

WATER-SUPPLY ASSESSMENT
(SB 610 & 221 REPORT)
FOR THE PROPOSED
PANORAMA POINT PLANNED DEVELOPMENT
COTTONWOOD,
SHASTA COUNTY, CALIFORNIA

May 2009

Prepared by Shasta County
With Assistance From Lawrence & Associates

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Attachments (following figures)

A. Shasta County Groundwater Ordinance

INTRODUCTION

This report presents the water-supply assessment for the proposed Panorama Point Planned Development (PPPD Project) pursuant to *Section 10910* of the *California Water Code* and *Section 65867.5* of the *California Government Code*. These sections contain the requirements of Senate Bills (SB) 610 and 221, respectively. As described in the *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 (Guidebook; California Department of Water Resources, October 8, 2003)*, both of these statutes require a water-supply assessment be provided to city and county decision makers prior to approval of specified large development projects.

The PPPD Project consists of a General Plan Amendment, Zone Amendment, and Tract Map for subdivision of approximately 307 acres into 440 lots, ranging in size from 4,000 square feet to over 3 acres (**Figures 1 and 2**). Approximately 130 acres will be preserved as open space. The PPPD Project site is located in the northeast portion of the Cottonwood Planning Area, bounded by Locust Road to the west, with Trefoil Lane and Balls Ferry Road to the south.

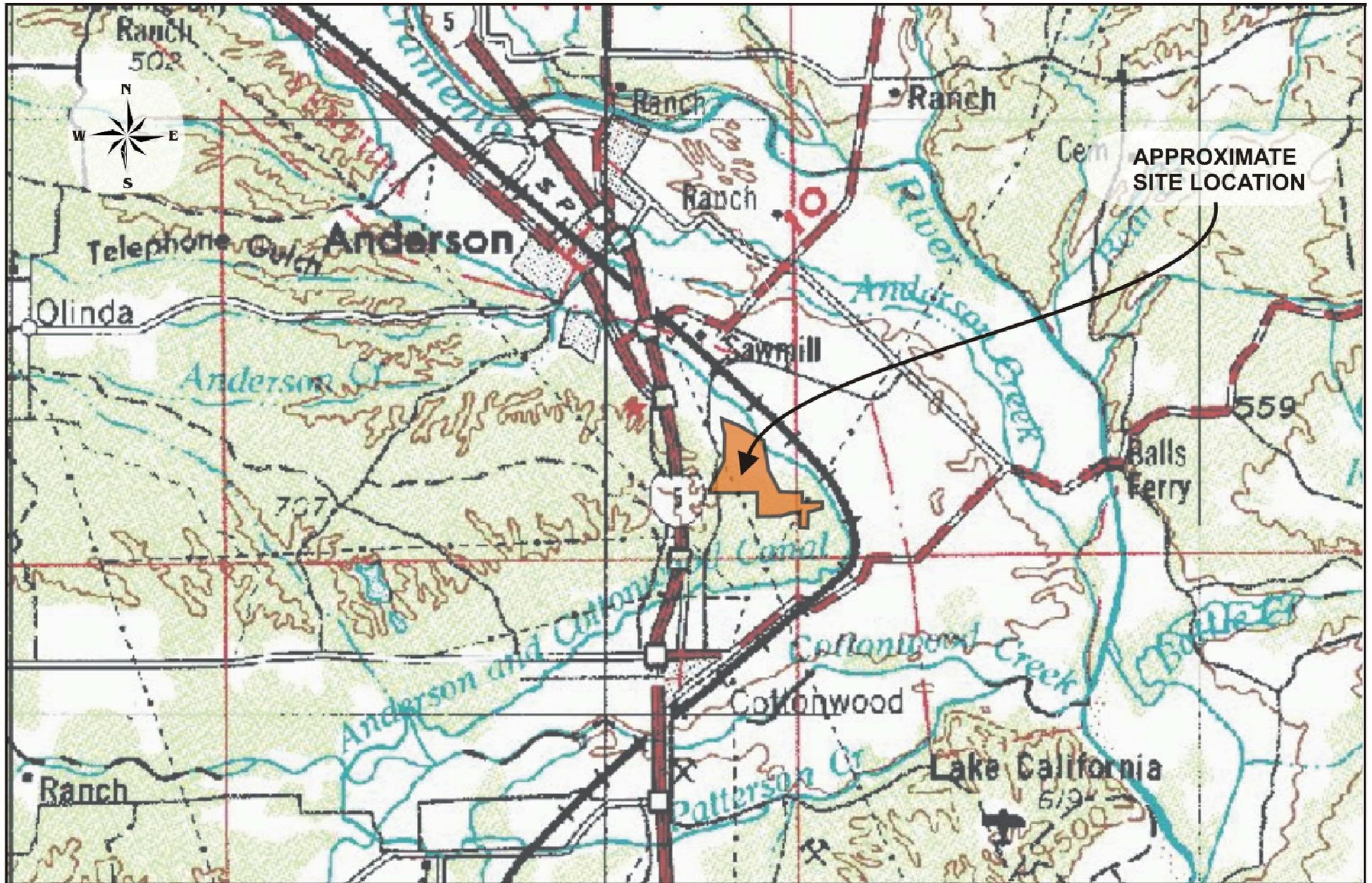
The Project will be supplied water from the Cottonwood Water District (CWD; **Figure 3**). The CWD supplies potable water to the town of Cottonwood; its supply consists solely of groundwater.

As part of the Project, the proponent will install a well at the Project site, a one-million gallon storage tank, a booster-pump station, and a back-up power source (generator). All of this infrastructure will be deeded to the CWD, which will make it part of their water-supply system. The CWD will be responsible for its operation and maintenance.

APPLICABILITY OF SB 610 & 221

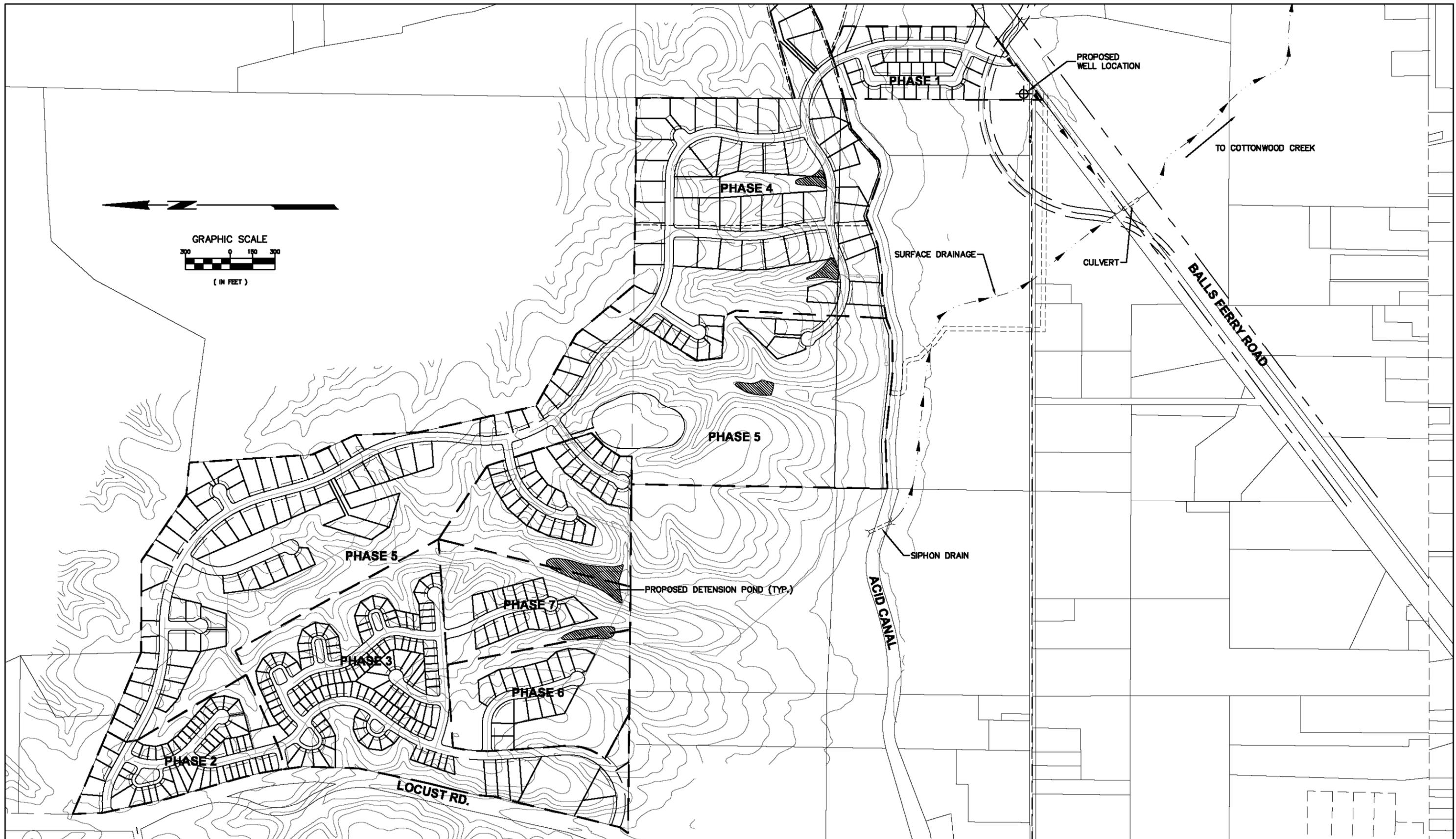
The PPPD Project meets the criteria of a large development project as defined in *Water Code §10912 (a) (1)* and in *Government Code §65867.5 (c)* in that it is a subdivision and will increase the number of services in the CWD by more than 10%. Therefore, it is subject to both SB 610 and SB 221.

VICINITY MAP - PANORAMA POINT PLANNED DEVELOPMENT



SCALE
1 INCH ~ 4,000 FEET

FIGURE 1



NO.	DATE	REVISIONS	BY	CHK

DRAWN BY: D. ZAITZ	PROJECT NO: 007136.00
ENGINEER: N/A	SCALE: 1"=300'
CHECKED BY: B. LAMPLEY	APPROVED BY:
DATE: 5/9/08	DATE:


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PANORAMA POINT

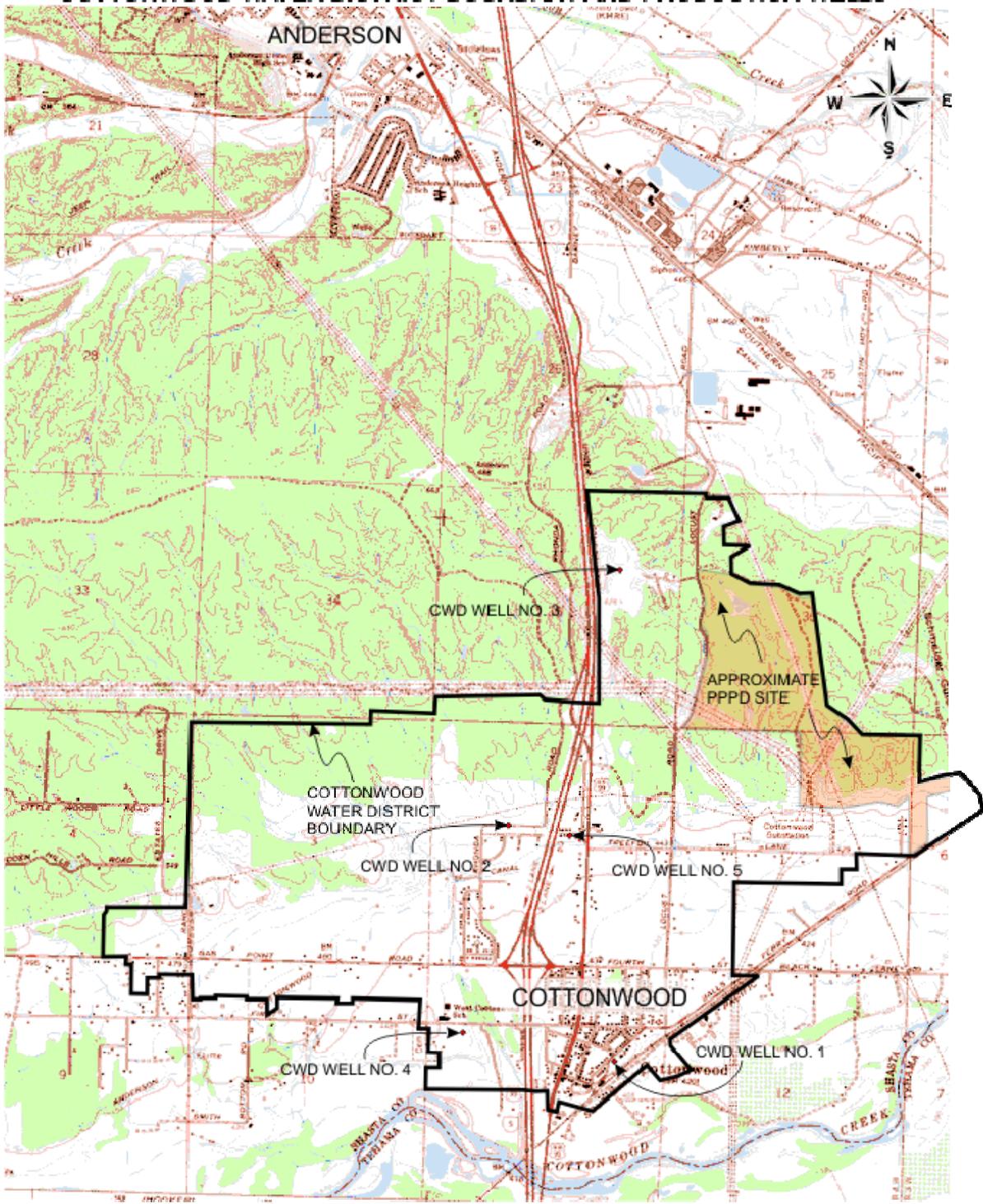
ENPLAN

SITE PLAN

Map Adapted From Panorama Planned
 Development Map By Sharrah Dunlop Sawyer, Inc.

DRAWING: FIGURE 2
SHEET: OF
REVISION NO: REVISION 0
DATE: 5-9-08

COTTONWOOD WATER DISTRICT BOUNDARY AND PRODUCTION WELLS



SCALE:
1" = 3,000'

FIGURE 3

PREPARATION OF SB 610 AND SB 221 ASSESSMENTS

Water Code §10910(b) requires a city or county to identify whether the water system that will supply a project subject to the California Environmental Quality Act (CEQA) is, or will be, a public water system as defined in *Water Code §10912*. If the water system is, or will be, a public water system (more than 3,000 service connections), the public water system prepares the SB 610 assessment. If the water system will not be a public water system as defined above, then the city or county lead agency prepares the assessment.

The PPPD Project will be part of the CWD, which had 1,066 service connections in 2005.¹ Because there will be less than 3,000 service connections, it will not be a public water system as defined in *Water Code §10912*. Therefore, the lead agency for the Project, Shasta County, has prepared this assessment.

Shasta County was assisted by Lawrence & Associates, a private consulting company that prepared a water-supply assessment as part of the CEQA analysis for the Project.² Lawrence & Associates prepared the water-supply report for Enplan, a company retained by Shasta County to prepare the Environmental Impact Report for the Project. The water-supply study analyzed groundwater impacts pursuant to CEQA requirements and included the technical analysis required by SB 610 & 221. Therefore, most of the following assessment is based on analysis in the May 2008 water-supply study; that study will be referred to as the Project *Water-Supply Study*.

PREVIOUS ASSESSMENTS

If the water supply for a development subject to SB 610 or SB 221 has been analyzed previously and the results meet certain factors, then that previous assessment can be used (*Water Code §10910 (h)*).

The water supply for the PPPD Project has not been previously analyzed (except for the recent CEQA analysis); therefore, the SB 610 and SB 221 assessments will be based on information available from other sources.

¹ Diaz Associates & Pace Civil, Inc., February 2006, *Cottonwood Water District Municipal Services Review*.

² Lawrence & Associates, May 9, 2008; rev. January 30, 2009, *Water-Supply Analysis for the Panorama Point Planned Development, Cottonwood, Shasta County, California*.

URBAN WATER MANAGEMENT PLAN

If there is an adopted Urban Water Management Plan (UWMP) for the Project area and the Project demand was accounted for in the UWMP, then information in the UWMP can be used for the SB 610 analysis.

There is no UWMP for the area of the PPPD Project; therefore, the SB 610 and SB 221 assessments are based on other information, in this case, from the CEQA analysis.

ASSESSMENT INFORMATION

GROUNDWATER ORDINANCE

The Shasta County Water Agency (SCWA) developed a groundwater ordinance, Ordinance No. SCC 98-1, found in *Title 18, Shasta County Code, Section 18.08. Groundwater Management* (included in **Attachment A**, herein). The purpose of the Ordinance is the protect the County's groundwater resource for use within the County through regulation of groundwater export.

Shasta County also has adopted a groundwater management plan, *Coordinated AB 3030 Groundwater Management Plan for the Redding Groundwater Basin*, November 1998, updated May 2007 (included here as **Attachment A**). The purposes of the Redding basin groundwater management plan are as follows:

- "A. To avoid or minimize conditions that would adversely affect groundwater availability and quality within the Plan area.*
- B. To develop a groundwater management program that addresses data collection and which protects and enables reasonable use of the groundwater resources of the Redding Basin."*

The groundwater management plan area encompasses the cities of Shasta Lake, Redding, and Anderson, and the lands served by the numerous other water districts, agencies and purveyors in Shasta County and northern Tehama County comprising the Redding Area Water Council (RAWC). Cottonwood Water District is part of the RAWC, therefore, the PPPD project area will be within the groundwater management plan area.

The groundwater management plan describes current conditions in the Redding basin and calls for voluntary cooperation between water agencies, purveyors, and interested private parties in the Redding Basin, with an emphasis on information gathering and monitoring. The plan includes elements for "(1) Data Development/Groundwater Monitoring; (2) Public Entity Coordination and Reporting; (3) Public Information and Education; (4) Export Limitations; (5) Water Quality; (6) Wellhead Protection; (7) Land Use; (8) Conjunctive Use

Operations; (9) Groundwater Management Facilities; and (10) Groundwater Overdraft and Well Interference.” Although no specific criteria are presented for conjunctive use, groundwater management facilities, or overdraft and interference, the management plan provides for development of such criteria, programs, or facilities as may be needed in the future.

Semiannually, the SCWA provides a report on basin conditions. Those reports are found at http://www.co.shasta.ca.us/html/Public_Works/Engineering/Water_Agency/AB3030_Plan.htm.

PROJECT WATER DEMAND

Based on the current California Waterworks Standards calculation method, the total project groundwater usage will be about 424 acre-feet per year, all residential demand. The usage of 424 acre-feet equates to 263 gallons per minute (gpm) for an average-annual pumping rate. The calculated maximum day demand (MDD) is 591 gpm (850,917 gallons per day) for one day. The calculated peak hour demand (PHD) is 886 gpm (53,182 gallons per hour) for one hour. The PHD will be met from storage, not direct pumping from the site’s well.

COTTONWOOD WATER DISTRICT WATER CONSUMPTION

Table 1 shows the total annual water consumption by CWD for the years 2000 through 2007, as recorded by CWD. **Figure 4** shows a graph of this data.

Table 1: Historic Annual Water Consumption

Year	Consumption	
	Cubic Feet	Acre-Feet
2000	34,477,010	791
2001	37,767,300	867
2002	40,560,294	931
2003	38,270,316	879
2004	40,377,010	927
2005	41,262,560	947
2006	44,393,150	1,019
2007	45,307,300	1,040

Cottonwood Water District - Water Consumption

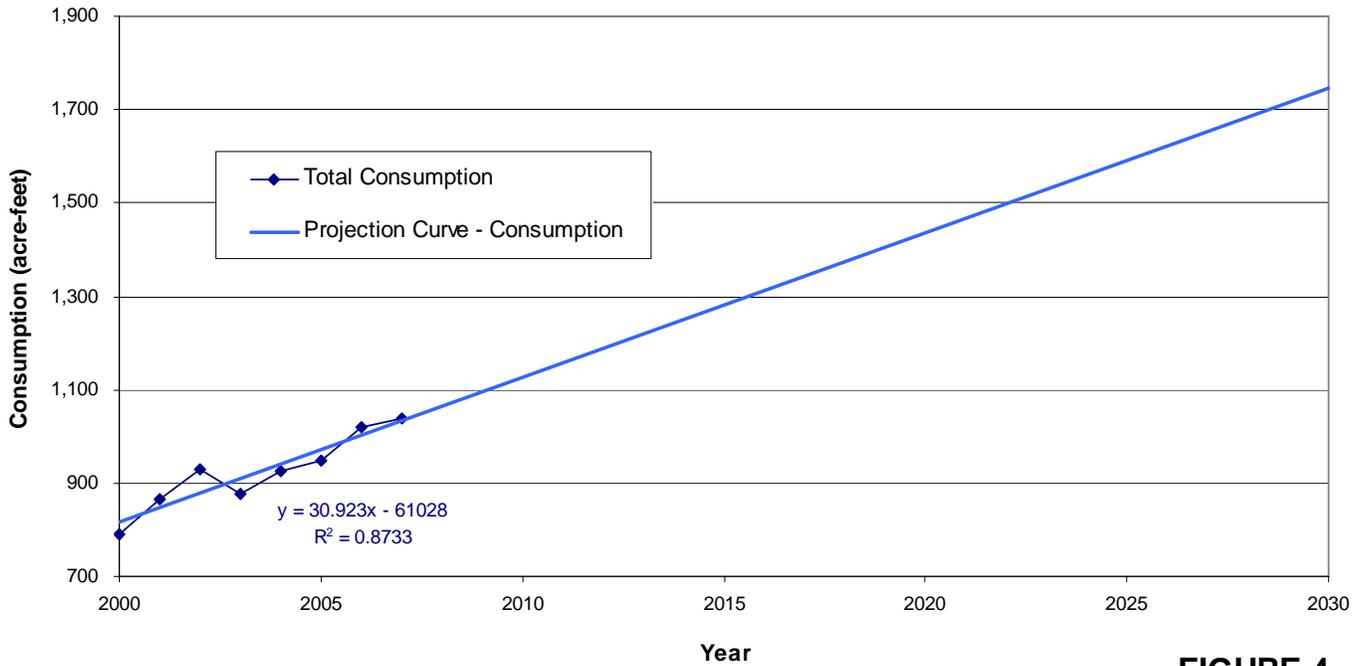


FIGURE 4

The water-consumption data in **Figure 4** was used to extrapolate consumption to the year 2030 by fitting a straight line to the data. The equation of that predictive line was used to calculate the potential future water consumption for each five-year period to the year 2030, per the *Guidelines*. **Table 2** shows those projections.

Table 2: Water-Use Sectors & Annual Water Consumption

Water-Use Sector	Year (2000 & 2005 actual; 2010 – 2030 projected)						
	2000	2005	2010	2015	2020	2025	2030
Single Family	732	876	1,042	1,185	1,328	1,471	1,614
Multi-Family							
Commercial							
Industrial	54	65	77	88	99	109	120
Institutional							
Landscape	5	7	8	9	10	11	12
Wholesale	0	0	0	0	0	0	0
Agricultural	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	791	947	1,127	1,282	1,436	1,591	1,746

Table 2 also shows consumption by water-use sectors, per the *Guidelines*. The water-use sector values were based on the relative amounts used by the sectors, as recorded by CWD. CWD records use for residential, commercial/industrial, and landscape; CWD does not break down the use by single family vs. multi-family units, etc. Currently, about 92% of CWD is used by residences, 7% by commercial/industrial concerns, and 1% by landscaping.

PROJECT WATER SUPPLY

ENTITLEMENT & GENERAL AVAILABILITY

The water supply for the Project will be wholly groundwater, pumped from a new on-site well. Groundwater in the area is utilized by the CWD (described in the previous section) and rural residences surrounding the CWD. The proposed use of the water, as a domestic supply, is a beneficial use.

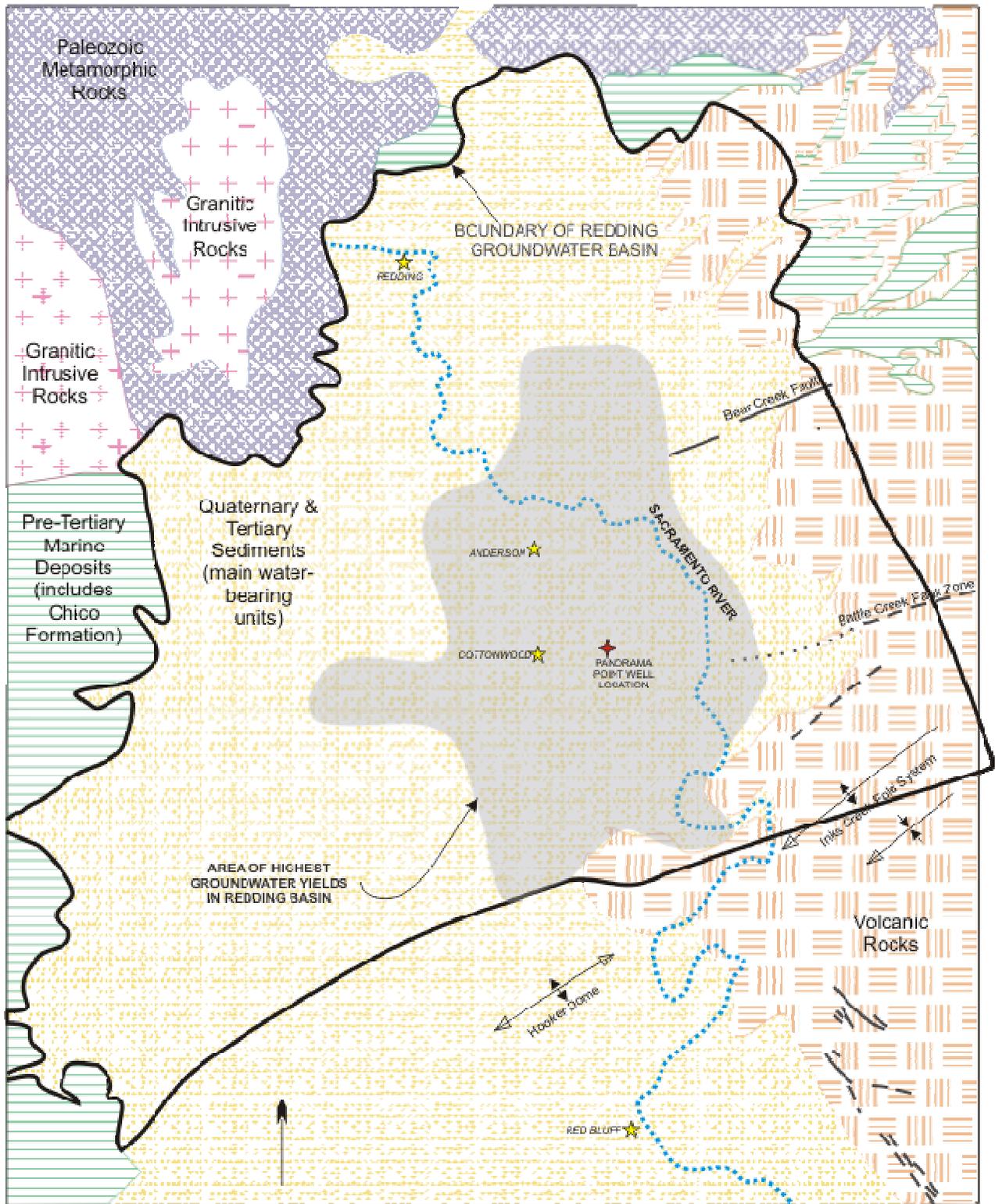
Under California case law, two types of groundwater rights have been recognized – overlying and appropriative. An overlying right is the right to beneficially use the groundwater beneath one’s property for use on the property itself. An appropriative right is the right to pump groundwater from beneath one property for use on other property. Municipal pumpers, such as the CWD, fall into the latter category. Because the CWD will own the well and well site, the CWD will have an appropriative right to pump groundwater from the well for distribution throughout its water system.

The aquifer from which the Project will draw water is located in the Anderson subbasin of the Redding groundwater basin (**Figure 5**). Neither the Anderson subbasin or Redding basin are adjudicated.

This aquifer is utilized by hundreds of wells in the Project vicinity, for domestic, irrigation, and municipal uses; the California Department of Water Resources (DWR) maintains monitoring wells in the aquifer. Many irrigated areas in the Project vicinity are also served by surface water from the Anderson Cottonwood Irrigation District (ACID). The current groundwater use in the area demonstrates that the aquifer is present and available to supply the Project.

Delivery of the water to the Project will be via pipelines installed as part of the Project construction. Financing of the delivery system will be part of the overall financing of the Project. Permits and regulatory approval for the delivery infrastructure and conveyance of water will be needed from the California Department of Public Health (CDPH) and Shasta County. These permits will relate to the construction and operation of the system (including wells), and the quality of the delivered water. The CWD will not be required to obtain a permit to use the water.

GENERALIZED GEOLOGIC MAP OF REDDING GROUNDWATER BASIN



Note All locations approximate.

Scale: 1 inch = 5 miles

FIGURE 5

DESCRIPTION OF GROUNDWATER SOURCE

The following discussion is excerpted from the more detailed description and analysis in the *Project Water-Supply Study*.

The site is located in the Anderson subbasin of the Redding groundwater basin, which is itself the northernmost subbasin of the Sacramento Valley groundwater basin (**Figure 5**). In the Project vicinity, the Redding groundwater basin is filled with Quaternary and Tertiary-age sediments that are thickest in the central part of the valley and thin to the east and west. Locally, the project site is immediately underlain by the Red Bluff Formation (capping the hills), which is composed of gravel, cobble and boulders in a silt/clay matrix. Below the Red Bluff Formation is the Tehama Formation, the main water-bearing deposit in the basin. Interfingering with the Tehama Formation is the Tuscan Formation, of similar age. These deposits extend to a depth of 4,000 feet beneath the central part of the basin near Cottonwood.

In the Redding groundwater basin (and extending to the south in the larger Sacramento River basin), groundwater occurs essentially everywhere beneath the ground, in the spaces between the sedimentary particles. The groundwater aquifers that yield large quantities of water are found where the groundwater occurs between sand, gravel, and cobbles. Generally, the spaces between sand, gravel, and cobbles are better connected to each other, allowing the water to flow more freely, and hence supporting high-yield wells. Groundwater also occurs in silt and clay layers, but a well drilled in a silt or clay layer yields only small quantities of water because the spaces between the silt and clay particles are not well connected.

Based on area well logs, these types of water-bearing deposits (both sand/gravel and silt/clay) extend to at least 600 feet below ground surface (bgs) in depth in the vicinity of the site. In the Project site vicinity at the base of the hills flanking the Cottonwood Creek valley, initial depth to groundwater (the water table) is about 35 to 40 feet. Depth to water increases as the elevation increases in the hills of the Project site and vicinity.

The first saturated zone (uppermost aquifer) in the Project vicinity is unconfined (at atmospheric pressure). Deeper zones are semiconfined to confined (at higher than atmospheric pressure). The Project site is in the central part of the Redding basin, and so the direction of the groundwater gradient is generally towards the site, towards the axis of the basin (**Figure 6**).

HYDROGRAPHS OF REDDING BASIN WELLS NEAR PANORAMA POINT

FROM CA DEPT. OF WATER RESOURCES
SEE FIGURE 6 FOR WELL LOCATIONS

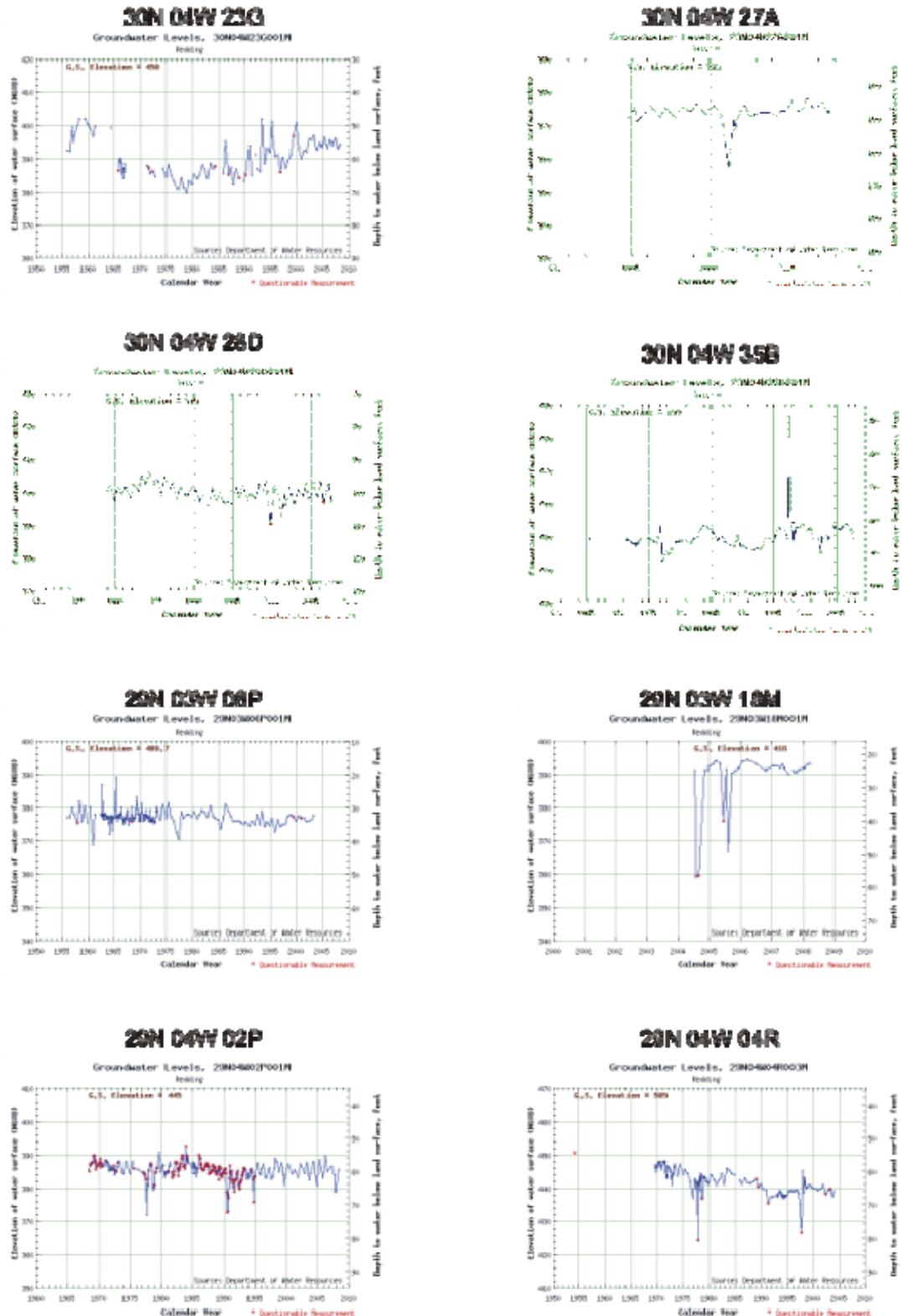


FIGURE 7

Recharge to the Redding basin aquifer is mainly from infiltration of precipitation, especially along the margins of the basin; lesser recharge occurs from infiltration of applied water (irrigation) and inflow from streams. Cottonwood Creek both recharges water to groundwater and receives water from groundwater, at different locations along its reach in the Redding groundwater basin.

Natural groundwater level variation in this area is typically about 10 feet seasonally (**Figure 7**). During the 1976 – 1977 drought, water levels declined about 15 to 20 feet. These are small proportions of the minimum total saturated interval (at least 500 feet thick) beneath the site and vicinity. That is, even during severe drought, there is still a thick saturated interval (aquifer) in this area.

GROUNDWATER QUANTITY

The groundwater budget for the Redding basin as a whole was estimated in the *Shasta County Water Resources Master Plan*.³ Total inflow into the groundwater system of the Redding basin is estimated to be 293,600 acre-feet. Groundwater discharge from the basin is estimated to be about 37,300 acre-feet from pumping and about 266,000 acre-feet to surface streams.

The total water demand in the Redding basin as of the date of the *Shasta County Water Resources Master Plan* (1997) was 280,460 acre-feet. This demand was met mainly with surface water. The projected demand for the year 2030 was 342,350 acre-feet, or an increase of about 62,000 acre-feet. To conservatively estimate groundwater-availability impacts for the PPPD Project, it will be assumed that all of the additional year 2030 demand will be supplied by groundwater, even though this is an unlikely scenario. This gives a total groundwater pumpage for the year 2030 of 99,300 acre-feet (62,000 + 37,300 acre-feet).

Current total pumpage is about 13% of groundwater inflow/recharge (37,300 ÷ 293,600 acre-feet). Estimated total future pumpage would be about 33% of groundwater inflow/recharge (99,300 ÷ 293,600 acre-feet). Pumping from the Project (424 acre-feet/year) would be about 0.1% of total Redding basin groundwater inflow.

Looking at the Anderson subbasin, DWR estimated that agricultural and municipal/industrial pumping was 3,000 and 20,000 acre-feet, respectively, in 1995.⁴ Assuming an annual

³ Shasta Co. Water Agency, CH2M Hill, 1997, *Shasta County Water Resources Master Plan, Phase 1 Report, Current and Future Water Needs*, Figure 19 and pp. 101 – 103.

⁴ DWR, 2003, Bulletin 118, *California's Groundwater*, individual basin descriptions on line; (http://www.dpla2.water.ca.gov/publications/groundwater/bulletin118/basins/pdfs_desc/5-6.03.pdf).

2.15% growth rate (Shasta County government figure⁵), gives year 2030 values for agricultural and municipal groundwater pumping of about 6,320 and 42,100 acre-feet, respectively. Panorama Point Project pumping would increase the future municipal pumping from the Anderson subbasin by about 1% (424 ÷ 42,100 acre-feet).

The Anderson subbasin covers about 25% of the total area of the Redding basin. Applying a 25% factor to the estimated total basin inflow gives a rough estimate of Anderson basin inflow of 73,400 acre-feet (25% × 293,600 acre-feet). Pumping from the Project would be about 0.6% of this inflow (4245 acre-feet ÷ 73,400 acre-feet).

During drought years, little to no recharge could occur to the aquifer. In these years, pumped groundwater would come from aquifer storage. Aquifer storage can be calculated by multiplying the areal extent of an aquifer, the aquifer thickness, and the storativity. Looking solely at the aquifer beneath the Panorama site, with a 540-foot thick section of aquifers (based on the inferred geologic section, and a saturated interval from about 40 feet bgs to at least 600 feet bgs), an area of 307 acres, and an average storativity of 0.15 (based on a combination of the aquifer types beneath the site, consisting of an unconfined aquifer with a storativity of 0.3 and a confined aquifer with storativity as low as 0.0025), the aquifer volume is about 24,800 acre-feet. Project pumping of 424 acre-feet per year would represent 1.7% of this volume.

In reality, the decrease in storage (and associated decrease in water levels) would be spread out over a larger area than just the Project site, and be combined with further decreases in storage (and declines in water levels) from neighboring pumpers. Because the calculation of storage depends heavily on the values for aquifer thickness and storativity, which are not quantified for many areas of the subbasin, it would be speculative to calculate either the storage or potential drought water-level declines for the entire Anderson subbasin. Rather, actual monitoring data from the DWR can be used to estimate drought water-level declines, as described in the *Water-Supply Study* (pp. 12 – 13). These data show water level declines of about 20 feet during short-duration, severe drought (1976 – 1977) and about 15 feet during a multiple-year drought (1987 – 1992).

Based on the small percentage (0.1%) that Project pumping would represent of basin inflow/recharge and considering historic drought water-level declines of approximately 20 feet, the aquifer would not be substantially depleted during average, single-dry, or multiple-dry years with the Project.

⁵ http://www.co.shasta.ca.us/html/Government/gov_index.htm

SECTION 6 IS WATER SUPPLY SUFFICIENT?

The proposed level of groundwater pumping, along with existing and potential future usage, would not substantially deplete the groundwater supply relative to either the annual water budget or the total volume of groundwater stored in the aquifer. Therefore, the proposed water supply is sufficient.

ATTACHMENT A
Shasta County Groundwater Ordinance

**Coordinated AB 3030
Groundwater Management Plan
for the
Redding Groundwater Basin**

**Prepared for the
Redding Area Water Council**

**Prepared by
Shasta County Water Agency**

November 1998

Updated May 2007

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APPENDICES

Appendix “A” – Ordinance SCC 98-1

Appendix “B” – DWR Groundwater Information

Chapter 1 - Introduction

Background and Authority of AB 3030

Section 1.01. On January 1, 1993, California Assembly Bill 3030, the Groundwater Management Act, was codified into California law. California Water Code Sections 10750 et seq., allow local water agencies to adopt local groundwater management plans. Local public and private entities are encouraged by Water Code Section 10755.2 to adopt and implement a coordinated AB 3030 Plan, such as this plan for the Redding Groundwater Basin.

Section 1.01.A. On September 16, 2002, the California Legislature passed Senate Bill 1938. This act amended Water Code Sections 10753.4 and 10795.4; amended and renumbered Sections 10753.7, 10753.8, and 10753.9; and added Sections 10753.1 and 10753.7.

Section 1.02. Development of an AB 3030 Plan under Water Code Sections 10750, et seq., allows local entities to efficiently manage groundwater supplies, assure long-term water supplies, and distribute costs, benefits, and water sharing in a locally determined equitable manner.

Section 1.03. The Department of Water Resources ("DWR") defines a "Groundwater Management Plan" as "planned use of the groundwater basin yield, storage space, transmission capability, and water in storage."

Section 1.04. Water Code Section 10750 et seq., defines "Groundwater Management Program" as "a coordinated and ongoing activity undertaken for the benefit of a groundwater basin pursuant to a Groundwater Management Plan as specified in AB 3030."

Section 1.05. The Redding Area Water Council ("Water Council") is an association of numerous public and private entities within the Redding Groundwater Basin area who have determined by Memorandum of Understanding (MOU) dated August 1998 to jointly prepare, adopt, and implement an AB3030 Plan for the Redding Basin.

The Shasta County Water Agency (SCWA), an authorized groundwater management agency as defined in Water Code Section 10753, was authorized by the Water Council MOU to serve as the lead agency in preparing, adopting, and implementing this AB 3030 Groundwater Management Plan. The MOU also designated the Water Council to serve in a policy making oversight capacity for this planning effort. Accordingly, this plan has been undertaken by agreement of the public and private entities comprising the Water Council, as permitted by Water Code Sections 10750.7, 10753 and 10755.2. (See Table 1 for a list of Water Council members.)

Section 1.06. By executing the MOU, each of the participating entities has found and declared that management of the groundwater within their combined jurisdictions, by joint preparation, adoption and implementation of this AB3030 Plan, is in the public interest and will be of common benefit to water users within the Plan Area described in Chapter 2 of this Plan.

Section 1.07. The Water Council has determined that the adoption of this plan will provide immediate and long-term benefits for all beneficial uses of water.

Management Objectives

Section 1.08. The purposes of this Groundwater Management Plan can be summarized as follows:

- A. To avoid or minimize conditions that would adversely affect groundwater availability and quality within the Plan area.
- B. To develop a groundwater management program that addresses data collection and which protects and enables reasonable use of the groundwater resources of the Redding Basin.

Section 1.09. The Plan will not intrude upon, diminish, or negate in any manner, the existing authority of each affected agency, except as may be expressly provided. This Plan is intended to supplement and strengthen individual agency authority, while building on coordination efforts through the public/private entity partnership established by the above-referenced MOU. Elements of the Groundwater Management Plan will be achieved by Basin-wide consensus, wherever possible.

Coordinated Implementation

Section 1.10. The Water Council shall implement this AB 3030 Plan, with SCWA serving as the lead agency, consistent with the MOU establishing the Water Council. Accordingly, SCWA, working with and at the direction of the Water Council Policy Advisory Committee, will coordinate with all affected water purveyors and other interested parties to implement this Plan within the defined Plan Area.

Section 1.11. Upon its adoption by majority vote of the Water Council, and upon meeting all regulatory prerequisites, this Plan will be effective within the entire jurisdictional boundary of each participating public entity except where the jurisdictional boundaries are outside of Shasta County or the Redding Groundwater Basin (as shown schematically in Figure 1).

TABLE 1

Redding Area Water Council

Member Agencies

City of Anderson
City of Redding
City of Shasta Lake
Shasta County Water Agency
Anderson-Cottonwood Irrigation District
Bella Vista Water District
Clear Creek Community Services District
Centerville Community Services District
Cottonwood Water District
Shasta Community Services District
Mountain Gate Community Services District
McConnell Foundation – Advisory Only

Chapter 2 - Plan Area

Location

Section 2.01. The AB 3030 Plan Area Encompasses the cities of Shasta Lake, Redding, and Anderson, and the lands served by the numerous other water districts, agencies and purveyors in Shasta County and northern Tehama County comprising the Water Council. The Plan Area is the Redding Groundwater Water Basin (shown on Figure 1), including the service areas of the public water purveyors (shown on Figure 2).

Physiography and Geology

Section 2.02. The Redding Basin is bounded on the east by the dissected alluvial terraces, which form the foothills of the Cascade Range. The low hills and dissected uplands of the Coast Range stretch for the length of the western Shasta and Tehama County borders. The interior of the Redding Basin is characterized by stream channels, floodplain, and natural levees of the Sacramento River and its tributaries. Alluvial fans are also present near the confluence of tributaries with the Sacramento River.

Section 2.03. The Redding Groundwater Basin consists of a sediment-filled, southward-plunging, symmetrical trough (Department, 2001). Simultaneous deposition of material from the Coast Range and the Cascade Range resulted in two different formations, which are the principal freshwater-bearing formations in the basin. The Tuscan Formation, in the east, is derived from Cascade Range volcanic sediments, and the Tehama Formation, in the western and northwest portion of the basin, is derived from Coast Range sediments. These formations are up to 2,000 feet thick near the confluence of the Sacramento River and Cottonwood Creek; the Tuscan Formation is generally more permeable and productive than the Tehama Formation (Department, 2001). Groundwater recharge occurs in the higher elevations through stream seepage and direct infiltration of precipitation. Rivers and streams transition to gaining streams at lower elevations and receive direct groundwater discharge. Areas of riparian vegetation occur along surface water features throughout the basin.

Section 2.04. The oldest rock unit exposed in the area is the Upper Cretaceous Chico Formation. This unit consists of sandstone, conglomerates, and shale, which are of marine origin. In most areas of the Redding Basin, the Chico Formation contains salt water under artesian pressure. The Chico Formation is overlain by the Tuscan Formation in the eastern portion of the basin and by the Tehama Formation in the eastern portion.

Section 2.05. The Tuscan Formation is Pliocene in age, and consists of tuff breccia, tuffaceous sandstone and conglomerate, and tuffaceous silt and clay (Anderson, 1933). The mudflow deposits are generally of low permeability, but in many areas of the Redding Basin, the mudflows were eroded, sorted, and redeposited shortly after eruption. These reworked deposits are composed of thick, highly permeable sand and gravel strata. These units of the Tuscan Formation are the most prolific aquifers of the Redding Basin.

Section 2.06. The valley fill sediments that were eroded from the finer-grained rocks of the Coast Range that bound the Redding Basin to the west comprise the Pliocene Tehama Formation. The Tehama Formation is comprised of silt, sand, gravel, and clays of fluvial origin, and have been observed to be locally cemented (Russel, 1931). The Tehama Formation is another principal water-bearing formation in the Redding Basin, and contains groundwater under both confined and unconfined conditions. While parts of the Tehama Formation appear to be younger in age than the Tuscan Formation, the two formations interfinger in the central portion of the basin, indicating that these portions of the two formations are equivalent in age.

(See Figure 3 for an illustrative depiction of a typical geologic cross-section view looking from west to east across the Redding Basin.)

Section 2.07. The Red Bluff Formation unconformably overlies most of the interbedded Tehama and Tuscan Formations. It is composed primarily of coarse gravels and boulders in a reddish sand, silt, and clay matrix, and outcrops to the west of the Sacramento River (Pierce, 1983). These materials may have been originally deposited by debris-laden, turbid streams draining glacial areas. (Bulletin 118-6, DWR, 1978) The Red Bluff Formation is poorly to moderately permeable, and, in general, areas of outcrop are above the zone of saturation.

Section 2.08. Alluvial deposits of varying age underlie the floodplain along the Sacramento River and its tributaries. These flood-deposited materials generally appear as thin layers of gravel, sand, silt, and clay that occur in thicker beds along the channel of the Sacramento River. The deposit is unconsolidated and the permeability is generally moderate but locally, where gravels predominate, may be very high (Pierce, 1983).

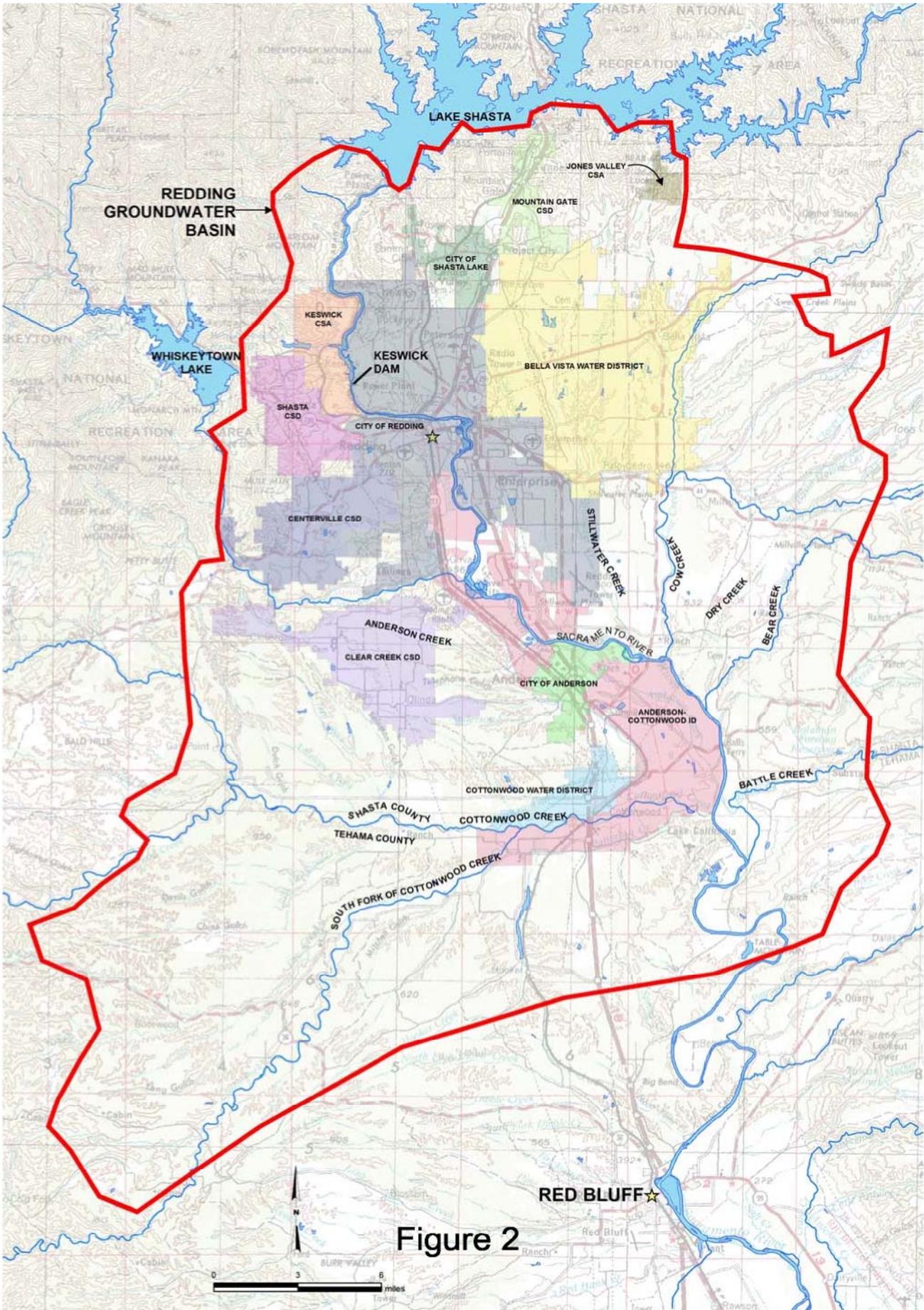


Figure 2

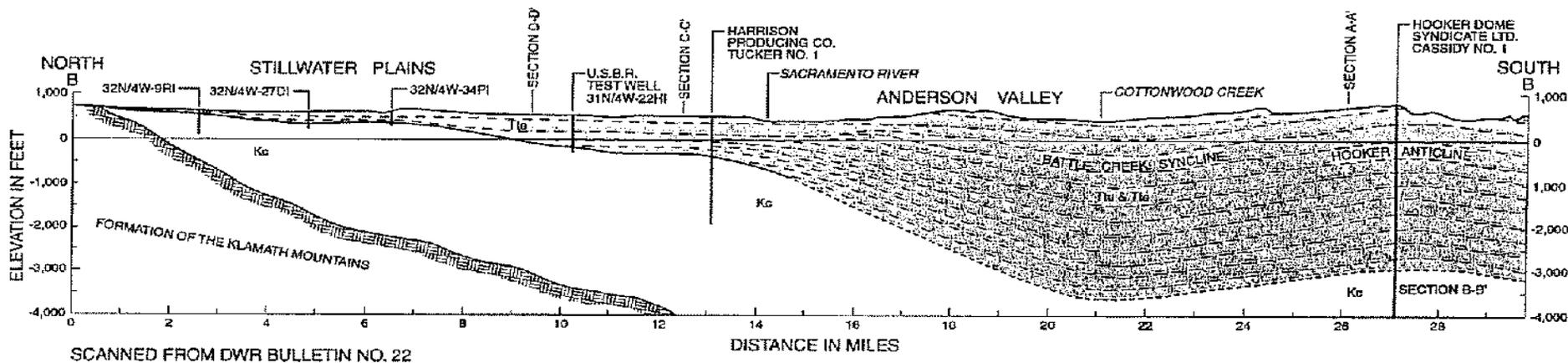


FIGURE 3
GENERALIZED CROSS SECTION
ACROSS THE SACRAMENTO VALLEY
 REDDING GROUNDWATER BASIN, SHASTA COUNTY

Climate

Section 2.09. Shasta County exhibits a wide range of precipitation and temperature due to the relatively large elevation difference between the valley floor and the highlands in the extreme eastern and western portions of the County adjacent to the Redding Basin. Precipitation and temperature data from Redding, representing typical valley floor climate parameters in the Redding Basin, demonstrate that the valley lands encompassing the Redding Basin experience hot dry summers and mild winters.

Section 2.10. Typical temperatures in the Redding area are summarized in Table 2. Mean annual precipitation in Shasta County (from the Shasta County Hydrology Manual) is shown on Figure 4.

Section 2.11. The major portion of annual precipitation generally occurs from November through April; very little rainfall typically occurs between May and October. Average annual rainfall in the Redding Basin varies from approximately 25 to 50 inches.

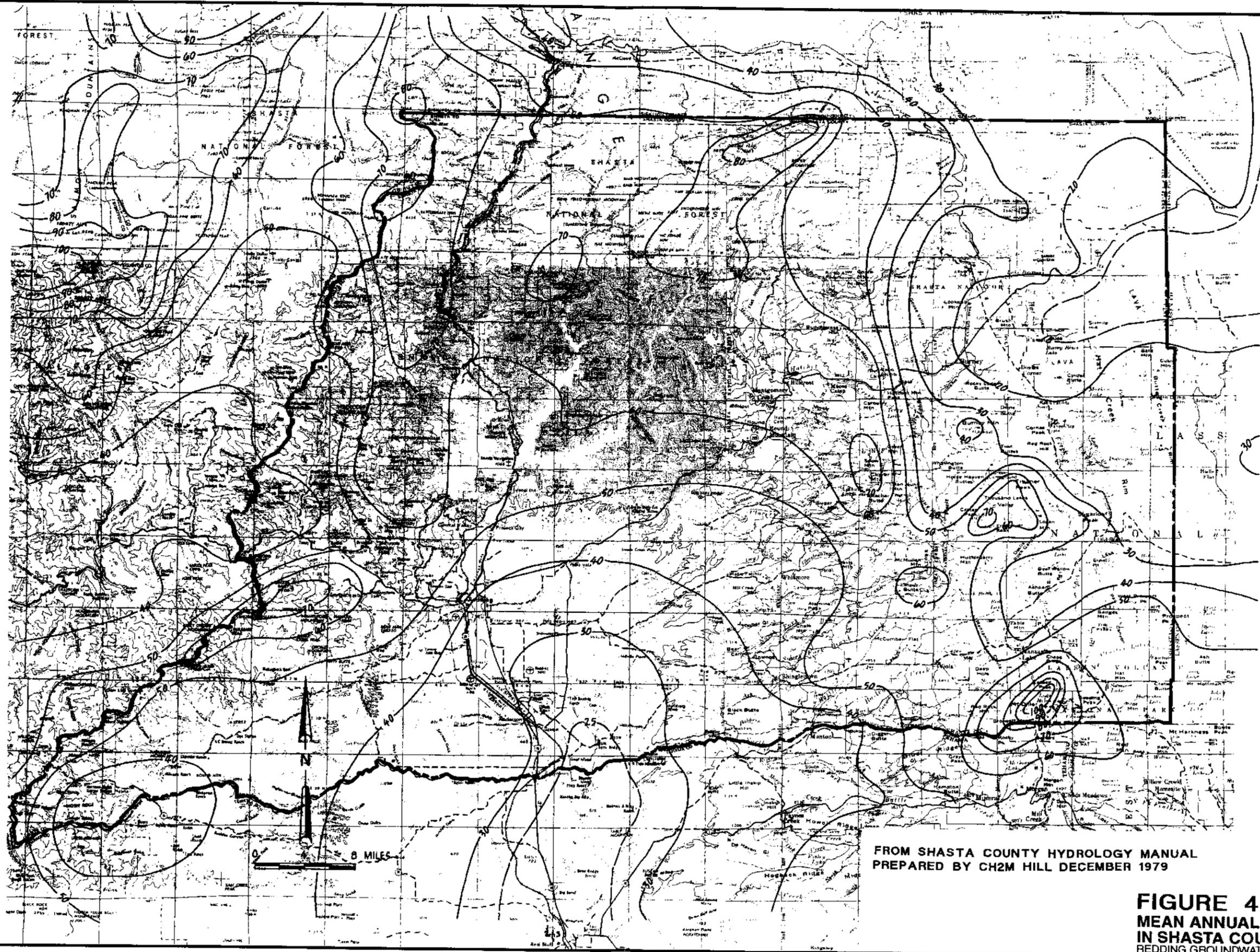
Section 2.12. The population within the Redding Basin is growing at a much higher rate than in the surrounding areas, in part because of the availability of public services, including public water supplies. The development of public water systems has resulted in a variety of high intensity land uses, including urban, residential, agriculture, riparian and native vegetation, and recreation. The three incorporated cities in the Redding Basin—Redding, Shasta Lake, and Anderson—currently account for about sixty-six percent (66%) of the total population within the Redding Basin. (See Shasta County Water Resources Master Plan—Phase 1 Report, SCWA (1997), Appendix C). Long-term population growth rates in the Redding Basin have been relatively uniform since World War II

TABLE 2**Historic Climatic Data for Redding, California**

Month	¹ Normal Mean Temperature (EF)	² Highest Temperature of Record (EF)	² Lowest Temperature of Record (EF)	² Average Sunshine
Jan	45.5	77	19	73%
Feb	50.7	83	21	83%
Mar	52.2	85	28	84%
Apr	58	94	33	90%
May	66.4	104	36	91%
Jun	76.1	111	42	94%
Jul	81.5	118	54	97%
Aug	79.5	115	51	97%
Sep	74.1	116	40	94%
Oct	63.5	105	33	92%
Nov	51.8	88	23	84%
Dec	45	74	17	73%
Annual Average	62	118	17	88%

¹Period of record: 1961 through 1990

²Data through 1995



FROM SHASTA COUNTY HYDROLOGY MANUAL
 PREPARED BY CH2M HILL DECEMBER 1979

FIGURE 4
MEAN ANNUAL PRECIPITATION
IN SHASTA COUNTY
 REDDING GROUNDWATER BASIN, SHASTA COUNTY

Economy

Section 2.13. The economy of Shasta County and the Redding Basin is directly tied to water supply. Lack of reliability in the water supplies has resulted in severe impacts within the service areas of purveyors who rely on federal water contracts for all or a major portion of their water supplies. Since 1991, there have been cutbacks of as much as 75 percent of agricultural allocations and 25 percent of municipal and industrial allocations. These cutbacks have resulted in substantial uncertainty and related constraints on the short-term and long-term planning needed for the orderly development of the Redding Basin.

Local Interest

Section 2.14. In late 1996, the SCWA, acting as a lead agency in this coordinated planning process, hired CH2M HILL, a water resources consulting firm, and retained legal counsel specializing in water, environmental, and regulatory law to assist with development and implementation of the Groundwater Management Plan. Working together, the Water Council members prepared the “Shasta County Water Resources Master Plan Phase 1 Report” (October 1997), which addresses current and future water needs in Shasta County and the Redding Basin. The Water Council members, by terms of the June 1998 MOU, have agreed to continue with this joint planning effort, including the preparation of an integrated surface and groundwater management plan for the Redding Groundwater Basin.

List of Participants

Section 2.15. The Water Council includes the major public and private water users in the Redding Basin. Water use for 1995 by type of use and purveyor or major user in the Redding Basin is shown in Table 3.

Section 2.16. In addition to the above referenced public and private stakeholders, key interest groups will be encouraged to participate in Plan implementation, including public education.

Section 2.17. The success of this Groundwater Management Plan, as prepared pursuant to Water Code Section 10750 et seq., will largely be dependent on the extent of coordination between all affected public entities and other interested parties. As required under Water Code Section 10750 et seq., a notice of public hearing will be published to consider whether to implement a Groundwater Management Plan.

Legal, Financial and Political Considerations

Section 2.18. In Shasta County, as in other parts of California, water resources management is governed by a complex system of local, state, and federal laws. Water use, development, and allocation are controlled by legal contracts and agreements, common law principles, statutes, constitutional provisions, and court decisions. These legal considerations, in combination with the jurisdictional powers of the various local governing agencies and the private property rights of groundwater users, form the framework that governs water resources management in Shasta County and the Redding Basin. A more thorough overview of the institutional framework for water resource management in California is provided in Chapter 2 of *The California Water Plan Update* (DWR Bulletin 160-98).

TABLE 3
 1998 Annual Water Needs Summary
 Redding Basin
 (acre-feet x 1,000, except as noted)

	Major Public Purveyors						Small Purveyors	Private Users		Totals
	ACID Gravity	BVWD Pressure	Clear Creek CSD Pressure	Anderson City Pressure	Redding City Pressure	Shasta Lake City Pressure	Others ^a Pressure	HWUI ^b Pressure	Irrigators, 50% Gravity, 50% Pressure	
Water-Using Lands										
Irrigated Agriculture										
Permanent Crops	5.40	0.24	3.10	0.00	0.14	0.00	0.00	0.00	0.04	8.92
Grain and Field Crops	1.04	0.63	0.09	0.00	0.45	0.00	0.00	0.21	1.31	3.73
Pasture	45.93	10.35	3.57	0.00	0.00	0.04	0.10	1.38	13.82	75.19
Truck	0.14	0.02	0.04	0.00	0.04	0.00	0.00	0.00	0.30	0.54
Rice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rural Urban (1 to 5 acres)	8.48	4.18	0.00	0.00	0.00	0.00	0.08	0.00	0.00	12.74
Total	60.99	15.42	6.80	0.00	0.63	0.04	0.18	1.59	15.47	101.12
Urban										
Urban	0.00	2.07	0.56	1.34	15.66	2.06	0.93	0.00	2.44	25.06
Rural Urban Domestic (1 to 5 acres)	0.00	0.98	0.95	0.09	1.51	0.02	1.44	0.00	1.63	6.62
Total	0.00	3.05	1.51	1.43	17.17	2.08	2.37	0.00	4.07	31.68
Commercial and Industrial										
Commercial	0.00	0.25	0.07	0.16	1.16	0.02	0.04	0.00	0.11	1.81
Industrial	0.00	1.70	0.14	0.07	0.60	0.00	0.12	14.67	0.71	18.01
Total	0.00	1.95	0.21	0.23	1.76	0.02	0.16	14.67	0.82	19.82
Recreational and Environmental										
Water Bodies	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00
Parks and Golf Courses	0.00	0.68	0.00	0.16	0.87	0.08	0.02	0.00	0.24	2.05
Riparian Vegetation	4.67	0.30	0.03	0.00	3.53	0.00	0.00	0.00	3.14	11.67
Total	4.67	0.98	0.03	0.16	4.40	0.08	0.02	0.00	3.38	13.72
Diversions to Other Counties										
Total	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
Total Water Delivery Demands, acre-feet per year	95.66	21.40	8.55	1.82	23.96	2.22	2.73	16.26	23.74	196.34
Conveyance Losses (acre-feet per year)	79.34	1.06	0.43	0.09	1.02	0.11	0.14	0.81	1.16	84.16
Current Diversion Requirements (acre-feet per year) ^c	175.00	22.46	8.98	1.91	24.98	2.33	2.87	17.07	24.90	280.50

a Centerville CSD, Shasta County CSD, Keswick CSA, Mountain Gate CSD, Cottonwood Water District and Jones Valley CSA.

b Heavy Water Usage Industrial (Simpson Paper Company, Sierra Pacific Industries, and Wheelabrator).

c Includes 20,000 acre-feet per year delivered to Tehama County and 10,000 acre-feet delivered to downstream users.

Section 2.19. The Water Council will adopt rules and regulations to implement provisions of this AB 3030 Plan. All such rules and regulations shall be adopted pursuant to Water Code Section 10753.8.

Section 2.20. Though permitted pursuant to Water Code Section 10754 et seq., no fees or assessments to finance AB 3030 Plan expenses, such as administrative and operating costs, will be considered by the Water Council unless a future need is demonstrated.

Condition of the Groundwater Basin

Redding Groundwater Basin and Sub-Basins

Section 2.21. The boundaries of the Redding Basin roughly approximate the eastern and western edges of the Sacramento Valley floor. (See Figure 1, showing the Basin and Plan Area.) The foothill areas that constitute the eastern and western portions of Shasta and Tehama Counties adjacent to the Redding Basin are designated as "highland" areas, and are noted for their relative scarcity of groundwater resources. Sub-basins and areas within the Redding Basin with unique characteristics will be identified and evaluated in AB 3030 Plan implementation.

Existing Monitoring

Section 2.22. Since the late 1920s, the State Department of Water Resources (DWR) and the United States Bureau of Reclamation have measured groundwater levels for 48 wells in the Redding Basin. Currently, 35 wells are monitored semi-annually and 5 wells are measured on a quarterly basis.

Section 2.23. The DWR issues periodic reports that relate to the monitoring program in the Redding Basin. These reports include groundwater hydrographs for the monitored wells. Appendix "B" contains access information for DWR Groundwater levels.

Section 2.24. Most wells in the monitoring program are measured by DWR semi-annually, usually in March and October. These monitoring periods provide an indication of groundwater levels before and after the typical agricultural irrigation season.

Section 2.25. In addition to recording water levels, the DWR reports also include, for each well, information on the producing aquifer(s), degree of certainty associated with the groundwater body classification, the hydrogeologic unit, and the applied use of the extracted groundwater.

Section 2.26. The data from these historic and ongoing monitoring efforts will be considered and reflected in the ongoing development of a Redding Basin computer model.

Historic Variations in Groundwater Levels

Section 2.27 Groundwater levels in the Redding Basin fluctuate seasonally in response to the quantities of discharge from, and recharge to, the groundwater basin that occurs in a particular year. The primary source of groundwater discharge from the aquifer is groundwater pumping, along with a small quantity of subsurface outflow from the basin, while the main sources of recharge are deep percolation of precipitation and applied water, along with leakage from surface streams.

Section 2.28. Monthly measurements of groundwater show that water levels start dropping in early spring (usually April) and continue to decline through the summer until early September. Maximum levels are usually reached by February.

Section 2.29. Over the long term, groundwater levels in the Redding Basin have remained steady. There are seasonal fluctuations (summer to winter), and there are some fluctuations caused by climatic patterns (wet or dry years), but overall, groundwater levels have not changed significantly throughout the period of record.

Historic Groundwater Pumpage

Section 2.30. In the earlier parts of this century, little groundwater was used in Shasta County and the Redding Basin. The Sacramento River and its primary tributaries provided the source of water for most irrigation. A notable exception is along Cottonwood Creek, where substantial groundwater extraction occurred over several decades, largely ending in the 1980s.

Section 2.31. In the early 1970s, approximately 5 percent of all irrigation water came from groundwater, and approximately 95 percent came from surface-water sources. In 1995, approximately 12.5 percent of all water used in the Redding Basin was derived from groundwater. The vast majority of groundwater extracted is put to municipal and industrial uses. Groundwater is the principal source of water supply for areas outside of the service areas of the 14 water districts within the basin.

Groundwater Quality

Section 2.32. The general quality of groundwater in the Redding Basin is considered good to excellent (TDS between 95 and 424 mg/L) for most uses, except for that water from shallow depths along the margin of the basin where pre-Tertiary formations may be tapped. Some wells in those areas yield water with constituents that are above limits for drinking (primarily metals, TDS, chloride and sulfate). This water is likely derived from the Chico Formation (Pierce, 1983).

Section 2.33. Additional review of existing and potential groundwater quality problems in the Redding Basin is needed. This will occur in AB 3030 Plan implementation.

Need for Groundwater Management Plan

Section 2.34. There is a substantial, but undefined, supply of groundwater in the Redding Basin. The Redding Basin does not appear to be in a state of groundwater overdraft; however, at this time there is no certainty as to how close the Redding Basin is to overdraft, what constitutes a “safe annual yield,” and when and how frequently well interference problems may arise in the future.

The Redding Groundwater Basin has been estimated to contain up to 3,500,000 AF of groundwater in storage (DWR Bulletin 118, 1975). Groundwater levels in wells within the Basin are depressed seasonally, but fully recover over the winter months in all but the driest rainfall years. However, further study is necessary to determine the effects of a prolonged, severe drought on regional groundwater levels.

Section 2.35. The need for an AB 3030 Plan is documented in the Shasta County Water Resources Master Plan Phase 1 Report (October 1997) “Phase 1 Report,” which was prepared for the Water Council. As indicated in that report, additional study of the Redding Basin’s characteristics is needed to better understand and evaluate the occurrence, movement, origin, and destination of groundwater in the Redding Basin, and what constitutes reasonable use thereof.

Section 2.36. This plan is intended to provide a mechanism for both the public and private stakeholders in the Redding Basin to evaluate, manage, protect, and preserve this valuable local groundwater resource.

Replace Figures 5-11 with citations to Appendix B in 2.22-2.36. Appendix B would contain appropriate web links to historic documents.

Chapter 3 - Elements of the AB 3030 Plan

AB 3030 Plan Elements

Section 3.01. The approach to groundwater management reflected in this AB 3030 Plan will generally be based on voluntary cooperation between water agencies, purveyors, and interested private parties in the Redding Basin, with an information gathering and monitoring emphasis. This plan includes the following elements: (1) Data Development/Groundwater Monitoring; (2) Public Entity Coordination and Reporting; (3) Public Information and Education; (4) Export Limitations; (5) Water Quality; (6) Wellhead Protection; (7) Land Use; (8) Conjunctive Use Operations; (9) Groundwater Management Facilities; and (10) Groundwater Overdraft and Well Interference. These elements are further described below.

Data Development/Groundwater Monitoring

Section 3.02. To ensure that its actions are taken in accordance with the public interest, and to further prevent the use of unnecessary and potentially burdensome management techniques, SCWA will work with Water Council participants to collect data and will conduct or receive necessary and relevant studies, for the purpose of further documenting the existing quality and quantity of groundwater within the Redding Basin. This SCWA activity will be undertaken in a scope and manner consistent with the Water Council MOU, including the preparation and maintenance of a linked surface water and groundwater computer-based model.

Section 3.03. SCWA will serve as the Water Council's information and data collection coordinator, and will collect and conduct, or have conducted, technical investigations to carry out this plan, including computer model development. All data collection and technical investigations authorized under this plan shall be carried out by SCWA in consultation with the Water Council Policy Advisory Committee.

Section 3.04. One of the goals in the data collection and evaluation process will be to determine the Redding Basin's long-term safe annual yield. For the purpose of this plan, "long-term safe annual yield" shall be as defined in Appendix A, which defines this and other key AB 3030 Plan and implementing regulation terms. The determination shall estimate the safe annual yield of the total Redding Basin under various hydrologic conditions and the probable boundaries of the sub-basin hydrologic units.

Section 3.05. The Water Council shall prepare a report on the status of the Redding Basin no less than bi-annually. The report shall include an estimate of annual recharge, pumping, and groundwater discharge to surface streams. The report shall include any other information that the Water Council deems relevant and necessary to the effective management of groundwater within the Plan Area, including estimated changes in water levels.

A. Collection and Analysis of Data/Preparation of Reports on Hydrologic Conditions. Data related to the hydrologic inventory of the Redding Basin will be collected and reviewed as a component of the periodic report to be prepared by the Water Council. Principal factors to be considered will include surface water imported to and exported from the Redding Basin, evapotranspiration, the estimated groundwater recharge, discharge, and extractions from the Redding Basin, and subterranean outflow.

B. Preference for Use of Existing Databases. To avoid incurring unnecessary costs, the Water Council shall utilize data and models developed for the Redding Basin Management Planning effort and further determine the status of additional studies and monitoring programs carried out within the Redding Basin by federal, state, and local agencies. Where possible, information from pre-existing data collection programs, and new data derived from the computer model to be developed for the Water Council and other sources, will be incorporated into the report.

C. Expansion of Data Collection Efforts. Where significant and important data are missing or incomplete, the Water Council will determine methods to acquire a more complete database.

Section 3.06. The Water Council, using its Technical Advisory Committee as it determines appropriate, may prepare or receive reports on groundwater and supplemental water supplies, groundwater quality, and other conditions within the Plan Area. The Water Council may identify information useful to a water replenishment or conjunctive use project and prepare reports on the utility of these types of projects within the Plan Area.

Section 3.07. To protect and/or enhance the quality and quantity of water within the Redding Basin, the Water Council shall develop and implement a Redding Basin monitoring program. The monitoring program may consist of the measures identified in these sections and will be implemented by the adoption of rules and regulations, as determined appropriate by the Water Council Policy Advisory Committee.

- A. Monitoring Redding Basin Conditions. The previous and ongoing collection and analysis of basic hydrologic data are important elements of the Management Plan. Monitoring is essential to characterize Redding Basin conditions and to provide the technical information needed to make decisions regarding the optimal use and management of the Redding Basin. Monitoring of the Redding Basin will allow the Water Council to: (1) identify reliable sources of information; (2) identify changing conditions; (3) develop and implement specific groundwater management programs as may be determined necessary in the future; and (4) document the accomplishments of the management program.
- B. Use of Existing Monitoring Data. The Water Council shall coordinate with the DWR, Northern District Office, Anderson-Cottonwood Irrigation District, and other appropriate entities to use and supplement their existing semi-annual well water level measurement program. Monitoring of water levels will allow the Water Council to gauge the status of the groundwater resource in response to changing hydrologic conditions and water use practices. The number and location of these wells will be determined by the Water Council Policy Advisory Committee.
- C. Monitoring Groundwater Quality Conditions. The Water Council shall include one or more monitoring wells within the Redding Basin, and in each sub-basin where feasible, for the purpose of measuring water quality conditions within the Redding Basin. The number and location of these wells will be determined by the Water Council Policy Advisory Committee. Efforts will be made to use existing wells that are subject to water quality testing to minimize costs associated with the water quality-monitoring program.

Section 3.08. The Water Council shall prepare an annual estimate of the amount of water extracted within the Plan Area and of the total cumulative groundwater extractions within the Redding Basin.

Public Entity Coordination and Reporting

Section 3.09. The Water Council shall strive at all times to coordinate with all agencies having jurisdiction over water-related matters in and adjacent to the Redding Basin.

Section 3.10. The Water Council will coordinate with the Regional Water Quality Control Board, U.S. Environmental Protection Agency, the State Office of Drinking Water, and other state and local regulatory agencies to monitor and develop information concerning groundwater quality compliance with applicable standards, and to otherwise manage and ensure reasonable use of Plan Area groundwater.

Public Information and Education

Section 3.11. It is essential to involve the public, agricultural, industrial, and business communities early in the development of the Groundwater Management Plan. Throughout the implementation of this plan, public education and community relations will be integral to successful groundwater management in the Redding Basin.

Section 3.12. The Water Council shall provide public outreach through public presentations, published information items, and references to groundwater data available through other public agencies, as determined by the Policy Advisory Committee.

Export Limitations

Section 3.13. In order to preserve and protect Redding Groundwater Basin resources, and to ensure their reasonable and beneficial use in a way that is not detrimental to the Basin and its local users, County of Shasta Ordinance No. SCC 98-1, as adopted by the Shasta County Board of Supervisors on January 27, 1998, is fully incorporated into this AB 3030 Plan by reference, and shall apply throughout the AB 3030 Plan area except: (1) as otherwise provided by this Plan; or (2) as it may be superceded by adoption of one or more local ordinances within individual public agency boundaries. That groundwater extraction and export ordinance, which is codified as Chapter 18.08 of the Shasta County Code, is attached to this Plan as Appendix A.

The term "Shasta County" as used in Exhibit "A" for the purpose of requiring a permit for the export of ground water outside of the County, shall mean the AB 3030 Plan area.

The term "Commission" as used in Exhibit "A" shall be the Water Council Technical Advisory Committee, as established by MOU, unless otherwise designated and appointed by the Water Council.

The terms "Clerk of the Board" and "Board" as used in Exhibit "A" for the purpose of appeals from Commission actions on permit applications, shall mean the "Director" as therein defined and the full Water council, Respectively.

Water Quality

Section 3.14. The Water Council, working with members and non-member entities shall develop a program to assess, monitor, and protect the quality of groundwater in the Redding Basin to ensure the quality is acceptable for all beneficial uses.

Wellhead Protection

Section 3.15. Abandoned wells provide the potential for pollutants or contaminants to enter and/or spread into the Redding Basin groundwater. As such, well abandonment represents a

key concern in groundwater management. The Water Council shall coordinate with the County Division of Environmental Health to obtain written notice concerning well abandonment projects.

Section 3.16. Improperly constructed and abandoned wells can impair yields and increase the potential for groundwater contamination. The Water Council supports the California Model Well Code standards, and the Shasta County well construction and destruction ordinance and regulations, and will work with the County Division of Environmental Health to provide information to well owners throughout the Basin regarding proper well construction and abandonment procedures.

Land Use

Section 3.17. To improve coordination among Water Council members and jurisdictions having land use authority, the Water Agency will request notification and circulation of CEQA documents for projects in the basin that identify potentially significant effects to groundwater quality. The Water Agency will notify members of the Water Council that may be affected and collaborate to assess the risk of groundwater contamination.

Conjunctive Use Operations

Section 3.18. The Water Council shall evaluate options and develop a program for conjunctive use of Redding Basin water sources in an effort to increase or maintain Redding Basin water supplies.

Groundwater Management Facilities

Section 3.19. The Water Council will assess the need for short- and long-term facilities, such as conjunctive use facilities, and develop plans as may be determined appropriate.

Groundwater Overdraft and Well Interference

Section 3.20. A mitigation and prevention program will be developed to address potential overdraft, well interference, and similar problems that would adversely affect the groundwater resources in the Plan area. This program will identify strategies and actions that will promote reasonable groundwater usage in the Redding Basin.

Section 3.21. The Water Council Policy Advisory Committee shall review this AB 3030 Plan and its implementation on a bi-annual basis and shall report its findings to all MOU participants.

Chapter 4 - Implementation

Procedure

Section 4.01. A Groundwater Management Plan developed pursuant to Water Code Section 10750 et seq., must be conducted according to the procedure show in Table 4.

TABLE 4 Procedure to Implement Groundwater Management Plan
1. Publish notice of public hearing to consider whether to adopt resolution of intent.
2. Conduct a hearing on whether to adopt a resolution of intent to adopt a Groundwater Management Plan.
3. Adopt a resolution of intention to adopt a Groundwater Management Plan.
4. Publication of notice.
5. Prepare a Groundwater Management Plan within 2 years.
6. Hold a second hearing after plan preparation is complete.
7. Consider protests at conclusion of second hearing.
8. If protests are received from landowners representing more than 50% of assessed value of property in the County occurs, the Plan shall not be adopted.
9. If protests are received from landowners representing less than 50% of assessed value of property in the Redding Basin Plan area occurs, the AB 3030 Plan may be adopted within 35 days after Step 6.

Plan Administration

Section 4.02. The Water Council will administer the AB 3030 Plan throughout the Plan Area in accordance with the adopted Water Council MOU. As reflected in that MOU, successful implementation of the AB 3030 Plan must involve the ongoing participation of, and coordination between, all Redding Basin agencies which are empowered with groundwater-related duties and other interested local entities.

Section 4.03. Consistent with Water Council objectives in preparing this AB 3030 Plan, it is intended that this Plan will apply to the service areas of all local water purveyors within its stated boundaries. However, any local agency, investor-owned utility, or mutual water company which may decline to have the plan made applicable within its service area will be exempt from this plan within its jurisdiction, as stated in the MOU or applicable law.

Section 4.04. Any local water agencies within the boundaries of the AB 3030 plan area that decline to participate in cooperative management of the Redding Basin within its agency boundary shall be encouraged to adopt their own groundwater management plans and coordinate with the Water Council to the extent possible.

Section 4.05. This AB3030 Plan shall be funded, with respect to implementation and maintenance, as provided in the Water Council MOU as may be amended.

Section 4.06. In accordance with the California Groundwater Management Act, the Water Council will develop rules and regulations from time to time, to implement provisions of this plan, as it may be amended consistent with the Water Council MOU. These rules and regulations shall be adopted by the Water Council by resolution.

Section 4.07. All meetings of the Policy Advisory Committee and/or Technical Advisory Committee will be publicly noticed in print media of general circulation. Parties that have requested will be notified of meetings in the same manner as the Policy Advisory Committee and/or Technical Advisory Committee.

- A. Time will be allotted during meetings of the Policy Advisory Committee and/or Technical Advisory Committee for public comment. The amount of time will be at the discretion of the Water Committee member conducting the meeting.
- B. Written comments germane to the Policy Advisory Committee and/or Technical Advisory Committee meeting will be considered if received before the close of business 5 working days after the meeting.

Section 4.08. All known water purveyors whose boundaries overlie the Redding Groundwater Basin will be notified of meetings of the Policy Advisory Committee and/or Technical Advisory Committee in the same manner as members of the Water Committee.

- A. Time will be allotted during meetings of the Policy Advisory Committee and/or Technical Advisory Committee for purveyor comment. The amount of time will be at the discretion of the Water Committee member conducting the meeting.
- B. Written comments germane to the Policy Advisory Committee and/or Technical Advisory Committee meeting will be considered if received before the close of business 10 working days after the meeting.

Chapter 5 - Plan Amendments

Section 5.01. This AB3030 Plan shall be periodically updated, based on changed circumstances within the Redding Basin, as determined by the Water Council.

Section 5.02. Plan Amendments shall occur in the manner established in the Water council MOU, as may be amended.

Section 5.03. The Water Council shall endeavor to publicly distribute, and educate the public concerning any AB3030 Plan amendments adopted resulting in more than mere technical changes.

APPENDIX "A"

**SHASTA COUNTY GROUNDWATER
EXTRACTION AND EXPORT ORDINANCE**

APPENDIX "A"

ORDINANCE NO. SCC 98-1

**AN ORDINANCE OF THE COUNTY OF SHASTA
REPEALING ORDINANCE NO. SCC 97-6 AND ADOPTING
CHAPTER 18.08 "GROUNDWATER MANAGEMENT"
REGARDING THE EXTRACTION AND EXPORTATION OF
GROUNDWATER FROM SHASTA COUNTY**

The Board of Supervisors of the County of Shasta does ordain as follows:

SECTION 1. GROUNDWATER MANAGEMENT. Chapter 18.08, entitled "Groundwater Management" is hereby added to Title 18 of the Shasta County Code to read as follows:

Chapter 18.08. Groundwater Management.

Section 18.08.010. Declaration of Findings and Purpose.

The Board hereby finds and declares:

(A) The groundwater underlying Shasta County has historically provided the people and lands of Shasta County with water for agricultural, domestic, municipal/industrial and other purposes;

(B) The Board recognizes that the principle of California law that water may be appropriated from a groundwater basin if the groundwater basin is in a surplus condition and such appropriation would not impair the reasonable and beneficial needs of overlying users;

(C) It is essential for the protection of the health, welfare, and safety of the residents of the County, that the groundwater resources of Shasta County be protected from harm resulting from the extraction of groundwater for use on lands outside of the County, until such time as needed additional surface water supplies are obtained for use on lands of the County, or as further and more accurate quantification of groundwater resources within the County is developed and groundwater management plans for affected basins have been adopted;

(D) Much of the economic production of the County depends upon the use of groundwater;

(E) The groundwater of Shasta County provides a significant amount of water for domestic uses throughout the County;

(F) The groundwater of Shasta County has been and will continue to be a vital part of the economic well-being and stability of the County;

(G) Because of the need for increased water supply to meet future needs within the county, and because surface water supplies obtained in the future may need to be used conjunctively with available local groundwater for reasonable and beneficial local uses, it is vital that the County's ground water supply and quality be preserved;

(H) Although the County intends to jointly undertake with affected local agencies to develop an integrated water resources management plan for each of the various regions of Shasta County to further plan and implement prudent water management practices, interim measures addressing the extraction of groundwater for export are needed to protect the existing groundwater basins;

(I) It is essential for information gathering and monitoring purposes, and for the protection of the County's groundwater resources, that the County adopt a permit process addressing the extraction of groundwater for use outside of the County; and

(J) In adopting and codifying this groundwater management ordinance the County does not intend to limit other authorized means of managing Shasta County groundwater, and intends to work cooperatively with interested local agencies to further develop and implement joint groundwater management practices.

Section 18.08.020. Definitions.

(A) “Annual yield” means the maximum quantity of water which can be withdrawn annually from a groundwater supply without causing a significant adverse impact on the affected basin or adverse water quality conditions, including the amount of water which can be extracted without:

(1) Exceeding in any calendar year the long-term mean annual water supply of the basin (considering all sources of recharge and withdrawal);

(2) Lowering water levels so as to make further drilling of water wells uneconomical;

(3) Causing water pumped from the basin to deteriorate below established drinking water quality standards;

(4) Violating water rights or restrictions in pumpage in the groundwater basin as established by court adjudication or application of state or federal law.

(B) “Aquifer” means a geologic formation that stores, transmits and yields significant quantities of water to wells and springs.

(C) “Board” means the Board of Supervisors of Shasta County.

(D) “Commission” means a nine (9) person decision-making body which shall be appointed, with membership serving at the pleasure of the appointing authority, as follows: one (1) representing the County of Shasta; three (3) representing the cities of Redding, Anderson and Shasta Lake, to be appointed by the City Selection Committee established pursuant to state law; three (3) representing independent water districts, including one such district located in Eastern Shasta County, to be appointed by the Special District Selection Committee established pursuant

to state law; one (1) representing agricultural users, to be nominated by the Shasta County Farm Bureau and appointed by the Board of Supervisors; and one (1) representing industrial users, to be appointed by the Board of Supervisors.

(E) “County” means the County of Shasta.

(F) “Director” means the Chief Engineer of the Shasta County Water Agency, or his designee.

(G) “Export” means the transportation of water from within Shasta County to any location outside of the County *by pipe, canal, stream, river or similar conveyance method. The transportation of bottled water outside of the County by vehicle shall not constitute an “export” as that term is used in this chapter.*

(H) “Groundwater management plan” means a plan prepared pursuant to the California Groundwater Management Act (commencing with Water Code Section 10750 et seq.) or California Water Code Section 1220, and adopted by the Board.

(I) “Groundwater” means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water which flows in known and definite channels.

(J) “Historical practice” means the consistent or predominant practice of an applicant within seven (7) years preceding the operative date of this chapter.

(K) “Hydraulic gradient” means the slope of the water table.

(L) “Hydrology” means the origin, distribution, and circulation of water through precipitation, stream flow, infiltration, groundwater storage, and evaporation.

(M) “Integrated water resources management plan” means a comprehensive surface and groundwater planning and management program involving affected local agencies.

(N) “Interested party” means any local agency or any property owner overlying an aquifer from which groundwater is proposed to be, or has been pumped, which is subject to the permit requirements of this chapter.

(O) “Local Agency” means a city located within Shasta County, or an independent special district wholly or in part located within the boundaries of the County, which is a purveyor of waters for agricultural, domestic, or municipal use.

(P) “Overdraft” means the condition of a groundwater supply in which the amount of water extracted by pumping exceeds the amount of water replenishing the supply, and the point at which extractions from the supply exceed its annual yield.

(Q) “Percolation” means the movement of water through the soil to the groundwater table.

(R) “Permeability” means the capability of the soil or another geologic formation to transmit water.

(S) “Piezometric surface” means the surface to which the water in a confined aquifer will rise

(T) “Porosity” means void or open spaces in alluvium and rocks that can be filled with water.

(U) “Recharge” means flow to groundwater storage from precipitation, irrigation, infiltration from streams, spreading basins and other sources of water.

(V) "Specific capacity" means the volume of water pumped from a well in gallons per minute per foot of draw down.

(W) "Spreading water" means discharging native or imported water to a permeable area for the purpose of allowing it to percolate to the zone of saturation including well injection and other forms of artificial recharge and replenishment.

(X) "Transmissivity" means the rate of flow of water through an aquifer.

(Y) "Usable storage capacity" means the quantity of groundwater of acceptable quality that can be economically extracted from storage.

(Z) "Water table" means the surface or level where groundwater is encountered in a well in an unconfined aquifer.

(AA) "Water agency" means the Shasta County Water Agency.

(BB) "Water year" means the year beginning October 1 and ending the last day of the following September.

(CC) "Zone of saturation" means the area below the water table in which the soil is saturated with groundwater.

Section 18.08.030. Permit Required for Export for Use Outside County.

It shall be unlawful to extract groundwater underlying lands in Shasta County for export of that groundwater, either directly or indirectly, without first obtaining a permit as provided in this chapter. For purposes of this section, the extraction of ground water to replace a surface water supply which has been, is being, or will be exported for commercial purposes shall be considered an extraction of groundwater that is subject to this ordinance.

Section 18.08.040. Exclusions From Permit Requirements.

This chapter shall not apply to the extraction of groundwater in the following circumstances:

- (A) To prevent the flood of lands; or
- (B) To prevent the saturation of the root zone of agricultural land; or
- (C) For use within the boundaries of a local agency which is located in part within County and located in part in another County where such extraction quantities and use are consistent the with historical practice of the local agency; or
- (D) For extractions to boost heads for portions of local agency facilities, consistent with the historical practice of the local agency; or
- (E) To enable water export that is expressly permitted by terms of an adopted groundwater management plan; or
- (F) Where the person or entity demonstrates to the satisfaction of the Director that its water management practices will result in an average annual groundwater basin recharge which is equal to or in excess of its extraction of groundwater for export uses.

The person or entity asserting that one or more of the exclusions of this section applies shall have the burden of supporting its assertion that no permit is required.

Section 18.08.050. Application for a use Permit.

An application for a permit shall be filed with the Water Agency on a form specified by the Director, which shall include all information specifically requested thereon and other information requested by the Director to address specific aspects of the proposed groundwater export. Concurrently, the applicant shall consent to the commencement and financing of

appropriate environmental review as may be required by the California Environmental Quality Act ("CEQA"; Public Resources Code §21000 et seq.) and applicable guidelines. The application for a permit and required environmental review shall be accompanied by the deposit of fees for these purposes, as shall be established by Board resolution.

Section 18.08.060. Procedures for Processing.

(A) Within ten (10) calendar days of filing of a complete permit application, which shall include all of that information and the deposit of fees required by section 18.08.050, the Director shall post a notice on the County Public Works Department public bulletin board that an application has been filed, and shall send a copy of the notice to all local agencies within the County which have jurisdiction over lands overlying or adjacent to the location of the proposed extraction, and to any interested party who has made a written request to the Director for such notice within the last twelve (12) calendar months, seeking written comments. Upon posting and otherwise providing notice of the application, the Director shall review the application to determine whether it is complete for purposes of proceeding pursuant to CEQA requirements and shall thereafter commence environmental review as may be appropriate.

(B) The Director may review the matter of the application with affected County departments, staff of the State Department of Water Resources, staff of the Regional Water Quality Board - Central Valley Region, and any interested local water agency within whose boundary the proposed activity is proposed to occur. If the applicant is proposing to extract groundwater from within or adjacent to an area within the County for which a groundwater management plan has been adopted, but which plan does not expressly permit the export of water, the Director shall consider the contents of any such plan and other relevant information provided

by each affected local agency. Any interested person or agency may provide written comments relevant to the matter of the proposed extraction of groundwater, which shall be submitted within thirty (30) days of the date of posting and mailing the notice of filing the permit application.

(C) The environmental review shall be undertaken in accordance with CEQA and implementing guidelines. All costs of the environmental review determined appropriate by the Water Agency shall be the responsibility of the applicant.

(D) Upon completion of the required environmental review the Director shall forward the application, together with any written comments received, environmental documentation and the Director's recommendations, to the Commission. Upon receipt of the Director's recommendations, the Commission shall immediately schedule a public meeting to consider the permit application, which shall be noticed pursuant to Government Code Section 6061.

Section 18.08.070. Public Review Concerning Issuance of Permit.

(A) Formal rules of evidence shall not apply in the Commission's public review proceeding for the application, but the Commission may establish such rules as will enable the expeditious presentation of the matter and receipt of relevant information thereto. At the Commission's public review, which may be continued from time to time as determined appropriate by the Commission, the applicant shall be entitled to present any oral or documentary evidence relevant to the application, and the applicant shall have the burden of proof of establishing the facts necessary for the Commission to make the required findings. The Commission shall also hear relevant evidence presented by other interested persons and entities, the Director, other County staff, and the public.

(B) The Commission, in considering each permit application, shall consider all potential impacts the proposed export would have on the affected aquifer, including but not limited to potential hydraulic gradient, hydrology, percolation, permeability, piezometric surface, porosity, recharge, annual yield, specific capacity, spreading waters, transmissivity, usable storage capacity, water table and zone of saturation impacts.

(C) The Commission may request any additional information it deems necessary for its decision. The cost of such additional information shall be borne by the applicant.

Section 18.08.080. Findings Required for Granting of Permit Approval or Denial.

The permit may only be granted if there is a majority of the total membership of the Commission present at the required public meeting and a majority of the total membership of the Commission finds that the proposed groundwater extraction will not have significant detrimental impacts on the affected groundwater basin by determining that:

(A) The proposed extraction will not cause or increase an overdraft of the groundwater underlying the County;

(B) The proposed extraction will not adversely affect the long term ability for storage or transmission of groundwater within the aquifer;

(C) The proposed extraction will not exceed the annual yield of the groundwater underlying the County and will not otherwise operate to the injury of the reasonable and beneficial uses of overlying groundwater users;

(D) The proposed extraction will not result in an injury to a water replenishment, storage, or restoration project operating in accordance with statutory authorization;

(E) The proposed extraction is in compliance with Water Code Section 1220; and

(F) The proposed extraction will not be otherwise detrimental to the health, safety and welfare of property owners overlying or in the vicinity of the proposed extraction site(s).

If the Commission determines that one or more of the findings required by this section cannot be made, upon considering the proposed export together with potential conditions of permit issuance, it shall deny the permit application. The basis for any such denial shall be reflected in the Commission's official record of proceedings.

The applicant shall be notified in writing of the Commission's decision on the application, including the basis for denial where applicable, within fifteen (15) days of the final Commission action on the application.

Section 18.08.090. Conditions of Permit Approval.

If the permit is to be approved, the Commission shall impose appropriate conditions of permit issuance so as to prohibit overdraft or other adverse conditions, and may impose other conditions that it deems necessary to promote or maintain the health, safety, and welfare of Shasta County residents. Such other conditions of permit issuance may include, but shall not be limited to, requirements for observation and/or monitoring wells. Notwithstanding the foregoing, the Commission may issue the permit if the Commission finds that the applicant will provide adequate mitigation to offset all adverse effects that would otherwise result from the proposed extraction.

Section 18.08.100. Reapplication After Commission Denial.

Reapplication for a permit which has been denied by the Commission may not be filed with the Water Agency until the water year following the denial. For any such reapplication to be accepted as complete, and for it to be further reviewed in accordance with the procedures set forth in sections 18.08.060 through 18.08.090, it must be accompanied by information that

demonstrates a significant change in those circumstances which represented the factual basis for the previous permit application denial.

Section 18.08.110. Appeal of Commission Action on Application.

(A) The applicant and any interested party may appeal a decision of the Commission by filing a written request with the Clerk of the Board within (15) days of issuance of the decision to be appealed from. Any such appeal shall specifically set forth the procedural and substantive reasons for the appeal or be deemed incomplete and ineffectual. The Clerk shall set a Board hearing time within ten (10) days of receipt of a complete request for appeal which shall be heard within twenty (20) days of notice thereof. Written notice of the appeal shall be given to the Commission, the permit applicant, the appellant, and all other interested parties, and the appeal hearing shall be published pursuant to Government Code Section 6061.

(B) The Board shall hear the appeal as to those disputed matters which were heard by the Commission and are specifically set out in the appeal request, but may continue such hearing from time to time as determined appropriate by the Board. The appeal before the Board shall not be conducted with formal rules of evidence, but rather shall be conducted under such rules as set by the Board for the expeditious presentation of the matter and relevant information pertaining thereto by the appellant and by other parties interested in the Commission decision appealed from. An appeal decision by the affirmative vote of a majority of Board members shall be the final administrative decision in the matter.

(C) In any appeal taken under this section the permit applicant who is proposing to extract groundwater for exportation outside of the County shall have the burden of proving to the satisfaction of the Board, that such extraction is either exempt from permit requirements pursuant

to Section 18.08.040 or will not have significant detrimental impacts based on the criteria set forth in Section 18.08.080.

Section 18.08.120. Challenge to Approved Permit.

(A) Any interested party may challenge the ongoing extraction of groundwater pursuant to an approved permit during the term of the permit based on allegations that one or more of the following circumstances exists:

(1) there has been or is an ongoing violation of one or more conditions of an approved permit; or

(2) the extraction of groundwater pursuant to this chapter has caused or increased an overdraft in the basin; has adversely affected the long term ability for storage or transmission of groundwater in the affected aquifer; exceeds the annual yield of the affected groundwater basin; operates to the injury of the reasonable and beneficial uses of overlying groundwater users; is in violation of Water Code Section 1220; or results in an injury to a water replenishment, storage, or restoration project operating in accordance with statutory authorization; or

(3) the continued extraction of groundwater pursuant to a previously approved permit will be detrimental to the health, safety and welfare of one or more affected local agencies or other interested parties.

(B) A challenge pursuant to this section shall be commenced by filing a written request with the Director on a form prescribed by the Director. Such a challenge shall allege one or more of the circumstances specified by this section and shall generally describes facts in support of those alleged circumstances. In such event the Director shall, within ten (10) days of receipt of such challenge in a completed form, give notice of the challenge to the Commission, the

permittee, the appellant, all affected local agencies, and to any other interested party which has requested such notice. A Commission review shall be held on the matter following the procedures set out in Section 18.08.070. The Commission's decision may be to deny the challenge and leave the previously issued permit unchanged, to grant the challenge and terminate the permit, or to impose modified conditions to the permit, which the permittee shall be obligated to adhere to if continued extraction for export purposes is to occur, based on findings addressing the criteria specified in Section 18.08.080.

(C) The standard for review in any such challenge proceeding shall be substantial evidence. The burden of proof shall be upon the person or entity extracting the groundwater that is the subject of the challenge.

(D) Appeals from Commission decisions on challenges may be made to the Board in accordance with the procedures in Section 18.08.110.

Section 18.08.130. Permit Term.

Except as may be modified pursuant to Section 18.08.110, all approved permits shall be valid for a term not to exceed three (3) water years from the date of the issuance of the permit, as determined by the approving body; however, if the permit is for extraction as part of a conjunctive use program that has been approved by the Board the permit shall not exceed the length of the term of that program. For the purpose of calculation, the water year in which the permit is granted shall not be counted in determining the three year time period if less than four (4) months remain in the water year at the time of final permit approval.

Section 18.08.140. Limitation of Permit.

(A) Nothing contained in this chapter nor in the conditions an issued permit shall be construed as giving the permittee an exclusive right to groundwater extraction, nor as establishing a compensable right in the event the permit is subsequently terminated or modified following a challenge to the permit.

(B) The issuance of a permit pursuant to this chapter shall evidence that the health, welfare, and safety of County residents will not be harmed by the extraction and exportation of local groundwater outside the County boundaries.

(C) Any issued permit shall not exempt, supersede, or replace any requirements of federal, state, and local laws and regulations, including but not limited to California Water Code section 1220, the Groundwater Management Act, and any other statutes governing California groundwater law, well drilling and maintenance or building permit requirements, and is to be construed and applied in harmony with applicable existing law.

(D) Upon the adoption of a groundwater management plan or similar plan affecting a particular groundwater basin or aquifer within Shasta County, as approved the Board of Supervisors in concert with other local agencies having jurisdiction, any provisions of such plan or permits issued thereunder shall supersede the provisions of this chapter and permits approved hereunder, in the event of any inconsistency.

Section 18.08.150. Inspection.

The Director, with good cause, may at any and all reasonable times enter any and all places, property, enclosures and structures. for the purpose of making examinations and investigations to determine whether any provision of this chapter has been violated.

Section 18.08.160. Civil Penalty.

Upon determining that a violation of this chapter has occurred or is ongoing, the County may elect to proceed with a civil action against a violator, including, but not limited to, injunctive relief. Any person or entity who violates this chapter shall also be subject to fines of up to five thousand dollars (\$5,000) per separate violation. A person shall be deemed to have committed separate violations for each and every day or portion thereof during which any such violation is committed, continued, or permitted, as well as for each and every separate groundwater well within which any such violation is committed, continued or permitted.

SECTION 2. If any section, subsection, sentence, clause or phrase of this chapter is for any reason held illegal, invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions hereof.

SECTION 3. This ordinance shall take effect and be in full force and effect thirty (30) days after its passage, and prior to the expiration of fifteen (15) days from the passage thereof shall be published once in one or more newspapers of general circulation, printed and published in the County of Shasta.

DULY PASSED AND ADOPTED this 27th day of January, 1998, by the Board of Supervisors of the County of Shasta by the following vote:

AYES: Supervisors Clarke, Dickerson, Fust, Hawes, and Wilson

NOES: None

ABSENT: None

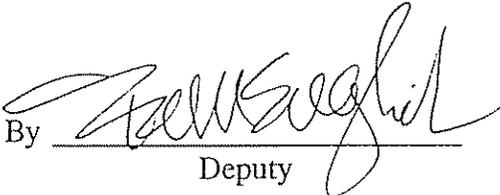
ABSTAIN:



PATRICIA A. CLARKE, Chairman
Board of Supervisors
County of Shasta
State of California

ATTEST:

CAROLYN TAYLOR
Clerk of the Board of Supervisors

By 
Deputy