Erler & Kalinowski, Inc.

City of Santa Cruz
Water Supply Assessment
GENERAL PLAN 2030
FINAL DRAFT

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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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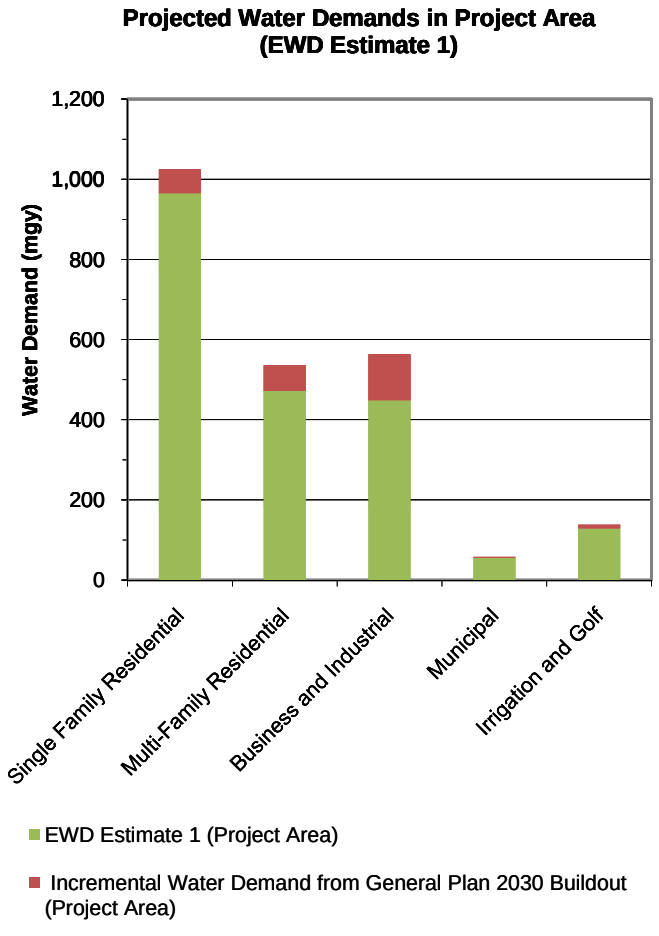
Tables

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**



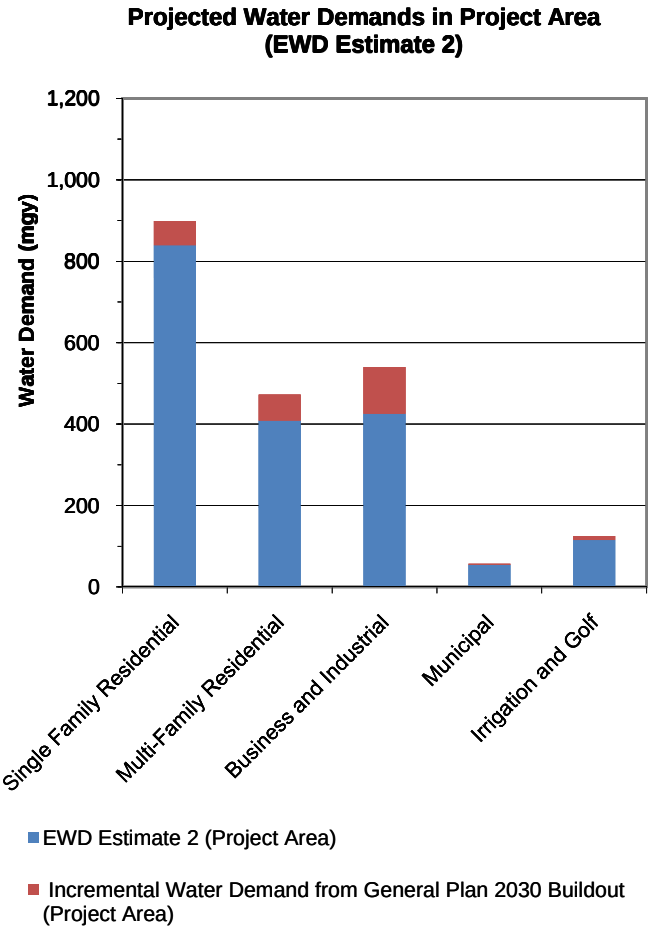


Table 1
Projected Water Demand Within Project Area
City of Santa Cruz, California

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.

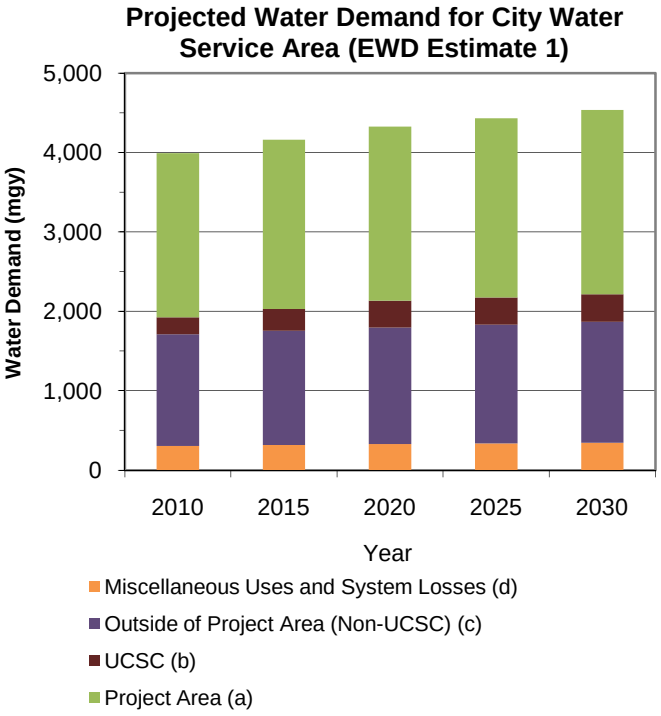
Reference:

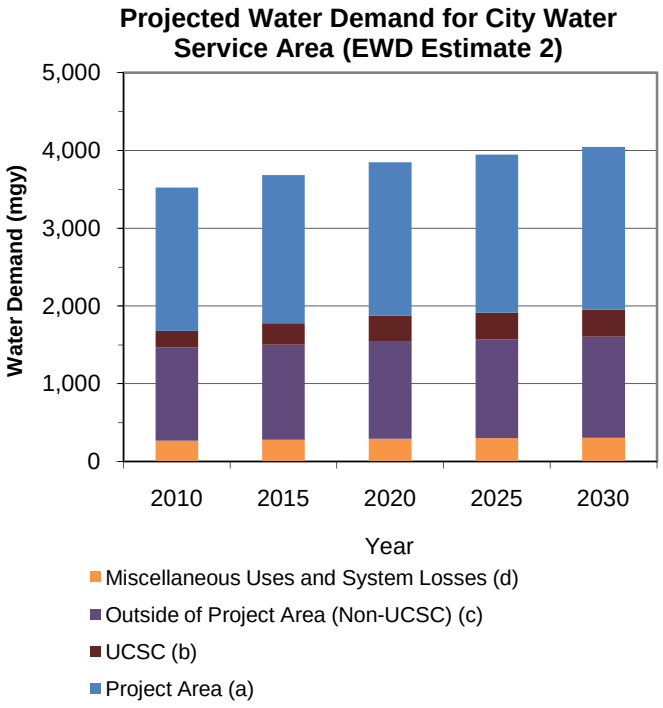
1 Santa Cruz, 2010. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

Table 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

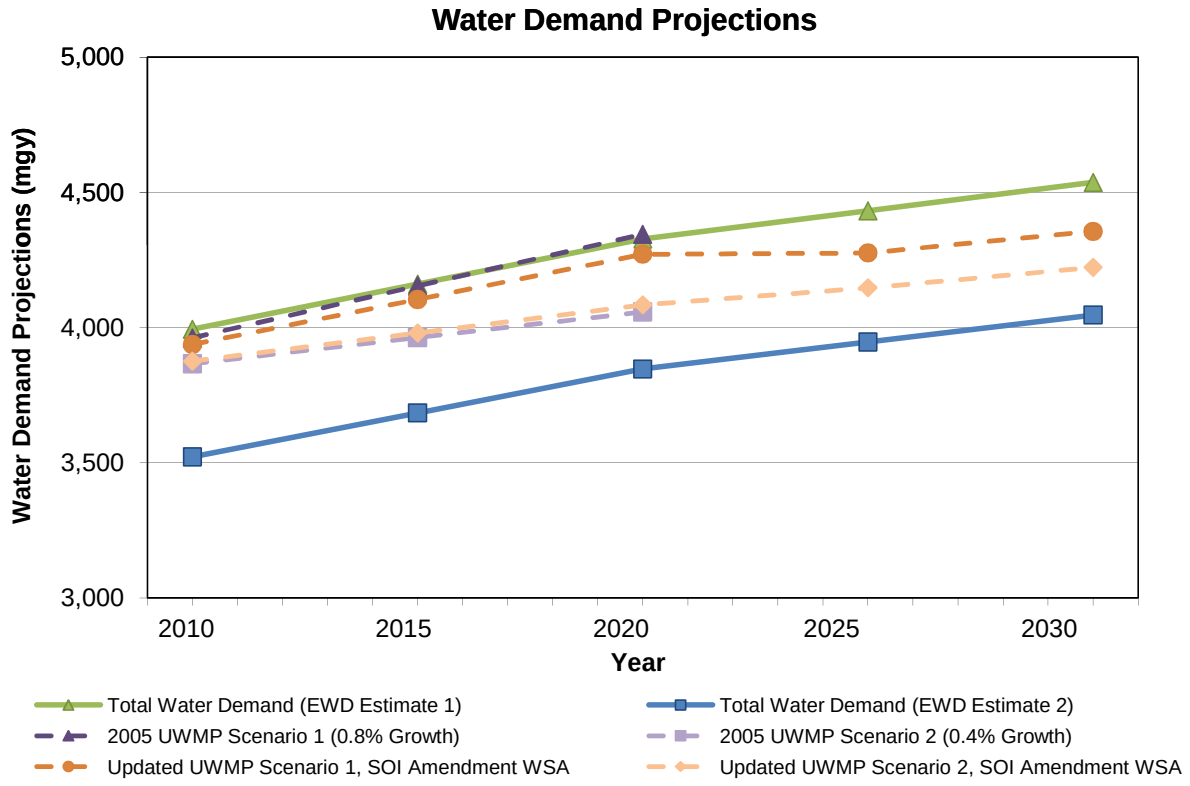


Table 3
Comparison of Projected Water Demand in City Service Area with Previous Water Demand Projections
City of Santa Cruz, California

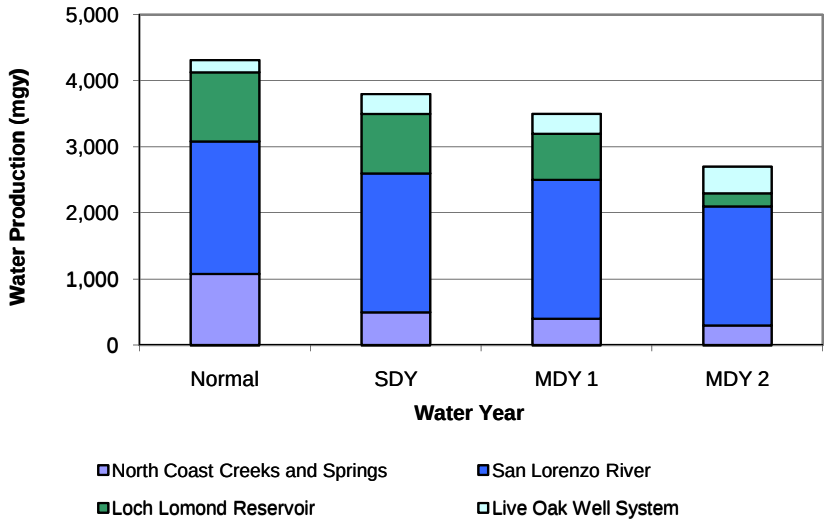
Abbreviations:
EIR - Environmental Impact Report
EWD - existing water demand
mgy - million gallons per year
SOI - Sphere of Influence
UCSC - University of California, Santa Cruz
UWMP - Urban Water Management Plan
WSA - Water Supply Assessment

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**

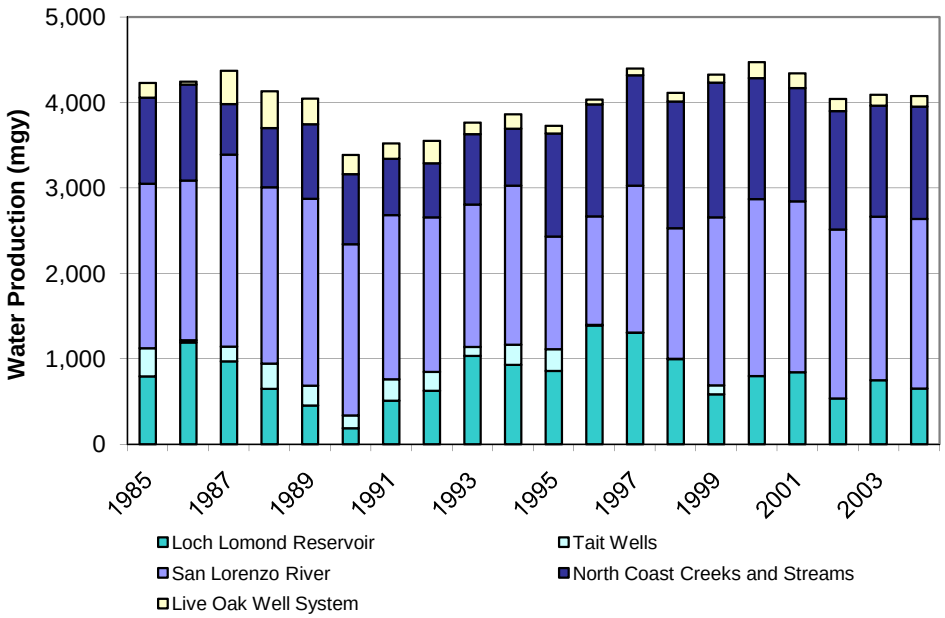


Table 5
Historical Water Supply Production (a)
City of Santa Cruz, California

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

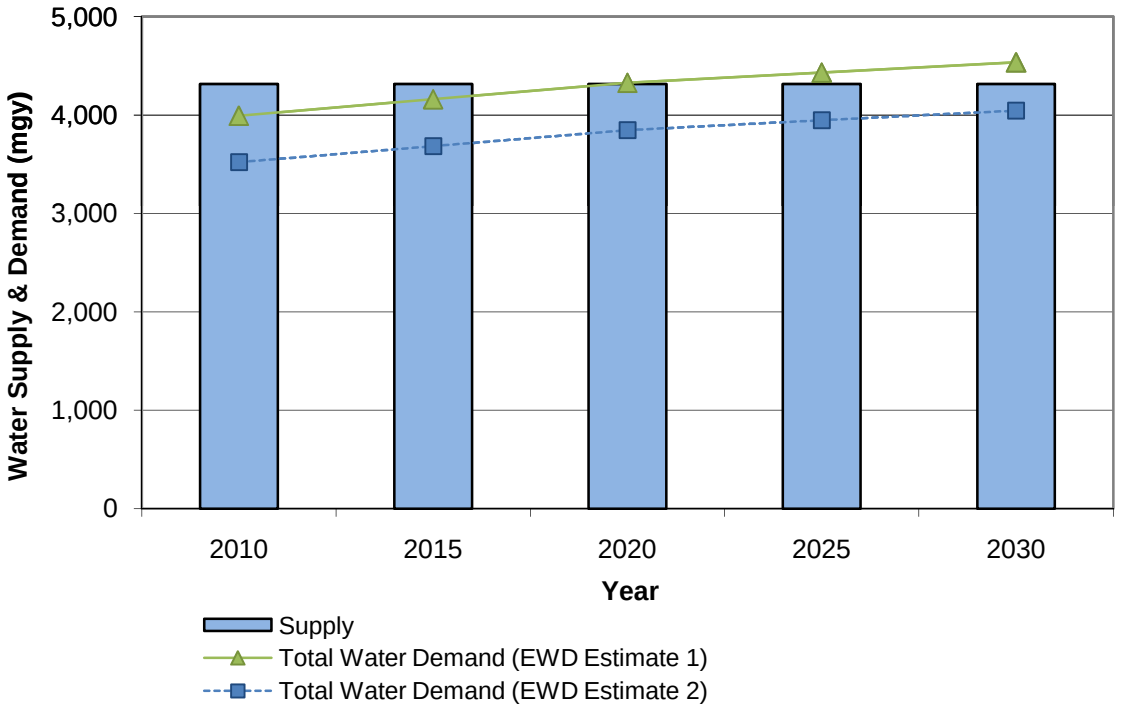
Abbreviations:
cfs - cubic feet per second
mgy - million gallons per year
NA - not applicable
SWRCB - State Water Resources Control Board

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.

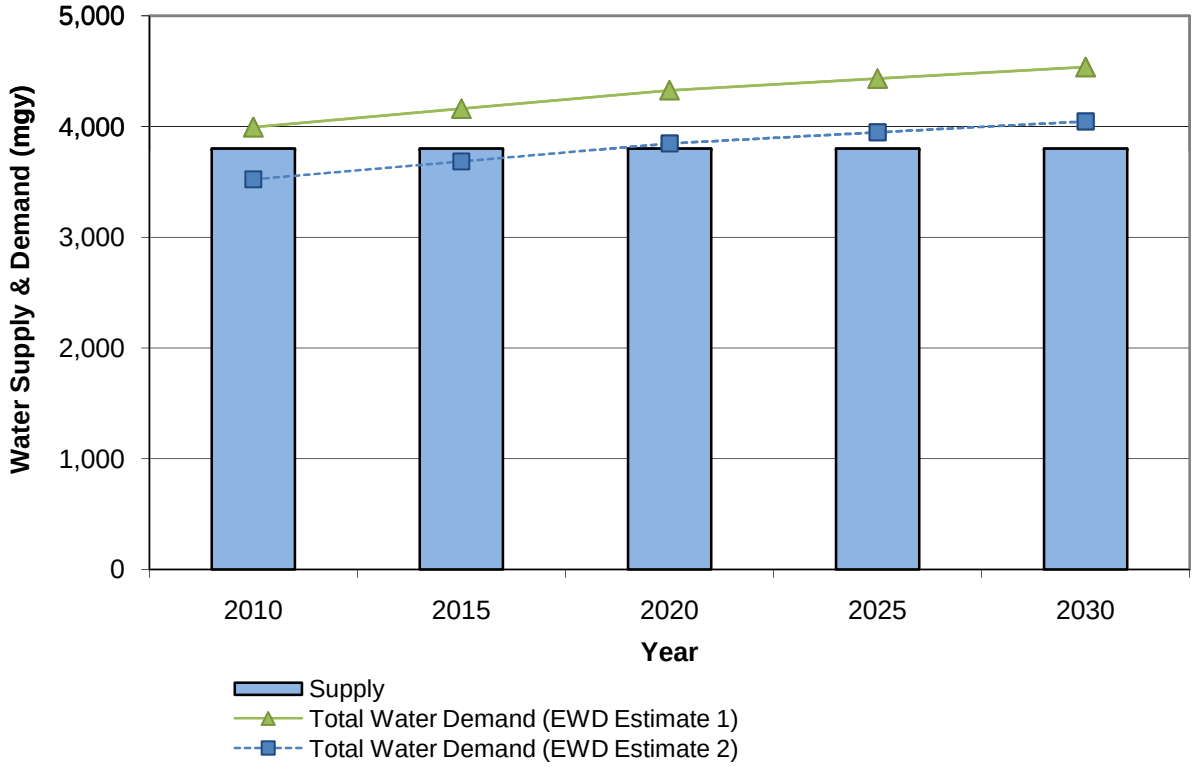
References:

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:

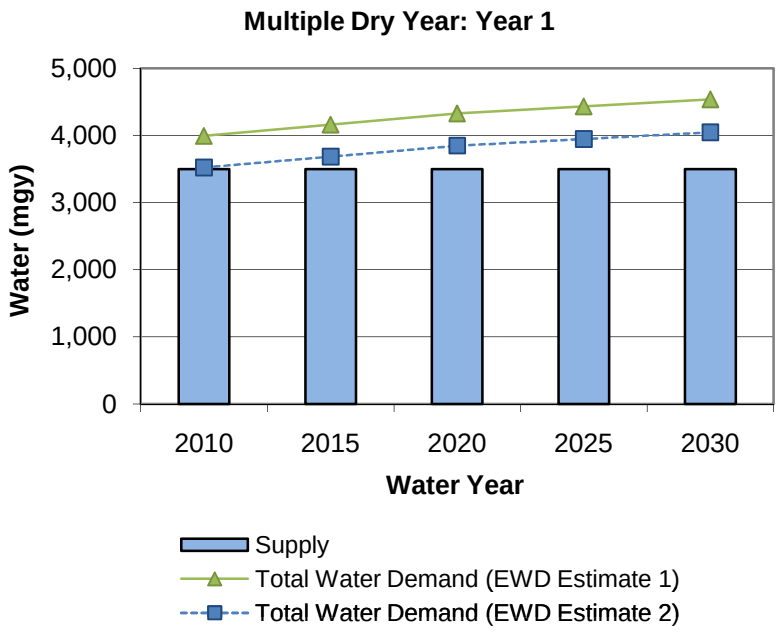
1 Santa Cruz, 2006. 2005 Urban Water Management Plan, dated February 2006.

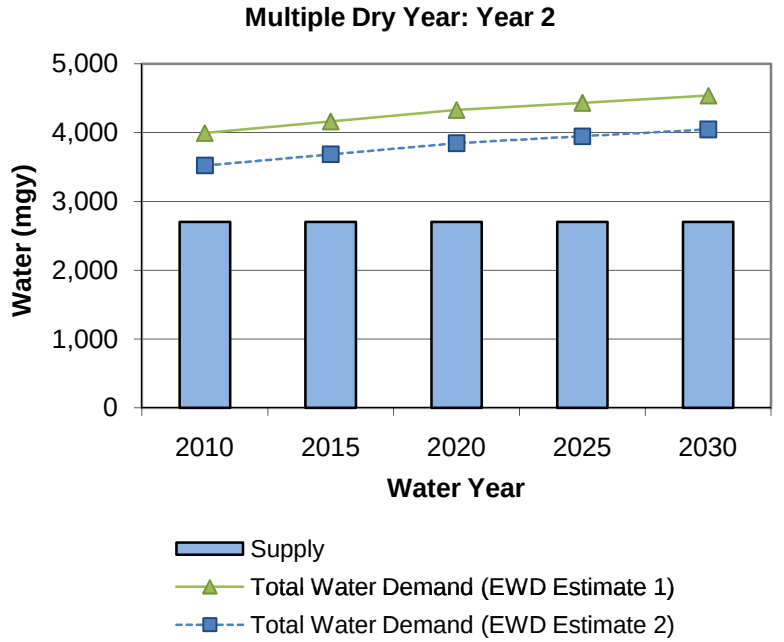
2 Santa Cruz, 2010. Memorandum to Bill Kocher, Water Director (City of Santa Cruz) entitled: *Updated 2010-2030 Water Demand Forecast,* dated 15 October 2010.

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

General Plan Planning Area

SANTA CRUZ 2030

0 1 2 Miles

City of Santa Cruz
Planning Department
809 Center St. Room 206
Santa Cruz, CA 95060
Ph: 420-5100

N W E S

Legend

- Planning Area
- City Limits

Projection: California State Plane Nad 83 Zone 3 (Feet)

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.

Project Area: General Plan 2030 Planning Area
City of Santa Cruz
Santa Cruz, CA

DRAFT

March 2011
EKI B00005.00

Figure 1

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

CITY OF SANTA CRUZ

SANTA CRUZ 2030

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)

Erler & Kalinowski, Inc.

General Plan 2030 Land Use Designations

City of Santa Cruz
Santa Cruz, CA

DRAFT

February 2011
EKI B00005.00

Figure 2

Landfill Inset

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

Source: City of Santa Cruz, Draft General Plan 2030 Preliminary Maps, http://www.cityofsantacruz.com/index.aspx?page=1208, accessed 22 October 2010.

Service Areas

0 0.75 1.5 Miles

City of Santa Cruz
Planning Department
809 Center St. Room 206
Santa Cruz, CA 95060
Ph: 420-5100

CITY OF SANTA CRUZ

SANTA CRUZ 2030

Legend

- = Santa Cruz City (Water, Sewer, Refuse, Recycling)
- = Outside City: unincorporated county and Capitola (Water Only)
- = Water Service Area Boundary

Projection: California State Plane Nad 83 Zone 3 (Feet)

Landfill Inset

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

Regional Setting
City Limit & Sphere of Influence

SANTA CRUZ 2030

0 0.75 1.5 Miles

City of Santa Cruz
Planning Department
809 Center St. Room 206
Santa Cruz, CA 95060
Ph: 420-5100

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 in formation. We have made considerable effort to assure the accuracy of the maps and data provided; nevertheless, some information may be inaccurate. The data available includ ing 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 in formation provided regardless of how accessed or provided.

Landfill Inset

Source: City of Santa Cruz, Draft General Plan 2030 Preliminary Maps, http://www.cityofsantacruz.com/index.aspx?page=1208, accessed 22 October 2010.

Legend

- City Limits
- Sphere of Influence

Erler & Kalinowski, Inc.

City of Santa Cruz Sphere of Influence

City of Santa Cruz
Santa Cruz, CA

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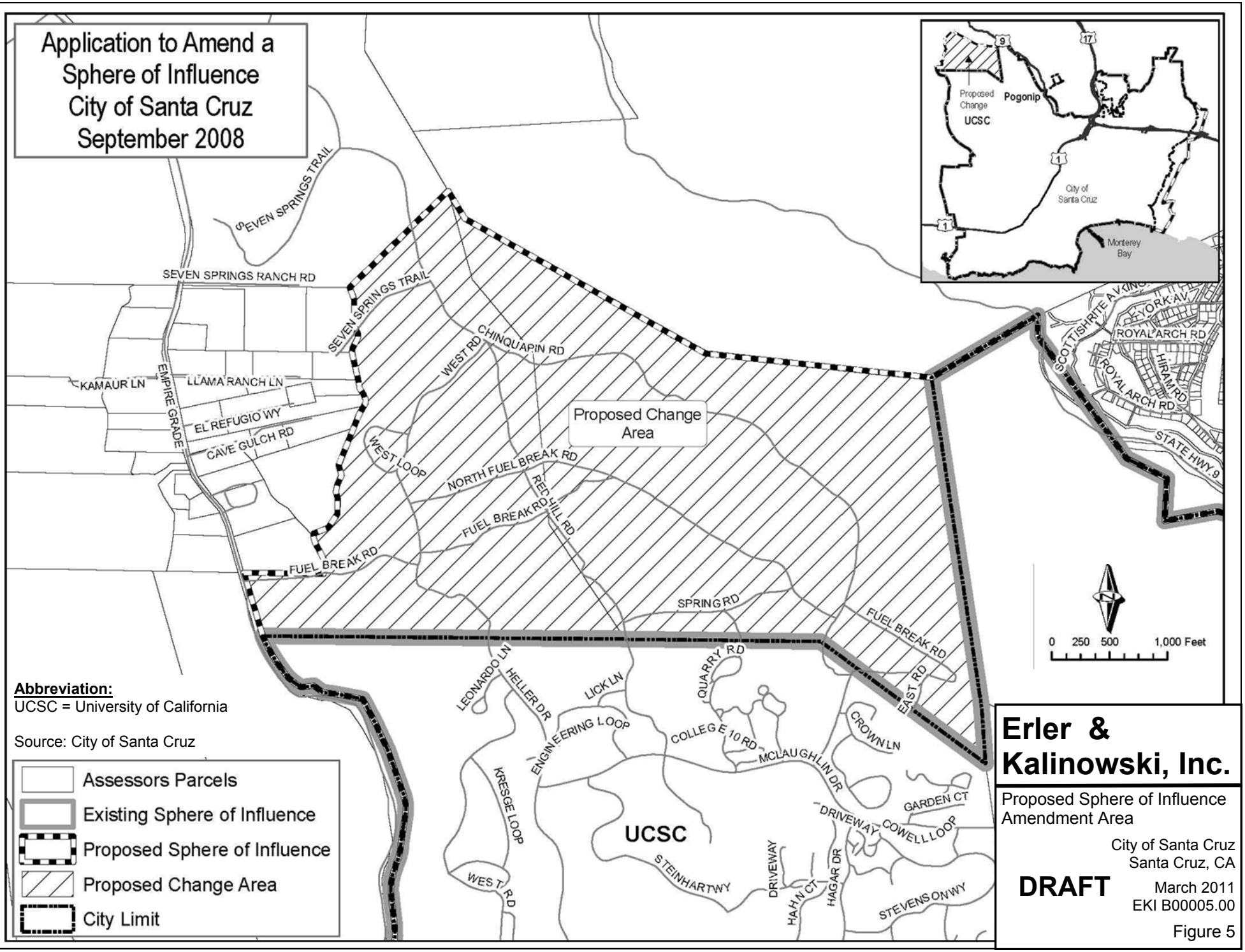
February 2011
EKI B00005.00

Figure 4



Erler & Kalinowski, Inc.

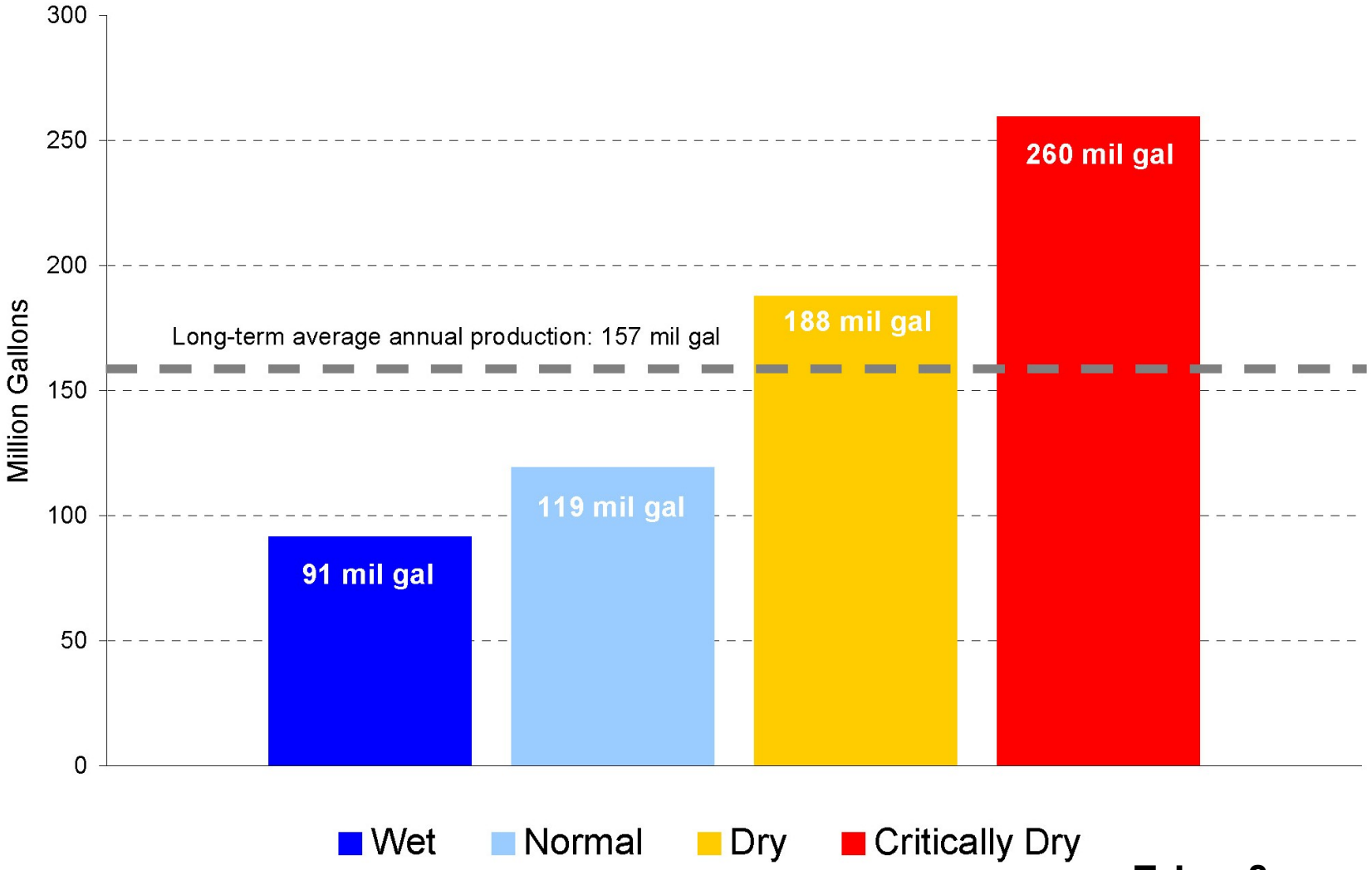
Proposed Sphere of Influence Amendment Area

City of Santa Cruz
Santa Cruz, CA

DRAFT

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

DRAFT

February 2011
EKI B00005.00

Figure 6

Appendices

Appendix A

Description of Water Demand Tracking Model and Selected Figures, Provided by the City of Santa Cruz, October 2010

Note, figure titles have been added by EKI for clarification purposes.

Description of Water Demand Tracking Models

The City's water demand tracking models were initially developed as part of the 1998 Water Demand Investigation. The purpose of these models was to identify historical water use patterns in gallons per account per day (gpd/a) for each major customer group and to project patterns into future periods. For most customer groups, consumption data extends back to 1983. These models were updated annually and used to assess ongoing trends and water conservation performance.

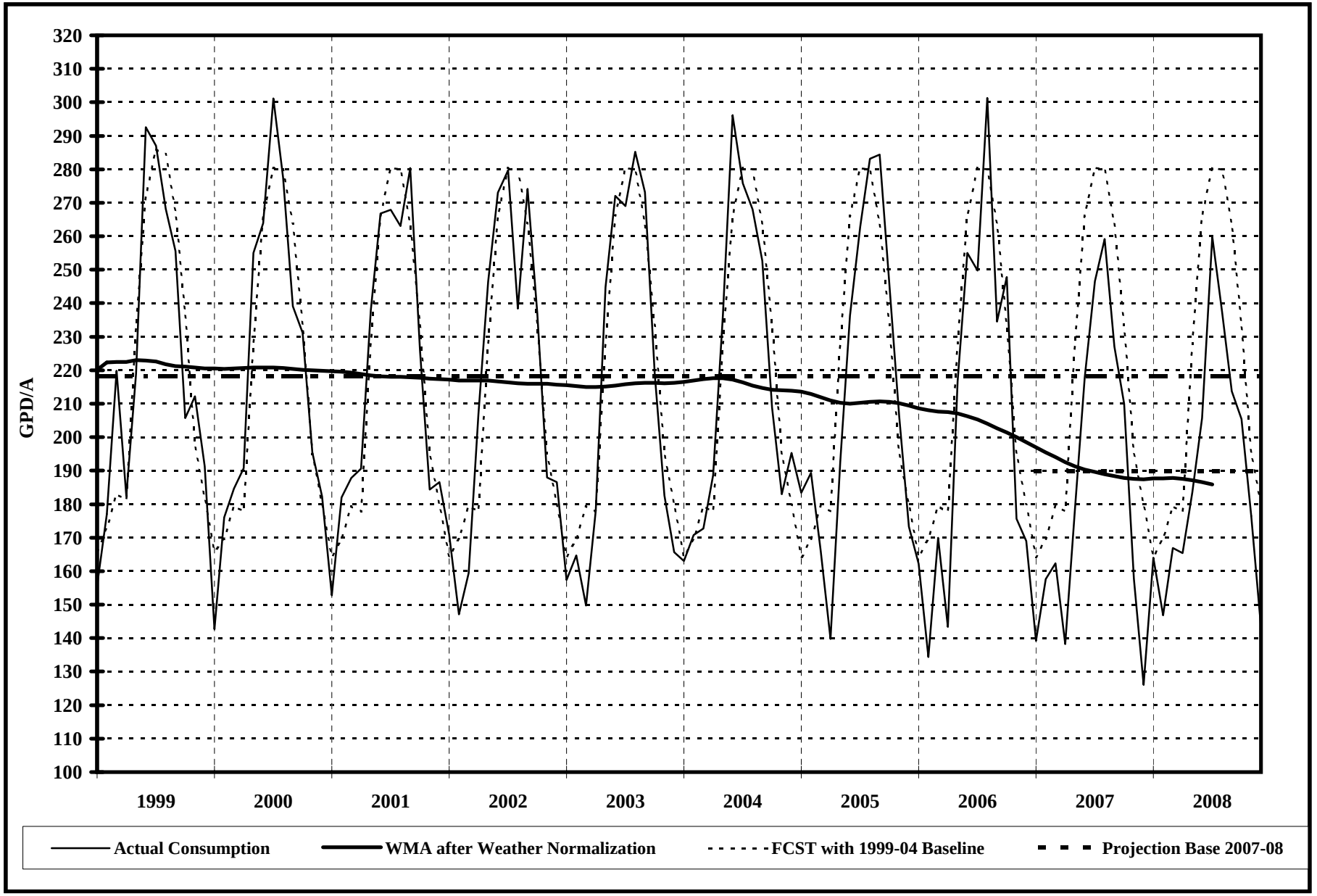
The model components consist of the following:

- The base data is monthly or bimonthly billings and the number of accounts billed.
- The model analysis is presented in terms of gallons per account per day to neutralize the effects of account growth.
- 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.
- The model includes a weighted moving average to provide a visual and arithmetic measure of the direction of the consumption pattern.

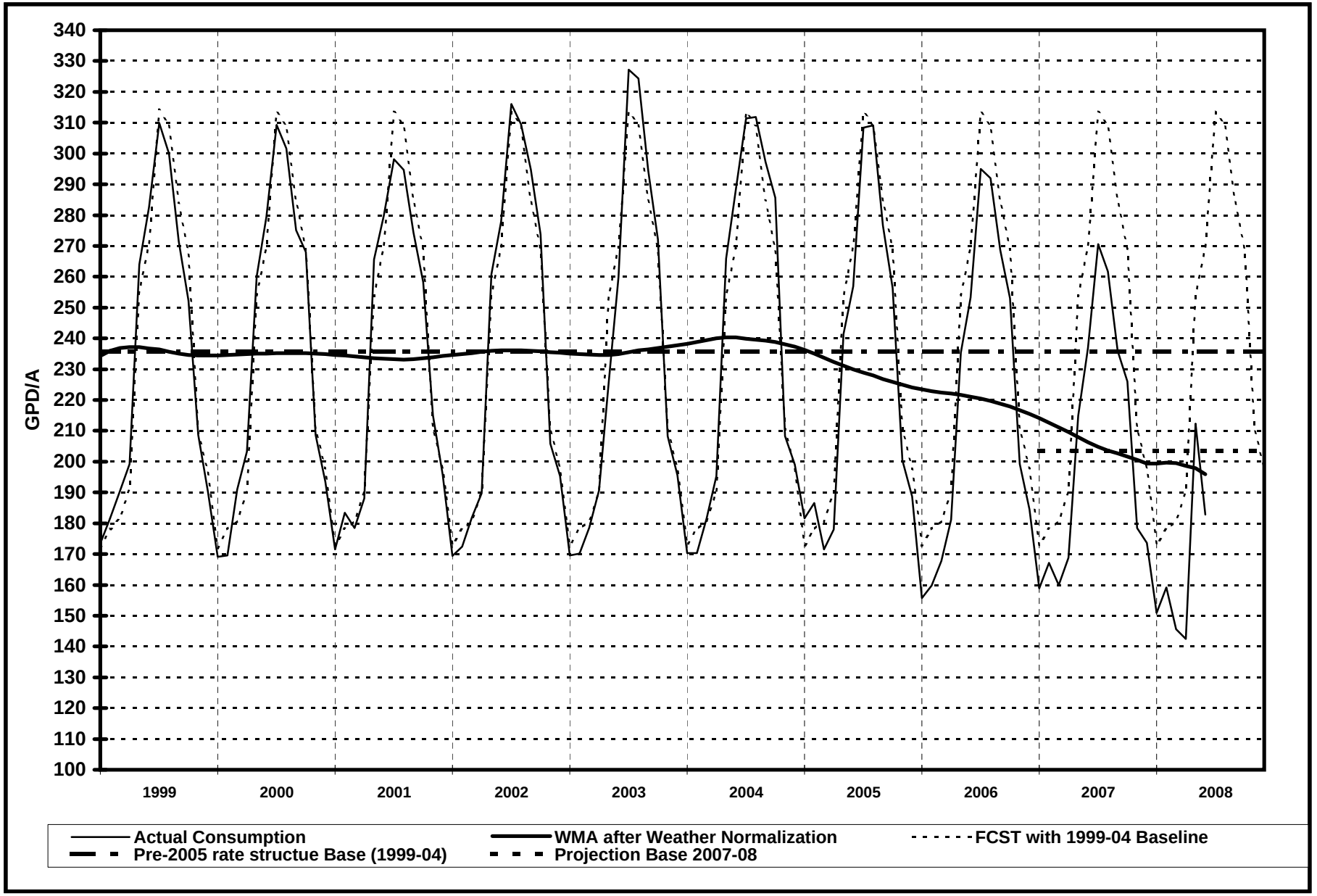
The water demand tracking models were updated and extended in 2008 to reflect recent changes in billing frequency, water rates, and rate structure. The models were divided into inside City, outside City and total City components to separately assess trends inside and outside the City, and then recombined to form a continuous record that that can be used to track long-term changes in water use over time.

The models were used to examine the effects of cool and wet weather in 2005 and 2006, and of dry weather in 2007 to help evaluate the recent downturn in water consumption. Although it is not possible to say with certainly, the decline experienced by several customer groups is thought to have been mainly a response to changes in pricing and in rate structure that were instituted over a five year period beginning in 2004, along with conservation effects other than pricing. Whether this recent trend represents a temporary situation from which usage will gradually recover to previously stable levels as the economy recovers, or represents a longer term condition is not possible to know.

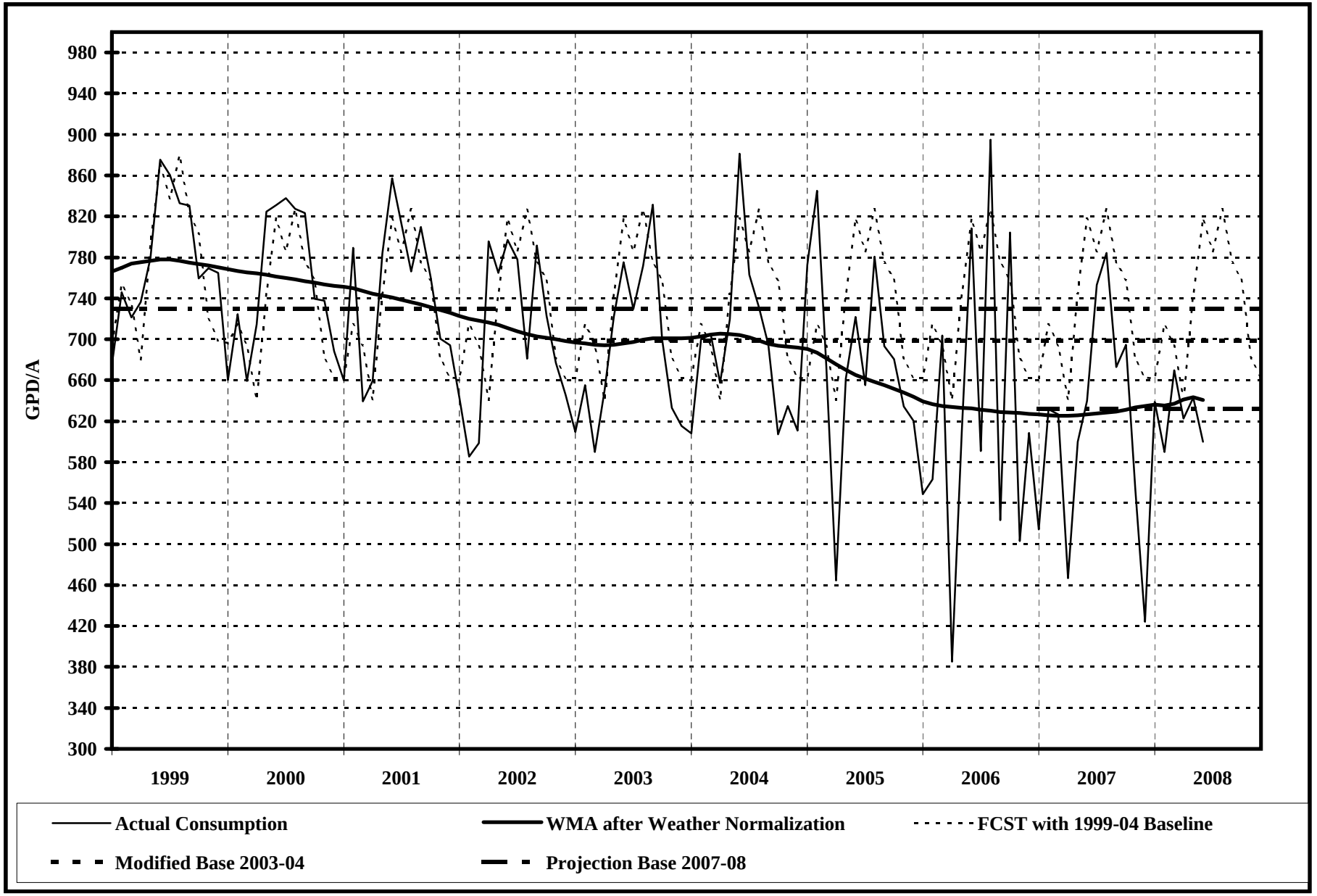
Water Demand Tracking Model:
Single Family Residential Accounts Located within City of Santa Cruz, Normalized for Weather Effects



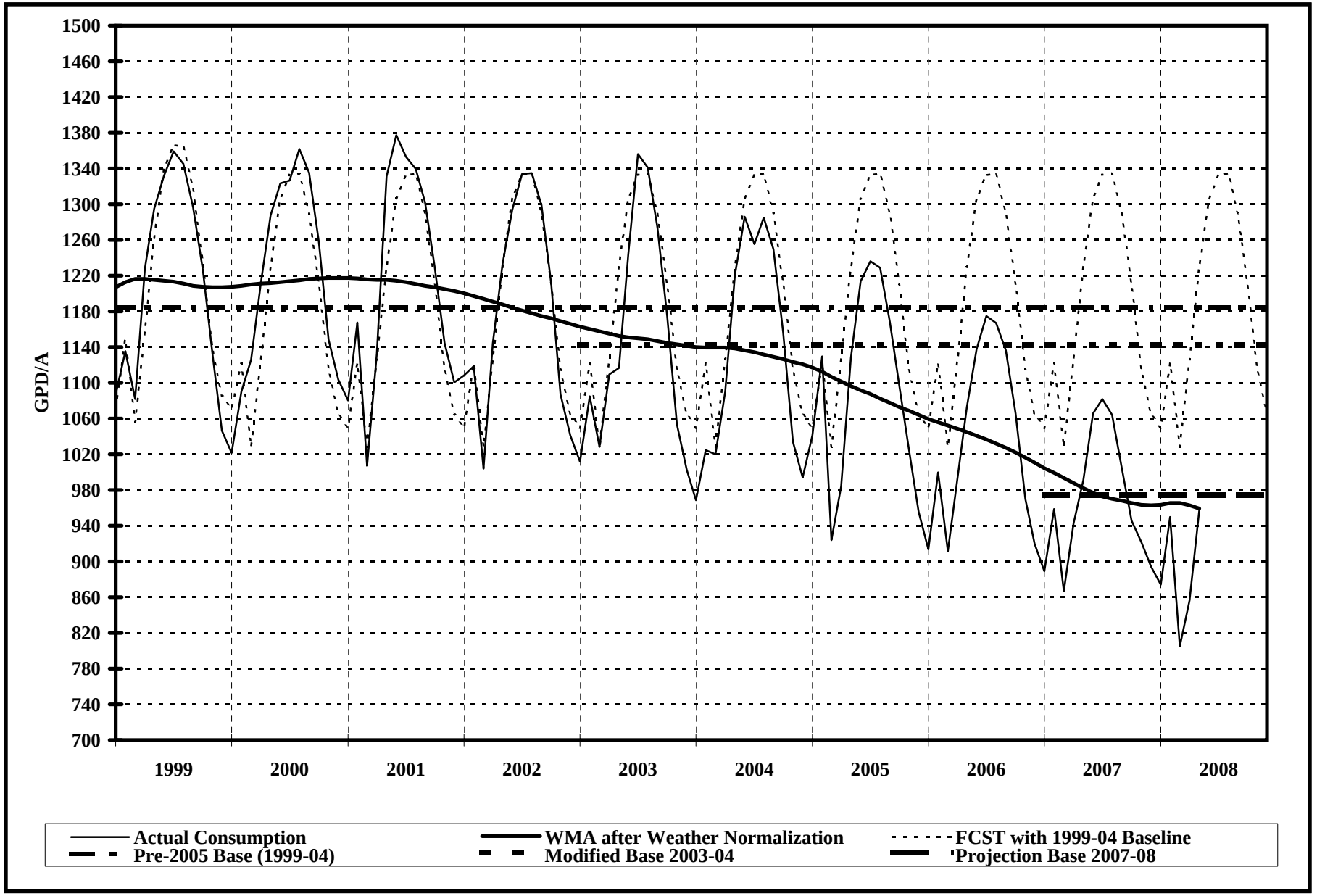
Water Demand Tracking Model:
Single Family Residential Accounts Located Outside of the City of Santa Cruz, Normalized for Weather Effects



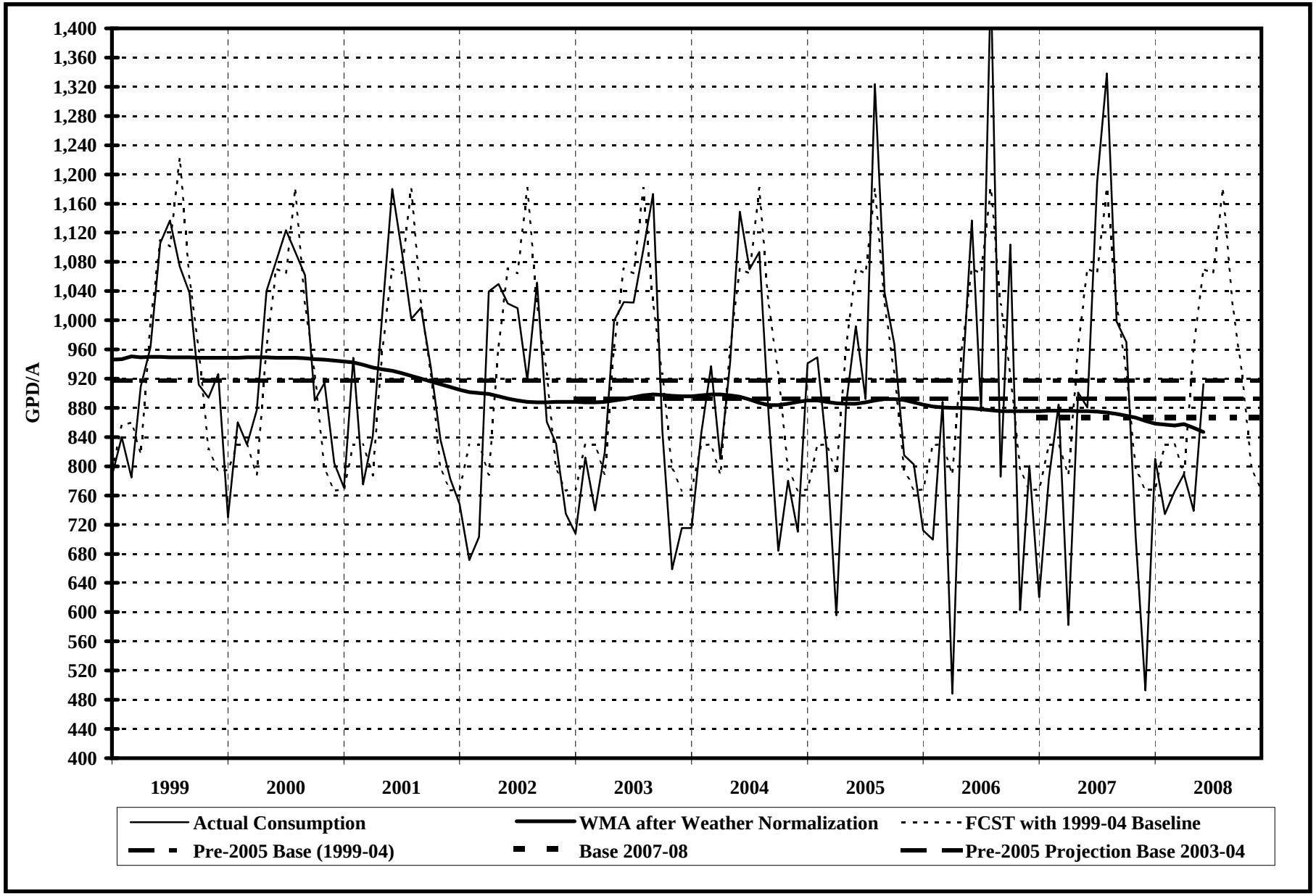
Water Demand Tracking Model:
Multiple Family Residential Accounts Located within City of Santa Cruz



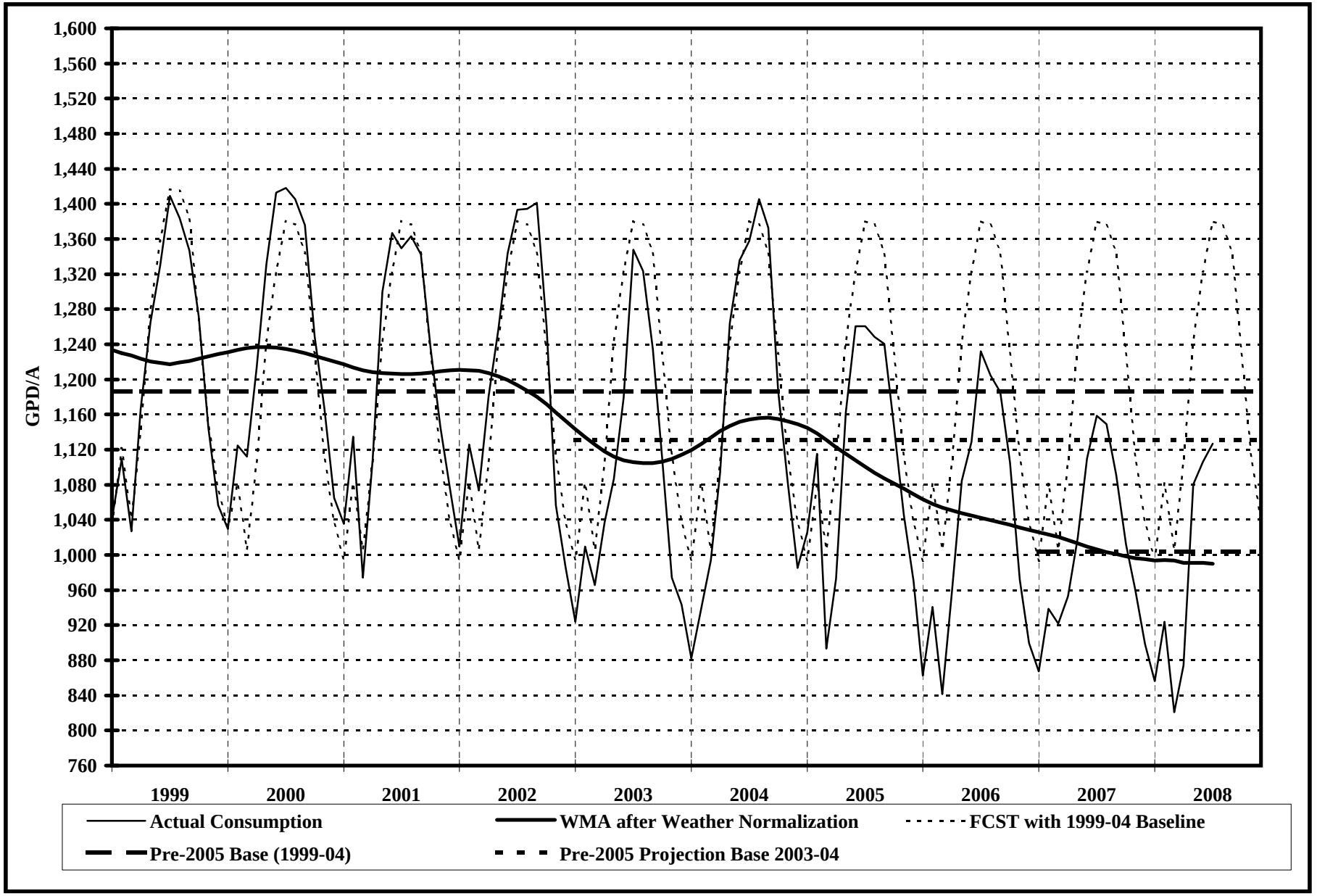
Water Demand Tracking Model:
Multiple Family Residential Accounts Located Outside of the City of Santa Cruz



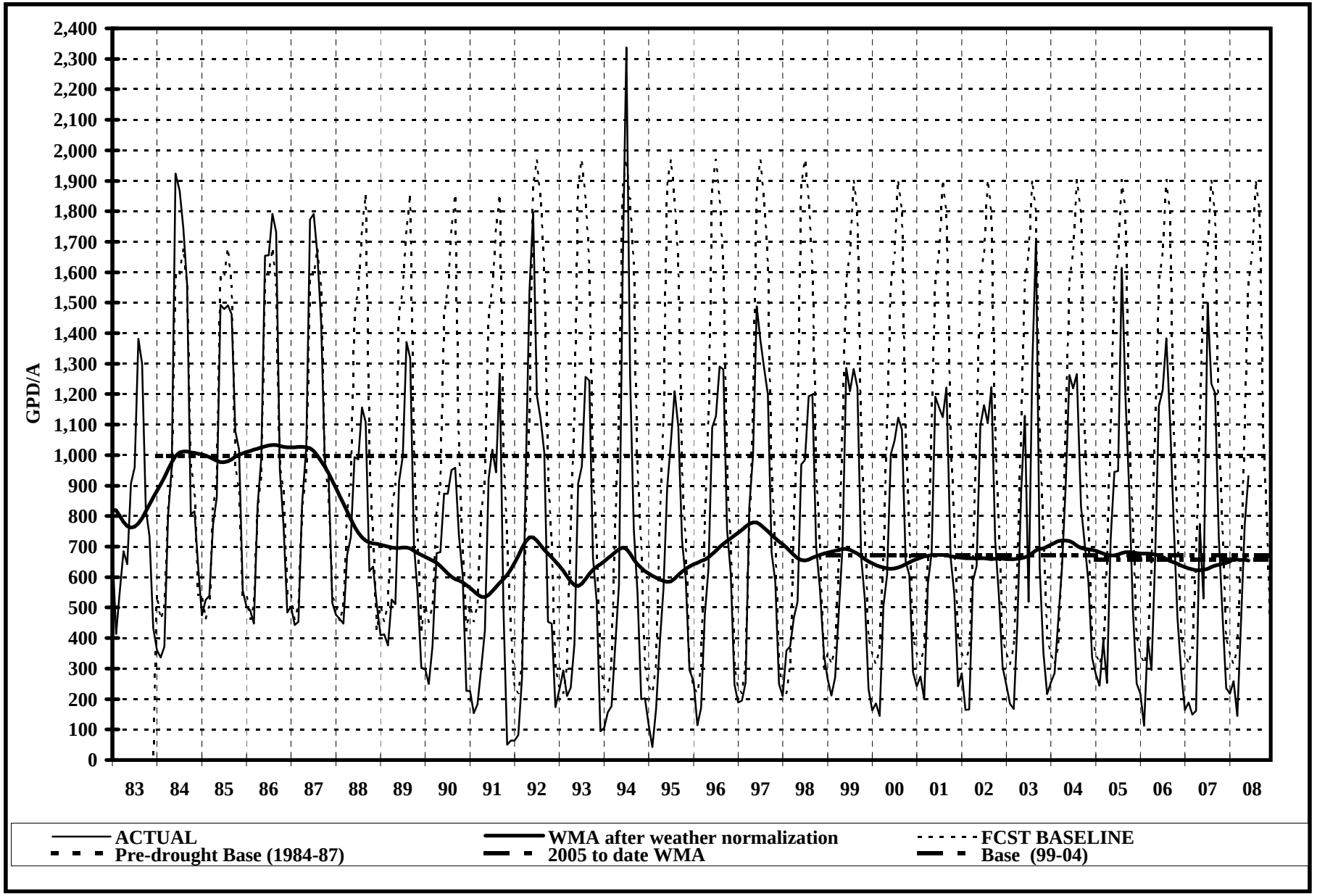
Water Demand Tracking Model:
Business and Industrial Accounts Located within City of Santa Cruz, Normalized for Weather Effects



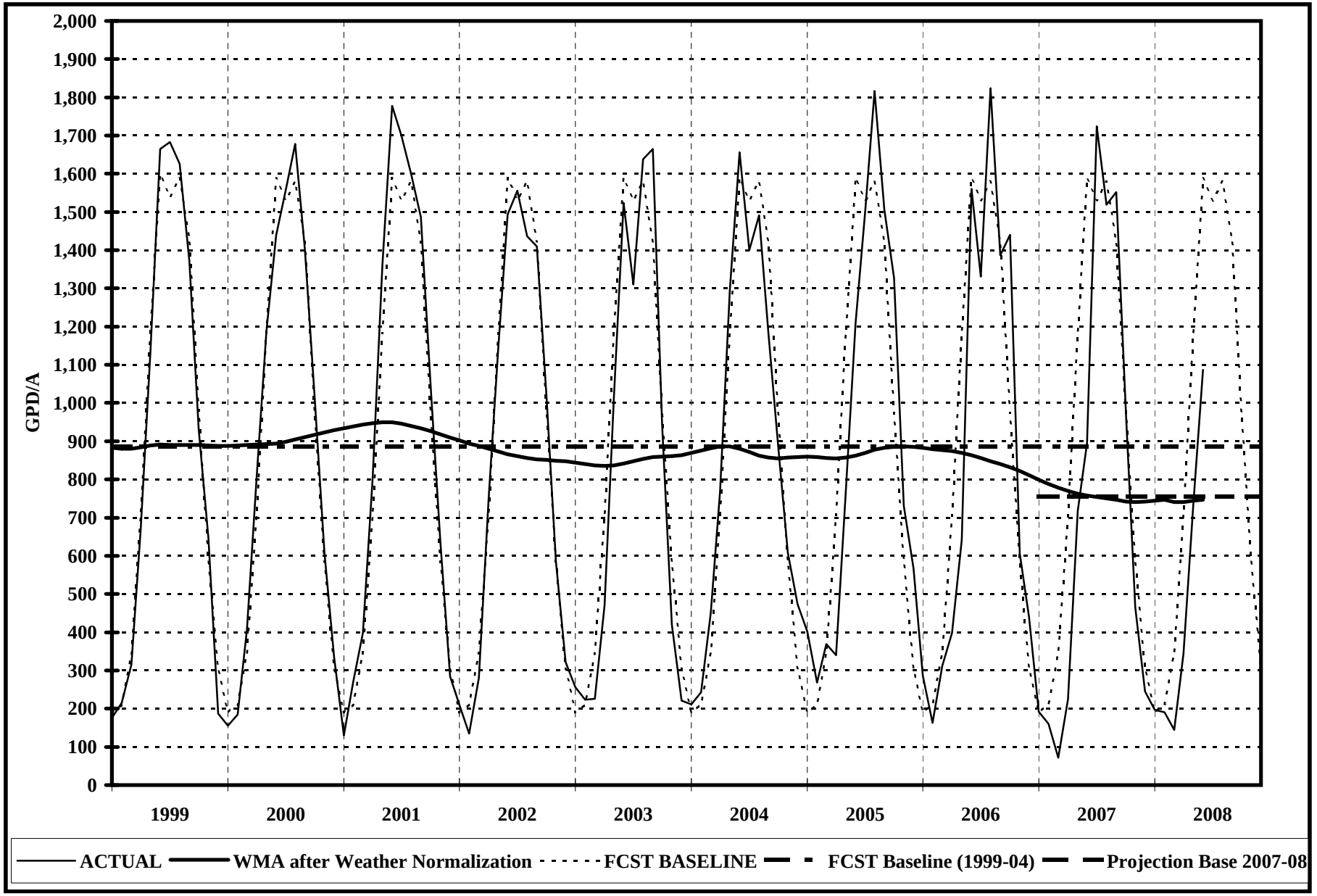
Water Demand Tracking Model:
Business and Industrial Accounts Located Outside of the City of Santa Cruz, Normalized for Weather Effects



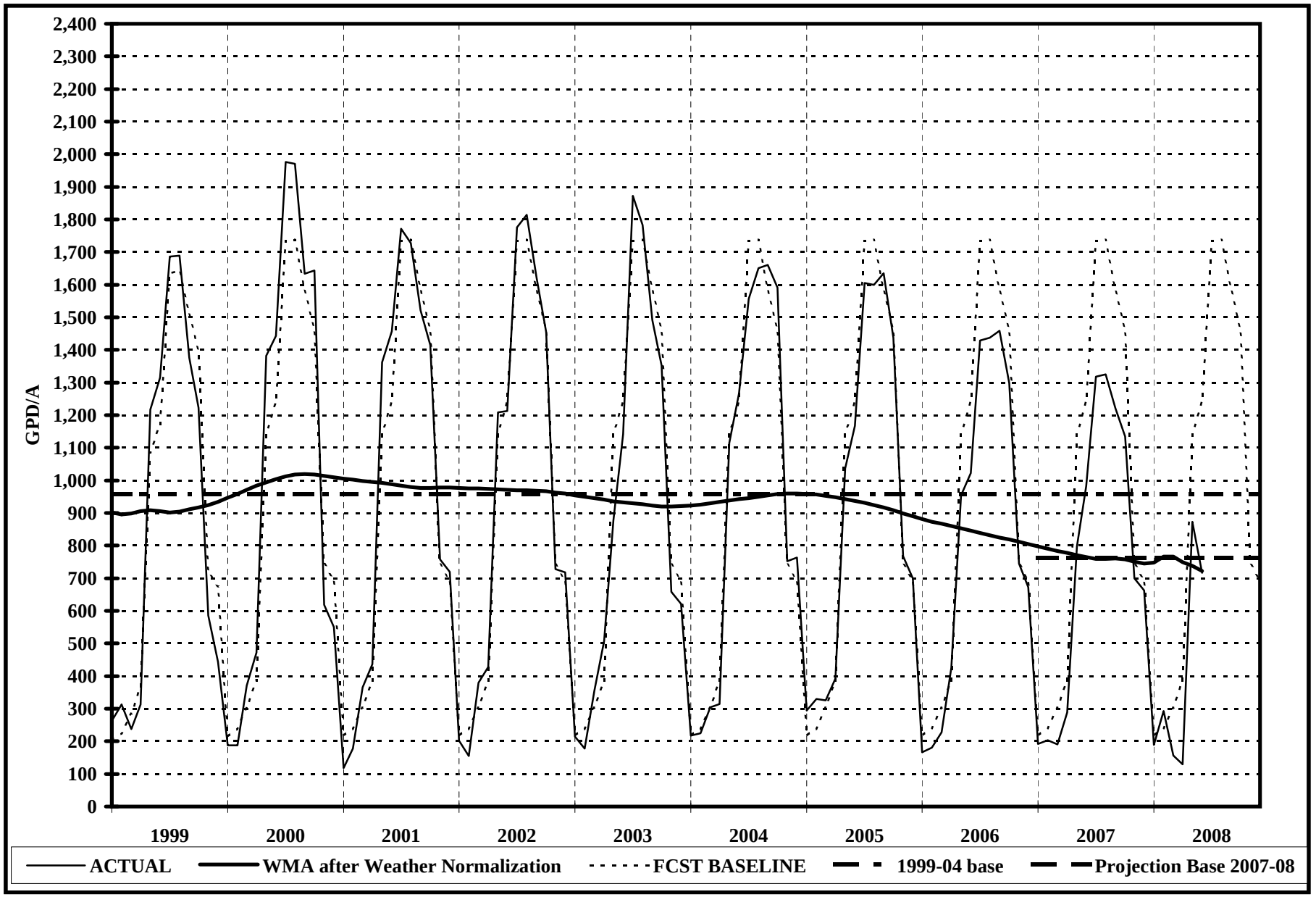
Water Demand Tracking Model:
Municipal Accounts Located within City of Santa Cruz, Normalized for Weather Effects



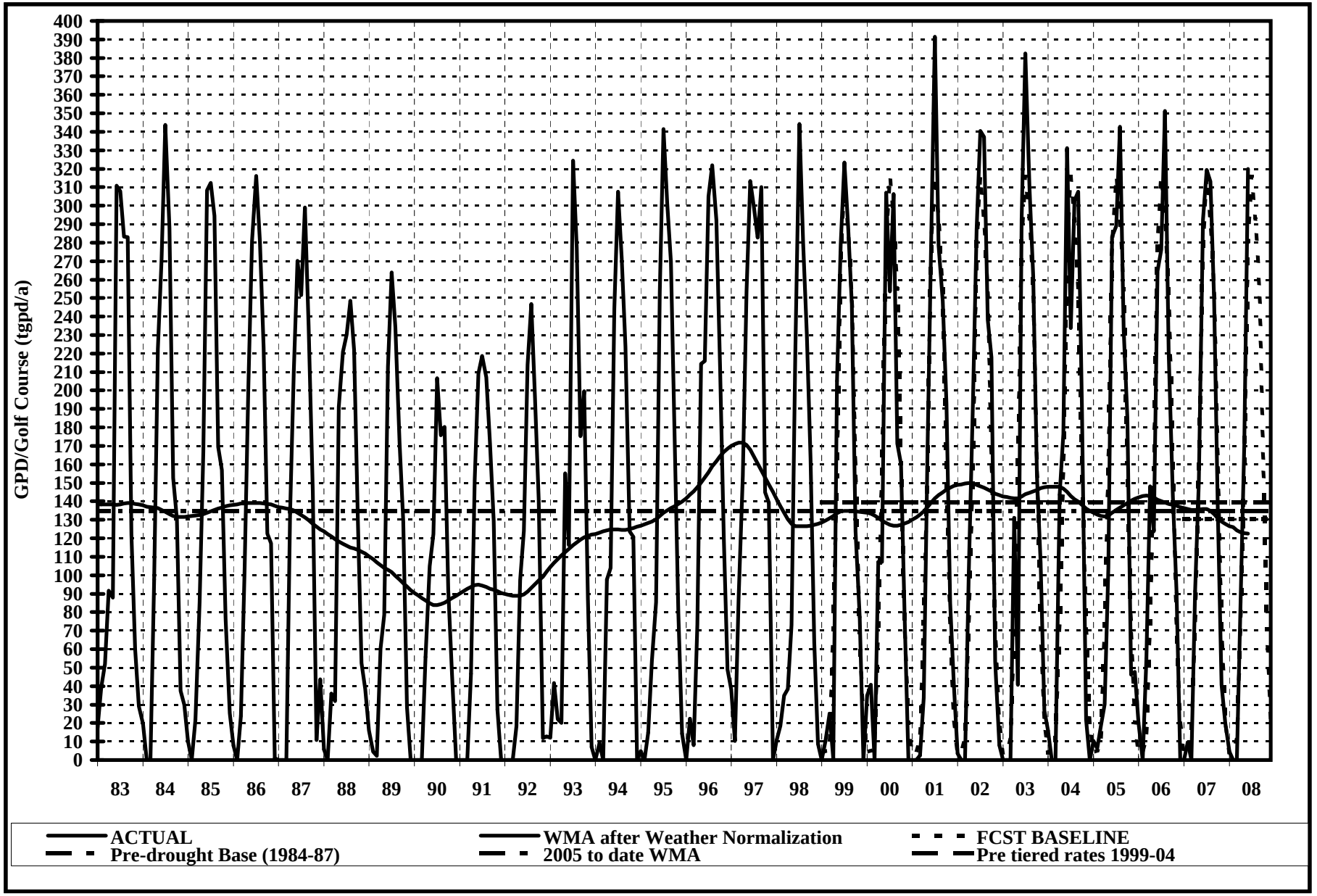
Water Demand Tracking Model:
Irrigation Accounts Located within City of Santa Cruz, Normalized for Weather Effects



Water Demand Tracking Model:
Irrigation Accounts Located Outside of the City of Santa Cruz, Normalized for Weather Effects



Water Demand Tracking Model:
Golf Course Accounts, Normalized for Weather Effects



Appendix B

Summary of Proposed General Plan 2030,
Provided by the City of Santa Cruz January 2011

SUMMARY OF PROPOSED *GENERAL PLAN 2030*

SUMMARY OF PROJECT

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.

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. the *General Plan 2030* is organized in the following chapters which address state-mandated topics, as well as 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

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.

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. 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 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 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.

GENERAL PLAN 2030 BUILDOUT ESTIMATES

To aid the environmental analysis, a "buildout" projection was developed by the City's land use consultant, Design, Community and Environment (DC&E), which is included following this summary. 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, and take into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels. The buildout projections estimates by the year 2030 and by geographic area are summarized on Table B-1 on the following page.

Several General Plan actions support specific types of development that would be accounted for in the buildout estimates. However, these buildout estimates do not account for some major pending or recently approved projects, 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 B-2 below. These projects have been added onto 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.

Table B-1: 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	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 B-2: 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	Use worst-case numbers for EIR traffic:395,382 sf industrial, office AND 161 MFD units

DESIGN, COMMUNITY & ENVIRONMENT

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BERKELEY, CA 94709
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FAX: 510 848 4315
www.dceplanning.com

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.

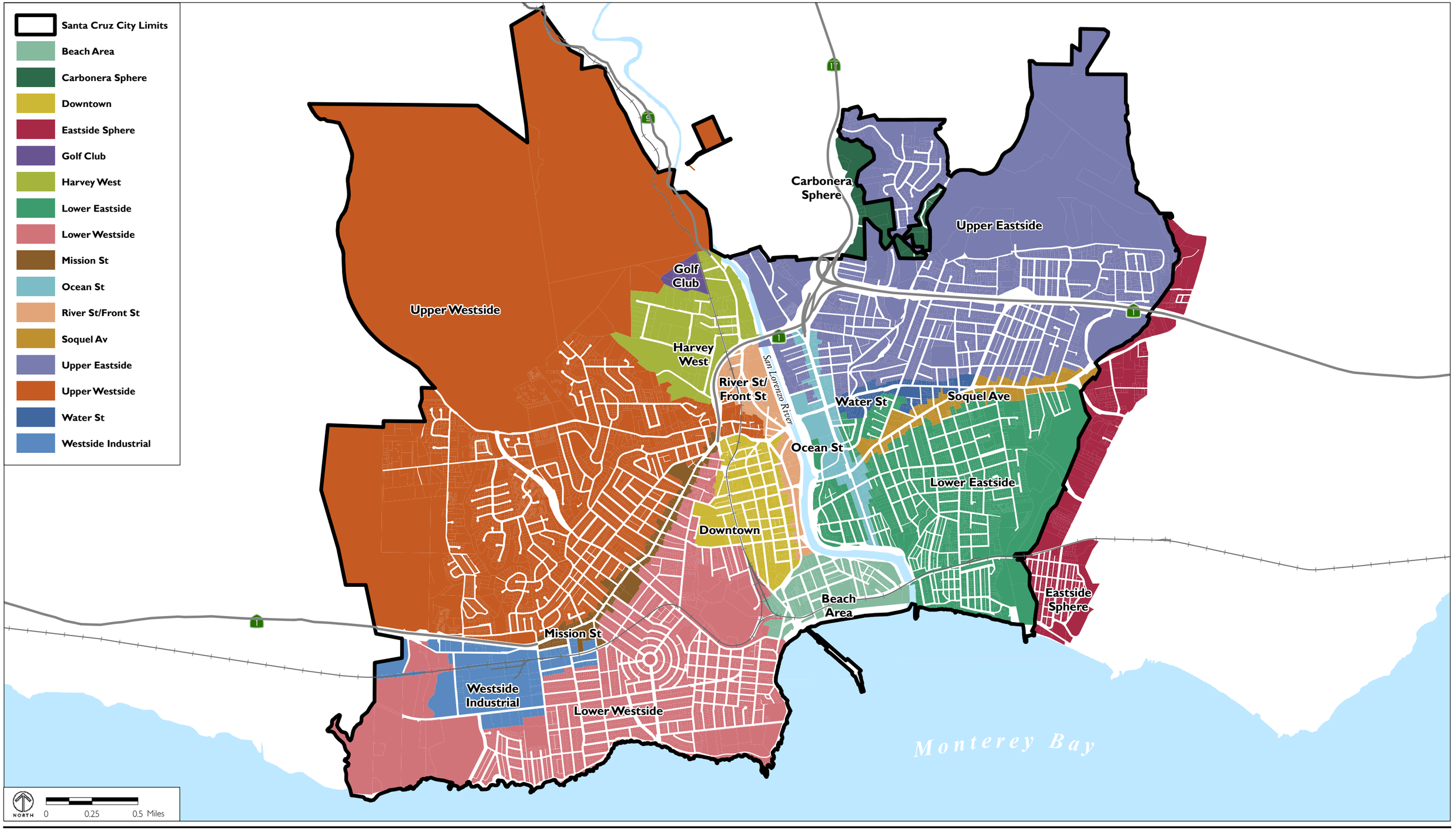
As a result, the analysis shows less potential for industrial expansion in the future, as compared with the "no project" scenario. The "no project" scenario projects 482,065 square feet of industrial development potential, compared to 381,544 square feet under General Plan 2030. The City anticipates 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.



Source: City of Santa Cruz GIS, 2008.

EXHIBIT B

GENERAL PLAN CHANGE AREAS: DECEMBER 2008

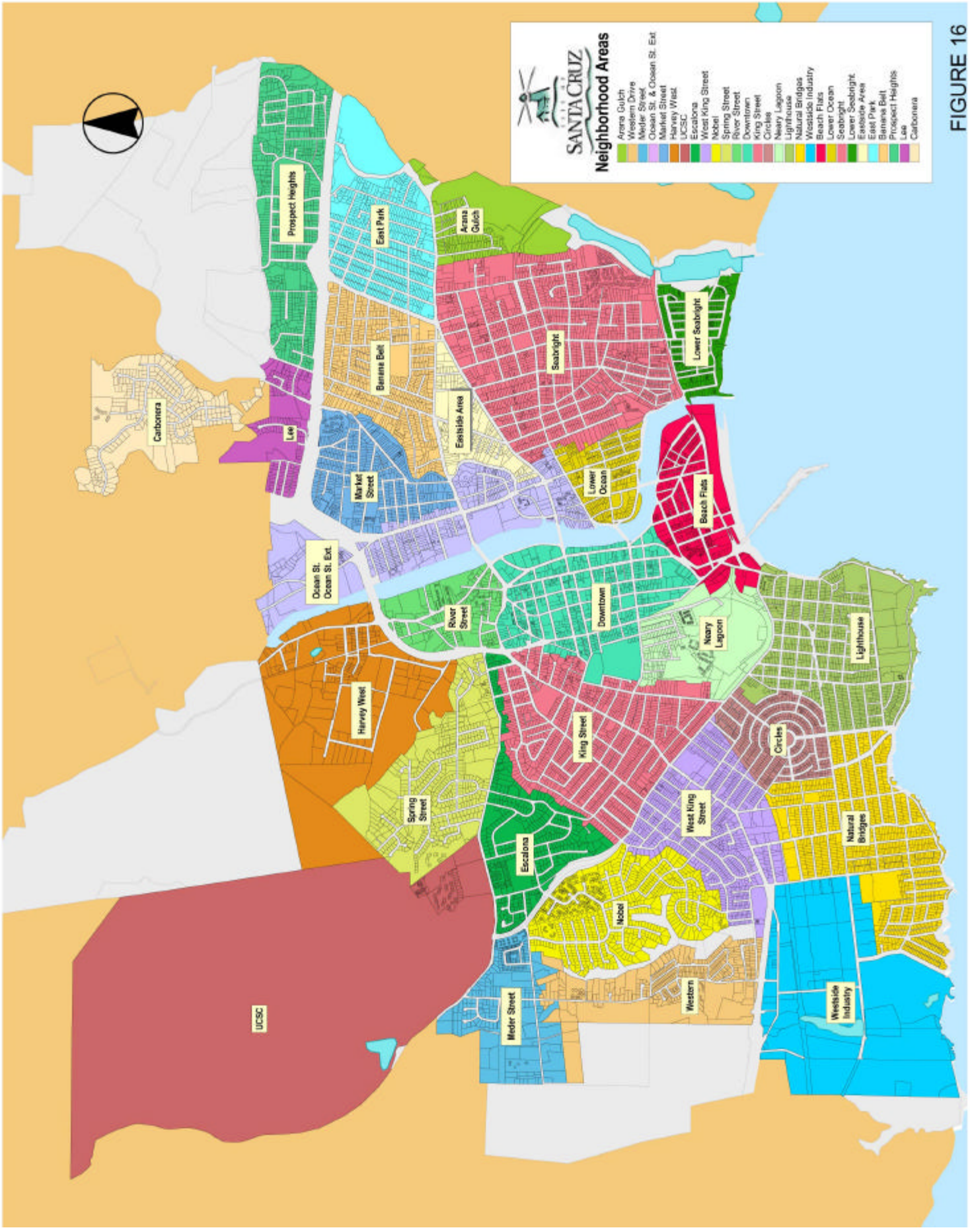

SANTA CRUZ
Neighborhood Areas
Arana Gulch
Western Drive
Meder Street
Ocean St. & Ocean St. Ext.
Market Street
Harvey West
UCSC
Escalona
West King Street
Nobel
Spring Street
River Street
Downtown
King Street
Circles
Neary Lagoon
Lighthouse
Natural Bridges
Westside Industry
Beach Flats
Lower Ocean
Seabright
Lower Seabright
Eastside Area
East Park
Banana Belt
Prospect Heights
Lee
Carbonera
Prospect Heights
East Park
Arana Gulch
Banana Belt
Seabright
Lower Seabright
Carbonera
Lee
Eastside Area
Market Street
Lower Ocean
Beach Flats
Ocean St. Ocean St. Ext.
River Street
Downtown
Neary Lagoon
Lighthouse
Harvey West
King Street
Circles
Spring Street
West King Street
Natural Bridges
Escalona
Nobel
Western
Westside Industry
Meder Street
UCSC

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**

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%

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%

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

City of Santa Cruz Surface Water Licenses, Permit and Applications to the State Water Resources Control Board

P16123

STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

ORDER

APPLICATION 22318 PERMIT 16123 LICENSE

ORDER APPROVING A NEW DEVELOPMENT SCHEDULE AND AMENDING THE PERMIT

WHEREAS:

1. A PETITION FOR EXTENSION OF TIME WITHIN WHICH TO DEVELOP THE PROJECT AND APPLY THE WATER TO THE PROPOSED USE HAS BEEN FILED WITH THE STATE WATER RESOURCES CONTROL BOARD.

2. THE PERMITTEE HAS PROCEEDED WITH DILIGENCE AND GOOD CAUSE HAS BEEN SHOWN FOR EXTENSION OF TIME AND FOR THE SAID CHANGE.

NOW, THEREFORE, IT IS ORDERED THAT:

1. PARAGRAPH 9 OF THE PERMIT IS AMENDED TO READ AS FOLLOWS:

COMPLETE APPLICATION OF THE
WATER TO THE PROPOSED USE
SHALL BE MADE ON OR BEFORE DECEMBER 1, 1990

2. PARAGRAPH 16 IS ADDED AS FOLLOWS:

PURSUANT TO CALIFORNIA WATER CODE SECTIONS 100 AND 275, ALL RIGHTS AND PRIVILEGES UNDER THIS PERMIT AND UNDER ANY LICENSE ISSUED PURSUANT THERETO, INCLUDING METHOD OF DIVERSION, METHOD OF USE, AND QUANTITY OF WATER DIVERTED, ARE SUBJECT TO THE CONTINUING AUTHORITY OF THE STATE WATER RESOURCES CONTROL BOARD IN ACCORDANCE WITH LAW AND IN THE INTEREST OF THE PUBLIC WELFARE TO PREVENT WASTE, UNREASONABLE USE, UNREASONABLE METHOD OF USE, OR UNREASONABLE METHOD OF DIVERSION OF SAID WATER.

THE CONTINUING AUTHORITY OF THE BOARD MAY BE EXERCISED BY IMPOSING SPECIFIC REQUIREMENTS OVER AND ABOVE THOSE CONTAINED IN THIS PERMIT WITH A VIEW TO MINIMIZING WASTE OF WATER AND TO MEETING THE REASONABLE WATER REQUIREMENTS OF PERMITTEE WITHOUT UNREASONABLE DRAFT ON THE SOURCE. PERMITTEE MAY BE REQUIRED TO IMPLEMENT SUCH PROGRAMS AS (1) REUSING OR RECLAIMING THE WATER ALLOCATED; (2) USING WATER RECLAIMED BY ANOTHER ENTITY INSTEAD OF ALL OR PART OF THE WATER ALLOCATED; (3) RESTRICTING DIVERSIONS SO AS TO ELIMINATE AGRICULTURAL TAILWATER OR TO REDUCE RETURN FLOW; (4) SUPPRESSING EVAPORATION LOSSES FROM WATER SURFACES; (5) CONTROLLING PHREATOPHYTIC GROWTH; AND (6) INSTALLING, MAINTAINING, AND OPERATING EFFICIENT WATER MEASURING DEVICES TO ASSURE COMPLIANCE WITH THE QUANTITY LIMITATIONS OF THIS PERMIT AND TO DETERMINE ACCURATELY WATER USE AS AGAINST REASONABLE WATER REQUIREMENTS FOR THE AUTHORIZED PROJECT. NO ACTION WILL BE TAKEN PURSUANT TO THIS PARAGRAPH UNLESS THE BOARD DETERMINES, AFTER NOTICE TO AFFECTED PARTIES AND OPPORTUNITY FOR HEARING, THAT SUCH SPECIFIC REQUIREMENTS ARE PHYSICALLY AND FINANCIALLY FEASIBLE AND ARE APPROPRIATE TO THE PARTICULAR SITUATION.

(000012)

3. PARAGRAPH 17 IS ADDED TO THIS PERMIT AS FOLLOWS:

THE STATE WATER RESOURCES CONTROL BOARD, UNDER ITS AUTHORITY TO CONSERVE THE PUBLIC INTEREST, RETAINS CONTINUING AUTHORITY OVER THIS PERMIT TO REQUIRE PERMITTEE TO DEVELOP AND IMPLEMENT A WATER CONSERVATION PROGRAM, AFTER NOTICE AND OPPORTUNITY FOR HEARING. THE REQUIREMENTS OF THIS TERM MAY BE SATISFIED BY PERMITTEE'S COMPLIANCE WITH ANY COMPREHENSIVE WATER CONSERVATION PROGRAM, APPROVED BY THE STATE WATER RESOURCES CONTROL BOARD, WHICH MAY BE IMPOSED BY A PUBLIC AGENCY. (000029B)

DATE: MARCH 31 1981

Walter G. Pettit

WALTER G. PETTIT, CHIEF
DIVISION OF WATER RIGHTS

CONTACT REPORT

DIVISION OF WATER RIGHTS
STATE WATER RESOURCES CONTROL BOARD

Subject: Fish water release at Felton Diversion Dam
Permits 16123 & 16601 (applications 22318 & 23710)

Division Personnel: L. Spencer

Date: 1-3-79 Time: 16:45

Personal ☐ Where:

Telephone ☒ Number: 408-429-3670

Individual(s)/Agency Contacted: Morris Allen

Conversation Description: Paul Chappelle of DFG called Wall Pettit this afternoon about a fisheries problem in San Lorenzo River below Felton Diversion Dam. He reported that flow was below 20 cfs and the City was bypassing the entire flow. The inflatable dam was not inflated enough to cause the fish ladder to operate and salmon were spawning below the diversion dam. See Wall's note for further info. Walt asked me to call Morris Allen and check out the factual situation.

Morris stated that the flow in the San Lorenzo was 16 cfs, that the entire flow was being bypassed. The inflatable dam was up about 2 feet and the fish ladder non-operational. The flow being bypassed was to swift for the salmon to navigate. We discussed Chappelle's proposal, and Morris mentioned an alternative. He stated that the City was not willing to operate at variance from its permit without a directive from us. He stated that an order by the Board would not be necessary, a written directive would be sufficient.

I stated we would keep him advised of developments.

Decision(s):

Action Items:

SURNAME	Spencer	Pettit 1/5		

P16123.

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

ORDER

Application 22318 Permit 16123 License _____

ORDER APPROVING A NEW DEVELOPMENT SCHEDULE AND AMENDING THE PERMIT

WHEREAS:

1. Permit 16123 was issued to City of Santa Cruz on December 21, 1970 pursuant to Application 22318.

2. A petition for an extension of time within which to develop the project and apply the water to the proposed use has been filed with the State Water Resources Control Board (SWRCB).

3. The permittee has proceeded with diligence and good cause has been shown for said extension of time.

4. Permit Condition 11 pertaining to the continuing authority of the SWRCB should be updated to conform to Section 780(a), Title 23 of the California Code of Regulations.

NOW, THEREFORE, IT IS ORDERED THAT:

1. Condition 9 of the permit be amended to read:

   COMPLETE APPLICATION OF THE WATER TO THE PROPOSED USE SHALL BE MADE ON OR BEFORE December 31, 2006 (0000009)

2. Condition 11 of the permit be amended to read:

   Pursuant to California Water Code Sections 100 and 275, and the common law public trust doctrine, all rights and privileges under this permit and under any license issued pursuant thereto, including method of diversion, method of use, and quantity of water diverted, are subject to the continuing authority of the SWRCB in accordance with law and in the interest of the public welfare to protect public trust uses and to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of said water.

   The continuing authority of the SWRCB may be exercised by imposing specific requirements over and above those contained in this permit with a view to eliminating waste of water and to meeting the reasonable water requirements of permittee without unreasonable draft on the source. Permittee may be required to implement a water conservation plan, features of which may include but not necessarily be limited to: (1) reusing or reclaiming the water allocated; (2) using water reclaimed by another entity instead of all or part of the water allocated; (3) restricting diversions so as to eliminate agricultural tailwater or to reduce return flow; (4) suppressing evaporation losses from water

surfaces; (5) controlling phreatophytic growth; and (6) installing, maintaining, and operating efficient water measuring devices to assure compliance with the quantity limitations of this permit and to determine accurately water use as against reasonable water requirements for the authorized project. No action will be taken pursuant to this paragraph unless the SWRCB determines, after notice to affected parties and opportunity for hearing, that such specific requirements are physically and financially feasible and are appropriate to the particular situation.

The continuing authority of the SWRCB also may be exercised by imposing further limitations on the diversion and use of water by the permittee in order to protect public trust uses. No action will be taken pursuant to this paragraph unless the SWRCB determines, after notice to affected parties and opportunity for hearing, that such action is consistent with California Constitution Article X, Section 2; is consistent with the public interest and is necessary to preserve or restore the uses protected by the public trust. (0000012)

Dated: SEPTEMBER 9 1996

for Edward C. Anton, Chief
Division of Water Rights

STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

ORDER

APPLICATION 22318 PERMIT 16123 LICENSE

ORDER CORRECTING DESCRIPTION OF
POINT OF DIVERSION

WHEREAS:

1. The permittee's Felton Diversion Plant was constructed within NE¼ of SW¼ of Section 22 instead at the permitted point of diversion being within SE¼ of NW¼ of said Section 22.

2. The State Water Resources Control Board has determined that no legal user of water will be injured by correcting the description of point of diversion.

NOW, THEREFORE, IT IS ORDERED THAT:

1. The description of the point of diversion under permit 16601 be corrected to read as follows:

   SOUTH 30° EAST 3,200 FEET FROM THE NW CORNER OF SECTION 22 BEING WITHIN THE NE¼ OF SW¼ OF PROJECTED SECTION 22, T10S, R2W, MDB&M.

Dated: DECEMBER 8 1978

for Michael A. Campos, Chief
Division of Water Rights

Permit 16123

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of Request for Modification of Terms of Permits 16123 and 16601 by CITY OF SANTA CRUZ	Decision 1464

DECISION TEMPORARILY MODIFYING PERMIT TERMS

BY BOARD MEMBER ADAMS:

On March 8, 1977, the State Water Resources Control Board held a public hearing in the above-entitled matter pursuant to Section 736.1 of Title 23, California Administrative Code. This hearing was held to determine whether the Board should exercise its continuing authority under Term 11 of Permits 16123 and 16601 to modify permit conditions regarding bypasses for preservation of fish and wildlife. The City of Santa Cruz, Department of Fish and Game and other interested parties having appeared and presented evidence; the evidence received at the hearing having been duly considered, the Board finds as follows:

Permittee's Water Supply System

1. Permittee's water system provides service to about 58,000 customers within and without the city limits. Permittee's major sources of water are the San Lorenzo River, coastal streams and wells.

2. Permittee holds Permits 16123 and 16601 which authorize diversion from San Lorenzo River at Felton diversion offstream storage in Loch Lomond Reservoir. These permits together limit the total quantity diverted at the Felton diversion to 3,000 acre-feet per annum (afa). The annual safe yield estimate for the remaining components of permittee's water supply is as follows: Newell Creek, 2,300 afa; San Lorenzo River at Crossing Street, 6,190 afa; wells, 450 afa; and coastal streams, 1,360 afa. The total annual safe yield estimate for the City's system, including the Felton diversion, is 13,300 afa.

3. Evidence established the existence of a bonafide drought and that because of the existing drought conditions the City would have a deficiency of 2,832 acre-feet (af) in estimated total annual safe yield at the end of this year, assuming normal usage.

Water Conservation Measures

4. On March 1, 1977, the City of Santa Cruz adopted a water conservation ordinance (Ordinance No. 77-6) which declares the presence of a drought emergency, reduces water use, and prescribes penalties for violations. The water usage provisions are substantially as follows:

Residential usage:

Persons per house	Bimonthly Amount	Equivalent Gallons per day	Equivalent Gallons per day per person
1	900 cf	112	112
2	1500 cf	187	94
3	2000 cf	250	83
4	2400 cf	300	75
Each additional person	400 cf	50	

All other uses, including commercial, industrial, and irrigation, are limited to 70 percent of use in 1975.

5. A priority system for water use based upon need was not established by the ordinance, and the ordinance is specifically found to be deficient in this respect. Moreover, testimony was presented, including that of a witness representing the County of Santa Cruz, generally critical of the daily per capita domestic water consumption allowed by the ordinance. One witness characterized the measure as a "water wasting" ordinance. Nevertheless, it is found that the measure does require a substantial reduction in "normal" water usage in the permittee's service area. The Board is reluctant to review the judgment of permittee's City Council, at this time, with respect to the specifics of its water conservation measures.

6. The water conservation measures noted above would, by permittee's estimate, reduce water consumption by 3,500 af by the end of this year. This saving in consumption, less the

deficit identified in paragraph 3 would result in a net savings of 700 af to permittee's system for use after 1977.

Availability of Alternative Supplies

7. Evidence established that the most likely source of an alternative water supply is increased use of groundwater. However, neither this source nor increased diversion from the San Lorenzo River at Crossing Street is available at this time. It is further found that permittee in the past has not diligently pursued development of alternative supplies.

Permittee's Request

8. By letter of February 9, 1977, permittee requested a temporary modification of Term 16 of Permit 16601. (Since the same restriction is imposed by Term 14 of Permit 16123, modification of that term was also considered at the hearing.) The effect of these terms relevant to this proceeding is to require bypass of 20 cubic-feet per second (cfs) or the natural flow, whichever is the less, until May 31, the end of the diversion season, for preservation of fish and wildlife. Permittee requested that this bypass requirement be reduced to 10 cfs.

9. Since the effect of the water conservation measures taken by permittee will be to achieve a net saving of 700 af this year for use next year, it is found that permittee's supply will not be exhausted this year. Therefore, the reason for the request to modify the bypass requirement is to further increase availability of water to the system should the

drought continue into 1978. The City estimates it can increase storage in Loch Lomond by 750-900 af by May 31, 1977, if its request to reduce the bypass flow is granted.

Impact on the Fishery

10. Evidence presented by the Department of Fish and Game established that the existing bypass requirement of 20 cfs is a minimum flow needed to provide transportation for migrating salmon and steelhead.

11. Department of Fish and Game evidence further established that a flow of 14.1 cfs existed on March 1 and flows immediately prior to the date of hearing were about 10.4 cfs, all of which flows, pursuant to the relevant permit terms, were being bypassed. As a result of these low flows, the San Lorenzo River fishery has been and will continue to be damaged. Such flows do not allow migration, but will only serve to keep a small population of fish alive in pools in which they are stranded.

12. Department of Fish and Game evidence further established that modification of the relevant terms to require bypass of 10 cfs for the remainder of the diversion season will not have a significant additional adverse impact on the already damaged fishery, but that any significant storm flows occurring between now and the end of the diversion season at the Felton diversion should be bypassed through the diversion to allow temporary fish movement to mitigate the drought's adverse impact upon the fishery.

13. The Board should, upon any request of Permittee for modification of bypass terms to be effective when the diversion season resumes next fall, hold further hearing to consider the suitability of permittee's water conservation measures and pursuit of alternate supplies.

14. The Department of Fish and Game also recommended that the fishery be given a "credit" in the form of a right to release from storage in a normal water year within five years, at a rate specified by the Department, the amount of water diverted to storage as the result of any modification. The record in this matter discloses considerable concern over the adequacy, in normal years, of the existing fish and wildlife preservation conditions of the permits governing the Felton diversion. Moreover, the record also discloses the existence of an on-going joint local-state program to develop a Waterway Management Plan for the San Lorenzo River. Accordingly, rather than acting upon the Department's recommendation to establish a "credit" for the diversions allowed by the modification, the Board announces its intention to review the adequacy of these existing permit terms in the light of the completed Waterway Management Plan and with the aid of further input by the Department of Fish and Game, permittee, and other interested parties. The Board may, on its own motion or upon request of any interested party, hold a hearing at the appropriate time to conduct such review.

DETERMINATION OF ISSUE

Cause exists for modification of the relevant permit terms regarding minimum bypass flows, upon suitable conditions, in accordance with law and in the interest of the public welfare to prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of water.

ORDER

1. Condition 14 of Permit 16123 is temporarily modified to read:

"14. Permittee shall bypass 10 cubic feet per second or the natural flow, whichever is less, from September 1 through May 31 for the preservation of fish and wildlife; provided, that diversion shall be made only during such times as flow at the diversion exceeds 12.5 cubic feet per second."

2. Condition 16 of Permit 16601 is temporarily modified to read:

"16. For the protection of fish, no diversion shall be made during the month of October which depletes the flow of the stream to less than 25 cubic feet per second nor to less than 10 cubic feet per second during the period November 1 to the succeeding May 31. No water shall be diverted until permittee has installed in the stream immediately below its point of diversion a staff gage, or other device satisfactory to the State Water Resources Control Board, showing the water levels which correspond

to the above-mentioned flows in cubic feet per second. As a condition of continuing diversion, said measuring device shall be properly maintained. Diversion shall be made only during such times as flow at the diversion exceeds 12.5 cubic feet per second."

3. The following additional condition, appropriately numbered, is added to Permits 16123 and 16601:

"The duration of the modification of Condition (14/16) authorized by State Water Resources Control Board Decision 1464, and of this condition shall be from March 17, 1977, through May 31, 1977, and shall thereafter be of no force or effect. From and after June 1, 1977, said condition (14/16) shall be as it existed immediately prior to the effective date of such modification. In addition, the following conditions shall be observed during the effective period of the modification of condition (14/16): (0000300)

a. During any period when flow at the diversion exceeds 20 cfs, permittee shall bypass 20 cfs for the preservation of fish and wildlife. When, following any such period, such flow recedes to 20 cfs or less but is greater than 18 cfs, permittee shall make no diversion until such flow recedes to 18 cfs or less, whereupon permittee may divert in accordance with modified condition (14/16).

b. Approval of permittee's gage system and rating table was required by State Water Resources Control Board Decision 1459. Interim approval thereof until March 31, 1977, as granted by letter from the Chief, Division of Water Rights, dated November 18, 1976, (333:MLS:22318), is hereby extended through May 31, 1977."

Dated: MAR 17 1977

WE CONCUR:

/s/ W. W. Adams
W. W. Adams, Member

/s/ John E. Bryson
John E. Bryson, Chairman

/s/ W. Don Maughan
W. Don Maughan, Vice Chairman

/s/ Roy E. Dodson
Roy E. Dodson, Member

/s/ Jean Auer
Jean Auer, Member

STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

PERMIT FOR DIVERSION AND USE OF WATER

PERMIT No. 16123

Application 22318 of City of Santa Cruz
City Hall, Santa Cruz, California 95061

filed on October 20, 1965, has been approved by the State Water Resources Control Board SUBJECT TO VESTED RIGHTS and to the limitations and conditions of this Permit.

Permittee is hereby authorized to divert and use water as follows:

1. Source:	Tributary to:
San Lorenzo River	Monterey Bay

2. Location of point of diversion:	40-acre subdivision of public land survey or projection thereof	Section	Township	Range	Base and Meridian
S 48° E 2,904' From NW Corner of	SE ¼ of NW ¼	22	10S	2W	MD
Section 22, T10S, R2W, MDB&M	¼ of ¼				
(Felton Diversion Station)	¼ of ¼				
	¼ of ¼				
	¼ of ¼				
	¼ of ¼				

County of Santa Cruz

3. Purpose of use:	4. Place of use:	Section	Township	Range	Base and Meridian	Acres
Municipal	City of Santa Cruz					
	Water Service Area,					
	within T10-11S,					
	R1-3W, MDB&M					

The place of use is shown on map filed with the State Water Resources Control Board.

27276-983 11-68 9M ② OSP

5. The water appropriated shall be limited to the quantity which can be beneficially used, and shall not exceed 3,000 acre-feet per annum by storage to be collected in Loch Lomond Reservoir from about September 1 of each year to about June 1 of the succeeding year.

The maximum rate of diversion to offstream storage shall not exceed 3,500 gallons per minute.

This permit does not authorize collection of water to storage outside of the specified season to offset evaporation and seepage losses or for any other purpose. (0000005)

6. The maximum quantity herein stated may be reduced in the license if investigation warrants. (0000006)

7. Actual construction work shall begin on or before December 1, 1971 and shall thereafter be prosecuted with reasonable diligence, and if not so commenced and prosecuted this permit may be revoked. (0000007)

8. Said construction work shall be completed on or before December 1, 1975. (0000008)

9. Complete application of the water to the proposed use shall be made on or before December 1, 1980. (0000009)

10. Progress reports shall be filed promptly by permittee on forms which will be provided annually by the State Water Resources Control Board until license is issued. (0000010)

11. All rights and privileges under this permit including method of diversion, method of use and quantity of water diverted are subject to the continuing authority of the State Water Resources Control Board in accordance with law and in the interest of the public welfare to prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of said water~~, and to carry out legally established water quality objectives~~. (0000012)

12. Permittee shall allow representatives of the State Water Resources Control Board and other parties, as may be authorized from time to time by said Board, reasonable access to project works to determine compliance with the terms of this permit. (0000011)

13. The quantity of water diverted under this permit and under any license issued pursuant thereto is subject to modification by the State Water Resources Control Board if, after notice to the permittee and an opportunity for hearing, the Board finds that such modification is necessary to meet water quality objectives in water quality control plans which have been or hereafter may be established or modified pursuant to Division 7 of the Water Code. No action will be taken pursuant to this paragraph unless the Board finds that (1) adequate waste discharge requirements have been prescribed and are in effect with respect to all waste discharges which have any substantial effect upon water quality in the area involved, and (2) the water quality objectives cannot be achieved solely through the control of waste discharges. (0000013)

14. Permittee shall bypass 10 cubic feet per second or the natural flow, whichever is less from September 1 through September 30; and 20 cubic feet per second or the natural flow, whichever is less from October 1 through May 31 for the preservation of fish and wildlife. (0140060)

15. The provisions of the preceeding paragraph are based on a bilateral agreement between permittee and the Department of Fish and Game, and shall not be construed as a finding by the State Water Resources Control Board that the amount of water named herein is either adequate or required for the maintenance of fish life. (0000300)

This permit is issued and permittee takes it subject to the following provisions of the Water Code:

Section 1390. A permit shall be effective for such time as the water actually appropriated under it is used for a useful and beneficial purpose in conformity with this division (of the Water Code), but no longer.

Section 1391. Every permit shall include the enumeration of conditions therein which in substance shall include all of the provisions of this article and the statement that any appropriator of water to whom a permit is issued takes it subject to the conditions therein expressed.

Section 1392. Every permittee, if he accepts a permit, does so under the conditions precedent that no value whatsoever in excess of the actual amount paid to the State therefor shall at any time be assigned to or claimed for any permit granted or issued under the provisions of this division (of the Water Code), or for any rights granted or acquired under the provisions of this division (of the Water Code), in respect to the regulation by any competent public authority of the services or the price of the services to be rendered by any permittee or by the holder of any rights granted or acquired under the provisions of this division (of the Water Code) or in respect to any valuation for purposes of sale to or purchase, whether through condemnation proceedings or otherwise, by the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State, of the rights and property of any permittee, or the possessor of any rights granted, issued, or acquired under the provisions of this division (of the Water Code).

Dated: DEC 21 1970

STATE WATER RESOURCES CONTROL BOARD

K. L. Woodward

Chief, Division of Water Rights

27276-C-983 11-68 7500 ② OSP

P16601

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

ORDER

Application 23710 Permit 16601 License _____

ORDER APPROVING A NEW DEVELOPMENT SCHEDULE AND AMENDING THE PERMIT

WHEREAS:

1. Permit 16601 was issued to City of Santa Cruz on July 23, 1973 pursuant to Application 23710.

2. A petition for an extension of time within which to develop the project and apply the water to the proposed use has been filed with the State Water Resources Control Board (SWRCB).

3. The permittee has proceeded with diligence and good cause has been shown for said extension of time.

4. Permit Condition 11 pertaining to the continuing authority of the SWRCB should be updated to conform to Section 780(a), Title 23 of the California Code of Regulations.

NOW, THEREFORE, IT IS ORDERED THAT:

1. Condition 9 of the permit be amended to read:

   COMPLETE APPLICATION OF THE WATER TO THE PROPOSED USE SHALL BE MADE ON OR BEFORE December 31, 2006 (0000009)

2. Condition 11 of the permit be amended to read:

   Pursuant to California Water Code Sections 100 and 275, and the common law public trust doctrine, all rights and privileges under this permit and under any license issued pursuant thereto, including method of diversion, method of use, and quantity of water diverted, are subject to the continuing authority of the SWRCB in accordance with law and in the interest of the public welfare to protect public trust uses and to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of said water.

   The continuing authority of the SWRCB may be exercised by imposing specific requirements over and above those contained in this permit with a view to eliminating waste of water and to meeting the reasonable water requirements of permittee without unreasonable draft on the source. Permittee may be required to implement a water conservation plan, features of which may include but not necessarily be limited to: (1) reusing or reclaiming the water allocated; (2) using water reclaimed by another entity instead of all or part of the water allocated; (3) restricting diversions so as to eliminate agricultural tailwater or to reduce return flow; (4) suppressing evaporation losses from water

surfaces; (5) controlling phreatophytic growth; and (6) installing, maintaining, and operating efficient water measuring devices to assure compliance with the quantity limitations of this permit and to determine accurately water use as against reasonable water requirements for the authorized project. No action will be taken pursuant to this paragraph unless the SWRCB determines, after notice to affected parties and opportunity for hearing, that such specific requirements are physically and financially feasible and are appropriate to the particular situation.

The continuing authority of the SWRCB also may be exercised by imposing further limitations on the diversion and use of water by the permittee in order to protect public trust uses. No action will be taken pursuant to this paragraph unless the SWRCB determines, after notice to affected parties and opportunity for hearing, that such action is consistent with California Constitution Article X, Section 2; is consistent with the public interest and is necessary to preserve or restore the uses protected by the public trust. (0000012)

Dated: SEPTEMBER 9 1996

for Edward C. Anton, Chief
Division of Water Rights

P1662

STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

ORDER

APPLICATION 23710 PERMIT 16601 LICENSE

ORDER APPROVING A NEW DEVELOPMENT SCHEDULE AND AMENDING THE PERMIT

WHEREAS:

1. A PETITION FOR EXTENSION OF TIME WITHIN WHICH TO DEVELOP THE PROJECT AND APPLY THE WATER TO THE PROPOSED USE HAS BEEN FILED WITH THE STATE WATER RESOURCES CONTROL BOARD.

2. THE PERMITTEE HAS PROCEEDED WITH DILIGENCE AND GOOD CAUSE HAS BEEN SHOWN FOR EXTENSION OF TIME AND FOR THE SAID CHANGE.

NOW, THEREFORE, IT IS ORDERED THAT:

1. PARAGRAPH 9 OF THE PERMIT IS AMENDED TO READ AS FOLLOWS:

COMPLETE APPLICATION OF THE WATER TO THE PROPOSED USE SHALL BE MADE ON OR BEFORE DECEMBER 1, 1990 (0000009)

2. PARAGRAPH 11 IS AMENDED AS FOLLOWS:

PURSUANT TO CALIFORNIA WATER CODE SECTIONS 100 AND 275, ALL RIGHTS AND PRIVILEGES UNDER THIS PERMIT AND UNDER ANY LICENSE ISSUED PURSUANT THERETO, INCLUDING METHOD OF DIVERSION, METHOD OF USE, AND QUANTITY OF WATER DIVERTED, ARE SUBJECT TO THE CONTINUING AUTHORITY OF THE STATE WATER RESOURCES CONTROL BOARD IN ACCORDANCE WITH LAW AND IN THE INTEREST OF THE PUBLIC WELFARE TO PREVENT WASTE, UNREASONABLE USE, UNREASONABLE METHOD OF USE, OR UNREASONABLE METHOD OF DIVERSION OF SAID WATER.

THE CONTINUING AUTHORITY OF THE BOARD MAY BE EXERCISED BY IMPOSING SPECIFIC REQUIREMENTS OVER AND ABOVE THOSE CONTAINED IN THIS PERMIT WITH A VIEW TO MINIMIZING WASTE OF WATER AND TO MEETING THE REASONABLE WATER REQUIREMENTS OF PERMITTEE WITHOUT UNREASONABLE DRAFT ON THE SOURCE. PERMITTEE MAY BE REQUIRED TO IMPLEMENT SUCH PROGRAMS AS (1) REUSING OR RECLAIMING THE WATER ALLOCATED; (2) USING WATER RECLAIMED BY ANOTHER ENTITY INSTEAD OF ALL OR PART OF THE WATER ALLOCATED; (3) RESTRICTING DIVERSIONS SO AS TO ELIMINATE AGRICULTURAL TAILWATER OR TO REDUCE RETURN FLOW; (4) SUPPRESSING EVAPORATION LOSSES FROM WATER SURFACES; (5) CONTROLLING PHREATOPHYTIC GROWTH; AND (6) INSTALLING, MAINTAINING, AND OPERATING EFFICIENT WATER MEASURING DEVICES TO ASSURE COMPLIANCE WITH THE QUANTITY LIMITATIONS OF THIS PERMIT AND TO DETERMINE ACCURATELY WATER USE AS AGAINST REASONABLE WATER REQUIREMENTS FOR THE AUTHORIZED PROJECT. NO ACTION WILL BE TAKEN PURSUANT TO THIS PARAGRAPH UNLESS THE BOARD DETERMINES, AFTER NOTICE TO AFFECTED PARTIES AND OPPORTUNITY FOR HEARING, THAT SUCH SPECIFIC REQUIREMENTS ARE PHYSICALLY AND FINANCIALLY FEASIBLE AND ARE APPROPRIATE TO THE PARTICULAR SITUATION.

3. PARAGRAPH 17 IS ADDED TO THIS PERMIT AS FOLLOWS:

THE STATE WATER RESOURCES CONTROL BOARD, UNDER ITS AUTHORITY TO CONSERVE THE PUBLIC INTEREST, RETAINS CONTINUING AUTHORITY OVER THIS PERMIT TO REQUIRE PERMITTEE TO DEVELOP AND IMPLEMENT A WATER CONSERVATION PROGRAM, AFTER NOTICE AND OPPORTUNITY FOR HEARING. THE REQUIREMENTS OF THIS TERM MAY BE SATISFIED BY PERMITTEE'S COMPLIANCE WITH ANY COMPREHENSIVE WATER CONSERVATION PROGRAM, APPROVED BY THE STATE WATER RESOURCES CONTROL BOARD, WHICH MAY BE IMPOSED BY A PUBLIC AGENCY. (0000029)

DATED: MARCH 31 1981

Walter G. Pettit

WALTER G. PETTIT, CHIEF
DIVISION OF WATER RIGHTS

CONTACT REPORT

DIVISION OF WATER RIGHTS

STATE WATER RESOURCES CONTROL BOARD

Subject [illegible] water release [illegible] Felton Diversion Dam
Permits [illegible] & [illegible] (Applications 22318 & 23710)

Division Personnel L. Spencer

Date 1-[illegible]-79 **Time** 16:45

Personal ☐ **Where**

Telephone ☒ **Number** 408-429-3670

Individual(s)/Agency Contacted Morris Allen

Conversation Description Paul Chappelle / DFG called Walt Pettit this afternoon about a fisheries problem in San Lorenzo River below Felton Diversion Dam. He reported that flow was below 20 cfs and the City was bypassing the entire flow. The inflatable dam was not inflated enough to cause the fish ladder to operate and salmon were spawning below the diversion dam. See Walt's note for further info. Walt asked me to call Morris Allen and check out the factual situation.

Morris stated that the flow in the San Lorenzo was 16 cfs that the entire flow was being bypassed. The inflatable dam was up about a foot and the fish ladder non-operational. The flow being bypassed was too small for the salmon to navigate. We discussed Chappelle's proposal and Morris mentioned an alternative. He stated that the City was not willing to operate at variance from its permit without a direction from us. I stated that an order by the Board would not be necessary, a written direction would be sufficient.

I stated we would keep him advised of developments.

Decision(s)

Action Items

SURNAME	Spencer	[illegible]		

STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

ORDER

APPLICATION 23710 PERMIT 16601 LICENSE

ORDER CORRECTING DESCRIPTION OF
POINT OF DIVERSION

WHEREAS:

1. The permittee's Felton Diversion Plant was constructed within NE¼ of SW¼ of Section 22 instead at the permitted point of diversion being within SE¼ of NW¼ of said Section 22.

2. The State Water Resources Control Board has determined that no legal user of water will be injured by correcting the description of point of diversion.

NOW, THEREFORE, IT IS ORDERED THAT:

1. The description of point of diversion under permit 16601 be corrected to read as follows:

   SOUTH 30° EAST 3,200 FEET FROM THE NW CORNER OF SECTION 22 BEING WITHIN THE NE¼ OF SW¼ OF PROJECTED SECTION 22, T10S, R2W, MDB&M.

Dated: DECEMBER 8 1978

for Michael A. Campos, Chief
Division of Water Rights

16283-987 11-67 2M OSP

STATE OF CALIFORNIA
THE RESOURCES AGENCY
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF WATER RIGHTS

PERMIT FOR DIVERSION AND USE OF WATER

PERMIT 16601

Application 23710 of CITY OF SANTA CRUZ

CITY HALL, SANTA CRUZ, CALIFORNIA 95060

filed on MARCH 1, 1971, has been approved by the State Water Resources Control Board SUBJECT TO VESTED RIGHTS and to the limitations and conditions of this Permit.

Permittee is hereby authorized to divert and use water as follows:

1. Source: SAN LORENZO RIVER — Tributary to: PACIFIC OCEAN

2. Location of point of diversion:	40-acre subdivision of public land survey or projection thereof	Section	Township	Range	Base and Meridan
SOUTH 48° EAST, 2,904 FEET FROM NW CORNER OF SECTION 22	SE1/4 OF NW1/4	22	10S	2W	MD

County of SANTA CRUZ

3. Purpose of use:	4. Place of use:	Section	Township	Range	Base and Meridan	Acres
MUNICIPAL	CITY OF SANTA CRUZ					
	WATER SERVICE AREA					
	WITHIN T10-11S, R1-3W, MDB&M					

The place of use is shown on map filed with the State Water Resources Control Board.

5. THE WATER APPROPRIATED SHALL BE LIMITED TO THE QUANTITY WHICH CAN BE BENEFICIALLY USED AND SHALL NOT EXCEED 3,000 ACRE-FEET PER ANNUM BY STORAGE TO BE COLLECTED FROM OCTOBER 1 OF EACH YEAR TO JUNE 1 OF THE SUCCEEDING YEAR.

THE TOTAL QUANTITY OF WATER DIVERTED UNDER THIS PERMIT TOGETHER WITH THAT DIVERTED UNDER PERMIT 16123 (APPLICATION 22318) SHALL NOT EXCEED 3,000 ACRE-FEET PER ANNUM.

THE COMBINED MAXIMUM RATE OF DIVERSION TO OFFSTREAM STORAGE UNDER THIS PERMIT AND PERMIT 16123 (APPLICATION 22318) SHALL NOT EXCEED 20 CUBIC FEET PER SECOND.

THIS PERMIT DOES NOT AUTHORIZE COLLECTION OF WATER TO STORAGE OUTSIDE THE SPECIFIED SEASON TO OFFSET EVAPORATION AND SEEPAGE LOSSES OR FOR ANY OTHER PURPOSE. (0000005)

6. THE AMOUNT AUTHORIZED FOR APPROPRIATION MAY BE REDUCED IN THE LICENSE IF INVESTIGATION WARRANTS. (0000006)

7. ACTUAL CONSTRUCTION WORK SHALL BEGIN ON OR BEFORE NINE MONTHS FROM DATE OF PERMIT AND SHALL THEREAFTER BE PROSECUTED WITH REASONABLE DILIGENCE, AND IF NOT SO COMMENCED AND PROSECUTED, THIS PERMIT MAY BE REVOKED. (0000007)

8. SAID CONSTRUCTION WORK SHALL BE COMPLETED ON OR BEFORE DECEMBER 1, 1975. (0000008)

9. COMPLETE APPLICATION OF THE WATER TO THE PROPOSED USE SHALL BE MADE ON OR BEFORE DECEMBER 1, 1980. (0000009)

10. PROGRESS REPORTS SHALL BE SUBMITTED PROMPTLY BY PERMITTEE WHEN REQUESTED BY THE STATE WATER RESOURCES CONTROL BOARD UNTIL LICENSE IS ISSUED. (0000010)

11. ALL RIGHTS AND PRIVILEGES UNDER THIS PERMIT AND UNDER ANY LICENSE ISSUED PURSUANT THERETO, INCLUDING METHOD OF DIVERSION, METHOD OF USE, AND QUANTITY OF WATER DIVERTED, ARE SUBJECT TO THE CONTINUING AUTHORITY OF THE STATE WATER RESOURCES CONTROL BOARD IN ACCORDANCE WITH LAW AND IN THE INTEREST OF THE PUBLIC WELFARE TO PREVENT WASTE, UNREASONABLE USE, UNREASONABLE METHOD OF USE, OR UNREASONABLE METHOD OF DIVERSION OF SAID WATER.

THIS CONTINUING AUTHORITY OF THE BOARD MAY BE EXERCISED BY IMPOSING SPECIFIC REQUIREMENTS OVER AND ABOVE THOSE CONTAINED IN THIS PERMIT WITH A VIEW TO MINIMIZING WASTE OF WATER AND TO MEETING THE REASONABLE WATER REQUIREMENTS OF PERMITTEE WITHOUT UNREASONABLE DRAFT ON THE SOURCE. PERMITTEE MAY BE REQUIRED TO IMPLEMENT SUCH PROGRAMS AS (1) REUSING OR RECLAIMING THE WATER ALLOCATED; (2) RESTRICTING DIVERSIONS SO AS TO ELIMINATE AGRICULTURAL TAILWATER OR TO REDUCE RETURN FLOW; (3) SUPPRESSING EVAPORATION LOSSES FROM WATER SURFACES; (4) CONTROLLING PHREATOPHYTIC GROWTH; AND (5) INSTALLING, MAINTAINING, AND OPERATING EFFICIENT WATER MEASURING DEVICES TO ASSURE COMPLIANCE WITH THE QUANTITY LIMITATIONS OF THIS PERMIT AND TO DETERMINE ACCURATELY WATER USE AS AGAINST REASONABLE WATER REQUIREMENTS FOR THE AUTHORIZED PROJECT. NO ACTION WILL BE TAKEN PURSUANT TO THIS PARAGRAPH UNLESS THE BOARD DETERMINES, AFTER NOTICE TO AFFECTED PARTIES AND OPPORTUNITY FOR HEARING, THAT SUCH SPECIFIC REQUIREMENTS ARE PHYSICALLY AND FINANCIALLY FEASIBLE AND ARE APPROPRIATE TO THE PARTICULAR SITUATION. (0000012)

12. THE QUANTITY OF WATER DIVERTED UNDER THIS PERMIT AND UNDER ANY LICENSE ISSUED PURSUANT THERETO IS SUBJECT TO MODIFICATION BY THE STATE WATER RESOURCES CONTROL BOARD IF, AFTER NOTICE TO THE PERMITTEE AND AN OPPORTUNITY FOR HEARING, THE BOARD FINDS THAT SUCH MODIFICATION IS NECESSARY TO MEET WATER QUALITY OBJECTIVES IN WATER QUALITY CONTROL PLANS WHICH HAVE BEEN OR HEREAFTER MAY BE ESTABLISHED OR MODIFIED PURSUANT TO DIVISION 7 OF THE WATER CODE. NO ACTION WILL BE TAKEN PURSUANT TO THIS PARAGRAPH UNLESS THE BOARD FINDS THAT (1) ADEQUATE WASTE DISCHARGE REQUIREMENTS HAVE BEEN PRESCRIBED AND ARE IN EFFECT WITH RESPECT TO ALL WASTE DISCHARGES WHICH HAVE ANY SUBSTANTIAL EFFECT UPON WATER QUALITY IN THE AREA INVOLVED, AND (2) THE WATER QUALITY OBJECTIVES CANNOT BE ACHIEVED SOLELY THROUGH THE CONTROL OF WASTE DISCHARGES. (0000013)

13. PERMITTEE SHALL ALLOW REPRESENTATIVES OF THE STATE WATER RESOURCES CONTROL BOARD AND OTHER PARTIES AS MAY BE AUTHORIZED FROM TIME TO TIME BY SAID BOARD REASONABLE ACCESS TO PROJECT WORKS TO DETERMINE COMPLIANCE WITH THE TERMS OF THIS PERMIT. (0000011)

14. PERMITTEE SHALL ACCORD TO THE PUBLIC, FOR THE PURPOSE OF FISHING, REASONABLE RIGHT OF ACCESS TO THE WATERS IMPOUNDED IN LOCH LOMOND RESERVOIR DURING THE OPEN SEASON FOR THE TAKING OF FISH SUBJECT TO THE REGULATIONS OF THE FISH AND GAME COMMISSION. (0030045)

15. IN ORDER TO PREVENT DEGRADATION OF THE QUALITY OF WATER DURING AND AFTER CONSTRUCTION OF THE PROJECT, PRIOR TO COMMENCEMENT OF CONSTRUCTION PERMITTEE SHALL FILE A REPORT PURSUANT TO WATER CODE SECTION 13260 AND SHALL COMPLY WITH ANY WASTE DISCHARGE REQUIREMENTS IMPOSED BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, CENTRAL COAST REGION, OR BY THE STATE WATER RESOURCES CONTROL BOARD. (0000100)

16. FOR THE PROTECTION OF FISH, NO DIVERSION SHALL BE MADE DURING THE MONTH OF OCTOBER WHICH DEPLETES THE FLOW OF THE STREAM TO LESS THAN 25 CUBIC FEET PER SECOND NOR TO LESS THAN 20 CUBIC FEET PER SECOND DURING THE PERIOD NOVEMBER 1 TO THE SUCCEEDING MAY 31. NO WATER SHALL BE DIVERTED UNTIL PERMITTEE HAS INSTALLED IN THE STREAM IMMEDIATELY BELOW ITS POINT OF DIVERSION A STAFF GAGE, OR OTHER DEVICE SATISFACTORY TO THE STATE WATER RESOURCES CONTROL BOARD, SHOWING THE WATER LEVELS WHICH CORRESPOND TO THE ABOVE-MENTIONED FLOWS IN CUBIC FEET PER SECOND. AS A CONDITION OF CONTINUING DIVERSION, SAID MEASURING DEVICE SHALL BE PROPERLY MAINTAINED. (0140060)

This permit is issued and permittee takes it subject to the following provisions of the Water Code:

Section 1390. A permit shall be effective for such time as the water actually appropriated under it is used for a useful and beneficial purpose in conformity with this division (of the Water Code), but no longer.

Section 1391. Every permit shall include the enumeration of conditions therein which in substance shall include all of the provisions of this article and the statement that any appropriator of water to whom a permit is issued takes it subject to the conditions therein expressed.

Section 1392. Every permittee, if he accepts a permit, does so under the conditions precedent that no value whatsoever in excess of the actual amount paid to the State therefor shall at any time be assigned to or claimed for any permit granted or issued under the provisions of this division (of the Water Code), or for any rights granted or acquired under the provisions of this division (of the Water Code), in respect to the regulation by any competent public authority of the services or the price of the services to be rendered by any permittee or by the holder of any rights granted or acquired under the provisions of this division (of the Water Code) or in respect to anyvaluation for purposes of sale to or purchase, whether through condemnation proceedings or otherwise, by the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State, of the rights and property of any permittee, or the possessor of any rights granted, issued, or acquired under the provisions of this division (of the Water Code).

Dated: JUL 23 1973

STATE WATER RESOURCES CONTROL BOARD

K. L. Woodward

Chief, Division of Water Rights

Permit 16601

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of Request for Modification of Terms of Permits 16123 and 16601 by CITY OF SANTA CRUZ	Decision 1464

DECISION TEMPORARILY MODIFYING PERMIT TERMS

BY BOARD MEMBER ADAMS:

On March 8, 1977, the State Water Resources Control Board held a public hearing in the above-entitled matter pursuant to Section 736.1 of Title 23, California Administrative Code. This hearing was held to determine whether the Board should exercise its continuing authority under Term 11 of Permits 16123 and 16601 to modify permit conditions regarding bypasses for preservation of fish and wildlife. The City of Santa Cruz, Department of Fish and Game and other interested parties having appeared and presented evidence; the evidence received at the hearing having been duly considered, the Board finds as follows:

Permittee's Water Supply System

1. Permittee's water system provides service to about 58,000 customers within and without the city limits. Permittee's major sources of water are the San Lorenzo River, coastal streams and wells.

2. Permittee holds Permits 16123 and 16601 which authorize diversion from San Lorenzo River at Felton diversion offstream storage in Loch Lomond Reservoir. These permits together limit the total quantity diverted at the Felton diversion to 3,000 acre-feet per annum (afa). The annual safe yield estimate for the remaining components of permittee's water supply is as follows: Newell Creek, 2,300 afa; San Lorenzo River at Crossing Street, 6,190 afa; wells, 450 afa; and coastal streams, 1,360 afa. The total annual safe yield estimate for the City's system, including the Felton diversion, is 13,300 afa.

3. Evidence established the existence of a bonafide drought and that because of the existing drought conditions the City would have a deficiency of 2,832 acre-feet (af) in estimated total annual safe yield at the end of this year, assuming normal usage.

Water Conservation Measures

4. On March 1, 1977, the City of Santa Cruz adopted a water conservation ordinance (Ordinance No. 77-6) which declares the presence of a drought emergency, reduces water use, and prescribes penalties for violations. The water usage provisions are substantially as follows:

Residential usage:

Persons per house	Bimonthly Amount	Equivalent Gallons per day	Equivalent Gallons per day per person
1	900 cf	112	112
2	1500 cf	187	94
3	2000 cf	250	83
4	2400 cf	300	75
Each additional person	400 cf	50	

All other uses, including commercial, industrial, and irrigation, are limited to 70 percent of use in 1975.

5. A priority system for water use based upon need was not established by the ordinance, and the ordinance is specifically found to be deficient in this respect. Moreover, testimony was presented, including that of a witness representing the County of Santa Cruz, generally critical of the daily per capita domestic water consumption allowed by the ordinance. One witness characterized the measure as a "water wasting" ordinance. Nevertheless, it is found that the measure does require a substantial reduction in "normal" water usage in the permittee's service area. The Board is reluctant to review the judgment of permittee's City Council, at this time, with respect to the specifics of its water conservation measures.

6. The water conservation measures noted above would, by permittee's estimate, reduce water consumption by 3,500 af by the end of this year. This saving in consumption, less the

deficit identified in paragraph 3 would result in a net savings of 700 af to permittee's system for use after 1977.

Availability of Alternative Supplies

7. Evidence established that the most likely source of an alternative water supply is increased use of groundwater. However, neither this source nor increased diversion from the San Lorenzo River at Crossing Street is available at this time. It is further found that permittee in the past has not diligently pursued development of alternative supplies.

Permittee's Request

8. By letter of February 9, 1977, permittee requested a temporary modification of Term 16 of Permit 16601. (Since the same restriction is imposed by Term 14 of Permit 16123, modification of that term was also considered at the hearing.) The effect of these terms relevant to this proceeding is to require bypass of 20 cubic-feet per second (cfs) or the natural flow, whichever is the less, until May 31, the end of the diversion season, for preservation of fish and wildlife. Permittee requested that this bypass requirement be reduced to 10 cfs.

9. Since the effect of the water conservation measures taken by permittee will be to achieve a net saving of 700 af this year for use next year, it is found that permittee's supply will not be exhausted this year. Therefore, the reason for the request to modify the bypass requirement is to further increase availability of water to the system should the

drought continue into 1978. The City estimates it can increase storage in Loch Lomond by 750-900 af by May 31, 1977, if its request to reduce the bypass flow is granted.

Impact on the Fishery

10. Evidence presented by the Department of Fish and Game established that the existing bypass requirement of 20 cfs is a minimum flow needed to provide transportation for migrating salmon and steelhead.

11. Department of Fish and Game evidence further established that a flow of 14.1 cfs existed on March 1 and flows immediately prior to the date of hearing were about 10.4 cfs, all of which flows, pursuant to the relevant permit terms, were being bypassed. As a result of these low flows, the San Lorenzo River fishery has been and will continue to be damaged. Such flows do not allow migration, but will only serve to keep a small population of fish alive in pools in which they are stranded.

12. Department of Fish and Game evidence further established that modification of the relevant terms to require bypass of 10 cfs for the remainder of the diversion season will not have a significant additional adverse impact on the already damaged fishery, but that any significant storm flows occurring between now and the end of the diversion season at the Felton diversion should be bypassed through the diversion to allow temporary fish movement to mitigate the drought's adverse impact upon the fishery.

13. The Board should, upon any request of Permittee for modification of bypass terms to be effective when the diversion season resumes next fall, hold further hearing to consider the suitability of permittee's water conservation measures and pursuit of alternate supplies.

14. The Department of Fish and Game also recommended that the fishery be given a "credit" in the form of a right to release from storage in a normal water year within five years, at a rate specified by the Department, the amount of water diverted to storage as the result of any modification. The record in this matter discloses considerable concern over the adequacy, in normal years, of the existing fish and wildlife preservation conditions of the permits governing the Felton diversion. Moreover, the record also discloses the existence of an on-going joint local-state program to develop a Waterway Management Plan for the San Lorenzo River. Accordingly, rather than acting upon the Department's recommendation to establish a "credit" for the diversions allowed by the modification, the Board announces its intention to review the adequacy of these existing permit terms in the light of the completed Waterway Management Plan and with the aid of further input by the Department of Fish and Game, permittee, and other interested parties. The Board may, on its own motion or upon request of any interested party, hold a hearing at the appropriate time to conduct such review.

DETERMINATION OF ISSUE

Cause exists for modification of the relevant permit terms regarding minimum bypass flows, upon suitable conditions, in accordance with law and in the interest of the public welfare to prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of water.

ORDER

1. Condition 14 of Permit 16123 is temporarily modified to read:

"14. Permittee shall bypass 10 cubic feet per second or the natural flow, whichever is less, from September 1 through May 31 for the preservation of fish and wildlife; provided, that diversion shall be made only during such times as flow at the diversion exceeds 12.5 cubic feet per second." (0030045)

2. Condition 16 of Permit 16601 is temporarily modified to read:

"16. For the protection of fish, no diversion shall be made during the month of October which depletes the flow of the stream to less than 25 cubic feet per second nor to less than 10 cubic feet per second during the period November 1 to the succeeding May 31. No water shall be diverted until permittee has installed in the stream immediately below its point of diversion a staff gage, or other device satisfactory to the State Water Resources Control Board, showing the water levels which correspond

to the above-mentioned flows in cubic feet per second. As a condition of continuing diversion, said measuring device shall be properly maintained. Diversion shall be made only during such times as flow at the diversion exceeds 12.5 cubic feet per second."

3. The following additional condition, appropriately numbered, is added to Permits 16123 and 16601:

"The duration of the modification of Condition (14/16) authorized by State Water Resources Control Board Decision 1464, and of this condition shall be from March 17, 1977, through May 31, 1977, and shall thereafter be of no force or effect. From and after June 1, 1977, said condition (14/16) shall be as it existed immediately prior to the effective date of such modification. In addition, the following conditions shall be observed during the effective period of the modification of condition (14/16):

a. During any period when flow at the diversion exceeds 20 cfs, permittee shall bypass 20 cfs for the preservation of fish and wildlife. When, following any such period, such flow recedes to 20 cfs or less but is greater than 18 cfs, permittee shall make no diversion until such flow recedes to 18 cfs or less, whereupon permittee may divert in accordance with modified condition (14/16).

b. Approval of permittee's gage system and rating table was required by State Water Resources Control Board Decision 1459. Interim approval thereof until March 31, 1977, as granted by letter from the Chief, Division of Water Rights, dated November 18, 1976, (333:MLS:22318), is hereby extended through May 31, 1977."

(0140060)

Dated: MAR 17 1977

WE CONCUR:

/s/ W. W. Adams
W. W. Adams, Member

/s/ John E. Bryson
John E. Bryson, Chairman

/s/ W. Don Maughan
W. Don Maughan, Vice Chairman

/s/ Roy E. Dodson
Roy E. Dodson, Member

/s/ Jean Auer
Jean Auer, Member

FORM 64

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

License for Diversion and Use of Water

LICENSE 1553 PERMIT 2372 APPLICATION 4017

THIS IS TO CERTIFY, *That* City of Santa Cruz of Santa Cruz, California

has made *proof to the satisfaction of the Division of Water Resources of California of a right to the use of the waters of* San Lorenzo River, surface and sub-surface flow, in Santa Cruz County

tributary of Pacific Ocean

for the purpose of municipal and domestic uses *under Permit* 2372 *of the Division of Water Resources and that said right to the use of said waters has been perfected in accordance with the laws of California, the rules and regulations of the Division of Water Resources and the terms of the said permit; that the priority of the right herein confirmed dates from* June 9, 1924,

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to the amount actually beneficially used for said purposes and shall not exceed six and two tenths (6.2) cubic feet per second from either or all points of diversion combined from January 1st to December 31st of each season.

The points of diversion of such water are located:

DIVERSION DAM: N. 25°00' E., 196.53 feet thence N. 65°00' W., 44 feet from the point of intersection of the eastern line of River Street with the northwestern line of Crossing Street; being within the SE¼ of NW¼ of projected Section 12, T 11 S, R 2 W, M.D.B.&M.

WELL NO. 1: N. 25°00' E., 150 feet thence S. 65°00' E., 116 feet from the point of intersection of the eastern line of River Street with the southeastern line of Crossing Street; being within the SE¼ of NW¼ of projected Section 12, T 11 S, R 2 W, M.D.B.&M.

WELL NO. 2: On southern line of Crossing Street, 461 feet westerly from the point of intersection of the western line of Ocean Street with the southern line of Crossing Street; being within the NE¼ of NW¼ of projected Section 12, T 11 S, R 2 W, M.D.B.&M.

WELL NO. 3: On Southern line of Crossing Street, 270 feet westerly from the point of intersection of the western line of Ocean Street with the southern line of Crossing Street; being within the NE¼ of NW¼ of projected Section 12, T 11 S, R 2 W, M.D.B.&M.

WELL NO. 4: S. 72°40' W., 322.58 feet thence N. 17°20' W., 135 feet from the point of intersection of northern line of Crossing Street with the western line of Ocean Street; being within the NE¼ of NW¼ of projected Section 12, T 11 S, R 2 W, M.D.B.&M.

A description of the lands or the place where such water is put to beneficial use is as follows: The City of Santa Cruz, and that area east of the City of Santa Cruz, bounded on the west by the eastern boundary of the City of Santa Cruz, on the south by the Bay of Monterey, on the east by the eastern line of 41st Avenue and a line from the intersection of the eastern line of 41st Avenue with the southern line of the Santa Cruz-Watsonville Highway at a right angle to said southern line of Santa Cruz-Watsonville Highway extending to the north boundary of Section 9, T 11 S, R 1 W, M.D.B.&M.; and bounded on the north by the north boundary of Sections 8 and 9, T 11 S, R 1 W, M.D.B.&M.; as shown on map entitled "Map to Accompany Petition to Amend Application 4017, Permit 2372 to Appropriate Waters of the San Lorenzo River for Area outside of the City of Santa Cruz" filed April 15, 1935, with the Division of Water Resources.

The right to the diversion and use of the water aforesaid hereby confirmed is restricted to the point of diversion herein specified and to the lands or place of use herein described.

1

This license is granted and said appropriator takes all rights herein mentioned subject to the terms and conditions set forth in Section 20 of Chapter 586, Statutes 1913, which is as follows:

SEC. 20. All permits and licenses for the appropriation of water shall be under the terms and conditions of this act, and shall be effective for such time as the water actually appropriated under such permits and licenses shall actually be used for the useful and beneficial purpose for which said water was appropriated, but no longer; and every such permit or license shall include the enumeration of conditions therein which in substance shall include all of the provisions of this section and likewise the statement that any appropriator of water, to whom said permit or license may be issued, shall take the same subject to such conditions as therein expressed; *provided*, that if, at any time after the expiration of twenty years after the granting of a license, the state, or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the state shall have the right to purchase the works and property occupied and used under said license and the works built or constructed for the enjoyment of the rights granted under said license; and in the event that the said state, city, city and county, municipal water district, irrigation district, lighting district or political subdivision of the state so desiring to purchase and the said owner of said works and property can not agree upon said purchase price, said price shall be determined in such manner as is now or may hereafter be determined in eminent domain proceedings. If it shall appear to the state water commission at any time after a permit or license is issued as in this act provided that the permittee or licensee, or the heirs, successors or assigns of said permittee or licensee, has not put the water granted under said permit or license to the useful or beneficial purpose for which the permit or license was granted, or that the permittee or licensee, or the heirs, successors or assigns of said permittee or licensee, has ceased to put said water to such useful or beneficial purpose, or that the permittee or licensee, or the heirs, successors or assigns of said permittee or licensee has failed to observe any of the terms and conditions in the permit or license as issued, then and in that case the said commission, after due notice to the permittee, licensee, or the heirs, successors or assigns of such permittee or licensee, and a hearing thereon, may revoke said permit or license, and declare the water to be unappropriated and open to further appropriation in accordance with the terms of this act. And the findings and declaration of said commission shall be deemed to be prima facie correct until modified or set aside by a court of competent jurisdiction; *provided*, that any action brought so to modify or set aside such finding or declaration must be commenced within thirty days after the service of notice of said revocation on said permittee or licensee, his heirs, successors or assigns. And every licensee or permittee under the provisions of this act if he accepts such permit or license shall accept the same under the conditions precedent that no value whatsoever in excess of the actual amount paid to the state therefor shall at any time be assigned to or claimed for any permit or license granted or issued under the provisions of this act, or for any rights granted or acquired under the provisions of this act, in respect to the regulations by any competent public authority of the services or the price of the services to be rendered by any permittee or licensee, his heirs, successors or assigns or by the holder of any rights granted or acquired under the provisions of this act, or in respect to any valuation for purposes of sale to or purchase, whether through condemnation proceedings or otherwise, by the state or any city, city and county, municipal water district, irrigation district, lighting district or any political subdivision of the state, of the rights and property of any permittee or licensee, or the possessor of any rights granted, issued, or acquired under the provisions of this act. The application for a permit by municipalities for the use of water for said municipalities or the inhabitants thereof for domestic purposes shall be considered first in right, irrespective of whether they are first in time; *provided, however*, that such application for a permit or the granting thereafter of permission to any municipality to appropriate waters, shall not authorize the appropriation of any water for other than municipal purposes; *and providing, further*, that where permission to appropriate is granted by the state water commission to any municipality for any quantity of water in excess of the existing municipal needs therefor, that pending the application of the entire appropriation permitted, the state water commission shall have the power to issue permits for the temporary appropriation of the excess of such permitted appropriation over and above the quantity being applied from time to time by such municipality; *and providing, further*, that in lieu of the granting of such temporary permits for appropriation, the state water commission may authorize such municipality to become as to such surplus a public utility, subject to the jurisdiction and control of the railroad commission of the State of California for such period or periods from and after the date of the issuance of such permission to appropriate, as may be allowed for the application to municipal uses of the entire appropriation permitted; *and provided, further*, that when such municipality shall desire to use the additional waters granted in its said application it may do so upon making just compensation for the facilities for taking, conveying and storing such additional water rendered valueless for said purposes, to the person, firm or corporation which constructed said facilities for the temporary use of said excess waters, and which compensation, if not agreed upon between the municipality and said person, firm or corporation, may be determined in the manner provided by law for determining the value of property taken by and through eminent domain proceedings.

Witness my hand and the seal of the Department of Public Works of the State of California, this seventh *day of* May *, 19* 35.

EDWARD HYATT
State Engineer

By Harold Conkling
Deputy

LICENSE 1553

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

DIVISION OF WATER RESOURCES

LICENSE TO APPROPRIATE WATER

ISSUED TO City of Santa Cruz

DATED May 7, 1935

2842 4-33 1M CALIFORNIA STATE PRINTING OFFICE

2

STATE OF CALIFORNIA—STATE WATER RIGHTS BOARD

License for Diversion and Use of Water

APPLICATION 5215 PERMIT 2738 LICENSE 7200

THIS IS TO CERTIFY, *That*

City of Santa Cruz
P. O. Box 919
Santa Cruz, California

has made proof as of July 10, 1963, *(the date of inspection) to the satisfaction of the State Water Rights Board of a right to the use of the water of* San Lorenzo River in Santa Cruz County

tributary to Pacific Ocean

for the purpose of municipal and domestic uses *under Permit* 2738 *of the State Water Rights Board and that said right to the use of said water has been perfected in accordance with the laws of California, the Rules and Regulations of the State Water Rights Board and the terms of the said permit; that the priority of the right herein confirmed dates from* September 20, 1926, *and that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to the amount actually beneficially used for said purposes and shall not exceed* six (6) cubic feet per second to be diverted from January 1 to December 31 of each year.

The points of diversion of such water are located:

Diversion Dam: North twenty-five degrees no minutes east (N25° 00'E) one hundred ninety-six and fifty-three hundredths (196.53) feet thence north sixty-five degrees west (N65°W) forty-four (44) feet from point of intersection of eastern line of River Street with northwestern line of Crossing Street, being within SE¼ of NW¼ of projected Section 12, T11S, R2W, MDB&M.

Well No. 2: On southern line of Crossing Street, four hundred sixty-one (461) feet westerly from point of intersection of western line of Ocean Street with southern line of Crossing street, being within NE¼ of NW¼ of projected Section 12, T11S, R2W, MDB&M.

Well No. 3: On southern line of Crossing Street, two hundred seventy (270) feet westerly from point of intersection of western line of Ocean Street with southern line of Crossing Street, being within NE¼ of NW¼ of projected Section 12, T11S, R2W, MDB&M.

Well No. 4: South seventy-two degrees forty minutes west (S72° 40'W) three hundred twenty-two and fifty-eight hundredths (322.58) feet thence north seventeen degrees twenty minutes west (N17° 20'W) one hundred thirty-five (135) feet from point of intersection of northern line of Crossing Street with western line of Ocean Street, being within NE¼ of NW¼ of projected Section 12, T11S, R2W, MDB&M.

A description of the lands or the place where such water is put to beneficial use is as follows:

Within the boundaries of the City of Santa Cruz and environs as shown on map filed with State Water Rights Board on October 14, 1963, and being within projected sections of the public land survey as follows:

Sections 29, 31, and 32, T10S, R1W, MDB&M.

Sections 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, and 21, T11S, R1W, MDB&M.

Sections 35 and 36, T10S, R2W, MDB&M.

Sections 1, 2, 10, 11, 12, 13, 14, 15, 22, 23, 24, 26, and 27, T11S, R2W, MDB&M.

All rights and privileges under this license including method of diversion, method of use and quantity of water diverted are subject to the continuing authority of the State Water Rights Board in accordance with law and in the interest of the public welfare to prevent waste, unreasonable use, unreasonable method of use or unreasonable method of diversion of said water.

Reports shall be filed promptly by licensee on appropriate forms which will be provided for the purpose from time to time by the State Water Rights Board.

The right hereby confirmed to the diversion and use of water is restricted to the point or points of diversion herein specified and to the lands or place of use herein described.

This license is granted and licensee accepts all rights herein confirmed subject to the following provisions of the Water Code:

Section 1625. Each license shall be in such form and contain such terms as may be prescribed by the board.

Section 1626. All licenses shall be under the terms and conditions of this division (of the Water Code).

Section 1627. A license shall be effective for such time as the water actually appropriated under it is used for a useful and beneficial purpose in conformity with this division (of the Water Code) but no longer.

Section 1628. Every license shall include the enumeration of conditions therein which in substance shall include all of the provisions of this article and the statement that any appropriator of water to whom a license is issued takes the license subject to the conditions therein expressed.

Section 1629. Every licensee, if he accepts a license does so under the conditions precedent that no value whatsoever in excess of the actual amount paid to the State therefor shall at any time be assigned to or claimed for any license granted or issued under the provisions of this division (of the Water Code), or for any rights granted or acquired under the provisions of this division (of the Water Code), in respect to the regulation by any competent public authority of the services or the price of the services to be rendered by any licensee or by the holder of any rights granted or acquired under the provisions of this division (of the Water Code) or in respect to any valuation for purposes of sale to or purchase, whether through condemnation proceedings or otherwise, by the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State, of the rights and property of any licensee, or the possessor of any rights granted, issued, or acquired under the provisions of this division (of the Water Code).

Section 1630. At any time after the expiration of twenty years after the granting of a license, the State or any city, city and county, municipal water district, irrigation district, lighting district, or any political subdivision of the State shall have the right to purchase the works and property occupied and used under the license and the works built or constructed for the enjoyment of the rights granted under the license.

Section 1631. In the event that the State, or any city, city and county, municipal water district, irrigation district, lighting district, or political subdivision of the State so desiring to purchase and the owner of the works and property cannot agree upon the purchase price, the price shall be determined in such manner as is now or may hereafter be provided by law for determining the value of property taken in eminent domain proceedings.

Dated: MAR 1 0 1965

L. K. Hill
Executive Officer

LICENSE 7200

STATE OF CALIFORNIA
STATE WATER RIGHTS BOARD

LICENSE
TO APPROPRIATE WATER

ISSUED TO City of Santa Cruz

DATED MAR 1 0 1965

72548 3-65 1M Ⓘ SPO

2

State Water Resources Control Board

Division of Water Rights
1001 I Street, 14th Floor ♦ Sacramento, California 95814 ♦ 916.341.5300
P.O. Box 2000 ♦ Sacramento, California 95812-2000
Fax: 916.341.5400 ♦ www.waterrights.ca.gov

Linda S. Adams
Secretary for
Environmental Protection

Arnold Schwarzenegger
Governor

NOTICE OF PETITIONS FOR EXTENSION OF TIME FOR PERMITS 16601 AND 16123 (APPLICATIONS 23710 AND 22318) AND PETITIONS FOR CHANGE OF METHOD OF DIVERSION FOR PERMITS 16601 AND 16123 (APPLICATIONS 23710 AND 22318) AND LICENSE 9847 (APPLICATION 17913)

COUNTY: Santa Cruz

STREAM SYSTEM: San Lorenzo River and Newell Creek

City of Santa Cruz (Petitioner) has filed a petition for a 25-year extension of time and petitions for change of method of diversion. The Petitioner request to change a portion of the storage rights to direct diversion. Any correspondence directed to the Petitioner should be addressed to City of Santa Cruz c/o Water Department, P.O. Box 682, Santa Cruz, CA 95061.

Summary of Permits 16601 and 16123

Source:	San Lorenzo River tributary to Pacific Ocean
Point of Diversion(POD):	Present: POD to offstream storage within NE¼ of SW¼ of Project Section 22, T10S, R2W, MDB&M for storage in Loch Lomond Reservoir Proposed: Addition of direct diversion at present POD.
Amount:	3,000 acre-feet per annum by storage under each permit. The maximum combined rate of diversion to offstream storage to exceed 20 cubic feet per second (cfs) a maximum combined limit of 3,000 acre-feet per annum (afa) by storage under both rights.
Season:	Permit 16123: September 1 of each year to June 1 of the succeeding year. Permit 16601: October 1 of each year to June 1 of the succeeding year.
Purpose of Use:	Municipal
Place of Use:	City of Santa Cruz water service area within T10 to 11S, R1 to 3W, MDB&M.

Summary of License 9847

Source:	Newell Creek
Point of Diversion:	Present: POD from Newell Creek at Newell Dam within NW¼ of SW¼ of Section 34, T9N, R2W, MDB&M for storage in Loch Lomond Reservoir Proposed: Addition of direct diversion at present POD.
Amount:	Annual collection of 5,600 afa. Total storage is 8,624 acre-feet in Loch Lomond Reservoir.
Season:	September 1 of each year to July 1 of each succeeding year
Purpose of Use:	Domestic, fire protection, industrial, municipal, and recreational
Places of Use:	Loch Lomond Reservoir, San Lorenzo Basin, Upper San Lorenzo Valley, Scotts Valley, and Santa Cruz within T8 to 11S, R1 to 3W, MDB&M.

Project information, procedures for protesting and protest forms are available at: www.waterrights.ca.gov. The contact person for this matter is Norm Ponferrada at (916) 341-5362, or by e-mail at nponferrada@waterboards.ca.gov.

Protests must be received by the Division of Water Rights by 4:30 p.m. on November 10, 2008

Date of Notice: October 9, 2008

NFP: DCC: 10/07/08
U:\PERDRV\NPonferrada\22318, 23710, & 17913 City of Santa Cruz\Notice Petition

Appendix D

Selected figures from:

(1) Soquel Creek Water District and Central Water District Groundwater Management Plan (SqCWD and CWD, 2007) and

(2) Groundwater Assessment of Alternative Conjunctive Use Scenarios (Johnson et. al, 2004)

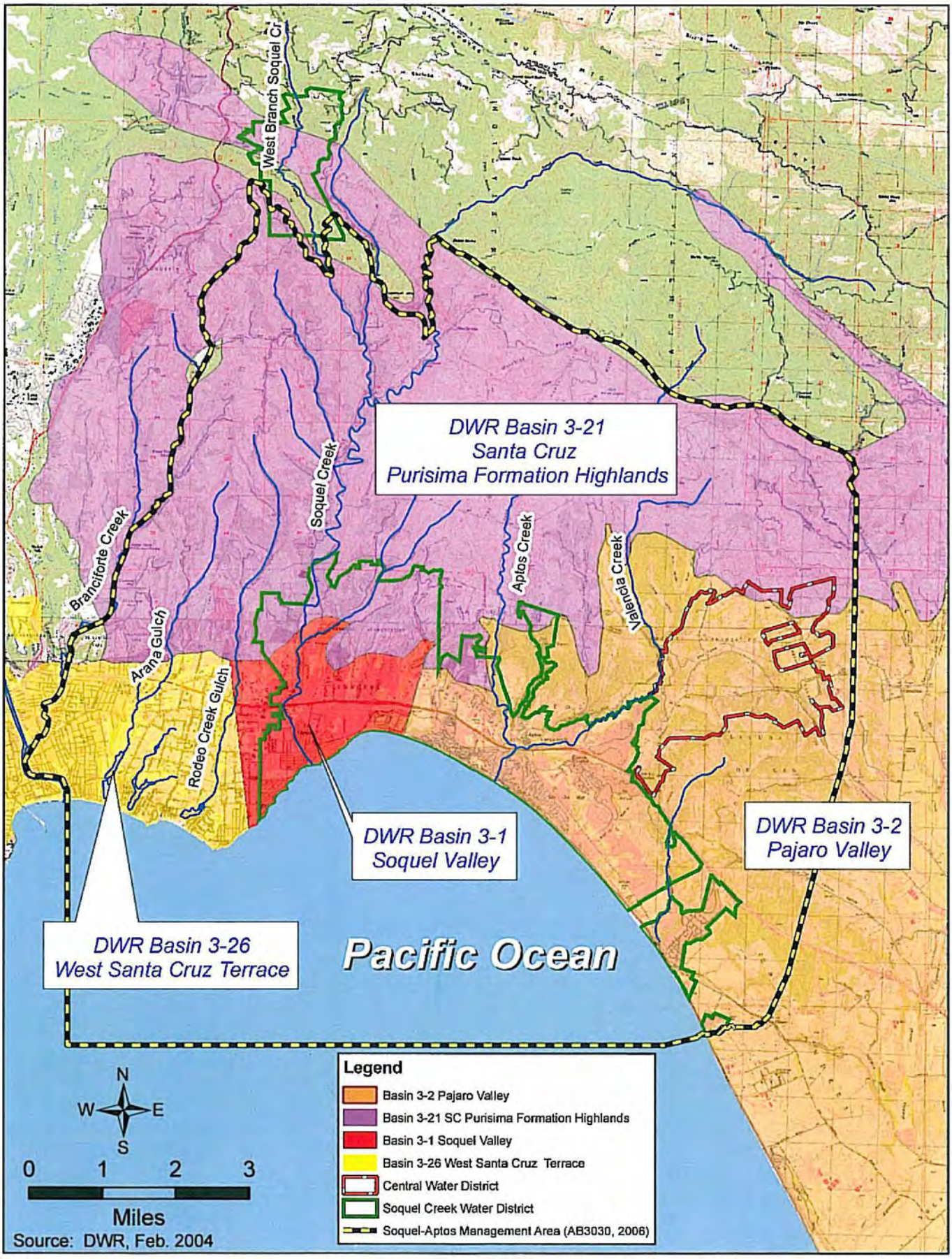


Figure 3-3
DWR Groundwater Basins

Figure D-1

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

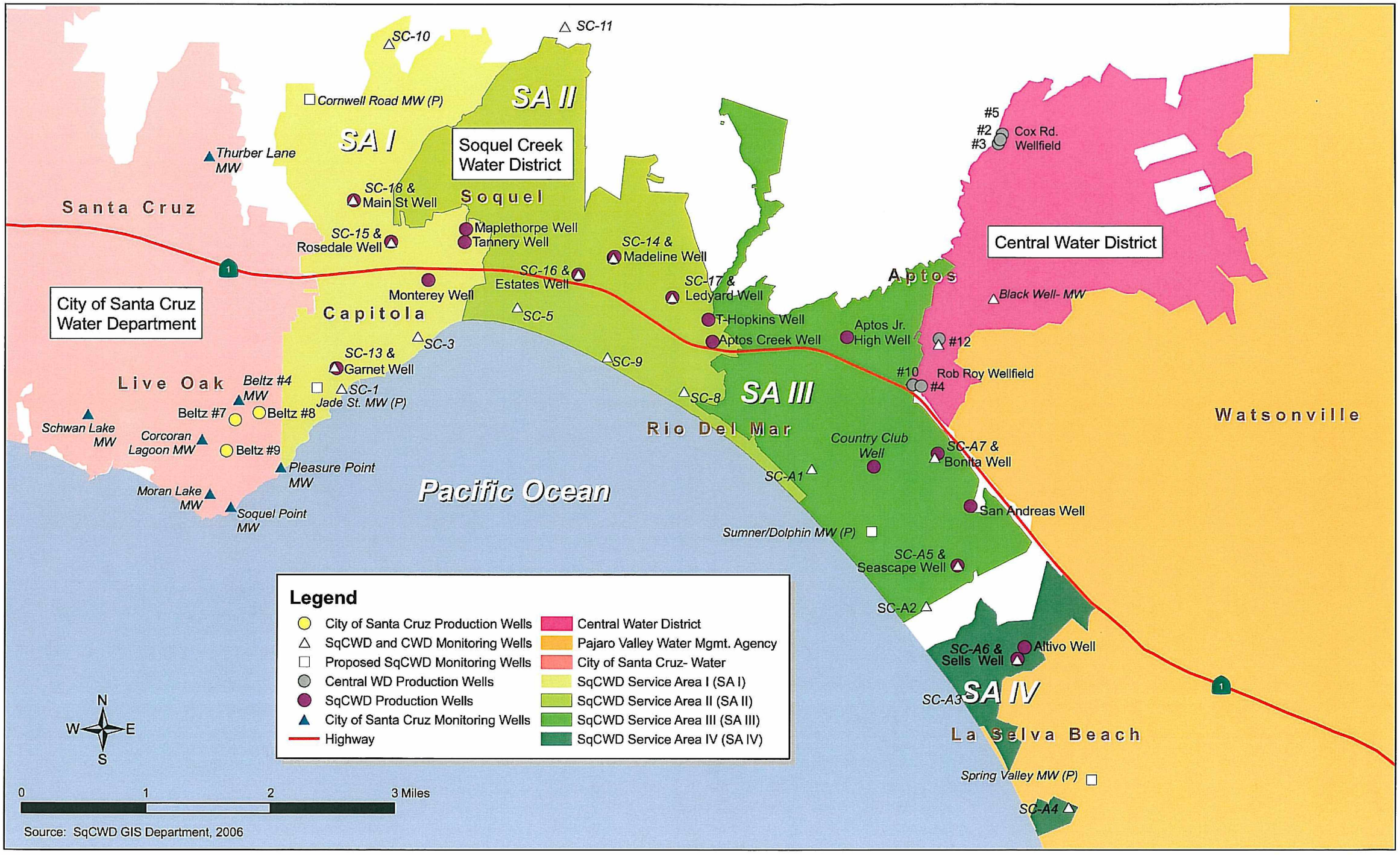


Figure 3-25
SqCWD, CWD, and City of Santa Cruz Service Areas
Production and Monitoring Wells

Figure D-2

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

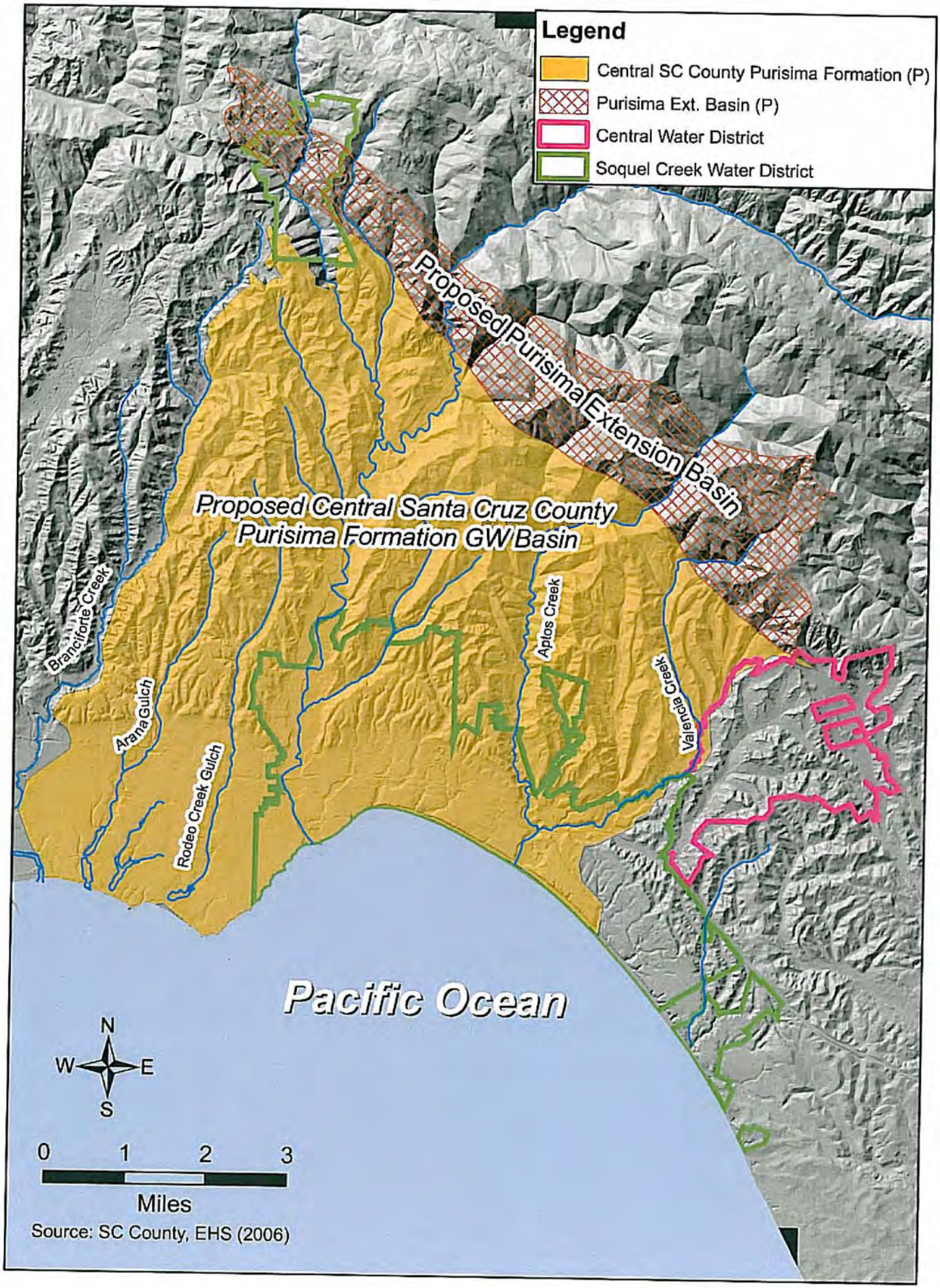


Figure 3-6
RWQCB Basin Plan- Boundary Proposal

Figure D-3

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

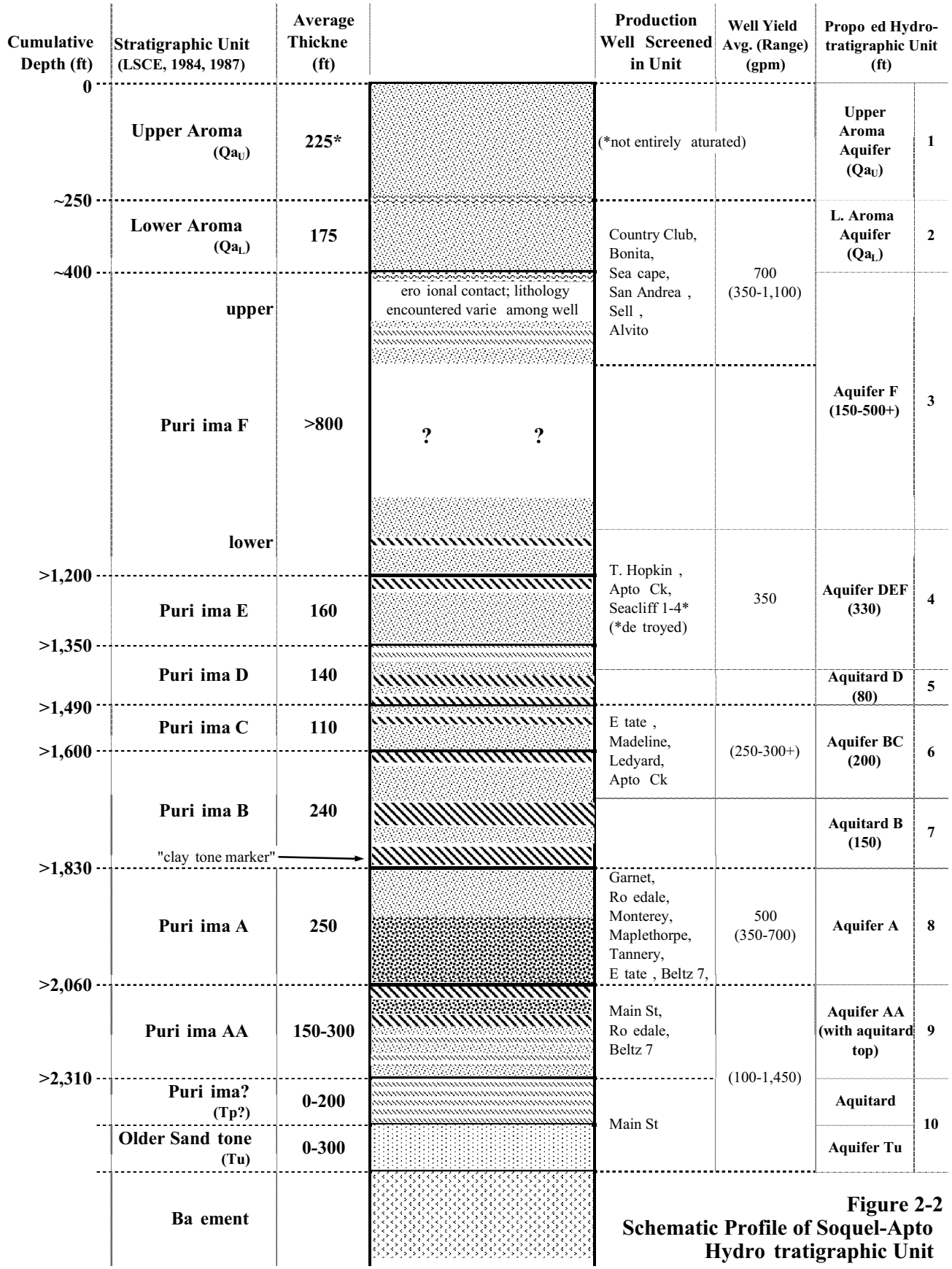


Figure 2-2
Schematic Profile of Soquel-Apto Hydro tratigraphic Unit

Stippling indicate relatively coar e-grained ediment, hatchuring indicate predominantly ilt and clay.

Source: *Groundwater Assessment of Alternative Conjunctive Use Scenarios* (Johnson et. al, 2004)

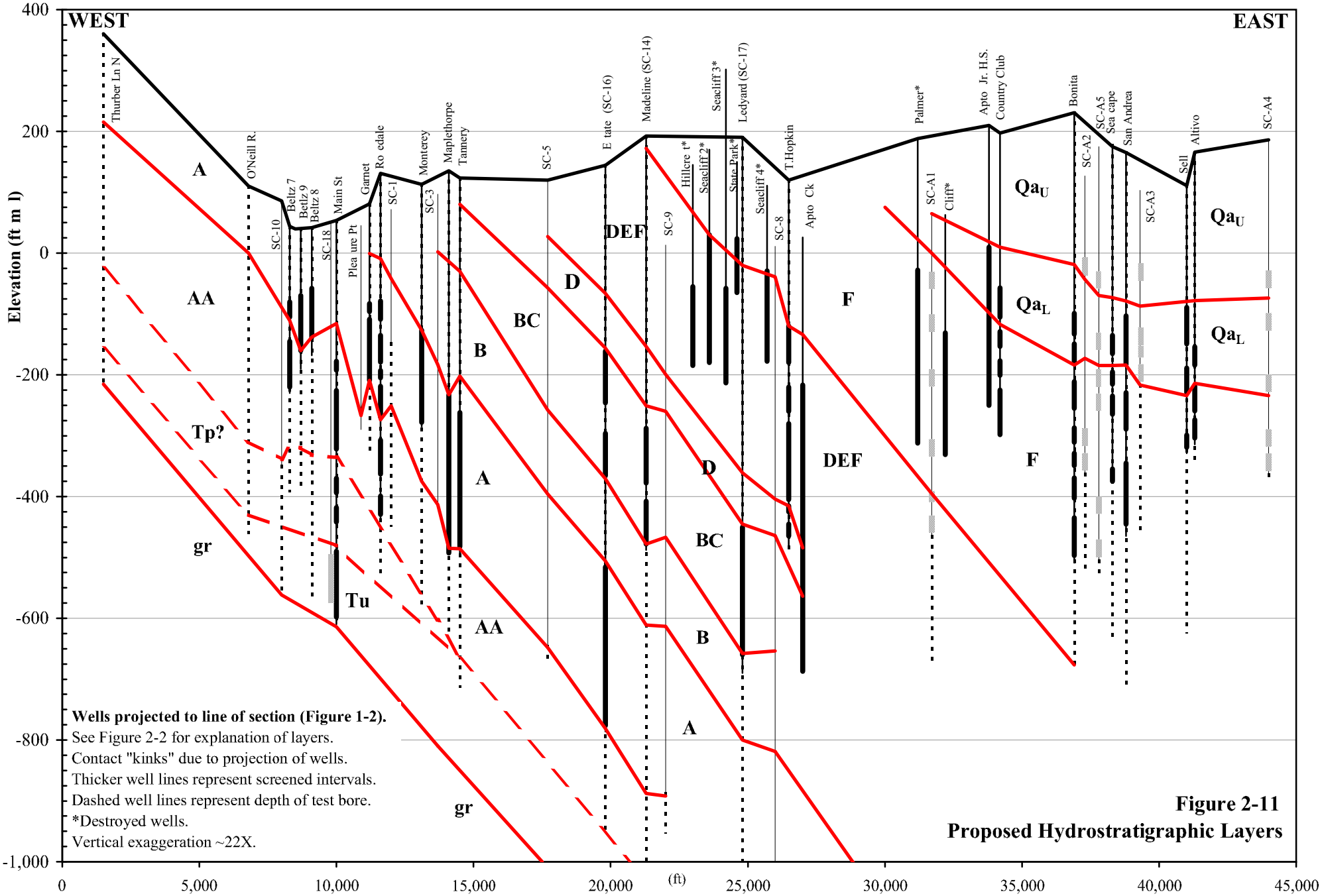


Figure 2-11
Proposed Hydrostratigraphic Layers

Source: *Groundwater Assessment of Alternative Conjunctive Use Scenarios* (Johnson et. al, 2004)

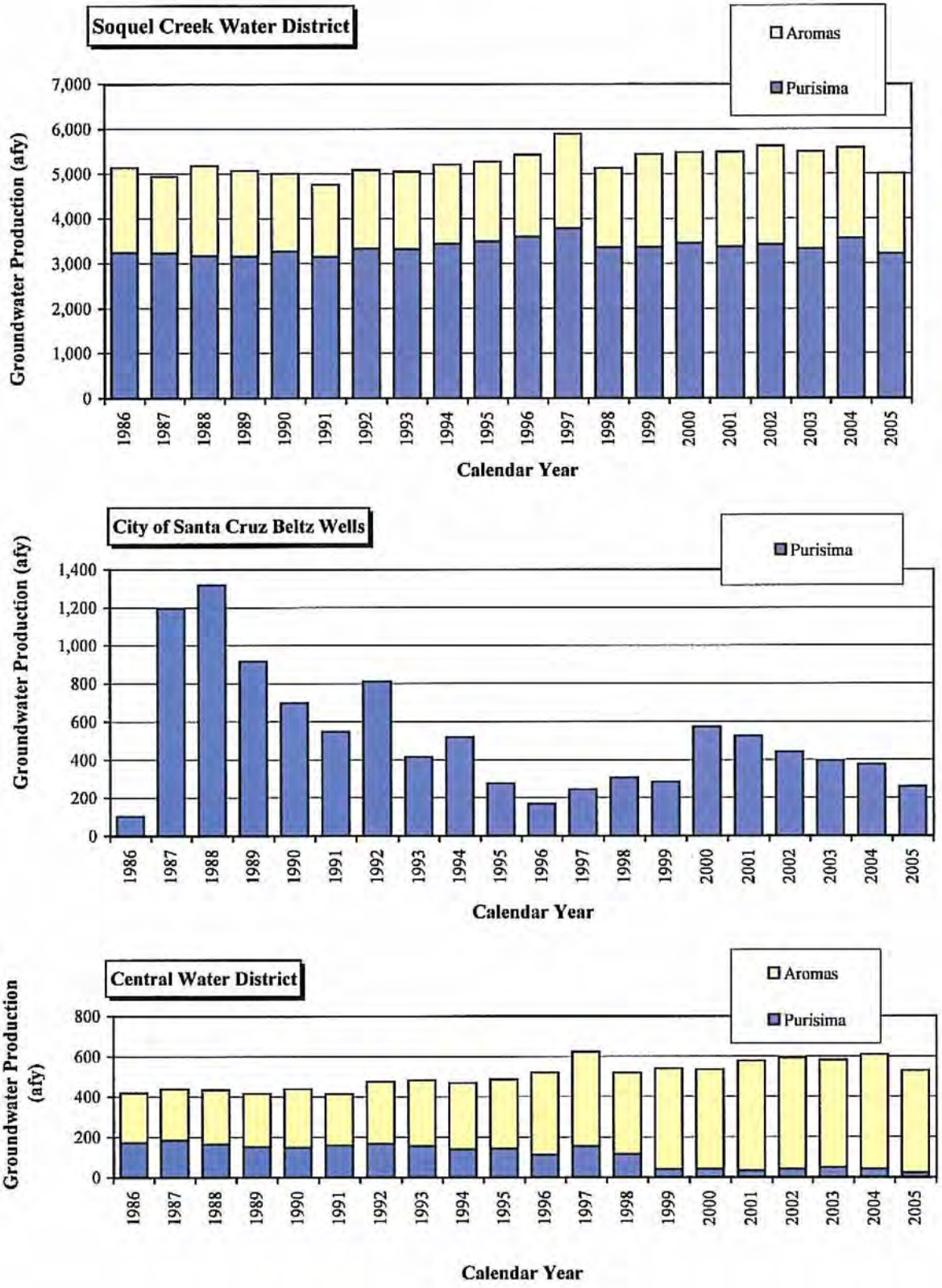


Figure 3-24
Soquel Creek Water District, City of Santa Cruz, and Central Water District
Annual Groundwater Production

Figure D-6

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

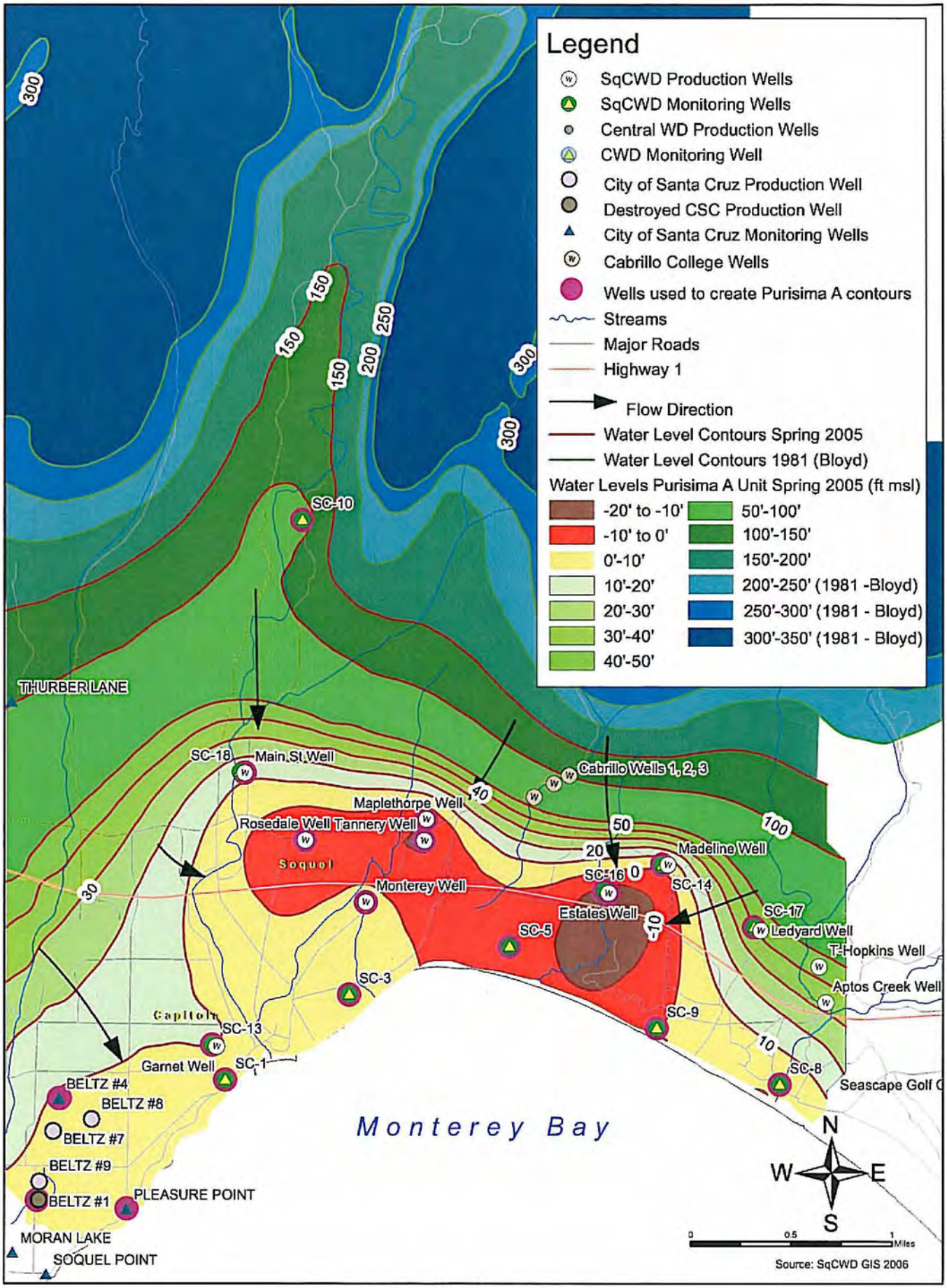


Figure 3-13
Water Levels - Purisima Formation (A Unit) Spring 2005

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

Figure D-7

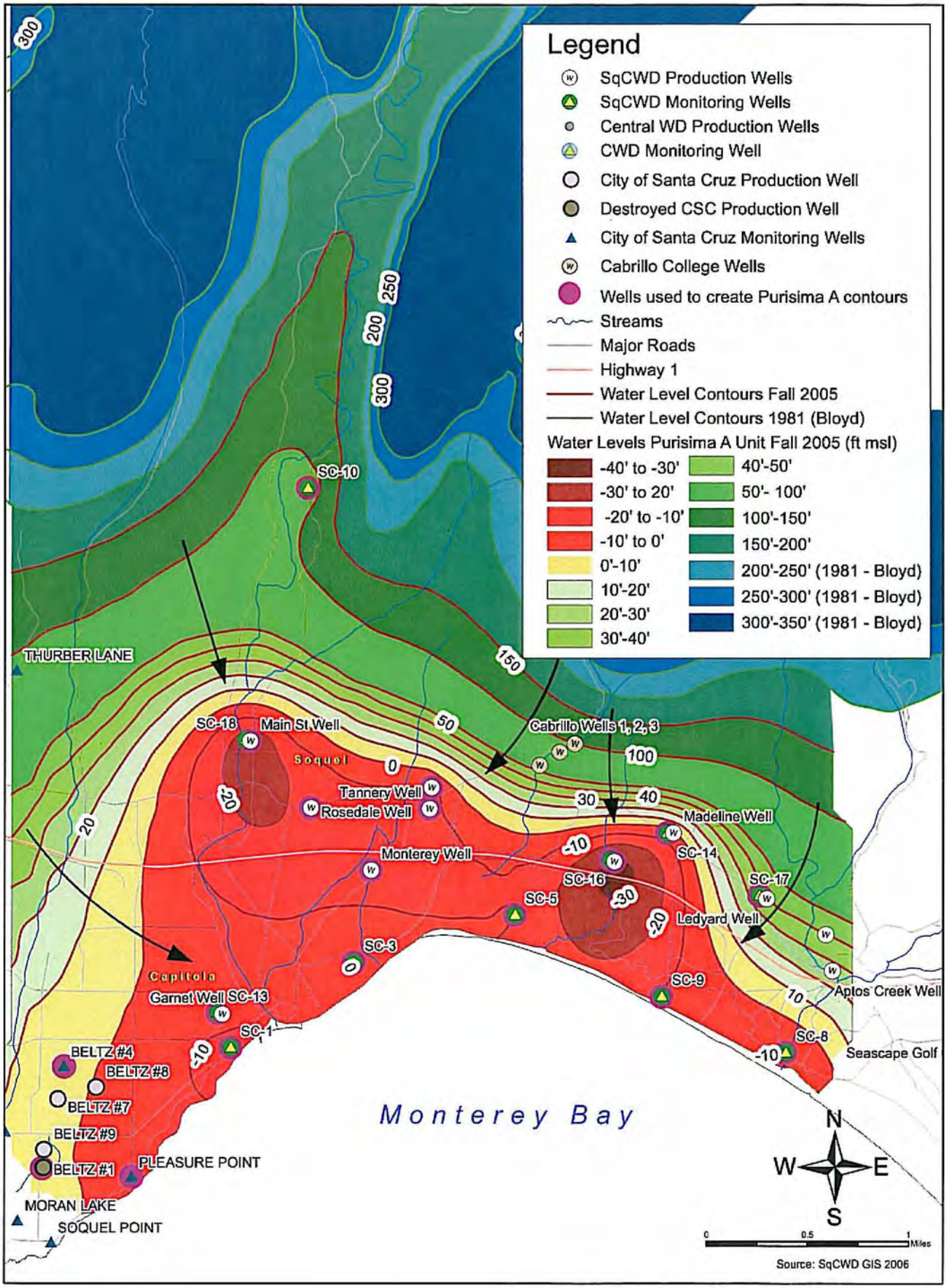


Figure 3-14
Water Levels - Purisima Formation (A Unit) Fall 2005

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

Figure D-8

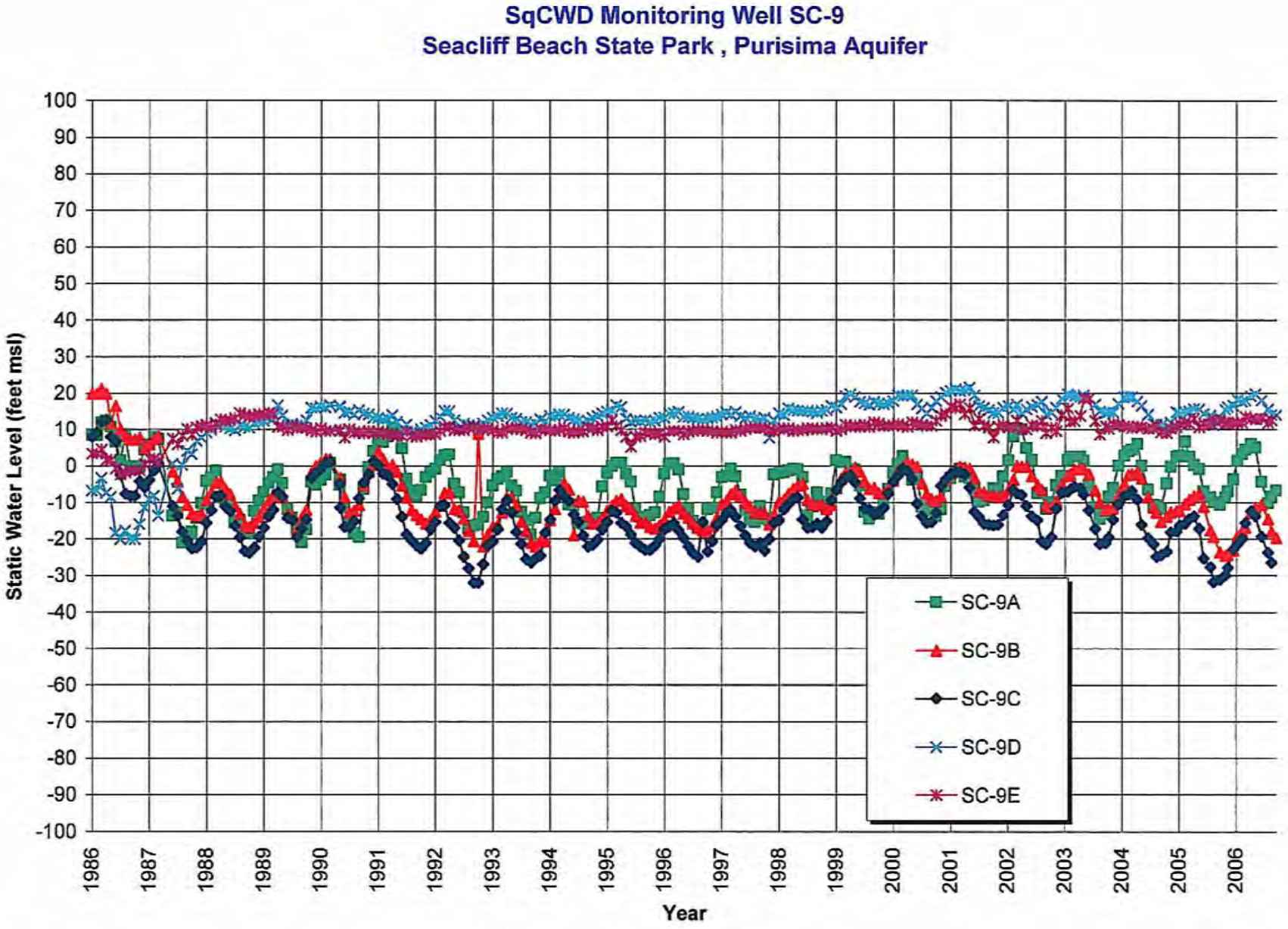


Figure 3-17
Hydrographs for SqCWD Monitoring Well SC-9

Source: *Groundwater Assessment of Alternative Conjunctive Use Scenarios* (Johnson et. al, 2004)

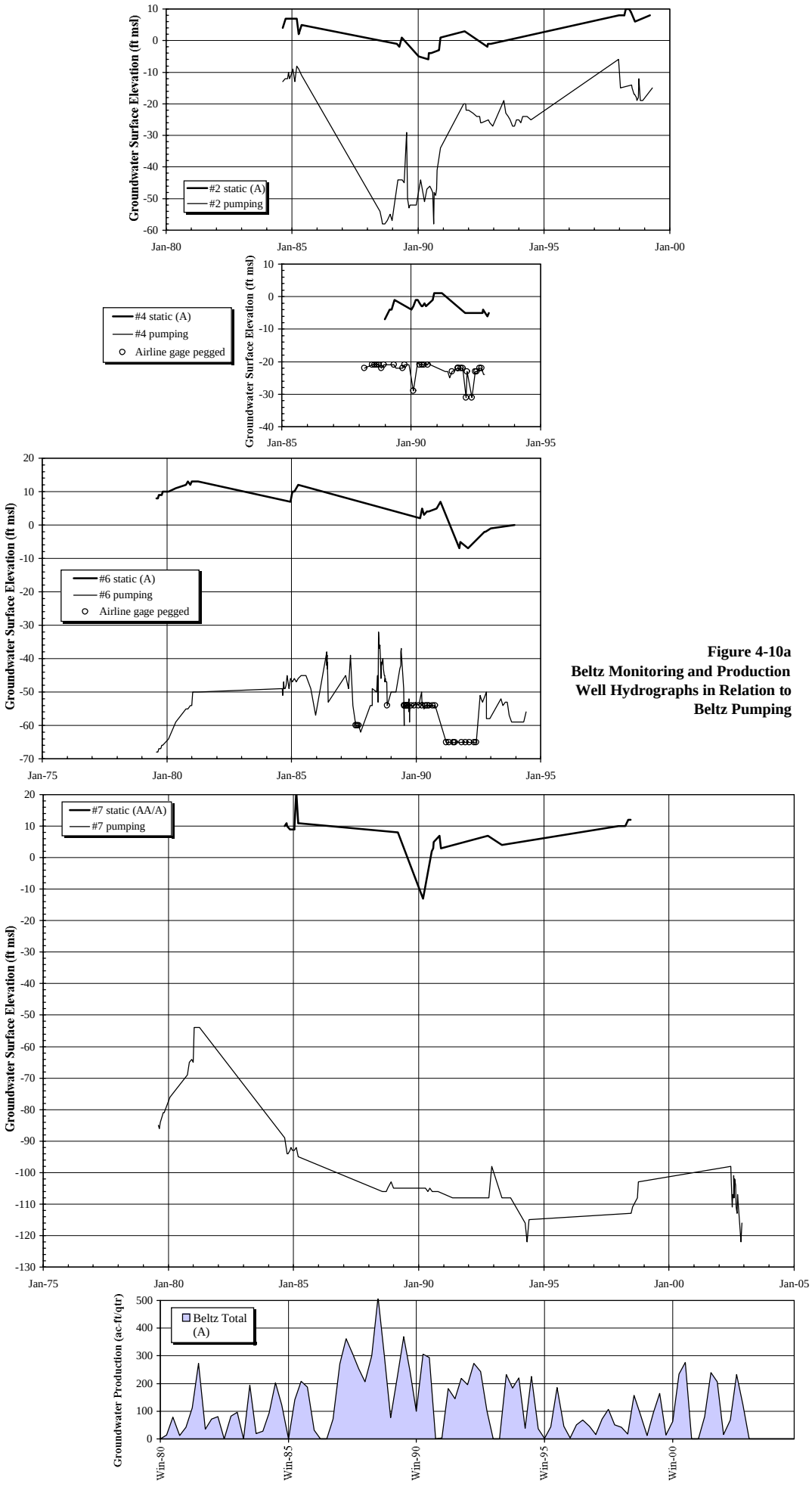
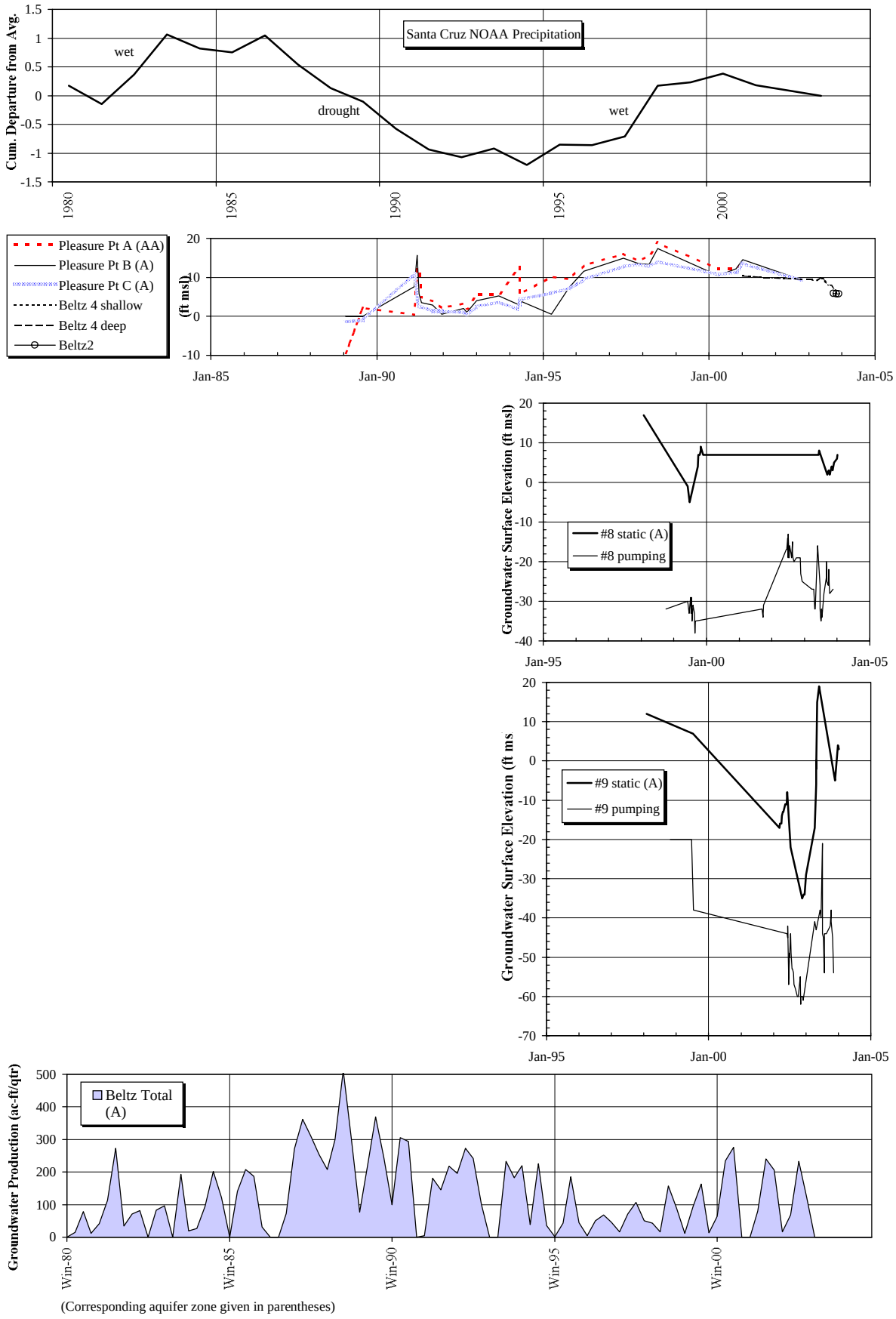


Figure 4-10a
Beltz Monitoring and Production Well Hydrographs in Relation to Beltz Pumping

Figure D-10a

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)



(Corresponding aquifer zone given in parentheses)

Figure 4-10b

Beltz Monitoring and Production Well Hydrographs in Relation to Beltz Pumping

Figure D-10b

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

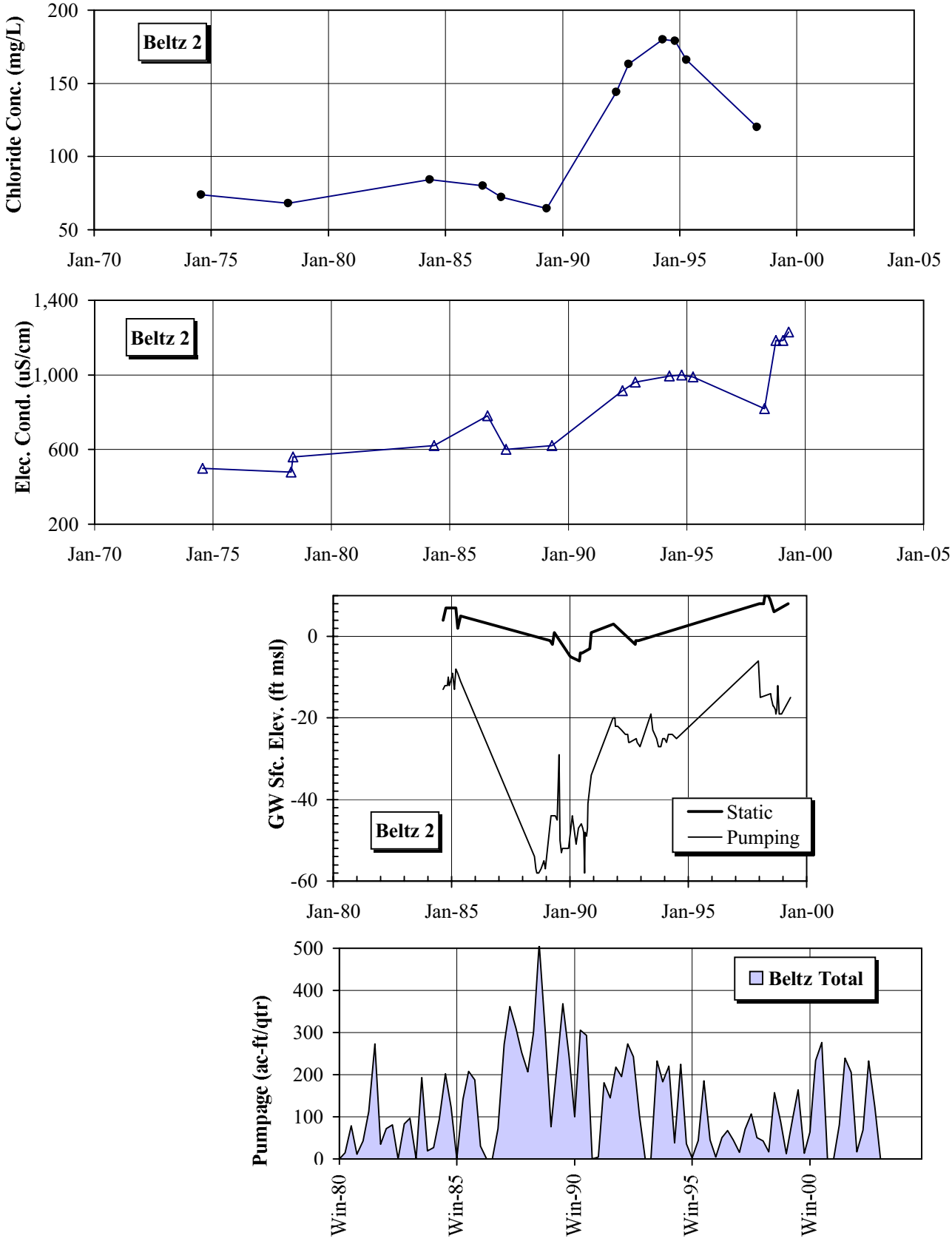


Figure 6-19
Beltz 2 Chloride, Water Level , and Pumping

Figure D-10c

Source: *Soquel Creek Water District and Central Water District Groundwater Management Plan* (SqCWD and CWD, 2007)

Appendix E

Cooperative Agreement for Groundwater Management between the Soquel Creek Water District, City of Santa Cruz, Central Water District, and the County of Santa Cruz.

COOPERATIVE AGREEMENT
FOR GROUNDWATER MANAGEMENT WITHIN THE SOQUEL-APTOS BASIN

THIS COOPERATIVE AGREEMENT, made and entered into this 1st day of November, two thousand and five, by and between Soquel Creek Water District, City of Santa Cruz, Central Water District, and the County of Santa Cruz, all of which represent agencies with interests in groundwater management within the area known regionally as the Soquel-Aptos Basin, hereby join together for a common and specific purpose.

ARTICLE I. BACKGROUND AND OBJECTIVES

RECITALS

1. The parties to this interagency cooperative agreement, pursuant to their respective statutory authorizations, are engaged in programs and projects intended to further the assurance of a long–term, sustainable, reliable, good quality groundwater supply in Santa Cruz County;

2 In 1994 and 1996, the Soquel Creek Water District and the Central Water District entered into a Joint Exercise of Powers Agreement and created the *Ground-Water Management Plan – Soquel-Aptos Area*, respectively, to manage the groundwater in their service areas under the provisions of AB3030, as set forth in Part 2.75 of Division 6 of the California Water Code;

3. The Department of Water Resources (DWR) has added Amendments to Sections 10750 et.seq. whereby the managing entity shall "involve other agencies that enables the local agency to work cooperatively with other public entities whose service area or boundary overlies the groundwater basin." (Water Code # 10753.7 (a)(2)) The County of Santa Cruz and the City of Santa Cruz are both agencies whose boundaries overlie the Soquel-Aptos Area groundwater basin;

4. The Soquel-Aptos Basin is currently in overdraft and susceptible to seawater intrusion and, in an effort to include locales that are outside the existing AB 3030 boundaries in order to provide consistent, basin wide management practices, the parties to this agreement are interested in developing an expanded regional Groundwater Management Plan (GWMP);

5. The City of Santa Cruz and the County of Santa Cruz have agreed to join the continued efforts by Soquel Creek Water District and Central Water District to manage the basin and update/expand the GWMP, although the extent of their participation has not yet been defined;

6. All parties to this agreement wish to join in a common effort to create an updated/expanded GWMP which shall include, but not be limited to: 1) Establishing management objectives for the Soquel-Aptos Basin, including components relating to monitoring and controlling saline intrusion, monitoring and managing groundwater levels and storage, groundwater quality, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping; and 2) Adopting monitoring protocols for the above referenced components;

7. The parties to this agreement are empowered by law to enter into this agreement.

ARTICLE II. STATEMENT OF WORK

NOW THEREFORE, the parties to this agreement mutually agree to:

1) Establish the Soquel-Aptos Groundwater Management Alliance (SAGMA). The agency members of the Alliance shall form a committee comprised of one representative from each party to this agreement, accompanied by support staff and consultants, as needed. The committee shall meet on a regular basis and establish programs and policies consistent with the alliance's objectives, review data and coordinate groundwater pumping to the extent possible to both meet demand and avoid exacerbating undesirable coastal groundwater conditions.

2) Undertake ongoing and comprehensive efforts to collect, maintain, and share groundwater data with respect to water levels and quality.

3) Support and provide technical assistance in updating the 1996 AB 3030 Groundwater Management Plan for the Soquel-Aptos Area.

4) Collaboratively review and update the database for private wells within the Soquel-Aptos Basin.

5) Prepare a map showing the area of the groundwater basin(s), as defined by DWR Bulletin 118, with area(s) subject to the Groundwater Management Plan as well as the boundaries of other local agencies that overlie the Soquel-Aptos Basin.

6) Develop and foster relationships with regional, state, and local governments, individuals, and other interested organizations to develop protocols that recognize the importance of groundwater management practices to preserve and protect this natural resource.

7) Establish cooperative relationships with state, local, and other public entities within this region that regulate groundwater matters.

8) Undertake cooperative research and resource management initiatives that are regional in scope and disseminate information resulting from these activities.

9) Establish and implement management objectives (MOs) for the Soquel-Aptos Groundwater Basin (Water Code 10753.7 (a)(1)).

10) Coordinate Urban Water Management Plans and Groundwater Emergency Plans.

11) Jointly pursue groundwater management grants or studies, such as grants available from the State under AB303 and Proposition 50 and studies undertaken by the University of California or United States Geological Survey.

12) Consider the benefits of and form for entering into an arrangement that expands the AB3030 Groundwater Management Authority established under the Joint Exercise of Powers Agreement between Soquel Creek Water District and Central Water District to include those areas within the Soquel-Aptos Groundwater Basin that are under the jurisdiction of the City and/or County of Santa Cruz.

13) Review land use plans and coordinate with land use planning agencies to assess activities and potential impacts of activities that have an impact on groundwater quantity and quality.

14) Produce and share relevant informational materials among the members of SAGMA

15) Recommend to the respective governing boards actions necessary to protect the groundwater basin.

ARTICLE III. TERM OF AGREEMENT

GWB by staff

This agreement shall be evaluated and reviewed no later than one year after its implementation at which time, recommendations for improvements and modifications shall be considered by all ~~parties~~ approving bodies GWB. Any amendment or modification to this agreement shall be in writing, agreed upon by all signatories, executed by the

duly authorized representatives of the parties hereto, and incorporated into this agreement by reference.

ARTICLE IV. KEY OFFICIALS

Laura D. Brown, General Manager, Soquel Creek Water District
Clarke Wales, General Manager, Central Water District
Bill Kocher, Director, City of Santa Cruz Water Department
John Ricker, Water Resources Program Coordinator, Santa Cruz County Environmental Health Services

ARTICLE V. AWARD

This basic agreement does not provide for any financial obligation and is a vehicle for determining agency agreement on basic premises, goals, and objectives. Subsequent work requiring the transfer of funds between member agencies may be made by amendment of this basic document with the approval of the legislative bodies of the participating agencies and the SAGMA.

Preliminary discussions regarding any costs associated with projects developed under this agreement may use a formula based on estimated net pumpage from the basin by member agencies.

ARTICLE VI. TERMINATION

Agencies can terminate their participation in the Soquel-Aptos Groundwater Management Alliance by providing 60 days written notice to all signatory parties.

SIGNATURES

Laura D. Brown
General Manager
Soquel Creek Water District

~~Bill Kocher~~ Richard C. Wilson 10/07/05
~~Director~~ City Manager
City of Santa Cruz, ~~Water Department~~

Clarke Wales
General Manager
Central Water District

~~John Ricker~~ Rama Khalsa
~~Water Resources Program Coordinator~~ Health Services Agency Director
County of Santa Cruz ~~Environmental Health Services~~

Approved as to Form:

Bosso Williams

District Counsel, Soquel Creek Water District & Central Water District

County Counsel

/Harry A. Oberhelman III 8/14/05

County Counsel, County of Santa Cruz

City Attorney

10-5-05

City Attorney, City of Santa Cruz

Appendix F

Draft List of Regulatory Permits, General Approach and Timeline for Permit Acquisition for the Desalination Plant, provided by the City

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
U.S. Fish and Wildlife Service (USFWS), Ecological Services Branch	Incidental Take Statement and coordination under Section 7 Endangered Species Act of 1973, as amended (ESA)	Under Section 7 of the ESA, Federal agencies must consult with the USFWS to determine the potential for effects to protected species and whether an Incidental Take Statement may be required. Key permit acquisition steps include: • Identify federally listed species potentially affected • Initiate early, informal Section 7 consultation and provide a project description with existing special studies • Conduct any additionally required flora and fauna surveys and evaluate the potential for 'take' • Prepare draft Biological Assessment (BA) for federal agency • Coordinate final BA with federal agency and SCWD[2] prior to submittal to USFWS/NMFS • Obtain USFWS/NMFS review and Biological Opinion (BO), and determine need for formal Section 7 consultation • Support USFWS consultation under Section 106 of the National Historic Preservation Act (NHPA), as described below • As necessary, complete consultation and obtain Incidental Take Statement.	6 – 12 months
	Incidental Take Permit (ITP) under the Migratory Bird Treaty Act (MBTA) (16 USC 703–711)	This Act prohibits the take of any migratory bird or any part, nest, or eggs of any such bird without an Incidental Take Permit from USFWS. For acquisition of this permit, we will: • Coordinate with USFWS simultaneously with the Section 7 ESA review regarding potential "take" and the need for a MBTA ITP • Obtain formal USFWS comment and, if needed, a ITP.	
	Consultation under the Fish and Wildlife Coordination Act (16 U.S.C. 661-667c)	This Act authorizes USFWS to review and comment on project effects to fish and wildlife for activities undertaken or permitted by a federal agency. To assist this federal consultation, we will: • Coordinate with USFWS simultaneously with Section 7 ESA process regarding the need for a ITP under MBTA • Obtain USFWS comment under the Act.	

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
NOAA National Marine Fisheries Service (NMFS)	Consultation and biological opinion in accordance with Section 7 ESA	Any federal permitting agency for this project must consult with the NMFS to determine whether the proposed action is likely to have an adverse effect to a federally listed marine species or designated critical habitat for such species; jeopardize the continued existence of such species that are proposed for listing under the ESA; or adversely modify proposed critical habitat. An ITP may be required. Consultation with the NMFS is the same as that described above for the USFWS under Section 7. (If no federal approval is required, an ITP would be issued in accordance with ESA Section 10.)	6 – 12 months
	ITP per Section 104, Marine Mammal Protection Act of 1972 (MMPA) (16 U.S.C. § 1374)	The MMPA prohibits unauthorized "take" of marine mammals in U.S. waters. NOAA NMFS will review project impacts to marine mammals and may authorize an incidental take. Staff will coordinate with the NMFS for ITPs under the MMPA simultaneously with consultation under Section 7 of the ESA, as discussed above, and assist with federal agency consultation under Section 106 of the National Historic Preservation Act (NHPA), as discussed below.	
	Consultation under Section 305(b), Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1855(b))	NMFS consultation is required whenever a federal or state approval is required for an activity that may adversely affect designated essential fish habitat (EFH). Coordination with NMFS would occur for the Sustainable Fisheries Act simultaneously with consultation under Section 7 of the ESA.	

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
National Oceanic & Atmospheric Administration (NOAA), National Marine Sanctuary Program (NMSP), Monterey Bay National Marine Sanctuary (MBNMS)	Authorization under the MBNMS Management Plan and the National Marine Sanctuary Program (15 Code Fed. Regs. Part 922)	Authorization is required from the MBNMS Superintendant for any permit, lease, license, approval or other authorization issued or granted by a federal, state or local agency for activities within the sanctuary. The following three Sanctuary regulations and inter-agency agreements related to MBNMS authorization of desalination projects need to be addressed. • Sanctuary authorization to issue Regional Water Quality Control Board (RWQCB) permits to dispose of brine concentrate, and other materials, into Sanctuary waters. • Sanctuary authorization to issue RWQCB permits to dispose of brine concentrate, and other materials, outside of the Sanctuary boundaries but which subsequently enter Sanctuary waters and negatively impact MBNMS resources. • Sanctuary authorization to issue a California Coastal Commission Coastal Development Permit, per MBNMS authority to prohibit activities that cause alteration of the seabed.	6 – 12 months
U.S. Army Corps of Engineers (USACE)	Individual Permit in accordance with Section 404 Clean Water Act (33 U.S.C. § 1344)	Activities that result in discharges of dredged or fill material into Waters of the United States are regulated by the USACE. Staff will perform the following steps to facilitate acquisition of a Department of the Army permit: • Coordinate early with USACE and other reviewing agencies (USFWS, NMFS, RWQCB, US Coast Guard) • Confirm permit type (Individual or Nationwide), application content, public notification process and likely permit stipulations • Prepare diagrams of alternatives and jurisdictional delineations of affected wetlands/Waters of the US • Prepare Engineer Form 4345, *Application for a Department of the Army Permit* for an Individual Permit • Coordinate with USACE regarding reviewing agency/public comments and permit conditions.	6 –18 months

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
	Individual Permit under Section 10 Rivers and Harbors Act (33 U.S.C. § 403)	Under section 10 of the Act, the building of any wharfs, piers, jetties, pipelines and other in-water structures is prohibited without the approval of the USACE. USACE concerns include contaminated sediments from dredge or fill activity in navigable waters. Staff will: • Submit Section 10 permit application simultaneously with a CWA §404 permit application • Monitor U.S. Coast Guard consultation with the USACE regarding marine traffic safety and navigational hazards, including underwater intake and outfall pipelines • Coordinate under Section 106 of the National Historic Preservation Act • Consult under Section 7 of the federal ESA • Consult under Section 305(b), Sustainable Fisheries Act.	6 – 18 months
Regional Water Quality Control Board (RWQCB)	National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated With Construction Activity (WQO No. 99-08-DWQ)	A NPDES General Construction Permit is required for stormwater discharges associated with construction activity totaling over 1 acre that would result in waste discharges into surface waters of the state. Staff will: • Conduct early coordination with the RWQCB regarding the proposed action and anticipated post-project monitoring and annual certification requirements • Compile data on content and rate of discharge anticipated for the proposed action • Submit a Notice of Intent (NOI) to the RWQCB for a General Construction Permit. • Prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) specifying best management practices (BMPs) and pollution prevention monitoring • Obtain General Permit and implement monitoring plan with monthly reports to RWQCB • Submit a Notice of Termination to the RWQCB upon completion of the project.	12 – 24 months
	NPDES Permit in	The proposed project will mix waste brine with City of Santa Cruz WWTF	

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
	accordance with Clean Water Act Section 402 (33 U.S.C. § 1342)	treated effluent and discharge through the City's deepwater outfall. scwd[2] will need to either: 1) obtain a separate NPDES Permit, or 2) modify the City's existing NPDES permit. As the City has an existing NPDES Permit, certain technical studies have already been completed for the outfall. The approach includes: • Develop and submit a Report of Waste Discharge (ROWD) describing the nature of the discharge including chemical testing results • Facilitate RWQCB technical analysis to determine the applicable receiving water quality objectives and effluent limitations (with conditions) • Consultation with NMFS under Section 305(b) of the Sustainable Fisheries Act • Draft NPDES permit is developed as a Tentative Order • Ensure CEQA and NEPA requirements are fulfilled prior to a public hearing for this permit • The Draft Permit may be altered based on public comment and is adopted as a Final Permit. The RWQCB then sends the Permit to the SWRCB and EPA for approval • Existing or planned studies to determine the effects of mixing brine with the treated effluent would provide the technical analysis needed in the CEQA/NEPA document.	
	Waste Discharge Requirements (WDR) per Porter-Cologne Water Quality Control Act (Water Code § 13000 et seq.)	Any activity that results or may result in a discharge of waste that directly or indirectly impacts the quality of waters of the State (including groundwater or surface water) or the beneficial uses of those waters is subject to WDRs. Staff will identify the need for WDRs under the Porter-Cologne Water Quality Control Act and coordinate with RWQCB to confirm required WDRs.	

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
	Water Quality Certification in accordance with Section 401 Clean Water Act (33 U.S.C. § 1341)	Any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters, must provide the licensing or permitting agency a certification that the activity meets State water quality standards. Staff will initiate Section 401 Water Quality Certification studies and seek approval concurrent with the USACE Section 404 CWA application process.	
California State Lands Commission	Land Use Lease (Right-of-Way Permit) (Pub. Res. Code § 6000 et seq.; 14 Cal. Code Regs. § 1900 et seq.)	A Right-of-Way Permit for use of state tidelands and submerged lands within 3 nautical miles seaward of the ordinary high water mark is required.	12 – 24 months
California Department of Fish and Game (CDFG)	Incidental Take Permit in accordance with the California Endangered Species Act (CESA) (Fish & Game Code § 2081)	A "take" of any endangered, threatened or candidate species may be allowed by permit if it is incidental to an otherwise lawful activity and if the impacts of the authorized "take" are minimized and fully mitigated. CDFG maintains a list of threatened and endangered species designated under California Fish and Game Code 2070. Staff will: • Coordinate with CDFG regarding affected habitats that may support state-listed rare, threatened, and endangered species and species of special concern • Determine whether a "take" of species designated by the California Fish and Game Commission as endangered or threatened • Apply for Incidental Take Permit, if required.	6 – 12 months

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
	Lake/Streambed Alteration Agreement (Fish & Game Code § 1602)	Under California Fish and Game Code Sections 1600–1607, CDFG may require agreements for projects that would substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. Staff will: • Coordinate with CDFG regarding jurisdiction and potentially affected stream, riparian and floodplain systems • Seek CDFG determination whether a Section 1601 agreement is necessary for the proposed project • Prepare Notification of Lake or Streambed Alteration (FG 2023) and Project Questionnaire (FG 2024) • Coordinate with CDFG regarding site inspections, additional information, approvals and conditions • Facilitate consultation under Section 305(b) of the Sustainable Fisheries Act and the Fish and Wildlife Coordination Act.	6 – 12 months

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
California Coastal Commission (CCC)	Coastal Development Permit in accordance with the California Coastal Act (Pub. Res. Code § 30000 et seq.)	Development proposed within the state Coastal Zone requires a Coastal Development Permit issued by the CCC, except where a Local Coastal Plan (LCP) applies. Staff will: • Consult early and continuously with the CCC regarding the proposed action, and physical and technological alternatives • Identify affected and important coastal zone resources • Coordinate the scope of marine biology and other marine resource evaluations • Facilitate review of proposed actions under the Coastal Act with the CCC, and actions evaluated under the City's LCP • Facilitate consultation under Section 305(b) of the Sustainable Fisheries Act • Facilitate a Coastal Act consistency determination for lead federal agency involvement • Respond to CCC inquiries and comments • Provide approved CEQA/NEPA documents and other information required for permit approval	12 – 24 months
California Department of Public Health (CDPH)	Permit to Operate a Public Water System (Health & Safety Code § 116525)	A permit from CDPH to operate a public water system is required to manage water quality and protect public health. Staff will: • Define project design elements and alternatives • Initiate early agency communication with local CDPH office • Prepare or provide Water System Technical Report per DHS requirements, including monitoring prior to use • Prepare Application for Domestic Water Supply Permit (or submittal to amend existing permit) • Obtain CDPH permit and, upon construction, prepare Inspection Sheets	12 – 24 months

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
California Department of Parks and Recreation Office of Historic Preservation	Coordination under Section 106 of the National Historic Preservation Act (NHPA) (16 USC 470 et seq.)	Section 106 of NHPA requires a federal agency with jurisdiction over a federally funded, federally assisted, or federally licensed activity to consider the effects of the agency's action on properties listed or eligible for listing in the NRHP. Staff will: • Consult with the State Historic Preservation Officer (SHPO) • Identify and evaluate historic properties (literature search and Phase 1 terrestrial survey) • Evaluate properties eligible for listing in the NRHP • Formally consult with the SHPO seeking agreement on effect and treatment of historic properties (if any).	6 – 12 months
California Department of Transportation (Caltrans)	Encroachment Permit (Streets & Highway Code § 660 et seq.)	Encroachments in, under, or over any portion of a state highway right-of-way, such as state Highway 1. Staff will: • Coordinate with Caltrans District 5 Permit Engineer • Complete an Encroachment Permit Application, including project information, drawings, plans and any prior approvals • Respond to Caltrans inquiries and facilitate permit approval process, as needed.	12 – 24 months
City of Santa Cruz Water Department	Regulation of Water Wells (Chapter 16.06)	This chapter of the City Code regulates the construction, repair and reconstruction of all wells through: • Preparation of plans for review and use by the public • Well standards and setbacks • Variances for public use • Inspections and Completion Reports • Public Hearings Staff will comply with these regulations, if required.	6 – 12 months
City of Santa Cruz Planning and Community	Use Permit	It is expected that permits or approvals will be required for review under City planning, zoning, building and local coastal regulations. Staff will comply with these regulations, if required.	12 months

Regulatory Agency	Regulatory Permit, Authorization or Approval	Key Requirements and General Permit Acquisition Approach	Anticipated Permit Acquisition Timeline
Development	Coastal Development Permit in accordance with the California Coastal Act (Pub. Res. Code § 30000 et seq.)	Development proposed within the Coastal Zone where the City has jurisdiction through its existing Local Coastal Plan, except where the CCC retains primary permit authority. See California Coastal Commission permit discussion above.	See CCC above
Monterey Bay Unified Air Pollution Control District (MBUAPCD)	Authority To Construct in accordance with Local Rule 3.1	The building, erection, alteration, or replacement of any article, machine, equipment or other contrivance which may cause the issuance of air contaminants from a stationary source or the use of which may eliminate or reduce or control the issuance of air contaminants requires an Authority to Construct to be issued by the Air Pollution Control Officer. Depending on equipment used and requirements for backup power, agency consultation would be initiated and, if required, an Application for Authority to Construct and Permit to Operate would be prepared and submitted to the MBUAPCD.	12 – 18 months
	Permit To Operate in accordance with Local Rule 3.2	The operation or use of any article, machine, equipment or other contrivance that may emit air contaminants from a stationary source requires a Permit to Operate to be issued by the Air Pollution Control Officer or the District's Hearing Board. Depending on equipment used and requirements for backup power, agency consultation would be initiated and, if required, an Application for Authority to Construct and Permit to Operate would be prepared and submitted to the MBUAPCD.	12 – 18 months