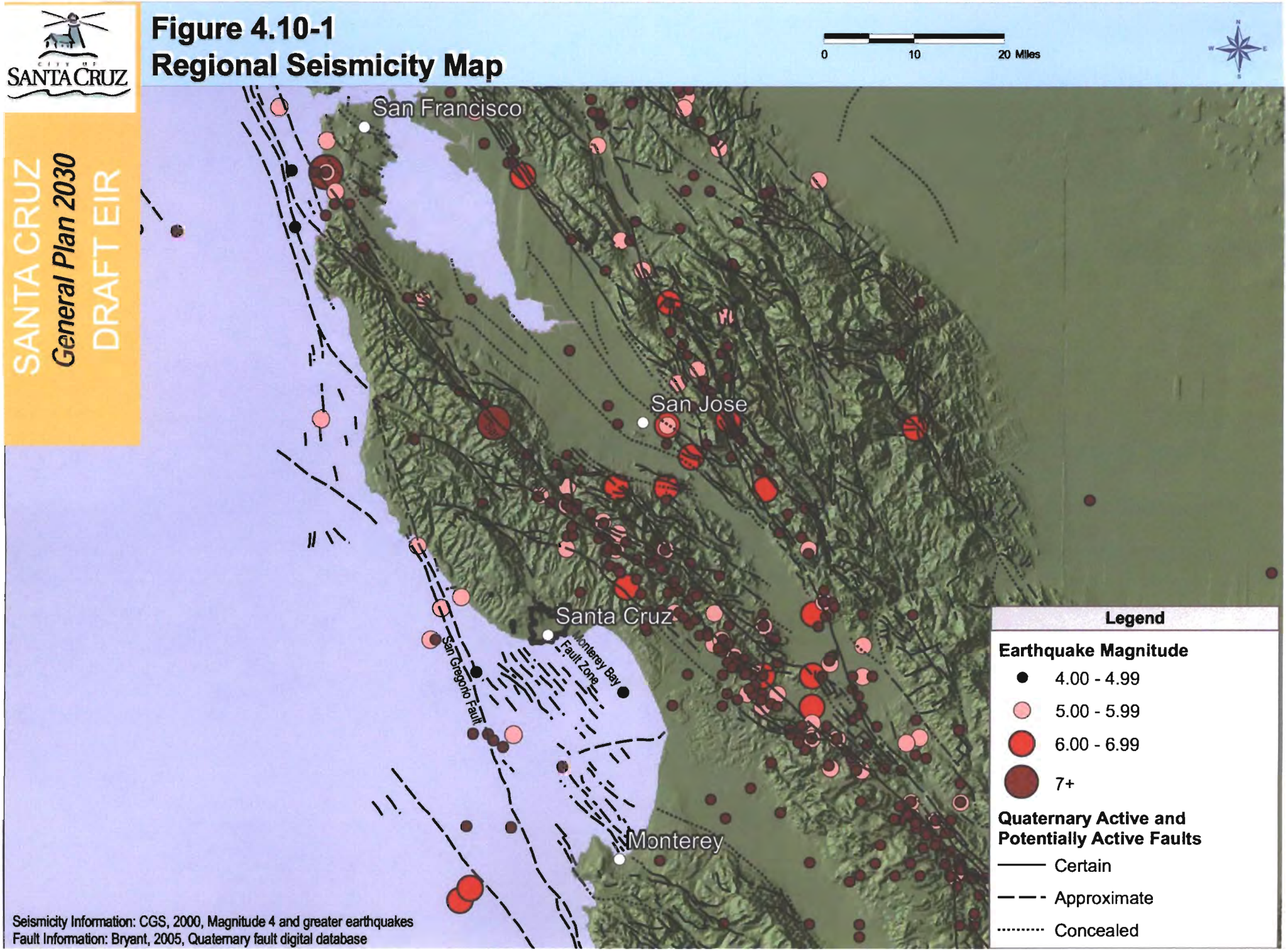
Figure 4.9-5
Areas of Paleontological Sensitivity



SOURCE: LSA Associates

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General Plan 2030
DRAFT EIR

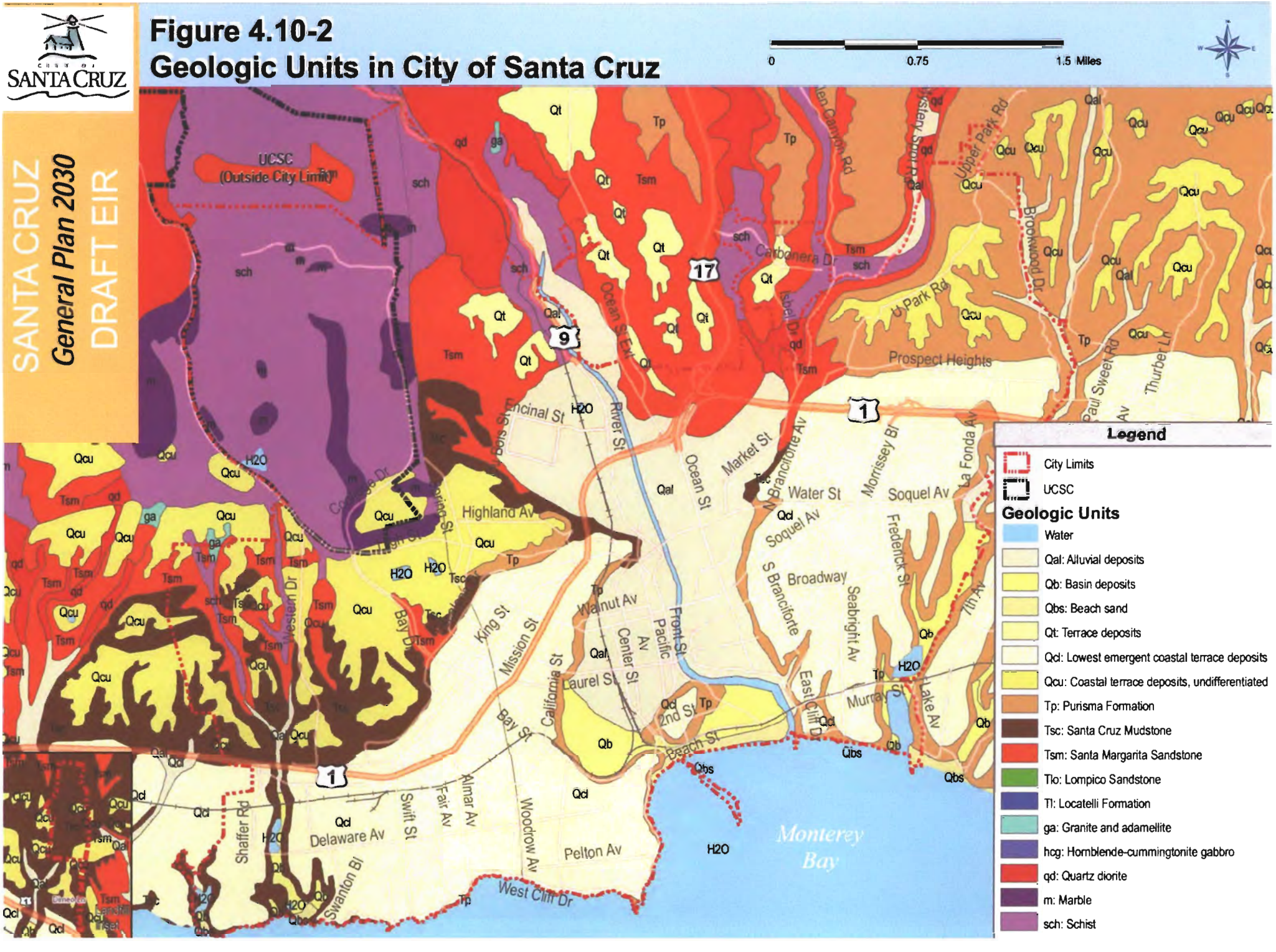
Figure 4.10-1
Regional Seismicity Map



Seismicity Information: CGS, 2000, Magnitude 4 and greater earthquakes
Fault Information: Bryant, 2005, Quaternary fault digital database

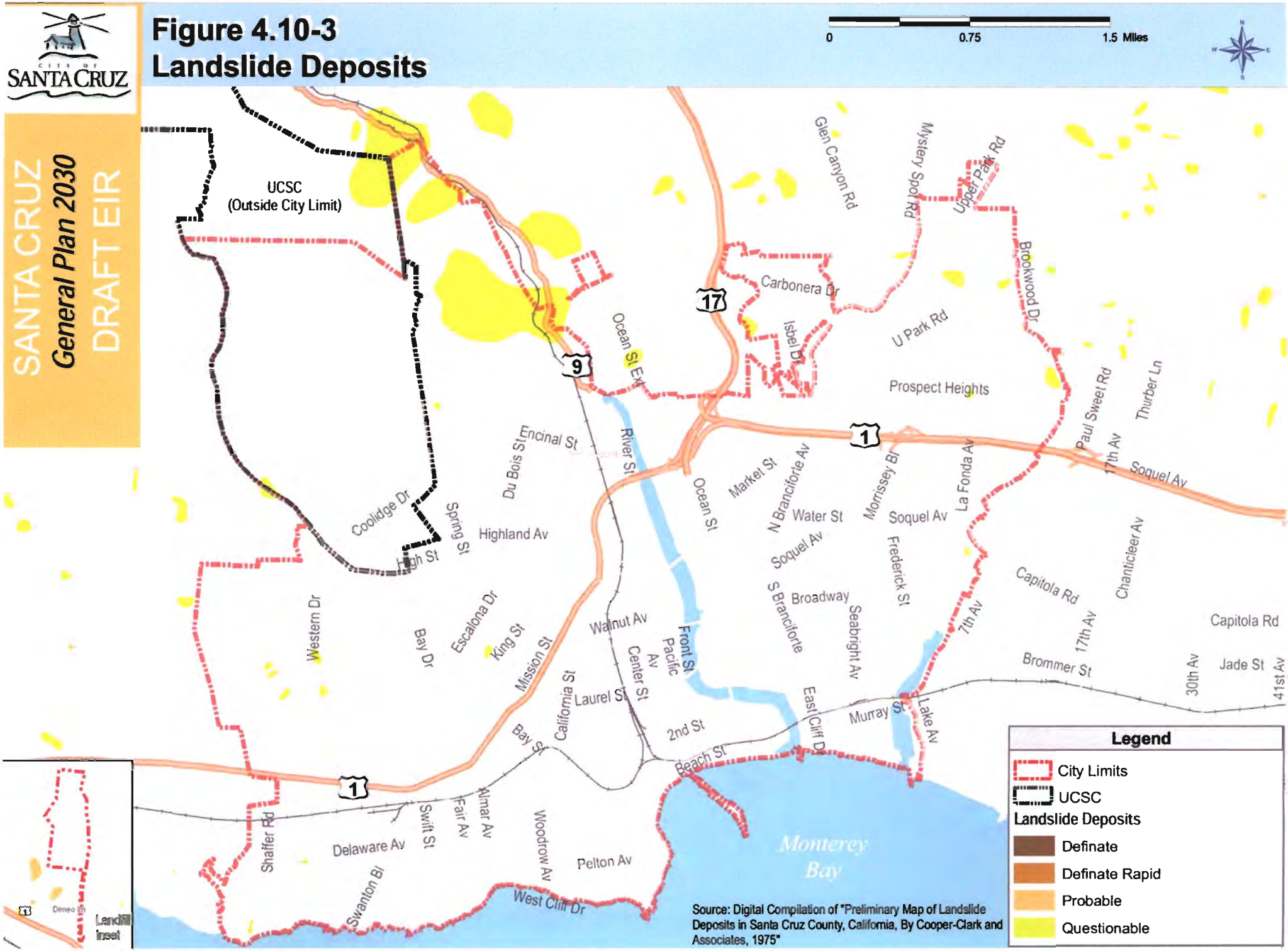
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Figure 4.10-2
Geologic Units in City of Santa Cruz



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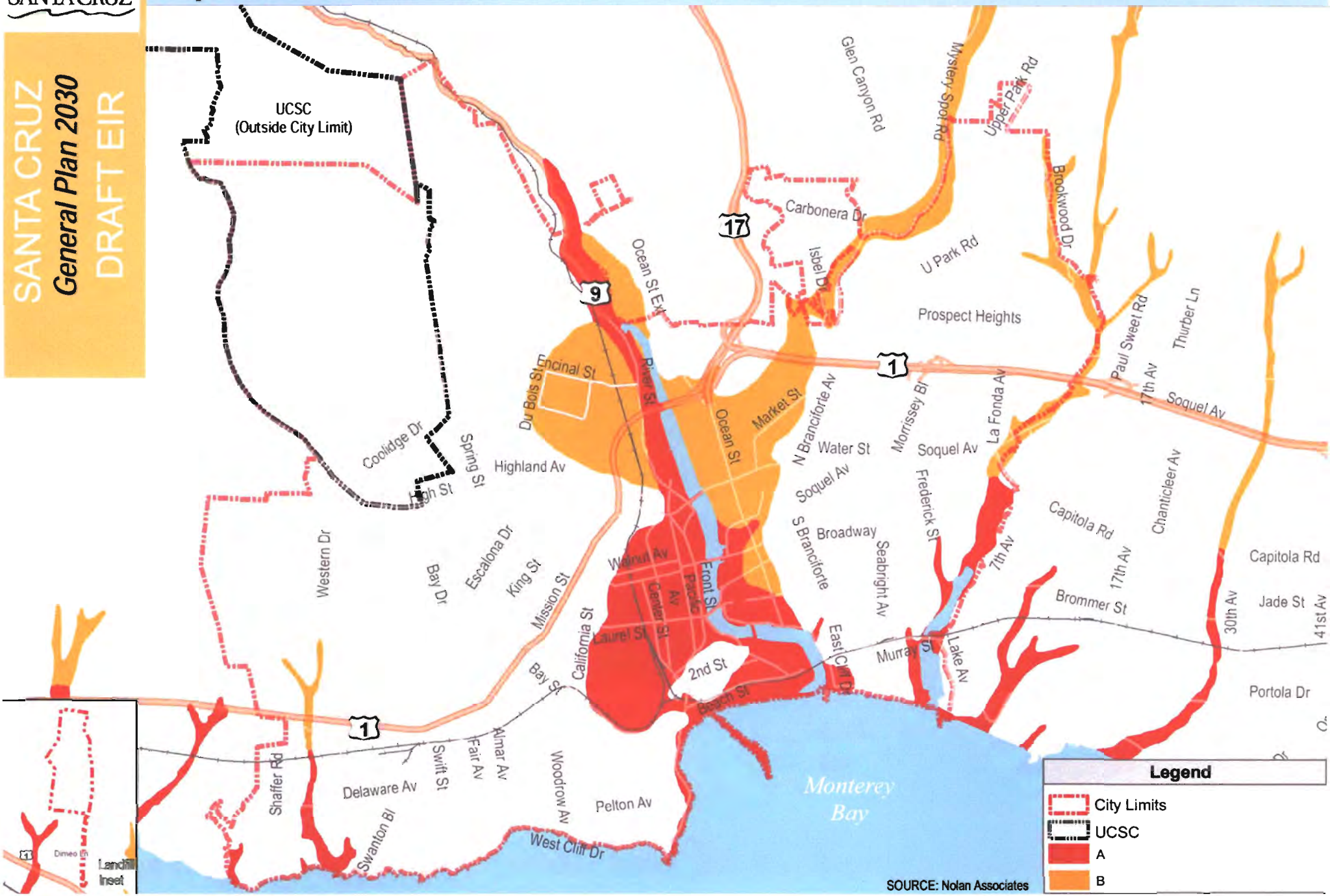
Figure 4.10-3
Landslide Deposits



Source: Digital Compilation of "Preliminary Map of Landslide Deposits in Santa Cruz County, California, By Cooper-Clark and Associates, 1975"

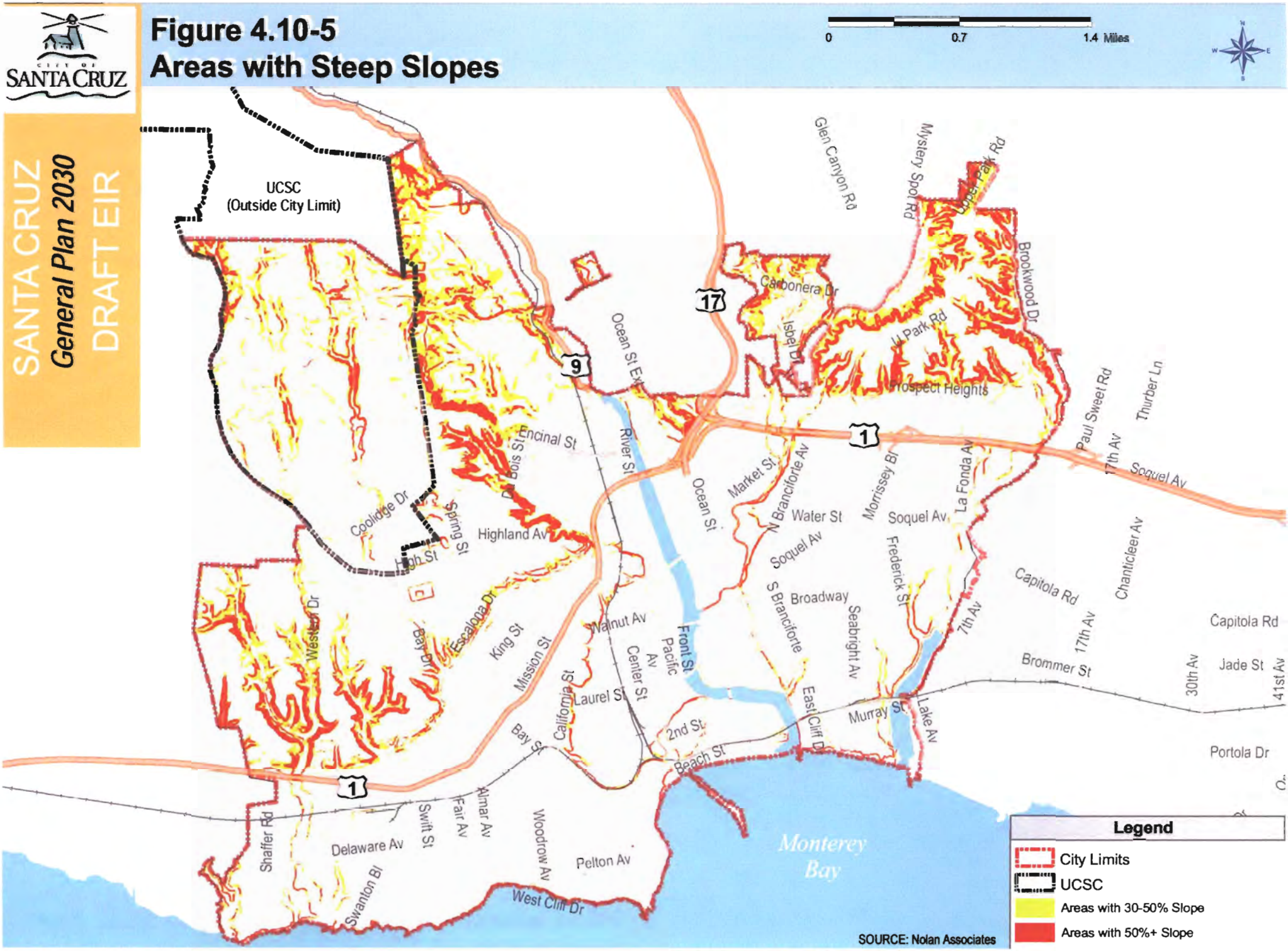
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Figure 4.10-4
Liquefaction Hazards



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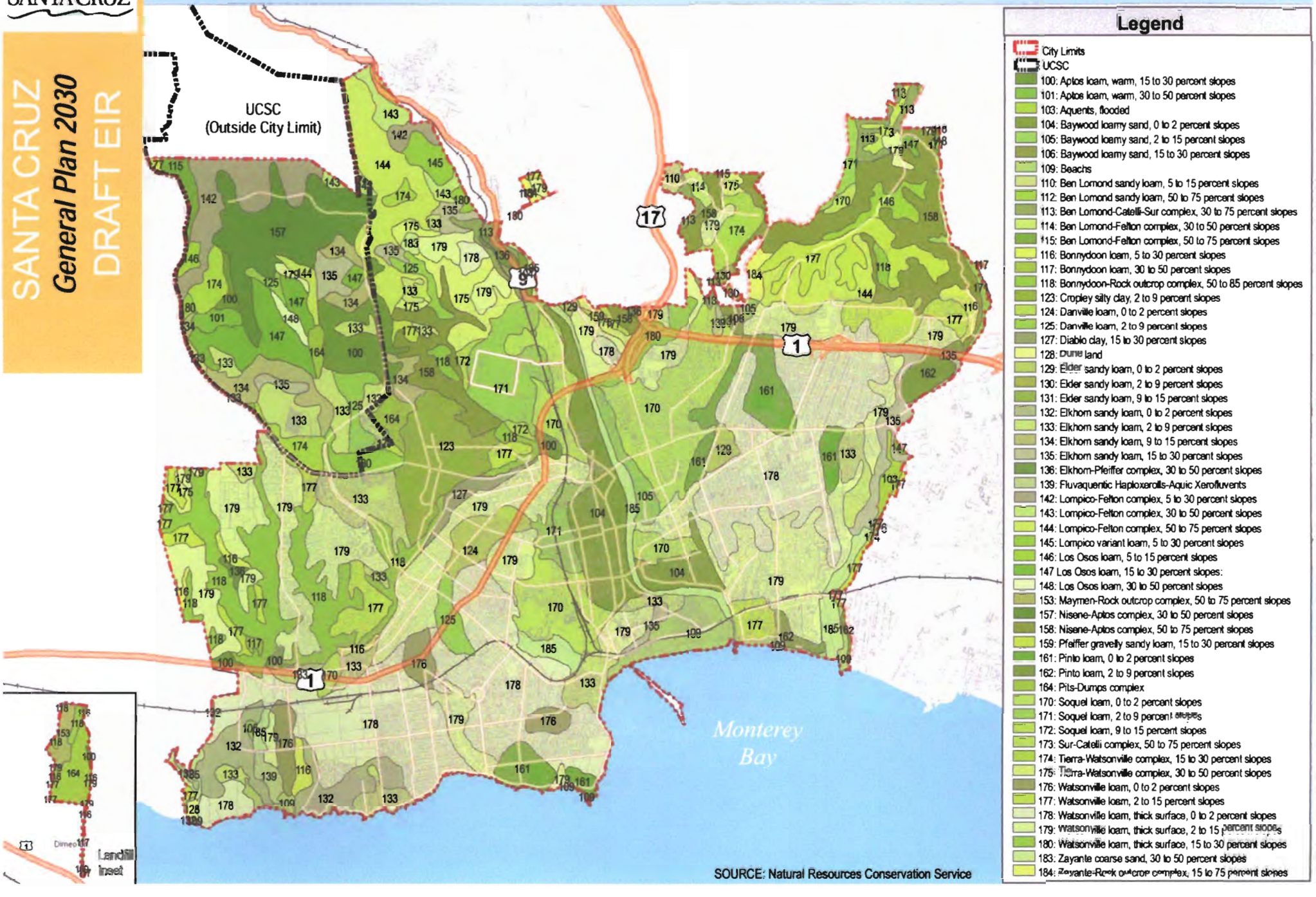
Figure 4.10-5
Areas with Steep Slopes



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General Plan 2030
DRAFT EIR

Figure 4.10-6
Soils

0 0.75 1.5 Miles

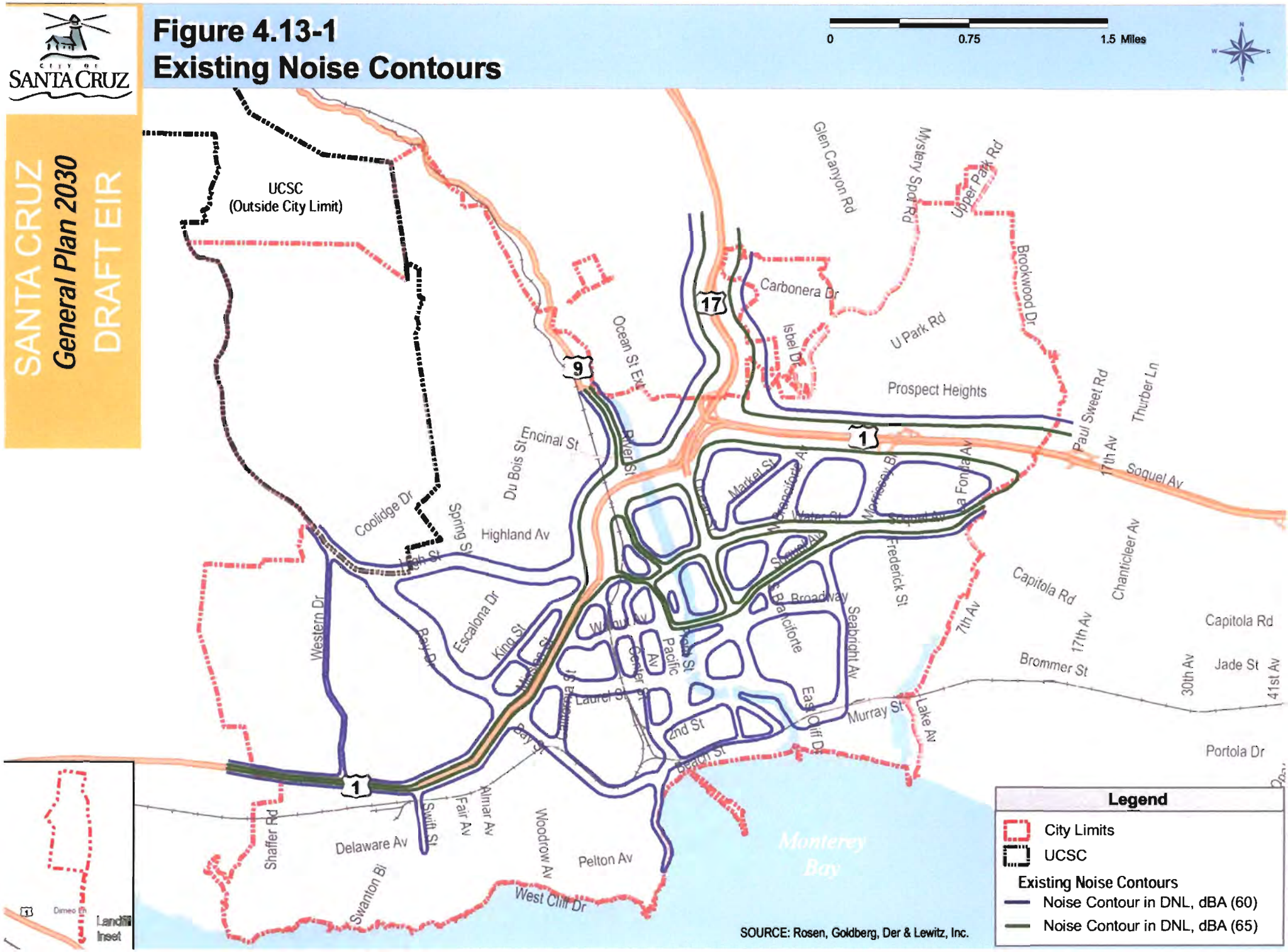


Legend

- City Limits
- UCSC
- 100: Aptos loam, warm, 15 to 30 percent slopes
- 101: Aptos loam, warm, 30 to 50 percent slopes
- 103: Aquents, flooded
- 104: Baywood loamy sand, 0 to 2 percent slopes
- 105: Baywood loamy sand, 2 to 15 percent slopes
- 106: Baywood loamy sand, 15 to 30 percent slopes
- 109: Beaches
- 110: Ben Lomond sandy loam, 5 to 15 percent slopes
- 112: Ben Lomond sandy loam, 50 to 75 percent slopes
- 113: Ben Lomond-Catelli-Sur complex, 30 to 75 percent slopes
- 114: Ben Lomond-Felton complex, 30 to 50 percent slopes
- 115: Ben Lomond-Felton complex, 50 to 75 percent slopes
- 116: Bonnydoon loam, 5 to 30 percent slopes
- 117: Bonnydoon loam, 30 to 50 percent slopes
- 118: Bonnydoon-Rock outcrop complex, 50 to 85 percent slopes
- 123: Cropley silty clay, 2 to 9 percent slopes
- 124: Danville loam, 0 to 2 percent slopes
- 125: Danville loam, 2 to 9 percent slopes
- 127: Diablo clay, 15 to 30 percent slopes
- 128: Dune land
- 129: Elder sandy loam, 0 to 2 percent slopes
- 130: Elder sandy loam, 2 to 9 percent slopes
- 131: Elder sandy loam, 9 to 15 percent slopes
- 132: Elkhorn sandy loam, 0 to 2 percent slopes
- 133: Elkhorn sandy loam, 2 to 9 percent slopes
- 134: Elkhorn sandy loam, 9 to 15 percent slopes
- 135: Elkhorn sandy loam, 15 to 30 percent slopes
- 136: Elkhorn-Pfeiffer complex, 30 to 50 percent slopes
- 139: Fluvaquentic Haploxerolls-Aquic Xerofluvents
- 142: Lompico-Felton complex, 5 to 30 percent slopes
- 143: Lompico-Felton complex, 30 to 50 percent slopes
- 144: Lompico-Felton complex, 50 to 75 percent slopes
- 145: Lompico variant loam, 5 to 30 percent slopes
- 146: Los Osos loam, 5 to 15 percent slopes
- 147 Los Osos loam, 15 to 30 percent slopes:
- 148: Los Osos loam, 30 to 50 percent slopes
- 153: Maymen-Rock outcrop complex, 50 to 75 percent slopes
- 157: Nisene-Aptos complex, 30 to 50 percent slopes
- 158: Nisene-Aptos complex, 50 to 75 percent slopes
- 159: Pfeiffer gravelly sandy loam, 15 to 30 percent slopes
- 161: Pinto loam, 0 to 2 percent slopes
- 162: Pinto loam, 2 to 9 percent slopes
- 164: Pits-Dumps complex
- 170: Soquel loam, 0 to 2 percent slopes
- 171: Soquel loam, 2 to 9 percent slopes
- 172: Soquel loam, 9 to 15 percent slopes
- 173: Sur-Catelli complex, 50 to 75 percent slopes
- 174: Tierra-Watsonville complex, 15 to 30 percent slopes
- 175: Tierra-Watsonville complex, 30 to 50 percent slopes
- 176: Watsonville loam, 0 to 2 percent slopes
- 177: Watsonville loam, 2 to 15 percent slopes
- 178: Watsonville loam, thick surface, 0 to 2 percent slopes
- 179: Watsonville loam, thick surface, 2 to 15 percent slopes
- 180: Watsonville loam, thick surface, 15 to 30 percent slopes
- 183: Zayante coarse sand, 30 to 50 percent slopes
- 184: Zayante-Rock outcrop complex, 15 to 75 percent slopes

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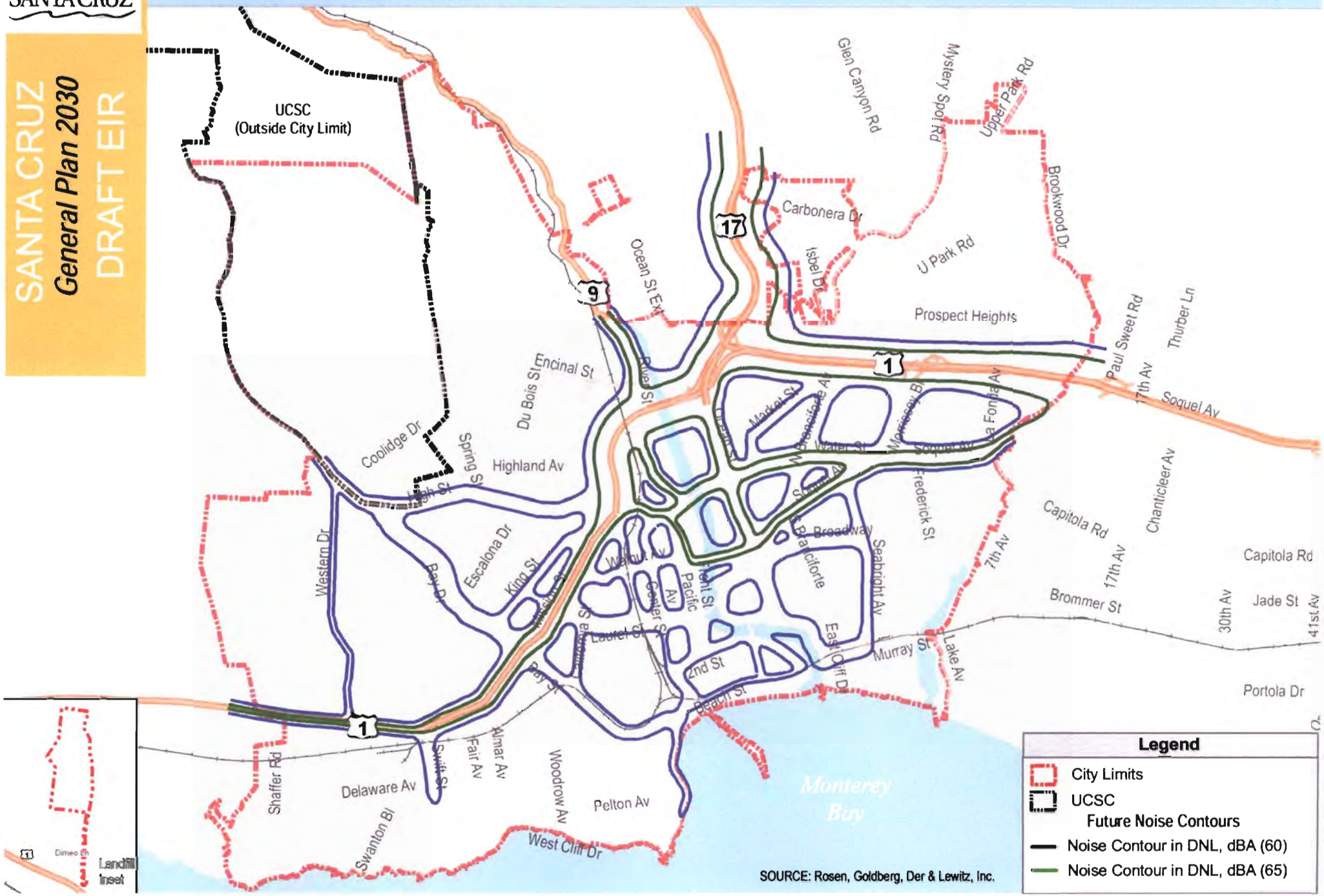
Figure 4.13-1
Existing Noise Contours



SOURCE: Rosen, Goldberg, Der & Lewitz, Inc.

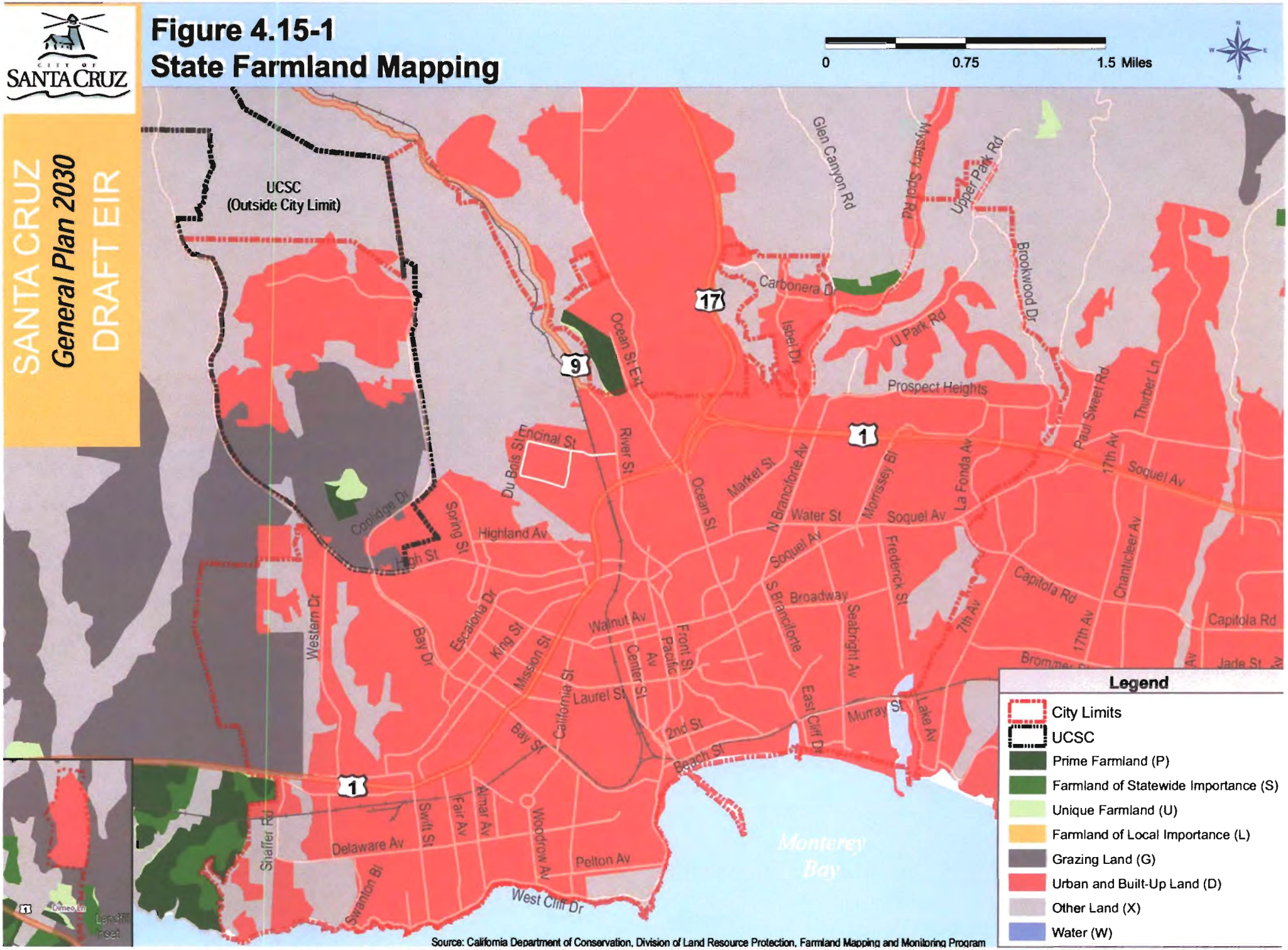
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Figure 4.13-2
Future Noise Contours



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General Plan 2030
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Figure 4.15-1
State Farmland Mapping



Source: California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program

APPENDIX A

EIR NOTICE OF PREPARATION
and
COMMENT LETTERS

ZONING/PERMIT PROCESSING
831/420-5100 • FAX 831/420-5101
INSPECTION SERVICES
831/420-5120 • FAX 831/420-5101

COMPREHENSIVE PLANNING,
HOUSING AND
COMMUNITY DEVELOPMENT
831/420-6250 • FAX 831/420-6458

809 Center Street • Room 206 • Santa Cruz, CA 95060 • cityplan@ci.santa-cruz.ca.us
JULIANA REBAGLIATI, DIRECTOR

FILE COPY

March 2, 2009

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

RE: City of Santa Cruz General Plan 2030 EIR

To Interested Agencies and Persons:

The City of Santa Cruz will be the lead agency and will prepare an Environmental Impact Report on the project described herein. Please respond with written comments regarding the scope and the content of the EIR as it may relate to your agency's area of statutory responsibility or your areas of concern or expertise. Your agency may need to use the EIR prepared by our agency when considering your permit or other approval for the project, if any is required. *Responses are due within 30 days of the receipt of this Notice, as provided by State law.* The contact person's name and address are listed below. Please include the name and phone number of a contact person at your agency in your response.

The project location, description, and potential environmental effects are presented below. An Initial Study has not been prepared. In accordance with State CEQA Guidelines section 15060(d), the City has determined that an EIR will be required for the project, and the probable environmental effects of the project that will be evaluated in the EIR are described in paragraph 4 below.

1. **Project Location.** The City of Santa Cruz, incorporated in 1866, is located approximately 75 miles south of San Francisco, 25 miles south of San Jose and 40 miles north of Monterey. The City has a total land area of 12.7 square miles, and is bordered by the Santa Cruz Mountains to the north, open space lands and agricultural lands to the west, the Monterey Bay to the south, and a portion of the unincorporated urban community of Live Oak to the east. As of January 1, 2008, the City supported a population of 58,125 with a mix of residential, commercial, industrial, visitor-serving, educational, public facility, recreational, and open space uses.

   The *General Plan 2030* planning area includes the following geographic areas as shown on Figure 1:

   - All lands located within the incorporated Santa Cruz city limits (including the City's Graham Hill water treatment plant and Dimeo Lane landfill);
   - Lands outside City limits but within the City's adopted Sphere of Influence that are located east of Highway 17 in the Carbonera neighborhood and along 7th Avenue to the east of city limits;
   - Unincorporated lands to the north and west of the City that generally extend from Graham Hill Road on the east to the Dimeo Lane and the City's landfill on the west. This area includes Henry Cowell State Park, University of California lands located

outside City limits, and Wilder Ranch State Park. State law requires the general plan to consider any territory outside the city boundaries which, in the City's judgment, bears relation to its planning. These "lands of interest" total approximately 26 square miles.

2. **Project Description.** The proposed project consists of the City's *Draft General Plan 2030* (dated February 27, 2009), which is an update of the City's existing *General Plan and Local Coastal Plan 1990-2005* that was adopted in 1992 and subsequently amended. The General Plan is a comprehensive, long-range, and internally consistent statement of the City's development and preservation policies within the General Plan planning area. State law requires that cities prepare general plans and regularly review and update them.

   Pursuant to State law, a General Plan must include the following elements: Land Use, Circulation, Housing, Conservation, Open Space, Safety, and Noise. The draft General Plan (except for Housing as discussed further below) addresses the State's requirements in the following chapters and also includes optional subjects set forth in the State General Plan Guidelines related to community design and economic development.

   - Historic Preservation, Arts, and Culture
   - Community Design
   - Land Use
   - Mobility
   - Economic Development
   - Civic and Community Facilities
   - Hazards, Safety, and Noise
   - Parks, Recreation, and Open Space
   - Natural Resources and Conservation

   In addition to "Guiding Principles" set forth in the General Plan, the draft *General Plan 2030* provides goals, policies and actions to address each of the above topics. A goal is a general, overall and ultimate purpose, aim or end toward which the City will direct effort during the timeframe of the General Plan. A policy is a specific statement of principle or guidance that implies clear commitment; the direction the City elects to follow in order to meet its goals. An action is a program, activity or strategy carried out in response to adopted policy to achieve a specific goal.

   A summary of the issues/topics addressed by the draft goals, policies and actions is provided below:

   - The HISTORIC PRESERVATION, ARTS, AND CULTURE chapter includes four goals and associated policies and actions that address: 1) cultural resources (archaeological, paleontological and historical resources and historic buildings); 2) arts and cultural facilities and performances; 3) arts and cultural programs; and 4) establishing a strong identity as an arts and cultural community.
   - The COMMUNITY DESIGN chapter includes five goals and associated policies and actions that address: 1) preservation of natural features that visually define areas with a built environment in harmony with its natural setting; 2) diverse neighborhoods and business districts with well-defined character; 3) design and

linkages between key areas; 4) attractive gateways, roadways and landscaping; and 5) walkable neighborhoods and districts with compatible uses and buildings.

- The LAND USE chapter includes four goals and associated policies and actions that address: 1) sustainable land uses; 2) a compact community with boundaries defined by the city's greenbelt and Monterey Bay; 3) complementary balance of diverse land uses; and 4) land use patterns that facilitate alternative transportation and/or minimize transportation demand.
- The MOBILITY chapter includes four goals and associated policies and actions that address: 1) facilitation of multiple transportation alternatives; 2) a safe, efficient, adaptive and accessible transportation system (including alternative transportation, transit, multi-modal systems); 3) a safe, efficient and adaptive road system; and 4) safe and inviting pedestrian and bicycle access.
- The ECONOMIC DEVELOPMENT chapter includes six goals and associated policies and actions that address: 1) the city as a vibrant regional economic center; 2) growth in the city's tax base; 3) the University as a major contributor to and beneficiary of a successful local economy; 4) diverse, educated and skilled work force; 5) diverse and dynamic business districts; and 6) a sustainable economy.
- The CIVIC AND COMMUNITY FACILTIES chapter includes eleven goals and associated policies and actions that address: 1) an involved and informed citizenry; 2) provision of comprehensive community facilities and services; 3) a safe, reliable water supply; 4) a sustainable and efficient wastewater systems; 5) a sustainable and efficient stormwater system; 6) solid waste; 7) police services; 8) educational opportunities; 9) health and human services; 10) childcare facilities and services; and 11) technical innovation.
- The HAZARDS, SAFETY AND NOISE chapter includes six goals and associated policies and actions that address: 1) emergency and disaster readiness; 2) air quality; 3) noise; 4) hazardous materials; 5) light pollution; and 6) natural hazards, including hazards related to erosion, steep slopes, earthquakes, flooding, tsunamis, and dam failure.
- The PARKS, RECREATION AND OPEN SPACE chapter includes four goals and associated policies and actions that address: 1) parks, open space and recreational facilities; 2) recreational programs, activities, events and services; 3) managed and convenient public access to open space lands and coastline; and 4) an integrated system of citywide and regional trails.
- The NATURAL RESOURCES AND CONSERVATION chapter includes seven goals and associated policies and actions that address: 1) creek, riparian and wetland systems; 2) plant and wildlife habitat; 3) conservation and stewardship of resources; 4) actions in reducing and responding to global warming; 5) a sustainable urban forest; 6) protected open space and coastline; and 7) reduction in energy use.

A Land Use Map is included in the General Plan that identifies land use designations throughout the City as shown on Figure 2. The allowable development density for residential land use is defined as the minimum and maximum number of permanent dwelling units per acre over the entire project or development site. A mix of residential densities may be used to achieve that average. For nonresidential uses, including commercial, office, and

industrial uses, development intensity is expressed as an average Floor Area Ratio (FAR). FAR is a measure of the total building floor area in proportion to the size of the building's lot.

The General Plan 2030 land use designations consist of:

- RESIDENTIAL DESIGNATIONS
  - Very-Low-Density Residential (VL), 0.1 to 1 dwelling unit per acre (du/ac)
  - Low-Density Residential (L), 1.1 to 10 du/ac
  - Low-Medium-Density Residential (LM), 10.1 to 20 du/ac
  - Medium-Density Residential (M), 20.1 to 30 du/ac
  - High-Density Residential (H), 30.1 to 55 du/ac
- COMMERCIAL DESIGNATIONS
  - Neighborhood Commercial (NC), 0.25 to 1.5 FAR
  - Community Commercial (CC), 0.25 to 1.75 FAR
  - Regional Visitor Commercial (RVC), 0.25 to 3.5 FAR
  - Office (OF), 0.25 to 1.75 FAR
- MIXED USE DESIGNATIONS
  - Mixed-Use Medium Density (MXMD), 0.75 to 1.75 FAR, 10 to 30 du/ac
  - Mixed-Use High Density (MXHD), 1.0 to 2.75 FAR, 10 to 55 du/ac
  - Mixed-Use Visitor Commercial (MXVC), 1.0 to 2.75 FAR, 0 to 55 du/ac
- INDUSTRIAL DESIGNATIONS
  - Industrial (IND), 0.25 to 2.0 FAR
  - Coastal Dependent (CD), 0 to 0.1 FAR
- PUBLIC AND INSTITUTIONAL DESIGNATIONS
  - Community Facilities (CF), 0 to 2.5 FAR
  - UCSC Development (UC)
- PARKS AND OPEN SPACE DESIGNATIONS
  - Coastal Recreation (CR), 0 to 0.1 FAR
  - Parks (PK), 0 to 0.1 FAR
  - Natural Areas (NA), 0 to 0.1 FAR
  - Agriculture/Grazing (AG), 0.05 du/ac

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan and Local Coastal Program, except for the following:

- NEW DESIGNATIONS & APPLICATION: Three new mixed use land designations have been developed and applied to the following areas.
  - Mixed use high density designation is applied to segments of Soquel Avenue and Water Avenue that are designated Community Commercial in the existing General Plan.
  - Mixed use medium density designation is applied to segments of Mission Street and Ocean Street that are designated Community Commercial in the existing General Plan.

- Mixed use visitor serving designation is applied to segments of Ocean Street that is designated Community Commercial in the existing General Plan.

- LAND USE MAP CHANGES: Land Use Map Changes:
  - Golf Club Drive Property: Change the existing General Plan land use designation from Low Density Residential (1.1-10 DU/acre) to Very Low Density Residential (.1-1 DU/acre). However, a residential density of 10.1-20 dwelling units per acre could be applied to the 20-acre area with preparation and adoption of an area plan. This could result in more residential units (200+) than allowed in the existing General Plan (up to 100 units).
  - Swenson Property: Change the existing General Plan land use designation from Low Density Residential (1.1-10 DU/acre) to Low Medium Density Residential (10.1-20 DU/acre)/Neighborhood Commercial/Office.

Some of the *General Plan 2030* policies and actions also support mixed use districts and/or intensified redevelopment, such as a Mixed Use River District, expansion of the High Density Overlay on Front and lower Pacific, and additional height and intensity along Pacific north of Cathcart. A transition to higher densities along the City's transit and commercial corridors also is encouraged. Another policy allows maximum residential densities to be exceeded for the following uses: single-room occupancy (SRO) units; small ownership units (SOU); accessory dwelling units (ADU); density bonus units; and residential uses within areas designated High-Density Overlay District (HD-O). Additionally, several General Plan actions support specific types of development, although site-specific locations are not identified. These facilities include arts and cultural facilities, a performing arts center, high-end lodging, large regional retail uses to the Harvey West area, and a desalination facility site.

The Housing Element is prepared as a separate volume to the General Plan as it requires more frequent updates than the remainder of the General Plan in accordance with State law. Thus, the Housing Element is not part of the *General Plan 2030* document and not included in the environmental review. The Housing Element is being updated and is anticipated to be completed in spring 2009.

Additionally, the City's existing certified Local Coastal Program (LCP) is part of the existing 1990-2005 General Plan. As part of the current General Plan update , the LCP will be updated as a separate document. Thus, these two plans are not included in the General Plan 2030 document or accompanying EIR.

3. **Probable Environmental Effects of the Project.** After completing a preliminary review of the project, as described in Section 15060 of the CEQA Guidelines, the City has determined that an EIR should be prepared to assess the potential environmental impacts of this project. The EIR will analyze the effects of the proposed project on land use, public facilities and services, resources and hazards as further described below and will provide a determination of impact significance. At present, the City lacks sufficient information to make conclusive determinations on significance. The City will consider the written comments received in response to this Notice of Preparation in determining the topics and scope to be assessed in the Draft EIR.

This EIR is being prepared as a "program" EIR pursuant to State CEQA Guidelines section 15168 that allows a comprehensive review of the actions that comprise the draft General Plan. Subsequent development would be reviewed in light of the General Plan EIR to determine whether an additional environmental document must be prepared. Commonly called "tiering," the environmental review for a subsequent project can be limited to those project-specific significant effects that were not examined in the General Plan EIR.

The EIR will assess significant environmental effects that may result from the implementation of plan's policies and actions or development/growth accommodated by the plan. Direct and indirect, secondary impacts will be examined. General Plan policies and actions that serve as mitigation measures will be described and considered.

The topics to be addressed in the *General Plan 2030* EIR include:

- *Land Use.* The EIR will include a review of existing land uses and existing/planned buildout projections. To aid the environmental analysis, a "buildout" projection was developed by the City's land use consultant for the General Plan. The projection considers the development potential of land permitted under the proposed General Plan that is estimated to occur in Santa Cruz by the year 2030. The projections are based on the draft Land Use Map, take into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels. Under the draft plan, the buildout projections estimate the following new development by the year 2030: a) 3,729 residential units; b) 1,292,289 square feet of commercial development; c) 1,318,916 square of office space; and d) 388,156 square feet of industrial development. The EIR will review consistency of the draft General Plan with other area plans.

- *Population and Housing.* The EIR will review population increases during the General Plan timeframe and effects of General Plan buildout on housing. Employment and jobs/housing issues will be addressed.

- *Public Facilities and Services.* The EIR will assess effects of General Plan buildout and growth on public facilities and services to include: a) transportation and traffic; b) water supply; c) public services and utilities; and d) hydrology and water quality. Consultation with the Water Department will be conducted in accordance with CEQA Guidelines section 15083.5 and California Water Code section 10910.

- *Resources and Hazards.* The EIR will assess effects of General Plan buildout and growth on resources and hazards at a "program" level to include: a) aesthetics; b) biological resources; c) cultural resources; d) air quality, including global climate change impacts; e) geology and soils; f) noise; g) hazardous materials; and h) agricultural and mineral resources.

- Other CEQA-required sections will be provided, including Alternatives and Cumulative Impacts. The Cumulative Impacts section will include UCSC growth as envisioned in its *2005 Long-Range Development Plan.*

4. **Scoping Meeting.** The City of Santa Cruz will hold EIR scoping meetings on March 16, 2009 pursuant to CEQA section 21083.9 which require scoping meetings for projects of "statewide, regional or areawide significance." The purpose is to take oral comments on the EIR Scope of Work. A public agency scoping meeting will be held from 3 to 5 PM, and a public scoping meeting will be held from 6 to 8 PM. Members from the public and public agency representatives may attend either meeting. Both meetings will be held at Santa Cruz Civic Auditorium, 307 Church Street, Room ABC, Santa Cruz, CA 95060.

5. **Contact Person Name and Phone Number.**

   Michelle King, City of Santa Cruz Planning and Community Development Department
   809 Center Street, Rm. 206
   Santa Cruz, CA 95060
   Phone: 831 420-5092

   Responses to this Notice of Preparation are due by April 2, 2009.

Sincerely,

Michelle D. L

Michelle King, Senior Planner

APPENDIX A

STATE OF CALIFORNIA

GOVERNOR'S OFFICE of PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

Notice of Preparation

March 3, 2009

To: Reviewing Agencies

Re: City of Santa Cruz General Plan
SCH# 2009032007

Attached for your review and comment is the Notice of Preparation (NOP) for the City of Santa Cruz General Plan draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Michelle King
City of Santa Cruz
809 Center Street
Santa Cruz, CA 95060

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Assistant Deputy Director & Senior Planner, State Clearinghouse

Attachments
cc: Lead Agency

RECEIVED
MAR 06 2009
CITY PLANNING DEPT

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

APPENDIX A

SCH# 2008032007
Project Title City of Santa Cruz General Plan
Lead Agency Santa Cruz, City of

Type NOP Notice of Preparation

Description The proposed project consists of the City's Draft General Plan 2030, which is an update of the City's existing General Plan and Local Coastal Plan 1990-2005 that was adopted in 1992 and subsequently amended. In addition to "Guiding Principles", the draft plan provides goals, policies and actions for the following elements: Historic Preservation, Arts, and Culture; Community Design; Land Use; Mobility; Economic Development; Civic and Community Facilities; Hazards, Safety, and Noise; Parks, Recreation, and Open Space; and Natural Resources and Conservation. Three new mixed use land designations have been added along major corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street.

Lead Agency Contact

Name Michelle King
Agency City of Santa Cruz
Phone (831) 420-5092 *Fax*
email
Address 809 Center Street
City Santa Cruz *State* CA *Zip* 95060

Project Location

County Santa Cruz
City Santa Cruz
Region
Cross Streets Citywide
Lat / Long
Parcel No.
Township *Range* *Section* *Base*

Proximity to:

Highways 1,9,17
Airports
Railways Union Pacific
Waterways Monterey Bay, San Lorenzo River
Schools Various
Land Use Citywide - General Plan Update

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Geologic/Seismic; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies California Coastal Commission; Cal Fire; Office of Historic Preservation; Department of Parks and Recreation; Department of Fish and Game, Region 3; Department of Food and Agriculture; Office of Emergency Services; Native American Heritage Commission; State Lands Commission; Department of Housing and Community Development; Caltrans, District 5; Integrated Waste Management Board; Regional Water Quality Control Board, Region 3; Resources Agency

Date Received 03/03/2009 *Start of Review* 03/03/2009 *End of Review* 04/01/2009

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erald R. Zimmerman

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ebecca Salazar

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llen Robertson

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'ayne Donaldson

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cott Flint
nvironmental Services Division

ish & Game Region 1
onald Koch

ish & Game Region 1E
aurie Harnsberger

- ☐ Fish & Game Region 2
  Jeff Drongesen
- ☒ Fish & Game Region 3
  Robert Floerke
- ☐ Fish & Game Region 4
  Julie Vance
- ☐ Fish & Game Region 5
  Don Chadwick
  Habitat Conservation Program
- ☐ Fish & Game Region 6
  Gabrina Gatchel
  Habitat Conservation Program
- ☐ Fish & Game Region 6 I/M
  Gabrina Getchel
  Inyo/Mono, Habitat Conservation Program
- ☐ Dept. of Fish & Game M
  George Isaac
  Marine Region

Other Departments

- ☒ Food & Agriculture
  Steve Shaffer
  Dept. of Food and Agriculture
- ☐ Depart. of General Services
  Public School Construction
- ☐ Dept. of General Services
  Anna Garbeff
  Environmental Services Section
- ☐ Dept. of Public Health
  Bridgette Binning
  Dept. of Health/Drinking Water

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  Linda Fiack
- ☒ Office of Emergency Services
  Dennis Castrillo
- ☐ Governor's Office of Planning & Research
  State Clearinghouse
- ■ Native American Heritage Comm.
  Debbie Treadway
- ☐ Public Utilities Commission
  Leo Wong
- ☐ Santa Monica Bay Restoration
  Guangyu Wang
- ☒ State Lands Commission
  Marina Brand
- ☐ Tahoe Regional Planning Agency (TRPA)
  Cherry Jacques

Business, Trans & Housing

- ☐ Caltrans - Division of Aeronautics
  Sandy Hesnard
- ☐ Caltrans - Planning
  Terri Pencovic
- ☐ California Highway Patrol
  Scott Loetscher
  Office of Special Projects
- ☒ Housing & Community Development
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- ☐ Caltrans, District 1
  Rex Jackman
- ☐ Caltrans, District 2
  Marcelino Gonzalez
- ☐ Caltrans, District 3
  Bruce de Terra
- ☐ Caltrans, District 4
  Lisa Carboni
- ☒ Caltrans, District 5
  David Murray
- ☐ Caltrans, District 6
  Michael Navarro
- ☐ Caltrans, District 7
  Elmer Alvarez
- ☐ Caltrans, District 8
  Dan Kopulsky
- ☐ Caltrans, District 9
  Gayle Rosander
- ☐ Caltrans, District 10
  Tom Dumas
- ☐ Caltrans, District 11
  Jacob Armstrong
- ☐ Caltrans, District 12
  Ryan P. Chamberlain

Cal EPA

Air Resources Board

- ☐ Airport Projects
  Jim Lemer
  - ☐ Transportation Projects
    Douglas Ito
  - ☐ Industrial Projects
    Mike Tollstrup
- ☒ California Integrated Waste Management Board
  Sue O'Leary
- ☐ State Water Resources Control Board
  Regional Programs Unit
  Division of Financial Assistance
- ☐ State Water Resources Control Board
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- ☐ State Water Resouces Control Board
  Steven Herrera
  Division of Water Rights
- ☐ Dept. of Toxic Substances Control
  CEQA Tracking Center
- ☐ Department of Pesticide Regulation
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- ☐ RWQCB 1
  Cathleen Hudson
  North Coast Region (1)
- ☐ RWQCB 2
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- ☒ RWQCB 3
  Central Coast Region (3)
- ☐ RWQCB 4
  Teresa Rodgers
  Los Angeles Region (4)
- ☐ RWQCB 5S
  Central Valley Region (5)
  - ☐ RWQCB 5F
    Central Valley Region (5)
    Fresno Branch Office
  - ☐ RWQCB 5R
    Central Valley Region (5)
    Redding Branch Office
- ☐ RWQCB 6
  Lahontan Region (6)
  - ☐ RWQCB 6V
    Lahontan Region (6)
    Victorville Branch Office
- ☐ RWQCB 7
  Colorado River Basin Region (7)
- ☐ RWQCB 8
  Santa Ana Region (8)
- ☐ RWQCB 9
  San Diego Region (9)

☐ Other _____

_____

_____

Last Updated on 01/07/2009

APPENDIX A

3STATE OF CALIFORNIA- THE NATURAL RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, *Governor*

BOARD OF FORESTRY AND FIRE PROTECTION
P.O. Box 944246
SACRAMENTO, CA 94244-2460
(916) 653-8007
(916) 653-0989 FAX
Website: http://www.bof.fire.ca.gov/

June 8, 2009

RECEIVED
JUN 11 2009
CITY PLANNING DEPT

Mrs. Michelle King
City of Santa Cruz
809 Center Street
Santa Cruz, CA 95060

Re: City of Santa Cruz General Plan Fire Safety Element Recommendations

Dear Mrs. Michelle King:

The State Board of Forestry and Fire Protection (Board) is required to review and provide recommendations to the safety element of county and local government general plans when such plans are being updated. This review is in accordance with Government Code (GC) §65302.5 which requires the Board to review the fire safety element when the general plan update contains State Responsibility Areas or Very High Fire Hazard Severity Zones.

Enclosed is a list of standard recommendations titled "*General Plan Fire Safety Elements Standard Recommendations*" which should be incorporated into the General Plan. Each entity should evaluate their general plan and include the appropriate recommendations from the list.

Please note requirements for response pursuant to GC §65302.5(b). Thank you for the opportunity to participate in your planning process. We hope this input leads to greater protection and reduced cost and losses from wildfires in your jurisdiction.

Sincerely,

Stan Dixon
Chair, State Board of Forestry and Fire Protection

William Hoehman, Northern Region Chief
John Ferreria, San Mateo-Santa Cruz Unit Chief

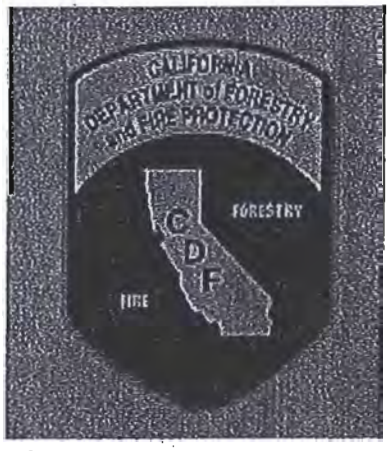
General Plan Fire Safety Element

Standard Recommendations

August 29, 2007

State Board of Forestry and Fire Protection





Contents

Purpose and Background

Methodology for Review and Recommendations

Standard List of Recommendations

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3101
FAX (805) 549-3329
TDD (805) 549-3259
http://www.dot.ca.gov/dist05/

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April 1, 2009

Michelle King
City of Santa Cruz
809 Center Street, Room 206
Santa Cruz, CA 95060

Dear Ms. King:

COMMENTS ON THE NOTICE OF PREPARATION (NOP) FOR THE CITY OF SANTA CRUZ GENERAL PLAN DRAFT ENVIRONMENTAL IMPACT REPORT (EIR)

The California Department of Transportation (Department), District 5, Development Review, has reviewed the above referenced project and offers the following comments:

1. The Department supports local development that is consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel and development.

2. We anticipate the conditions of approval for a General Plan Amendment to include requiring a comprehensive regional traffic study and look forward to reviewing it. Please visit the Department's Internet site for a copy of our *Guidelines for the Preparation of Traffic Impact Studies* at: http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf. An alternative method that produces technically comparable results can also be use.

3. The Department is responsible for the safety, operations, and maintenance of the State transportation system; therefore, our Level of Service (LOS) standards should be used to determine the significance of a project's impact. We endeavor to maintain a target LOS at the transition between LOS C and LOS D on all State transportation facilities. In cases where a State facility is already operating at an unacceptable LOS, *any* additional trips should be considered a significant cumulative traffic impact, and should be mitigated accordingly.

Thank you for the opportunity to comment on the NOP for the City of Santa Cruz General Plan Draft EIR, and for your consideration and action upon these issues. If you have any questions or concerns, or need further clarification on the items discussed above, please do not hesitate to call me at (805) 549-3099 or e-mail jennifer.calate@dot.ca.gov.

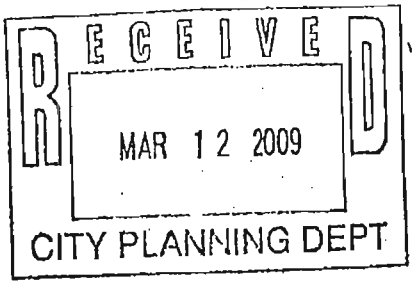
Sincerely,

JENNIFER CALATÉ
Associate Transportation Planner
District 5 Development Review Coordinator

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298





March 10, 2009.

Michelle King
City of Santa Cruz
809 Center Street
Santa Cruz, CA 95060

Re: Notice of Preparation, Draft Environmental Impact Report (DEIR)
City of Santa Cruz General Plan
SCH# 2009032007

Dear Ms. King:

As the state agency responsible for rail safety within California, the California Public Utilities Commission (CPUC or Commission) recommends that development projects proposed near rail corridors be planned with the safety of these corridors in mind. New developments and improvements to existing facilities may increase vehicular traffic volumes, not only on streets and at intersections, but also at at-grade highway-rail crossings. In addition, projects may increase pedestrian traffic at crossings, and elsewhere along rail corridor rights-of-way. Working with CPUC staff early in project planning will help project proponents, agency staff, and other reviewers to identify potential project impacts and appropriate mitigation measures, and thereby improve the safety of motorists, pedestrians, railroad personnel, and railroad passengers.

The Commission urges your agency to include consideration of potential project-related rail safety impacts, and measures to reduce adverse impacts in the DEIR for the update to your General Plan. In general, the major types of impacts to consider are collisions between trains and vehicles, and between trains and pedestrians. Changes in land use should not be allowed that would permit housing adjacent to existing rail yards. Similarly, where a need for grade-separated crossings is identified, new development should not be placed adjacent to at-grade highway rail crossings, within the footprint of land needed for future grade-separation structures.

Thank you for your consideration of these comments. If you have any questions in this matter, please call me at (415) 703-1306.

Sincerely,

Daniel Kevin

Daniel Kevin
Regulatory Analyst
Consumer Protection and Safety Division

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

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PHYSICAL PLANNING AND CONSTRUCTION

SANTA CRUZ, CALIFORNIA 95064

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April 1, 2009

Ms. Juliana Rebagliati, AICP
Director of Planning and Community Development
809 Center Street, Room 107
Santa Cruz, Ca 95060

Re: City of Santa Cruz General Plan 2030 Environmental Impact Report
Scoping Comments

Dear Juliana:

Thank you for sending the Notice of Preparation of the City of Santa Cruz General Plan 2030 Environmental Impact Report. We have reviewed the Project Description and Probable Environmental Effects of the Project and have the following comment related to the scope of the Draft Environmental Impact Report.

The 2005 Long-Range Development Plan (LRDP), its Environmental Impact Report and the Comprehensive Settlement Agreement provide a comprehensive framework for the physical development of the UC Santa Cruz campus. The LRDP plans for development sufficient to accommodate an on-campus enrollment level of up to a three-quarter average of 19,500 full-time equivalent students and 4,463 faculty and staff using academic year 2020-2021 as the planning time frame. As the planning horizon for the General Plan 2030 occurs approximately ten years later than the planning horizon for the LRDP, the information in the LRDP, its EIR and the Comprehensive Settlement Agreement does not take into account the growth of the campus and other related conditions that may exist in 2030. Because the majority of campus lands are within the City's limits and/or sphere of influence the City should include UC Santa Cruz' long-range projections through 2030 as part of the City's General Plan 2030 EIR analysis.

In reviewing the campus's 45-year history, the campus has not had a consistent annual growth rate. However, the average annual campus growth rate over the 45 years is a reliable indicator for predicting campus conditions and was a factor when the campus considered future enrollment for the LRDP. Therefore, while we cannot provide a definitive description of UC Santa Cruz in 2030, we will provide the City with long-range projections based on historic campus growth trends. This information will allow the City to account for, with programmatic accuracy, the environmental effects of future campus enrollment and physical development between the LRDP's 2021 planning horizon and the 2030 horizon of the General Plan 2030 EIR. Please contact me if you have questions regarding the campus' long -range growth projections so that the General Plan 2030 EIR accurately reflects anticipated future environmental conditions.

Sincerely,

John Barnes
Director of Campus Planning

cc: Tom Vani
Carol Rossi
Kelly Drumm
Frank Zwart

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

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PHYSICAL PLANNING AND CONSTRUCTION SANTA CRUZ, CALIFORNIA 95064

May 20, 2009

Ms. Juliana Rebagliati
Director of Planning and Community Development
809 Center Street, Room 107
Santa Cruz, CA 95060

Re: City of Santa Cruz General Plan 2030 EIR
Potential UC Santa Cruz Conditions in 2030

Dear Juliana:

By letter dated April 1, 2009, UC Santa Cruz (UCSC) provided comments in response to the Notice of Preparation of the City of Santa Cruz 2030 General Plan Environmental Impact Report. UCSC requested that the City's General Plan and General Plan EIR take into account campus population through year 2030.

UCSC prepares a plan that projects campus programmatic and population growth approximately every 15 years, and the current 2005 Long-Range Development Plan (2005 LRDP) runs through the 2020-21 academic calendar. The 2005 LRDP is based on a projected fall-winter-spring enrollment of 19,500 students and an employee population of about 4,500 persons, for a total campus population of about 24,000 in 2020-21. Campus planning beyond 2021 has not yet commenced, however historic enrollment trends at the University of California and the UCSC campus can be used to provide a reasonable forecast for UCSC population through 2030. At the University of California, system-wide enrollment has increased approximately 2.5% annually in the last decade. The University has planned for similar increased enrollments through 2010-11, although a downward adjustment may be necessary based on current budget constraints.

At UCSC, in the 42 years between the campus' establishment in 1965 and 2007-08, enrollment has annually increased at an average rate of between 320-350 students per year. The employee population has averaged between 22% and 23% of enrollment during the same period. The campus' current LRDP is based on a similar projected population increase through academic year 2020-2021. The projected enrollment rate and ratio of students to employees used in the preparation of the 2005 LRDP (22-23%) is likely to remain relatively constant beyond academic year 2020-2021. In the planning process for the next LRDP major amendment, a comprehensive analysis of locating enrollment growth outside the City of Santa Cruz will be conducted. However, UCSC has an obligation to fulfill the University of California's legislative mandate "to plan that adequate spaces are available to accommodate all California resident students who are eligible and likely to apply to attend an appropriate place within the [UC] system." *Education Code Section 66202.5.* Accordingly, UCSC population between 2020 and 2030 based on historical UC and UCSC enrollment patterns of between 320 and 350 additional students per year and associated employee growth should conservatively be included as part of the City's 2030 General Plan EIR. Please let me know if you have further questions about this information.

Sincerely,

John Barnes

John Barnes
Director of Campus Planning

MONTEREY BAY
Unified Air Pollution Control District
serving Monterey, San Benito, and Santa Cruz counties

Interim Air Pollution Control Officer
Ed Kendig

24580 Silver Cloud Court • Monterey, California 93940 • 831/647-9411 • FAX 831/647-8501

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Monterey County

Reb Monaco
San Benito County

Richard Ortiz
South Monterey County Cities

April 1, 2009

Ms. Michelle King, Senior Planner
City of Santa Cruz
Planning and Community Development Dept.
809 Center Street, Room 206
Santa Cruz, CA 95060

Sent Electronically To:
MKing@ci.santa-cruz.ca.us
Original Sent by First Class Mail.

SUBJECT: NOTICE OF PREPARATION FOR GENERAL PLAN 2030

Dear Ms. King:

The Air District submits the following comments for your consideration:

General Plan Update's Cumulative Air Quality Impact on Regional Ozone
The District uses consistency with the 2008 Air Quality Management Plan (AQMP) for the North Central Coast Air Basin to determine a general plan's cumulative impact on regional air quality (ozone levels). Please request a formal consistency determination from AMBAG and include it in the Draft EIR.

General Plan Update's Localized Air Quality Impact on Carbon Monoxide Levels
Localized impact is evaluated by determining if build-out identified in the General Plan Update would create or substantially contribute to carbon monoxide "hotspots" (where federal of State ambient air quality standards are exceeded). If project or cumulative traffic would cause LOS to decline from D or better to E or F, dispersion modeling should be undertaken to determine if carbon monoxide concentrations would violate ambient air quality standards at sensitive receptor locations.

Odors, Nuisances and Sensitive Receptors
If the General Plan Update would revise land use designations that might result in development of odors, nuisances or sensitive receptors in adjacent land uses, the Draft EIR should include an assessment of those impacts. District Rule 402, Nuisances, should be reviewed for applicable requirements.

Mitigation Measures
Mitigation measures should be identified for any significant impacts on air quality. The Draft EIR should quantify the emission reduction effectiveness of each measure, identify the agencies responsible for implementation and monitoring, and determine whether mitigation measures reduce impacts to a less-than-significant level.

Projects Constructed in Accord with the General Plan

The Draft EIR should indicate that projects constructed in accord with the General Plan could have impacts on air quality, which would be evaluated when the projects are proposed. The District has established the following thresholds of significance for individual projects: 137 lbs/day for VOC or NO_x, 82 lbs/day for PM_{10}, 150 lbs/day for SO_x, a significant decline in LOS, and a cancer risk greater than 10 per 1,000,000 people. (Please refer to Table 5-3 on page 5-6, and page 9-3 of the District's CEQA Air Quality Guidelines, February 2008).

The District's CEQA Air Quality Guidelines may be found on the District's website at www.mbuapcd.org under "Air Quality Plan".

Thank you for the opportunity to review the document.

Sincerely,

Jean Getchell
Supervising Planner
Planning and Air Monitoring Division

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MAR 11 2009
CITY PLANNING DEPT

U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

March 9, 2009

Michelle King
City of Santa Cruz Planning and
Community Development Department
809 Center Street, Room 206
Santa Cruz, California 95060

Dear Ms. King:

This is in response to your request for comments on the Notice of Preparation of an Environmental Impact Report for the City of Santa Cruz General Plan 2030 EIR.

Please review the current effective Flood Insurance Rate Maps (FIRMs) for the City of Santa Cruz (Community Number 060355), Map revised March 2, 2006. Please note that the City of Santa Cruz, Santa Cruz County, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The City of Santa Cruz floodplain manager can be reached by calling Joe H. Hall, Management Professional, at (831) 420-5103.

If you have any questions or concerns, please do not hesitate to call Michael Hornick of the Mitigation staff at (510) 627-7260.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Joe H. Hall, Management Professional, City of Santa Cruz
Antonella Gentile, Resource Planner, Santa Cruz County
Michael Hornick, Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX



About Us

2007 Past Meetings

2008 Past Meetings

Topics & Meetings

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Santa Cruz Neighbors is a city-wide organization that represents a network of neighborhoods which teams with educational institutions, local government, and local businesses, dedicated to a Community oriented government and provides a neighborhood voice for the residents of Santa Cruz.

Upcoming Meetings

Wednesday, FEBRUARY 18th
7-8:30pm
WATER, WATER, EVERYWHERE
155 Center Street, Community Room
Plan to Attend, and Bring a Neighbor!

SAVE THE DATES: *Tentative Schedule until guests are confirmed*

March 18th, Judges Forum
This was a popular one last year!

April 15th, Still deciding topic

Note Tuesday Meeting May 19th, UCSC Chancellor Conversation (confirmed)

June 17th, GENERAL MEETING / Fire Prevention

July No Meeting - Neighborhoods - Plan a get together, Yard Sale, Clean Up or Beautification Project

WHAT IS A NEIGHBORHOOD ASSOCIATION?
Do you want your voice to be heard?
Do you want to know what is happening in your neighborhood?

A Neighborhood Association is comprised of a group of residents and business representatives who devote their time and energy to improve and enhance a well-defined geographic area where they and others live. Neighborhood association meetings, like earlier town meetings, provide a place to meet neighbors, exchange ideas, prioritize projects, propose solutions, and implement plans for the neighborhood. Most neighborhood associations are concerned with issues that affect the quality of life in the community.

WHAT's NEW on the WEBSITE?
Neighborhoods Page -- Map and email contacts
Minutes from Past Meetings
Resources - Organizing Your Neighborhood

Contact Us At: email@santacruzneighbors.org
P.O. Box 8002 • Santa Cruz, CA 95060-8002

Michelle King

From: John Golder [jhond@comcast.net]
Sent: Wednesday, January 28, 2009 12:07 PM
To: Alex Khoury; jrebagliatio@ci.santa-cruz.ca.us
Cc: Michelle King; Ken Thomas
Subject: FW: ANY COMMMENTS? P&R 2030 General Plan -MAJOR FLAWS NOT YET ADDRESSED!

From: John Golder [mailto:jhond@comcast.net]
Sent: Tuesday, January 27, 2009 8:12 PM
To: 'viewpoint@ci.santa-cruz.ca.us'; 'agamboa@ci.santa-cruz.ca.us'
Cc: 'Dannettee Shoemaker'; 'Ken Thomas'; 'mking@ci.santa-cruz.ca.us'; 'mrotkin@ci.santa-cruz.ca.us'; 'ereilly@ci.santa-cruz.ca.is''; 'kblers@ci.santa-cruz.ca.us'; 'lrobinson@ci.santa-cruz.ca.us'; 'tmadrigal@ci.santa-cruz.ca.us'; 'rcoonerty@ci.santa-cruz.ca.us'; 'rwilson@ci.santa-cruz.ca.us'; 'cmathews@ci.santa-cruz.ca.us'; 'dlane@ci.santa-cruz.ca.us'; 'jcoffis@gmail.com'; 'Todd@scsoccer.com'; 'info@brattononline.com'
Subject: FW: ANY COMMMENTS? P&R 2030 General Plan -MAJOR FLAWS NOT YET ADDRESSED!

From: John Golder [mailto:jhond@comcast.net]
Sent: Thursday, June 12, 2008 5:28 PM
To: 'Dannettee Shoemaker'; 'shammack@ci.santa-cruz.ca.us'; 'Michelle King'; Mike Rotkin (mrotkin@ci.santa-cruz.ca.us); Emily Reilly (ereilly@ci.santa-cruz.ca.us); Ed Porter (eporter@ci.santa-cruz.ca.us); 'ed@villadebranciforte.org'; Lynn Robinson (lrobinson@ci.santa-cruz.ca.us); Tony Madrigal (tmadrigal@ci.santa-cruz.ca.us); Ryan Coonerty (rcoonerty@ci.santa-cruz.ca.us); Richard Wilson (rwilson@ci.santa-cruz.ca.us); (cmathews@ci.santa-cruz.ca.us)
Cc:; Richard Wilson (rwilson@ci.santa-cruz.ca.us)
Subject: P&R 2030 General Plan -missing elements, Arana Gulch fields -failed planning process!!

To City of Santa Cruz administrators, planners, and particularly Parks & Recreation Commission staff and administration.

The following comments apply to the Parks & Recreation 2030 General Plan Update goals, policies, activities and programs.

For three consecutive months during this year's General Plan update process Parks & Recreation Commission canceled all their meetings.

How, in the middle of a process that happens less than once a decade, for the second largest division of City government, and the one MOST IMPACTED by budget shortfalls, can these commissioners find NOTHING to put on their agenda?

What is P & R administration trying to hide from the public?

Perhaps the following:

Major unanswered flaws in the City Parks & Rec planning 2030 General Plan

proposal:

Planning & standards

NO Master Park Plan (what types of parks go where?)
NO planning map distinguishing between developed & undeveloped parklands
NO standards for undeveloped vs developed "parks"

Facilities

NO new neighborhood or community parks
NO family campgrounds
NO RV facilities
NO parking improvements for greenbelt
NO bath or toilet facilities in greenbelts
NO water lines, tanks or reservoirs for fire suppression in greenbelts

Financing & evaluation

NO capital acquisition program or dedicated fund for community parks
NO capital acquisition program or dedicated fund for neighborhood parks
NO cumulative data on funds spent for studies, or for a particular parkland
NO current inventory of facilities or city owned land
NO inventory assessment schedule for facilities or developable land.
NO costs recovery strategy or program for undeveloped lands/ greenbelt users
NO attendance statistics data program for recreational activities
NO cost apportionment program for users of facilities or programs

Programs

NO program to serve or encourage tourist, group or RV camping
NO joint use program that benefits the general public (City programs only, not citizens are entitled to free joint-use of school facilities)
NO active program to develop greenbelt concessions (such as outdoor skills classes, walkin camps, native plant nurseries)

Administration

NO reports from P &R administration on the P & R Department's future perspective or current state (per Dir. Shoemaker)
NO written recommendations from sports & recreation supervisors for needed improvements or facilities or program expansions
NO administrative authority or (council) legislation authorizing citations issued under SCMC 13.04.010, .011, .020
NO list of closed facilities or lands for which citations can be issued
NO map tracking of problem areas such as illegal camps, drug dealing, etc.
NO designation of addresses or locations in greenbelts under which crime/illegal activities data can be compiled
NO clear legal definitions of important planning/ordinance terms such as: "trail, greenbelt, preserve, open space ",
NO outreach to active sports programs for P & R planning process
NO permit process for authorizing activity in "closed areas"

By John Golder 831-704-7108
Dir. ARC-Santa Cruz (Active Recreation Coalition of Santa Cruz - a 501c4 nonprofit corporation "A Team of Teams Speaking for Sports")

I am particularly concerned about the inability of the City's administration to effectively resolve

problems or achieve goals through the existing General Plan, planning process and Council political will.

A VIVID RECENT EXAMPLE OF P & R GENERAL PLANNING FAILURE

As an example, despite more than 10 different planning studies recommending up to 20 new ballfields within the City and a single soccer field at Arana Gulch, ***no person in SC P& R administration (planner Sue Harris , Dir D. Shoemaker & Superintendent S. Hammack) made a single use recommendation for any active recreation facilities at Arana Gulch*** (10/14/03 SC City Council Meeting –Arana Gulch Draft Master Plan). The City of Santa Cruz has had a significant **net loss** of playing fields and has built only ONE NEW FIELD & COMMUNITY PARK IN OVER 40 YEARS!

Dir. Shoemaker has replied that not a single document or record exists or was developed within the staff meetings for the draft Arana Gulch Master Plan. She says that all direction was a result of "informal staff meetings". Apparently not a single one of the council approved direction setting studies and recommendations referred to below, were reviewed .

The studies and recommendations included:

1) The1994 Sportsfield Needs and Siting Study (SNASS) recommendation for 10 multi-purpose fields (20 ac) and to site most of them in the existing owned Greenbelt, accepted by SC City Council 1995 I was instrumental in initiating this study, the only such one ever.
2) A recognized City sports field deficit of 25 acres going back to 1970 (SC GP 1980) and (2005 GP, Vol.I,P&R Element, Table PR-9 Rec Facility standards, 1992, 1994)
3) A recognized Lower Eastside P&R neighborhood park deficit of 6.8 ac.(Ibid,Table PR-2 Neighborhood Park needs by 2005 p.330 1992)
4) A scientific random City survey (Evans/ McDonough 06-3494, May 2006) that determined 62% of city residents (77% of those 18-29 yrs) would like to see recreational facilities improvements in the city's 2000 ac of greenbelt.
5) Another scientific random survey that determined 73% of City residents wanted a playground in Arana Gulch, 58% wanted a sports-field and 76% picnic sites (City of SC Greenbelt Master Plan Feasibility Study done June 1994, p51 –summarized in GRBT B-029, p.7).
6) Unanimous recommendation by the Greenbelt Advisory Committee that Arana Gulch had the highest potential to provide field space.
7) Minimum 4 new multi-purpose athletic fields and one gymnasium -recommendation by Conrad Sudduth, former SC P&R rec super-visor, (Pogonip Task Force Questionnaire Dec, 1991)
8) Arana Gulch Land Use & Revenue Study determined the nw 6 ac of Arana could accommodate a ball field, playground, restroom & parking consistent with all constraints of a biotic survey & other gen'l plan requirements (Table F option G, p.56, AGLURS, Dec. 1996)
9) Planning Commission detailed recommendation for same, see GRBT B-029, p.7.
10) Existing 1990 General Plan Community Facility zoning for nw 10 ac of Arana Gulch.
11) A May, 1996 City Council budget requisition of $370K for sportsfield, playground, parking lot, restrooms at Arana Gulch.
12) SC County offer to contribute $200K for development of a soccer field in Arana Gulch.

Mark Primack
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General plan EIR scoping
Subject: Preferred Alternative

EIR Scope

Though CEQA itself may be on the verge of collapse as a credible vehicle for environmental protection, the city is still mandated to at least attempt a scientific analysis of the environmental impacts of the new General Plan. This may prove to be all but impossible in light of the historic distortion and misappropriation of the practice of preparing and certifying Environmental Impact Reports in Santa Cruz.

An EIR, when prepared for a specific project, generally relies solely on the policy-based claims of cut-and-paste consultants, untrained agency administrators, and the unsubstantiated doubts of self-entitled property owners. It assumes the worst, and discounts the best of any project. It is an instrument of resistive lawsuits and the opportunistic hedge funds of political capital.

A credible analysis of a city's General Plan must be something much different than the type of 'Administrative' Impact Report described above. For one thing, a city is a whole system. Whereas an EIR generally presumes to evaluate the impacts of a lone development project on its neighbors WITHIN the city, this EIR must have as its primary goal the impact OF the city on its environment. That is a much different assignment.

The primary role of a city is that of Population Center. And the primary truth of environmental science is that the survival of nature hinges on the successful densification of established cities. The alternative, espoused by self-serving developers and their NIMBY supporters is sprawl. We have overwhelming proof of sprawl's disastrous impact on the planet. With a density half that of Berkeley and on a par with Fresno, Santa Cruz is by definition sprawl.

'Project' Alternatives

My purpose in reiterating these truths, inconvenient as they still are in privileged communities like Santa Cruz, is to make it clear what science has already established- that the preferred environmental alternative to a conservative General Plan such as ours is to 'double the population within current city limits within twenty years.'

Exploring such an alternative requires science rather than rhetoric. If those who prepare the EIR do as they are legally and contractually obligated to do, then I am confident that the many fabricated excuses for low-density exclusivity that have dominated the planning culture here for decades will evaporate. These are the issues that must be examined scientifically in the EIR:

1. Water. We have sufficient water in the region to meet our needs well into the future, but we have crippled or destroyed our capacity to store adequate amounts of it. Our General Plan can and must include mandates and time frames for resolving what is nothing

more than misguided political inertia. An EIR cannot legally confuse not WANTING water with not HAVING water.

2. Global Warming. The issue of Global Warming alone dictates the consideration of much denser cities. Densification is presently the only verified antidote to this rapidly escalating threat. We cannot act too soon to do our share as a city to meaningfully reduce our carbon footprint through maximized densification.

3. Transportation. Only by doubling our population will we enable public transit at a level that would ensure its viability. There is objective critical mass data behind this observation, and it is readily available.

4. Economic Sustainability. Doubling the city's population would bolster the health of local businesses, produce more walkable streets and more jobs close to home, just in time for the collapse of our fossil fuel dependency. We are well past the kusp of cheap fossil fuel availability; our future projections must acknowledge that. Worrying about future automobile traffic and dedicating excessive areas to car parking is about as forward-thinking as fretting about manure from horse-drawn carriages.

5. Schools. Doubling the city's population would support schools within walking distance of all our children. Recent closures of public schools attest to the failure of past General Plans to accommodate working families.

6. Preservation of open space and agriculture. Doubling the city's population within existing boundaries would allow the city to absorb the lion's share of countywide growth, thereby taking development pressure off our rural areas.

I am not proposing this EIR alternative as my personal preference. Like most of the propertied citizens and administrators contributing to this document, I enjoy my privileged life here, and would prefer that those less fortunate than myself be accommodated somewhere else, on some Greenfield far from where I live, in one of those places I scorn as I drive by on the highway, like Salinas or San Jose. But this EIR is mandated to reveal science, not prejudice, and those who resist change- who refuse to share- those people will be dead or gone before this General Plan comes to full fruition. If the infrastructure of Santa Cruz can, through conscientious design and care, be made to comfortably and happily support a population twice that which is being projected in this draft General Plan, than it is the obligation of this CEQA process to demonstrate and recommend that it happen. Though I don't claim to represent anyone but myself in these views, I'm pleased to note that the National and State Sierra Club and the Natural Resource Defense Council couldn't agree with me more.

The most pathetic irony in this community's abrogation of environmental responsibility might at first blush appear to be found in the endless bickering around what a city's 'fair share' of state growth should be. Sadly, it is when we claim that maintaining or improving our infrastructure, our ability as a city to DO our fair share in the fight for environmental justice and balance, when we insist that such acts of global responsibility would be 'growth inducing' and therefore to be avoided, that is when we reveal the shallowness of our commitment to those principles of which we boast. Those who prepare and administer this EIR cannot by law allow themselves such decadence.

Thank you,

Mark Primack

Michelle King

From: Andy Schiffrin [BDS030@co.santa-cruz.ca.us]
Sent: Monday, April 06, 2009 10:21 AM
To: Michelle King
Cc: Juliana Rebagliati
Subject: RE: NOP Posted at County Clerk

Hi Michelle -

I would like to be placed on the notification list as an individual, not an employee at the Board of Supervisors. My address is 130 Shelter Lagoon Drive, Santa Cruz, CA 95060.

Since all local agencies post CEQA notices with the Clerk of the Board, Supervisors don't normally check the list. In addition, I don't think the Clerk sees her responsibility as notifying the Board of Supervisors when notices are posted. I would request that you add the Board of Supervisors, Room 500, 701 Ocean Street, SC 95060 to the list to receive CEQA notices.

Thank you.

Andy

-----Original Message-----
From: Michelle King [mailto:MKing@ci.santa-cruz.ca.us]
Sent: Monday, April 06, 2009 9:58 AM
To: Andy Schiffrin
Cc: 'steph@strelowconsulting.com'; Juliana Rebagliati
Subject: NOP Posted at County Clerk

Dear Andy:

The Notice of Preparation was relayed via email and US Post to the Clerk of the Board for posting on March 2. Apparently there was an error and it was not posted until March 11, 2009. Due to this delay we will extend the comment period until April 13, 2009. I will ask the Clerk to directly distribute the NOP to all the Board of Supervisors with the new date in case there were others who did not see the posting.

Please let me know if you have any questions.

Michelle

Michelle D. King
Senior Planner
City of Santa Cruz
Planning and Community Development
809 Center Street
Santa Cruz, CA 95060
(831) 420-5092
mking@ci.santa-cruz.ca.us

From: Tess Fitzgerald [mailto:CBD015@co.santa-cruz.ca.us]

Comments on Notice of Preparation
City of Santa Cruz Draft General Plan 2030 EIR
April 1, 2009

Michelle King
City of Santa Cruz Planning and Community Development Dept.
809 Center St., Rm. 206
Santa Cruz, CA 95060

The following comments on the Notice of Preparation for the City of Santa Cruz Draft General Plan 2030 EIR are submitted for your consideration.

1. The draft General Plan document is incomplete, missing the Housing Element (now under preparation) and the Local Coastal Plan, as well as some mapping elements required by law. The City apparently intends to process the Housing Element and LCP separately, and eventually integrate them into the General Plan document, with separate environmental review for each one (an expensive approach for the City). This approach makes the environmental impact analysis of the draft General Plan 2030 a moving target, since at this point in time the draft General Plan 2030 is incomplete, and it is not possible fully to ensure that the document is integrated and internally consistent as required by state law (Gov. Code Sec. 65300.5). It would be preferable for the City to complete the Housing Element (now before the Planning Commission), as well as the LCP, and conduct an integrated EIR on a complete General Plan document. The current General Plan document contains both an Housing Element and an LCP.

In addition the maps for the draft General Plan 2030 document are only "preliminary", as indicated on the City's website. In particular, critical maps are missing from the Hazards, Safety and Noise Element, namely the maps included in the current General Plan (Maps EQ 12, EQ 13, and EQ 14) which indicate acceptable noise levels for land use categories, existing noise exposure (in contours) within the city, and future noise exposure. State law requires that noise contours be shown for specified noise sources, as set forth in Gov. Code Section 65302(f). The number of maps and charts in the draft General Plan 2030 is minimal compared with the current General Plan, and the text also contains no cross references to the 19 "preliminary" maps shown on the City website. Are there more maps coming at some future date?

In addition it is also not clear whether the goals and policies contained in the Natural Resources and Conservation Element which address climate change are the final Climate Action Plan for the city, or just a preliminary one. The Climate Action Program document on the City's website is a much more extensive document than the General Plan policies and refers to "completing" a Climate Action Plan for the General Plan update.

The draft General Plan 2030 document (and maps) was also not available at the Santa Cruz Public Library (checked today, April 1), despite assurances that it would be there.

2. The EIR should analyze a reasonable range of alternatives for the draft General Plan 2030, as required by CEQA. On page 6 of the NOP, buildout projections for the 2030 Plan are included. A reasonable range of alternatives (in addition to the required No Project Alternative, which would continue the current General Plan) would examine both higher and lower buildout projections, as well as different configurations of land use. In particular, one alternative should examine retaining the unique Golf Club Drive area, with its agricultural and natural resources, as a low density area, with increased protection, rather than diminished protection, for those resources.

3. The Cumulative Impacts analysis for greenhouse gas emissions should comply with the Technical Advisory issued by the Governor's Office of Planning and Research in June 2008, as well as the draft CEQA Guidelines required to be issued by OPR on July 1, 2009. In particular, there should be a quantification of GHG emissions for each alternative, including both direct and indirect emissions.

4. There are many policies and programs contained in the current General Plan which, in my opinion, should not have been eliminated in the draft General Plan 2030. In particular, the absence of any protection for steep slopes is a serious omission in the updated plan. The Planning Dept. has been provided with a list of those omissions during the preparation of the current draft. It is unclear whether the EIR will address those policy and program changes, but it would be beneficial if the EIR consultant would consider whether significant environmetnal impacts may arise from those omissions.

Thank you for consideration of these comments.

Sincerely,

Celia Scott

Michelle King

From: H. Reed Searle [hrsearle@sbcglobal.net]
Sent: Monday, March 23, 2009 3:20 PM
To: Michelle King
Cc: Juliana Rebagliati; Emily Reilly; jrebagliati-ci.santa-cruz.ca.us
Subject: scoping session, eir for general plan --community benefit element

Michelle, I'll try to summarize in a later e-mail the issues I suggest be covered in the EIR for the new General Plan. I want now to discuss again the inclusion of a community benefit component in the EIR.

At the scoping session, I requested that this be a topic of the EIR. The response from Staff was that this element was not to be included.

Public Resources Code # 15131 refers generally to a permissive community benefit component. The relevant sub-section is 15151(b) which permits study of economic or social effects where they follow from a physical change. So the component may be added and once added, it is as important as any other element of the Plan.

Following the Council meeting on Oct 28, 2008, staff was directed "...to develop and return to the City Council a set of guidelines or a rubric to be used to weight the community benefit aspect of development projects that comes before the City Council." I am not aware that Staff has done that; I certainly understand that time and money may have precluded that effort.

I have attempted to follow up on the Community Benefit element. Since the Council meeting, I have been in touch with Juliana several times. Her most recent response was on Dec 4, 2008:

"Reed,

This is to follow up on our conversation on Council□s direction with regard to returning to them with a procedure or rubric for consideration of Community Benefits related to development projects. At the Council meeting we had discussion about the possibility of including a structure in the General Plan Implementation for providing guidance in discussion of Community Benefits. As such, staff expects to be working on this aspect of the General Plan in summer 2009. I know you would like to be involved in discussions on this subject. I have passed on your offer to staff, and we'll let you know more as our plan for addressing this aspect of the implementation plan evolves. Feel free to contact me periodically if you wish to follow up on the status."

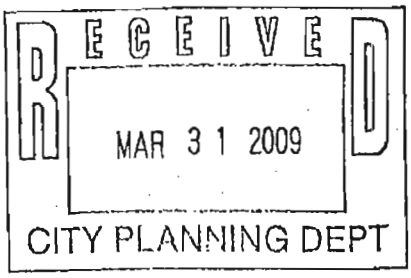
A copy of this was sent to you and to Ken.

So the issue was put on hold, but the clear implication is that a community benefit rubric would be part of the General Plan. Once again, I believe it is appropriate and within the spirit of the Council action and Juliana's response, that a Community Benefit element be added to the General Plan. The EIR is the appropriate forum to evaluate community benefits of the physical changes that will follow from the new General Plan. The community effects of General Plan policies are among the issues of most significance to the people of Santa Cruz.

Reed

H Reed Searle
114 Swift St.,
Santa Cruz, Ca. 95060
Phone and Fax 831-425-8721
hrsearle@sbcglobal.net

APPENDIX A



H Reed Searle
114 Swift St.
Santa Cruz, Ca. 95060
Phone and fax 831-425-8721
27 March 2009
rsearle@sbcglobal.net

Ms. Michelle King
Planning and Community Development
809 Center St., Room 206
Santa Cruz, Ca 95060

Re: comments and requests re scoping of General Plan EIR

Dear Michelle,

In addition to the comments in this letter, I again request that a Community Benefit element per PRC# 15151(b) be included in the EIR, as in my e-mail of March 23.

I'm not sure of the extent to which my comments are appropriate re the scoping session, but I'll list them anyway. These are largely a recap of my oral comments.

PR1.8 refers to dog use in public parks. The EIR should comment on the environmental consequences of off leash dog use in parks. To the extent it is appropriate, the EIR should comment on the extent to which off-leash dog use reduces the effective use of parks by old people, young people and the rest of us---this is in part a community benefit issue.

Can the EIR quantify the extent to which vehicle traffic and VMT are likely to increase during the period of the General Plan, the extent to which such traffic will divert into residential areas and the environmental consequences, including global warming, resulting from the traffic.

Can the expected increase in VMT be made to comply with AB 32? Perhaps a better question is how the additional traffic can be made consistent with global warming rules.

Does the expected increase/growth over the period of the General Plan necessitate or contemplate that water be provided via a de sal plant? If so, I request that the EIR analyze the environmental consequences of de sal as well as describe the probable location of the plant and the effect on traffic and adjoining neighborhoods.

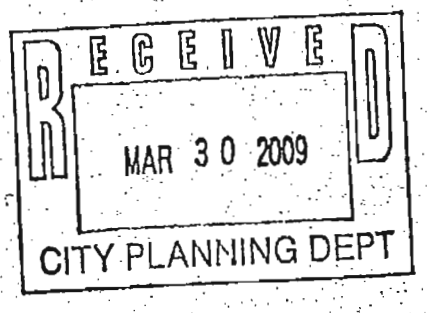
What is the probable state and AMBAG requirement for new housing likely to be, where are those dwelling units to be constructed? In this regard, does the UCSC on campus housing serve to satisfy the new housing requirements?

The M.T.S. is referred to in the draft General Plan. Is it appropriate to make the MTS a part of the GP?

Sincerely,

H Reed Searle

APPENDIX A



March 27, 2009

Ms. Juliana Rebagliati
Director of Community Development
City of Santa Cruz
809 Center Street, Room 107
Santa Cruz, CA 95060

Re: Villa de Branciforte Historic Preservation Community Planning Area Effort and Status as it affects the current Draft EIR and Draft General Plan 2010-2030 schedule.

Dear Ms. Rebagliati;

Thank You for planning the time for our next meeting with me regarding the upcoming progress and status of the Santa Cruz General Plan 2010-2030 and Draft Environmental Report documents, as it affects our 212 year neighborhood planning area. The Villa de Branciforte Historic Preservation District Area needs further recognition and neighborhood preservation against all future high density proposals.

Villa de Branciforte Historic Preservation Land Use Planning Area needs formal recognition by the City of Santa Cruz Planning Department as part of the General Plan Amendment 2010-2030

As a local citizen advisor and neighborhood appointed planning leader of the Branciforte neighborhood by the City of Santa Cruz (1.) I was requested last year to head the coordination of the Villa Branciforte Neighborhood (planning area) while developing city wide housing policies. We need to work closely with you (the City) and other city officials regarding our concerns. We have become increasingly alarmed in recent months since 2008, during which my testimony at a planning commission meeting had been stricken from the tape recorded record. We find it interesting that this has happened more than once. (2.) This form of censure is problematic and is prohibited by State of California Code under the California Public Records Act (Government Code Sections §§ 6250 - 6276.48 et al Seq) (3.)

Erased Public Testimony

The information that was erased from the minutes of the July 24th, 2008 General Plan public status update meeting was critical input to our area planning process because the conversation with GPAC member Mr. Rod Quartararo requested that the City Planning Department establish the planning area boundaries of Villa De Branciforte Historic Preservation Neighborhood Plan onto the new City of Santa Cruz General Plan Map-2010-2030. The request was that the Planning Commission helps establish boundary lines for the Villa de Branciforte community planning historic area. Mr. Quartararo's direction was deleted from the Planning Commission Minutes and therefore has delayed the planning efforts of our community

plan. We need you, Ms. Rebagliati, to speak with Mr. Quartararo and we will be approaching the City Planning Commission to make sure that this boundary definition issue is quickly resolved in order to continue on with the local Branciforte planning area effort.

2009 marks a new era of governmental full disclosure and transparency in all areas of government, but even more importantly, especially the city planning process. The City of Santa Cruz has recently been ignoring and further simply not paying attention to our input at public hearings. The city planning department still delays the recognition of our community planning area, including the significance of the original Spanish adobe settlement area dating back to 1797. The Villa de Branciforte planning group wishes to include its input in the form of an amended community area land use and zoning maps, as part of the General Plan 2010-2030 plan of amendment cycle and associated draft CEQA document review.

The City of Santa Cruz adoption of the current "draft" GP-2010-2030 & DEIR may have many compatible goal statements with the Villa Branciforte Historic Preservation Area Plan-but until the Villa Branciforte Historic Preservation Neighborhood planning group and consultant have reviewed and approved on a lot by lot basis within the Branciforte planning area, this area's plan goals, policies and action items will need to be analyzed for compatibility with the City's General Plan 2010-2030. During the current plan amendment cycle, which includes determining the scope of the EIR and the requesting neighborhood public input, our proposed Villa Branciforte community planning and historic preservation area plan has long term impacts on the existing City of Santa Cruz General Plan. This includes affecting long term "unique historic character, livability, and residential as well as the LU Goals, Policies and Programs for page 1-24 through 1-35 "City Character" Goals, Policies and Programs CD-1, CD-2, & CD-3; Sustainable, Historic Preservation, Residential Uses described in LU-1,page 1-54, LU-3, page 1-56, LU3.7 thru LU-3.9 and LU3.10 through density and historic homes restoration efforts in our community planning area. (4.)

The Villa de Branciforte Historic Preservation Community Planning Area's is in the process of being defined through adoption and recommendation of planning area mapping by its residents as members of the Villa Branciforte Historic Preservation Area Planning group. Local planning area activities shall finally assure that our well defined historic district maintains current land use densities, land use characteristics and low density neighborhood sustainable living values to maintain this historic neighborhood's "charming small town atmosphere." Our neighborhood planning area has been surveyed once before with 63% percent of the population in favor of the City's major goal affecting all neighborhoods wishing to maintain our small town atmosphere and quality of life that most of the citizens have demanded through primary community planning workshops. (5.)

Villa de Branciforte Historic Preservation Community Area residential land owners may undoubtedly request some modifications to the general land use and zoning amendment documents, specific unique historic preservation and

single family architectural standards of rehabilitation while we are also participating in the current City of Santa Cruz General Plan 2010-2030 effort.

The neighborhood planning group requests that the City recognizes and integrates Villa de Branciforte Historic Preservation Community Planning Area's goals, policies and action statements. Our planning area welcomes much needed land use and historic preservation policies to be recognized through the local neighborhood Santa Cruz general planning processes and DEIR scoping activity to ensure that the Villa de Branciforte Historic Preservation Community Area Plan stands along side other special area plans. Proposed historic district neighborhood livability goals and standards shall be pursued by adopting local neighborhood low density general plan land use designation, and complimentary and compatible low density residential zoning classifications. Most of the existing residential lots shall be defined by a clear majority of the Villa Branciforte Historic Preservation Area Plan property owners who are working together to clearly define the boundaries and land use lot sizes of Villa Branciforte planning area. We are working as a cohesive neighborhood, relying on historic and cultural resource documents, along with personal testimony from local, State and Federal historic and cultural resource experts. (6.)

These same historic, archaeological and cultural resources documents lay the frame work for a more detailed planning area map which is in process of being defined by our neighborhood planning area group by hosting regular informal meetings in cooperation with the City or other Villa Branciforte Planning Area community historians and the Villa Branciforte Neighborhood steering committee.

By adding the new the Villa Branciforte Historic Preservation Area Plan by reference to the City of Santa Cruz General Plan 2010-2030 on page 1-8 we shall be able to be officially included in utilizing the compatible General Plan land use and historic preservation goals, policies so we can protect existing historic residential units and neighborhoods; allow for the development of additional historic residential unit motifs from the same era to be constructed on smaller and medium size lots; eliminate further threats from high density multifamily and mixed units development now being approved for the South Branciforte and Soquel Road frontage. Instead our Branciforte Historic Preservation Area Plan shall concentrate on restoring historic homes or redeveloping new single family homes to the earlier period architectural styles which have been found throughout the City such as Mediterranean, New England Colonial, Cape Cod, California Craftsman, California-Victorian style single and two story homes. We also seek eventual development of local community neighborhood tourist destination interpretative center to highlight and showcase our rich Villa Branciforte Planning Area's 212 year old significant cultural history and artifacts-to attract more weekend tourism business. (7.)

It is time to include and identify this valuable planning area resource as a very unique neighborhood to live in, but by adopting the planning area designation that's been long overdue. In addition, other incentives include applying for numerous private and public grants from foundations interested

in community development, energy conservation, and architectural preservation. Villa de Branciforte Historic Preservation Community Area Plan envisions the construction of a much needed historic and cultural interpretative center-which will increase destination tourism opportunities to the Villa Branciforte neighborhood, along both lower density historic homes of the North Branciforte neighborhoods as well as attract more tourism to commercial businesses actively relocating to South Branciforte and Soquel Avenue redevelopment corridor to the south of our proposed planning area.

Villa de Branciforte Historic Preservation Community Area Planning Group's public input needs to be heard to create and adopt complimentary land Use, historic preservation Goals, Policies, and Actions as feedback to the existing General Plan Amendment 2010-2030 project including making significant inputs to the Scoping DEIR Process.

Villa de Branciforte Historic Neighborhood Planning Area Preservation and Complimentary Land Use, Zoning Classification Standards & Mills Act Ordinance No. 2003-14 integration

By recommending and adopting by resolution a Villa Branciforte Historic Preservation Area Plan similar complementary goals, policies guidelines and implementation action statements should become more focused and consistent to broaden the City of Santa Cruz General Plan 2010-2030 "Planning & Development" Chapter 3 standards. Such recommendations may include more appropriate land use designations and zoning regulations as provided by the City of Santa Cruz GP, City of Santa Cruz Zoning Map, while echoing those general Historic Preservation goals and guidelines and "Cultural Resources Background Report and Archaeological Sensitivity Map for the City of Santa Cruz General Plan Update" prepared with LSA, December 2006. By including our unique historic neighborhood district planning area, we can obtain additional funding through private, state, federal, local historic preservation and improvements such as defined in the Mills Act program administered through the City of Santa Cruz Ordinance No. 2003-14. (8.)

Risking Potential Damage to National Historic Preservation of Sensitive TCP Issues

In the new General Plan, in our proposed planning area plan amendment we hope to amplify the standards that the City of Santa Cruz must follow regarding the preservation and management of historic sites by adopting Villa Branciforte Planning Area historic guidelines and standards.

Our Villa de Branciforte Historic Preservation Planning Area will promote better selection of reputable archeologists who will enforce standards to establish well organized and disciplined archeological digs. This will include, but limit to, archeological research, to careful extraction; artifact identification; labeling; and local display at a future interpretative center in the heart of the Villa de Branciforte Historic Preservation Community Planning Area.

Villa Branciforte Planning Area and the 2010-2030 General Plan Amendment

We feel that the Villa de Branciforte Historic Preservation Community Area planning area public feedback process needs further evaluation into the "Goals, Policies and Programs of Draft General Plan 2010-2030, through the DEIR "Scoping" process by encouraging full and inclusive public participation by local residents from the Villa de Branciforte Historic Preservation Community Area to absolutely ensure the city's adoption of compatible land use designation and zoning classification which shall not only define the Villa de Branciforte Historic Preservation Community Area Planning area boundary but shall protect "all (TCP) traditional cultural properties, valued by living communities for culturally important reasons, if they embody or help reinforce that community neighborhood area's values, beliefs and customs" i.e. retaining historic neighborhoods in their original architectural style and densities keeping with the small town focus on daily person to person friendly interaction promoting a more sustainable living atmosphere. (7.)

CEQA Draft EIR Scoping Review Process-and Establishing the Branciforte Planning Area Boundaries-2010-2030 Plan Amendment

As you are also aware during the Scoping phase of the EIR, the City can request important input from other governmental agencies, specialists and citizens group per CEQA Guidelines 15082 make multiple challenges to the adequacy and proper scope of the project undergoing environmental review of the current Draft General Plan as it exists. In the current DEIR for the new City of Santa Cruz General Plan-2010-2030, we are concerned about the adequacy and analysis of certain major elements of General Plan, that have not been addressed or completely. Mainly we of the Villa de Branciforte Historic Preservation Neighborhood Planning Area are concerned about the following that were not addressed in the current DEIR:

(1.) Alternatives to the Proposed Action (CEQA sec. 15126-d) in the current GP2010-2030 document do not include a reference for inclusion of another unique planning area- i.e. Villa de Branciforte Historic Preservation Neighborhood Planning Area on pages 1-8. We would like to recommend that the Villa de Branciforte Historic Preservation Neighborhood Planning Area formally recognized as another Alternative to the Existing Proposed General Plan and this planning needs to include a new planning area boundary defined with the help of the Villa de Branciforte Historic Preservation Neighborhood Planning Area membership.

(2.) Alternatives to the Proposed Action (CEQA sec. 15126-d) The Villa de Branciforte Historic Preservation Neighborhood Planning Area are very interested in lowering land use designation from the existing Low Density Residential (L) 1.1 to 10 du/ac to a more suitable Very-Low-Density Residential (VL) 0.1 to 1 du/ac as well as a similar rezoning to similar low density neighborhoods. The environmental and socio-economic impacts should be very positive for all of the citizens and residences of the City.

(3.) The current General Plan Land Use designations have been significantly increased recently with building of south Branciforte all the way to Soquel

Road intersection-has been really intensified with a mixture of commercial land uses mixed with attached high rise residential units through the most recent General Plan Amendment-produces high density residential attached units to be build above the first unit commercial street buildings has been really increasing lately. The new combined land uses were approval obviously to attract more urban density for younger people and lower to moderate income families however this trend will create "growth inducing" impacts per (CEQA Sec. 15126(G) as well as Significant irreversible environmental changes to the whole east side per (CEQA 15126(f)). The irreversible environmental changes will affect further losses of low density residential stock and also create more dangerous traffic patterns on future existing lower density neighborhoods all along Branciforte and Soquel with only two lanes. These overwhelming current land use designation amendments as allowed by the current General Plan will create unmitigated residential traffic, water, sewerage and storm drain infrastructure impacts. (9.)

Sincerely,

Ed Silveira

Ed Silveira,
Villa de Branciforte Historic Preservation Neighborhood Planning Area-Neighborhood Leader

Reference Footnotes

(1.) Mr. Ed Silveira – appointment reference letter dated April 9th, 2008 from the City of Santa Cruz. –Community Housing Strategy workshop, appointing Mr. Silveira to coordinate and lead and represent local efforts in preparing Villa de Branciforte Historic Preservation Community Area Plan neighborhood planning strategies as part of the City General Planning 2010-2030.

(2.) Letter to Historic Commission Members, City Council Members, Julia Rebagliati, Alex Khoury-City Planner, Richard Wilson, City Manager and John Barrisone, City Attorney-dated November 5th, 2009

(3.) California Public Records Act GOVT. CODE §§ 6250 - 6276.48 et seq. and Ralph M. Brown Act Govt. Code §§ 54950 et seq.

(4.) CEQA Guidelines section 15082 & 15083. Also look at Draft General Plan Update Document and Program Review Planning Commission Agenda Report-dated July 17th, 2008 LU Goals, Policies and Programs for page 1-24 through 1-35 "City Character" Goals, Policies and Programs CD-1, CD-2, & CD-3; Sustainable, Historic Preservation, Residential Uses described in LU-1,page 1-54, LU-3, page 1-56, LU3.7 thru LU-3.9 and LU-3.10.

(5.) Quoted statistics from City of Santa Cruz public survey of community values statements overhead slide rationalizing a new City of Santa Cruz General Plan Amendment Update 2010-2030 –

Paraphrased in the Metro Santa Cruz newspaper article dated during the week of July 30th-August 6th, 2008 called "Balancing Act"

(6.) National Historic Trust Letter, from Brian Turner dated October 31st, 2008 pertaining to the historic district of Villa de Branciforte.

(7.) Draft General Plan Update Document and Program Review Planning Commission Agenda Report-dated July 17th, LU Goals, Policies and Programs for page 1-24 through 1-35 "City Character" Goals, Policies and Programs CD-1, CD-2, & CD-3; Sustainable, Historic Preservation, Residential Uses described in LU-1, page 1-54, LU-3, page 1-56, LU3.7 thru LU-3.9 and LU3.10

(8.) City of Santa Cruz Ordinance No. 2003-14–enforcing only those very old and historic neighborhoods to use the benefits of the Mills Act funding through reduced property tax assessment reduction; private and public agency grants (tax credits and grants) to rehabilitate older historic homes; includes robust weatherization and solar installation funding by certified solar and weatherization experts, but only if a Nationally recognized historic and cultural resources preservation area plan is adopted by resolution as part of the overall General Planning effort by the City of Santa Cruz.

(9.) (Alternative Draft Maps) Villa de Branciforte Land Use and Historic Preservation Community Planning Area

List of consultants and agencies reviewing proposed Villa de Branciforte Land Use and Historic Preservation Community Planning Area.

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APPENDIX B

GENERAL PLAN BUILDOUT ESTIMATES & METHODOLOGY

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MEMORANDUM

DATE October 29, 2009

TO Michelle King
City of Santa Cruz

FROM Jeff Williams

RE **Methodology for Estimating General Plan 2030 Buildout Potential**

This memorandum explains the methodology that DC&E used to estimate the buildout potential of Santa Cruz's General Plan 2030. This analysis is intended to provide a realistic estimate of the amount of development that could be accommodated in Santa Cruz between adoption of the revised General Plan and the year 2030, which is the planning horizon for the revised General Plan. The buildout analysis includes land within Santa Cruz's city limits and sphere of influence.

This analysis is meant to help the City plan for the infrastructure and services that will be needed to support growth and change through 2030. It is also intended to be used as a starting point for further assessment of the General Plan through the environmental review process.

I. How Buildout Potential was Estimated

At the City's request, DC&E prepared an analysis that explored three possible scenarios for the Mixed Use Medium Density (MXMD) and Mixed Use High Density (MXHD) land use designations. The MXMD designation applies to some properties along Mission Street, and the MXHD designation applies to some properties along Water Street and Soquel Avenue. After consideration of the buildout potential for the three scenarios, the City identified a Preferred Alternative. The Preferred Alternative assumes a maximum residential density of 35 dwelling units per acre (du/ac) in the MXMD designation, and 55 du/ac in the MXHD designation.

DC&E also analyzed the "no project" buildout potential, which estimates the amount of development that could reasonably be accommodated through 2030 if the existing land use designations were left unchanged.

To assess the buildout potential, we made several assumptions to address the fact that not all development would occur at the maximum possible intensity, and not every parcel with development potential would be redeveloped by 2030. To adjust for these conditions, we applied percentages, or "factors," to the development potential in order to avoid substantially overestimating how much development could be accommodated. These factors are explained in detail in Section III of this memo.

The analysis reflects the potential for higher-intensity redevelopment of properties that have already been developed. On these properties, the existing development has been "netted out," so that the analysis more accurately reflects the amount of change that could occur through infill redevelopment. To net out existing dwelling units, DC&E used parcel-level data from the City's Land Use Information System (LUIS). To net out existing commercial, office and industrial square footage, DC&E made assumptions about the typical development intensities of actual buildings in each General Plan land use designation.

The analysis does not reflect potential new development on properties owned by the University of California (UC), or on properties that are in the City's development pipeline. Based on direction from City staff, we have assumed that the City's environmental review consultant will incorporate this potential development into the buildout calculations before they are used for technical analysis.

The buildout model that was used to complete the analysis was created in Excel. It uses parcel-level data exported from GIS, which includes information about acreages, land use designations, potential development opportunities, improvement-to-land value (I/L) ratios and existing dwelling units.

II. IDENTIFYING DEVELOPMENT POTENTIAL

DC&E used several different criteria to determine whether each parcel in Santa Cruz has the potential for new development in the future. We assumed that a parcel had development potential if it was not owned by UC or in the development pipeline, and if it fell into one of the following categories:

- **Vacant.** The parcel is currently undeveloped. Vacant parcels within the city limits were identified using a field survey conducted by City of Santa Cruz staff. Vacant parcels within the sphere of influence (SOI) were identified based on assessor data.
- **Reuse Potential.** The parcel is underutilized and could be developed more intensively in the future. Parcels with reuse potential were identified as follows, and validated using an aerial photo:
  - In the MXMD and MXHD land use designations, all parcels were assumed to have reuse potential.

- In areas covered by the Ocean Street Area Plan, the "opportunity sites" identified in the Ocean Street Opportunities and Constraints Report were assumed to have reuse potential.
- In all other commercial, office and industrial land use designations, parcels with an improvement to land value (I/L) ratio below 0.5 were assumed to have reuse potential.
- Parcels that are designated as Very Low Density Residential (VL) or Low Density Residential (L), are at least one acre in size, and are currently developed with only one or two dwelling units were assumed to have reuse potential.

♦ **Seabright LM/M Parcels.** The Seabright neighborhood has many areas that are designated for Low Medium Density Residential (LM) or Medium Density Residential (M) development, but that are currently developed with single-family homes. We assumed that some of these properties would be redeveloped at higher densities. (The properties in Seabright were treated separately from other parcels with reuse potential, because we have assumed that a relatively small percentage of Seabright parcels will be redeveloped.)

There are three areas in the city where development potential was analyzed based on a different land use designation than what is shown on the General Plan land use map, to reflect land use changes that are either expected to occur in the future or explicitly called for in General Plan 2030:

♦ **Swenson Property.** This undeveloped parcel, located near Antonelli Pond and the Westside Industrial district, is 11.1 acres and is designated as Low-Density Residential (L). It was analyzed as Low Medium Density Residential (LM).

♦ **Golf Club Drive Properties.** These six largely undeveloped parcels in Harvey West total 20.6 acres and are designated as L, but were analyzed as LM.

♦ **Harvey West Large-Format Retail.** General Plan 2030 calls for large-scale retail uses to be directed to Harvey West. The analysis assumes that a 7.7 acre site that is currently designated Industrial (I) will be redesignated as Community Commercial (CM) and redeveloped for retail use.

III. FACTORS FOR ADJUSTING DEVELOPMENT POTENTIAL

As noted on page 2, the analysis of buildout potential assumes that 1) not all development will happen at the maximum possible intensity, and 2) not every parcel with development potential will be redeveloped by 2030.

To address the first assumption, the analysis assumes that on average, all new development in Santa Cruz will occur at 80 percent of the permitted residential density or floor area ratio

(FAR)[1]. This standard percentage accounts for hard-to-develop sites and places where people simply choose to build less than the maximum that is allowed, due to economic factors or other reasons.

To address the second assumption, we assign a probability of redevelopment based on the type of development opportunity that exists. The probabilities are assigned as follows:

- **Vacant:** 90 percent within city limits; 70 percent in sphere of influence
- **Reuse Potential:** 75 percent within city limits; 60 percent in sphere of influence
- **Seabright LM/M Parcels:** 10 percent

Lower probabilities were used within the sphere of influence because many of these parcels are affected by biological resources, steep slopes or other natural factors that limit their development potential.

In addition, General Plan 2030 allows residential development to exceed the maximum allowed density if it incorporates single-room occupancy (SRO) units or small ownership units (SOUs). The analysis assumes that SRO/SOU development will cause the total amount of residential development to increase by up to 5 percent, depending on the General Plan land use designation.

To estimate buildout potential, these various factors are combined into a single adjustment factor for each parcel, as shown in the example below.

IV. SAMPLE CALCULATIONS

This section provides two hypothetical examples to show the steps for estimating buildout potential, using a one-acre vacant parcel that is designated Low Medium Density Residential (LM) and a one-acre reuse parcel designated Office (OF).

A. LM Parcel

The LM parcel in this example is one acre and is vacant. The steps for estimating its development potential are as follows:

1. Calculate Gross Potential Development

This is calculated by multiplying a parcel's acreage by the allowed density (the total number of dwelling units per acre (du/ac)) or FAR permitted under that parcel's land use designation.

---

[1] Floor area ratio (FAR) is the total square footage of the buildings on a site, divided by the total square footage of the underlying site.

The LM designation permits up to 20 du/ac, so the parcel's gross potential development is:

1 ac x 20 du/ac = 20 du

2. Calculate Net Potential Development

Net potential development equals the gross potential development on a parcel minus any existing development (number of existing dwelling units or non-residential square footage).

The LM parcel is vacant, so its net potential development is:

20 du – 0 du = 20 du

3. Calculate the Adjustment Factor

The adjustment factor is the standard assumed development intensity (80 percent for all parcels), times the likelihood of development based on the development opportunity (90 percent for vacant parcels), plus the increased amount of residential development that is expected to result from SRO/SOU units (2 percent in the LM designation).

For the LM parcel, the adjustment factor is:

(80% x 90%) + (2% x (80% x 90%)) = 73.4%

4. Calculate Final Buildout

This is calculated by multiplying net potential development by the appropriate adjustment factor.

Since only residential development is permitted on LM parcels, the final estimate of buildout potential for this parcel by 2030 is:

20 du x 73.4% = 14.7 du

B. OF Parcel

The OF parcel in this example is one acre, has reuse potential and has 12,000 sf of existing office development. The steps for estimating its development potential are as follows:

1. Calculate Gross Potential Development

For purposes of estimating potential development on OF parcels, we assume a commercial FAR of .25 and an office FAR of 1.5, so the parcel's gross potential development is:

Commercial: 43,560 sf x .25 = 10,890 sf
Office: 43,560 sf x 1.5 = 65,340 sf

2. Calculate Net Potential Development

The OF parcel has 12,000 sf of existing office development, so its net potential development is:

65,340 sf – 12,000 sf = 53,340 sf

3. Calculate the Adjustment Factor

For the OF parcel, the adjustment factor equals the standard assumed development intensity (80 percent for all parcels), times the likelihood of development based on the development opportunity (75 percent for reuse parcels), plus the increased amount of residential development that is expected to result from SRO/SOU units (0 percent in the OF designation).

Therefore, the adjustment factor is:

(80% x 75%) + (0% x (80% x 75%)) = 60%

4. Calculate Final Buildout

The final estimate of buildout potential for the OF parcel by 2030 is:

Commercial: 10,890 sf x 60% = 6,534 sf
Office: 53,340 sf x 60% = 32,004 sf

V. GROWTH POTENTIAL UNDER GENERAL PLAN 2030

As the analysis shows, some development potential exists in Santa Cruz even under its current General Plan. However, General Plan 2030 would increase this potential so that the City can accommodate an appropriate amount of growth over the next 20 years. The land use changes in General Plan 2030 are meant to allow Santa Cruz to accommodate significantly more residential units; to provide for modest increases in commercial and office development; and to create a slightly reduced, but still adequate, potential for industrial growth.

The following sections highlight significant changes in development potential that are expected to result from General Plan 2030.

A. Residential

General Plan 2030 would substantially increase the number of new residential units that can be accommodated over the next 20 years. The buildout analysis shows that 1,655 units could be accommodated under the current General Plan, which would increase to 3,189 units under the Preferred Alternative for General Plan 2030.

The increase reflects the following notable differences in several General Plan change areas:

- **Golf Club Drive:** A future redesignation of these parcels from L to LM would increase the potential amount of residential development.
- **Harvey West:** A future redesignation of some land as CM could create limited potential for additional residential units.
- **Lower Westside:** A future redesignation of the Swenson parcel from L to LM would accommodate more residential development.
- **Mission Street, Ocean Street, Soquel Avenue, Water Street:** New mixed-use designations on these commercial corridors would allow for increased residential growth in the future.

B. Commercial

The analysis shows a very slight increase in commercial development potential as a result of the land use changes that were analyzed. The analysis shows that 1,038,456 square feet of commercial development could be accommodated under the current General Plan, compared to 1,087,983 square feet under General Plan 2030.

This increase reflects the following notable differences from the current General Plan:

- **Harvey West:** A future redesignation of some land as CM would increase the potential for retail development in Harvey West.
- **Mission Street, Ocean Street, Soquel Avenue, Water Street:** New development on these corridors is expected to emphasize office uses somewhat more than commercial uses, slightly reducing the potential for commercial development under General Plan 2030.

C. Office

The analysis shows a modest increase in office development potential as a result of the land use changes that were analyzed. Under the current General Plan, 942,101 square feet of office development could be accommodated, compared to 1,273,913 square feet under General Plan 2030.

This increase reflects the following notable differences from the current General Plan:

- **Harvey West:** A future redesignation of some land as CM could potentially result in some additional office development along with the new retail.
- **Mission Street, Ocean Street, Soquel Avenue, Water Street:** New development on these corridors is expected to emphasize office uses somewhat more than commercial uses, increasing the potential for office development under General Plan 2030.

D. Industrial

General Plan 2030's land use changes do not affect the potential for industrial development in Santa Cruz. However, the analysis assumes that some land in Harvey West will be redesignated for commercial use. While this change has not yet occurred, it is supported by policies in General Plan 2030.

As a result, the analysis shows less potential for industrial expansion in the future, as compared with the "no project" scenario. The "no project" scenario projects 482,065 square feet of industrial development potential, compared to 381,544 square feet under General Plan 2030. The City anticipates that the slightly reduced industrial land supply will be sufficient to meet future demand.

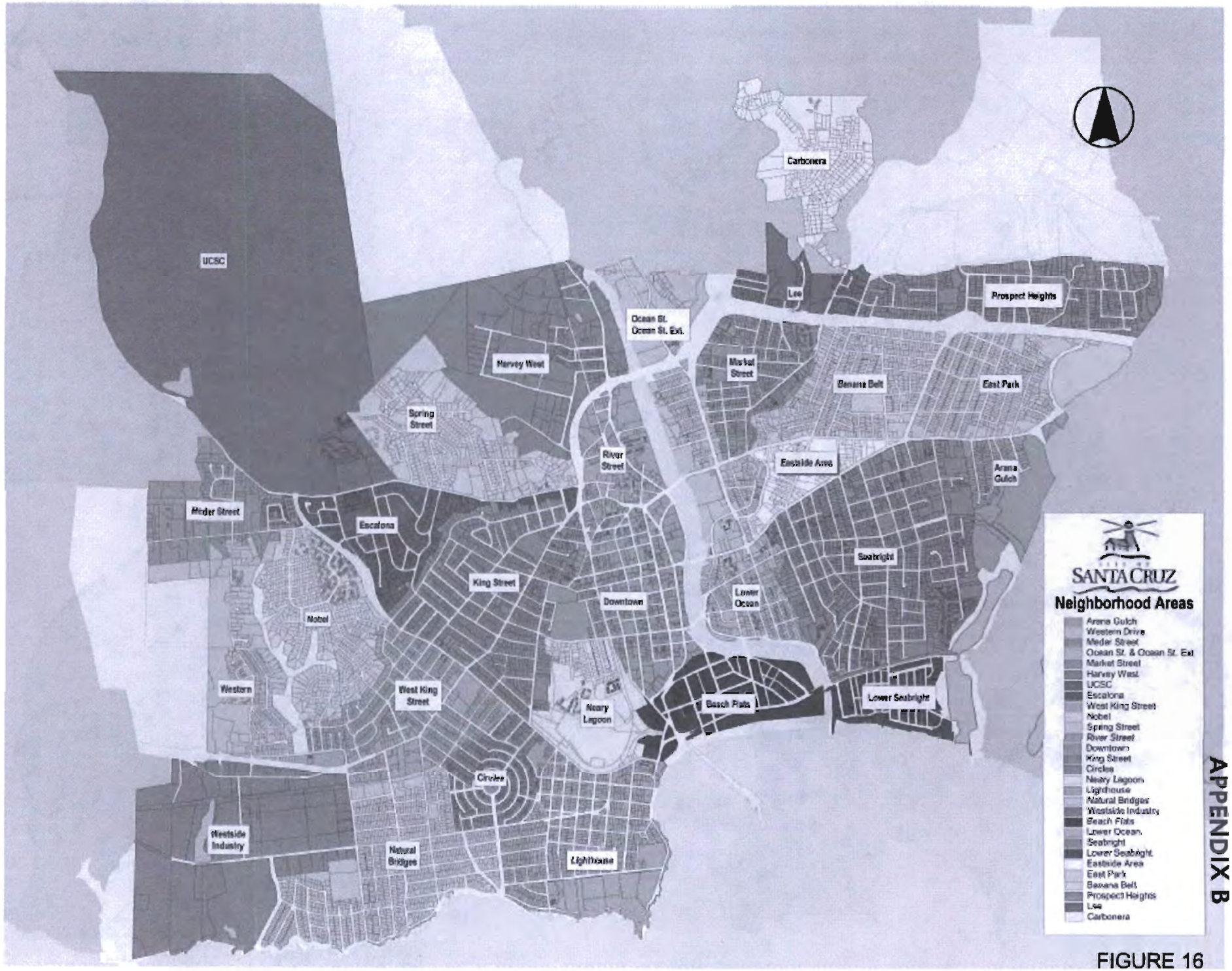
VI. GRADUATED DENSITY ZONING

The City is considering graduated density zoning as an implementation tool for General Plan 2030. The concept behind graduated density zoning is simple: Maximum densities are set very low on small properties, and they are increased on larger properties, up to a set limit. For example, a zoning ordinance could set a maximum density of 5 dwelling units per acre on an 0.2-acre site, increasing up to 50 units per acre on a site that is 1 acre or larger.

By increasing development potential based on a property's size, graduated density zoning provides a financial incentive for property owners to assemble small, hard-to-develop parcels—such as those on many of Santa Cruz's commercial corridors—into larger sites that allow for higher-quality development. This strategy would be consistent with an action in General Plan 2030 to offer incentives for consolidation of underdeveloped parcels.

There is no guarantee that parcel assembly would actually occur under graduated density zoning. However, the analysis of General Plan 2030's buildout potential assumes that if graduated density zoning is used in the future, parcels will typically be assembled so that new development can achieve the maximum densities specified in the General Plan. If this parcel assembly does not occur, the actual buildout would likely be lower than the findings in our analysis. Therefore, this analysis may represent a conservative estimate of future growth under General Plan 2030, in the sense that it may overestimate the amount of development that could be accommodated.


Carbonera Sphere
Upper Eastside
Golf Club
Upper Westside
Harvey West
River St/ Front St
San Lorenzo River
Water St
Soquel Ave
Ocean St
Lower Eastside
Downtown
Eastside Sphere
Beach Area
Mission St
Westside Industrial
Lower Westside
Monterey Bay



APPENDIX B

FIGURE 16

Buildout Projections
Units and SF by MTS Neighborhood

	Preferred Alternative	No Project
Sum of Factored DU		
MTS	Total	Total
Arana Gulch	5	5
Banana Belt	178	20
Beach Flats	94	94
Carbonera	12	12
Carbonera Sphere	0	0
Central Eastside	68	68
Circles	0	0
Downtown	560	550
East Park	41	41
Eastside Area	370	29
Eastside Heights	0	0
Escalona	5	5
Harvey West	311	143
King Street	117	31
Lee	6	6
Lighthouse	1	1
Lower Ocean	-19	-21
Lower Seabright	0	0
Market Street	46	30
Meder Street	60	60
Natural Bridges	1	1
Neary Lagoon	0	0
Nobel	0	0
Ocean Street	185	57
Prospect Heights	43	43
River Street	37	37
Seabright	530	154
South Eastside	14	14
Spring Street	92	92
UCSC	0	0
West King Street	223	56
Western	13	13
Westside Industry	196	113
Grand Total	**3,189**	**1,655**

	Preferred Alternative	No Project
Sum of Factored Comm SF		
MTS	Total	Total
Arana Gulch	11,632	11,632
Banana Belt	12,805	15,722
Beach Flats	21,872	21,872
Carbonera	0	0
Carbonera Sphere	0	0
Central Eastside	46,160	46,160
Circles	0	0
Downtown	44,274	38,913
East Park	25,117	25,117
Eastside Area	22,378	47,227
Eastside Heights	0	0
Escalona	923	923
Harvey West	278,929	158,303
King Street	18,813	27,409
Lee	0	0
Lighthouse	0	0
Lower Ocean	8,559	12,949
Lower Seabright	0	0
Market Street	70,639	45,655
Meder Street	0	0
Natural Bridges	4,622	4,622
Neary Lagoon	0	0
Nobel	0	0
Ocean Street	234,834	289,699
Prospect Heights	0	0
River Street	65,355	65,355
Seabright	53,427	60,523
South Eastside	6,766	6,766
Spring Street	0	0
UCSC	0	0
West King Street	51,489	50,220
Western	0	0
Westside Industry	109,390	109,390
Grand Total	**1,087,983**	**1,038,456**

	Preferred Alternative	No Project
Sum of Factored Office SF		
MTS	Total	Total
Arana Gulch	23,263	23,263
Banana Belt	56,479	31,445
Beach Flats	0	0
Carbonera	0	0
Carbonera Sphere	0	0
Central Eastside	92,319	92,319
Circles	0	0
Downtown	-27,562	-32,923
East Park	50,234	50,234
Eastside Area	111,307	94,454
Eastside Heights	0	0
Escalona	1,847	1,847
Harvey West	156,751	106,490
King Street	67,878	54,818
Lee	0	0
Lighthouse	0	0
Lower Ocean	14,304	5,369
Lower Seabright	0	0
Market Street	34,117	86,886
Meder Street	0	0
Natural Bridges	3,081	3,081
Neary Lagoon	0	0
Nobel	0	0
Ocean Street	183,584	18,858
Prospect Heights	0	0
River Street	120,864	120,864
Seabright	162,333	101,280
South Eastside	14,203	14,203
Spring Street	0	0
UCSC	0	0
West King Street	135,982	96,685
Western	0	0
Westside Industry	72,927	72,927
Grand Total	**1,273,913**	**942,101**

	Preferred Alternative	No Project
Sum of Factored Ind SF		
MTS	Total	Total
Arana Gulch	0	0
Banana Belt	0	0
Beach Flats	0	0
Carbonera	0	0
Carbonera Sphere	0	0
Central Eastside	0	0
Circles	0	0
Downtown	0	0
East Park	0	0
Eastside Area	0	0
Eastside Heights	0	0
Escalona	0	0
Harvey West	162,123	262,645
King Street	0	0
Lee	0	0
Lighthouse	0	0
Lower Ocean	0	0
Lower Seabright	0	0
Market Street	0	0
Meder Street	0	0
Natural Bridges	7,703	7,703
Neary Lagoon	0	0
Nobel	0	0
Ocean Street	0	0
Prospect Heights	0	0
River Street	0	0
Seabright	24,706	24,706
South Eastside	0	0
Spring Street	0	0
UCSC	0	0
West King Street	4,695	4,695
Western	0	0
Westside Industry	182,317	182,317
Grand Total	**381,544**	**482,065**

APPENDIX B

Buildout Projections
Dwelling Units and SF by GP Change Area

	Preferred Alternative	No Project
Sum of Factored DU		
GP_CHGAREA	Total	Total
Beach Area	54	54
Carbonera Sphere	0	0
Downtown	299	299
Eastside Sphere	82	82
Golf Club	245	117
Harvey West	66	27
Lower Eastside	141	141
Lower Westside	188	105
Mission St	314	61
Ocean St	144	-1
River St/Front St	337	328
Soquel Av	690	68
Upper Eastside	143	143
Upper Westside	171	171
Water St	280	27
Westside Industrial	34	34
Grand Total	**3,189**	**1,655**

	Preferred Alternative	No Project
Sum of Factored Comm SF		
GP_CHGAREA	Total	Total
Beach Area	21,872	21,872
Carbonera Sphere	0	0
Downtown	38,913	38,913
Eastside Sphere	52,925	52,925
Golf Club	0	0
Harvey West	278,929	158,303
Lower Eastside	40,066	40,066
Lower Westside	0	0
Mission St	68,409	75,736
Ocean St	298,697	327,489
River St/Front St	70,058	64,697
Soquel Av	60,938	88,684
Upper Eastside	3,415	8,895
Upper Westside	658	658
Water St	36,274	43,390
Westside Industrial	116,828	116,828
Grand Total	**1,087,983**	**1,038,456**

	Preferred Alternative	No Project
Sum of Factored Office SF		
GP_CHGAREA	Total	Total
Beach Area	0	0
Carbonera Sphere	0	0
Downtown	4,495	4,495
Eastside Sphere	106,522	106,522
Golf Club	0	0
Harvey West	156,751	106,490
Lower Eastside	60,367	60,367
Lower Westside	0	0
Mission St	203,829	151,471
Ocean St	195,855	69,483
River St/Front St	87,492	82,130
Soquel Av	248,422	177,369
Upper Eastside	12,311	17,791
Upper Westside	1,316	1,316
Water St	118,667	86,780
Westside Industrial	77,886	77,886
Grand Total	**1,273,913**	**942,101**

	Preferred Alternative	No Project
Sum of Factored Ind SF		
GP_CHGAREA	Total	Total
Beach Area	0	0
Carbonera Sphere	0	0
Downtown	0	0
Eastside Sphere	0	0
Golf Club	0	0
Harvey West	162,123	262,645
Lower Eastside	24,706	24,706
Lower Westside	0	0
Mission St	0	0
Ocean St	0	0
River St/Front St	0	0
Soquel Av	0	0
Upper Eastside	0	0
Upper Westside	0	0
Water St	0	0
Westside Industrial	194,714	194,714
Grand Total	**381,544**	**482,065**

Preferred Alternative Development Standards

FARs and DU/ac

Land Use Designa	Comm FAR	Office FAR	Ind FAR
VL	0	0	0
L	0	0	0
LM	0	0	0
M	0	0	0
H	0	0	0
NC	0.5	0.25	0
OF	0.25	1.5	0
CD	0	0	0
CM	0.75	0.75	0
CM_OCEAN	1.25	0.25	0
RVC_75	0.75	1.25	0
RVC_50	0.75	0.75	0
RVC_35	0.75	0.5	0
RVC	0.75	0.5	0
RVC_OCEAN	1.25	0.25	0
IND	0.15	0.5	0.5
AG	0	0	0
PK	0	0	0
NA	0	0	0
UC	0	0	0
CR	0	0	0
CF	0	0	0
MXHD	0.5	0.5	0
MXMD	0.5	0.5	0
MXMD_OCEAN	0.75	0.5	0
MXVC_7	1.5	1	0
MXVC_6	1.25	1	0
MXVC_4	1	0.5	0
MXVC_3	0.75	0.5	0

Assumed Development Intensity

Percent of Maximum	80%

Likelihood of Development (OPPT field)

VAC	90%
REUSE	75%
REUSE_MX	75%
SEABRIGHT	10%
XX	0%
VAC_Sphere	70%
REUSE_Sphere	60%

SRO/SOU Unit Bonus

Land Use Designation	%
VL	0%
L	0%
LM	2%
M	5%
H	5%
NC	2%
OF	0%
CD	0%
CM	5%
CM_OCEAN	0%
RVC_75	5%
RVC_50	5%
RVC_35	5%
RVC	5%
RVC_OCEAN	0%
IND	0%
AG	0%
PK	0%
NA	0%
UC	0%
CR	0%
CF	0%
DTC	5%
MXHD	5%
MXMD	2%
MXMD_OCEAN	2%
MXVC_7	2%
MXVC_6	2%
MXVC_4	2%
MXVC_3	2%

APPENDIX B

No Project Scenario Development Standards

FARs and DU/ac

Land Use De	*DU/ac*	*Comm FAR*	*Office FAR*	*Ind FAR*
VL	1	0	0	0
L	10	0	0	0
LM	20	0	0	0
M	30	0	0	0
H	55	0	0	0
NC	20	0.5	0.25	0
OF	0	0.25	1.5	0
CD	0	0	0	0
CM	10	0.75	0.75	0
CM_OCEA				
N	5	1.25	0.25	0
RVC_75	70	0.75	1.25	0
RVC_50	55	0.75	0.75	0
RVC_35	25	0.75	0.5	0
RVC	20	0.75	0.5	0
RVC_OCE				
AN	5	1.25	0.25	0
IND	2	0.15	0.5	0.5
AG	0.1	0	0	0
PK	0	0	0	0
NA	0	0	0	0
UC	0	0	0	0
CR	0	0	0	0
CF	0	0	0	0

Assumed Development Intensity

Percent of Maximum	80%

Likelihood of Development (OPPT field)

VAC	90%
REUSE	75%
REUSE_MX	0%
SEABRIGHT	10%
XX	0%
VAC_Sphere	70%
REUSE_Sphere	60%

SRO/SOU Unit Bonus

Land Use Designation	*%*
VL	0%
L	0%
LM	2%
M	5%
H	5%
NC	2%
OF	0%
CD	0%
CM	5%
CM_OCEAN	0%
RVC_75	5%
RVC_50	5%
RVC_35	5%
RVC	5%
RVC_OCEAN	0%
IND	0%
AG	0%
PK	0%
NA	0%
UC	0%
CR	0%
CF	0%
DTC	5%
MXHD	5%
MXMD	2%
MXMD_OCEAN	2%
MXVC_7	2%
MXVC_6	2%
MXVC_4	2%
MXVC_3	2%

APPENDIX B

Assumptions for Existing Non-Residential Development

FARs

Land Use De	*Comm FAR*	*Office FAR*	*Ind FAR*
VL	0	0	0
L	0	0	0
LM	0	0	0
M	0	0	0
H	0	0	0
NC	0.5	0	0
OF	0	1	0
CD	0	0	0
CM	0.5	0.25	0
CM_OCEA			
N	0.5	0.25	0
RVC_75	0.75	1.25	0
RVC_50	0.75	1	0
RVC_35	0.5	0.5	0
RVC	0.5	0.5	0
IND	0	0.4	0.25
AG	0	0	0
PK	0	0	0
NA	0	0	0
UC	0	0	0
CR	0	0	0
CF	0	0	0

Note: existing residential development was obtained from the City's Land Use Information System (LUIS).

APPENDIX C

TRAFFIC ANALYSIS METHODOLOGIES

Memorandum

To: Chris Schneiter

From: Ron Marquez

Date: August 29, 2011

Re: General Plan Traffic Analysis Methodology

The purpose of this memorandum is to document the assumptions and approach for the traffic Analysis prepared for the City of Santa Cruz 2030 General Plan. The assumption center around adjustments made for the interaction between new development, adjustments for UCSC trips, adjustments for smart growth (mixed use)corridors and the appropriateness of the traffic counts used for the general plan modeling.

Trip Generation Rate Interactivity Adjustments

The Planning Department has provided the total number of residential units and the potential square footage of non-residential development by neighborhood for the entire City. The Traffix model used for analysis of the circulation effects of this proposal will estimate the trip generation for all uses and distribute these new trips to the existing road network. A measurable amount of the new trips generated by the residential development will travel to the new commercial and office development. To avoid double counting these trips a method must be defined to estimate the number of trips that interact with the variety of land uses. A similar condition exists for the residential to residential trips.

One component of the Master transportation study completed in July 2003 for the City of Santa Cruz was a household survey. This survey provided information regarding City resident travel patterns such as travel purpose and travel mode. As an example 58 % of all trips are made for shopping, work or personal purposes. In addition about 75% of all trips made by residents remain within the City of Santa Cruz. If we assume that this distribution will remain relatively constant for all new residents in the City then approximately 44% (58% X 75%) of all trips made by new residents will be to commercial, office, industrial or personal service facilities within the City.

By assuming that the above trips will be distributed proportionally to all the non residential development in the City we can estimate what percentage of residential trips will be made to all new non-residential development. The City does not have a good estimate of the square footage of non-residential development however

there are good estimates of City employment. The estimated number of new employees over the total number of employees in the future will provide the final factor to adjust the trip rate for residential development. The AMBAG population, housing and employment forecast provide an estimate in 2005 of 34,016 employees. The following table presents an estimate of the potential employment at buildout of the general plan.

General Plan Buildout Employment Forecast Increase

Use	Estimated Square footage	Employment rate *per 1,000 sq. ft.	Estimated Employment Increase
Commercial	1,087,983	2	2,176
Office	1,273,913	3.31	4,217
Industrial	776,926	2.3	1,787
Hotels	310 rooms	1.6 emp/room	496
		Total	**8,676**

* These employment rates are found in ITE "Trip Generation" for the respective uses

Based on this estimated increase the ratio of new employment to total employment at buildout would be 20%. (8676/ (8676+ 34,106))Using this factor to adjust the trips made within the City results in an estimate that 8.9% of all trips made by new residential development will travel to new non-residential locations. (20% X 44%).

This percentage will used as a reduction factor for the residential trip generation estimated for the general plan traffic analysis.

A similar reduction factor may be identified for residential to residential trips. The Santa Cruz Travel Survey indicated that 25% of all trips were made for social purposes. If we assume that the majority of these trips are made to other residential uses and that 75% of them will remain within the City then approximately 19% of all trips made by new residents will remain in the City. These trips will be distributed evenly to new residential uses and existing residential uses. Based on the General Plan Buildout calculations there will be 3,890 new units in Santa Cruz. There are currently about 23,133 units in Santa Cruz. The percentage of new units to total units will be 14%. Therefore 14% of the 19% trips made for social purposes will be made to the new housing units or about 2.7%. Half of this number can be deducted from the residential trip distribution or 1.4%.

Trip Reduction for UCSC trips

School trips made from residential development may similarly be reduced since the trip generation applied to the University growth accounts for these trips. The household telephone survey also tells us that 15,000 students now in the City account for school trips on the order of 14% of all trips. Assuming 4,500 new students at the University and maintaining the same ratio of school trip purpose to students over population then the new population of students to population growth in the City would result in approximately 25% of the new trip generation to be for school purposes. Since only 45% of these trips are taken in automobiles then the reduction in auto trips would be equivalent to approximately 11%. For purposes of this estimate the 2005 and 2030 population is estimated at 56,421 and 65,884 respectively per AMBAG 2008 Population and Employment forecast. This reduction is only applied to the analysis that includes University growth. Its purpose is to avoid double counting trips made from the University to residential development and back. These trips are accounted for only once in the trip generation and distribution applied to Campus growth.

Summarizing Trip Generation Adjustments

The underlying assumptions are:

Future residential trips will distribute through the street system with the same characteristics of the existing residential trips

75% of all residential trips will remain within the city (from MTS)

58% of all trips are made for shopping, work, or personal purposes (from MTS)

New shopping/work/personal trips remaining within the city is 20% of all such trips(derived from growth in employment within city)

Percentage calculations:

25% of all new residential trips would be to areas outside of the city (100% - 75%)

44% of all new residential trips would remain in city and be made to shopping, work, or personal purposes (75% x 58%)

8.9% of all new residential trips will remain in city and be made to new shopping, work, or personal service locations (44% x 20%)

34.8% of all new residential trips would remain in city and be made to existing shopping, work or personal service locations (44% - 9.2%)

11% of all new residential trips are made for school purposes primarily to UCSC.

20% of all new residential trips would remain in city and be made to existing and future residential locations (75% - 44% - 11%)

2.7% of all new residential trips would be made to new residential locations.

Smart Growth (Mixed Use) Adjustments

The proposed general plan encourages smart growth through the development of mixed use corridors along Mission Street, Ocean Street, Water Street and Soquel Avenue. One purpose of these mixed use corridors is to create an environs that encourages transit use, walking, bicycling and reduces auto travel demand.

Quantifying this reduction in travel demand is the subject of ongoing research. Until this research is documented however the best available quantifiable methodology is included in URBEMIS an air pollution estimation model developed by the South Coast Air Quality Management District. This model includes methodology to calculate the reduction in trip generation associated with mixed use developments, with accessible transit, pedestrian facilities and bikeways. The formulas developed for this modeling have been used to refine the trip generation estimates for the Santa Cruz City General Plan traffic model. The following are the assumptions, formulas, and conclusions of this component of the modeling process for Santa Cruz.

The following reductions are intended to be additive to those reductions calculated for the overall intra city travel associated with new development as described earlier.

Trip generation reductions can be calculated based on the following characteristics;

- Mix of land uses
- Presence of local serving retail
- Bicycle and pedestrian accessibility and
- Transit Service accessibility

Mix of land uses

The following formula is used to adjust trip generation rates as a function of the mix of land uses for any particular project.

Trip reduction = (1- (ABS (1.5 * h - e) / (1.5 * h + e)) - 0.25) / 0.25 * 0.03

Where:

h = study area households (or housing units)
e = study area employment

This formula assumes an "ideal" housing jobs balance of 1.5 and a baseline diversity of 0.25. The maximum possible reduction using this formula is 9%. This formula was used to account for the overall jobs housing balance for each of the four corridors.

Presence of Local Serving Retail

The presence of local serving retail can be expected to bring further trip reduction benefits, and an additional reduction of 2% is assumed for this factor. This is used although it is towards the lower end of the values presented in the research, in order to avoid double counting with the mixed use indicator.

Bike and Pedestrian Accessibility

The pedestrian/bicycle reduction is calculated as follows:

Ped/bike trip reduction = 9% x ped/bike factor

Ped/bike factor = (network density + sidewalk completeness + bike lane completeness) /3

Network density = number of intersection valences per square mile / 1300

Sidewalk completeness = % of area with sidewalk on both sides + 0.5 x % of area with sidewalk on one side

Bike lane completeness = % of arterials and collectors with bike lanes or effective parallel routes.

Transit Service Accessibility

Trip reduction due to transit service is calculated as follows;

Transit trip reduction = t x 0.075+ t x ped/bike factor x 0.075

t = .06 for areas with 30 minute bus service from 5 am to 7 pm or .17 for areas with 15 minute service from 5 am to 12 midnight. For purposes of this analysis it is assumed that transit service of 30 minute headways is available and that capacity exists to accommodate the demand.

The following table presents the results of this analysis.

Table 1 Residential Mixed Use Corridor Trip Generation Reduction

	Mixed Use trip reduction	Local serving retail	Ped Bike Reduction	Transit Reduction	Total Trip reduction
Mission Street	5.5%	2%	5.4%	0.9%	13.8%
Ocean Street	0.5%	2%	4.5%	0.8%	7.8%
Soquel Ave	8.4%	2%	6.0%	0.9%	17.3%
Water Street	7.1%	2%	6%	0.9%	16.0%

Validity of Counts Used for Traffic Analysis

I was asked to compare recent counts with the counts made for the General Plan in late 2006. The objective was to insure the validity of the counts made for the environmental analysis.

To do this I consulted with the Santa Cruz County Regional Transportation Commission who provided me with counts made in Santa Cruz in 2008 and 2009. All but one of the counts the City made in 2006 were higher than those reported by the Commission. The one count that was not was a very low volume count on Branciforte Avenue north of Goss Avenue. The reliability of low volume counts is questionable without numerous samples. Dropping the low and the high values, the average count in 2006 is about 20% higher than those of 2008 and 2009.

I also compared traffic volumes as reported by Caltrans on its website. Counts made in 2009 have not yet been reported. Overall the counts reported for 2006 are 8% higher than those reported in 2008. Anecdotal observations suggest that 2009 volumes are even lower than those of 2008. The economic recession has had this effect on traffic volumes.

I would recommend therefore that the 2006 counts continue to be used as the most reliable worst case base conditions, inasmuch as these traffic volume conditions could be duplicated without any change in existing development.

Initial Trip Generation Rate for Multi-Family Units

The multi-family unit category includes condominiums, townhomes, apartments and sro's. The forecast of these unit assumes that there will be a blend of these various unit types both ownership and rental. For purposes of our analysis the traffic model uses an apartment trip generation rate for all multi-family units. This rate falls in between the townhouse and sro rates and avoids the need to estimate the number in each category of residential development.

Land Use	Rates	
	Daily	PM Peak
SFDU	9.57	1.01
Townhomes	8.11	0.82
Apartments	6.65	0.62
SRO	5.65	0.53
Specialty Retail	44.32	2.71
Offices	11.01	1.49
Light Industrial	6.97	0.97
Arana Gulch - Soquel		
Townhomes	6.71	0.68
Apartments	5.50	0.51
SRO	4.67	0.44
Banana Belt - Water		
Townhomes	6.81	0.69
Apartments	5.59	0.52
SRO	4.75	0.45
King - Mission		
Apartments	5.73	0.53
SRO	4.87	0.46
Lower Ocean - Ocean		
Apartments	6.13	0.57
SRO	5.21	0.49

City of Santa Cruz General Plan 2030

Trip Generation Rates for Future City Buildout

Location	Land Use	Trip Rate	
		Daily	PM Peak Hour
Beach Area	Apartments	6.65	0.62
	Single-Room Occupancy (SRO)	5.65	0.53
	Commercial	44.32	2.71
Downtown	Apartments	6.65	0.62
	Single-Room Occupancy (SRO)	5.65	0.53
	Commercial	44.32	2.71
	Office	11.01	1.49
Golf Club	Townhomes	8.11	0.82
	Single-Room Occupancy (SRO)	5.65	0.53
Harvey West	Townhomes	8.11	0.82
	Single-Room Occupancy (SRO)	5.65	0.53
	Commercial	44.32	2.71
	Office	11.01	1.49
	Industrial	6.97	0.97
Lower Eastside	Townhomes	8.11	0.82
	Apartments	6.65	0.62
	Single-Room Occupancy (SRO)	5.65	0.53
	Commercial	44.32	2.71
	Office	11.01	1.49
	Industrial	6.97	0.97
Lower Westside	Single-Family Dwelling Unit	9.57	1.01
Mission Street *	Apartments	5.73	0.53
	Single-Room Occupancy (SRO)	4.87	0.46
	Commercial	44.32	2.71
	Office	11.01	1.49
Ocean St *	Apartments	6.13	0.57
	Single-Room Occupancy (SRO)	5.21	0.49
	Commercial	44.32	2.71
	Office	11.01	1.49
River St/Front St	Apartments	6.65	0.62
	Single-Room Occupancy (SRO)	5.65	0.53
	Commercial	44.32	2.71
	Office	11.01	1.49
Soquel Ave *	Apartments	5.50	0.51
	Single-Room Occupancy (SRO)	4.67	0.44
	Commercial	44.32	2.71
	Office	11.01	1.49
Upper Eastside	Single-Family Dwelling Unit	9.57	1.01
	Townhomes	8.11	0.82
	Office	11.01	1.49
Upper Westside	Single-Family Dwelling Unit	9.57	1.01
	Single-Room Occupancy (SRO)	5.65	0.53
	Commercial	44.32	2.71
	Office	11.01	1.49
Water St *	Apartments	5.59	0.52
	Single-Room Occupancy (SRO)	4.75	0.45
	Commercial	44.32	2.71
	Office	11.01	1.49
Westside Industrial	Apartments	6.65	0.62
	Single-Room Occupancy (SRO)	5.65	0.53
	Commercial	44.32	2.71
	Office	11.01	1.49
	Industrial	6.97	0.97

Notes:

1. Units for rates are as follows:

Residential (Single-Family Dwelling Unit, Townhomes, Apartments, Single-Room Occupancy)	trips per unit
Commercial	trips per 1,000 square feet
Office	trips per 1,000 square feet
Industrial	trips per 1,000 square feet

2. * = Mixed-use arterial corridor. Trip rates include the following internal trip reductions, applied to the residential trip rates of these corridors:

Mission St	13.8%
Ocean St	7.8%
Soquel Ave	17.3%
Water St	16.0%

City of Santa Cruz General Plan 2030
Residential Breakdown by Unit Type

Location	Residential Land Use Type	Number of Units
Beach Area	Apartments	193
	Single-Room Occupancy (SRO)	128
Downtown	Apartments	209
	Single-Room Occupancy (SRO)	139
Golf Club	Townhomes	147
	Single-Room Occupancy (SRO)	98
Harvey West	Townhomes	40
	Single-Room Occupancy (SRO)	27
Lower Eastside	Townhomes	26
	Apartments	77
	Single-Room Occupancy (SRO)	51
Lower Westside	Single-Family Dwelling Unit	147
	Apartments	30
	Single-Room Occupancy (SRO)	19
Mission Street *	Apartments	187
	Single-Room Occupancy (SRO)	124
Ocean St *	Apartments	86
	Single-Room Occupancy (SRO)	58
River St/Front St	Apartments	185
	Single-Room Occupancy (SRO)	123
Soquel Ave *	Apartments	311
	Townhomes	172
	Single-Room Occupancy (SRO)	207
Upper Eastside	Single-Family Dwelling Unit	40
	Apartments	23
	Single-Room Occupancy (SRO)	16
	Townhomes	78
Upper Westside	Single-Family Dwelling Unit	259
	Apartments	77
	Single-Room Occupancy (SRO)	51
Water St *	Apartments	112
	Townhomes	95
	Single-Room Occupancy (SRO)	78
Westside Industrial	Apartments	20
	Single-Room Occupancy (SRO)	14

Mixed Use Corridor Trip Generation Reduction Calculations
City of Santa Cruz General plan
29-Apr-09

Smart Growth Trip Reduction

	HU	Commercial Sq Ft	Commercial Employment	Office Sq Ft	Office Emplyment	Total Employment	Mixed Use trip reduction	Local serving retail	Network density	Sidewalk completion	Bikeway Completion	Ped Bike factor	Ped Bike Reduction	Transit Index	Transit Reduction	Total Trip reduction
Mission Street	311	72,799	146	212,610	704	849	5.5%	2%	0.6	0.8	0.4	0.6	5.4%	0.06	0.9%	13.8%
Ocean Street	144	298,697	597	195,855	648	1246	0.5%	2%	0.4	0.7	0.4	0.5	4.5%	0.06	0.8%	7.8%
Soquel Ave	690	60,938	122	248,433	822	944	8.4%	2%	0.6	0.8	0.6	0.7	6.0%	0.06	0.9%	17.3%

Source: URBEMIS9 User Manual Appendix D

	Mixed Use trip reduction	Local serving retail	Ped Bike Reduction	Transit Reduction	Total Trip reduction
Mission Street	5.5%	2%	5.4%	0.9%	13.8%
Ocean Street	0.5%	2%	4.5%	0.8%	7.8%
Soquel Ave	8.4%	2%	6.0%	0.9%	17.3%

Trip Generation by Zone (Update January 2010)

		PM Peak Hour			Sat Peak Hour		
TFX Zone #	Neighborhood Area	In	Out	Total	In	Out	Total
9	Harvey West (Office/Industrial #2)	29	166	195	23	20	43
17	Downtown & Neary Lagoon	272	154	426	210	178	388
19	River	124	256	380	121	108	229
27	West King (Commercial/Office #1)	49	125	174	48	43	91
36	Harvey West (Office/Industrial #1)	30	166	196	23	21	44
79	Meder & UCSC	38	23	61	30	26	56
80	Western	8	5	13	6	6	12
81	West King (Residential #1) & Nobel	21	12	33	13	12	25
82	West King (Residential #2)	19	10	29	14	11	25
83	West King (Residential #3)	19	10	29	14	11	25
84	West King (Residential #4)	19	10	29	14	11	25
85	West King (Commercial/Office #2) & Circles	48	126	174	48	44	92
86	Spring	59	34	93	45	41	86
87	King & Escalona (Res./Comm./Office #1)	42	71	113	34	29	63
88	King & Escalona (Res./Comm./Office #2)	42	70	112	33	30	63
89	Lighthouse	1	0	1	0	1	1
93	Seabright (Residential #2)	107	57	164	76	62	138
97	Seabright (Residential #1)	107	58	165	76	62	138
101	Eastside Area	178	238	417	142	118	260
103	Westside Industrial (Industrial)	21	156	177	12	14	26
108	Westside Industrial (Office)	18	91	109	16	14	30
109	Westside Industrial (Retail)	130	166	296	139	128	267
110	Westside Industrial (Residential)	79	43	122	56	46	102
111	Beach Flats (Office)	0	0	0	0	0	0
112	Beach Flats (Retail)	26	33	59	28	25	53
113	Beach Flats (Residential)	38	20	58	27	22	49
114	Lower Ocean	6	27	33	9	8	17
115	Ocean (#1)	132	206	338	129	117	246
116	Ocean (#2)	132	206	338	129	117	246
117	Ocean (#3)	132	207	339	130	116	246
118	Prospect Heights	27	16	43	21	19	40
119	Market & Lee	111	159	270	111	99	210
120	Banana Belt	89	122	212	72	60	132
121	East Park	71	93	164	53	46	99
122	Arana Gulch	22	47	69	21	19	40
123	Harvey West (Residential)	125	68	193	89	73	162
124	Harvey West (Commercial)	333	423	756	355	327	682
125	Seabright (Commericial/Office #1)	43	121	164	42	38	80
126	Seabright (Commericial/Office #2)	43	121	164	42	38	80
127	Seabright (Commericial/Office #3)	22	61	83	21	20	41
128	Natural Bridges	10	15	25	7	7	14
129	Carbonera	8	4	12	6	5	11
130	Central Eastside (Res./Comm./Office #1)	53	100	153	49	44	93
131	Central Eastside (Res./Comm./Office #2)	53	100	153	49	44	93
135	South Eastside (Res./Comm./Office)	18	30	48	16	14	30
-	Carbonera Sphere	0	0	0	0	0	0

Trip Generation by Zone (Update January 2010)

NO PROJECT		PM Peak Hour			Sat Peak Hour		
TFX Zone #	Neighborhood Area	In	Out	Total	In	Out	Total
9	Harvey West (Office/Industrial #2)	29	178	207	20	20	40
17	Downtown & Neary Lagoon	260	137	397	199	169	368
19	River	124	256	380	121	108	229
27	West King (Commercial/Office #1)	43	100	143	43	39	82
36	Harvey West (Office/Industrial #1)	29	178	207	21	20	41
79	Meder & UCSC	38	23	61	30	26	56
80	Western	8	5	13	6	6	12
81	West King (Residential #1) & Nobel	5	1	6	5	2	7
82	West King (Residential #2)	5	3	8	3	3	6
83	West King (Residential #3)	5	3	8	3	3	6
84	West King (Residential #4)	5	3	8	3	3	6
85	West King (Commercial/Office #2) & Circles	42	100	142	42	40	82
86	Spring	59	34	93	45	41	86
87	King & Escalona (Res./Comm./Office #1)	31	61	92	27	24	51
88	King & Escalona (Res./Comm./Office #2)	30	60	91	28	25	52
89	Lighthouse	1	0	1	0	1	1
93	Seabright (Residential #2)	31	17	48	22	18	40
97	Seabright (Residential #1)	31	16	47	22	18	40
101	Eastside Area	90	194	284	88	79	166
103	Westside Industrial (Industrial)	21	156	177	12	14	26
108	Westside Industrial (Office)	18	91	109	16	14	30
109	Westside Industrial (Retail)	130	166	296	139	128	267
110	Westside Industrial (Residential)	46	24	70	32	27	59
111	Beach Flats (Office)	0	0	0	0	0	0
112	Beach Flats (Retail)	26	33	59	28	25	53
113	Beach Flats (Residential)	38	20	58	27	22	49
114	Lower Ocean	8	22	30	12	11	23
115	Ocean (#1)	124	158	282	129	119	248
116	Ocean (#2)	124	158	282	129	119	248
117	Ocean (#3)	123	158	282	129	118	247
118	Prospect Heights	27	16	43	21	19	40
119	Market & Lee	89	184	273	87	77	164
120	Banana Belt	34	66	100	32	28	60
121	East Park	71	93	164	53	46	99
122	Arana Gulch	22	47	69	21	19	40
123	Harvey West (Residential)	58	31	89	41	33	74
124	Harvey West (Commercial)	189	240	429	201	186	387
125	Seabright (Commericial/Office #1)	40	95	135	40	37	77
126	Seabright (Commericial/Office #2)	40	95	135	40	37	77
127	Seabright (Commericial/Office #3)	21	48	69	20	19	39
128	Natural Bridges	11	15	26	8	6	14
129	Carbonera	8	4	12	6	5	11
130	Central Eastside (Res./Comm./Office #1)	53	100	153	49	44	93
131	Central Eastside (Res./Comm./Office #2)	53	100	153	49	44	93
135	South Eastside (Res./Comm./Office)	18	30	48	16	14	30
-	Carbonera Sphere	0	0	0	0	0	0

APPENDIX C

City of Santa Cruz 24 hr Counts
Compared to Turning Movement Counts

Count Location & Type	Date	Dir	Day 1	Day 2	Average	Dir	Day 1	Day 2	Average	
Bay so of Escalona 24 hr	4/14-15/09	n	530	513	522	so	730	816	773	
Bay at Escalona Turn	Oct-06	n			652	so			908	21%
Branciforte Ave no of Gross Ave 24 hr	4/21-22/09	n	70	103	87	s	122	137	130	
Branciforte @ Goss Turn	Oct-06	n			56				147	-6%
Laurel St @ San Lorenzo Br 24	6/24-25/08	e	556	557	557	w	377	393	385	
Laurel St @ Front St Turn	Oct-06	e			977				827	92%
Soquel Ave @ San lorenzo Br 24 hr	6/24-25/08	e	615	656	636	w	450	455	453	
Soquel Ave @ Dakota St Turn	Oct-06	e			741				534	17%
Water St @ San Lorenzo Br 24 hr	6/24-25/08	e	632	627	630	w	900	881	891	
Water St @ River St Turn	Oct-06	e			999	w			898	25%
Totals				24 hr	2430				2631	
				Turn	3425				3314	33%

Caltrans Counts Peak Hour	**2006**	**2008**	**(2006-2008) /2008**
Ro1 at Soquel Ave	7100	6600	8%
Ro1 at Emeline	7700	6300	22%
Ro1 at River St	4800	4600	4%
Route 1 at Mission	4050	3900	4%
Ro 1at Bay	3100	3050	2%
Ro 1 at City limits	1750	1700	3%
Ro 17 at Pasatiempo	6200	5900	5%
Totals	34700	32050	8%

City of Santa Cruz General Plan Counts Compared to 2010 Counts
Total Volume at Intersection

APPENDIX C

	GP Counts Total	2010 Count	ADJUSTED GP [1]	% change
1. McLaughlin/Hagar				
2. Heller/Meyer				
3. Heller/Empire Grade				
4. Western/High	1370	1058		-23%
5. Bay/High	2877	2013		-30%
6. High/Laurent	1380	1068		-23%
7. River/Highway 1	5528	5872	**5965**	6%
8. Bay/Escalona	1872	1367		-27%
9. Bay/King	2253	1512		-33%
10. Storey/King	854	934	**870**	9%
11. Mission/Almar/Younglove	2000	2278	**2428**	14%
12. Mission/Bay	3229	3093		-4%
13. Mission/Laurel	3083	3321	**3493**	8%
14. Mission/Walnut	2471	2586	**2902**	5%
15. Mission/King/Union	3694	3342		-10%
16. Mission/Chestnut	4258	4439	**4582**	4%
17. River/Water	2728	2777	**2906**	2%
18. Water/N. Branciforte	3198	2336		-27%
19. Soquel/Capitola Rd.	3149	3156		0%
20. Bay/West Cliff	1099	1388	**1117**	26%
21. Seabright/Murray	2093	2030		-3%
22. Laurel/Front	2562	2783	**2606**	9%
23. Ocean/East Cliff	2290	1870		-18%
24. Delaware/Swift	721	904	**1064**	25%
25. Mission/King				
26. King/Laurel				
27. King/Walnut				
28. Mission/Swift	1712	1792	**1996**	5%
29. Mission/Miramar	2690	2323		-14%
30. Western/Highway 1	1291	1310	**1341**	1%
31. Western/Meder				
32. Delaware/Natural Bridges				
33. Western/Mission Street Extension				
34. Natural Bridges/Mission Street Extension				
35. Swift/McPherson/Mission Street Extension				
	58402	55552		-5%

[1] Traffic from projects that were being constructed and/or occupied after the General Plan traffic counts were taken have been added to the "Existing" baseline conditions.

SEE TABLE ON THE FOLLOWING PAGE FOR A LIST OF ADDED PROJECTS.

PROJECTS ADDED TO EXISTING TRAFFIC COUNTS

It was decided that trips from the following projects be added to existing traffic as they were constructed or nearly constructed/occupied after the traffic counts were completed in December 2006.

Projects Under Construction or Being Occupied

PLANNING AREA		
Beach	108-122 Second Street	Demolish 17 apts. and construct 44 SRO units
Downtown	1375 Pacific	36,177 sf retail & 54,265 sf office
Downtown	2027 N. Pacific	3,720 square feet commercial & 4 condo units
Downtown	125 River Street / N. Pacific	70 condos & 5,522 sf commercial
Harvey West	Tannery Arts Center	**ONLY 100 residential units**
Mission Street	Almar Center Expansion	Demolish and replace Safeway (27,000 sf net increase)
Ocean Street	Ocean Street Hotel	100 hotel rooms
Soquel Avenue	1606 Soquel Avenue	36 SROs, 1 manager unit
Upper Westside	250 Cardiff	23 MFR units
Westside	New Leaf Market	17,778 sf grocery store; attached 3,000 sf tenant space

AND

Projects completed / occupied after December 2006 traffic counts were completed.

Beach	106 Younger Way	Demo SFR and replace with 4 townhouses
Beach	170 West Cliff Drive	Remodel historic SFD to B&B with 7 guest rooms & 9 townhouses
Harvey West	425 Encinal-Georgiana Bruce Kirby School	225-260 student private middle/high school
Ocean Street	132 Clay	16 condos
River Street	303 Potrero - Sash Mill	17,600 sf commercial/office
Soquel Avenue	1226 Soquel	9 townhouses
Soquel Avenue	Grace Commons Apts.	15 MFD
Soquel Avenue	Doyle Street	4 townhouses
Upper Eastside	175 Belvedere Terrace	4 MFD
Upper Eastside	1430 North Branciforte	9 SFD
Upper Eastside	121, 131, 134 Kennan St	14 townhouses
Upper Westside	1463 High	26 lots & SFDs

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2901 Western_Dr/High_St	D	34.9	0.442	E	45.9	0.544	+11.064 D/V
#2902 Bay-Coolidge/High	C	33.6	0.901	D	35.4	0.919	+ 1.844 D/V
#2903 High/Moore	A	4.8	0.499	A	4.8	0.506	-0.028 D/V
#2904 High/Laurent	F	53.4	1.045	F	59.6	1.066	+ 0.022 V/C
#2905 River/Potrero	B	17.8	0.570	B	18.0	0.605	+ 0.241 D/V
#2906 River-Hwy_9/Hwy_1	E	75.4	0.874	F	83.9	0.942	+ 8.503 D/V
#2907 River/Fern	B	13.8	0.444	B	14.5	0.464	+ 0.678 D/V
#2908 River/Encinal	E	61.4	1.038	E	73.9	1.099	+12.488 D/V
#2909 Ocean-Hwy_17/Plymouth-Ocean_Ex	C	31.4	0.651	C	31.5	0.662	+ 0.070 D/V
#2910 Market/Goss-Isbel	B	12.6	0.538	B	12.8	0.546	+ 0.008 V/C
#2911 N.Branciforte/Goss	B	14.5	0.617	B	14.6	0.618	+ 0.001 V/C
#2912 Morrissey_Blvd/Fairmount_Av	A	8.0	0.469	A	8.0	0.470	+ 0.042 D/V
#2913 Bay/Nobel-Iowa	B	11.5	0.498	B	11.6	0.503	+ 0.071 D/V
#2914 Bay_St/Escalona_Dr	F	739.8	1.937	F	782.2	2.015	+42.378 D/V
#2915 Bay_St/King_St	B	13.0	0.786	B	13.6	0.799	+ 0.569 D/V
#2916 King_St/Laurel_St	B	14.8	0.702	B	15.0	0.707	+ 0.006 V/C
#2917 Storey/King	B	14.5	0.593	B	15.0	0.608	+ 0.015 V/C
#2918 Shaffer/Highway_1	D	26.2	0.219	D	30.1	0.281	+ 3.946 D/V
#2919 Western/Highway_1	B	14.5	0.554	B	15.3	0.574	+ 0.735 D/V
#2920 Swift/Mission	B	15.6	0.529	B	19.1	0.702	+ 3.517 D/V
#2921 Miramar/Mission	B	18.2	0.480	B	19.0	0.533	+ 0.803 D/V
#2922 Almar-Younglove/Mission	B	10.0	0.364	B	10.7	0.474	+ 0.672 D/V
#2923 Bay/Mission	D	46.8	0.882	E	55.8	0.944	+ 9.037 D/V
#2924 Laurel/Mission	C	23.9	0.688	C	24.9	0.782	+ 0.992 D/V
#2925 Mission/Walnut	B	15.1	0.526	B	17.8	0.598	+ 2.706 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2926 King/Mission	C	30.5	0.795	C	32.7	0.877	+ 2.250 D/V
#2927 Chestnut/Mission	D	40.7	0.837	D	42.9	0.905	+ 2.191 D/V
#2928 N_Pacific/River	B	10.9	0.507	B	11.6	0.567	+ 0.762 D/V
#2929 Center/Mission	C	31.3	0.804	C	34.5	0.855	+ 3.255 D/V
#2930 Pacific/Water-Mission	C	21.4	0.455	C	22.0	0.486	+ 0.522 D/V
#2931 River/Water	C	29.2	0.693	C	30.1	0.726	+ 0.911 D/V
#2932 Ocean/Washburn-Keenan	A	4.3	0.571	A	4.4	0.584	+ 0.127 D/V
#2933 Ocean/Water	E	67.9	1.050	E	73.6	1.081	+ 5.701 D/V
#2934 Market/Water	C	21.9	0.727	C	22.3	0.748	+ 0.394 D/V
#2935 N_Branciforte/Water	D	35.6	0.808	D	36.6	0.834	+ 0.965 D/V
#2936 Seabright/Water	F	OVRFL	2.656	F	OVRFL	3.113	+244.376 D/
#2937 Morrissey/Soquel/Water	E	61.0	1.075	E	65.4	1.093	+ 4.343 D/V
#2938 Frederick/Soquel	C	27.4	0.885	C	28.6	0.907	+ 1.176 D/V
#2939 Hagemann-Trevethan/Soquel	A	8.2	0.667	A	8.4	0.689	+ 0.278 D/V
#2940 Park/Soquel	B	11.1	0.820	B	11.6	0.842	+ 0.478 D/V
#2941 Capitola_Rd/Soquel_Av	C	31.0	0.939	D	37.4	0.991	+ 6.360 D/V
#2942 La_Fonda_Av/Soquel_Av	B	10.4	0.280	B	10.3	0.282	-0.047 D/V
#2943 California_Ave/Bay	F	60.0	1.100	F	67.6	1.130	+ 0.030 V/C
#2944 California_St/Bay	F	389.4	1.614	F	434.0	1.704	+44.673 D/V
#2945 California_St/Laurel_St	C	20.0	0.621	C	20.3	0.641	+ 0.281 D/V
#2946 Chestnut/Laurel	B	16.9	0.628	B	17.2	0.639	+ 0.349 D/V
#2947 Center/Laurel	B	15.6	0.606	B	16.0	0.620	+ 0.315 D/V
#2948 Cedar/Laurel	C	16.1	0.256	C	16.4	0.259	+ 0.288 D/V
#2949 Pacific/Laurel	B	18.5	0.696	B	18.9	0.709	+ 0.360 D/V
#2950 Front/Laurel	C	26.1	0.689	C	26.4	0.700	+ 0.322 D/V
#2951 Front/Metro_Center	A	2.7	0.415	A	2.6	0.422	-0.015 D/V

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Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
#2952 Front/Cathcart	A	6.5	0.379	A	6.6	0.386	+ 0.112 D/V
#2953 Front/Soquel	C	25.3	0.552	C	25.5	0.627	+ 0.174 D/V
#2954 Front/Cooper	A	8.3	0.441	A	9.6	0.499	+ 1.244 D/V
#2955 River_S/Soquel	B	17.6	0.526	B	17.8	0.536	+ 0.210 D/V
#2956 Riverside-Dakota/Soquel	A	9.0	0.340	A	8.7	0.359	-0.330 D/V
#2957 Ocean_St/Soquel_Av	D	39.9	0.644	D	40.3	0.663	+ 0.429 D/V
#2958 Branciforte/Soquel	C	22.5	0.748	C	23.6	0.780	+ 1.130 D/V
#2959 Seabright/Soquel	C	32.0	0.823	C	32.9	0.835	+ 0.916 D/V
#2960 San_Lorenzo_Blvd/Broadway(Laur	B	11.8	0.614	B	11.9	0.628	+ 0.093 D/V
#2961 Ocean_St/Broadway	C	33.5	0.740	C	34.3	0.752	+ 0.741 D/V
#2962 S_Branciforte/Broadway	B	11.6	0.671	B	11.7	0.683	+ 0.116 D/V
#2963 Seabright/Broadway	B	14.3	0.717	B	14.6	0.732	+ 0.318 D/V
#2964 Pacific-Center/W_Cliff-Pacific	B	12.1	0.541	B	12.2	0.548	+ 0.007 V/C
#2965 W_Cliff/Bay	C	15.8	0.633	C	16.2	0.642	+ 0.010 V/C
#2966 Pacific/Beach	C	17.6	0.771	C	20.9	0.848	+ 0.077 V/C
#2967 Cliff/Beach	B	10.8	0.400	B	10.8	0.400	+ 0.000 V/C
#2968 Riverside/Beach	A	6.2	0.077	A	6.2	0.077	+ 0.000 D/V
#2969 Riverside/Second-Leibrandt	A	7.5	0.097	A	7.5	0.097	+ 0.000 V/C
#2970 Riverside/3rd_St	C	34.4	0.800	C	34.7	0.806	+ 0.282 D/V
#2971 Riverside/San_Lorenzo_Blvd	C	28.8	0.665	C	28.9	0.669	+ 0.106 D/V
#2972 Ocean_St/E_Cliff_Dr	E	63.6	1.057	E	64.7	1.061	+ 1.102 D/V
#2973 Seabright/Murray	D	44.7	0.877	D	44.8	0.879	+ 0.082 D/V
#2974 Swift/Delaware	B	10.9	0.500	C	23.9	1.001	+ 0.501 V/C
#2975 Seventh/Soquel	C	23.3	0.747	C	23.3	0.748	-0.021 D/V
#2976 Seventh/Capitola	C	26.8	0.609	C	26.8	0.626	+ 0.003 D/V
#2977 Seventh/Brommer	C	18.3	0.713	C	19.3	0.744	+ 0.032 V/C

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2978 Seventh/Eaton	D	36.5	0.844	D	36.8	0.848	+ 0.274 D/V
#2979 Seventh/E_Cliff	C	15.8	0.677	C	15.8	0.678	+ 0.001 V/C

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2901 Western_Dr/High_St	D	34.9	0.442	F	109.7	0.819	+74.834 D/V
#2902 Bay-Coolidge/High	C	33.6	0.901	D	46.1	0.999	+12.500 D/V
#2903 High/Moore	A	4.8	0.499	A	4.7	0.535	-0.075 D/V
#2904 High/Laurent	F	53.4	1.045	F	93.6	1.180	+ 0.136 V/C
#2905 River/Potrero	B	17.8	0.570	C	20.1	0.771	+ 2.360 D/V
#2906 River-Hwy_9/Hwy_1	E	75.4	0.874	F	212.1	1.525	+136.630 D/
#2907 River/Fern	B	13.8	0.444	F	OVRFL	XXXXX	+51966.630
#2908 River/Encinal	E	61.4	1.038	F	216.6	1.636	+155.146 D/
#2909 Ocean-Hwy_17/Plymouth-Ocean_Ex	C	31.4	0.651	D	39.6	0.902	+ 8.168 D/V
#2910 Market/Goss-Isbel	B	12.6	0.538	C	19.2	0.779	+ 0.241 V/C
#2911 N.Branciforte/Goss	B	14.5	0.617	C	20.9	0.785	+ 0.168 V/C
#2912 Morrissey_Blvd/Fairmount_Av	A	8.0	0.469	A	9.6	0.533	+ 1.635 D/V
#2913 Bay/Nobel-Iowa	B	11.5	0.498	B	13.3	0.568	+ 1.706 D/V
#2914 Bay_St/Escalona_Dr	F	739.8	1.937	F	OVRFL	1.182	+ 1.8E+0308
#2915 Bay_St/King_St	B	13.0	0.786	C	30.2	1.013	+17.202 D/V
#2916 King_St/Laurel_St	B	14.8	0.702	C	20.7	0.832	+ 0.130 V/C
#2917 Storey/King	B	14.5	0.593	C	24.4	0.834	+ 0.241 V/C
#2918 Shaffer/Highway_1	D	26.2	0.219	F	51.1	0.463	+24.929 D/V
#2919 Western/Highway_1	B	14.5	0.554	B	18.7	0.734	+ 4.135 D/V
#2920 Swift/Mission	B	15.6	0.529	D	42.2	1.005	+26.624 D/V
#2921 Miramar/Mission	F	522.7	1.693	F	OVRFL	9.383	+ 1.8E+0308
#2922 Almar-Younglove/Mission	B	16.6	0.605	F	90.4	1.253	+73.736 D/V
#2923 Bay/Mission	D	46.8	0.882	F	168.9	1.326	+122.119 D/
#2924 Laurel/Mission	C	23.9	0.688	E	70.7	1.137	+46.870 D/V
#2925 Mission/Walnut	C	27.7	0.715	E	74.7	1.124	+47.062 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2926 King/Mission	C	30.5	0.795	F	87.9	1.131	+57.419 D/V
#2927 Chestnut/Mission	D	40.7	0.837	F	119.3	1.218	+78.533 D/V
#2928 N_Pacific/River	B	10.9	0.507	B	15.0	0.819	+ 4.098 D/V
#2929 Center/Mission	C	26.7	0.851	E	60.0	1.083	+33.364 D/V
#2930 Pacific/Water-Mission	C	21.4	0.455	C	25.1	0.705	+ 3.674 D/V
#2931 River/Water	C	29.2	0.693	D	45.3	0.949	+16.112 D/V
#2932 Ocean/Washburn-Keenan	A	4.3	0.571	B	16.1	0.860	+11.787 D/V
#2933 Ocean/Water	E	67.9	1.050	F	184.0	1.490	+116.099 D/
#2934 Market/Water	C	21.9	0.727	C	29.1	0.902	+ 7.284 D/V
#2935 N_Branciforte/Water	D	35.6	0.808	E	69.3	1.099	+33.722 D/V
#2936 Seabright/Water	F	OVRFL	2.656	F	OVRFL	XXXXX	+4572.192 D
#2937 Morrissey/Soquel/Water	E	61.0	1.075	F	118.5	1.259	+57.526 D/V
#2938 Frederick/Soquel	C	27.4	0.885	E	57.2	1.094	+29.739 D/V
#2939 Hagemann-Trevethan/Soquel	A	8.2	0.667	B	11.3	0.819	+ 3.154 D/V
#2940 Park/Soquel	B	11.1	0.820	C	21.1	0.978	+10.059 D/V
#2941 Capitola_Rd/Soquel_Av	C	34.8	0.973	F	80.0	1.218	+45.246 D/V
#2942 La_Fonda_Av/Soquel_Av	B	10.4	0.280	B	10.7	0.314	+ 0.277 D/V
#2943 California_Ave/Bay	F	60.0	1.100	F	145.3	1.389	+ 0.289 V/C
#2944 California_St/Bay	F	389.4	1.614	F	OVRFL	2.928	+645.638 D/
#2945 California_St/Laurel_St	C	20.0	0.621	C	25.9	0.828	+ 5.836 D/V
#2946 Chestnut/Laurel	B	16.9	0.628	C	24.8	0.838	+ 7.933 D/V
#2947 Center/Laurel	B	15.6	0.606	C	22.8	0.841	+ 7.183 D/V
#2948 Cedar/Laurel	C	16.1	0.256	C	24.8	0.404	+ 8.725 D/V
#2949 Pacific/Laurel	B	18.5	0.696	D	35.4	0.952	+16.887 D/V
#2950 Front/Laurel	C	26.1	0.689	D	39.0	0.921	+12.917 D/V
#2951 Front/Metro_Center	A	2.7	0.415	A	2.6	0.543	-0.016 D/V

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Intersection	Base LOS	Del/ Veh	V/ C	Future LOS	Del/ Veh	V/ C	Change in
#2952 Front/Cathcart	A	6.5	0.379	A	8.2	0.512	+ 1.624 D/V
#2953 Front/Soquel	C	25.3	0.552	C	32.7	0.833	+ 7.403 D/V
#2954 Front/Cooper	A	8.3	0.441	B	10.1	0.594	+ 1.773 D/V
#2955 River_S/Soquel	B	17.6	0.526	B	19.6	0.700	+ 1.996 D/V
#2956 Riverside-Dakota/Soquel	A	9.0	0.340	A	7.4	0.432	-1.654 D/V
#2957 Ocean_St/Soquel_Av	D	39.9	0.644	E	58.5	0.983	+18.609 D/V
#2958 Branciforte/Soquel	C	22.5	0.748	E	65.5	1.066	+43.049 D/V
#2959 Seabright/Soquel	C	32.0	0.823	D	42.8	0.939	+10.829 D/V
#2960 San_Lorenzo_Blvd/Broadway(Laur	B	11.8	0.614	B	17.0	0.830	+ 5.252 D/V
#2961 Ocean_St/Broadway	C	33.5	0.740	F	125.6	1.285	+92.102 D/V
#2962 S_Branciforte/Broadway	B	11.6	0.671	B	16.5	0.849	+ 4.885 D/V
#2963 Seabright/Broadway	B	14.3	0.717	C	31.3	0.979	+16.956 D/V
#2964 Pacific-Center/W_Cliff-Pacific	B	12.1	0.541	C	17.0	0.744	+ 0.203 V/C
#2965 W_Cliff/Bay	C	15.8	0.633	D	28.5	0.890	+ 0.258 V/C
#2966 Pacific/Beach	C	17.6	0.771	E	39.8	1.064	+ 0.293 V/C
#2967 Cliff/Beach	B	10.8	0.400	C	17.0	0.667	+ 0.267 V/C
#2968 Riverside/Beach	A	6.2	0.077	A	5.8	0.242	-0.453 D/V
#2969 Riverside/Second-Leibrandt	A	7.5	0.097	A	8.4	0.316	+ 0.219 V/C
#2970 Riverside/3rd_St	C	34.4	0.800	F	81.8	1.087	+47.360 D/V
#2971 Riverside/San_Lorenzo_Blvd	C	28.8	0.665	D	50.7	1.009	+21.900 D/V
#2972 Ocean_St/E_Cliff_Dr	E	63.6	1.057	F	137.8	1.268	+74.129 D/V
#2973 Seabright/Murray	D	44.7	0.877	E	66.3	1.026	+21.586 D/V
#2974 Swift/Delaware	B	10.9	0.500	F	214.4	2.105	+ 1.605 V/C
#2975 Seventh/Soquel		0.0	0.000	C	20.7	0.073	+20.659 D/V
#2976 Seventh/Capitola		0.0	0.000	B	15.8	0.134	+15.810 D/V
#2977 Seventh/Brommer		0.0	0.000	A	7.7	0.136	+ 0.136 V/C

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2978 Seventh/Eaton		0.0	0.000	C	20.9	0.099	+20.934 D/V
#2979 Seventh/E_Cliff		0.0	0.000	A	7.4	0.029	+ 0.029 V/C

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2901 Western_Dr/High_St	D	34.9	0.442	F	227.7	1.062	+192.790 D/
#2902 Bay-Coolidge/High	C	33.6	0.901	F	103.3	1.264	+69.741 D/V
#2903 High/Moore	A	4.8	0.499	A	5.3	0.663	+ 0.528 D/V
#2904 High/Laurent	F	53.4	1.045	F	196.3	1.531	+ 0.486 V/C
#2905 River/Potrero	B	17.8	0.570	B	19.7	0.753	+ 1.974 D/V
#2906 River-Hwy_9/Hwy_1	E	75.4	0.874	F	244.5	1.555	+169.071 D/
#2907 River/Fern	B	13.8	0.444	F	OVRFL	1.259	+ +Inf D/V
#2908 River/Encinal	E	61.4	1.038	F	202.7	1.728	+141.260 D/
#2909 Ocean-Hwy_17/Plymouth-Ocean_Ex	C	31.4	0.651	D	36.9	0.853	+ 5.440 D/V
#2910 Market/Goss-Isbel	B	12.6	0.538	C	16.8	0.704	+ 0.166 V/C
#2911 N.Branciforte/Goss	B	14.5	0.617	C	18.9	0.728	+ 0.111 V/C
#2912 Morrissey_Blvd/Fairmount_Av	A	8.0	0.469	B	10.3	0.559	+ 2.325 D/V
#2913 Bay/Nobel-Iowa	B	11.5	0.498	B	13.0	0.652	+ 1.496 D/V
#2914 Bay_St/Escalona_Dr	F	739.8	1.937	F	OVRFL	2.193	+ 1.8E+0308
#2915 Bay_St/King_St	B	13.0	0.786	D	53.4	1.295	+40.415 D/V
#2916 King_St/Laurel_St	B	14.8	0.702	F	55.6	1.121	+ 0.419 V/C
#2917 Storey/King	B	14.5	0.593	F	93.2	1.294	+ 0.701 V/C
#2918 Shaffer/Highway_1	B	12.5	0.219	C	18.9	0.485	+ 6.354 D/V
#2919 Western/Highway_1	B	14.5	0.554	C	24.6	0.845	+10.090 D/V
#2920 Swift/Mission	B	15.6	0.529	E	72.2	1.142	+56.691 D/V
#2921 Miramar/Mission	B	17.0	0.624	D	41.7	1.045	+24.668 D/V
#2922 Almar-Younglove/Mission	B	10.0	0.364	C	25.2	0.889	+15.167 D/V
#2923 Bay/Mission	D	46.8	0.882	F	225.7	1.515	+178.871 D/
#2924 Laurel/Mission	C	23.9	0.688	F	119.1	1.315	+95.250 D/V
#2925 Mission/Walnut	B	15.1	0.526	D	52.5	1.051	+37.394 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2926 King/Mission	C	30.5	0.795	F	155.4	1.313	+124.907 D/
#2927 Chestnut/Mission	D	40.7	0.837	F	164.8	1.380	+124.038 D/
#2928 N_Pacific/River	B	10.9	0.507	B	14.3	0.809	+ 3.487 D/V
#2929 Center/Mission	C	30.8	0.804	C	22.3	0.753	-8.559 D/V
#2930 Pacific/Water-Mission	B	19.9	0.455	C	24.8	0.742	+ 4.861 D/V
#2931 River/Water	C	29.2	0.693	D	49.4	0.992	+20.221 D/V
#2932 Ocean/Washburn-Keenan	A	4.3	0.571	B	13.3	0.785	+ 9.040 D/V
#2933 Ocean/Water	E	67.9	1.050	F	172.7	1.464	+104.805 D/
#2934 Market/Water	C	21.9	0.727	C	34.2	0.942	+12.339 D/V
#2935 N_Branciforte/Water	D	35.6	0.808	E	76.1	1.129	+40.517 D/V
#2936 Seabright/Water	F	84.0	0.497	F	OVRFL	3.234	+1348.311 D
#2937 Morrissey/Soquel/Water	C	25.8	0.811	D	43.2	1.002	+17.367 D/V
#2938 Frederick/Soquel	C	27.4	0.885	E	55.7	1.090	+28.303 D/V
#2939 Hagemann-Trevethan/Soquel	A	8.2	0.667	B	11.4	0.821	+ 3.229 D/V
#2940 Park/Soquel	B	11.1	0.820	C	20.6	0.977	+ 9.530 D/V
#2941 Capitola_Rd/Soquel_Av	C	23.5	0.596	C	25.4	0.684	+ 1.846 D/V
#2942 La_Fonda_Av/Soquel_Av	B	10.4	0.280	B	10.8	0.315	+ 0.397 D/V
#2943 California_Ave/Bay	F	60.0	1.100	F	188.5	1.567	+ 0.467 V/C
#2944 California_St/Bay	F	389.4	1.614	F	OVRFL	3.540	+936.660 D/
#2945 California_St/Laurel_St	C	20.0	0.621	C	33.5	0.937	+13.499 D/V
#2946 Chestnut/Laurel	B	16.9	0.628	C	31.9	0.926	+15.027 D/V
#2947 Center/Laurel	B	15.6	0.606	C	25.3	0.907	+ 9.619 D/V
#2948 Cedar/Laurel	C	16.1	0.256	D	27.3	0.443	+11.281 D/V
#2949 Pacific/Laurel	B	18.5	0.696	D	46.0	1.002	+27.489 D/V
#2950 Front/Laurel	C	26.1	0.689	D	41.8	0.977	+15.691 D/V
#2951 Front/Metro_Center	A	2.7	0.415	A	2.6	0.528	-0.055 D/V

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2952 Front/Cathcart	A	6.5	0.379	A	9.0	0.496	+ 2.465 D/V
#2953 Front/Soquel	C	25.3	0.552	C	33.3	0.824	+ 7.945 D/V
#2954 Front/Cooper	A	8.3	0.441	A	9.7	0.583	+ 1.377 D/V
#2955 River_S/Soquel	B	17.6	0.526	B	19.1	0.681	+ 1.500 D/V
#2956 Riverside-Dakota/Soquel	A	9.0	0.340	A	7.5	0.422	-1.541 D/V
#2957 Ocean_St/Soquel_Av	D	39.9	0.644	D	51.3	0.906	+11.413 D/V
#2958 Branciforte/Soquel	C	22.5	0.748	E	67.0	1.071	+44.550 D/V
#2959 Seabright/Soquel	C	32.0	0.823	D	42.4	0.935	+10.437 D/V
#2960 San_Lorenzo_Blvd/Broadway(Laur	B	11.8	0.614	B	19.2	0.879	+ 7.401 D/V
#2961 Ocean_St/Broadway	C	33.5	0.740	F	95.1	1.165	+61.556 D/V
#2962 S_Branciforte/Broadway	B	11.6	0.671	B	18.2	0.879	+ 6.580 D/V
#2963 Seabright/Broadway	B	14.3	0.717	C	29.7	0.967	+15.426 D/V
#2964 Pacific-Center/W_Cliff-Pacific	B	12.1	0.541	C	15.5	0.699	+ 0.158 V/C
#2965 W_Cliff/Bay	C	15.8	0.633	D	25.9	0.869	+ 0.237 V/C
#2966 Pacific/Beach	C	17.6	0.771	E	44.8	1.093	+ 0.322 V/C
#2967 Cliff/Beach	B	10.8	0.400	B	13.4	0.560	+ 0.160 V/C
#2968 Riverside/Beach	A	6.2	0.077	A	7.3	0.169	+ 1.090 D/V
#2969 Riverside/Second-Leibrandt	A	7.5	0.097	A	7.8	0.153	+ 0.056 V/C
#2970 Riverside/3rd_St	C	34.4	0.800	D	47.4	0.946	+13.027 D/V
#2971 Riverside/San_Lorenzo_Blvd	C	28.8	0.665	D	38.0	0.905	+ 9.223 D/V
#2972 Ocean_St/E_Cliff_Dr	E	63.6	1.057	F	120.8	1.182	+57.180 D/V
#2973 Seabright/Murray	D	43.7	0.877	E	64.8	1.022	+21.156 D/V
#2974 Swift/Delaware	B	10.9	0.500	F	407.5	2.958	+ 2.458 V/C
#2975 Seventh/Soquel	C	23.3	0.747	C	26.5	0.817	+ 3.214 D/V
#2976 Seventh/Capitola	C	26.8	0.609	C	27.8	0.720	+ 0.924 D/V
#2977 Seventh/Brommer	C	18.3	0.713	D	34.6	0.926	+ 0.213 V/C

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2978 Seventh/Eaton	D	36.5	0.844	D	46.8	0.933	+10.313 D/V
#2979 Seventh/E_Cliff	C	15.8	0.677	C	16.7	0.709	+ 0.032 V/C

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2901 Western_Dr/High_St	D	34.9	0.442	F	69.5	0.678	+34.657 D/V
#2902 Bay-Coolidge/High	C	33.6	0.901	D	39.0	0.947	+ 5.359 D/V
#2903 High/Moore	A	4.8	0.499	A	4.8	0.517	-0.055 D/V
#2904 High/Laurent	F	53.4	1.045	F	90.4	1.178	+ 0.134 V/C
#2905 River/Potrero	B	17.8	0.570	B	19.3	0.731	+ 1.506 D/V
#2906 River-Hwy_9/Hwy_1	E	75.4	0.874	F	178.0	1.373	+102.589 D/
#2907 River/Fern	B	13.8	0.444	F	85.9	1.495	+72.083 D/V
#2908 River/Encinal	E	61.4	1.038	F	171.8	1.570	+110.383 D/
#2909 Ocean-Hwy_17/Plymouth-Ocean_Ex	C	31.4	0.651	D	35.6	0.823	+ 4.184 D/V
#2910 Market/Goss-Isbel	B	12.6	0.538	C	16.1	0.688	+ 0.149 V/C
#2911 N.Branciforte/Goss	B	14.5	0.617	C	18.6	0.726	+ 0.109 V/C
#2912 Morrissey_Blvd/Fairmount_Av	A	8.0	0.469	A	9.8	0.532	+ 1.780 D/V
#2913 Bay/Nobel-Iowa	B	11.5	0.498	B	12.7	0.542	+ 1.107 D/V
#2914 Bay_St/Escalona_Dr	F	739.8	1.937	F	OVRFL	5.115	+ 1.8E+0308
#2915 Bay_St/King_St	B	13.0	0.786	C	22.2	0.920	+ 9.159 D/V
#2916 King_St/Laurel_St	B	14.8	0.702	C	22.0	0.847	+ 0.145 V/C
#2917 Storey/King	B	14.5	0.593	C	21.9	0.781	+ 0.187 V/C
#2918 Shaffer/Highway_1	B	12.5	0.219	C	16.7	0.399	+ 4.168 D/V
#2919 Western/Highway_1	B	14.5	0.554	B	18.2	0.728	+ 3.649 D/V
#2920 Swift/Mission	B	15.6	0.529	D	37.3	0.974	+21.695 D/V
#2921 Miramar/Mission	B	17.0	0.624	C	29.6	0.956	+12.553 D/V
#2922 Almar-Younglove/Mission	B	10.0	0.364	B	18.8	0.756	+ 8.806 D/V
#2923 Bay/Mission	D	46.8	0.882	F	144.9	1.297	+98.067 D/V
#2924 Laurel/Mission	C	23.9	0.688	E	73.7	1.147	+49.821 D/V
#2925 Mission/Walnut	B	15.1	0.526	C	30.8	0.906	+15.674 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2926 King/Mission	C	30.5	0.795	E	73.0	1.104	+42.512 D/V
#2927 Chestnut/Mission	D	40.7	0.837	F	104.6	1.180	+63.839 D/V
#2928 N_Pacific/River	B	10.9	0.507	B	13.5	0.775	+ 2.598 D/V
#2929 Center/Mission	C	30.8	0.804	C	21.6	0.711	-9.234 D/V
#2930 Pacific/Water-Mission	B	19.9	0.455	C	24.6	0.708	+ 4.676 D/V
#2931 River/Water	C	29.2	0.693	D	42.9	0.922	+13.732 D/V
#2932 Ocean/Washburn-Keenan	A	4.3	0.571	B	11.9	0.759	+ 7.606 D/V
#2933 Ocean/Water	E	67.9	1.050	F	152.6	1.399	+84.713 D/V
#2934 Market/Water	C	21.9	0.727	C	31.2	0.909	+ 9.322 D/V
#2935 N_Branciforte/Water	D	35.6	0.808	E	61.2	1.056	+25.600 D/V
#2936 Seabright/Water	F	84.0	0.497	F	976.1	2.353	+892.144 D/
#2937 Morrissey/Soquel/Water	C	25.8	0.811	D	37.8	0.969	+11.954 D/V
#2938 Frederick/Soquel	C	27.4	0.885	D	48.1	1.054	+20.709 D/V
#2939 Hagemann-Trevethan/Soquel	A	8.2	0.667	B	10.8	0.802	+ 2.642 D/V
#2940 Park/Soquel	B	11.1	0.820	B	18.1	0.955	+ 6.961 D/V
#2941 Capitola_Rd/Soquel_Av	C	23.5	0.596	C	24.9	0.671	+ 1.424 D/V
#2942 La_Fonda_Av/Soquel_Av	B	10.4	0.280	B	10.9	0.316	+ 0.500 D/V
#2943 California_Ave/Bay	F	60.0	1.100	F	139.7	1.390	+ 0.290 V/C
#2944 California_St/Bay	F	389.4	1.614	F	929.2	2.717	+539.864 D/
#2945 California_St/Laurel_St	C	20.0	0.621	C	26.7	0.850	+ 6.661 D/V
#2946 Chestnut/Laurel	B	16.9	0.628	C	24.4	0.838	+ 7.579 D/V
#2947 Center/Laurel	B	15.6	0.606	C	20.4	0.820	+ 4.737 D/V
#2948 Cedar/Laurel	C	16.1	0.256	C	22.8	0.384	+ 6.755 D/V
#2949 Pacific/Laurel	B	18.5	0.696	C	32.5	0.926	+13.985 D/V
#2950 Front/Laurel	C	26.1	0.689	C	34.6	0.888	+ 8.463 D/V
#2951 Front/Metro_Center	A	2.7	0.415	A	2.6	0.520	-0.073 D/V

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2952 Front/Cathcart	A	6.5	0.379	A	9.0	0.492	+ 2.463 D/V
#2953 Front/Soquel	C	25.3	0.552	C	32.4	0.801	+ 7.124 D/V
#2954 Front/Cooper	A	8.3	0.441	A	9.6	0.578	+ 1.253 D/V
#2955 River_S/Soquel	B	17.6	0.526	B	18.6	0.651	+ 1.044 D/V
#2956 Riverside-Dakota/Soquel	A	9.0	0.340	A	7.7	0.412	-1.377 D/V
#2957 Ocean_St/Soquel_Av	D	39.9	0.644	D	48.4	0.870	+ 8.485 D/V
#2958 Branciforte/Soquel	C	22.5	0.748	D	51.2	1.011	+28.742 D/V
#2959 Seabright/Soquel	C	32.0	0.823	D	39.6	0.912	+ 7.619 D/V
#2960 San_Lorenzo_Blvd/Broadway(Laur	B	11.8	0.614	B	15.8	0.797	+ 4.029 D/V
#2961 Ocean_St/Broadway	C	33.5	0.740	E	67.0	1.058	+33.456 D/V
#2962 S_Branciforte/Broadway	B	11.6	0.671	B	14.1	0.784	+ 2.495 D/V
#2963 Seabright/Broadway	B	14.3	0.717	B	18.4	0.837	+ 4.031 D/V
#2964 Pacific-Center/W_Cliff-Pacific	B	12.1	0.541	B	14.9	0.679	+ 0.139 V/C
#2965 W_Cliff/Bay	C	15.8	0.633	C	22.3	0.804	+ 0.171 V/C
#2966 Pacific/Beach	C	17.6	0.771	E	36.2	1.028	+ 0.257 V/C
#2967 Cliff/Beach	B	10.8	0.400	B	13.4	0.560	+ 0.160 V/C
#2968 Riverside/Beach	A	6.2	0.077	A	7.3	0.169	+ 1.090 D/V
#2969 Riverside/Second-Leibrandt	A	7.5	0.097	A	7.8	0.156	+ 0.060 V/C
#2970 Riverside/3rd_St	C	34.4	0.800	D	47.3	0.945	+12.858 D/V
#2971 Riverside/San_Lorenzo_Blvd	C	28.8	0.665	C	35.0	0.868	+ 6.191 D/V
#2972 Ocean_St/E_Cliff_Dr	E	63.6	1.057	F	110.1	1.153	+46.433 D/V
#2973 Seabright/Murray	D	43.7	0.877	E	59.8	0.997	+16.121 D/V
#2974 Swift/Delaware	B	10.9	0.500	F	226.7	2.180	+ 1.680 V/C
#2975 Seventh/Soquel	C	23.3	0.747	C	26.4	0.814	+ 3.063 D/V
#2976 Seventh/Capitola	C	26.8	0.609	C	27.8	0.704	+ 0.998 D/V
#2977 Seventh/Brommer	C	18.3	0.713	D	31.1	0.909	+ 0.197 V/C

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Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
#2978 Seventh/Eaton	D	36.5	0.844	D	42.0	0.899	+ 5.553 D/V
#2979 Seventh/E_Cliff	C	15.8	0.677	C	16.8	0.709	+ 0.032 V/C

Memorandum

To: Chris Schneiter

From: Ron Marquez

Date: August 1, 2011

Re: **Mitigation Measures for General Plan**

The purpose of this memorandum is to document the approach taken to identify the mitigation measures for the impacted intersections in the analysis of the General Plan buildout and cumulative buildout. For purposes of consistency I have used Synchro software to calculate the level of service for the intersections that needed modification.

The general plan buildout analysis identified 21 intersections that did not meet the desired level of service with the traffic volumes added with the buildout of the general plan. The development potential was provided by the consultant working on the General Plan for the Planning Department. An attempt was made to identify mitigation measures that would be reasonable to implement. Eight of those impacted intersection could not easily be mitigated although three of those intersections reflect the level of service of a left turn movement from a stop sign.

The analysis of cumulative traffic which included the buildout and the growth of University traffic identified 26 intersection below the desired criteria. Of these intersections 15 intersections could be mitigated to acceptable levels.

The modifications proposed for the following intersections could not fully mitigate the impacts of the proposed development.

- Western Dr at High St (Only minor left turn movement)
- Route 1 at Route 9
- Bay St at Mission St
- Laurel St at Mission St
- King St/Union St at Mission St
- Chestnut St at Mission St
- Ocean St at Water St

- N. Branciforte Dr at Water St
- Seabright Ave at Water St (Only minor left turn movement)
- California Ave at Bay St (Only minor left turn movement)
- Seabright Ave at Murray St

Attached are the spreadsheets which presents the level of service calculations for the buildout and cumulative development scenarios. Hard copies of the analysis work sheets are also provided for your files.

City of Santa Cruz General Plan Traffic Analysis
Level of Service and Mitigation Study Intersections
Proposed General Plan

Intersection	Control	Existing LOS	Existing Delay	Buildout LOS	Buildout Delay	Buildout Mitigation	Mitigated LOS	Mitigated Delay
#2901 Western_Dr/High_St	Stop	E	45.9	F	69.5	TWLTL	E	38.1
#2902 Bay-Coolidge/High	Signal	D	35.4	D	39.3			
#2903 Moore/High	Signal	A	4.8	A	4.7			
#2904 High/Laurent	4-way stop	F	59.6	F	94.1	Signalize	B	18.2
#2905 River/Potrero	Signal	B	18	B	19.8			
#2906 River-Hwy_9/Hwy_1	Signal	F	83.9	F	209	Ebnd 2l 3t 1r, wbnd 2l 3t 1r, nbnd 1tl 1t 2r, sbnd 2l 1tl 1t 1r	F	80.6
#2907 River/Fern	Stop	B	14.5	F	Ovrfl	Signalize no l esbnd	B	15.1
#2908 River/Encinal	Signal	E	73.9	F	196.7	Ebnd 1l 1tr 1r, wbnd 1l 1tr, nbnd 1l, 1t, 1r, sbnd 1l,1t, 1tr	D	37.9
#2909 Ocean-Hwy_17/Plymouth-Ocean_Ex	Signal	C	31.5	D	37.5			
#2910 Market/Goss-Isbel	4-way stop	B	12.8	C	16.8			
#2911 N.Branciforte/Goss	4-way stop	B	14.6	C	19.5			
#2912 Morrissey_Blvd/Fairmount_Av	Signal	A	8	B	10.3			
#2913 Bay/Nobel-Iowa	Signal	B	11.6	B	13.2			
#2914 Bay_St/Escalona_Dr	2-way stop	F	782.2	F	Ovrfl	Escalona right turns only	C	18.3
#2915 Bay_St/King_St	Signal	B	13.6	C	27.7			
#2916 King_St/Laurel_St	4-way stop	B	15	D	26.1			
#2917 Storey/King	3-way stop	B	15	D	25.4			
#2918 Shaffer/Highway_1	Stop	B	12.1	C	16.8			
#2919 Western/Highway_1	Signal	B	15.3	B	18.7			
#2920 Swift/Mission	Signal	B	19.1	D	41.4			
#2921 Miramar/Mission	Signal	B	19	C	31.2			
#2922 Almar-Younglove/Mission	Signal	B	10.7	C	20.1			
#2923 Bay/Mission	Signal	E	55.8	F	164.1	Ebnd 1l, 2t,1r, wbnd 1l,2t,1r,nbnd 1l,1t,1r, sbnd 2l,1t,1r	E	57.7
#2924 Laurel/Mission	Signal	C	24.9	F	87.9	Add Ebnd r	F	85.6
#2925 Mission/Walnut	Signal	B	17.8	D	35.6			
#2926 King/Mission	Signal	C	32.7	F	99.5	Ebnd no l, 2t, 1tr, wbnd 1l, 1t, 1tr,nbnd 1ltr, sbnd 2l 1ltr	D	50.8
#2927 Chestnut/Mission	Signal	D	42.9	F	121.8	Ebnd 2l, 2t, 1r, wbnd 1lt,1t, 1r, nbnd 1l, 1t, 1tr, sbnd 1l,2t, 2r	F	112.9
#2928 N_Pacific/River	Signal	B	11.6	B	14.5			
#2929 Center/Mission	Signal	C	20.5	C	22			

APPENDIX C

Intersection	Control	Existing LOS	Existing Delay	Buildout LOS	Buildout Delay	Buildout Mitigation	Mitigated LOS	Mitigated Delay
#2930 Pacific/Water-Mission	Signal	C	20.4	C	25.2			
#2931 River/Water	Signal	C	30.1	D	47			
#2932 Ocean/Washburn-Keenan	Signal	A	4.4	B	13.7			
#2933 Ocean/Water	Signal	E	73.6	F	189.4	Ebnd 2l, 2t, 1r, wbnd 1l,2t, 1r, nbnd 1l, 2t, 1r, sbnd 2l, 2t, 1r	F	130.7
#2934 Market/Water	Signal	C	22.3	C	32.9			
#2935 N_Branciforte/Water	Signal	D	36.6	E	73.7	Add ebnd l, nbnd r & sbnd r	D	53.6
#2936 Seabright/Water	Stop	F	112.8	F	Ovrfl	Extend TWLTL & add nbnd r	E	39
#2937 Morrissey/Soquel/Water	Signal	C	26.5	D	42.7			
#2938 Frederick/Soquel	Signal	C	28.6	D	53.9			
#2939 Hagemann-Trevethan/Soquel	Signal	A	8.4	B	11.4			
#2940 Park/Soquel	Signal	B	11.6	B	19.2			
#2941 Capitola_Rd/Soquel_Av	Signal	C	23.9	C	25.1			
#2942 La_Fonda_Av/Soquel_Av	Signal	B	10.3	B	11			
#2943 California_Ave/Bay	3-way stop	F	67.6	F	150.3	Allow nbnd t free	D	26.4
#2944 California_St/Bay	3-way stop	F	434	F	Ovrfl	Allow sbnd t free	B	12.5
#2945 California_St/Laurel_St	Signal	C	20.3	C	28.9			
#2946 Chestnut/Laurel	Signal	B	17.2	C	28			
#2947 Center/Laurel	Signal	B	16	C	22.7			
#2948 Cedar/Laurel	2-way stop	C	16.4	D	25.3			
#2949 Pacific/Laurel	Signal	B	18.9	D	39.8			
#2950 Front/Laurel	Signal	C	26.4	D	38.2			
#2951 Front/Metro_Center	Signal	A	2.6	A	2.6			
#2952 Front/Cathcart	Signal	A	6.6	A	9.2			
#2953 Front/Soquel	Signal	C	25.5	C	33.6			
#2954 Front/Cooper	Signal	A	9.6	A	9.7			
#2955 River_S/Soquel	Signal	B	17.8	B	19.1			
#2956 Riverside-Dakota/Soquel	Signal	A	8.7	A	7.5			
#2957 Ocean_St/Soquel_Av	Signal	D	40.3	D	51.4			
#2958 Branciforte/Soquel	Signal	C	23.6	E	67.6	Esbnd 1 l, 1t, 1 tr, wsbnd 1l, 1tr no split phase	C	24.5
#2959 Seabright/Soquel	Signal	C	32.9	D	42.7			
#2960 San_Lorenzo_Blvd/Broadway(Laur	Signal	B	11.9	B	17.6			
#2961 Ocean_St/Broadway	Signal	C	34.3	F	99.8	Prohibit lfts from Ocean	D	36.5
#2962 S_Branciforte/Broadway	Signal	B	11.7	B	16.7			
#2963 Seabright/Broadway	Signal	B	14.6	C	30.1			
#2964 Pacific-Center/W_Cliff-Pacific	4-way stop	B	12.2	C	15.3			

Intersection	Control	Existing LOS	Existing Delay	Buildout LOS	Buildout Delay	Buildout Mitigation	Mitigated LOS	Mitigated Delay
#2965 W_Cliff/Bay	3-way stop	C	16.2	C	23.8			
#2966 Pacific/Beach	3-way stop	C	20.9	E	39.9	Roundabout	C	
#2967 Cliff/Beach	3-way stop	B	10.8	B	13.4			
#2968 Riverside/Beach	Signal	A	6.2	A	7.3			
#2969 Riverside/Second-Leibrandt	4-way stop	A	7.5	A	7.8			
#2970 Riverside/3rd_St	Signal	C	34.7	D	47.8			
#2971 Riverside/San_Lorenzo_Blvd	Signal	C	28.9	D	35.8			
#2972 Ocean_St/E_Cliff_Dr	Signal	E	64.7	F	113.9	Add sbnd r	D	53.2
#2973 Seabright/Murray	Signal	D	43.7	E	62.7	ADD wsbnd r, nbnd r & sbnd r	E	59.4
#2974 Swift/Delaware	4-way stop	C	23.9	F	241.6	Roundabout/Signal	C	20.1
#2975 Seventh/Soquel	Signal	C	23.3	C	26.5			
#2976 Seventh/Capitola	Signal	C	26.8	C	27.8			
#2977 Seventh/Brommer	4-way stop	C	19.3	D	32.3			
#2978 Seventh/Eaton	Signal	D	36.8	D	42.9			
#2979 Seventh/E_Cliff	3-way stop	C	15.8	C	16.8			

APPENDIX C

City of Santa Cruz General Plan Traffic Analysis
Level of Service and Mitigation Study Intersections
Proposed General Plan Buildout Cumulative

Intersection	Control	Existing LOS	Existing Delay	Cumulative LOS	Cumulative Delay	Cumulative Mitigation	Mitigated LOS	Mitigated Delay
#2901 Western_Dr/High_St	Stop	E	45.9	F	227.7	TWLTL	F	49.7
#2902 Bay-Coolidge/High	Signal	D	35.4	F	103.3	Add wsbnd l	D	50.1
#2903 Moore/High	Signal	A	4.8	A	5.3			
#2904 High/Laurent	4-way stop	F	59.6	F	196.3	Signalize	B	13.3
#2905 River/Potrero	Signal	B	18	B	19.7			
#2906 River-Hwy_9/Hwy_1	Signal	F	83.9	F	244.5	Ebnd 2l 3t 1r, wbnd 2l 3t 1r, nbnd 1tl 1t 2r, sbnd 2l 1tl 1t 1r	F	104.3
#2907 River/Fern	Stop	B	14.5	F	OVER	Signalize no l esbnd	B	14.3
#2908 River/Encinal	Signal	E	73.9	F	202.7	Ebnd 1l 1tr 1r, wbnd 1l 1tr, nbnd 1l, 1t, 1r, sbnd 1l,1t, 1tr	D	37.9
#2909 Ocean-Hwy_17/Plymouth-Ocean_Ex	Signal	C	31.5	D	36.9			
#2910 Market/Goss-Isbel	4-way stop	B	12.8	C	16.8			
#2911 N.Branciforte/Goss	4-way stop	B	14.6	C	18.9			
#2912 Morrissey_Blvd/Fairmount_Av	Signal	A	8	B	10.3			
#2913 Bay/Nobel-Iowa	Signal	B	11.6	B	13			
#2914 Bay_St/Escalona_Dr	2-way stop	F	762.2	F	OVER	Escalona right turns only	C	24.9
#2915 Bay_St/King_St	Signal	B	13.6	D	53.4			
#2916 King_St/Laurel_St	4-way stop	B	15	F	55.6	Add ebnd r	D	34.1
#2917 Storey/King	3-way stop	B	15	F	93.2	Add sbnd l	D	29.3
#2918 Shaffer/Highway_1	Stop	B	12.1	C	18.9			
#2919 Western/Highway_1	Signal	B	15.3	C	24.6			
#2920 Swift/Mission	Signal	B	19.1	E	72.2	Add nbnd r overlay	C	31
#2921 Miramar/Mission	Signal	B	19	D	41.7			
#2922 Almar-Younglove/Mission	Signal	B	10.7	C	25.2			
#2923 Bay/Mission	Signal	E	55.8	F	222.5	Ebnd 1l, 2t,1r, wbnd 1l,2t,1r,nbnd 1l,1t,1r, sbnd 2l,1t,1r	F	81.2
#2924 Laurel/Mission	Signal	C	24.9	F	119.1	Add Ebnd r	F	109
#2925 Mission/Walnut	Signal	B	17.8	D	52.5			
#2926 King/Mission	Signal	C	32.7	F	155.4	Ebnd no l, 2t, 1tr, wbnd 1l, 1t, 1tr,nbnd 1ltr, sbnd 2l 1ltr	E	65.9
#2927 Chestnut/Mission	Signal	D	42.9	F	164.6	Ebnd 2l, 2t, 1r, wbnd 1lt,1t, 1r, nbnd 1l, 1t, 1tr, sbnd 1l,2t, 2r	F	164.6
#2928 N_Pacific/River	Signal	B	11.6	B	14.3			
#2929 Center/Mission	Signal	C	20.5	C	22.3			

Intersection	Control	Existing LOS	Existing Delay	Cumulative LOS	Cumulative Delay	Cumulative Mitigation	Mitigated LOS	Mitigated Delay
#2930 Pacific/Water-Mission	Signal	C	20.4	C	24.8			
#2931 River/Water	Signal	C	30.1	D	49.4			
#2932 Ocean/Washburn-Keenan	Signal	A	4.4	B	13.3			
#2933 Ocean/Water	Signal	E	73.6	F	172.7	Ebnd 2l, 2t, 1r, wbnd 1l,2t, 1r, nbnd 1l, 2t, 1r, sbnd 2l, 2t, 1r	F	135.1
#2934 Market/Water	Signal	C	22.3	C	34.2			
#2935 N_Branciforte/Water	Signal	D	36.6	E	76.1	Add ebnd l, nbnd r & sbnd r	E	57.2
#2936 Seabright/Water	Stop	F	112.9	F	OVER	Extend TWLTL & add nbnd r	E	41.1
#2937 Morrissey/Soquel/Water	Signal	C	26.5	D	43.2			
#2938 Frederick/Soquel	Signal	C	28.6	E	55.7	Add nbnd r overlay	D	38.5
#2939 Hagemann-Trevethan/Soquel	Signal	A	8.4	B	11.4			
#2940 Park/Soquel	Signal	B	11.6	C	20.6			
#2941 Capitola_Rd/Soquel_Av	Signal	C	23.9	C	25.4			
#2942 La_Fonda_Av/Soquel_Av	Signal	B	10.3	B	10.8			
#2943 California_Ave/Bay	3-way stop	F	67.6	F	188.5	Allow nbnd t free	E	38.3
#2944 California_St/Bay	3-way stop	F	434	F	OVER	Allow sbnd t free	B	13.9
#2945 California_St/Laurel_St	Signal	C	20.3	C	33.5			
#2946 Chestnut/Laurel	Signal	B	17.2	C	31.9			
#2947 Center/Laurel	Signal	B	16	C	25.3			
#2948 Cedar/Laurel	2-way stop	C	16.4	D	27.3			
#2949 Pacific/Laurel	Signal	B	18.9	D	46			
#2950 Front/Laurel	Signal	C	26.4	D	41.8			
#2951 Front/Metro_Center	Signal	A	2.6	A	2.6			
#2952 Front/Cathcart	Signal	A	6.6	A	9			
#2953 Front/Soquel	Signal	C	25.5	C	33.3			
#2954 Front/Cooper	Signal	A	9.6	A	9.7			
#2955 River_S/Soquel	Signal	B	17.8	B	19.1			
#2956 Riverside-Dakota/Soquel	Signal	A	8.7	A	7.5			
#2957 Ocean_St/Soquel_Av	Signal	D	40.3	D	51.3			
#2958 Branciforte/Soquel	Signal	C	23.6	E	67	Esbnd 1 l, 1t, 1 tr, wsbnd 1l, 1tr no split phase	C	24.8
#2959 Seabright/Soquel	Signal	C	32.9	D	42.4			
#2960 San_Lorenzo_Blvd/Broadway(Laur	Signal	B	11.9	B	19.2			
#2961 Ocean_St/Broadway	Signal	C	34.3	F	95.1	Prohibit lfts from Ocean	D	38.2
#2962 S_Branciforte/Broadway	Signal	B	11.7	B	18.2			
#2963 Seabright/Broadway	Signal	B	14.6	C	29.7			
#2964 Pacific-Center/W_Cliff-Pacific	4-way stop	B	12.2	C	15.5			

APPENDIX C

Intersection	Control	Existing LOS	Existing Delay	Cumulative LOS	Cumulative Delay	Cumulative Mitigation	Mitigated LOS	Mitigated Delay
#2965 W_Cliff/Bay	3-way stop	C	16.2	D	25.9			
#2966 Pacific/Beach	3-way stop	C	20.9	E	44.6	Roundabout	C	
#2967 Cliff/Beach	3-way stop	B	10.8	B	13.4			
#2968 Riverside/Beach	Signal	A	6.2	A	7.3			
#2969 Riverside/Second-Leibrandt	4-way stop	A	7.5	A	7.8			
#2970 Riverside/3rd_St	Signal	C	34.7	D	47.4			
#2971 Riverside/San_Lorenzo_Blvd	Signal	C	28.9	D	38			
#2972 Ocean_St/E_Cliff_Dr	Signal	E	64.7	F	120.8	Add sbnd r	D	49.1
#2973 Seabright/Murray	Signal	D	43.7	E	64.6	ADD wsbnd r, nbnd r & sbnd r	E	64.5
#2974 Swift/Delaware	4-way stop	C	23.9	F	407.5	Roundabout/Signal	C	25.1
#2975 Seventh/Soquel	Signal	C	23.3	C	26.5			
#2976 Seventh/Capitola	Signal	C	26.8	C	27.8			
#2977 Seventh/Brommer	4-way stop	C	19.3	D	34.6			
#2978 Seventh/Eaton	Signal	D	36.8	D	46.8			
#2979 Seventh/E_Cliff	3-way stop	C	15.8	C	16.7			

APPENDIX C

APPENDIX D

WATER SUPPLY ASSESSMENT (WSA)

NOTE: The WSA technical appendices are included on the *General Plan 2030* DEIR CD and are available for review at:

- The City of Santa Cruz Planning Department at 809 Center Street, Room 107, Santa Cruz, California.
- The City's website – the Draft EIR will be posted online at: http://www.cityofsantacruz.org

APPENDIX D

Erler & Kalinowski, Inc.

City of Santa Cruz
Water Supply Assessment

GENERAL PLAN 2030

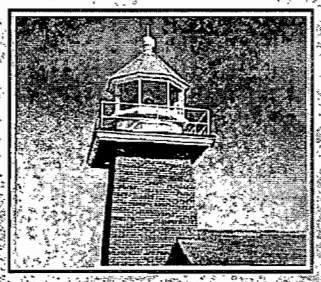
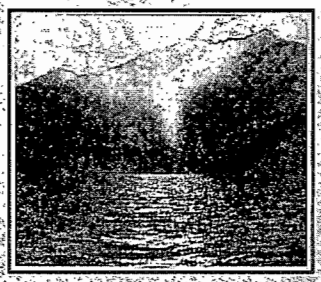
FINAL DRAFT

Prepared by:

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29 March 2011

EKI B00005.00


Consulting engineers and scientists

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COMMON ABBREVIATIONS AND ACRONYMS

AFY – acre-feet per year
AMBAG – Association of Monterey Bay Area Governments
cfs – cubic feet per second
CEQA – California Environmental Quality Act
CESA – California Endangered Species Act
CII – Commercial, industrial, and institutional
City or Santa Cruz – City of Santa Cruz
CPEN – Marine Corp Base, Camp Pendelton
CWD – Central Water District
CUWCC – California Urban Water Conservation Council
DFG – Department of Fish and Game
DWR – California Department of Water Resources
EIR – Environmental Impact Report
EKI – Erler & Kalinowski, Inc.
FESA – Federal Endangered Species Act
gpd/a – gallons per day per account
HCP – Habitat Conservation Plan
IWP – Integrated Water Plan
LAFCO – Local Agency Formation Commission
LRDP – Long-Range Development Plan
mgd – million gallons per day
mgy – million gallons per year
MOU – Memorandum of Understanding Regarding Urban Water Conservation in California
MWM – Maddaus Water Management
NCP – North Coast Pipeline
NCS – North Coast System
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
Project or General Plan 2030 – 2030 Update of the City's General Plan
SOI – Sphere of Influence
SLVWD – San Lorenzo Valley Water District
sq ft – square feet
SqCWD – Soquel Creek Water District
SWRCB- State Water Resources Control Board
UCSC – University of California, Santa Cruz
ULFT – Ultra low flow toilet
UWMP – Urban Water Management Plan
WSA – Water Supply Assessment
WSV – Water Supply Verification
WTP – Water Treatment Plant

1.0 EXECUTIVE SUMMARY

In 2001, Senate Bills 610 and 221 ("SB 610" and "SB 221") amended California law to improve the linkage between land use decisions made by cities and counties and water supply availability. Pursuant to SB 610, a Water Supply Assessment ("WSA") is now required for projects that are subject to the California Environmental Quality Act ("CEQA") and meet certain size thresholds. The City has voluntarily chosen to prepare this WSA pursuant to Water Code Section 10910 et. seq. to support the City's update of its General Plan, the General Plan 2030. The City of Santa Cruz's ("City's" or "Santa Cruz's") General Plan is being updated in accordance with California law, which requires each city and county to adopt a general plan for "the physical development of the county or city, and any land outsides its boundaries which bears relation to its planning" over a long-term horizon (Government Code section 65300). The proposed project consists of the City's draft General Plan 2030 (dated February 27, 2009), which is an update of the City's existing General Plan and Local Coastal Plan 1990- 2005 that was adopted in 1992 and subsequently amended. The General Plan 2030 extends to the year 2030 to coordinate with the U.S. Census timeframe, and if adopted, will supersede the 1990-2005 General Plan and its several amendments. The City's Local Coastal Plan will be updated as a separate document.

As part of a WSA, the public water supplier for a proposed project must evaluate whether water supplies are sufficient to meet the demand of the proposed project over the next 20 years, in addition to the public water system's existing and planned future uses. As the water supplier for the area addressed by the General Plan 2030, the City has elected to prepare a WSA for the Project as a tool to help inform long-term planning decisions. This WSA describes the City's historical water demand, projected water demand (including that associated with the Project) and water supply sources, and provides a comparison of the City's expected water supply and demand through the year 2030 (including the demand of the Project). Information from the City's 2005 Urban Water Management Plan ("2005 UWMP") is incorporated in this WSA, supplemented by findings from additional studies performed by the City and other agencies (such as the neighboring Soquel Creek and Central Water Districts), and by recent information provided by the City's Water Department, Planning Department, and EIR consultant.

1.1 WATER DEMAND

Water demand projections for the Project presented herein are based on historical water use of existing City customers that have been adjusted for the projected land-use changes envisioned in the General Plan 2030. Water demand projections for elsewhere in the City's water service area presented herein are based on historical water use of existing customers that have been adjusted for anticipated population growth and for planned development by the University of California, Santa Cruz ("UCSC").

The economic downturn, a multiple-year drought and ensuing water restrictions, water conservation efforts, and an increase in water billing rates have resulted in lower water demand for 2007 and 2008 as compared with prior years. The degree to which this lower

water demand is permanent is uncertain. Consequently, the City developed two estimates of existing water demand based on the time periods 1999 through 2004 *(Existing Water Demand Estimate 1)* and 2007 through 2008 *(Existing Water Demand Estimate 2)*. These estimates were used as the basis for the projected water demands in both the Project area and the City's entire water service area.

The additional incremental water demand for the Project (i.e., the area addressed by General Plan 2030) at full buildout in the year 2030 is estimated to be 251 million gallons per year ("mgy;" Table 1). The projected water demands for the City's entire water service area by the year 2030 are estimated to be 4,537 mgy, based on *Existing Water Demand Estimate 1*, and 4,046 mgy based on *Existing Water Demand Estimate 2* (Table 2). These projected water demands include demands associated with development within the Project area and other development that will occur outside the Project area but in the City's service area.

1.2 WATER SUPPLY

Water for the City is currently provided by the following four sources:

(1) Surface water diversions from creeks and natural springs on the North Coast,

(2) Surface water diversions from the San Lorenzo River,

(3) Surface water from Loch Lomond Reservoir (which is used primarily to collect and store water from the Newell Creek watershed, but also stores water from the San Lorenzo River), and

(4) Groundwater produced by the Live Oak Well System (which is extracted from the Purisima Formation).

The City does not import water from outside of Santa Cruz County.

These four water supplies provide the City with approximately 4,314 mgy during normal hydrologic years. The percentage of total supply that is available from the City's four water supply sources is: 25% from the North Coast creeks and springs, 47% from the San Lorenzo River, 24% from the Loch Lomond Reservoir, and 4% from the Live Oak Well System.[1] Table 4 lists the City's future water supply availability for normal and dry years from these local sources based on the City's 2005 UWMP. Historical production from these supplies is shown in Table 5.

1.3 WATER SUPPLY RELIABILITY

The primary reliability issue facing the City's water supply system is the lack of adequate water supply during droughts. This issue stems from two factors: (1) a wide range in the

[1] Note that these percentages reflect the potential capacity of each of the City's four water supply sources, which is different from the percentage of the City's actual supply that is currently produced by each source.

yield of surface water sources from year to year, and (2) limited surface water storage capacity. Furthermore, the City's groundwater supply is near the coast and is particularly vulnerable to seawater intrusion. Although seawater intrusion does not appear to be an imminent threat to the City's groundwater supply under normal operating conditions, the potential for seawater intrusion exists and could potentially limit the City's future use of groundwater and ability to meet peak demands during dry years.

In normal and wet years, when rainfall and runoff are abundant, base flows in the coast watershed and associated river sources are restored by winter rains, and Loch Lomond Reservoir is typically replenished to full capacity with runoff from the Newell Creek watershed (Santa Cruz, 2006). The water system, however, is vulnerable to shortage in drought years when the San Lorenzo River and North Coast creeks and springs run low. In single dry years, the system relies heavily on water stored in Loch Lomond Reservoir to satisfy demand, which draws down the reservoir level lower than usual and depletes available supply in the event of a subsequent dry year. In multiple dry years, or drought conditions, very low surface water flows in the San Lorenzo River and North Coast creeks and springs, combined with depleted supply stored in Loch Lomond Reservoir reduces the City's available supply to a level which cannot support water demand, even with an increase in groundwater production.

Adopted City plans assume that the City will continue to use its existing water supply sources in the future without change in current production levels. However, the City faces a series of ongoing challenges that potentially could lead to some loss of existing supply in the future, such as negotiations over a Habitat Conservation Plan, water rights conformance issues, and effects of climate change. It is possible that resolution of these issues have some potential to affect the City's water supply at some time in the future. However, many of these issues have been ongoing and unresolved for a considerable length of time, and at this time there is uncertainty of timing or resolution of these issues and potential resulting effects on water supplies.

1.4 NORMAL YEAR SUPPLY AND DEMAND COMPARISON

Based upon the updated water demand projections presented herein, this WSA concludes that the City's water supply for a normal hydrologic year is sufficient to meet the existing water demand and the incremental water demand of the Project through about the year 2020. After 2020, the City's normal water supply may not be sufficient to meet the water demand projected for the development envisioned in the General Plan 2030 and other development expected to occur within the City's water service area.

If water demand is consistent with *Existing Water Demand Estimate 1*, the City's demand will be 223 mgy greater than the available normal year supply in 2030 (Table 7). This unmet demand would represent an average annual deficit of approximately 5%. If water demand by existing customers is consistent with *Existing Water Demand Estimate 2*, the City will have sufficient normal year supply to meet the projected demand in 2030.

1.5 DRY YEAR SUPPLY SHORTFALL

This WSA concludes that the City does *not* have sufficient water to meet current or future projected water demand during dry years, irrespective of development associated with the Project. This finding is consistent with the 2005 UWMP findings and the conclusions presented in the 2003 Integrated Water Plan ("IWP"), which state that the City's water system is inadequate to meet current demand under drought conditions (Gary Fiske & Associates, 2003).

The City's water supply during dry years is unlikely to meet the existing water demand and will not meet the incremental demand of the Project. An annual average deficit of 5% may exist between the City's water supply during a single dry year and the existing water demand (Table 8). If development associated with the Project and elsewhere within the City's water service area also are considered then an annual average deficit of 12% between 2010 and 2020, and up to 16% by 2030 may be experienced during a single dry year. Annual average deficits are greater for multiple dry year periods. The annual average deficit between the City's water supply during a second dry year and existing demand is estimated to be 23% to 32% (Table 9). This deficit increases to 33% to 40% by 2030 if planned development also is taken into account. It is important to note that these deficits are annual average values that do not address peak season cutbacks, which can be significantly greater than the annual average deficits due to seasonal variations in demand and supply, and limitations on the City's water storage facilities.

1.6 ALTERNATIVE WATER SUPPLIES

The City is actively considering possible new water supplies. In 2003, the City produced an IWP that evaluated potential water supply strategies. The IWP identified three preferred strategies for managing the City's water supply and demand to address the current supply deficit during dry years. These strategies include: (1) water conservation to reduce per capita water use in all years, (2) curtailment of water demand up to 15% during drought conditions, and (3) desalination of seawater. The City has made progress towards implementing these strategies. It was estimated in the 2005 UWMP that conservation measures had reduced water use by 153 mgy in 2005; due to the current economic conditions it is unknown what portion of the current demand reduction is due to conservation efforts. The City completed a one-year pilot desalination project in 2009 and has begun environmental review of a full-scale regional desalination plant.

The three strategies address supply shortfalls for current customers during dry years. The strategies do not address water supply shortfalls that will result from development due to the Project and development that will occur elsewhere within the City's service area. For example, the proposed desalination plant is designed to alleviate dry year supply shortfalls for existing customers and to provide a supplemental water source for the Soquel Creek Water District for groundwater protection. It potentially could be expanded to provide water supply to meet water demand resulting from future growth. The timing and need for additional supply will depend largely on three factors: (1) the

City's policies regarding land use, housing, and economic development to be included in the General Plan 2030, (2) amount of growth at UCSC, and (3) actual increase in water use that accompanies the allowed growth. Matters related to expansion of the desalination plant were postponed for consideration by future decision-makers on as as-needed basis (Santa Cruz, 2006).

The City has evaluated over 30 different supplemental water supply options in the past and has previously determined them to be inadequate, infeasible, or too costly based on the factors considered at the time. However, additional supply alternatives may need to be re-evaluated in the future to avoid increased dry year cutbacks due to new development (including the Project), and potentially to augment the City's water supply if future development is approved at a rate greater than can be accommodated by the City's existing normal year water supply.

2.0 INTRODUCTION

2.1. REGULATORY BACKGROUND

In 2001, Senate Bills 610 and 221 ("SB 610" and "SB 221") amended California law to improve the linkage between land use decisions made by cities and counties and water supply availability.

SB 610, in particular, requires that a Water Supply Assessment ("WSA") be prepared by a water supplier and incorporated into environmental documentation for a proposed project if, among other factors:

(1) The project is subject to the California Environmental Quality Act ("CEQA"), and

(2) The project is a proposed development including more than 500 residential units, 500,000 square feet ("sq ft") of retail space, 250,000 sq ft of office space, or if the project is expected to use an equivalent amount of water.

Pursuant to SB 221, a Water Supply Verification ("WSV") must also be completed prior to a city or county's approval of a tentative map, parcel map, or development agreement for a subdivision of 500 residential units or more. Thus, the local planning agency may not approve a proposed residential development unless the water supplier has verified that sufficient water is available to support the project.

The intent of SB 610 and SB 221 is to promote collaborative planning between local water suppliers and cities and counties. Both statues require that detailed information regarding water availability be documented and submitted to the decision-making body prior to approval of specified large development projects. Furthermore, SB 610 and SB 221 require that this information be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. In this way, WSAs and WSVs link water supply reliability with land use planning.

2.2. PRIOR EVALUATION OF THE ABILITY TO SUPPORT FUTURE DEVELOPMENT

In response to the passage of SB 610 and 221, the City prepared a study *Adequacy of Municipal Water Supplies to Support Future Development in the City of Santa Cruz Water Service Area* (Santa Cruz, 2004). This study assessed the ability of the Santa Cruz water system to continue to support the type and amount of future development being envisioned by the land planning agencies within the City's service area.

A comparison of the City's current water supplies to the existing demand at that time showed that, during normal years, the City had approximately 300 mgy of remaining capacity to support future development (Santa Cruz, 2004). However, significant discussion was given in the City's 2004 study to the issue of dry year supplies and how the known dry year supply deficits should factor into decisions regarding future growth.

Two methods were proposed for evaluating the City's supply sufficiency during dry years. The first approach focused on defining a "Maximum Acceptable Level of Shortage," taking into account the worst-case scenario drought and the probability of occurrence over different time periods (i.e., the recurrence interval). The second proposed method focused on "Annual Use of Loch Lomond," which is the City's only major water source that is not presently being used at maximum capacity. Loch Lomond Reservoir is also the City's only surface water reservoir and thus is critical to meeting dry year demands.

Based on the second approach, "Annual Use of Loch Lomond," combined with historical water supply and demand information, the City determined that the water system could accommodate approximately 300 mgy growth in demand before reaching the maximum capacity of the current supply system.[2] The City acknowledged that this growth in demand would increase future drought hardships on existing customers, but these effects may be acceptable depending on the City's tolerance for drought cutbacks. The issue of maximum acceptable level of shortage was not resolved as part of the *Adequacy of Municipal Water Supplies to Support Future Development in the City of Santa Cruz Water Service Area* study and may be evaluated by the City in the future.

2.3. PROJECT BACKGROUND

This WSA has been prepared pursuant to Water Code Section 10910 et. seq. to support the City's update of its general plan, the General Plan 2030. This section describes the Project, the Project location, and the City's service area.

2.3.1 Project Definition

The "Project" is defined as the 2030 Update of the City's General Plan ("Project" or "General Plan 2030"), and is limited to the area addressed in the General Plan 2030, excluding UCSC[3]. The City's General Plan is being updated in accordance with California State law, which requires each city and county to adopt a general plan for "the physical development of the county or city, and any land outside its boundaries which bears relation to its planning" over a long-term horizon (Government Code section 65300). The Project consists of the City's draft General Plan 2030 (dated 27 February 2009), which is an update of the City's existing *General Plan and Local Coastal Plan 1990-2005* that was adopted in 1992 and subsequently amended[4]. The General Plan 2030 extends to the year 2030 to coordinate with the U.S. Census timeframe. The

[2] The estimated 300 mgy was based on a five year average historical water demand of approximately 4,000 mgy between 1999 and 2003. Using the historical relationship between system demand and production from Loch Lomond Reservoir, the City estimated the water system capacity to be approximately 4,300 mgy, which correlated with the maximum withdrawal from Loch Lomond Reservoir allowed by the current State Water Resources Control Board license.

[3] UCSC on-campus and off-campus facilities are within the geographical area covered by the General Plan 2030, however campus development and growth is guided by the University's 2005 Long Range Development Plan ("LRDP") adopted by The Regents of the University of California, rather than by the City's General Plan, and therefore are not considered part of the Project.

[4] The City's Local Coastal Plan will be updated as a separate document.

General Plan 2030, if adopted, will supersede the 1990-2005 General Plan and its several amendments.

The planning area addressed in the General Plan 2030 includes approximately 26 square miles, as shown on Figures 1 and 2, and includes the following geographic areas:

- All lands located within the incorporated Santa Cruz city limits;
- Lands outside City limits but within the City's adopted Sphere of Influence ("SOI") that are located east of Highway 17 in the Carbonera neighborhood and along 7th Avenue; and
- Unincorporated area to the north and west of the City that generally extend from Graham Hill Road on the east to the Dimeo Lane and the City's landfill on the west. This area includes Henry Cowell State Park, University of California, Santa Cruz ("UCSC") lands, Wilder Ranch State Park and privately-owned open space and agricultural lands adjacent to the city on the west.[5]

The City's water service area extends beyond the area addressed by the General Plan 2030 to portions of the City of Capitola and unincorporated areas of Santa Cruz County, as indicated on Figure 3. For the purposes of this WSA, the area addressed by the General Plan 2030 is referred to as the "Project" as identified above. In some areas, the General Plan 2030 planning area extends beyond the City's water service area, however, with the exception of proposed expansion of the City's SOI (see Section 2.3.3), no growth is anticipated in the areas outside of the water service area.

2.3.2 Project Location

Santa Cruz is located on the central coast of California, along the northern shore of Monterey Bay, approximately 75 miles south of the City of San Francisco, 25 miles south of San Jose, and 40 miles north of Monterey. The General Plan 2030 addresses an area of approximately 26 square miles, as indicated on Figures 1 and 2 and described in Section 2.3.1 above.

2.3.3 City of Santa Cruz Sphere of Influence and Water Service Area

The designation of the City's SOI is regulated by the Santa Cruz Local Agency Formation Commission ("LAFCO"). LAFCOs were created by state law, in 1963, to regulate the boundaries of cities and special districts. The purpose of establishing LAFCOs was to promote the orderly development of local government agencies and efficient provision of services, to guide development away from prime agricultural land, and to discourage urban sprawl. One of Santa Cruz LAFCO's many responsibilities is to develop and determine a SOI for each local governmental agency within Santa Cruz

[5] State law requires the General Plan to consider any territory outside the city boundaries which, in the City's judgment, bears relation to its planning.

County. The SOI is a plan for the probable future physical boundaries and service area of a local governmental agency.

As indicated above, lands outside City limits but within the City's existing adopted SOI are limited to a small area east of Highway 17 in the Carbonera neighborhood and along 7th Avenue east of the Santa Cruz Harbor. Applications are pending before Santa Cruz LAFCO to amend the City's SOI to include a portion of the UCSC north campus for provision of extraterritorial water and sewer service, as further described below.

Water is provided by the City's Water Department to approximately 21,000 residential accounts, 2,200 commercial, industrial, institutional and municipal accounts, and 500 irrigation accounts (Santa Cruz, 2010b). The City's water service area (shown in Figure 3) is approximately 30 square miles and includes all lands within City limits, a portion of UCSC that is within City limits (and a small adjoining portion of UCSC outside City limits), adjoining unincorporated areas of Santa Cruz County (i.e., Live Oak), a small part of the City of Capitola, and coastal agricultural lands outside City limits (Santa Cruz, 2006). As shown on Figures 3 and 4, the City's water service area covers a larger geographical area than the City limits and current SOI.

In 2006, Santa Cruz LAFCO passed a resolution to grant the City of Santa Cruz "Areawide Approval" to provide water service to the areas outside the current city limits as shown on a water service area map submitted by the City and as amended by Santa Cruz LAFCO as shown in Figure 3. The service area includes properties that are currently provided water service or are within the City or County urban service areas. The LAFCO action was taken pursuant to local regulations that were adopted by Santa Cruz LAFCO to implement state Government Code provisions that LAFCOs in each county regulate the service areas of cities and special districts outside the boundaries of those agencies. The City applied to the Santa Cruz LAFCO pursuant to Santa Cruz LAFCO's local regulations for authorization to provide water service to certain areas outside the City limits. This Areawide Approval will expire on 1 November 2016.

In October 2008, the City and UCSC submitted applications to the Santa Cruz LAFCO to amend the City of Santa Cruz' SOI (City application) and provision of extraterritorial water and sewer services (University of California application) to a 374-acre portion of the UCSC campus known as "North Campus" (Santa Cruz, 2010a) (Figure 5). The City completed and certified an Environmental Impact Report ("EIR"), including a Water Supply Assessment that addresses the potential environmental effects of the applications to Santa Cruz LAFCO and identifies water demands associated with the expansion of the SOI and the planned development within the SOI Amendment. The EIR and the University's application are being legally challenged and the applications are pending before Santa Cruz LAFCO. This WSA identifies the additional water demands associated with the proposed expansion of the SOI as part of the future demand within the City's water service area. . It should be recognized; however, that campus development and growth is guided by the University's 2005 Long Range Development Plan ("LRDP") and other specific plans developed by the University, rather than by the City's General Plan, and thus is not considered part of the Project's potential buildout.

3.0 PREPARATION OF A WATER SUPPLY ASSESSMENT

3.1. APPLICABILITY OF SENATE BILL 610 TO THE PROJECT

Water Code Section 10910

(a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

Water Code Section 10912

For the purposes of this part, the following terms have the following meanings:

(a) "Project" means any of the following:

(1) A proposed residential development of more than 500 dwelling units.

(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.

(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.

(4) A proposed hotel or motel, or both, having more than 500 rooms.

(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.

(6) A mixed-use project that includes one or more of the projects specified in this subdivision.

(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

This document is intended to provide the kind of information required of a formal "water supply assessment" required by Water Code section 10910 et seq. (commonly known as SB 610), even though the City does not believe that SB 610 actually applies to a comprehensive general plan update. Rather, SB 610 applies to categories of "projects" subsidiary to city-wide general plan updates (e.g., specific plans or general plan amendments contemplating the construction of more than 500 dwelling units). The limited application of these Water Code requirements was very clear in the predecessor to SB 610, known as SB 901 (see former Water Code sections 10910, subd (a) and 10913.) When SB 901 was in effect (1996 through 2001), it was clearly intended to complement the requirements of Government Code sections 65352, subdivision (b)(7), and 65352.5, which remain in effect and require cities and counties, in updating their general plans, to consult with "public water agencies" and to receive from them detailed information regarding water supply availability.

Even though the City believes that SB 610 was not intended to change the approach that was in effect during the lifetime of SB 901, the City has nevertheless undertaken preparation of this document with the intent of having it function as a de facto water

supply assessment, despite the general nature of the project at issue and the inevitably of the somewhat general nature of discussion included herein. It is important to acknowledge, however, that this document is not a substitute for the formal consultation required by Government Code sections 65352 and 65352.5.

3.2. RESPONSIBILITY FOR PREPARATION OF THE WSA

Water Code Section 10910

(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site.

As discussed in Section 3.1 above, the City has chosen to prepare this WSA to assist in the planning and management of water resources. Erler & Kalinowski, Inc. ("EKI") has prepared this WSA on behalf of the City, pursuant to an agreement dated 26 January 2010. This WSA is not intended to be relied upon by any party or entity other than the City without the express written consent from EKI.

3.3. RELIANCE ON THE URBAN WATER MANAGEMENT PLAN

Water Code Section 10910

(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

The City's 2005 Urban Water Management Plan ("2005 UWMP") projected water supply through the year 2030 and projected water demands through 2020. The City had begun developing the General Plan 2030 at the time the 2005 UWMP was written, and the 2005 UWMP was intended to inform the General Plan update process with respect to water supply issues (Santa Cruz, 2006). This WSA relies upon the 2005 UWMP for water supply projections, however, water demand projections previously developed in the

2005 UWMP have been revised and updated. The following methods have been used to update water demand projections for the Project and other areas within the City's water service area:

- Land use changes envisioned in the General Plan 2030 serve as the basis for water demand projections for the Project;
- Estimates of population growth developed by the Association of Monterey Bay Area Governments ("AMBAG") serve as the basis for water demand projections for the portion of the City's service water area, outside the Project footprint Sections 4.2 and 5.3); and
- Water demands for UCSC are based on the University's 2005 LRDP and the Comprehensive Settlement Agreement resulting from litigation of the EIR for the 2005 LRDP.

A comparison of updated water demand projections to previous water demand projections, including those presented in the 2005 UWMP, are summarized in Section 5.5 below.

3.4. COMPONENTS OF A WATER SUPPLY ASSESSMENT

The primary purpose of a WSA is to evaluate whether sufficient water is available to meet projected future demands within a water supplier's service area, including demands associated with the proposed project. The WSA must assess the sufficiency of water supplies during normal and dry hydrologic years. The following information provides the basis for a WSA:

- Projected water demands associated with the proposed project,
- Total water demands projected for the entire service area of the water supplier over the next 20 years, and
- Total projected water supplies available to the water supplier over the next 20 years.

In order to assess the sufficiency of the City's water supplies to meet the demands of the Project, in addition to the City's existing and future planned uses, the following information is included in this WSA:

- Water Demand: Projected demand on the City's water system attributed to the Project, in addition to the City's existing and future planned uses, in 5-year intervals over a 20 year period;
- Water Supply Entitlements: Identification of the City's water supply entitlements;
- Historical Supply: Historical water supply volumes for the City's water system;

- Groundwater Supply:
  - A description of the groundwater basins that will be used to supply the Project,
  - A summary of the California Department of Water Resources' determination regarding overdraft of the groundwater basin,
  - Historical groundwater production by the City's water system,
  - Future anticipated groundwater production by the City's water system, and
  - An analysis of the sufficiency of groundwater supplies to meet the Project's demand;
- Projected Supply: Projected water supply volumes for the City's water system during normal years, single dry years, and multiple dry years, in 5-year intervals over a 20 year period;
- Supply Sufficiency Determination: A determination of the sufficiency of supply to meet the projected demands on the City's water system, including the demands of the Project; and
- Additional Supply: Plans for acquiring additional water supplies and the measures that are being undertaken to develop these supplies.

These elements are discussed in Sections 4 through 9 below.

4.0 ESTIMATED PROJECT WATER DEMAND

Water Code Section 10910

(c) (2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

The City's 2005 UWMP included projections of water demand and supply for its entire service area, including the area proposed for redevelopment as part of the General Plan 2030. However, at the time the 2005 UWMP was developed the City was operating under a General Plan adopted in 1992 with a planning horizon through 2005, and beginning the process of developing the General Plan 2030 update (see Section 5.5). Water demand projections in the 2005 UWMP, were therefore developed through the year 2020 and based on population growth estimates. These water demand projections were extended to 2030 in the SOI Amendment EIR WSA.

Population-based water demand projections must assume that water demands are uniformly distributed over the service area, and therefore may not account for changes in land uses, which can have wide variations in water demand. As part of the process of developing the City's draft General Plan 2030, a "buildout" projection was prepared that provides new information about residential and commercial development potential foreseen in the City over the next 20 years that was not factored into the City's 2005 UWMP. Given this new information, a decision was made not to rely on the past water demand projections contained in the 2005 UWMP, or the revisions to those same demand projections that were used in a previous WSA for amending the City's SOI[6]. This decision was made for several reasons including (a) the impending need to update the City's UWMP in 2011 and (b) changes in water use that have taken place over the past five years.

Therefore, this WSA develops new water demand projections based upon land-use changes identified within the General Plan 2030 and other projected growth within the City's service area (i.e., outside of the Project) and compares these updated demands with

[6] As required under state law, UWMPs are required to be updated and adopted every five years. The City last updated its UWMP in 2006. The next update is due in 2011 and the work on this project is already underway.

the City's water supplies. The WSA also reviews existing (i.e., baseline) water use within the City's service area, which has been significantly affected by the down turn in the economy and other factors in recent years. The technical basis for these new projections is explained below. It is anticipated, that these new projections will be incorporated into the upcoming UWMP.

4.1. GENERAL PLAN 2030 BUILDOUT

The General Plan 2030 outlines a buildout projection that considers development potential estimated to occur by the year 2030. This buildout projection is considered the maximum plausible level of potential development. However, many factors will affect the actual level of development that will occur by 2030, and this level of development may not be realized. The Project water demands estimated herein assume that all development projected in the General Plan 2030 will be realized by 2030.

The General Plan 2030 estimates that the following new development may occur by the year 2030[7]:

- 3,350 residential units;
- 1,087,983 square feet of commercial development and 311 hotel rooms;
- 1,273,913 square of office space; and
- 776,926 square feet of industrial development.

4.2. EXISTING WATER DEMAND OF PROJECT AREA

The economic downturn, a multiple-year drought and ensuing water restrictions, and a phased 5-year increase in water billing rates have resulted in lower water demand for 2007 and 2008 as compared with prior years. The degree to which this lower water demand is permanent is uncertain. Consequently, the City estimated the existing water demand for the Project area based upon the following time periods (Santa Cruz, 2010b):

- *Existing Water Demand Estimate 1* – (1999 through 2004). This time period represents an extended period of stable water use before the onset of several factors that have affected recent water use, such as the economic downturn, drought conditions, and increase in water billing rates.

[7] A General Plan "buildout" projection was developed by the City's land use consultant, Design, Community and Environment (DC&E). The projection considers the development potential of land permitted under the proposed General Plan that is estimated to occur in Santa Cruz by the year 2030, taking into account proposed land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels. Major approved projects also are included in the buildout estimates (i.e., the Delaware Avenue Mixed Use Project and the Tannery Arts Center non-residential uses) to ensure that all potential development that would occur during the General Plan's timeframe is considered in the EIR impact analyses. A summary of the estimated General Plan buildout estimates and supporting methodology is attached for reference as Appendix B.

- *Existing Water Demand Estimate 2* – (2007 through 2008). This time period reflects water usage after the economic downturn, drought conditions, and increase in water billing rates[8].

The two estimates are intended to bracket the upper and lower range of water demand that may reasonably be expected to occur in the future. Both are based on actual levels of water use by City customers in recent years. The demand estimates do take into account long-term water conservation reductions already realized by existing customers but do not assume additional reductions in future years.

The existing water demands for the Project area were estimated using water demand tracking models, which take into account historical water use patterns for each major customer group and control for seasonal and weather effects[9]. Details regarding the City's water demand tracking models are provided in Appendix A.

These models indicate that existing water demand for the Project area is 2,069 mgy based on *Existing Water Demand Estimate 1* and 1,843 mgy based on *Existing Water Demand Estimate 2*. Section 4.3 discusses the incremental water demand associated with the Project.

4.3. ESTIMATED PROJECT WATER DEMAND

The City developed water demand factors for each major water customer categories (i.e., single family residential, multi-family residential, business and industrial, municipal, and irrigation and golf courses) based on historical water use using the City's utility billing system on a per account basis (Santa Cruz, 2010b). The water demand factors developed for the two time periods considered were then applied to the numbers of existing accounts for each customer category. Using historical water utility billing system information, billing data, and square footage area from the County Assessor's Office, water demand estimates were developed for the new development envisioned in the General Plan 2030 (Santa Cruz, 2010b).

The incremental water demand of the Project is estimated to be approximately 251 mgy at buildout. It is assumed that the development rate will be constant over the 20-year buildout period. Adding the incremental water demand to the existing water demand estimates indicates the total water demand for the Project area at buildout will be between 2,094 mgy and 2,320 mgy. Existing and projected water demands associated with each customer category are described below and summarized in Table 1.

[8] This water demand estimate does not consider water use in 2009, as water use restrictions were imposed during this period due to drought conditions.

[9] Seasonality of demand is defined by the use of a seasonal index, a standard statistical method for identifying the ratio of each month's consumption to the average month. The effects of weather on water consumption are calculated by regressing actual water consumption on the seasonal index and on departures of weather from normal weather. Actual water consumption is restated in terms of weather normalized water use.

4.3.1 Single Family Residential

Existing single family residential customers within the City of Santa Cruz used an average of 218 gallons per day per account ("gpd/a") during the *Existing Water Demand Estimate 1* time period and 190 gpd/a during the *Existing Water Demand Estimate 2* time period. The existing level of single-family residential water demand based on *Existing Water Demand Estimates 1 and 2* is estimated to be 965 mgy and 839 mgy, respectively.

New houses built under modern plumbing and building codes tend to use less water than older houses. To estimate the water demand of new construction envisioned in the General Plan 2030, a water demand factor was calculated based on water use history for single-family homes constructed since 1996 (i.e., 194 gpd/a). Approximately 840 new single family homes are envisioned in the General Plan 2030, which would result in an increased water demand of approximately 60 mgy by 2030.

4.3.2 Multi-Family Residential

Existing multi-family residential customers within the City of Santa Cruz used an average of 730 gpd/a during the *Existing Water Demand Estimate 1* time period and 867 gpd/a during the *Existing Water Demand Estimate 2* time period. The existing level of multi-family residential water demand based on *Existing Water Demand Estimates1 and 2* is estimated to be 472 mgy and 408 mgy, respectively.

Historically, multi-family residential water accounts, by definition, have only one water meter per building regardless of the number of residential units within the building and may include landscape irrigation system usage. Additionally, modern plumbing codes tend to result in lower water usage per residential unit than in historical buildings. Modern multi-family residential buildings are typically built with a separate water meter for common irrigation areas. Recent and anticipated multi-family residential housing in the Santa Cruz area has been smaller and oriented more towards single-person occupancy than the older multi-family residential buildings. Data about potential growth in the multi-family sector for the General Plan 2030 were provided based on the number of dwelling units and not on the number of new multi-family water accounts. Therefore, to estimate the water demand of new construction envisioned in the General Plan 2030, a water demand factor was calculated based on water use history for multi-family accounts constructed since 1996, which was then adjusted for the number of dwelling units on each account (i.e., 70 gpd/dwelling unit). Approximately 2,510 new multi-family homes are envisioned in the General Plan 2030, which would result in an increased water demand of approximately 64 mgy by 2030.

4.3.3 Business and Industrial

Existing business customers within the City of Santa Cruz used an approximate average of 917 gpd/a during the *Existing Water Demand Estimate 1* time period and 867 gpd/a during the *Existing Water Demand Estimate 2* time period. Existing industrial customers used approximately 25 mgy, during both time periods. The existing level of business and

industrial water demand based on *Existing Water Demand Estimates 1 and 2* is estimated to be 448 mgy and 425 mgy, respectively.

The General Plan 2030 lists four types of business and industrial growth: (1) commercial, (2) hotel, (3) office, and (4) industrial. To estimate water demands for new development, water demand factors were developed for each of these business and industrial types based on historical use per account and square footage data available at the County Assessor's Office. The City estimated that future commercial development will use approximately 66 gallons per year per square foot ("gpy/sq ft"), future hotel development will use approximately 93 gpd/room, office development will use approximately 18 gpy/sq ft, and industrial development will use approximately 12 gpy/sq ft. Approximately 1,087,933 sq ft of new commercial space, 311 new hotel rooms, 1,273,913 sq ft of new office space, and 776,926 sq ft of new industrial space are envisioned in the General Plan 2030, which would result in an increased water demand of approximately 115 mgy by 2030.

4.3.4 Municipal

Existing municipal facilities used an approximate average of 671 gpd/a during the *Existing Water Demand Estimate 1* baseline time period and 658 gpd/a during the *Existing Water Demand Estimate 2* baseline time period. The existing level of municipal water demand based on *Existing Water Demand Estimates 1 and 2* is estimated to be 56 mgy and 54 mgy, respectively.

City Parks Department staff estimate 3.5 acres in new park development, which would add potentially 2 mgy in new water demand (Santa Cruz, 2010b). No other municipal development is envisioned in the General Plan 2030.

4.3.5 Irrigation and Golf

Existing irrigation accounts used an approximate average of 885 gpd/a during the *Existing Water Demand Estimate 1* time period and 755 gpd/a during the *Existing Water Demand Estimate 2* time period. De Laveaga Golf Course is the only golf course in the Project area. The De Laveaga Golf Course used approximately 139,487 gpd during the *Existing Water Demand Estimate 1* time period and 134,824 gpd during the *Existing Water Demand Estimate 2* time period. The existing level of irrigation and golf course account water demand based on *Existing Water Demand Estimates 1 and 2* is estimated to be 128 mgy and 115 mgy, respectively.

The General Plan 2030 does not specify anticipated new irrigation areas associated with the envisioned development. Therefore, it is assumed that irrigation accounts will grow in proportion to the average growth rate of single-family residential, multi-family residential, and business and industrial accounts combined (i.e., approximately 12% by 2030). This assumption results in an increased water demand of approximately 10 mgy by 2030. Golf usage is assumed to be constant over the 20 year planning horizon.

5.0 SERVICE AREA WATER DEMAND

Section 5.0 estimates the existing and projected water demands within the City's service area including the Project. Water demands within the Project area are based information presented in Section 4 and have been estimated on the basis of projected land use changes within the Project area. Although UCSC is located within the geographical area covered by the General Plan 2030, campus development and growth is guided by the University's 2005 LRDP adopted by The Regents of the University of California, rather than by the City's General Plan. Therefore UCSC's water demands are not considered as part of the Project. However, UCSC is within the City's service area, and existing and projected water demands for UCSC are presented in Section 5.2 below.

Water demands outside of the Project area (i.e., excluding water demands associated with UCSC) are presented in Section 5.3, and have been estimated on the basis of population growth, as no specific information is available regarding land use changes outside of the Project area. For informational purposes, these updated water demand estimates have been compared with prior water demand estimates presented in 2005 UWMP and SOI Amendment EIR WSA (i.e., which extended the 2005 UWMP projections for the City's water service area through 2030 and estimated the incremental increase in water demand anticipated from the SOI Amendment).

5.1. WATER DEMAND WITHIN PROJECT AREA

As discussed in detail in Section 4.0 and shown on Table 1, incremental water demand of the Project is estimated to be approximately 251 mgy at buildout, which is assumed to occur by 2030. Based upon existing water demand estimates for the project area (i.e., from 1,843mgy to 2,069 mgy), this incremental water demand brings the total estimated water demand for the Project area at buildout to between 2,094 mgy and 2,320 mgy. For planning purposes, it is assumed that the development rate will be constant over the 20-year buildout period (see Table 2).

5.2. WATER DEMAND UCSC

The City of Santa Cruz recently completed and certified an EIR for the *City of Santa Cruz Sphere of Influence Amendment and Provision of Extraterritorial Water & Sewer Service* ("SOI Amendment EIR," Santa Cruz, 2010a) [10]. The WSA for the SOI Amendment EIR included an estimate of water demands for UCSC through 2020, based on the University's 2005 LRDP and the Comprehensive Settlement Agreement resulting from litigation of the EIR for the 2005 LRDP (Settlement Agreement, 2008) (see Section 5.5). Total UCSC water demand to 2020 was estimated as 338 mgy. For purposes of the SOI Amendment EIR WSA, all water demands from 2020 through 2030 for the City of Santa Cruz water service area, including the UCSC were estimated based on population projections developed by AMBAG; UCSC demands from 2020 to 2030 were not differentiated from the demands for the rest of the City's water service area.

[10] The SOI Amendment EIR was certified by the Santa Cruz City Council on 3 August 2010.

The University's 2005 LRDP extends through 2020, and any further development plans beyond 2020 are unknown. To calculate water demand from 2020 through 2030 for UCSC, the student enrollment growth rate was calculated from historical enrollment at the University. Enrollment grew by approximately 350 students per year from 1987 to 2008. A demand factor was calculated from historical water usage data from this same time period. Based on the assumed student enrollment growth rate and demand factor, it is estimated that water demand for the UCSC campus will increase by 10 mgy from 2020 to 2030.

Total UCSC demand at 2030 would be 348 mgy, which represents a net increase of 136 mgy over existing water use.

5.3. WATER DEMAND OUTSIDE OF PROJECT AREA (EXCLUDING UCSC)

Water demand projections for the portion of the City's water service area located outside of the Project area and outside of UCSC (i.e., county areas and portions of the City of Capitola) (see Figures 1 and 3) were estimated on the basis of population growth estimates for this area. Population projections were based upon information developed by AMBAG (AMBAG, 2008). The existing water demand for this portion of the water service area was estimated using the same time periods employed to derive the existing water demands for the Project area.

5.3.1 Existing Water Demand Outside of Project Area (Excluding UCSC)

As discussed in Section 4.2, the City selected two time periods from which to estimate existing water demand. The two time periods consist of: (1) 1999 through 2004 (*Existing Water Demand Estimate 1*) and (2) 2007 through 2008 (*Existing Water Demand Estimate 2*). The water use was calculated on a per account basis for each time period and then scaled to the current number of accounts per each customer type. The resulting estimated water demand by existing customers in the City's water service area outside of the Project area, excluding UCSC, is 1,409 mgy, based on *Existing Water Demand Estimate 1* and 1,199 mgy based on *Existing Water Demand Estimate 2*.

5.3.2 Projected Water Demand Outside of Project Area (Excluding UCSC)

Approximately every five years, AMBAG produces a regional forecast of population, housing, and employment for a Monterey, San Benito, and Santa Cruz Counties. The most recent population projections by AMBAG estimate population growth in 5-year increments through the year 2035 (AMBAG, 2008). The population growth for the City's water service area outside of the Project area is estimated to be approximately 8.2% over the next 20 years (i.e., 0.4% growth per year; AMBAG, 2008).

Existing water demands within the single family residential, multi-family residential and business and industrial, and irrigation customer categories were scaled in proportion with the population growth estimated by AMBAG. No municipal water accounts are located outside of the Project area. Pasatiempo Golf Course is the only one golf course within the City's water service that is outside of the Project area. It is assumed that no new golf courses will be built outside of the Project area and water use by Pasatiempo Golf Course

will remain the same. Projected water demand outside of the Project Area, excluding UCSC, is estimated to be 1,525 mgy, based on *Existing Water Demand Estimate 1* and 1,297 mgy based on *Existing Water Demand Estimate 2*.

5.4. Miscellaneous Water Uses and System Losses

To calculate total water demand, miscellaneous water uses and system losses also must be considered in addition to water use by customer accounts. Miscellaneous water uses include temporary construction accounts and bulk water use and average approximately 4 mgy (Santa Cruz, 2010b). System losses include physical leakage, apparent losses from meter errors, as well as unmetered authorized uses such as system flushing, process water use at the water treatment plant, fire usage, sewer flushing, and other similar uses. System losses are estimated to be approximately 7.5 percent of overall treated water production (Santa Cruz, 2010b). Total miscellaneous water uses and system losses associated with existing demand are estimated to be 303 mgy based on *Existing Water Demand Estimate 1* and 268 mgy based on *Existing Water Demand Estimate 2* (see Table 2). Miscellaneous water uses were assumed to remain constant at 4 mgy and system losses were estimated at approximately 7.5 percent of overall treated water production in the future.

5.5. Water Demand in City Service Area

As shown on Table 2, the existing water demand for the entire City's water service area, including the Project area, is estimated to be 3,993 mgy based on *Existing Water Demand Estimate 1* and 3,522 mgy based on *Existing Water Demand Estimate 2*. The projected water demand by 2030 for the entire City's water service area, including the Project area, is estimated to be 4,537 mgy based on *Existing Water Demand Estimate 1* and 4,046 mgy based on *Existing Water Demand Estimate 2*.

Water demand projections for the City's water service area (including the Project area but excluding UCSC) were developed based on existing water demand factors that incorporate water savings resulting from water conservation efforts that have been, and will continue to be, implemented by the City. The City is actively evaluating potential additional conservation measures; however, potential water savings from such additional measures are not incorporated in projected water demands in this WSA, as their effects cannot be quantified at this time. More information regarding the City's water conservation program is presented in Section 9.1.

5.6. Previous Water Demand Projections

Water demands in the 2005 UWMP were primarily based on estimates of population- and water account-growth through 2020. These estimates updated prior water demand estimates that had been developed for the City's service area by Maddaus Water Management ("MWM") in its *Water Demand Investigation*, which was completed in 1998. The 2005 UWMP showed that the MWM projections significantly overestimated actual water demand within the City's service area. These water demand estimates presented in the 2005 UWMP were further updated in the SOI Amendment EIR WSA

based on projected development within the SOI Amendment area and projected population growth within the City's service area through 2030. These estimates are summarized in Table 3 and are further described in Section 5.5.1 below. As shown in Table 3, the updated water demand projections presented in this WSA generally bracket previous demand projections presented in the 2005 UWMP and the SOI Amendment EIR WSA.

5.6.1 2005 UWMP and SOI Amendment WSA

The City's 2005 UWMP presented two plausible projections (i.e., scenarios) of potential water demand growth between 2005 and 2020:

(1) *Scenario 1* assumed that the City's accounts for the three largest customer classes (residential, business, and irrigation) would grow at an annual rate of 0.8% (i.e., in proportion to the amount of growth envisioned in existing housing elements from general plans for the City and County of Santa Cruz and the City of Capitola), and that water use at UCSC would increase by 2020 as predicted in the draft 2005 LRDP (UCSC, 2005a).

(2) *Scenario 2* assumed that the City's accounts would increase at a lower annual rate of 0.4% (based on actual growth rates experienced since 1997), and that water use at UCSC would increase at *half* the rate predicted in the Draft 2005 LRDP (UCSC, 2005a).

Both of the 2005 UWMP scenarios included 130 mgy of projected conservation savings through the year 2010, in accordance with the conservation savings estimated as part of the City's *Water Conservation Plan* (Gary Fiske & Associates, 2000). Neither of the 2005 UWMP scenarios extended beyond the year 2020, as the City considered these projections to be too speculative at that time.

Revised demand projections through 2030 were developed for the City's service area as part of the SOI Amendment EIR WSA, which was completed in 2009. In order to extend the City's demand projection out to the year 2030, the City looked at the updated AMBAG (2008) population projection and multiplied this additional growth by the average per capita water use projected for 2010 through 2020 in the *UWMP Scenarios 1 & 2*. In addition to extending the UWMP scenarios by 10 years (i.e., to the year 2030), two additional modifications were made to the 2005 UWMP scenarios as part of this WSA. These modifications include the incorporation of changes to Draft 2005 LRDP water demand projections pursuant to the 2005 LRDP Final EIR and the Settlement Agreement, and the inclusion of the full volume of the projected water use for UCSC for the lower-end scenario, instead of just half of the UCSC water demand, as was assumed in the 2005 UWMP. As discussed above and shown on Table 3, these prior projected water demands generally fall within the range of updated projected water demands presented herein.

6.0 CITY OF SANTA CRUZ WATER SUPPLY

Water Code Section 10910

(d) (1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.

(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

(A) Written contracts or other proof of entitlement to an identified water supply.

(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.

(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.

(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.

Water served by the City originates from rainfall, surface water runoff, and groundwater infiltration occurring within watersheds located in Santa Cruz County. The City's four current water sources consist of the following:

(1) Surface water diversions from creeks and natural springs on the North Coast,

(2) Surface water diversions from the San Lorenzo River,

(3) Surface water from Loch Lomond Reservoir (which is used primarily to collect and store water from the Newell Creek watershed, but also stores water from the San Lorenzo River), and

(4) Groundwater produced by the Live Oak Well System (which is extracted from the Purisima Formation).

These four water supplies provide the City with approximately 4,314 mgy during normal hydrologic years. The percentage of this supply that is potentially available from the City's four water supply sources is: 25% from the North Coast Stream creeks and streams, 47% from the San Lorenzo River, 24% from the Loch Lomond Reservoir, and 4% from the Live Oak Well System.[11] Table 4 lists the City's future water supply

[11] These percentages reflect the potential capacity of each of the City's four water supply sources, which differs from the percentage of the City's actual supply that is currently produced by each source.

availability for normal and dry years from these local sources based on the City's 2005 UWMP. Historical production from these supplies is shown in Table 5[12].

Prior to service to the City's customers, local surface water supplies are treated at the Graham Hill Water Treatment Plant ("WTP"), while groundwater from the Live Oak Wells is treated at the Live Oak Treatment Plant. Once treated, the City's water is either transferred for temporary storage at the Bay Street Reservoir site or fed by gravity directly into the City's distribution system.

Additional information is presented for each of these water supplies below based on the City's 2005 UWMP and supplemental information from other City documents and discussions with members of the City's Water Department.

6.1. SURFACE WATER SUPPLY SOURCES

The City relies on surface water from North Coast creeks and springs, and the San Lorenzo River for approximately 75% of its annual water supply needs. The yield of these sources in any given year is directly related to the amount of rainfall received and runoff generated during the winter season. Water stored in Loch Lomond Reservoir is used mainly in the summer and fall seasons, when the flows in the coast and river sources decline and additional supply is needed to meet dry season demands (Santa Cruz, 2004).

A summary of the City's surface water supply sources and entitlements is included in Table 6. Copies of the City's permit and licenses for the City's San Lorenzo River supplies, issued by the State Water Resources Control Board ("SWRCB"), are included in Appendix C.

6.1.1 North Coast Creeks and Springs

Surface water is diverted from three coastal streams and one natural spring, located between six and eight miles northwest of downtown Santa Cruz. These supply sources consist of Laguna Creek, Reggiardo Creek, Majors Creek, and Liddell Spring. The City has been using North Coast Stream creeks and springs as water supply sources since 1890. Because the City has been using North Coast creeks and springs since before 1914, the City holds pre-1914 appropriative rights to the water in the amount that was used in 1914. Therefore, diversions from these sources are limited primarily by available flows (Santa Cruz, 2006).

North Coast creek and spring diversions and their transmission system are referred to collectively as the North Coast System ("NCS"). The NCS includes diversion facilities located on the East Fork of Liddell Creek, Reggiardo Creek, Laguna Creek and Majors Creek. Water is diverted and conveyed by gravity through four pipelines from the diversions to the North Coast Pipeline ("NCP"). The NCP runs along the Highway 1 corridor from Laguna Creek to the eastern extent of Wilder Ranch State Park. The NCP

[12] Historical water production refers to the total amount of raw water diverted at the source, which varies based on a variety of factors including customer demand, hydrologic conditions, and operations and maintenance (Santa Cruz, 2006).

then traverses several private and commercial properties, City open space, and runs through City streets to the Coast Pump Station located on River Street at the San Lorenzo River (EDAW, 2005).

6.1.2 San Lorenzo River

The San Lorenzo River is the City's largest water supply source. The City diverts water from the San Lorenzo River at two locations (1) the Tait Street Diversion, near the City limits just north of Highway 1, and (2) the Felton Diversion located about six miles upriver from the Tait Street Diversion. The City is the largest user of water from the San Lorenzo River basin; however, three other water districts, several private water companies, and numerous individual property owners share the San Lorenzo River watershed as their primary source for drinking water supply (Santa Cruz, 2006).

6.1.2.1 Tait Street Diversion

The drainage area above the Tait Street Diversion is 115 square miles. The Tait Street Diversion is the primary diversion from the San Lorenzo River and dates to the 1920s. Two shallow auxiliary wells located across the river (referred to as the "Tait Street Wells") are used by the City to supplement water from the Tait Street Diversion. Because the Tait Street Wells are hydraulically connected to the San Lorenzo River, water produced by the wells is tied to the City's appropriative rights for surface diversion (Santa Cruz, 2006). Under SWRCB Permit 2738 and License 7200, the Tait Street Diversion is subject to a 12.2 cubic feet per second ("cfs") maximum diversion rate per year (Gary Fiske & Associates, 2003).

6.1.2.2 Felton Diversion

The Felton Diversion is an inflatable dam and intake structure built in 1974, and located approximately 6 miles upstream from the Tait Street Diversion on the San Lorenzo River. Water is pumped from the Felton Diversion through the Felton Booster Station up to Loch Lomond Reservoir (Santa Cruz, 2006). The inflatable dam is used seasonally as discussed below.

Under the City's current SWRCB permits (16123 and 16601), the City may divert up to 3,000 acre-feet per year ("AFY;" or 977 mgy) of water from the San Lorenzo River at the Felton Diversion between September and May (Santa Cruz, 2006). Current permits require this water to be diverted to the Loch Lomond Reservoir and cannot be sent directly to the Graham Hill WTP. Thus, the City's ability to utilize water from the Felton Diversion is dependent on the volume of available storage in Loch Lomond Reservoir. As a result, the Felton Diversion is operated only intermittently, as needed to augment storage in Loch Lomond Reservoir when natural inflow from Newell Creek to the reservoir is low. The Felton Diversion is typically used during the winter months of dry years (Santa Cruz, 2006).

The City's SWRCB permits for the Felton Diversion also restrict diversions based on minimum instream flow requirements. To protect fish habitat in the San Lorenzo River, the Felton Diversion may be used only when instream flow exceeds the prescribed flow. These minimum average daily flow requirements for instream flow are 10 cfs in

September, 25 cfs in October, 20 cfs from November to May, and 0 cfs between June and August (Santa Cruz, 2006). Additionally, at the beginning of each autumn, the City operates the Felton Diversion only following two days of river flows that exceed 100 cfs. The purpose of this requirement is to allow for flushing of debris that may have been introduced during the low-flow summer months (Gary Fisk & Associates, 2003).

6.1.3 Loch Lomond Reservoir and the Newell Creek Watershed

Loch Lomond Reservoir is located near the town of Ben Lomond in the Santa Cruz Mountains. The reservoir provides surface water storage for the City and the San Lorenzo Valley Water District. The reservoir and surrounding watershed also are used for no-body-contact public recreation purposes, including fishing, boating, hiking, and picnicking (Santa Cruz, 2006). Loch Lomond Reservoir receives runoff from the Newell Creek watershed, which covers an area of approximately eight square miles upstream from the reservoir.

Loch Lomond Reservoir was constructed in 1960 and has an operational storage capacity of 2,800 mg. In normal and wet years, reservoir storage refills naturally to full capacity with runoff from the Newell Creek watershed. This runoff is supplemented with water pumped up from the San Lorenzo River via the Felton Booster Station during dry years when runoff from Newell Creek is below average.

The City's SWRCB license for Newell Creek (License No. 9847) allows for diversion to storage of up to 1,825 mgy. These water rights allow only for diversion to storage and not for direct diversion. Furthermore, based on the historical use of the reservoir, licensed withdrawals from Loch Lomond Reservoir are restricted to 1,042 mgy. Of this total 1,042 mgy, the San Lorenzo Valley Water District ("SLVWD") is entitled to104 mgy (approximately 10%). Although the district has not taken water in recent years, the City has reopened discussions with SLVWD about its entitlement to this water and the City expects that the SLVWD intends to exercise its right to that supply.

6.2. GROUNDWATER SUPPLY SOURCES

Water Code Section 10910

(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the

department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

Although groundwater constitutes only 4% of the City's normal year water supply, it is a critical component for meeting peak season and dry year demands.[13] A description of the City's groundwater supply is provided below, summarized from the 2005 UWMP and other relevant documents prepared by the City, the Soquel Creek Water District ("SqCWD"), Central Water District ("CWD"), and the California Department of Water Resources ("DWR").

The City currently produces water through the Live Oak Well System which extracts groundwater from one of the water bearing units of the Purisima Formation. The City overlies a basin that is referenced by DWR as the Western Santa Cruz Terrace Groundwater Basin (DWR Basin No. 3-26), as shown in Appendix D (Figure D-1). Although the City is the only public groundwater producer in the DWR-defined Western Santa Cruz Terrace Groundwater Basin, the Purisima Formation also underlies three other DWR-defined groundwater basins and provides drinking water for two adjacent water districts, SqCWD and CWD, as well as multiple private landowners. See discussion in Section 6.2.2 below regarding basin definitions.

[13] This percentage is based on the values shown in Table 4: 187 mgy of groundwater supply divided by 4,314 mgy total supply. Normal year water supply estimates are from the 2005 UWMP (Santa Cruz, 2006).

6.2.1 Live Oak Well System

The Live Oak Well System consists of three production wells and a treatment plant located in the southeast portion of the City water service area. The facilities were acquired by the City from the Beltz Water Company in 1964, and thus, the City's three wells are known as the "Beltz" wells (in addition to the "Live Oak" wells). Wells 8 and 9 were installed in 1998 as replacement wells for Wells 1 and 2, which were damaged in the 1989 Loma Prieta earthquake. Well 7, which began operating in 1974, has been replaced by Well 10.[14] Groundwater from the Beltz wells is conveyed to the Live Oak Treatment Plant where iron and manganese are removed from the water. The Live Oak Treatment Plant was expanded in 1986 from its original capacity of 1 million gallons per day ("mgd") to a new capacity of 2 mgd (Santa Cruz, 2006). Additional upgrades to the City's groundwater treatment system are being designed to help the City maintain 2 mgd of groundwater production during peak times in dry years when surface water supplies are reduced (Santa Cruz, 2009c).

The Beltz wells are normally operated by the City 150 to 200 days of the year during the dry season at a combined production rate of approximately 1.0 mgd. The total annual production, however, varies considerably from year to year, depending on hydrologic conditions and availability of water from the City's other sources. In general, groundwater production decreases in wet years and increases in dry years. Based upon a 30-year record from 1972 to 2002, groundwater production by the Live Oak Well System has ranged from approximately 91 mgy in wet years, to 260 mgy in critically dry years, with a long-term average of 157 mgy during this period (Santa Cruz, 2006). Figure 6 depicts the City's historical groundwater production by water year type (i.e., wet year, normal year, dry year, and critically dry year).[15]

The Live Oak Well System was operated at its full 2 mgd capacity at times during the 1987-1992 drought, bringing the annual production from the wells to a high of 430 mgy (Santa Cruz, 2006). Table 5 includes the water supply production from the Live Oak Well System from 1985 to 2004.

6.2.2 DWR Bulletin 118: West Santa Cruz Terrace Groundwater Basin

The West Santa Cruz Terrace Groundwater Basin, as defined by DWR (2003), includes most of the City of Santa Cruz and part of unincorporated Santa Cruz County. The approximate boundaries of the basin are shown on Figure D-1 of Appendix D along with other adjacent DWR-defined groundwater basins. The West Santa Cruz Terrace Groundwater Basin is bounded to the south by Monterey Bay and to the north by a series of hills that define the contact of Quaternary deposits and the Pliocene Purisima Formation. The eastern boundary of the basin coincides with the western boundary of the

[14] According to the City Water Department staff, Well 10 began operation in July 2009.

[15] "Water Year Type" refers to normal, single dry, and multiple dry years as defined in the 2005 UWMP based on the hydrologic record. The 2005 UWMP calculates "normal year" supply based on the period between 1999 and 2003, "single dry year" supply based on the year 1994 (the most recent single dry year on record), and "multiple dry year" supply based on the two-year drought sequence from 1976 to 1977 (the most critical drought on record).

SqCWD, and the DWR-defined Soquel Valley Groundwater Basin. Ground surface elevations within the basin range from near sea level to approximately 100 feet above sea level (DWR, 2003).

Water-bearing sediments within the West Santa Cruz Terrace Groundwater Basin consist of the Pliocene Purisima Formation, Quaternary terrace deposits, and alluvium along the San Lorenzo River and other streams crossing the basin. The Purisima Formation is the principal aquifer in the eastern portion of the basin, along the boundary with the Soquel Valley Groundwater Basin. The Purisima Formation, described in more detail below, is a thick sequence of highly variable sediments ranging from marine fossiliferous rocks near its base to continental deposits in its upper portion. The sediments are primarily poorly indurated, moderately permeable gravel, sands, silts and silty clays. The Quaternary alluvium and terrace deposits within the West Santa Cruz Terrace Groundwater Basin are thin and yield only minor quantities of groundwater (DWR, 2003).

According to DWR (2003), groundwater levels within the basin range from ground surface (e.g., artesian) to 400 feet below ground surface. Due to the variations in well construction and aquifer geology, depth to water across the basin is highly variable. No information was available from DWR (2003) regarding estimated groundwater storage within the basin. The basin is recharged from deep percolation of rainfall, especially near the upper watersheds of the San Lorenzo River, and other streams crossing the basin (DWR, 2003).

The West Santa Cruz Terrace Groundwater Basin is not adjudicated, and DWR has not designated the basin as overdrafted or projected that the basin will become overdrafted if present management conditions continue (Santa Cruz, 2006).

6.2.3 Purisima Formation

Groundwater produced by the City's Live Oak Well System is extracted from the Purisima Formation. The Purisima Formation is the primary source of groundwater in the mid-Santa Cruz County region and supplies water to the SqCWD, CWD, and numerous private well owners in addition to the City of Santa Cruz. The approximate locations of groundwater production and monitoring wells operated by the City, SqCWD, and CWD are shown in Appendix D (see Figure D-2). Although SqCWD and CWD pump from a different DWR-defined basin than the City, the Purisima Formation is the primary water bearing formation for all three agencies. Figure D-3, also included in Appendix D, shows the approximate extent of the Purisima Formation as defined by the Central Coast Regional Water Quality Control Board in 2006. The Purisima Formation extends across four DWR-defined groundwater basins: (1) West Santa Cruz Terrace, (2) Soquel Valley, (3) Santa Cruz Purisima Formation Highlands, and (4) Pajaro Valley (SqCWD and CWD, 2007).

6.2.3.1 Hydrostratigraphy

The Purisima Formation has a total thickness of roughly 2,000 feet. The formation has been studied extensively in the past 40 years in an effort to define hydrostratigraphic boundaries and to model groundwater flow. The current hydrostratigraphic model of the

formation was developed by Johnson et. al (2004) and defines nine units comprising regional aquifers and aquitards (SqCWD and CWD, 2007). The primary water-bearing units of the Purisima Formation consist of fine-to-coarse grained marine sands interbedded and confined by silt and sandy clay strata. The Purisima Formation hydrostratigraphic units as defined by Johnson et. al (2004) are shown on Figure D-4 of Appendix D.

Beneath the City's water service area, the Purisima Formation is relatively shallow and dips to the southeast, becoming deeper and thicker towards Capitola and Aptos and outcropping along the Monterey Bay shoreline. The City's wells extract groundwater from hydrostratgraphic units "A" and "AA" (see Figure D-5). The SqCWD also operates production wells within units A and AA within the Soquel Valley Groundwater Basin (DWR Basin No. 3-1).

6.2.3.2 Groundwater Production

The volume of groundwater produced from the Purisima Formation by the City, SqCWD, and CWD between 1986 and 2005 is summarized on Figure D-6 (SqCWD and CWD, 2007). Total groundwater production from the Purisima Formation by these agencies has ranged from a high of 1,530 mgy (4,700 AFY) in 1988 to a low of 1,140 mgy (3,500 AFY) in 2005 (SqCWD and CWD, 2007). Current total groundwater production from the Purisima Formation is estimated to be 1,988 mgy (6,100 AFY). Of this total, the City currently produces about 167 mgy (8%), SqCWD produces approximately 1,075 mgy (54%), CWD pumps 18 mgy (1%) and private well production is estimated at about 728 mgy (37%) (Santa Cruz, 2006).

6.2.3.3 Groundwater Levels

Historical groundwater levels reported by Johnson et. al. (2004) between 1998 and 2004 show fluctuations throughout the Purisima Formation due to seasonal and annual variations in groundwater production. Figures D-9a through 9c depict groundwater levels in SqCWD Purisima well SC-9 (screened in multiple water bearing units, including Unit A) and Figures D-10a through D-10c depict groundwater levels in the City's Beltz wells. These figures demonstrate significant fluctuations in groundwater water levels occur as a result of variable groundwater production, as well as indicate the ability of the aquifer to rebound from short term increases in production.

Groundwater levels in the Purisima Formation near the neighboring SqCWD are characterized by a broad and persistent trough surrounding the SqCWD production wells. Piezometric maps for Purisima Unit A during spring and fall 2005 are shown on Figures D-7 and D-8. These two figures illustrate the trough that persists in Unit A throughout the year, centered approximately in the middle of the SqCWD's water service area (SqCWD and CWD, 2007).

Groundwater levels consistently below sea level in SqCWD wells (particularly in Unit B/C but also in Unit A) suggest that production may be "mining" freshwater in the deeper Purisima units offshore and exceeding the sustainable yield of the aquifer (SqCWD and CWD, 2007). Johnson et. al. (2004) estimates that total pumping from the

Purisima Formation is likely greater than the sustainable yield of the aquifer. Although the positions of the freshwater-seawater interfaces for the individual Purisima aquifers are largely unknown, Johnson et. al. (2004) concludes that these interfaces have probably moved inward in response to pumping.

6.2.4 Groundwater Reliability

As a coastal system, the Purisima Formation is vulnerable to seawater intrusion, especially in dry years when groundwater production typically increases by most users due to reduced surface water availability. Evidence of seawater intrusion in Beltz Well 2 (i.e., increased chloride concentrations and electrical conductivity), following the City's peak groundwater production period during the 1987-1992 drought, is indicative of this vulnerability.[16] Although all units of the Purisima Formation extend offshore, the Purisima Unit A outcrops in the vicinity of Pleasure Point in close proximity to the City's Live Oak Well System. This outcrop provides a pathway for seawater to enter the Unit A aquifer, potentially threatening the City of Santa Cruz's existing wells (SqCWD and CWD, 2007). Although pumping by the City constitutes a small proportion of the total extraction from the Purisima Formation, because the City's production wells are located close to the shoreline, they would be among the first impacted by seawater intrusion (Santa Cruz, 2006). This potential for seawater intrusion could reduce the City's dry year supply and exacerbate supply shortfalls during extended dry year periods.

To better understand how the Purisima Formation responds to pumping stresses and to detect potential seawater intrusion, the City maintains a network of 20 monitoring wells at 10 sites. Groundwater levels and water quality, including chlorides, pH, total dissolved solids, general minerals, and other constituents in the wells are measured at regular intervals (Santa Cruz, 2006). According to the groundwater management plan developed by SqCWD and CWD (2007), seawater intrusion has not been detected recently in production wells in the Purisima Formation, but elevated chloride concentrations have been detected in City's shallow monitoring wells at Moran Lake and Soquel Point (see Figure D-2), and in wells located in other water bearing Purisima Formation units operated by SqCWD.

The groundwater management plan by SqCWD and CWD concludes that the combination of historical seawater intrusion and the low groundwater elevations currently observed in the SqCWD area suggests that future seawater intrusion is likely (SqCWD and CWD, 2007). According to the City's 2005 UWMP, the threat of seawater intrusion to Purisima Unit A under the City's normal operations does not appear imminent. However, if all users continue to pump groundwater at the present cumulative rate, the City's future use of the Live Oak Well System at up to 2 mgd during peak times (as was done during the 1987-1992 drought) may potentially exacerbate conditions that could lead to seawater intrusion (Santa Cruz, 2006).

[16] Beltz Well 2 is also sometimes referred to as Beltz Wells 1 & 2 (Johnson et. al. 2004).

6.2.5 Agreement for Groundwater Management

The City has not prepared a groundwater management plan; however, as discussed in Section 6.2.3 above, a groundwater management plan has been prepared by neighboring water districts that extract water from the Purisima Formation in adjacent groundwater basins. This plan was originally prepared by SqCWD and CWD in 1996 and updated in 2007. In 2005, the City entered into an agreement for groundwater management of the Soquel-Aptos area groundwater, along with the SqCWD, CWD, and the County of Santa Cruz (see Appendix E). The goals of the agreement are to establish common basin management objectives, undertake joint research projects, and improve interagency coordination to assure the safe production and protect the quality of the underground resource.

In March 2006, the SqCWD released its Well Master Plan. The Well Master Plan calls for the addition of the O'Neil Ranch well that will allow for more intense pumping of the western Purisima aquifer and allow SqCWD to decreases is pumping from the Aromas Red Sands and coastal Purisima formation. In a letter from the City's groundwater hydrogeologist, the City was advised that SqCWD's continued increase in pumping within the western Purisima, which has occured since the early 1990s, as already noticeably reduced the availability of groundwater stored in the aquifer from which the City draws its water. This reduction in available groundwater is evidenced by a decline in static groundwater levels, which are roughly half of what they were in the mid-1990s before the establishment of SqCWDs well facilities in the Capitola area (Hopkins, 2007). The City was advised that production of up to 2 mgd from its coastal well field may no longer be viable (Hydrometrics, 2007; Hopkins, 2007) during peak periods. As a result of this finding, the City identified sites for potential new wells further inland. (Santa Cruz, 2011a).

In 2009, the City entered into an option agreement to purchase a parcel of land on Research Park Drive, to allow completion of a new inland well. It also continued to work toward a cooperative pumping agreement with SqCWD that would enable sharing of the western Purisima groundwater resource (Santa Cruz, 2011a). By late 2010, however, efforts to formulate a cooperative agreement with SqCWD reached an impasse with the circulation of SqCWD's draft EIR for the Well Master Plan. The City concluded that implementation of the Well Master Plan could pose a significant threat to the City's coastal well field by intercepting groundwater flow (Santa Cruz, 2011a). At the City's urging, SqCWD revised its mitigation plan to include monitoring and mitigation of impacts to the City's coastal well field. However, SqCWD only committed to mitigate for potential impacts from the Well Master Plan if the City did not exceed an average pumping rate of approximately 520 AFY (approximately 0.8 mgd over seven months) or a drought year production rate of 645 AF (approximately 1.0 mgd over seven months). The Final EIR was certified 22 February 2011. The City continues to pursue completion of an inland well to supplement its diminished well capacity and maintain its ability to produce up to 2 mgd during peak periods and a total of 645 AFY in drought conditions (Santa Cruz, 2011a).

7.0 WATER SUPPLY RELIABILITY

This section provides an overview of issues facing the City related to its water supply system reliability and operation during dry years, followed by a quantitative estimate of the City's water supply during normal hydrologic conditions, single dry years, and multiple dry years. The latter part of this section briefly discusses reliability issues related to the City's existing water rights and entitlements. Information for Sections 7.1, 7.2, and 7.3 are largely taken from the 2005 UWMP.

7.1. OVERVIEW OF WATER SYSTEM RELIABILITY DURING DRY YEARS

The primary water management issue currently facing the City's water supply system is the lack of adequate water supply during droughts. This shortage stems from two factors: (1) a wide range in the yield of surface water sources from year to year, and (2) limited surface water storage capacity. Threats of seawater intrusion into the Purisima Formation, discussed above in Section 6.2.4, also could exacerbate the City's dry year supply shortages.

In normal and wet years when rainfall and runoff are abundant, base flows in the North Coast creeks and springs, and San Lorenzo River are restored by winter rains, and Loch Lomond Reservoir is typically replenished to full capacity (Santa Cruz, 2006). The water system, however, is vulnerable to shortage in dry years when the North Coast and San Lorenzo River sources run low.

In single dry years, the system relies heavily on water stored in Loch Lomond Reservoir to satisfy demand, which draws down the reservoir level lower than usual and depletes available supply in the event of a subsequent dry year. As discussed in the following sections, in multiple dry years or critical drought conditions, very low surface water flows in North Coast creeks and springs, and the San Lorenzo River combined with depleted storage in Loch Lomond Reservoir reduces the City's available supply to a level that cannot support water demands, even with an increase in groundwater production. Compounding the situation is the need to reserve some amount of storage in Loch Lomond Reservoir to meet the following year water demands in the event drought conditions continue (Santa Cruz, 2006). The decision about whether the City's supplies are adequate for a given dry year are, thus, dependent not just on how much water is available in that year from the City's sources of supply, but also on the level of demand expected to be exerted by customers over the coming season and management's comfort level with predicted carry over storage (Santa Cruz, 2004).

7.2. PROJECTED WATER SUPPLY DURING NORMAL, SINGLE DRY, AND MULTIPLE DRY YEARS

Water Code Section 10910

(c) (2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in

preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.

The City's anticipated water supplies for normal, single dry, and multiple dry years between 2005 and 2030 were projected in the 2005 UWMP. Since the duration of the water supply projections included in the 2005 UWMP meet the requirements of a WSA pursuant to SB 610, information from the 2005 UWMP is used herein to evaluate the adequacy of the City's water supplies to meet future demand. Current and projected water supplies listed in the 2005 UWMP are summarized in Table 4 (Santa Cruz, 2006).

7.2.1 Normal Year Supply

During normal hydrologic years through 2030, the City expects to have a total of 4,314 mgy of reliable water supply available for use annually. This supply includes 1,077 mgy from the North Coast creeks and springs, 2,008 mgy from the San Lorenzo River, 1,042 mgy from Loch Lomond Reservoir, and 187 mgy from the Live Oak Well System.

7.2.2 Single Dry Year Supply

Supply reliability during a single dry year was estimated in the 2005 UWMP based on the amount of water that was available to the City in 1994, the most recent single dry year on record. The City's cumulative water supply is expected to be reduced from a normal year of 4,134 mgy to approximately 3,800 mgy during a single dry year (Santa Cruz, 2006). This supply represents a 12%reduction from the City's normal year available supply. As summarized in Table 4, the City will rely more heavily on water supplied by the San Lorenzo River and the Live Oak Well System during a single dry year, as production from these sources are planned to increase by 5% and 60%, respectively. Conversely, water from the North Coast creeks and springs and Loch Lomond Reservoir are expected to be reduced by 54% and 14%, respectively, compared with a normal year.

7.2.3 Multiple Dry Year Supply

Supply reliability during a multiple dry year period was estimated in the 2005 UWMP based on the hydrologic record for 1976-1977. It is estimated that the supply available to the City during the second year of a two-year drought similar to what was experienced in 1976 and 1977 would be approximately 2,700 mgy, 37% less than the normal year supply. The multiple dry year supply assumes 72%, 10%, and 81% less water from North Coast creeks and springs, the San Lorenzo River, and Loch Lomond Reservoir, respectively, and 114% increase in groundwater production from the Live Oak Well System (see Table 4; Santa Cruz, 2006).

7.2.4 Peak Season Reliability

The reductions in the City's water supply during single and multiple dry years reflect the average annual volume of available water and do not account for the City's need to meet peak demand during shorter intervals. Increased demand and constraints on the City's water rights and water storage facilities contribute to greater supply shortages during summer months.

According to the 2005 UWMP, the available water supply during the second year of a multiple dry year period is currently estimated to be just over one-half of the City's peak season water demand (Santa Cruz, 2006). As a result, customers will experience supply cutbacks or curtailments during certain times of the year that are greater than the average annual curtailment for the entire year. For example, the 2005 UWMP estimated that if the City were to experience a multiple dry year event in 2005, the City's total supply for that year would be 31% less than its total demand. However, the "peak season deficit" would be as high as 46%, meaning that customers would be required to reduce water use by 46% during certain times of the year even though over the entire year their total curtailment would only be 31%. In the event the City is unable to increase groundwater production during dry years to meet peak demand, the curtailment could be even more severe.

Although this peak season analysis is not required by SB 610, and therefore not evaluated in this WSA, it is important to understand that the annual comparison of supply and demand shown above does not reflect the maximum supply cutback that will be experienced by customers throughout the year. The City's approach to meeting the peak season deficit is laid out in its *Water Shortage Contingency Plan* (Santa Cruz, 2009a).

7.3. Reliability Issues Associated with Water Rights and Entitlements

Uncertainties exist with regards to an Endangered Species Section 10 permit and habitat conservation plan ("HCP") for all of the City's surface water diversions, a water rights conformance proposal to the SWRCB related to Newell Creek diversions, and an application to extend water rights diversions from the Felton Diversion along the San Lorenzo River. These uncertainties have the potential to reduce the City's water supply, as discussed in Sections 7.3.1 through 7.3.3.

7.3.1 Section 10 Permit

The City is presently undertaking a Section 10 Permit Program pursuant to the Federal Endangered Species Act ("FESA") and Section 2081 of the California Endangered Species Act ("CESA"). Pursuant to federal and state law, parties that engage in activities that are likely to result in a "take" of threatened or endangered species are required to obtain an "incidental take" permit and prepare and implement a HCP. Because the City's surface water diversions reportedly result in what is referred to as a "take" as defined by FESA and CESA, the City must obtain incidental take permits and implement an HCP in order to minimize (and mitigate) the effects of the City's water management activities on the pertinent listed and other sensitive species (Santa Cruz, 2006; Santa Cruz, 2009d).

The permit and plan must be approved by the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration ("NOAA") Fisheries.

The conservation measures associated with the HCP may result in changes in the City's operation and management activities and potentially affect the timing and use of all components of the City's existing water supply (Santa Cruz, 2010a). However, the effect, if any, on the City's water supply is yet to be determined. At this time there has been no tentative, let alone final, agreement on the strategies by which all of the life stages of all of the threatened or endangered species potentially present in areas of the City's water supply operations will be protected. A draft HCP has not yet been prepared, and tentative agreements on operations have not been reached. Nor has the City received any written communication from the resource agencies regarding the amount of any potential reductions in the City's water supplies due to implementation of the HCP. However, the City has interim Stream Alteration Agreements with the California Department of Fish and Game ("DFG") that have resulted in voluntary fish releases from Liddell Spring, Majors Creek, and Laguna Creek, and the City continues to conduct in-stream analyses of flow regimes as they relate to the life stages of the threatened and endangered species in all of those water bodies (Santa Cruz, 2010a).

It is not known how much longer it will take to finalize not just the HCP process but also the process by which the City receives a Section 10 Permit. It is also very uncertain how much water will be needed for habitat conservation, not only in quantity, but seasonally, which is important as it relates to water supply availability. With regards to timing, the City's studies have been expanded from North Coast streams to include new surveys in the San Lorenzo River and Newel Creek due to their importance in Coho salmon recovery efforts (Santa Cruz, 2010a). Additionally, there are structural-type remedies that are beneficial that do not involve release of water, (e.g. in-stream placement of woody structures and lagoon management).

7.3.2 Water Rights Conformance Proposal

As described above, the City is also in the process of developing and submitting filings to the SWRCB to rectify a historical deficiency in the City's water rights on Newell Creek. For example, SWRCB does not allow the City to divert water from Newell Creek directly to the Graham Hill WTP. Instead, a 30-day "last-in-first-out" restriction prohibits the withdrawal of water from Loch Lomond Reservoir until 30 days following the most recent diversion into the reservoir from the same source (Gary Fiske & Associates, 2003). Based upon the original filings, which were thought to be adequate due to the anticipated use of Loch Lomond Reservoir, these water rights allow only for diversion to storage and not for direct diversion, (i.e., into the City's water supply distribution system). This circumstance makes the water supply technically unavailable as a source for City use during times when, for example, the reservoir is receiving more inflow from Newell Creek than is released downstream. The water rights filings by the City are intended to correct this historical deficiency and bring the water rights and current operations into conformance.[17] The proposed direct diversion rights are limited to the same volume of

[17] Official notice of the City's petitions to the SWRCB are included in Appendix C, from October 2008.

water, purposes and places of use as the existing rights such that they match the existing rights to the extent possible while allowing direct diversion, consistent with historic practice (Santa Cruz, 2006).

7.3.3 Felton Diversion Water Rights Time Extension Project

Pursuant to the City's permits to divert water at Felton for storage in Loch Lomond Reservoir, the City must put all 3,000 AFY (approximately 977 mgy) of its entitlement to full beneficial use by December 2006, in order to maintain its appropriative rights to the water. While the City has been diligently putting water from the Felton Diversion to beneficial use over the years, to date the City has used just half the permitted amount on an annual basis. In the future, however, the City expects to need the full 977 mgy and, therefore, has filed petitions with the SWRCB to extend the time allowed for putting the full 977 mgy to beneficial use. The water supplied from the Felton Diversion is considered critical to meeting the City's projected future demand, in particular during operational outages, changes in operations in response to environmental concerns, and during dry years (Santa Cruz, 2006). This petition is currently being protested by the California DFG and is awaiting decision from the SWRCB (Santa Cruz, 2010a).

Three different parties filed protests to this application and to the City's petition for an extension of time to go to full appropriation on Felton Diversion: the Marine Corp Base, Camp Pendelton ("CPEN"); the California DFG; and National Marine Fisheries Service ("NMFS") (Santa Cruz, 2010a). The CPEN protest raised the legal issue of whether a water right holder or applicant may petition to the SWRCB to change an application, permit or license to allow for direct diversion when the current application, permit or license is for diversion to storage. The City appealed to the SWRCB that the public interest and the law supports the use of the change petition process to add direct diversion to its San Lorenzo River and Newell Creek Water Rights. In December 2009, the SWRCB affirmed the legitimacy of the application for a change, finding that it has the authority to approve such a change, and denied the CPEN Petition for Reconsideration (Santa Cruz, 2010a).

The City has been granted two other such extensions of time – in the mid-1980s and again in the mid-1990s after negotiations with California DFG and execution of a Memorandum of Agreement that modified the manner in which the City operated the facility (Santa Cruz, 2010a). The City also is working with DFG and NOAA Fisheries to consider how the facility could possibly be used to aid the Coho Recovery Plan enhancement strategies (Santa Cruz, 2010a).

7.4. Live Oak Well System Reliability

As discussed in Section 6.2, the ability to produce groundwater from the Live Oak Well System in drought years, and potentially all years, may be compromised by continued deterioration of groundwater basin conditions due to region-wide pumping of the Purisima aquifers and resulting seawater intrusion (Santa Cruz, 2006). The City is currently in the process of pursuing installation of replacement wells to restore their original capacity of 2 mgd (Santa Cruz, 2010a).

7.5. CLIMATE CHANGE

Increasing attention is being paid to the issue of global climate change and its potential effects on existing water resources and supplies. However, studies prepared to date by the State of California do not provide sufficient or specific information with respect to predicted effects on coastal water supplies to allow the City to reach a reliable conclusion of how global climate change may affect the City's water supplies and specific studies have not been conducted by the City to address this issue.

General studies prepared by the State of California indicate that climate change may seriously affect the State's water resources as a result of temperature increases, changes in timing and amount of precipitation, and sea level rise that could adversely affect coastal areas (DWR, July 2006). Trends in precipitation change are hard to determine, but worldwide precipitation is reported to have increased about 2% since 1990. Precipitation and stream flow records indicate an increase in precipitation, and increased precipitation could benefit water supplies and improve environmental conditions in some areas, especially where water supply diversions have significantly affected stream flow (DWR, July 2006).

Global climate models vary considerably in projecting precipitation patterns, and climate change could potentially alter California's historical precipitation patterns. Simulations conducted by the State of California predict drier conditions in the future, although at the same time there is continued risk from intense rainfall events that can generate more frequent and/or more extensive runoff (California Natural Resources Agency, 2009b). While many of the state reports have focused on changes on Sierra snowpack and other major California water sources, recent reports indicate that warming temperatures, combined with changes in rainfall and runoff patterns will exacerbate the frequency and intensity of droughts. Although average annual precipitation may not change, more intense wet and dry periods are anticipated (DWR, 2008). Regions that rely heavily upon surface water (i.e., rivers, streams, and lakes) could be particularly affected as runoff becomes more variable (DWR, 2008).

Coastal watersheds such as the one above Santa Cruz do not currently receive much snow, however, it is possible that they could experience changes in frequency and amounts of precipitation, which could affect the amounts of water available for diversion and storage in the City's existing facilities. Another study indicates that sea level is expected to rise an additional 22 to 35 inches by the end of the century (California Climate Change Center, 2006). Generally, there are two ways it is thought that the Santa Cruz water supply system may be impacted: 1) sea level rise may create increase the likelihood of groundwater contamination from seawater intrusion; and 2) rainfall events would likely be heavier and less frequent, thus affecting storage in Newell Creek Reservoir.

The City has acknowledged that climate change may impact City water supplies that are largely dependent on surface water flows. To the extent that rain events are more intense but less frequent, the base flow in streams and rivers from which the City diverts could

change. Predictions regarding the extent of climate change on water resources are dependent on many variables. Models are being developed to assist water utilities in looking at climate change variables in their water planning efforts, but the timing and quantification of potential climate change effects are too speculative to predict with any certainty at this time (see Water Utility Climate Alliance, 2010). However, the City is working with other Santa Cruz County water agencies to look at the models that are being developed and will use the information during the next update of the City's UWMP.

8.0 COMPARISON OF WATER SUPPLY AND DEMAND

Water Code Section 10911

(c) The city or county may include in any environmental document an evaluation of any information included in that environmental document provided pursuant to subdivision (b). The city or county shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses. If the city or county determines that water supplies will not be sufficient, the city or county shall include that determination in its findings for the project.

Comparisons of the City's projected water supply and demand for normal hydrologic years, single dry years, and multiple hydrologic dry years are presented in Tables 7, 8, and 9, respectively. The projected water demand consists of the existing water demand and the incremental demand that may result from development in the City's water service area (including demand associated with the Project). Two estimates of the projected water demand are provided to take into account the uncertainty associated with the existing water demand of the City's service area.

Water supply deficits shown in the tables are annual averages. Actual cutbacks or demand curtailment levels are likely to vary throughout the year, with peak season deficits being the greatest. Section 9.0 discusses City strategies to address water supply deficits.

8.1. NORMAL YEAR SUPPLY VERSUS DEMAND

Notwithstanding the supply uncertainties described above, the City's available water supply during normal hydrologic years is assumed to remain constant at 4,314 mgy between 2010 and 2030. The water demand within the City's service area is estimated to range from 3,522 mgy to 3,993 mgy in 2010 and from 4,046 mgy to 4,537 mgy in 2030. As summarized in Table 7, this supply appears sufficient to meet the projected demand through about the year 2020.

After 2020, the City's water supply during normal hydrologic years may not be sufficient to meet the development envisioned in the General Plan 2030 and other development that occurs within the City's water service area. If water demand is consistent with *Existing Water Demand Estimate 1*, the City's demand will be 223 mgy greater than the available normal year supply in 2030. This unmet demand represents an average annual deficit of approximately 5%. If water demand by existing customers is consistent with *Existing Water Demand Estimate 2*, the City will have sufficient normal year supply to meet the projected demand in 2030.

8.2. SINGLE DRY YEAR SUPPLY VERSUS DEMAND

As shown in Table 8, the City's water supply during a single dry year may not be sufficient to meet the City's projected demand through 2020, and is not sufficient to meet the projected demand from 2020 through 2030. The City may experience an annual

average deficit of up to 12% between 2010 and 2020, and up to 16% by 2030 during a single dry year.

8.3. MULTIPLE DRY YEAR SUPPLY VERSUS DEMAND

Even in the absence of any growth, the City's water supplies are insufficient to meet existing water demands in a multiple dry year period. Estimated supply deficits range from 23% to 32% in the second year of a multiple dry year period with existing water demand. With the Project and other projected growth, the magnitude of the estimated water supply deficit in the second year of a multiple dry year period ranges from an annual average of 30% to 38% between 2010 and 2020, and 33% to 40% by 2030. Table 9 summarizes the annual average water supply deficits during multiple dry years between 2010 and 2030. Actual peak season deficits experienced in a severe drought would be substantially greater than the annual average deficits identified above.

9.0 ADDITIONAL POTENTIAL WATER SUPPLIES

Water Code Section 10911

(a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:

(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.

(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.

(3) Based on the considerations set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to be able to acquire additional water supplies.

In 2003, the City produced an *Integrated Water Plan* ("IWP") that evaluated various water supply strategies (Gary Fiske & Associates, 2003). The IWP identified three preferred strategies for managing the City's water supply and demand to address the deficit during dry years. These strategies consist of: (1) water conservation, (2) curtailment of water use up to 15% during drought conditions, and (3) seawater desalination.

The City has made progress towards implementing these strategies. It was estimated in the 2005 UWMP that conservation measures had reduced water use by 153 mgy in 2005; due to the current economic conditions it is unknown what portion of the current demand reduction is due to conservation efforts. The City completed a one-year pilot desalination project in 2009 and has begun environmental review of a full-scale regional desalination plant. The City has also since adopted an updated *Water Shortage Contingency Plan* that establishes the procedures and actions to achieve the up to 15 percent cutback in system-wide demand envisioned in the IWP (Santa Cruz, 2009a).

The three strategies address supply shortfalls for current customers during dry years. The strategies do not address water supply shortfalls that will result from development due to the Project and development that will occur elsewhere within the City's service area. For example, the regional desalination plant is designed to alleviate dry year supply shortfalls for existing customers, but could be expanded to provide water supply to meet water demand resulting from future growth. The timing and need for additional supply will depend largely on three factors: (1) the City's policies regarding land use, housing, and economic development to be included in the General Plan 2030, (2) amount of growth at

UCSC, and (3) actual increase in water use that accompanies the allowed growth. Matters related to expansion of the desalination plant were postponed for consideration by future decision-makers on as as-needed basis (Santa Cruz, 2006).

9.1. WATER CONSERVATION

One major goal of the IWP was to achieve the maximum practical water use efficiency through water conservation. Thus, as part of the IWP efforts, the City prepared a *Water Conservation Plan* (Gary Fiske & Associates, 2000) to accomplish future water conservation within the City's service area.[18] The goals of the *Water Conservation Plan* were to: (1) evaluate which conservation programs were most cost-effective and best suited to the City's customer base; (2) identify the potential water savings those programs could achieve and the estimated costs of implementation, and (3) develop an action plan to guide the City's efforts in water conservation over the next ten years. Estimated annual costs of implementing the water conservation programs ranged between approximately $600,000 and $1,000,000 (Gary Fiske & Associates, 2003). Funding for the City's water conservation program is budgeted in the City's Water Fund each year, which is supported by water rate revenues. A total of $788,000 is currently budgeted toward water conservation programs for the 2010-2011 fiscal year.

The programs in the *Water Conservation Plan* apply to all major water customer categories and include financial incentives, new regulations, water audits, and distribution of water saving devices. Specific conservation programs in the *Water Conservation Plan* include:

- Ultra low flow toilet ("ULFT") rebates
- High efficiency clothes washer rebates
- Conservation kit distribution
- Plumbing fixture retrofit ordinance
- Residential water surveys
- Apartment building sub-meters
- New construction ordinance
- Commercial ULFT rebates
- Commercial, Industrial and Institutional ("CII") water surveys
- Large landscape water use review
- Parks water use review
- Large landscape budget-based rates

[18] Conservation measures for UCSC that were identified by MWM (2007) in the *UC Santa Cruz Water Efficiency Survey* include only minimal overlap with the conservation program described in the *Water Conservation Plan* (Gary Fiske & Associates, 2000).

Many of the programs included in the *Water Conservation Plan* overlap with conservation programs developed by the California Urban Water Conservation Council ("CUWCC") *Memorandum of Understanding Regarding Urban Water Conservation in California ("MOU")*, which was signed by the City in 2001. The City has established programs to implement all fourteen best management practices contained in the MOU and continues to implement the *Water Conservation Plan* programs to achieve the full water savings estimated in the plan (Santa Cruz, 2006).

The City has also implemented several other water conservation programs and initiatives not included in the *Water Conservation Plan* or covered in the MOU. The Water Conservation Act of 2009 requires that the state of California reduce its per capita water use 20% by the year 2020 and that individual water agencies develop specific per capita water use targets based on guidelines and methodologies set forth in the Act. Preliminary calculations of the City's per capita baseline water use, pursuant to the Water Conservation Act of 2009, indicate that the City's current per capita water use is below the threshold of 100 gallons per capita per day and therefore further reductions in water use will not be required within the City's service area by the Act. While it is not anticipated that additional water conservation will be required by the state, the City continues to expand its program as new technologies emerge and opportunities arise to reduce per capita water use.

9.2. CURTAILMENT

Based upon the results of the *Water Curtailment Study* (Gary Fiske & Associates, 2001), the City decided it will not attempt to meet full demand in drought years when surface water supplies fall short. Instead, the City intends to supply 85% of normal peak season demand during drought years, such as 1976 and 1977. The remaining 15% of normal peak season demand will be curtailed through temporary watering restrictions or rationing that target landscape irrigation and other outdoor uses and would be in addition to the water saved on a long-term basis through conservation programs (Santa Cruz, 2006).

The IWP assessed combinations of needed additional water supply sources in terms of three curtailment scenarios, ranging from no curtailment to a 25% system-wide curtailment in water use under worst-case drought conditions. According to the 2005 UWMP, the decision to select 15% was based primarily on the fact that, while only a slight difference exists in overall cost between the 15% and 25% scenarios, the hardship to residential and business customers, as well as the frequency of cutbacks, between these two curtailment levels was much more substantial. The decision also recognized that per capita water use is already very low and the ability of customers to make such cutbacks would become more difficult or costly over time because of the efficiency achieved through implementation of conservation program (Santa Cruz, 2006).

Costs related to curtailment during dry years are assessed in the City's *Water Shortage Contingency Plan* (Santa Cruz, 2009a). This plan estimates that potential additional staff

positions needed during a curtailment level of 15% would cost approximately $113,000 (Stage 2: Water Shortage Warning). Shortages that curtail water use by greater than 15% would require additional funds. In addition to increased staffing costs, curtailment would result in revenue losses for the City due to decreased customer purchases of water. Revenue losses from a 15% curtailment are estimated to be on the order of $1.65 million per year. Options for funding additional staff and recovering lost revenue include:

- Seeking funding from the City's Water Department's Rate Stabilization Fund (currently $2.2 million),
- Deferring planned capital improvements, and
- Considering possible rate adjustments or surcharges.

Given that the City anticipates occasional curtailment of up to 15%, the *Water Shortage Contingency Plan* recommends that the Rate Stabilization Fund be maintained at least at a level that would fully mitigate expected revenue losses associated with that level of curtailment. The fund presently will fully cover revenue losses of a 15% curtailment lasting one year (Santa Cruz, 2009a).

9.3. DESALINATION

9.3.1 IWP Recommendation for Desalination

Several possible options for development of alternative water supplies were evaluated by the City as part of the IWP, including drilling more wells, upgrading the North Coast system and treatment facilities, and exchanging groundwater with recycled wastewater for agricultural use on state park lands north of the City. The IWP recommended a seawater regional desalination plant as an alternative water supply in times of drought (Santa Cruz, 2006).

9.3.2 Establishment of a Regional Desalination Cooperative

In response to the City Council's direction to pursue the IWP recommendation, a cooperative was established by the City and SqCWD to evaluate a potential regional desalination plant in Santa Cruz. The cooperative, known as scwd^2, is responsible for carrying out desalination efforts identified in the IWP and SqCWD's *Integrated Resources Plan* (ESA, 2006).

The IWP envisions constructing a seawater intake using an existing abandoned wastewater outfall or through other alternatives[19], building a new desalination plant with a capacity of producing water at a rate of 2.5 mgd or approximately 500 mg over a seven-month long peak season in a drought year, and installing pipelines and pumping stations to deliver treated water to the distribution system[20] and to convey seawater concentrate to

[19] Several seawater intake approaches in addition to using this existing abandoned wastewater outfall are currently being evaluated (Santa Cruz, 2010c).

[20] IWP contemplated delivering water to the Bay Street Reservoir for blending, however this alternative has since been eliminated (Santa Cruz, 2010c).

the City's wastewater outfall facilities, where it would be blended with municipal wastewater flows and discharged via a deep ocean outfall (Santa Cruz, 2006).

The City would use the desalination plant only during dry years when its existing water supply falls short (Santa Cruz, 2006). SqCWD may use the desalination plant during both normal and dry years. The additional water provided by desalination would allow SqCWD to reduce groundwater over-pumping (Santa Cruz, 2010c).

9.3.3 Progress Made by scwd[2]

Several studies have been completed, are currently underway, or are planned that will provide data and recommendations for the full-scale regional desalination plant. These studies include:

- Pilot Plant Program (completed April 2010);
- Watershed Sanitary Survey (completed March 2010);
- Intake Studies:
    - Entrainment Study (completed December 2010);
    - Off-shore Geological Survey (completed May 2010);
    - Intake Feasibility Study (ongoing, completion expected April 2011);
- Energy Minimization and Greenhouse Gas Reduction Study (ongoing);
- Environment Impact Report (ongoing);
- Seawater Reverse Osmosis ("SWRO") Desalination Facility Design (ongoing);
- SWRO Intake Facility Design (engineering firm hired September 2010, completion of preliminary design expected spring 2013); and
- SWRO Infrastructure Design (RFP tentatively planned for spring 2013).

The IWP Program EIR for the regional desalination plant was approved by the City Council in 2005, and a pilot program was implemented using funds provided by the City, SqCWD, and DWR Proposition 50 grant money (Santa Cruz, 2009b). Grant funding received for the pilot plant totaled over $2.5 million, with approximately $2 million awarded by DWR for the pilot plant study and $611,000 awarded by the SWRCB for the intake study.

9.3.4 Anticipated Permits

Various federal, state, and local agencies will need to be obtained, and a comprehensive CEQA environmental review will need to be performed before approval to construct a full-scale desalination plant is obtained. As part of the CEQA environmental review, the City has initiated preparation of an EIR to identify potential effects that the proposed desalination plant is likely to have on the environment. The EIR will also propose ways in which these environmental effects might be minimized or mitigated (Santa Cruz,

2009b). A complete list of the anticipated permits required for the desalination plant is provided in Appendix F.

9.3.5 Anticipated Schedule

The City is currently under contract for the design of a regional desalination plant. Scoping sessions were held in December 2010 to discuss environmental issues related to the plant and the scope of the EIR to be prepared. Environmental review for the full-scale plant is expected to extend through 2012 and plant construction is anticipated to begin shortly thereafter. Major design and construction tasks, with the anticipated preparation dates shown in parentheses, are listed below (Santa Cruz, 2010c):

- Intake Design (2011-2013)
- Intake Construction (2013-2015)
- Full-scale Plant Design (2010-2012)
- Full-scale Plant Construction (2012-2015)
- Infrastructure Design (2011-2012)
- Infrastructure Construction (2013-2014)

9.3.6 Estimated Cost and Funding for a Regional Desalination Plant

The current estimated cost for design, permitting, property acquisition, and construction of the regional desalination plant between 2010 and 2018 is approximately $116 million (Santa Cruz, 2011b). The City anticipates that the City will share these costs with SqCWD. City funds are expected to come from the sale of bonds. The City also will evaluate the potential for future grants from the state for part of the construction of the regional plant; however, at present, no grant funding has been obtained for the plant (Santa Cruz, 2010c).

9.4. Need for Future Water Supply

As discussed in Section 8.0, the projected water demands associated with development within the City's service area is greater than the projected water supply, particularly in a dry year and multiple dry years. The City's current strategies for water conservation, curtailment, and desalination outlined in the IWP are designed to meet existing dry year water supply deficits. The City will need to establish additional water supply or impose more stringent curtailment during dry years in response to the larger water demand attributable to growth. The City may face increased dry year supply shortfalls in proportion to the amount of growth that is experienced in the next 20 years. The City may even face normal year supply shortfalls at some point between 2020 and 2025 if the existing water demand is consistent with *Existing Water Demand Estimate 1* and development envisioned in the General Plan 2030 occurs as assumed in Section 4.3.

Options for expanding the water supply to meet increased demand due to growth include:

- Expanded desalination capacity in 1 mgd increments,
- Water recycling,
- Groundwater recharge,
- Reservoir expansion,
- Aquifer storage and recovery, and
- Off-stream storage.

These and other supply alternatives may need to be evaluated to avoid increased dry year curtailment because of new development in the City's service area, and to augment the City's normal year water supply if the combination of existing water demand and future water demand attributable to new development is greater than can be accommodated by the City's existing normal year water supply.

10.0 CONCLUSIONS

Based upon the updated water demand projections presented herein, the City's water supply for a normal hydrologic year is sufficient to meet the existing water demand and the incremental water demand of the Project through about the year 2020. After 2020, the City's normal water supply may not be sufficient to meet the projected water demand. The City's demand may be 223 mgy greater than the available normal year supply in 2030. This unmet demand would represent an average annual deficit of approximately 5%.

The City's water supply during dry years is unlikely to meet the existing water demand and will not meet the incremental demand of the Project. An annual average deficit of 5% may exist between the City's water supply during a single dry year and the existing water demand. If development associated with the Project and elsewhere within the City's water service area also are considered, then an annual average deficit of up to 12% between 2010 and 2020, and up to 16% by 2030 may be experienced during a single dry year. Annual average deficits are greater for multiple dry year periods. The annual average deficit between the City's water supply during a second dry year and existing demand is estimated to be 23% to 32%. This deficit increases to 33% to 40% by 2030 if planned development also is taken into account.

Further, the annual average deficits anticipated during dry years do not reflect curtailments associated with peak season demand, which are likely to be significantly greater than the annual average deficits. Both the annual average deficits and peak season curtailments could increase if the City's water supply is restricted by water right and entitlement issues facing the City and continued deterioration of groundwater basin conditions due to region-wide pumping of the Purisima aquifers and resulting seawater intrusion.

The City has identified three preferred strategies for managing its water supply and *existing* water demand to address deficits during dry years. These strategies consist of: (1) water conservation, (2) curtailment of water use up to 15% during drought conditions, and (3) seawater desalination. As of the 2005 UWMP, the City has implemented conservation measures that have reduced water use by 153 mgy; due to the current economic conditions it is unknown what portion of the current demand reduction is due to conservation efforts. The City also completed a one-year pilot desalination project in 2009 and has begun environmental review of a full-scale regional desalination plant that has the capacity to produce water at a rate of 2.5 mgd or approximately 500 mg over a seven-month long peak season in a drought year.

Construction of the regional desalination plant is anticipated to be completed by 2015. The City and SqCWD will jointly operate the desalination plant. The City intends to use the desalination plant only during dry years when its existing water supply falls short. Through implementation of water conservation measures and augmentation of the water supply by the desalination plant, the City will be able to reduce the peak season deficit in drought years, such as 1976 and 1977, from 46% to 15%. The City's approach to

meeting the peak season deficit is laid out in its *Water Shortage Contingency Plan* (Santa Cruz, 2009a).

The City has not adopted an approach to address water supply shortfalls that will result from development due to the Project and development that will occur elsewhere within the City's service area. The strategies intended to alleviate dry year supply shortfalls associated with *existing* demand could be adapted to accommodate future growth. The timing and need for additional supply will depend largely on three factors: (1) the City's policies regarding land use, housing, and economic development to be included in the General Plan 2030, (2) amount of growth at UCSC, and (3) actual increase in water use that accompanies the allowed growth.

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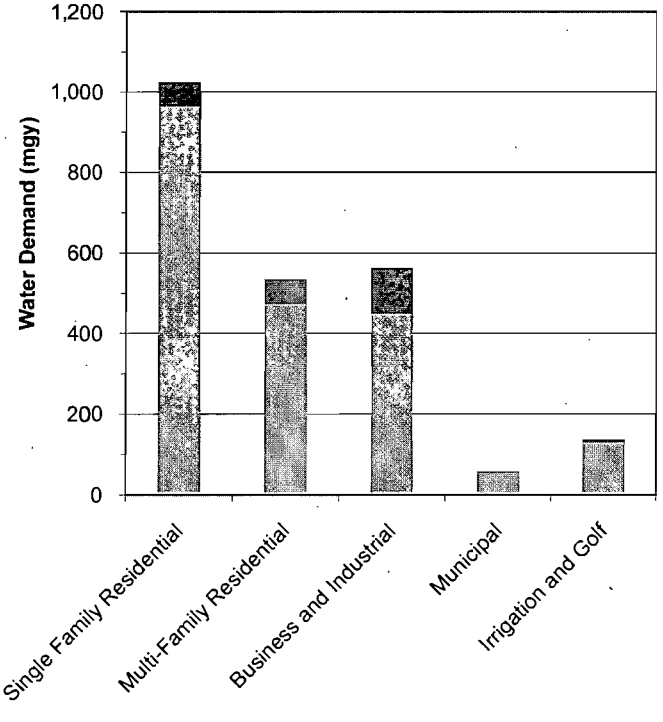
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Tables

Table 1
Projected Water Demand Within Project Area
City of Santa Cruz, California

Category	Water Demand (mgy) (a)		
	EWD Estimate 1 (Project Area)	EWD Estimate 2 (Project Area)	Incremental Water Demand from General Plan 2030 Buildout (Project Area)
Single Family Residential	965	839	60
Multi-Family Residential	472	408	64
Business and Industrial	448	425	115
Municipal	56	54	2
Irrigation and Golf	128	115	10
Totals	**2,069**	**1,843**	**251**

Projected Water Demands in Project Area (EWD Estimate 1)



Projected Water Demands in Project Area (EWD Estimate 2)

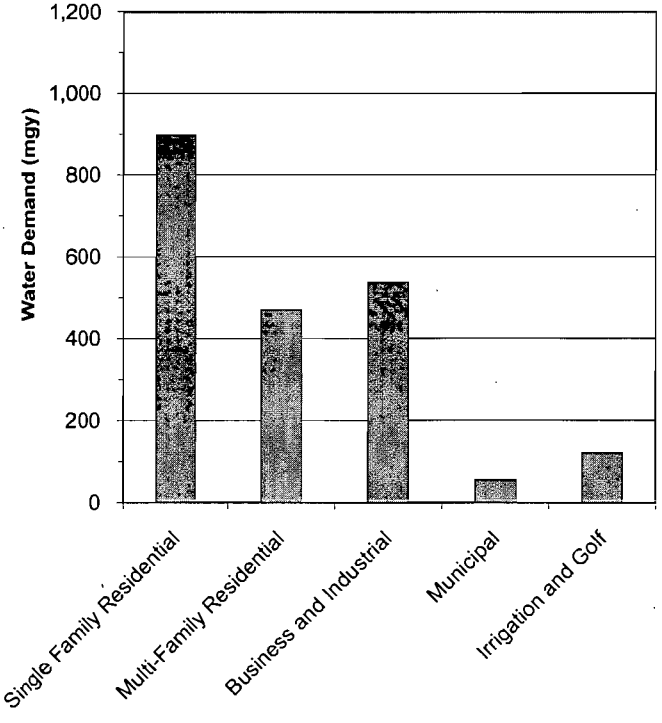


Table 1
Projected Water Demand Within Project Area
City of Santa Cruz, California

Abbreviations:

EIR - Environmental Impact Report
EWD - existing water demand
LRDP - Long Range Development Plan
mgy - million gallons per year

Note:

(a) EWD estimates for all customer categories are based on two time periods, due to the uncertainty in estimating current water use described in Section 4.1. EWD estimate 1 is based on water use from 1999 through 2004; EWD estimate 2 is based on water use from 2007 through 2008.

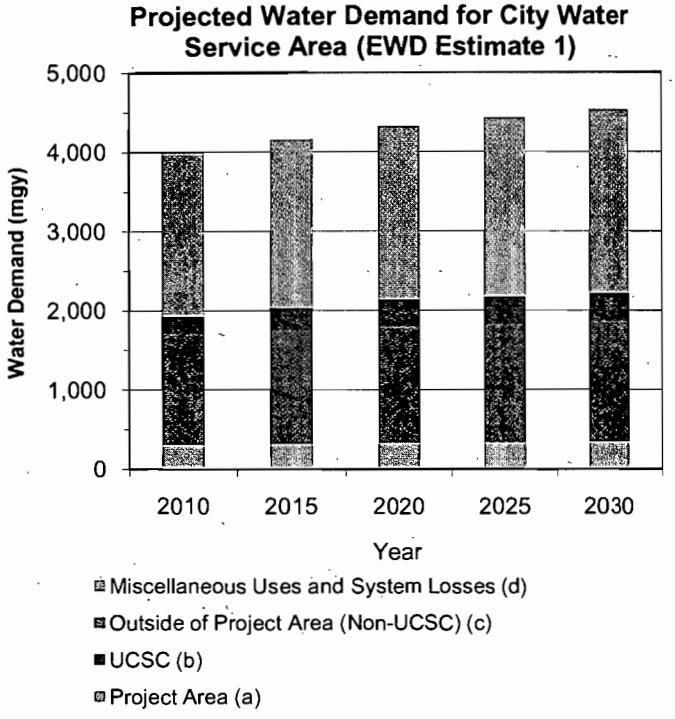
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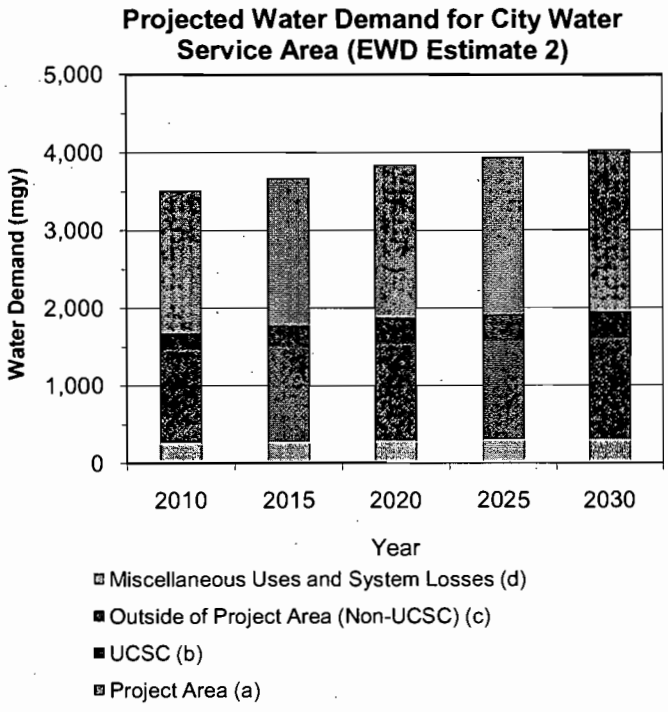
1 Santa Cruz, 2010. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

Table 2
Projected Water Demand in City Service Area
City of Santa Cruz, California

Projection	Water Demand (mgy) 2010	2015	2020	2025	2030
Projected Water Demand Based on EWD Estimate 1					
Project Area (a)					
EWD Estimate 1	2,069	2,069	2,069	2,069	2,069
Projected Incremental Water Demand	0	63	125	188	251
Subtotal	*2,069*	*2,132*	*2,195*	*2,258*	*2,320*
UCSC (b)					
EWD Estimate	212	212	212	212	212
Projected Increase in Water Demand	0	63	126	131	136
Subtotal	*212*	*275*	*338*	*343*	*348*
Outside of Project Area (Non-UCSC) (c)					
EWD Estimate 1	1,409	1,409	1,409	1,409	1,409
Projected Increase in Water Demand	0	29	58	87	116
Subtotal	*1,409*	*1,438*	*1,467*	*1,496*	*1,525*
Miscellaneous Uses and System Losses (d)					
EWD Estimate 1	303	303	303	303	303
Projected Increase in Water Demand	0	13	25	33	41
Subtotal	*303*	*316*	*328*	*336*	*344*
Total Water Demand in Service Area (EWD Estimate 1)	**3,993**	**4,161**	**4,328**	**4,432**	**4,537**
Projected Water Demand Based on EWD Estimate 2					
Project Area (a)					
EWD Estimate 2	1,843	1,843	1,843	1,843	1,843
Projected Incremental Water Demand	0	63	125	188	251
Subtotal	*1,843*	*1,906*	*1,968*	*2,031*	*2,094*
UCSC (b)					
EWD Estimate	212	212	212	212	212
Projected Increase in Water Demand	0	63	126	131	136
Subtotal	*212*	*275*	*338*	*343*	*348*
Outside of Project Area (Non-UCSC) (c)					
EWD Estimate 2	1,199	1,199	1,199	1,199	1,199
Projected Increase in Water Demand	0	25	49	74	98
Subtotal	*1,199*	*1,224*	*1,248*	*1,273*	*1,297*
Miscellaneous Uses and System Losses (d)					
EWD Estimate 2	268	268	268	268	268
Projected Increase in Water Demand	0	12	24	32	39
Subtotal	*268*	*280*	*292*	*300*	*307*
Total Water Demand in Service Area (EWD Estimate 2)	**3,522**	**3,684**	**3,847**	**3,947**	**4,046**

Table 2
Projected Water Demand in City Service Area
City of Santa Cruz, California





Abbreviations:

AMBAG - Association of Monterey Bay Area Governments
EIR - Environmental Impact Report
EWD - existing water demand
LRDP - Long Range Development Plan
mgy - million gallons per year
UCSC - University of California, Santa Cruz

Notes:

(a) EWD estimates for the Project area are based on two time periods, due to the uncertainty in estimating current water use described in Section 4.2. EWD estimate 1 is based on water use from 1999 through 2004; EWD estimate 2 is based on water use from 2007 through 2008.

(b) Water demand estimates for UCSC are based on the UCSC's 2005 LRDP Final EIR and Settlement Agreement as well as historical student enrollment growth, as described in Section 5.2.

(c) Water demands for the portion of the service area outside of the Project area, with the exception of UCSC, are based on the two time periods 1999 through 2004 and 2007 through 2008 and were scaled in proportion with population growth estimated by AMBAG, using the method described in Section 5.3.

(d) Miscellaneous water uses include temporary construction accounts and bulk water use and average approximately 4 mgy. System losses include physical leakage, apparent losses from meter errors, and unmetered authorized uses such as system flushing, process water use at the water treatment plant, fire usage, sewer flushing, and other similar uses. System losses are estimated to be approximately 7.5 percent of overall treated water production.

Reference:

1 Santa Cruz, 2010. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

Table 3
Comparison of Projected Water Demand in City Service Area with Previous Water Demand Projections
City of Santa Cruz, California

Projection	Water Demand (mgy)				
	2010	2015	2020	2025	2030
Water Demand Projections for City Service Area (a)					
Total Water Demand (EWD Estimate 1)	3,993	4,161	4,328	4,432	4,537
Total Water Demand (EWD Estimate 2)	3,522	3,684	3,847	3,947	4,046
Previous Water Demand Projections					
2005 UWMP Scenario 1 (0.8% Growth) (b)	3,962	4,154	4,345	--	--
2005 UWMP Scenario 2 (0.4% Growth) (b)	3,866	3,963	4,058	--	--
Updated UWMP Scenario 1, SOI Amendment WSA (c)	3,937	4,104	4,271	4,276	4,356
Updated UWMP Scenario 2, SOI Amendment WSA (c)	3,875	3,980	4,084	4,147	4,222

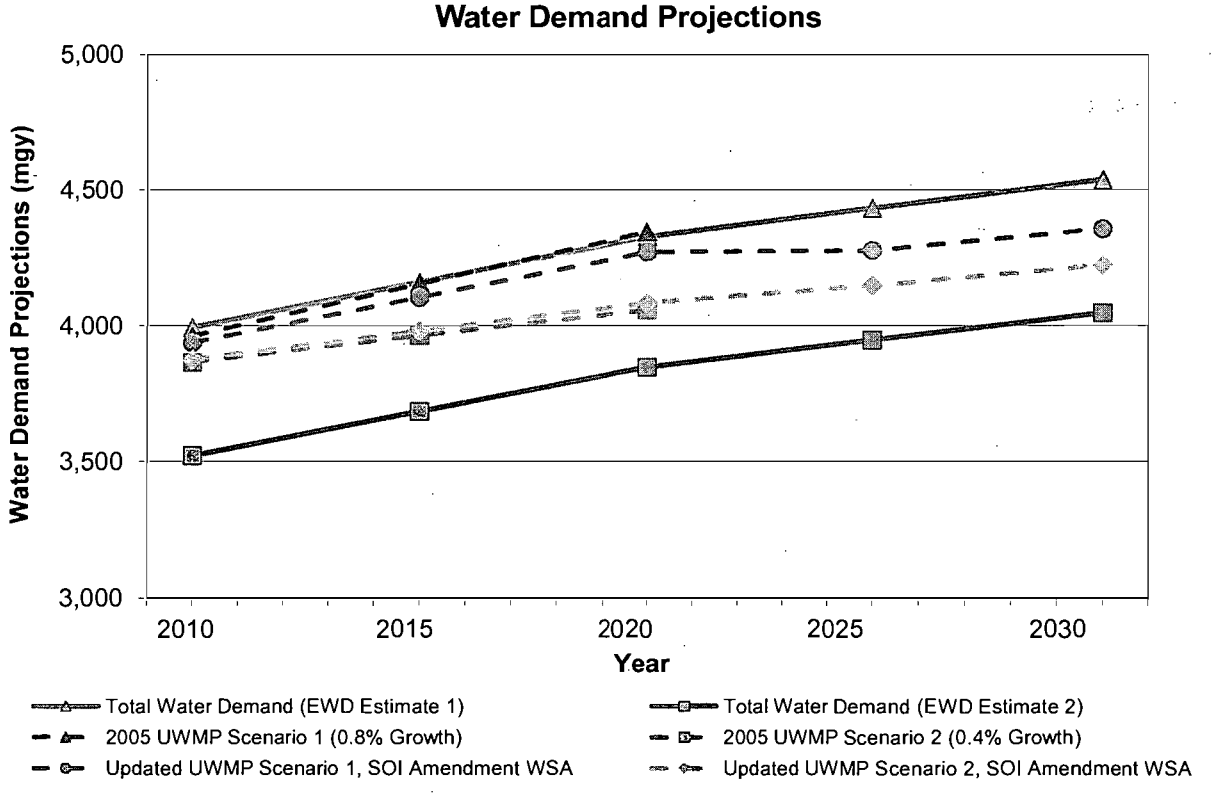


Table 3
Comparison of Projected Water Demand in City Service Area with Previous Water Demand Projections
City of Santa Cruz, California

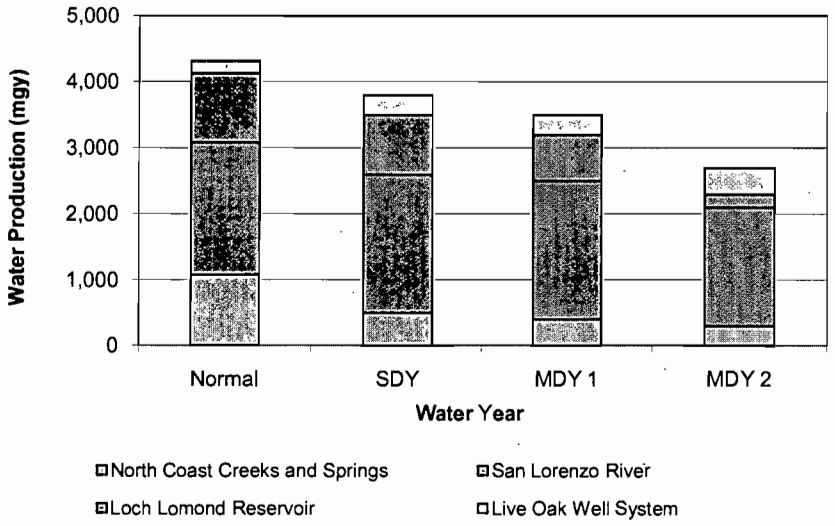
Abbreviations:
EIR - Environmental Impact Report
EWD - existing water demand
mgy - million gallons per year
SOI - Sphere of Influence
UCSC - University of California, Santa Cruz
UWMP - Urban Water Management Plan
WSA - Water Supply Assessment

Notes:
(a) Water demand projections for the City's water service area are based on two time periods, due to the uncertainty in estimating current water use described in Section 4.2. EWD estimate 1 is based on water use from 1999 through 2004; EWD estimate 2 is based on water use from 2007 through 2008. Water demands for the Project area were developed based on envisioned land-use changes. Water demands for the area outside of the Project area were based on population projections. Further details are provided in Sections 4.2, 5.2, through 5.4.
(b) The 2005 UWMP's "Scenario 1" and "Scenario 2" demand projections were based on the assumption that the City's three largest customer classes (single-family residential, multi-residential and business, and irrigation) would grow at an annual rate of 0.8% and 0.4%, respectively, in proportion to the amount of growth envisioned in existing housing elements from general plans for the City and County of Santa Cruz and the City of Capitola, and that water use at the University would increase as predicted in the 2005 LRDP Draft
(c) Water demand projections in the SOI Amendment WSA were based on the water demands projected in the 2005 UWMP, but were updated for the UCSC area to reflect the 2005 LRDP Final EIR and the Settlement Agreement.

References:
1 Santa Cruz, 2006. *2005 Urban Water Management Plan*, dated February 2006.
2 Santa Cruz, 2010a. *Final EIR: Sphere of Influence Amendment and Provision of Extraterritorial Water & Sewer Service*, dated July 2010.
3 Santa Cruz, 2010b. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

Table 4
Projected Water Supply Availability (a)
City of Santa Cruz, California

Water Supply Source (b)	Water Supply by Water Year Type (mgy) (c)			
	Normal Year	Single Dry Year	Multiple Dry Year	
			Year 1	Year 2
North Coast Creeks and Springs	1,077	500	400	300
San Lorenzo River	2,008	2,100	2,100	1,800
Loch Lomond Reservoir	1,042	900	700	200
Live Oak Well System	187	300	300	400
Total Water Supply	**4,314**	**3,800**	**3,500**	**2,700**



Abbreviations:
SDY - single dry year
MDY - multiple dry year
mgy - million gallons per year

Notes:
(a) Supply availability is from Table 5-2 of the 2005 Urban Water Management Plan (Santa Cruz, 2006).
(b) See Sections 6 and 7 of the text for a complete description of the City's water supply sources.
(c) "Water Year Type" refers to normal, single dry, and multiple dry years as defined in the 2005 Urban Water Management Plan ("UWMP") based on the hydrologic record. The UWMP calculates "normal year" supply based on the period between 1999 and 2003, "single dry year" supply based on the year 1994 (the most recent single dry year on record), and "multiple dry year" supply based on the two-year drought sequence from 1976 to 1977 (the most critical drought on record).

Reference:
1 Santa Cruz, 2006. *2005 Urban Water Management Plan,* dated February 2006.

Table 5
Historical Water Supply Production (a)
City of Santa Cruz, California

Year	Water Supply Production (mgy)					
	North Coast Creeks and Streams	San Lorenzo River	Tait Wells (b)	Loch Lomond Reservoir	Live Oak Well System	TOTAL
1985	1,004.4	1,926.7	331.5	793.9	174.7	4,231
1986	1,123.3	1,867.5	27.6	1,192.7	33.6	4,245
1987	592.5	2,246.5	172.5	971.8	389.6	4,373
1988	692.1	2,066.5	294.1	650.4	429.8	4,133
1989	872.3	2,187.2	232.3	455.0	298.6	4,045
1990	820.6	2,001.2	152.8	187.0	227.4	3,389
1991	661.9	1,921.0	251.1	510.1	178.7	3,523
1992	633.7	1,807.6	223.1	625.2	264.4	3,554
1993	826.1	1,667.2	102.3	1,035.7	135.5	3,767
1994	665.6	1,861.0	235.5	931.8	169.1	3,863
1995	1,207.7	1,317.2	256.8	857.2	90.0	3,729
1996	1,312.5	1,267.3	9.9	1,389.8	54.7	4,034
1997	1,291.6	1,719.6	5.3	1,304.5	79.9	4,401
1998	1,484.8	1,527.7	4.8	996.8	99.6	4,114
1999	1,580.0	1,966.0	106.1	583.7	92.4	4,328
2000	1,417.3	2,073.2	--	797.0	187.0	4,475
2001	1,326.5	2,003.0	--	842.4	171.4	4,343
2002	1,386.2	1,976.2	--	538.0	143.8	4,044
2003	1,297.0	1,917.9	--	748.5	129.7	4,093
2004	1,315.4	1,984.5	--	652.6	123.6	4,076
Average from 2000 to 2004	**1,348.5**	**1,991.0**	**n/a**	**715.7**	**151.1**	**4,206**

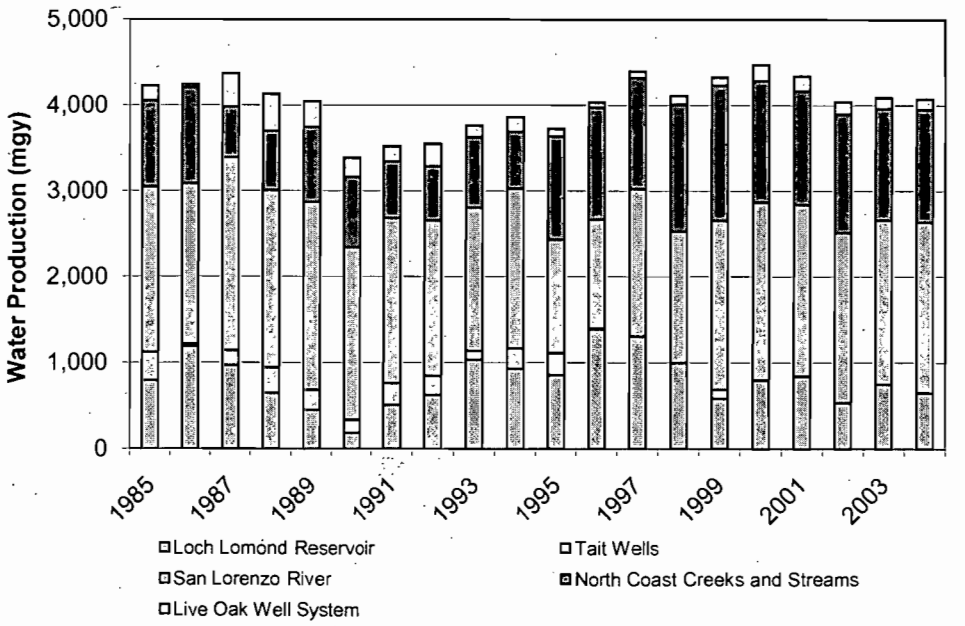


Table 5
Historical Water Supply Production (a)
City of Santa Cruz, California

Abbreviations:
mgy - million gallons per year

Notes:
(a) Historical water production for the City of Santa Cruz is from Table 3.2 of the 2005 Urban Water Management Plan (Santa Cruz, 2006).
(b) Production from the Tait Wells is pursuant to the City's water rights permit for the Tait Street Diversion on the San Lorenzo River.

References:
1 Santa Cruz, 2006. *2005 Urban Water Management Plan,* dated February 2006.

Table 6
Surface Water Rights and Entitlements (a)
City of Santa Cruz, California

Water Supply Source (b)	SWRCB Permit / License (c)	Permit / License Face Value (mgy)	Seasonal Availability	Maximum Diversion (cfs)	Instream Flow Requirements (cfs) (d)	Annual Diversion Limit (mgy)
North Coast Creek and Stream Diversions	Pre-1914	None	Year-round	No limit	None	None
San Lorenzo River						
- Tait Street Diversion / Wells	2372 / 1553 2738 / 7200	1,463 1,416	Year-round	12.2	None	None
- Felton Diversion (for storage in Loch Lomond Reservoir)	16601 / -- 16123 / --	977	September October November-May June-August	7.8 20 20 0	10 25 20 NA	
Loch Lomond Reservoir						
- Collection from Newell Creek (for storage in Loch Lomond Reservoir)	11618 / 9847	1,825	Sept-June	No limit	NA	1,825
- Withdrawal from Loch Lomond Reservoir	11618 / 9847	1,042	Year-round	NA	1	1,042

Abbreviations:

cfs - cubic feet per second
mgy - million gallons per year
NA - not applicable
SWRCB - State Water Resources Control Board

Notes:

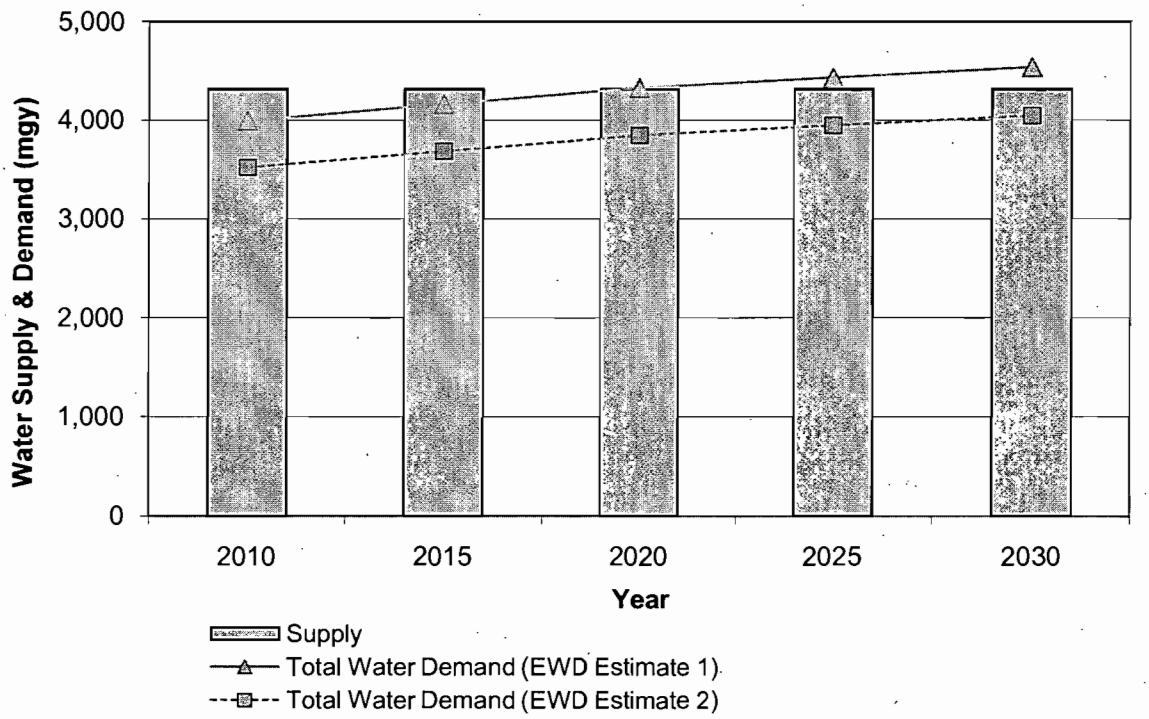
(a) Surface water rights and entitlements for the City of Santa Cruz are from Table 3-1 of the 2005 Urban Water Management Plan (Santa Cruz, 2006).
(b) See Sections 6 and 7 of the text for a complete description of the City's water supply sources.
(c) Copies of the City's permits and licenses for the Felton Diversion and the Tait Street Diversion are included in Appendix D.
(d) Instream requirements are the minimum flow that must be met before water can be diverted by the City. Instream flows are for fish and other instream environmental uses.

References:

1 Santa Cruz, 2006. *2005 Urban Water Management Plan,* dated February 2006.

Table 7
Projected Normal Year Supply Versus Demand in Service Area
City of Santa Cruz, California

Projection	Water Supply and Demand (mgy)				
	2010	2015	2020	2025	2030
Projected Water Supply (a)	4,314	4,314	4,314	4,314	4,314
Projected Water Demand (b)					
Total Water Demand (EWD Estimate 1)	3,993	4,161	4,328	4,432	4,537
Total Water Demand (EWD Estimate 2)	3,522	3,684	3,847	3,947	4,046
Difference (c)					
Total Water Demand (EWD Estimate 1)	321	153	-14	-118	-223
Total Water Demand (EWD Estimate 2)	792	630	467	367	268
Average Annual Deficit (d)					
Total Water Demand (EWD Estimate 1)	--	--	-0.3%	-3%	-5%
Total Water Demand (EWD Estimate 2)	--	--	--	--	--



Abbreviations:
EWD - existing water demand
mgy - million gallons per year
UWMP - Urban Water Management Plan

Table 7
Projected Normal Year Supply Versus Demand in Service Area
City of Santa Cruz, California

Notes:

(a) Projected normal year water supply is from Table 5-3 of the 2005 UWMP (Santa Cruz, 2006).

(b) Projected demands for the City's water service area are from Table 3. These water demand projections for the City's water service area are based on two time periods, due to the uncertainty in estimating current water use described in Section 4.2. EWD estimate 1 is based on water use from 1999 through 2004; EWD estimate 2 is based on water use from 2007 through 2008. Water demands for the Project area were developed based on envisioned land-use changes, and water demands for the area outside of the Project area were based on population projections. Further details are provided in Sections 4.2, 5.2, through 5.4.

(c) Negative values indicate that demand is greater than supply.

(d) Annual average deficit is shown as a percent of demand. The annual average does not account for peak season deficits, which may be significantly greater.

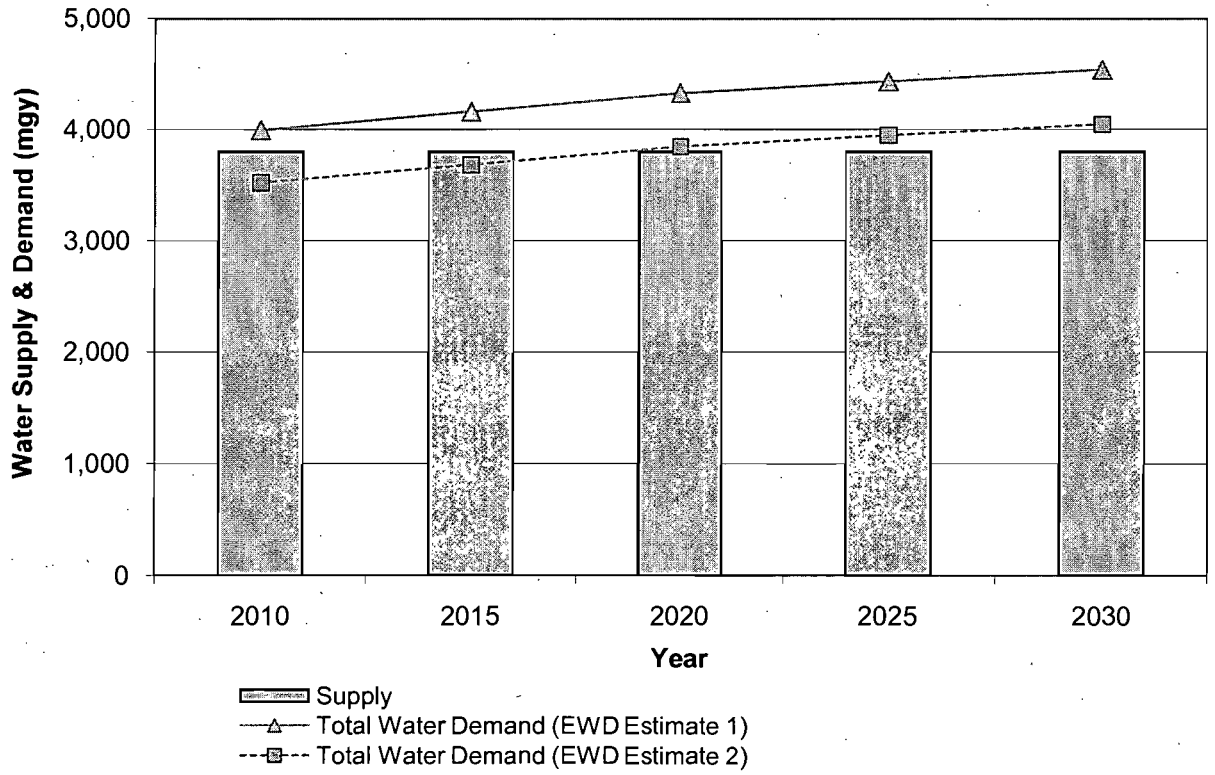
References:

1 Santa Cruz, 2006. 2005 Urban Water Management Plan, dated February 2006.

2 Santa Cruz, 2010. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

Table 8
Projected Single Dry Year Supply Versus Demand in Service Area
City of Santa Cruz, California

Projection	Water Supply and Demand (mgy)				
	2010	2015	2020	2025	2030
Projected Supply (a)	3,800	3,800	3,800	3,800	3,800
Projected Demand (b)					
Total Water Demand (EWD Estimate 1)	3,993	4,161	4,328	4,432	4,537
Total Water Demand (EWD Estimate 2)	3,522	3,684	3,847	3,947	4,046
Difference (c)					
Total Water Demand (EWD Estimate 1)	-193	-361	-528	-632	-737
Total Water Demand (EWD Estimate 2)	278	116	-47	-147	-246
Average Annual Deficit (d)					
Total Water Demand (EWD Estimate 1)	-5%	-9%	-12%	-14%	-16%
Total Water Demand (EWD Estimate 2)	--	--	-1%	-4%	-6%



Abbreviations:
EWD - existing water demand
mgy - million gallons per year
UWMP - Urban Water Management Plan

Table 8
Projected Single Dry Year Supply Versus Demand in Service Area
City of Santa Cruz, California

Notes:

(a) Projected single dry year water supply is from Table 5-3 of the 2005 UWMP (Santa Cruz, 2006).

(b) Projected demands for the City's water service area are from Table 3. These water demand projections for the City's water service area are based on two time periods, due to the uncertainty in estimating current water use described in Section 4.2. EWD estimate 1 is based on water use from 1999 through 2004; EWD estimate 2 is based on water use from 2007 through 2008. Water demands for the Project area were developed based on envisioned land-use changes, and water demands for the area outside of the Project area were based on population projections. Further details are provided in Sections 4.2, 5.2 through 5.4.

(c) Negative values indicate that demand is greater than supply.

(d) Annual average deficit is shown as a percent of demand. The annual average does not account for peak season deficits, which may be significantly greater.

References:

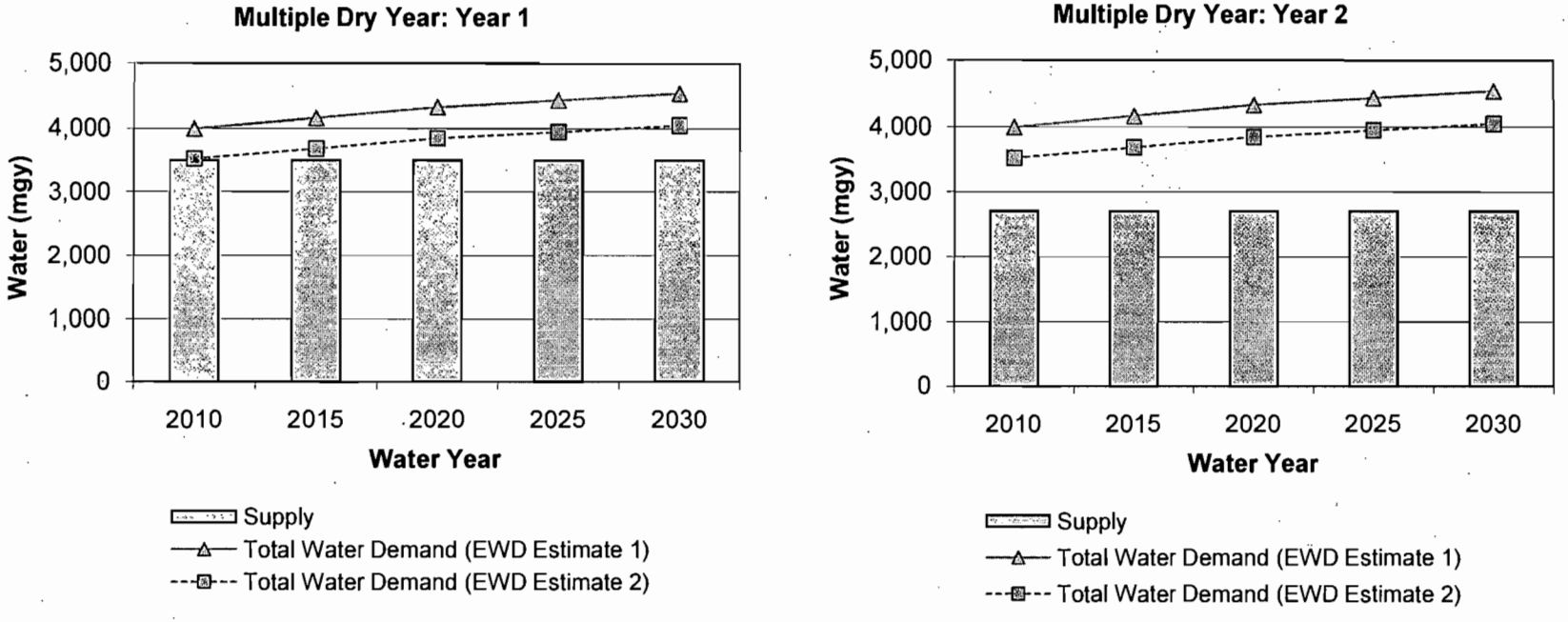
1 Santa Cruz, 2006. 2005 Urban Water Management Plan, dated February 2006.

2 Santa Cruz, 2010. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

Table 9
Projected Multiple Dry Year Supply Versus Demand in Service Area
City of Santa Cruz, California

Projection	Water Supply and Demand (mgy)									
	Multiple Dry Year: Year 1					Multiple Dry Year: Year 2				
	2010	2015	2020	2025	2030	2010	2015	2020	2025	2030
Projected Supply (a)	3,500	3,500	3,500	3,500	3,500	2,700	2,700	2,700	2,700	2,700
Projected Demand (b)										
Total Water Demand (EWD Estimate 1)	3,993	4,161	4,328	4,432	4,537	3,993	4,161	4,328	4,432	4,537
Total Water Demand (EWD Estimate 2)	3,522	3,684	3,847	3,947	4,046	3,522	3,684	3,847	3,947	4,046
Difference (c)										
Total Water Demand (EWD Estimate 1)	-493	-661	-828	-932	-1,037	-1,293	-1,461	-1,628	-1,732	-1,837
Total Water Demand (EWD Estimate 2)	-22	-184	-347	-447	-546	-822	-984	-1,147	-1,247	-1,346
Average Annual Deficit (d)										
Total Water Demand (EWD Estimate 1)	-12%	-16%	-19%	-21%	-23%	-32%	-35%	-38%	-39%	-40%
Total Water Demand (EWD Estimate 2)	-1%	-5%	-9%	-11%	-14%	-23%	-27%	-30%	-32%	-33%

Table 9
Projected Multiple Dry Year Supply Versus Demand in Service Area
City of Santa Cruz, California



Abbreviations:
EWD - existing water demand
mgy - million gallons per year
UWMP - Urban Water Management Plan

Notes:
(a) Projected multiple dry year water supply is from Table 5-3 of the 2005 UWMP (Santa Cruz, 2006).
(b) Projected demands for the City's water service area are from Table 3. These water demand projections for the City's water service area are based on two time periods, due to the uncertainty in estimating current water use described in Section 4.2. EWD estimate 1 is based on water use from 1999 through 2004; EWD estimate 2 is based on water use from 2007 through 2008. Water demands for the Project area were developed based on envisioned land-use changes, and water demands for the area outside of the Project area were based on population projections. Further details are provided in Sections 4.2, 5.2, through 5.4.

Table 9
Projected Multiple Dry Year Supply Versus Demand in Service Area
City of Santa Cruz, California

(c) Negative values indicate that demand is great than supply.
(d) Annual average deficit is shown as a percent of demand. The annual average does not account for peak season deficits, which may be significantly greater.

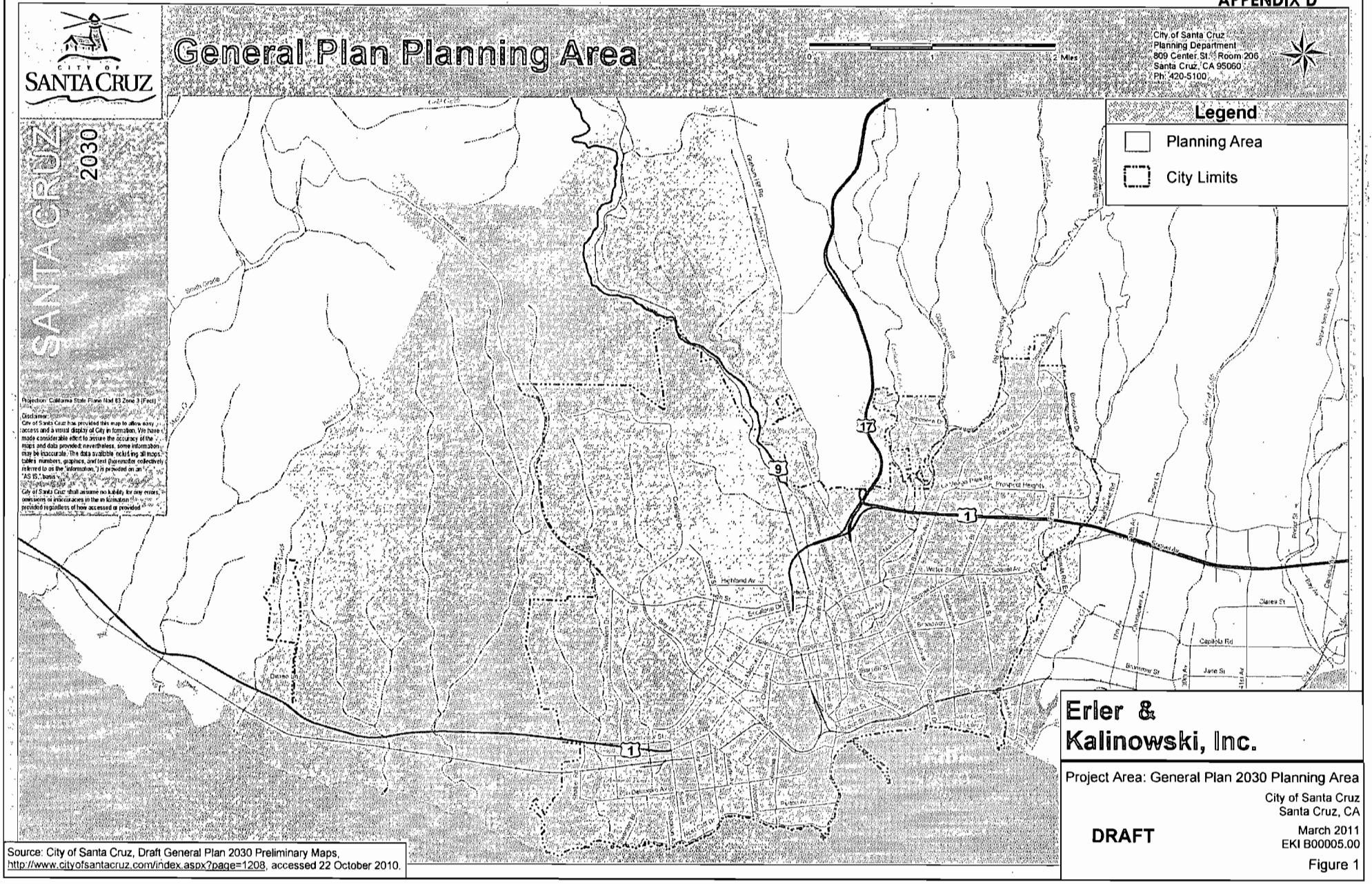
References:

1 Santa Cruz, 2006. 2005 Urban Water Management Plan, dated February 2006.
2 Santa Cruz, 2010. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

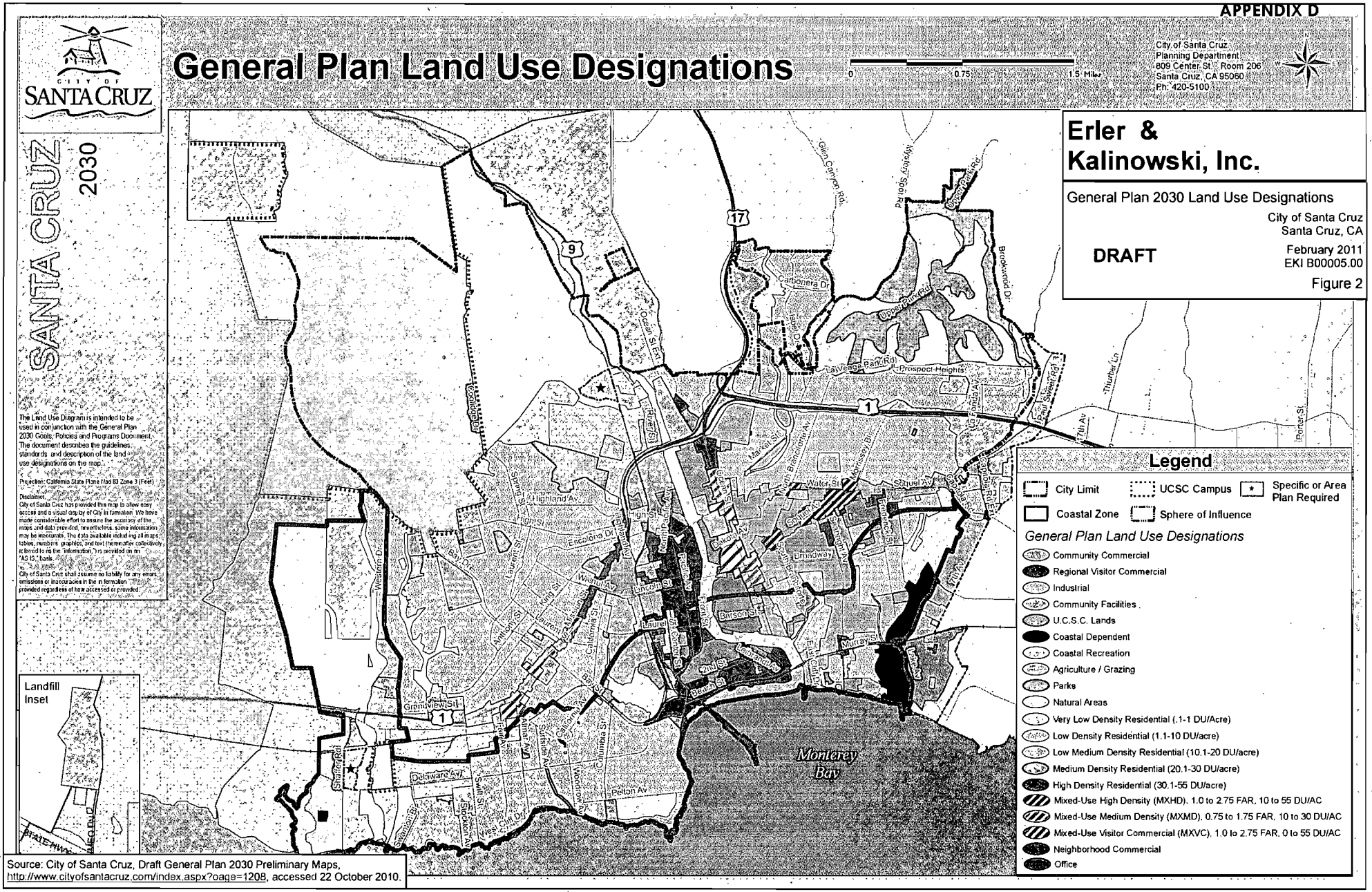
Figures

APPENDIX D

General Plan Planning Area

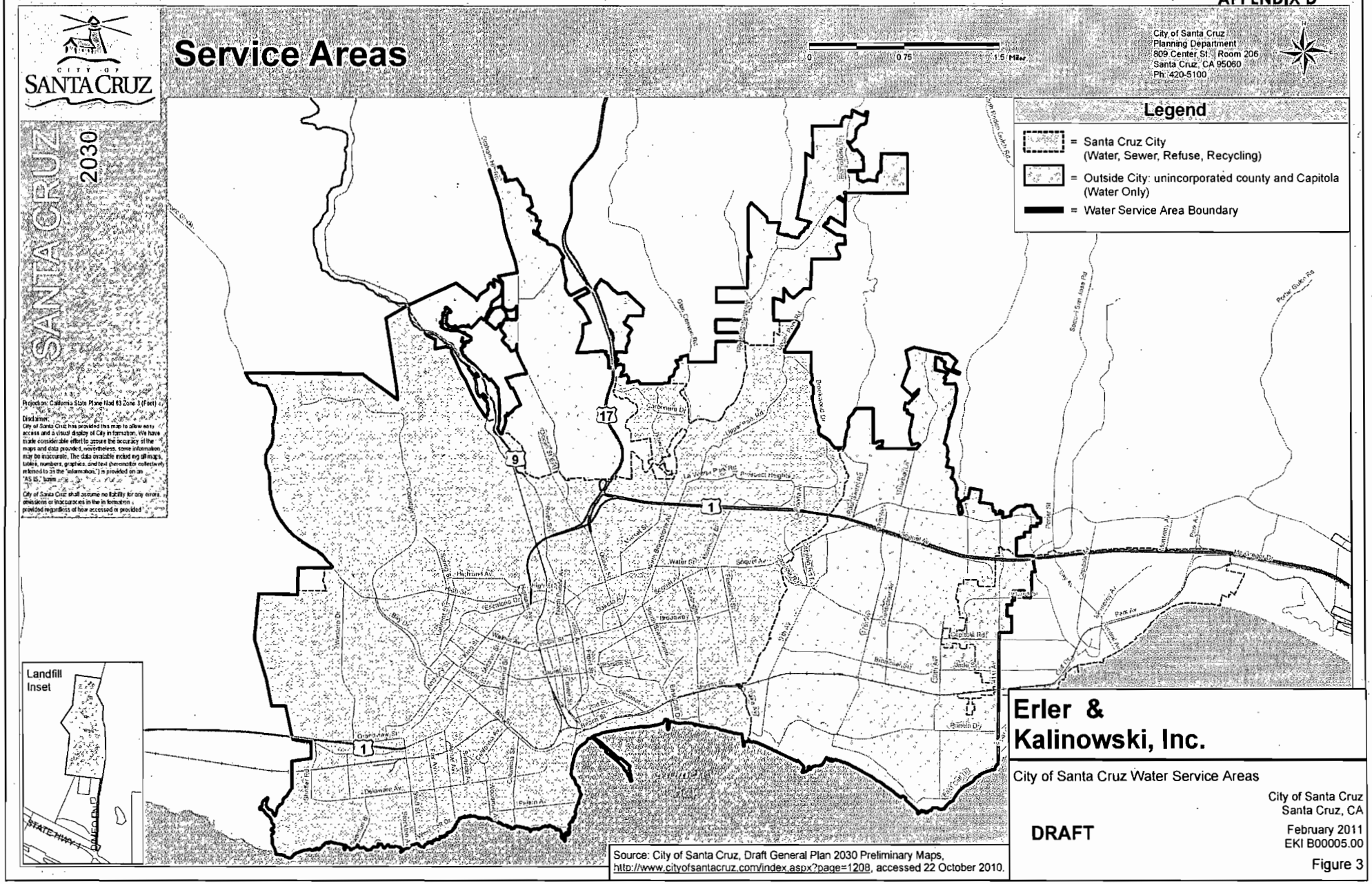


General Plan Land Use Designations


0
0.75
1.5 Miles
City of Santa Cruz
Planning Department
809 Center St., Room 206
Santa Cruz, CA 95060
Ph: 420-5100
SANTA CRUZ 2030
Erler & Kalinowski, Inc.
General Plan 2030 Land Use Designations
City of Santa Cruz
Santa Cruz, CA
DRAFT
February 2011
EKI B00005.00
Figure 2
The Land Use Diagram is intended to be used in conjunction with the General Plan 2030 Goals, Policies and Programs Document. The document describes the guidelines, standards and description of the land use designations on the map.
Projection: California State Plane Nad 83 Zone 3 (Feet)
Disclaimer:
City of Santa Cruz has provided this map to allow easy access and a visual display of City information. We have made considerable effort to assure the accuracy of the maps and data provided, nevertheless, some information may be inaccurate. The data available including all maps, tables, numbers, graphics, and text (hereinafter collectively referred to as the "information") is provided on an "AS IS," basis.
City of Santa Cruz shall assume no liability for any errors, omissions or inaccuracies in the information provided regardless of how accessed or provided.
Legend
City Limit
UCSC Campus
Specific or Area Plan Required
Coastal Zone
Sphere of Influence
General Plan Land Use Designations
Community Commercial
Regional Visitor Commercial
Industrial
Community Facilities
U.C.S.C. Lands
Coastal Dependent
Coastal Recreation
Agriculture / Grazing
Parks
Natural Areas
Very Low Density Residential (.1-1 DU/Acre)
Low Density Residential (1.1-10 DU/acre)
Low Medium Density Residential (10.1-20 DU/acre)
Medium Density Residential (20.1-30 DU/acre)
High Density Residential (30.1-55 DU/acre)
Mixed-Use High Density (MXHD), 1.0 to 2.75 FAR, 10 to 55 DU/AC
Mixed-Use Medium Density (MXMD), 0.75 to 1.75 FAR, 10 to 30 DU/AC
Mixed-Use Visitor Commercial (MXVC), 1.0 to 2.75 FAR, 0 to 55 DU/AC
Neighborhood Commercial
Office
Landfill Inset
Monterey Bay
Bay View Park Rd
Prospect Heights
Upper Park Rd
Brookwood Dr
Glen Canyon Rd
Mystery Spot Rd
Ocean St Ext
Bay St
Highland Av
Escalona Dr
Market St
Water St
Soquel Av
Broadway
Barson St
Murray St
Delaware Av
Pelton Av
Granview St
Shaffer Rd
Western Dr
Swift St
Stockton Av
West Cliff Dr
Thurber Ln
Porter St
17th Av
Paul Sweet Rd
Capitola Rd
Soquel Dr
Morrissey Blvd
Portola Dr
Frederick St
Laurel St
Lincoln St
Cedar St
Center St
Front St
Pacific Av
Mission St
Chestnut St
Walnut Ave
Riverside Ave
Ingalls St
Laurent St
King St
Sherman St
Ashtony St
Seabright Av
Soquel Ave
Fair Ave
Capitola Av
Bronson Rd
Rodriguez St
Escalona Dr
Bay Dr
Meder St
Almar Av
Seaside Av
Woodrow Av
California St
Columbia St
Bethany Curve
Cliff Dr
Murray St
Barson St
Broadway
Soquel Av
Water St
Market St
Morrissey Blvd
Soquel Dr
Capitola R

APPENDIX D

Service Areas



City of Santa Cruz
Planning Department
809 Center St., Room 206
Santa Cruz, CA 95060
Ph: 420-5100

Source: City of Santa Cruz, Draft General Plan 2030 Preliminary Maps, http://www.cityofsantacruz.com/index.aspx?page=1208, accessed 22 October 2010.

Erler & Kalinowski, Inc.

City of Santa Cruz Water Service Areas

City of Santa Cruz
Santa Cruz, CA

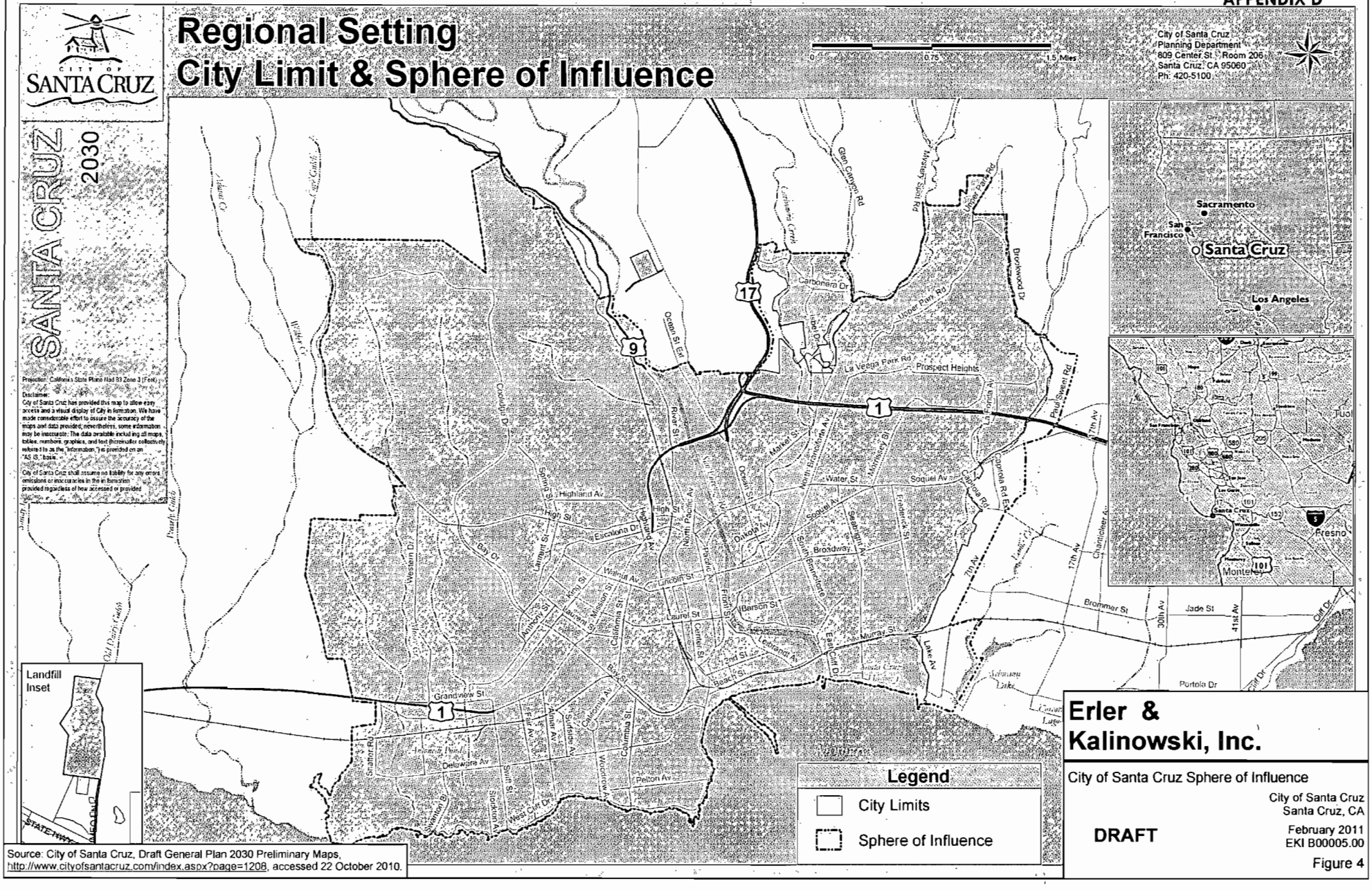
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February 2011
EKI B00005.00

Figure 3

APPENDIX D

Regional Setting
City Limit & Sphere of Influence



Source: City of Santa Cruz, Draft General Plan 2030 Preliminary Maps, http://www.cityofsantacruz.com/index.aspx?page=1208, accessed 22 October 2010.

Erler & Kalinowski, Inc.

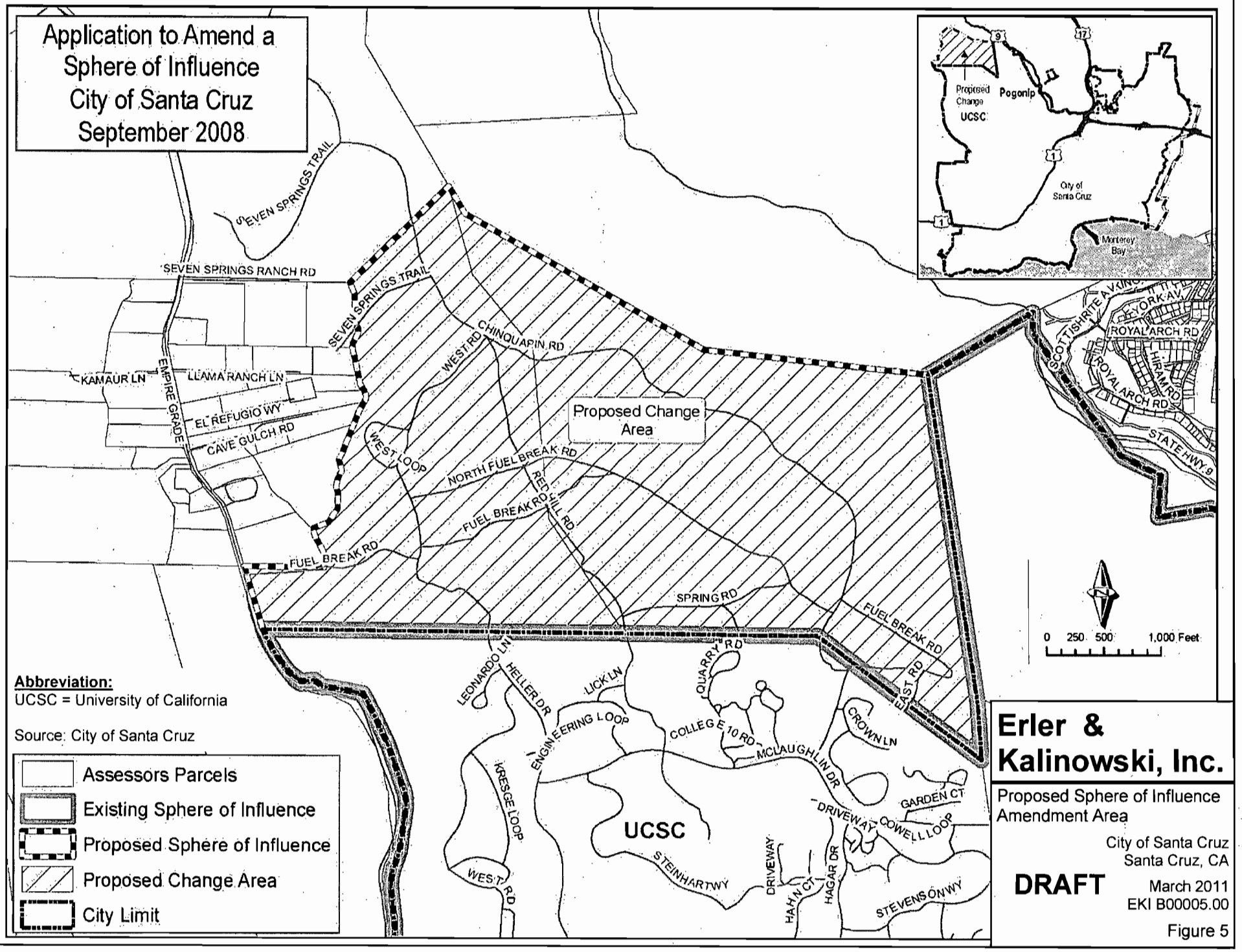
City of Santa Cruz Sphere of Influence

City of Santa Cruz
Santa Cruz, CA

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February 2011
EKI B00005.00

Figure 4



Erler & Kalinowski, Inc.

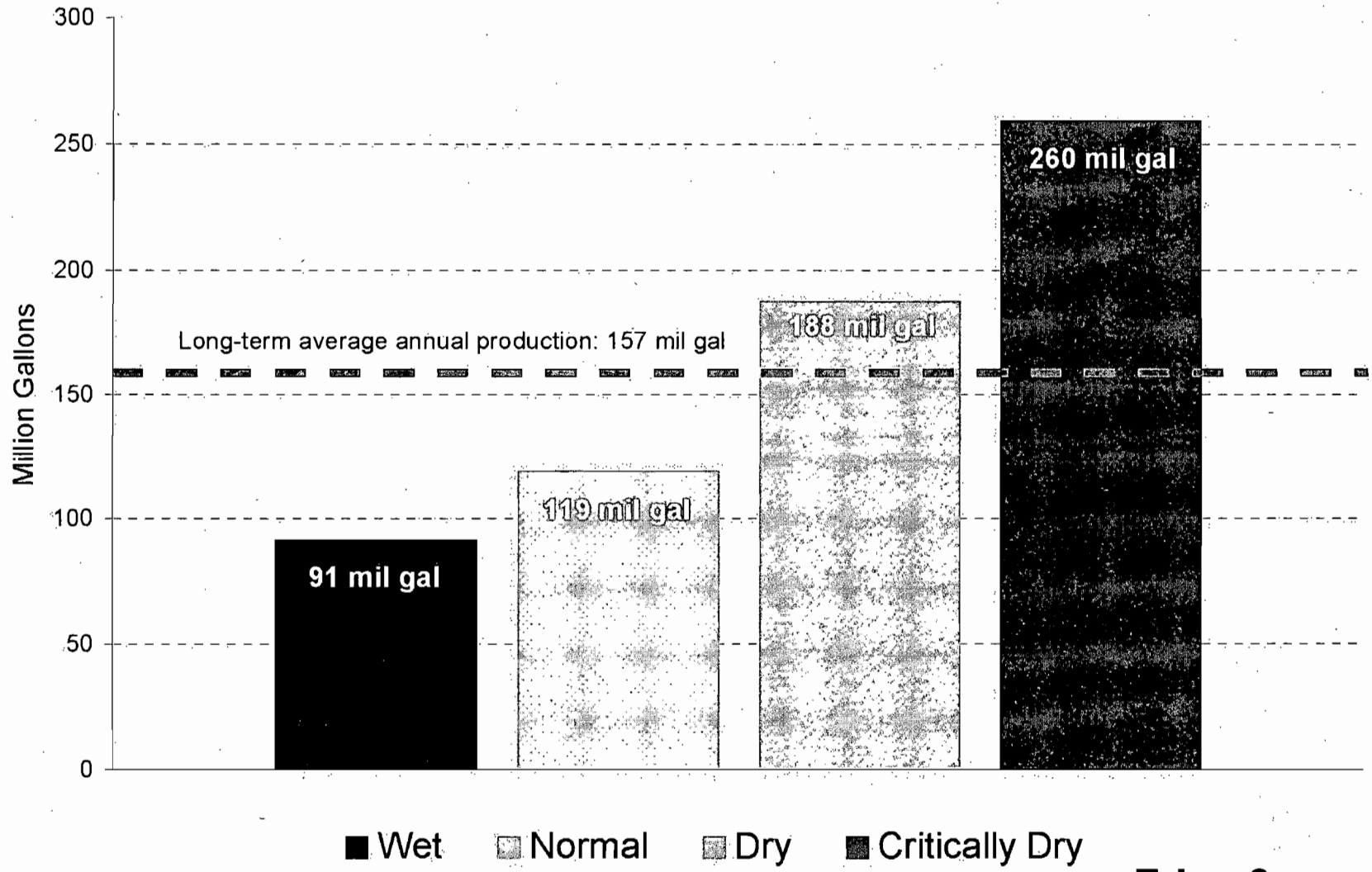
Proposed Sphere of Influence Amendment Area

City of Santa Cruz
Santa Cruz, CA

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March 2011
EKI B00005.00

Figure 5



Note:
Long-term annual average production is the average historical production from 1972 to 2002.

Source: 2005 Urban Water Management Plan, Prepared by the City of Santa Cruz, dated February 2006.

Erler & Kalinowski, Inc.

Historical Groundwater Production by Water Year Type

City of Santa Cruz
Santa Cruz, CA

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February 2011
EKI B00005.00

Figure 6

Appendices

APPENDIX E

GREENHOUSE GAS & AIR QUALITY EMISSIONS CALCULATIONS

Donald Ballanti
Certified Consulting Meteorologist

1424 Scott Street
El Cerrito, CA 94530
(510) 234-6087
Fax: (510) 232-7752

MEMORANDUM

To: Stephanie Strelow

From: Don Ballanti

Date: April 6, 2011

Subject: Santa Cruz GP GHG Emissions

I applied the URBEMIS program and the Bay Greenhouse Model (BGM) to the incremental growth expected by 2030. The trip rates used were adjusted trip rates accounting for interactivity between land uses and smart growth factors (enhanced mixed uses, local serving retail, transit/bike/pedestrian accessibility).[1]

Greenhouse gas emissions were estimated using the BGM Model developed by the Bay Area Air Quality Management District.[2] The Bay Area Air Quality Management District's (BAAQMD's) Greenhouse Gas Model (BGM) is an Excel spreadsheet program that allows users to estimate operational greenhouse gas (GHG) emissions from land development projects. BGM reads URBEMIS-2007 project files to generate a portion of a project's GHG emission estimates.

URBEMIS-2007 is a land-use based program. Inputs are land use type, amount of each land use, a trip generation rate. The general plan growth increments by land use were input along with adjusted daily trip rates. URBEMIS-2007 has no Single Room Occupancy land use category, so the land use "low rise apartment" was substituted.

[1] Memorandum to Chris Schneiter from Ron Marquez, General Plan Traffic Analysis Methodology, March 30, 2010.
[2] Bay Area Air Quality Management District, *Draft Bay Area Air Quality Management District Greenhouse Gas Model User's Manual*, April 29, 2010.

My emissions estimates for General Plan Growth should be directly comparable to the inventory of GHG for the City of Santa Cruz CAP. Because the inventory only includes vehicle emissions within the Santa Cruz city limits, a 2.2 mile average trip length for all trip types was used. This average trip distance was based on studies of peak hour VMT and trip generation prepared in 2003.

The project build-out year is 2030. URBEMIS-2007 and BGM were run for this year. A second URBEMIS-2007 and BGM run was made for the same land use/trip inputs but for the year 2008. Comparison of the two sets of results revealed the BGM includes the effects of vehicle fleet changes and California fuel rules, as transportation emissions from the same land use inputs drop 30% between 2008 and 2030. It also revealed that BGM makes no adjustments for future energy efficiency as area sources, electricity use and natural gas emissions were identical for the 2008 and 2030 model runs. BGM assumes that homes and businesses in 2030 would be no more energy efficient in 2030 than homes and businesses in 2008. Therefore, the URBEMIS-2007/BGM results needed adjustment to reflect the State regulations and AB 32 programs, as described below.

Future buildings will be more energy efficient than existing buildings, so the BGM results had to be modified to reflect that fact. The Bay Area Air Quality Management District recently performed an analysis of GHG emission reductions that are anticipated to occur from implementation of the State regulations and AB 32 programs. Measures such as the Renewable Portfolio Standard, improvements in energy efficiency through periodic updates to Title 24, Solar Roofs program and other measures were determined to account for an estimated 9.5% reduction in natural gas GHG emissions and a 38.2% percent reduction in GHG emissions from electricity by 2020.[3] These reductions were been applied to the BGM emission calculations.

The results are shown in Table 1. It is possible that refinements to the analysis could be made in water/wastewater and solid waste as the BGM assumptions for these emissions categories may not be accurate for Santa Cruz. The wastewater treatment plant uses biogas to generate electricity, and this fact is not accounted for by BGM. Also, future improvements in Increased water efficiency and solid waste generation reductions would also reduce water/wastewater and solid waste emissions, but BGM cannot take this into account. Therefore, the emissions projections shown in Table 1 should be considered as conservative estimates.

[3] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, Appendix D, June 2010.

Table 1: General Plan Growth GHG Emissions, in CO_2 Equivalent Metric Tons/Year

Source	2008	2030
Transportation	39,805.84	28,208.41
Area Sources	2,918.54	2,918.54
Electricity	14,861.48	9,184.39
Natural Gas	6,809.85	6,162.91
Water and Wastewater Treatment	679.88	636.05
Solid Waste	6,045.40	6,061.82
Total	71,120.98	53,172.12

Donald Ballanti
Certified Consulting Meteorologist

1424 Scott Street
El Cerrito, CA 94530
(510) 234-6087
Fax: (510) 232-7752

MEMORANDUM

To: Stephanie Strelow

From: Don Ballanti

Date: August 29, 2011

Subject: Santa Cruz GP Criteria Pollutant Emissions

The California Air Resources Board provides estimates of emission inventories for past and future years on a county, air basin and state basis. There are currently no complete emission inventories for criteria pollutants available for specific cities.

Therefore, I have calculated vehicular emissions (the largest single source in the inventory) within city limits. The methodology involved developing estimates of Vehicle Miles Travelled (VMT) within city limits and multiplying by an annual average emission factor derived from the EMFAC-2007 program.

Vehicle travel on local roads within city limits were provided by Caltrans' Highway Performance Modeling System (HPMS) Data Library[1], which showed that total daily VMT within the Santa Cruz City limits was 566,070 in 2008. The URBEMIS-2007 analysis of projected growth through 2030 estimated that anticipate growth would increase daily VMT within city limits by 231,828 to a total of 797,898.

The EMFAC 2007 program was used to generate emissions factors for the Santa Cruz County vehicle fleet in the years 2008 and 2030 under the following assumptions:

Average Vehicle Speed: 30 mph
Temperature: 60 degrees F
Relative Humidity: 50%

[1] http://www.dot.ca.gov/hq/tsip/hpms/datalibrary.php

The 2008 EMFAC 2007 emission factors were multiplied by the 2008 VMT estimate to generate a baseline estimate of vehicular emissions within city limits. Year 2030 EMFAC 2007 emission factors were multiplied by the year 2030 VMT to generate forecasted 2030 emission estimates.

The results are shown in Table 1. Ozone precursors (ROG and NO_x) and CO show substantial reductions by 2030 despite anticipated increases in VMT due to reductions in per-mile emission rates for the 2030 vehicle fleet.

PM_{10} are expected to increase slightly by 2030. Vehicular emissions for this pollutant are not expected to decrease in the future as fast other criteria pollutants. This is because it has two components: exhaust and tire wear. While exhaust emissions will decrease over time, tire wear does not. Even so, the anticipated increase is less than 6 pounds per day, and would represent a significant air quality impact.

Table 1: City-Wide Existing and Future Criteria Pollutant Emissions, in Pounds Per Day

Year	Daily Average Emissions in Pounds/Day			
	ROG	CO	NO_x	PM_{10}
2008	328.6	6,854.1	1,194.6	40.0
2030	82.8	1,997.6	332.93	45.8
Change	-245.8	-4,856.5	-861.7	+5.8

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Users\Weatherman\My Documents\Business\Project Files\Santa Cruz GP\Santa Cruz GP 2030.urb924

Project Name: Santa Cruz General Plan Growth 2008

Project Location: Santa Cruz County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	65.51	11.04	122.75	0.35	18.36	17.67	14,062.36

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	125.41	117.81	1,146.43	0.40	73.45	14.53	41,672.73

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	190.92	128.85	1,269.18	0.75	91.81	32.20	55,735.09

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.67	8.90	5.22	0.00	0.02	0.02	11,090.21
Hearth	25.28	2.11	114.90	0.35	18.33	17.64	2,967.76
Landscape	0.39	0.03	2.63	0.00	0.01	0.01	4.39
Consumer Products	32.56						
Architectural Coatings	6.61						
TOTALS (tons/year, unmitigated)	65.51	11.04	122.75	0.35	18.36	17.67	14,062.36

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	5.55	4.88	50.70	0.02	2.98	0.59	1,744.07
Apartments low rise	8.31	6.86	71.32	0.02	4.19	0.83	2,453.71
Apartments mid rise	11.08	9.15	95.06	0.03	5.59	1.11	3,270.17
Condo/townhouse general	5.97	5.17	53.75	0.02	3.16	0.63	1,849.15
General office building	17.90	16.37	162.51	0.06	10.13	2.01	5,808.42
General light industry	7.16	6.21	63.12	0.02	3.81	0.76	2,212.30
Commercial	69.44	69.17	649.97	0.23	43.59	8.60	24,334.91
TOTALS (tons/year, unmitigated)	125.41	117.81	1,146.43	0.40	73.45	14.53	41,672.73

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Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2008 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	148.67	9.57	dwelling units	446.00	4,268.22	9,390.08
Apartments low rise	70.81	5.30	dwelling units	1,133.00	6,004.90	13,210.78
Apartments mid rise	39.74	5.30	dwelling units	1,510.00	8,003.00	17,606.60
Condo/townhouse general	34.88	8.11	dwelling units	558.00	4,525.38	9,955.84
General office building		11.01	1000 sq ft	1,318.92	14,521.31	31,946.88
General light industry		6.97	1000 sq ft	783.54	5,461.27	12,014.80
Commercial		44.32	1000 sq ft	1,412.29	62,592.69	137,703.93
					105,376.77	231,828.91

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	44.8	2.9	96.2	0.9
Light Truck < 3750 lbs	18.7	3.7	91.5	4.8
Light Truck 3751-5750 lbs	19.8	1.5	98.0	0.5
Med Truck 5751-8500 lbs	6.9	1.4	98.6	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.2	0.0	66.7	33.3
Lite-Heavy Truck 10,001-14,000 lbs	0.8	0.0	50.0	50.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.1	9.1	18.2	72.7
Heavy-Heavy Truck 33,001-60,000 lbs	0.1	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	5.0	78.0	22.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	7.7	84.6	7.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	2.2	2.2	2.2	2.2	2.2	2.2
Rural Trip Length (miles)	2.2	2.2	2.2	2.2	2.2	2.2
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0
Commercial				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name:

Project Name: Santa Cruz General Plan Growth 2030

Project Location: Santa Cruz County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	65.51	11.04	122.75	0.35	18.36	17.67	14,062.36

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	36.44	25.89	264.99	0.38	73.08	14.24	41,127.05

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	101.95	36.93	387.74	0.73	91.44	31.91	55,189.41

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.67	8.90	5.22	0.00	0.02	0.02	11,090.21
Hearth	25.28	2.11	114.90	0.35	18.33	17.64	2,967.76
Landscape	0.39	0.03	2.63	0.00	0.01	0.01	4.39
Consumer Products	32.56						
Architectural Coatings	6.61						
TOTALS (tons/year, unmitigated)	65.51	11.04	122.75	0.35	18.36	17.67	14,062.36

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	1.61	1.07	11.78	0.02	2.97	0.58	1,721.37
Apartments low rise	2.50	1.50	16.58	0.02	4.17	0.82	2,421.77
Apartments mid rise	3.33	2.00	22.09	0.03	5.56	1.09	3,227.61
Condo/townhouse general	1.75	1.13	12.49	0.02	3.14	0.62	1,825.08
General office building	5.23	3.59	37.65	0.05	10.08	1.97	5,732.76
General light industry	2.13	1.36	14.66	0.02	3.79	0.74	2,183.61
Commercial	19.89	15.24	149.74	0.22	43.37	8.42	24,014.85
TOTALS (tons/year, unmitigated)	36.44	25.89	264.99	0.38	73.08	14.24	41,127.05

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Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	148.67	9.57	dwelling units	446.00	4,268.22	9,390.08
Apartments low rise	70.81	5.30	dwelling units	1,133.00	6,004.90	13,210.78
Apartments mid rise	39.74	5.30	dwelling units	1,510.00	8,003.00	17,606.60
Condo/townhouse general	34.88	8.11	dwelling units	558.00	4,525.38	9,955.84
General office building		11.01	1000 sq ft	1,318.92	14,521.31	31,946.88
General light industry		6.97	1000 sq ft	783.54	5,461.27	12,014.80
Commercial		44.32	1000 sq ft	1,412.29	62,592.69	137,703.93
					105,376.77	231,828.91

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	45.1	0.0	100.0	0.0
Light Truck < 3750 lbs	17.6	0.0	99.4	0.6
Light Truck 3751-5750 lbs	20.3	0.0	100.0	0.0
Med Truck 5751-8500 lbs	7.1	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.2	0.0	75.0	25.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.1	0.0	18.2	81.8
Heavy-Heavy Truck 33,001-60,000 lbs	0.1	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	0.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	5.1	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	92.3	7.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	2.2	2.2	2.2	2.2	2.2	2.2
Rural Trip Length (miles)	2.2	2.2	2.2	2.2	2.2	2.2
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0
Commercial				2.0	1.0	97.0

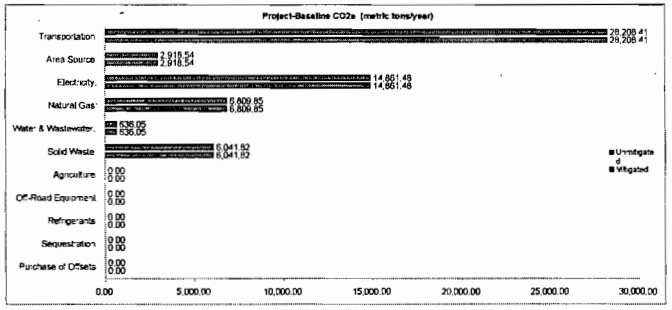
APPENDIX E

Summary Results

Project Name: Santa Cruz General Plan Growth 2030
Project and Baseline Years: 2030 N/A

Results	Unmitigated Project-Baseline CO2e (metric tons/year)	Mitigated Project-Baseline CO2e (metric tons/year)
Transportation:	28,208.41	28,208.41
Area Source:	2,918.54	2,918.54
Electricity:	14,861.48	14,861.48
Natural Gas:	6,809.85	6,809.85
Water & Wastewater:	636.05	636.05
Solid Waste:	6,041.82	6,041.82
Agriculture:	0.00	0.00
Off-Road Equipment:	0.00	0.00
Refrigerants:	0.00	0.00
Sequestration:	N/A	0.00
Purchase of Offsets:	N/A	0.00
Total:	59,476.15	59,476.15

Baseline is currently: OFF
Baseline Project Name:
Go to Settings Tab to Turn On Baseline



Detailed Results

Unmitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				28,208.41	47.43%
Area Source:	2,697.05	10.13	0.03	2,918.54	4.91%
Electricity:	14,837.74	0.12	0.07	14,861.48	24.99%
Natural Gas:	6,792.44	0.64	0.01	6,809.85	11.45%
Water & Wastewater:	635.04	0.01	0.00	636.05	1.07%
Solid Waste:	88.93	283.47	N/A	6,041.82	10.16%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				59,476.15	100.00%

Baseline	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				0.00	N/A
Area Source:	0.00	0.00	0.00	0.00	N/A
Electricity:	0.00	0.00	0.00	0.00	N/A
Natural Gas:	0.00	0.00	0.00	0.00	N/A
Water & Wastewater:	0.00	0.00	0.00	0.00	N/A
Solid Waste:	0.00	0.00	N/A	0.00	N/A
Agriculture:	0.00	0.00	0.00	0.00	N/A
Off-Road Equipment:	0.00	0.00	0.00	0.00	N/A
Refrigerants:	N/A	N/A	N/A	0.00	N/A
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				0.00	0.00%

* Several adjustments were made to transportation emissions after they have been imported from URBEMIS.
After importing from URBEMIS, CO2 emissions are converted to metric tons and then adjusted to account for the "Pavley" regulation. Then, CO2 is converted to CO2e by multiplying by 100/95 to account for the contribution of other GHGs (CH4, N2O, and HFCs [from leaking air conditioners]). Finally, CO2e is adjusted to account for th low carbon fuels rule.

Mitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				28,208.41	47.43%
Area Source:	2,697.05	10.13	0.00	2,918.54	4.91%
Electricity:	14,837.74	0.12	0.07	14,861.48	24.99%
Natural Gas:	6,792.44	0.64	0.01	6,809.85	11.45%
Water & Wastewater:	635.04	0.01	0.00	636.05	1.07%
Solid Waste:	88.93	283.47	N/A	6,041.82	10.16%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	0.00	0.00%
Purchase of Offsets:	N/A	N/A	N/A	0.00	0.00%
Total:				59,476.15	100.00%

Mitigation Measures Selected:

Transportation: Go to the following tab: Transp. Detail Mit for a list of the transportation mitigation measures selected (in URBEMIS)

Electricity: The following mitigation measure(s) have been selected to reduce electricity emissions.

Natural Gas: The following mitigation measure(s) have been selected to reduce natural gas emissions.

Water and Wastewater: The following mitigation measure(s) have been selected to reduce water and wastewater emissions.

Solid Waste: The following mitigation measure has been selected to reduce solid waste related GHG emissions.

Ag: No existing mitigation measures available.

Off-Road Equipment: No existing mitigation measures available.

Refrigerants: The following mitigation measure has ben selected to reduce refrigerant emissions

Carbon Sequestration: Project does not include carbon sequestration through tree planting.

Emission Offsets/Credits: Project does not include purchase of emission offsets/credits.

APPENDIX F

TECHNICAL STUDIES
AVAILABLE ON CD & CITY WEBSITE

F-1 Biological Resources Study – EcoSystems West Consulting Group

F-2 Cultural Resources Studies – LSA Associates

F-3 Noise Studies – Rosen, Goldberg, Der & Lewitz

F-4 Geology & Soils Background Report – Nolan Associates

F-5 Traffic Counts & Volumes

F-6 Traffic – Intersection Levels of Service Analyses