Resource Capacity Study

Water Supply in the Paso Robles Groundwater Basin

Adopted by Board of Supervisors, February 2011

Board of Supervisors

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EXECUTIVE SUMMARY

This Resource Capacity Study (RCS) addresses the state of the Paso Robles Groundwater Basin. It is based on work already accomplished by the County and other parties through:

- Fugro 2002 Paso Robles Groundwater Basin Study
- Fugro 2005 Phase II Report
- Todd Engineers 2009 Evaluation of Paso Robles Groundwater Basin Pumping
- Fugro 2010 Paso Robles Groundwater Basin Water Balance Review and Update.

In addition, this RCS acknowledges a peer review of the preceding groundwater studies commissioned by the City of Paso Robles (Yates 2010 Peer Review of Paso Robles Groundwater Studies).

These studies have calculated water use by the major groundwater use sectors (agriculture, rural land uses, small commercial uses, municipal systems and small community systems). Water use by these sectors has increased during the period 1980 to 2009 to the point where basin outflows will soon be greater than basin inflows.

A Level of Severity III can be established if a basin has reached its perennial yield or its perennial yield will be depleted before new supplies are developed. A Level of Severity (LOS) III is recommended for the Paso Robles Groundwater Basin and a separate LOS I is recommended for the Atascadero Sub-basin. Recommended actions include groundwater monitoring to collect additional data on the status of the basin and land use measures that will reduce conflicts over the limited groundwater resource.

INTRODUCTION

<u>The Resource Management System</u>

The County's Resource Management System (RMS) is a mechanism for ensuring a balance between land development and the resources necessary to sustain such development. When a resource deficiency becomes apparent, efforts are made to determine how the resource capacity might be expanded, whether conservation measures could be introduced to extend the availability of unused capacity, or whether development should be limited or redirected to areas with remaining resource capacity. The RMS is designed to avoid adverse impacts from depletion of a resource.

The RMS describes a resource in terms of its "level of severity" (LOS) based on the rate of depletion and an estimate of the remaining capacity, if any. In response to a resource issue or recommended LOS, the Board of Supervisors may direct that a Resource Capacity Study (RCS) be conducted. A RCS provides additional details that enable the Board of Supervisors to certify a LOS and adopt whatever measures are needed to eliminate or reduce the potential for undesirable consequences. The Board of Supervisors directed the preparation of this RCS in January 2007.

LOS I	Level I is reached for a water resource when increasing water demand projected over nine years equals or exceeds the estimated dependable supply.
LOS II	Level II for a water resource occurs when water demand projected over seven years (or other lead time determined by a resource capacity study) equals or exceeds the estimated dependable supply.
LOS III	A Level of Severity III exists when water demand equals the available resource; the amount of consumption has reached the dependable supply of the resource.

BACKGROUND

According to the 2002 report on the Paso Robles groundwater basin (the basin) prepared by Fugro, Inc., the basin encompasses an area of approximately 505,000 acres (790 square miles). The basin extends from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon (See Attachment 1). Internally, the Atascadero sub-basin was defined as a single hydrologically distinct sub basin (see Fugro 2002 for an explanation of the distinction between the basin and sub-basin). It encompasses the Salinas River corridor area south of Paso Robles and includes the communities of Garden Farms, Atascadero, Templeton and a portion of the City of Paso Robles' water supply.

The basin also contains "sub-areas" (as opposed to the sub-basin) that are identified for management purposes only (see Attachment 1). They do not constitute separate sub-basins such as the Atascadero Sub-basin. These sub-areas do not have perennial yields separate from the basin as a whole. Due to the complexity of the hydrogeology at the sub-area boundaries and the amount of data that would be needed to determine the behavior at those boundaries, it is not currently possible to establish a perennial yield for these sub-areas.

However, it is possible to draw conclusions regarding the proportions of total basin pumping by sub–area. This RCS addresses this issue below.

<u>What is the "perennial yield" of a groundwater basin?</u>

There are several definitions of perennial (or safe) yield available from the California Dept of Water Resources and the hydro geologic literature. For purposes of this RCS and to be consistent with the technical work already completed on the basin, the definition of perennial (and safe) yield will be taken from Fugro 2002 and Fugro 2005.

The Fugro 2002 Report text (pg 138, Hydrologic Budget section):

> *"The perennial yield of a groundwater basin may be defined as the rate in which water can be pumped from wells year after year without decreasing the groundwater in storage. Many definitions of perennial yield tie the acceptable level of extractions to a negative economic impact. However, for the purposes of this study, the perennial yield is tied more closely to the rate of replenishment or recharge to the basin that will not result in diminished storage. The Paso Robles Groundwater Basin has a very large amount of groundwater in storage that can be used as carryover storage during years when there is little to no recharge. The drought of the late 1980's is an example."*

The Fugro 2002 report also defines perennial yield in its glossary:

> Perennial yield:
>
> *"…the amount of usable water of a groundwater basin that can be withdrawn and consumed economically each year for an indefinite period of time. It cannot exceed the sum of the natural recharge, artificial recharge, and incidental recharge, without causing depletion of the basin."*

<u>How are groundwater levels related to the perennial yield of a groundwater basin?</u>

Groundwater levels in wells fluctuate over time, representing the continuous adjustment of groundwater in storage to changes in recharge and discharge. Groundwater levels may fluctuate seasonally and over a period of years, reflecting the net effect of changes in recharge (e.g., percolation of precipitation and streamflow, infiltration of applied water, and subsurface inflow) and changes in outflow (e.g., pumping and subsurface outflow). Groundwater level changes also may be sustained. A long-term trend of groundwater level declines would indicate an imbalance of outflows over inflows.

A water level analysis is based on empirical measurement of water levels in both production wells and monitoring wells. Water levels in individual wells are compared to levels in other wells throughout a basin to create a contour map showing elevations of the groundwater surface. Contour maps are useful for estimating the direction and rate of flow of groundwater within an aquifer. They are also used for estimating the amount of groundwater in storage. Observation of water levels over time can illuminate trends and implications about the long-term prospects for a basin. A series of groundwater elevation maps have been developed for the basin over the years. The maps show contour lines of equal water level elevation (see Attachments 2 and 3).

In general, long-term observation of groundwater levels has found a large area of drawdown. This area of concern is located roughly east and north of the City of Paso Robles, both north and south of State Highway 46. Data collected and analyzed from 1980 to 2006 indicate that the area of drawdown is growing both horizontally and vertically.

Annual recharge of groundwater from precipitation, as well as resulting streamflow, is highly variable; therefore, a long-term analysis of water level trends must include representative periods of above average, below average and average rainfall. Determination of trends is based on a period of observation that is not biased by an unusually dry or wet year or series of years. The data available from the 2002 Fugro report and the 2009 pumping update by Todd Engineers covers the time period 1980 to 2006, an adequate span of time to include varied conditions.

The basin's perennial yield has been calculated by Fugro to be 97,700 acre feet/year (afy). The Atascadero Sub-basin's perennial yield has been calculated at 16,400 afy. That means that over a given period of time, which in this case is 1980-1997, outflows of 97,700 acre feet/year can be offset by the same amount of inflow. This will not occur each year (i.e. inflow might not total 97,700 acre feet in any given year). However, when considering the balance of inflows and outflows over a long period of time, 97,700 afy of water can be removed on average, with no long-term decrease in storage. If outflows over a longer term basis are greater than 97,700 acre feet per year, it is assumed that water cannot be replaced and the process of "mining" groundwater has occurred. Mining of groundwater means that the water removed can never be replaced. Outflows would have to be lower than the perennial yield in a future year(s) to the same degree that outflows exceeded the perennial yield in order for mining of groundwater to not occur.

The most important thing to remember is that given a reliable perennial yield figure, as is the case in the basin, control of outflows so that they never reach perennial yield is critical to the health of the basin. As explained above, outflows exceeding the perennial yield cannot be replaced through normal inflow conditions unless outflows are brought under the perennial yield by the same amount in a future year(s). Therefore, while below or above-average rainfall and attendant basin inflow might have short-term or temporary effects on groundwater levels; in the long-term, basin health is dependent on keeping outflows under the perennial yield.

Information Base

This Resource Capacity Study now has three methods to estimate present and forecasted groundwater supply and demand and the state of the basin:

- A water balance and water balance analysis from 1998 to 2025 (Fugro 2010).
- 2006 and projected 2025 Paso Robles Groundwater Basin Pumping (Todd 2009).
- Observed change in the level of groundwater over 30 years. (Fugro 2005 and Todd 2009).

The information base must be used carefully as many assumptions have gone into the gathering and reporting of data. The data used to calculate present and future demand in the agriculture, rural, small commercial and small community systems is based on estimated factors or "water duties" for each pumping sector. It is important to note that water demand and groundwater pumping may be reported to a fraction of an acre foot, but these levels are not purported to be accurate to that degree.

The City of Paso Robles has recently released a peer review of the conclusions reached in published reports on the groundwater basin since the year 2000. The peer review recommends future courses of action that include: 1) increased well monitoring; 2) update and enhance previous models; 3) secure supplemental water such as Nacimiento Project water; and 4) cooperatively manage the basin.

BASIN WATER SUPPLY AND DEMAND

Basin-wide Supply and Demand

The 2005 Fugro report estimated that the perennial yield of the basin is approximately 97,700 afy. The report estimated that annual pumping had reached approximately 82,600 afy as of the year 2000. The pumping estimate was updated by the 2009 Todd Report (using the 2006 water year), and compared the 2006 pumping estimates with pumping estimates for 1997 and

2000. In 2010, Fugro estimated total pumping in the basin and sub-basin as of the year 2009. These estimates show total outflows of 91,838 afy to 96,723 afy in the basin and 15,255 afy to 16,012 afy in the Atascadero Sub-basin. The ranges are due to use of two different water duties for rural pumping: 1.0 afy and 1.7 afy.

Estimated Basin Pumping by Users

There are five different groups of groundwater "users" included in the supply/demand analysis:

- Agriculture
- Municipal
- Rural
- Small Community Systems
- Small Commercial Systems (e.g. golf courses, wineries, institutional uses)

Table 1
Total Groundwater Pumping by User (1997, 2000, 2006) (afy)

Groundwater User	1997	2000	2006
Net Agriculture	49,683 afy	56,551 afy	58,680 afy
Urban	13,513	14,629	15,665
Rural	9,400	9,993	10,891
Small Community	---	----	594
Small Commercial	1,465	1,465	2,323
Total	**74,061**	**82,638**	**88,153**

Small Community was included in Rural in 1997 and 2000.

As a matter of comparison, the estimated perennial yield of the basin is approximately 97,700 afy, while the estimated 2006 total basin pumping was 88,153 afy, or 90% of the perennial yield. Fugro 2010 estimates are that the basin has reached 91,838 afy to 96,723 afy (94% - 99% of perennial yield) and the Atascadero Sub-basin has reached approximately 15,255 afy to 16,012 afy (93% - 98% of perennial yield). Stated another way, approximate inflows are 977 acre feet/year to 5,862 acre feet/year more than outflows in the basin.

The Todd Report identified the amount of groundwater pumping by each user group. The report also explains the methods used to estimate groundwater pumping where actual pumping records do not exist.

Municipal Pumping

Municipal pumping includes four public water purveyors: 1) City of Paso Robles; 2) Atascadero Mutual Water Co. (AMWC); 3) Templeton Community Services District (CSD); and 4) San Miguel Community Services District. Pumping records from each jurisdiction were used to calculate total municipal pumping.

The City of Paso Robles pumps from both the Atascadero Sub-basin and the Estrella sub-area portion of the main groundwater basin. Well records were used to accurately determine the volume of pumping from the sub-basin and Paso Robles groundwater basin. The AMWC and the Templeton CSD pump from the Atascadero Sub-basin. The San Miguel CSD pumps from the Estrella sub-area portion of the main Paso Robles groundwater basin. The data for municipal pumping are the most accurate of all uses, as they are based on well pumping records.

In 2010, Fugro updated the estimated municipal pumping figures for the years 2007-2009:

Table 2
Urban Pumping 2007-2009

	AMWC	Paso Robles	Templeton	San Miguel	Total
2007	6210	7668	1673	354	15905
2008	6200	7850	1727	367	16144
2009	6189	8032	1782	379	16382

An important point to consider regarding urban pumping is the location of the Atascadero Sub-basin wells. As is identified in Table 7 below, a substantial amount of urban pumping in the sub-basin is from the Salinas River alluvium. According to Fugro 2010 and further reinforced by the expert testimony at the November 9, 2010 joint Board/Commission hearing, pumping from this shallower portion of the sub-basin does not have the same effect on groundwater levels as does pumping from the deeper Paso Robles Formation.

Agricultural Pumping

Estimating the amount of agricultural pumping is more complex than for other basin users. Agricultural pumping was estimated using acreage and water demands of different types of crops. Crop data show that irrigated acreage rose from 20,172 acres in 1997 to 40,836 acres in 2006. Table 1 (above) shows that although irrigated acreage increased by approximately 100% from 1997-2006, water use increased by less than 20% in the same time frame.

The following is Fugro’s 2010 straight line projection for agricultural pumping for the years 2007-2009:

Table 3
Agricultural Pumping 2007-2009

2007	2008	2009
61,026 afy	62,052 afy	63,077 afy

Small Community Systems

This water use sector includes mutual water companies, county service areas, and mobilehome parks. For small community systems that report groundwater pumping, well records were used to accurately determine their pumping. Using these reports, estimates were derived for the systems that do not report their water use.

Small Commercial Systems

The small commercial pumping sector includes such users as wineries, golf courses and schools. Estimates of water use had to be derived for most of the users, as no data are reported in this sector (only Atascadero State Hospital and the California Youth Authority reported pumping). Water use estimates are based on factors from the Pacific Institute and information from consultation with winery operators.

Rural Pumping

This sector is domestic water use by development in the rural areas. No data exist to measure groundwater pumping by rural domestic users. An estimate was derived by using parcel data and applying a water use factor or “water duty.” The assumed water duty of 1.7 afy/dwelling unit was taken from Fugro 2002 and Todd 2009.

There are two alternative water duties for rural pumping used in Fugro’s 2010 report. Water duties of 1.00 and 1.7 afy/dwelling were used to calculate rural pumping. These two water duties were used in order to observe the sensitivity of outflows to changes in rural water duties. This Resource Capacity Study uses 1.7 afy, except where noted to reflect the wide range of land uses and parcel sizes and associated water use rates in the rural pumping category.

Table 4
Total Basin Pumping by Sector
Perennial yield = 97,700 afy

Groundwater User	1997	2000	2006	2009
Net Agriculture	49,683 afy	56,551 afy	58,680 afy	63,077
Urban	13,513	14,629	15,665	16,382
Rural	9,400	9,993	10,891	11,817
Small Community	---	----	594	----
Small Commercial	1,465	1,465	2,323	2631
Total	**74,061**	**82,638**	**88,153**	**93,907**

Sub-basin and Sub-area Pumping

Groundwater pumping is not uniform throughout the basin. Most pumping (39% of the basin total) takes place in the Estrella sub-area. The Atascadero Sub-basin is next in pumping volume at 18% of the basin total, and the Shandon sub-area is third at 13% of total basin pumping The Estrella sub-area is where the most serious groundwater level declines have been identified (see Attachment 1 for the basin and its sub-areas and sub-basin).

The Estrella sub-area does not have its own perennial yield estimate, as it is hydrologically part of the larger basin. The Atascadero Sub-basin, however, is hydrologically distinct from the rest of the basin. Its perennial yield is estimated at 16,400 afy (Fugro, 2000). Estimated pumping in the Atascadero Sub-basin has reached 93%-98% of its perennial yield in 2006 and reached its perennial yield in 2008 (Todd, 2009; Fugro, 2010). A separate LOS can be assigned to the sub-basin based on the definitions in the RMS, because the sub-basin is hydrologically distinct from the entire basin and has its own perennial yield.

Staff has identified an area of the basin--made up of a portion of the Estrella sub-area and the northern portion of the Creston sub-area--that has shown the greatest and most consistent drawdown of water levels since 1980. This area is identified as the "Estrella/Creston Area of Concern" (see Attachment 4).

Atascadero Sub-basin

The Atascadero Sub-basin is a long and narrow strip that extends from the south end of Paso Robles to Santa Margarita on both the east and west sides of the Salinas River (see Attachment 1). Pumping in the sub-basin in 2006 is estimated by Todd (2009) as tabulated below. The percentage of total sub-basin pumping is also shown for each type of user.

Table 5
Atascadero Sub-basin Pumping, 2006

Groundwater User	Amount (afy)	% of Total Sub-basin
Agriculture	1,348	9%
Municipal	11,582	75%
Small Community	213	1.3%
Small Commercial	430	2.7%
Rural	1,819	12%
Total	**15,392**	**100%**

Perennial yield estimated at 16,400 afy

Municipal pumpers are the primary groundwater users of the Atascadero Sub-basin. The City of Paso Robles pumps approximately 3,896 afy and Atascadero Mutual Water Company (AMWC) pumps approximately 6,221 afy from the sub-basin. This is approximately 62% of the perennial yield of the basin.

Table 6 shows Fugro's 2010 estimated water use in the sub-basin for the years 2007-2009. Total pumping in the sub-basin is approaching the safe yield.

Table 6
Estimated Atascadero Sub-basin Pumping 2007-2009

Groundwater User	2007	2008	2009
Agriculture	1384 afy	1420 afy	1456 afy
Municipal	11,717 afy	11,852 afy	11,987 afy
Rural/Sm. Community	1832 afy	1836 afy	1839 afy
Small Commercial	444 afy	459 afy	473 afy
Total	15,377 afy	15567 afy	15755 afy

Perennial yield estimated at 16,400 afy

The municipal pumping in the sub-basin occurs in both the alluvium of the Salinas River and in the deeper Paso Robles Formation.

Table 7
Pumping in the Atascadero Sub basin

Calendar Year	Salinas River Underflow (acre-feet)	Paso Robles Formation (acre-feet)	Total (acre-feet)
2006	3,316	2,905	6,221
2007	3,004	3,817	6,821
2008	3,014	3,563	6,577
2009	2,180	3,523	5,703

According to Fugro 2010, pumping of the alluvium does not have the same effect on groundwater levels as does pumping from the deeper Paso Robles Formation. Fugro 2010 also recommends that the alluvium's perennial yield be established separately from the deeper Paso Robles Formation. Furthermore, according to expert testimony at a joint hearing on November 9, 2010, municipal use makes up most of the pumping in the sub-basin. Agencies such as the City of Paso Robles and large purveyors such as the AMWC can mange their pumping more effectively than the thousands of individual users in the main basin.

Estrella Subarea

The Estrella sub-area is not a hydrologically separate part of the basin as is the Atascadero Sub-basin. Therefore, no separate perennial yield figure is available for the sub-area. The area that has shown the most severe and constant lowering of groundwater levels since 1980 is located in the southern Estrella sub-area and the northern Creston sub-area. As shown below, the Todd Report estimated the breakdown of pumping in the Estrella sub-area in terms of afy and as a percentage of the total pumping:

Table 8
Estrella Sub area Pumping, 2006

Groundwater User	Amount (afy)	% of Total Sub-basin
Agriculture	23,110	68%
Municipal	3,930	11.5%
Small Community	156	0.45%
Small Commercial	1,603	5%
Rural	5,277	15.5%
Total	**34,076**	**100%**

In 2006, agriculture was the primary user of water in this sub-area, at 68% of total water use. Rural pumping accounts for 15.5% of total water use and urban use 11.5%.

The Estrella sub-area represents approximately 16% of the total land area in the basin. According to Todd (2009), pumping in the sub-basin accounts for approximately 40% of the total amount of water pumped from the entire basin. This proportion will be considered in development of recommended actions in this RCS.

Basin Water Balance

This RCS has been updated to include a groundwater basin water balance continued from 2006 through 2009 and then 2009 through 2025. The water balance update was developed specifically to gauge the effect of varying the rural water duty factor on the overall water balance for the years 1998 through 2009 and of the introduction of Nacimiento Project water into the basin and sub-basin from 2009 through 2025.

In Tables 14 and 15 of the Fugro report, all other pumping is held constant and urban pumping is varied according to the delivery schedules of the Nacimiento Project. The water balance shows that urban pumping in the basin grows slowly over the period 2010 to 2016 and is then offset as additional Nacimiento Project water is used in the basin.

In order to see the effects of different assumptions for pumping and growth rates on the water balance, staff developed several different scenarios using different assumptions for water duty (e.g. 1.7 afy vs. 1.0 afy for rural pumping; 1.25 afy/ac for vineyards vs. 0.75 afy/ac.) and forecasted growth in each pumping sector and corresponding return flows. These water balance projections or scenarios each forecast the status of the basin to the year 2025. A summary of the scenarios, including the projected year when overdraft is reached for each scenario, is as follows (see attachments 5-13 for the scenario spreadsheets):

1. Scenario 1
   a. Agricultural pumping increases 1.5% per year.
   b. Rural\Small Community increases 1.7% per year.
   c. Small commercial pumping increases 4% per year.
   d. Perennial yield reached in 2011

2. Scenario 2
   a. Agricultural pumping increases 3.0% per year.
   b. Rural\Small Community increases 3.47% per year.
   c. Small commercial pumping increases 8% per year.
   d. Perennial yield reached in 2010

3. Scenario 3
   a. Same rate of increase as Scenario 1.
   b. Vineyards use decreased by 0.25 afy/ac.
   c. Perennial yield reached in 2019

4. Scenario 4
   a. Same rate of increase as Scenario 1.
   b. Vineyards use decreased by 0.50 afy/ac.
   c. Perennial yield reached in 2025

5. Scenario 5
   a. Same rate of increase as Scenario 2
   b. Vineyard use decreases by 0.25 afy/ac.
   c. Perennial yield reached in 2014

6. Scenario 6
   a. Same rate of increase as Scenario 2
   b. Vineyard use decreases by 0.50 afy/ac.
   c. Perennial yield reached in 2019

7. Scenario 7
   a. Same rate of increase as Scenario 1.
   b. Rural pumping uses 1.0 afy vs. 1.7 afy.
   c. Perennial yield reached in 2014

8. Scenario 8
   a. Same rate of increase as Scenario 2.

b. Rural pumping uses 1.0 afy vs. 1.7 afy.
c. Perennial yield reached in 2011

These eight scenarios all result in reaching perennial yield of the basin anywhere from the year 2010 to 2025. The scenarios that exhibit the greatest effect on when perennial yield is reached are those that reduce vineyard water use from 1.25 and 1.50 afy/acre to 1.00 and 1.25 afy/acre and to 0.75 and 1.00 afy/acre.

Atascadero Sub-basin Water Balance

The water balance in the Atascadero Sub-basin differs from the Paso Robles basin in that a majority of the sub-basin pumping is in the urban sector (cities of Paso Robles, Atascadero and the Templeton Community Services District (CSD). The City of Paso Robles receives half of its water supply from wells in the sub-basin, while the Templeton CSD and the AMWC receive all their water from the sub-basin. Together, these groundwater users account for more than 65% of the water use in the sub-basin.

These jurisdictions will import Nacimiento Project water into the basin. This imported water resource will keep urban pumping fairly constant through the year 2019 (10,673 afy in 2010 vs. 11,683 afy in 2019). After the year 2019, urban pumping will increase again to 12,567 afy. Outflows in the sub-basin are estimated to consistently exceed perennial yield (16,400 afy) in year 2021 and thereafter.

Attachment 13 contains the water balance forecasts for the sub-basin. Urban pumping values are from Fugro (2010) and are based on a schedule of Nacimiento Project water delivery to the three urban water purveyors. However, it is important to point out that approximately half the pumping in the sub-basin is from the Salinas River alluvium. As described above, pumping the alluvium does not have the same effect on groundwater levels as does pumping in the deeper Paso Robles Formation.

Summary of the Problem

a. The 2009 Todd Report found that water demand in both the basin and sub-basin is approaching perennial yields.
b. Groundwater level contour maps have shown consistent lowering of groundwater levels in a wide area east of the City of Paso Robles. Specific well locations and their groundwater levels over time are as follows (from draft public review materials for the Paso Robles Groundwater Basin Management Plan that is under development):

Table 9
Selected Groundwater Elevations

Well No.	Location	Long Term decline	1997-2009 decline
25S/12E- 26K01	North of Airport Rd	80 feet	40 feet
26S/13E- 5D01	North of Jardine Rd	120 feet	90 feet
27S/12E- 2F02	Southwest corner of City	110 feet	95 feet
26S/12E- 15N01	North of City	60' to stable	80 feet

c. The Fugro 2010 Water Balance review finds that the basin is approaching the average annual perennial yield in 2010, and the introduction of Nacimiento Project water into the basin will cumulatively offset approximately 66,798 afy of pumping by the year 2025.

d. Increases in outflows in pumping sectors lead the basin into overdraft notwithstanding the introduction of Nacimiento Project water.

e. According to the Scenarios 7 and 8 above, use of alternative water duties for rural pumping (1.7 afy vs. 1.0 afy) does not result in substantive change to the water balance and the estimated time to reach the basin's perennial yield.

f. Introduction of Nacimiento Project water into the Atascadero Sub-basin will keep outflows at or just above perennial yield through 2016. Outflows will be greater than inflows after 2016.

Estrella/Creston Area of Concern

An area of the basin - the southern portion of the Estrella sub-area and the northern portion of the Creston sub-area - has shown the greatest and most consistent decline of water levels since 1980 (see Attachment 4). This area is being called the "Estrella/Creston Area of Concern." There is no perennial yield estimate for this area. Sustained groundwater level declines represent a stressing of the groundwater resource, may cause water quality problems, and may require groundwater users to lower wells as groundwater levels decline.

The Estrella sub-area (most of which is in the Area of Concern) represents approximately 16% of the area of the groundwater basin. However, approximately 40% of all groundwater pumping takes place within this area. The amount of pumping has caused a substantial drop in groundwater elevations since 1980. The preceding Table 9 is based on data from the Groundwater Management Plan in development by the District. It shows both short and longer-term declines in wells in the Area of Concern.

Conservation and Data Collection Efforts

Both agricultural and municipal groundwater users have made substantial strides in water efficiency and conservation. Vineyards in the basin have reduced their water use due to economic conditions, more efficient vine and soil management and a commitment to sustainable operations. According to information from the Paso Robles Wine Country Alliance (PRWCA), vineyard water use on a per-acre basis has been dropping in the last 10 years. Many vineyards have adopted the "Code of Sustainable Winegrowing Practices" that covers sustainable operations in water, energy, ecosystem management, solid waste reductions and other areas. The result of this multi-year effort is seen in the declining amount of water used on each acre of vineyard. According to the PRWCA, water use in vineyards has been reduced in some cases to less than one acre-foot/acre/year. The Alliance states that ten years ago, vineyard water use was over two acre-feet/acre/year.

Conservation efforts have also been applied in a winery setting. For example, J. Lohr Vineyards has an aggressive water efficiency and conservation program at its facilities. Water use at this winery has been reduced from 3.5 gallons of water/gallon of wine to 1.2 gallons of water/gallon of wine (2003-2007); a 66% reduction at this facility.

U.C. Extension has commenced a three year study of vineyard water use. It is hoped that this study will more accurately estimate water use in the vineyards. Attachments 5-13 are water balance forecasts using different outflows and water duty assumptions. These scenarios include 0.25-0.50 afy/acre reductions in vineyard water use.

Additionally, the Department has worked with the PRWCA to develop Best Management Practices (BMPs) for water conservation by wineries. These BMPs will address new wineries and will identify actions existing wineries can take to be more water efficient.

The City of Paso Robles has recently embarked on a far-reaching water conservation effort. Mandatory three-day water use restrictions for residential customers were implemented in April 2009, and the City is committing substantial funds to its water conservation program. A comprehensive long-range water conservation plan is in development with the goal of achieving significant reductions in future per capita water use.

Atascadero Mutual Water Company (AMWC) has promoted water conservation since 1993. According to AMWC, the water conservation program has reduced per capita indoor water use and the use of potable water for landscape irrigation. AMWC provides educational resources on its website, in its offices, and in periodic brochures included with water bills. AMWC made a further commitment to conservation in 1997, signing an MOU with the California Urban Conservation Council and continues to implement and meet the goals of Best Management Practices for Water Conservation including

- Conservation Rate Structure (i.e. Tier Water Rates)
- Turf conversion rebates
- Lawn aeration rebates
- Sprinkler nozzle replacement rebates
- Irrigation controller rain sensor rebates
- Weather based irrigation controller and soil moisture sensor rebates
- High efficiency clothes washing machine rebates
- High efficiency toilet rebates
- School education programs
- Free seminars on water conserving landscape design and plant selection
- Free landscape/home water surveys
- Annual Water-Conserving Landscape awards

Atascadero MWC is a member of the California Urban Water Conservation Council, Groundwater Guardian Program, Alliance for Water Efficiency, Water Education Foundation, and SLO County Partners in Water Conservation.

The Templeton CSD currently promotes water conservation throughout its service area. The Templeton CSD has a full time water conservation coordinator who works to educate the public through informational workshops, literature, handouts, and occasional rebate programs. Recently, the Templeton CSD has revised their Water Conservation Ordinance to ensure that conservation standards for the Templeton CSD remain current and efficient. The Templeton CSD is an active member in the SLO County Partners in Water Conservation, Central Coast Partners in Water Quality, and the California Urban Water Conservation Council.

Decision–Making Constraints

There are several possible actions available to address the potential for overdraft. However, there are over-arching issues that complicate any action the County might wish to take:

1. The County has limited regulatory authority in water use, especially by cities and agriculture. Therefore, it will be difficult for the County to directly affect the use of water by the two primary groundwater users.
2. The County's primary regulatory role is land use and building.

3. The major portion of basin outflows are not measured, but are estimated. While municipal pumping is measured, agricultural, rural, and most small community/commercial pumping is estimated. This adds to the uncertainty regarding actual groundwater use.
4. Identification of changing groundwater levels is based on limited data.

Consistency with the General Plan

As noted above, the County's primary regulatory role is land use regulation and issuance of building permits. The recommended actions below emphasize this regulatory role. These recommended land use and building actions must be consistent with any applicable general plan policies. The Water Resource chapter of the Conservation and Open Space Element (COSE) contains goals, policies and implementation strategies that will affect the recommended actions in this RCS. Policies in the Agriculture Element address the preeminence of agricultural water supply.

Conservation and Open Space Element (COSE)

Goal 1 of the COSE Water Resources chapter states:

> *The County will have a reliable and secure regional water supply*.

Policies in support of this goal include:

> **Policy WR 1.13 Density increases in rural areas**- Do not approve General Plan amendments or land divisions that increase the density or intensity of non-agricultural uses in rural areas that have a recommended or certified Level of Severity II or III for water supply until a Level of Severity I or better is reached, unless there is an overriding public need.
>
> **Policy WR 1.14 Avoid net increase in water use** - Avoid a net increase in non-agricultural water use in groundwater basins that are recommended or certified as Level of Severity II or III for water supply. Place limitations on further land divisions in these areas until plans are in place and funded to ensure that the perennial yield will not be exceeded.
>
> **Policy WR 1.2 Conserve Water Resources** - Water conservation is acknowledged to be the primary method to serve the county's increasing population. Water conservation programs should be implemented countywide before more expensive and environmentally costly forms of new water are secured.

Policy WR 1.7 Agricultural operations - Groundwater management strategies will give priority to agricultural operations. Protect agricultural water supplies from competition by incompatible development through land use controls.

Implementation Strategy WR 1.7.1 Protect agricultural water supplies - Consider adopting land use standards, such as growth management ordinance limits for non-agriculturally-related development on certain rural areas, larger minimum parcel sizes in certain rural areas, and merger of substandard rural parcels, in order to protect agricultural water supplies from competing land uses.

Implementation Strategy WR 1.12.2 Require water supply assessments - Require applications for land divisions, which would increase density or intensity in groundwater basins with recommended or certified Levels of Severity II or III for water supply or water systems and are not in adjudication, to include a water supply assessment (WSA) prepared by the applicable urban water supplier (as defined by California Water Code Section 10617). The WSA should:

a. Determine whether the total projected water supplies for the project during the next 20 years will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural uses.
b. If water supplies will be insufficient, the WSA should include the water purveyor's plans for acquiring additional water supplies.
c. If there is no water purveyor, then the County will direct the preparation of the WSA at the subdivider's expense.

Goal 2 of the COSE Water Resources chapter states:

The County will collaboratively manage groundwater resources to ensure sustainable supplies for all beneficial uses.

Policies and Implementation Strategies in support of this goal include:

a. **Implementation Strategy WR 2.2.2 Improve well permit data collection** - Improve data obtained from well permit applications regarding location, depth, yield, use, flow direction, and water levels.

b. **Implementation Strategy WR 2.2.3 Pursue data collection from all groundwater wells** - Secure right of access to all new key wells together with retaining voluntary access to existing wells having useful histories to ensure that the County's investment in these records is protected. Develop a data collection program by seeking permission from each of the well owners for County use with identification of the land owner protected from public or other uses and individual data shall remain confidential.

c. **Implementation Strategy WR 2.2.4 Groundwater data collection from water purveyors** - Require, to the extent feasible, all water purveyors with five or more connections to report monthly pumping data to the Department of Planning and Building on an annual basis for use in the Resource Management System.

d. **Implementation Strategy WR 2.2.5 Groundwater data collection for new development** - Condition discretionary land use permits for new, nonagricultural uses in groundwater basins with a recommended or certified Level of Severity I, II, or III to monitor and report water use to the Department of Planning and Building on an annual basis for use in the Resource Management System.

Agriculture Element

The Agriculture Element addresses priority of groundwater use. The Element states:

AGP11: Agricultural Water Supplies.

a. Maintain water resources for production agriculture, both in quality and quantity, so as to prevent the loss of agriculture due to competition for water with urban and suburban development.
b. Do not approve proposed general plan amendments or rezonings that result in increased residential density or urban expansion if the subsequent development would adversely affect: (1) water supplies and quality, or (2) groundwater recharge capability needed for agricultural use.
c. Do not approve facilities to move groundwater from areas of overdraft to any other area, as determined by the Resource Management System in the Land Use Element.

<u>LOS Criteria</u>

For water supply, the RMS defines levels of severity in relation to the time it would take for the resource to be used to its capacity, as follows:

LOS I	Level I is reached for a water resource when increasing water demand projected over nine years equals or exceeds the estimated dependable supply.
LOS II	Level II for a water resource occurs when water demand projected over seven years (or other lead time determined by a resource capacity study) equals or exceeds the estimated dependable supply.
LOS III	A Level of Severity III exists when water demand equals the available resource; the amount of consumption has reached the dependable supply of the resource.

According to the above table, a Level of Severity III (LOS III) can be established if a basin has reached its perennial yield *or dependable supply will be depleted before new supplies are developed* (emphasis added). The water forecasts in Attachments 5-12 indicate that perennial yield will be reached in the Paso Robles basin anywhere from 2010 to 2025. With the exception of unallocated Nacimiento Project water, no additional supplemental water supplies are on the horizon.

A Level of Severity I is recommended for the Atascadero Sub-basin. According to the sub-basin water balance scenario (Attachment 13), perennial yield will be reached in the years 2019-2021. This nine-year period corresponds to an LOS I.

RECOMMENDATIONS

A Level of Severity III is recommended for the Paso Robles Groundwater Basin. Recommended actions are divided into monitoring and land use measures.

A. Paso Robles Groundwater Basin

Recommended Level of Severity: **III**

Recommended Monitoring Actions: (The following actions A1-6 also apply to the Atascadero Sub basin)

1. The County should initiate the development of a groundwater monitoring program for approval by the Board of Supervisors and with elements that can be adopted by ordinance. The program should, at a minimum, address groundwater level and usage data collection. Effort to develop the program should include town-hall meetings to ensure stakeholder involvement. Issues to be addressed during the development of the program would include, but not be limited to, gaps in the existing monitoring network, voluntary versus non-voluntary participation, distinguishing how different users (urban, agricultural, rural) would be involved/affected/not affected, education and outreach, understanding what other amendments to County Code related to groundwater data collection are being developed, and the legal authorities of the County/District. The program should be consistent with the following:

    a. California Statewide Groundwater Elevations Monitoring Program (CASGEM – Senate Bill X7 6)

    b. District and stakeholder efforts on the Groundwater Management Plan now under preparation.

    c. The Countywide Master Water Plan

    d. Current monitoring programs of the Department of Public Works

2. Continue studies of the groundwater basin and stakeholder coordination efforts including the update and improvement of the numerical groundwater model and establishing a mechanism to fund these ongoing efforts (e.g. zone of benefit; groundwater district).

3. The County will develop and implement, in collaboration with other water purveyors within the Paso Robles Groundwater Basin and the Atascadero Sub-basin, a water conservation outreach and education program for the rural area. The outreach program will inform rural groundwater users of the state of the basin, include suggested conservation and efficiency measures, and if possible, provide incentives to water conservation and efficiency efforts.

4. The District will continue to conduct biannual groundwater measurements to chart the scope of groundwater level changes.

5. Title 8 of the County Code will be amended in accordance with the recommendations in the Resource Management System Annual Summary Report.

6. The County will require that the new wells be a part of the District groundwater level measuring program if needed.

Recommended Land Use Actions: The following actions 7, 8, 9, 10 and 12 do not apply to the Atascadero Sub basin.

7. In urban areas (defined as lands located within the County Land Use Element's Urban Reserve Lines) that do not have access to supplemental water (e.g. Nacimiento Project water), require new discretionary development that uses groundwater to use the California Urban Water Conservation Council's (CUWCC) best management practices for water conservation and offset 100 percent of its new water use with non-agricultural water.

   No land use restrictions are imposed on development applications by this RCS in urban areas (defined as lands located within the County's Urban Reserve Lines) of the basin, including LAFCo Spheres of Influence for incorporated cities, if the following requirements are met:

   a. the project has access to supplemental water;
   b. the development application is accompanied by a "will-serve" letter from a water purveyor that has access to supplemental water; and
   c. the site of the proposed development will be annexed and developed within a city.

8. In unincorporated rural areas of the basin defined as lands located outside the County Land Use Element's Urban Reserve Lines:

   a. Do not approve General Plan amendments that result in a net increase in the non-agricultural use of groundwater;
   b. Prohibit new land divisions in the rural areas of the basin;
   c. All discretionary development shall offset its water use with non-agricultural water, except that proposed Agricultural Processing uses (as defined in the Land Use Ordinance), including outdoor and other appurtenant water use, shall be subject to project-specific land use and/or water conservation mitigation measures required by the review authority based on environmental review.

9. New wineries shall use best management practices consistent with the BMP's identified in Attachment 14.

10. Revise the Growth Management Ordinance and the Resource Management System to substantially limit yearly non-agricultural development in the rural areas of the basin.

11. The County will develop a landscape ordinance that will limit the amount of turf and other high-water use features on all parcels within the Paso Robles Groundwater Basin, Including the Atascadero Sub-basin.

12. The Department shall work with stakeholders to develop best management practices for prevalent land uses in the basin similar to the winery BMP developed by the Paso Robles Wine County Alliance.

B. Atascadero Sub-basin

Recommended Level of Severity: **I**

1. Support and actively facilitate collaborative efforts among the Atascadero Mutual Water Company, the Templeton CSD and the City of Paso Robles in their efforts, to develop recycled water programs and subscribe to and deliver additional Nacimiento Water as needed to help keep outflows from exceeding inflows to continue to expand their water conservation efforts.

Attachments:

1. Map of the Basin and subareas
2. Groundwater elevations (2000)
3. Groundwater elevations (2006)
4. Estrella/Creston Area of Concern
5. Scenario 1
6. Scenario 2
7. Scenario 3
8. Scenario 4
9. Scenario 5
10. Scenario 6
11. Scenario 7
12. Scenario 8
13. Atascadero Sub-basin Scenario
14. Winery Best Management Practices

References:

1. Todd Engineers; Update for the Paso Robles Groundwater Basin, December 2007

2. Fugro; Final Report; Paso Robles Groundwater Basin Study – Phase II; February 2005

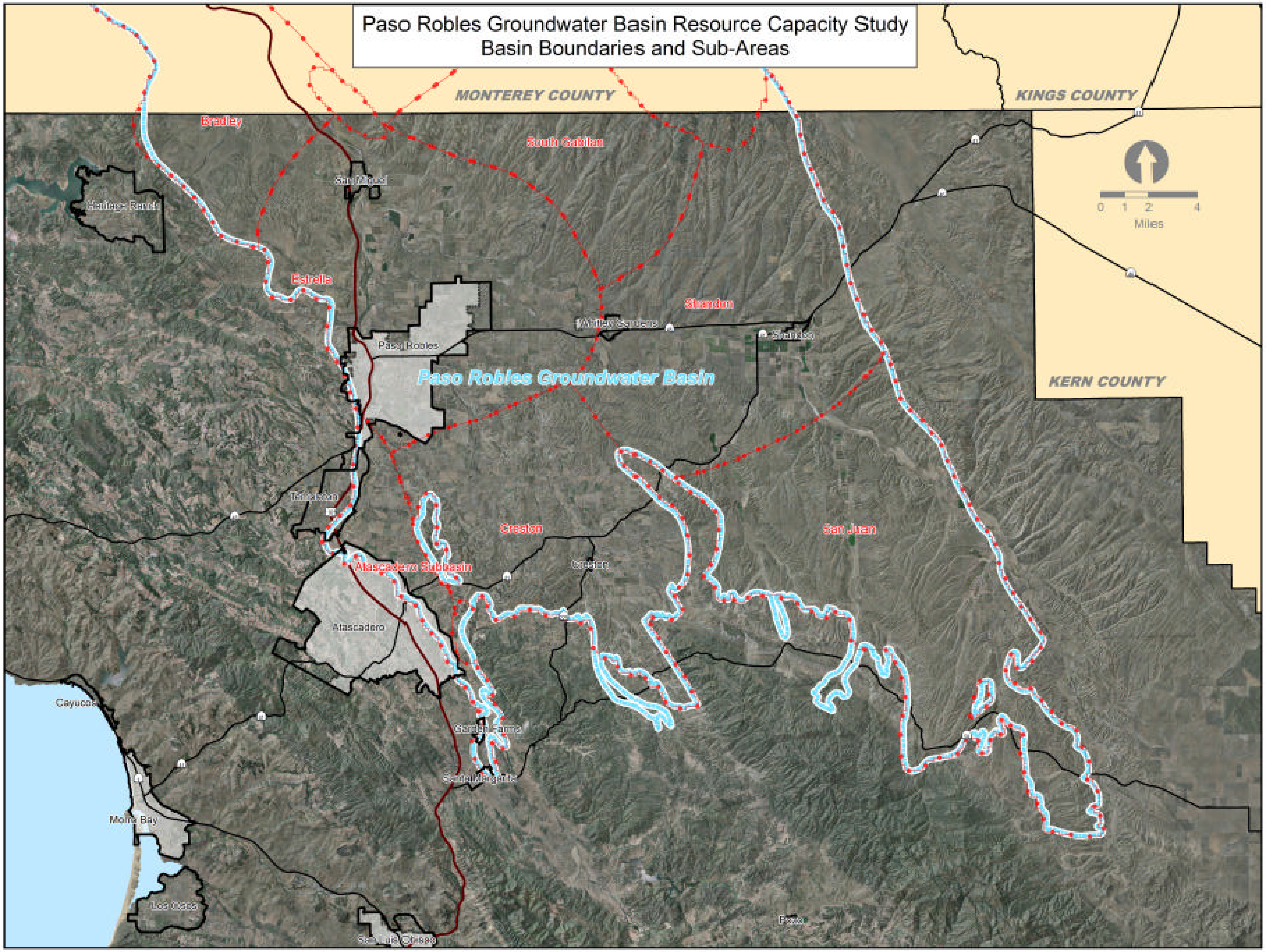
3. Fugro; Final Report; Paso Robles Groundwater Basin Study – Phase I; August 2002

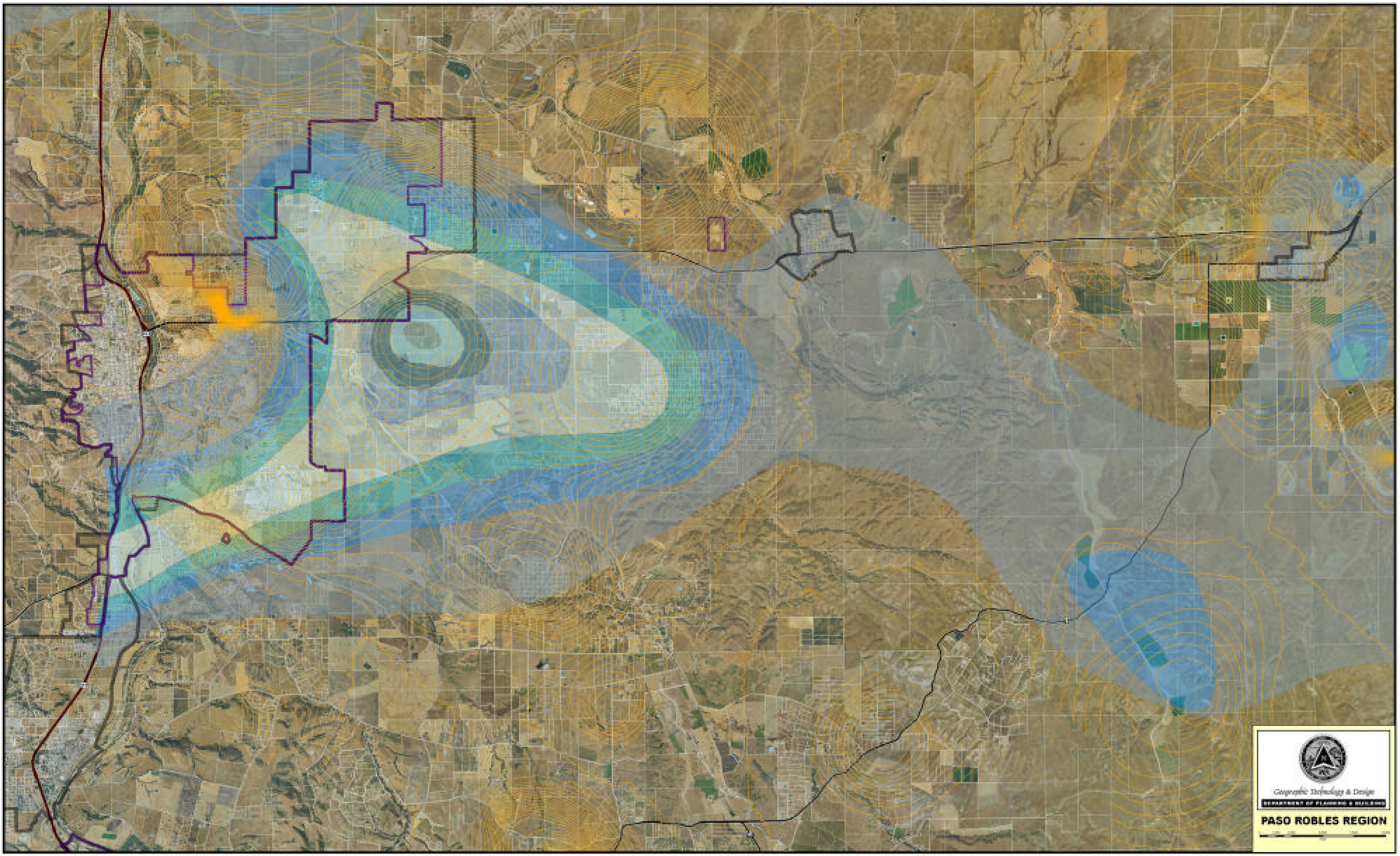
5. Todd Engineers; Evaluation of Paso Robles Groundwater Basin Pumping, Water Year 2006; May 2009

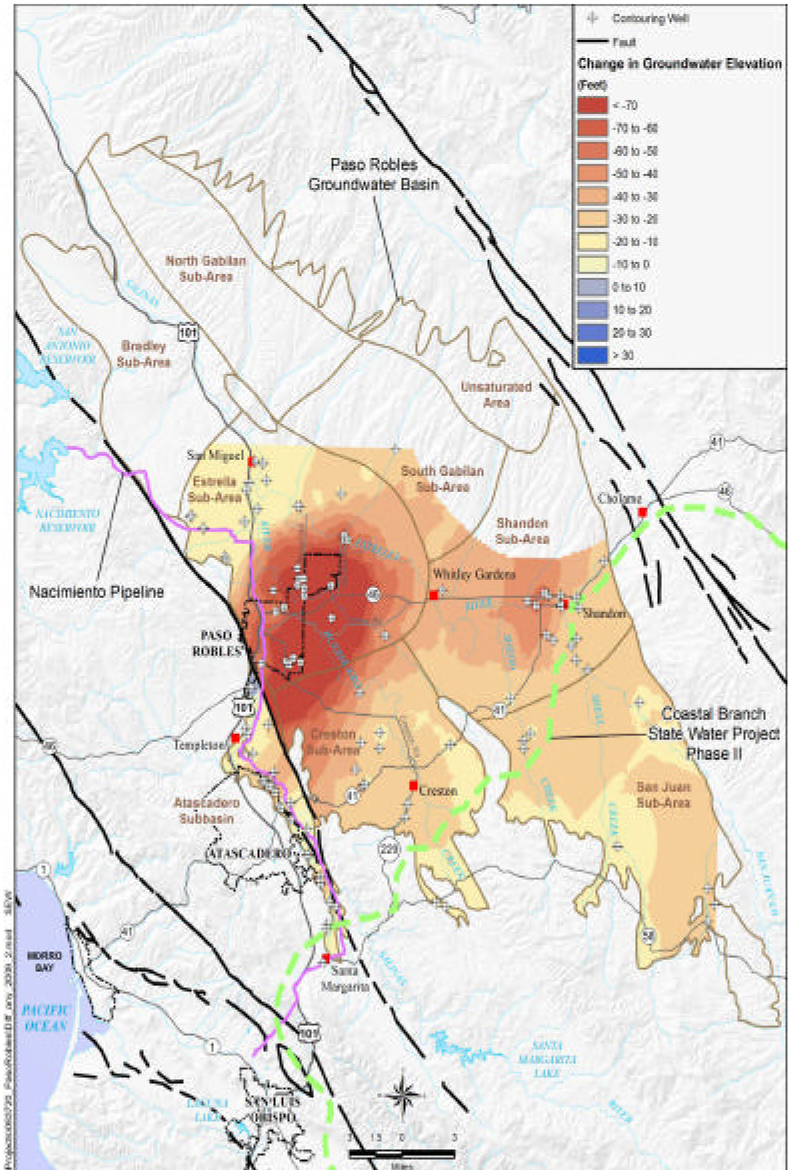
6. Fugro; Paso Robles Groundwater Basin Water Balance Review and Update; March 2010
7. Yates; Peer Review of Paso Robles Groundwater Studies

All of these technical studies are available on the Flood Control and Water Conservation District's website at www.slocountywater.org

Paso Robles Groundwater Basin Resource Capacity Study
Basin Boundaries and Sub-Areas




Geographic Technology & Design
DEPARTMENT OF PLANNING & BUILDING
PASO ROBLES REGION



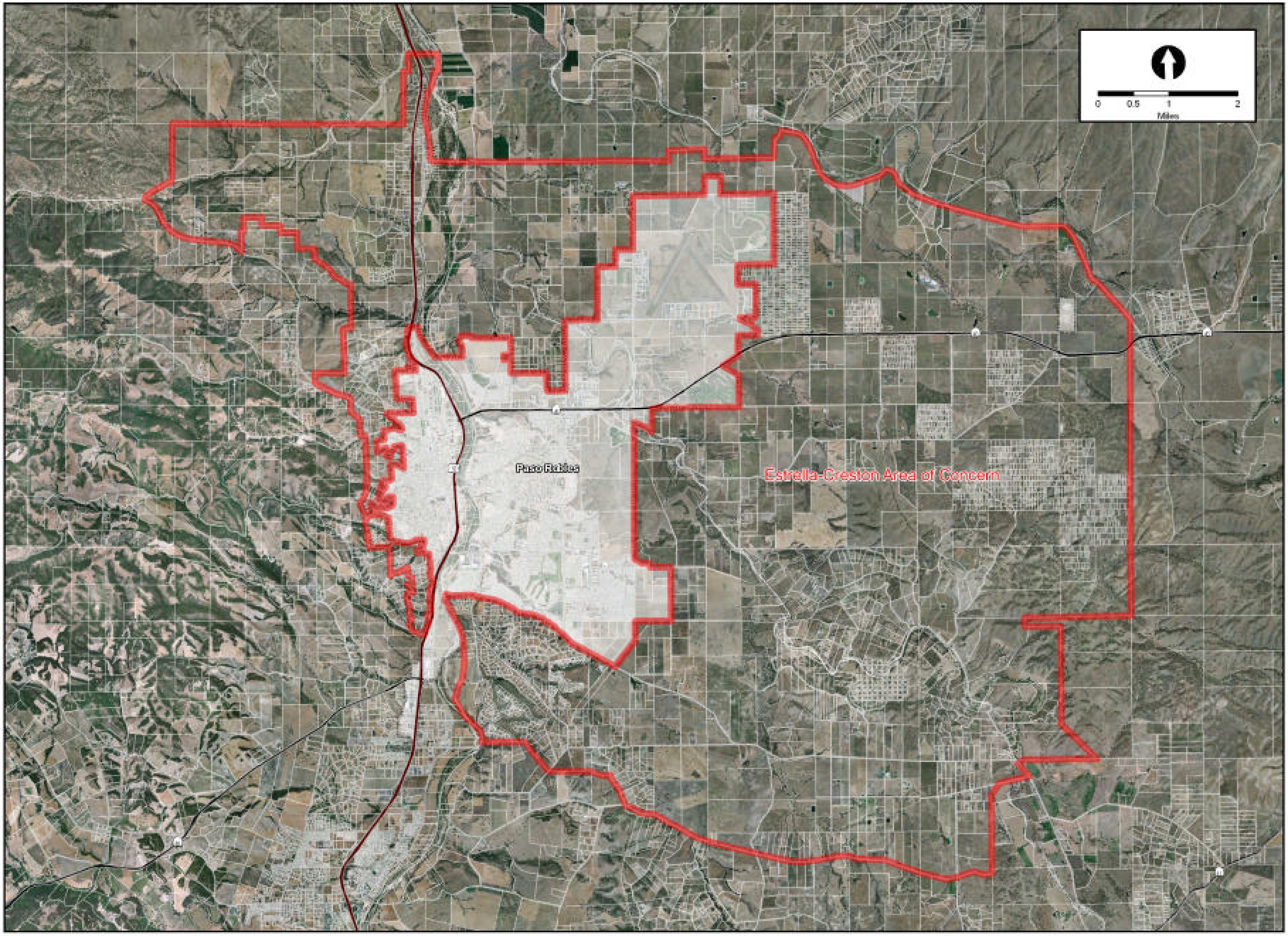
Paso Robles Groundwater Basin
Regional Groundwater Management Plan

City of Paso Robles
San Luis Obispo County, California

GEI Consultants

DIFFERENCE IN SPRING GROUNDWATER ELEVATION
1997 - 2009

MAY 2010 | DRAFT | FIGURE 2-3


Paso Robles
Estrella-Creston Area of Concern
0
0.5
1
2
Miles

Attachment 5

Paso Robles Groundwater Basin

Scenario 1

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,409	4,961	6,009	1,368	**32,157**	600	64,023	14,720	12,018	2,736	1,728	**95,825**	-63,669	-63,669
2011	11,810	339,592	108,688	1,430	5,062	6,111	1,423	**474,116**	600	64,984	13,970	12,222	2,846	6,390	**101,011**	373,104	309,435
2012	7,577	321	51,092	1,451	5,111	6,215	1,480	**73,247**	600	65,958	14,606	12,430	2,960	3,938	**100,492**	-27,245	282,191
2013	8,828	3,373	68,771	1,473	5,194	6,321	1,539	**95,498**	600	66,948	13,677	12,641	3,078	4,660	**101,604**	-6,105	276,085
2014	12,511	318,645	103,408	1,495	5,317	6,428	1,601	**449,405**	600	67,952	15,141	12,856	3,201	6,784	**106,534**	342,870	618,956
2015	5,142	0	26,644	1,517	5,437	6,537	1,665	**46,942**	600	68,971	15,107	13,075	3,329	2,533	**103,615**	-56,673	562,283
2016	6,876	12	44,369	1,540	5,561	6,649	1,731	**66,738**	600	70,006	16,066	13,297	3,462	3,536	**106,967**	-40,229	522,054
2017	7,573	8,986	35,181	1,563	5,687	6,762	1,800	**67,552**	600	71,056	13,503	13,523	3,601	3,936	**106,219**	-38,666	483,387
2018	3,626	0	14,269	1,587	5,817	6,876	1,872	**34,048**	600	72,122	12,860	13,753	3,745	1,659	**104,738**	-70,691	412,697
2019	4,599	0	41,206	1,610	5,950	6,993	1,947	**62,306**	600	73,203	14,859	13,987	3,895	2,220	**108,764**	-46,458	366,239
2020	3,943	0	12,734	1,635	6,085	7,112	2,025	**33,534**	600	74,301	14,528	14,225	4,050	1,842	**109,546**	-76,012	290,227
2021	13,033	214,856	98,220	1,659	6,225	7,233	2,106	**343,332**	600	75,416	15,230	14,466	4,212	7,085	**117,010**	226,323	516,550
2022	8,751	12,997	49,650	1,684	6,368	7,356	2,190	**88,997**	600	76,547	15,699	14,712	4,381	4,615	**116,554**	-27,558	488,992
2023	3,510	0	1,500	1,709	6,515	7,481	2,278	**22,994**	600	77,695	15,922	14,962	4,556	1,592	**115,328**	-92,334	396,658
2024	6,499	316	41,834	1,735	6,665	7,608	2,369	**67,026**	600	78,861	15,244	15,217	4,738	3,316	**117,976**	-50,949	345,708
2025	4,691	0	19,386	1,761	6,820	7,738	2,464	**42,860**	600	80,044	16,750	15,475	4,928	2,273	**120,070**	-77,210	268,498

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700 AFY.

- Agricultural Groundwater Pumping increase by 1.5%/yr
- Rural/Small Community Groundwater Pumping increase by 1.7%/yr
- Small Commercial Groundwater Pumping increase by 4%/yr
- Vineyard water use 1.25-1.50 acre-feet/year/acre
- Rural pumping 1.7 acre-feet/year/acre

Attachment 6
Paso Robles Groundwater Basin
Scenario 2

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,429	4,961	6,109	1,421	**32,330**	600	64,969	14,720	12,219	2,841	1,728	**97,078**	-64,747	-64,747
2011	11,810	339,592	108,688	1,472	5,062	6,317	1,534	**474,476**	600	66,918	13,970	12,634	3,069	6,390	**103,581**	370,894	306,147
2012	7,577	321	51,092	1,516	5,111	6,532	1,657	**73,806**	600	68,926	14,606	13,064	3,314	3,938	**104,448**	-30,642	275,506
2013	8,828	3,373	68,771	1,562	5,194	6,754	1,790	**96,272**	600	70,994	13,677	13,508	3,579	4,660	**107,018**	-10,747	264,759
2014	12,511	318,645	103,408	1,609	5,317	6,984	1,933	**450,406**	600	73,124	15,141	13,967	3,866	6,784	**113,482**	336,925	601,684
2015	5,142	0	26,644	1,657	5,437	7,221	2,088	**48,189**	600	75,317	15,107	14,442	4,175	2,533	**112,174**	-63,986	537,698
2016	6,876	12	44,369	1,707	5,561	7,467	2,255	**68,246**	600	77,577	16,066	14,933	4,509	3,536	**117,221**	-48,975	488,723
2017	7,573	8,986	35,181	1,758	5,687	7,720	2,435	**69,340**	600	79,904	13,503	15,441	4,870	3,936	**118,254**	-48,913	439,809
2018	3,626	0	14,269	1,811	5,817	7,983	2,630	**36,135**	600	82,301	12,860	15,966	5,259	1,659	**118,645**	-82,510	357,299
2019	4,599	0	41,206	1,865	5,950	8,254	2,840	**64,714**	600	84,770	14,859	16,509	5,680	2,220	**124,638**	-59,924	297,375
2020	3,943	0	12,734	1,921	6,085	8,535	3,067	**36,285**	600	87,313	14,528	17,070	6,135	1,842	**127,488**	-91,203	206,173
2021	13,033	214,856	98,220	1,979	6,225	8,825	3,313	**346,450**	600	89,933	15,230	17,650	6,625	7,085	**137,123**	209,327	415,500
2022	8,751	12,997	49,650	2,038	6,368	9,125	3,578	**92,507**	600	92,631	15,699	18,250	7,155	4,615	**138,951**	-46,444	369,056
2023	3,510	0	1,500	2,099	6,515	9,435	3,864	**26,923**	600	95,410	15,922	18,871	7,728	1,592	**140,122**	-113,199	255,857
2024	6,499	316	41,834	2,162	6,665	9,756	4,173	**71,405**	600	98,272	15,244	19,513	8,346	3,316	**145,290**	-73,885	181,972
2025	4,691	0	19,386	2,227	6,820	10,088	4,507	**47,719**	600	101,220	16,750	20,176	9,014	2,273	**150,033**	-102,314	79,658

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700.

- Agricultural Groundwater Pumping increase by 3.0%/yr
- Rural/Small Community Groundwater Pumping increase by 3.4%/yr
- Small Commercial Groundwater Pumping increase by 8.0%/yr
- Vineyard water use 1.25-1.50 acre-feet/year/acre
- Rural pumping 1.7 acre-feet/year/acre

Attachment 7
Paso Robles Groundwater Basin
Scenario 3

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,218	4,961	6,009	1,368	**31,966**	600	55,362	14,720	12,018	2,736	1,728	**87,164**	-55,198	-55,198
2011	11,810	339,592	108,688	1,236	5,062	6,111	1,423	**473,922**	600	56,192	13,970	12,222	2,846	6,390	**92,220**	381,702	326,504
2012	7,577	321	51,092	1,255	5,111	6,215	1,480	**73,051**	600	57,035	14,606	12,430	2,960	3,938	**91,569**	-18,518	307,985
2013	8,828	3,373	68,771	1,274	5,194	6,321	1,539	**95,299**	600	57,891	13,677	12,641	3,078	4,660	**92,547**	2,752	310,738
2014	12,511	318,645	103,408	1,293	5,317	6,428	1,601	**449,202**	600	58,759	15,141	12,856	3,201	6,784	**97,341**	351,861	662,599
2015	5,142	0	26,644	1,312	5,437	6,537	1,665	**46,737**	600	59,641	15,107	13,075	3,329	2,533	**94,284**	-47,547	615,051
2016	6,876	12	44,369	1,332	5,561	6,649	1,731	**66,529**	600	60,535	16,066	13,297	3,462	3,536	**97,496**	-30,967	584,084
2017	7,573	8,986	35,181	1,352	5,687	6,762	1,800	**67,341**	600	61,443	13,503	13,523	3,601	3,936	**96,606**	-29,265	554,819
2018	3,626	0	14,269	1,372	5,817	6,876	1,872	**33,833**	600	62,365	12,860	13,753	3,745	1,659	**94,982**	-61,149	493,670
2019	4,599	0	41,206	1,393	5,950	6,993	1,947	**62,088**	600	63,300	14,859	13,987	3,895	2,220	**98,861**	-36,772	456,898
2020	3,943	0	12,734	1,413	6,085	7,112	2,025	**33,313**	600	64,250	14,528	14,225	4,050	1,842	**99,495**	-66,182	390,716
2021	13,033	214,856	98,220	1,435	6,225	7,233	2,106	**343,108**	600	65,214	15,230	14,466	4,212	7,085	**106,807**	236,301	627,017
2022	8,751	12,997	49,650	1,456	6,368	7,356	2,190	**88,769**	600	66,192	15,699	14,712	4,381	4,615	**106,199**	-17,430	609,587
2023	3,510	0	1,500	1,478	6,515	7,481	2,278	**22,762**	600	67,185	15,922	14,962	4,556	1,592	**104,817**	-82,055	527,532
2024	6,499	316	41,834	1,500	6,665	7,608	2,369	**66,792**	600	68,192	15,244	15,217	4,738	3,316	**107,307**	-40,516	487,016
2025	4,691	0	19,386	1,523	6,820	7,738	2,464	**42,621**	600	69,215	16,750	15,475	4,928	2,273	**109,242**	-66,620	420,396

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700 AFY.

- Agricultural Groundwater Pumping increase by 1.5%/yr
- Rural/Small Community Groundwater Pumping increase by 1.7%/yr
- Small Commercial Groundwater Pumping increase by 4%/yr
- Vineyard water use 1.00-1.25 acre-feet/year/acre
- Rural pumping 1.7 acre-feet/year/acre

Attachment 8
Paso Robles Groundwater Basin
Scenario 4

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	RuralSmall Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	RuralSmall Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,026	4,961	6,009	1,368	**31,774**	600	46,621	14,720	12,018	2,736	1,728	**78,423**	-46,649	-46,649
2011	11,810	339,592	108,688	1,041	5,062	6,111	1,423	**473,727**	600	47,320	13,970	12,222	2,846	6,390	**83,348**	390,379	343,729
2012	7,577	321	51,092	1,057	5,111	6,215	1,480	**72,852**	600	48,030	14,606	12,430	2,960	3,938	**82,564**	-9,711	334,018
2013	8,828	3,373	68,771	1,073	5,194	6,321	1,539	**95,098**	600	48,751	13,677	12,641	3,078	4,660	**83,407**	11,691	345,710
2014	12,511	318,645	103,408	1,089	5,317	6,428	1,601	**448,998**	600	49,482	15,141	12,856	3,201	6,784	**88,064**	360,934	706,644
2015	5,142	0	26,644	1,105	5,437	6,537	1,665	**46,530**	600	50,224	15,107	13,075	3,329	2,533	**84,868**	-38,338	668,306
2016	6,876	12	44,369	1,122	5,561	6,649	1,731	**66,319**	600	50,977	16,066	13,297	3,462	3,536	**87,939**	-21,620	646,686
2017	7,573	8,986	35,181	1,138	5,687	6,762	1,800	**67,127**	600	51,742	13,503	13,523	3,601	3,936	**86,905**	-19,778	626,909
2018	3,626	0	14,269	1,155	5,817	6,876	1,872	**33,616**	600	52,518	12,860	13,753	3,745	1,659	**85,135**	-51,519	575,390
2019	4,599	0	41,206	1,173	5,950	6,993	1,947	**61,868**	600	53,306	14,859	13,987	3,895	2,220	**88,866**	-26,998	548,392
2020	3,943	0	12,734	1,190	6,085	7,112	2,025	**33,090**	600	54,106	14,528	14,225	4,050	1,842	**89,350**	-56,261	492,131
2021	13,033	214,856	98,220	1,208	6,225	7,233	2,106	**342,882**	600	54,917	15,230	14,466	4,212	7,085	**96,511**	246,371	738,502
2022	8,751	12,997	49,650	1,226	6,368	7,356	2,190	**88,539**	600	55,741	15,699	14,712	4,381	4,615	**95,748**	-7,209	731,293
2023	3,510	0	1,500	1,245	6,515	7,481	2,278	**22,529**	600	56,577	15,922	14,962	4,556	1,592	**94,209**	-71,681	659,612
2024	6,499	316	41,834	1,263	6,665	7,608	2,369	**66,555**	600	57,426	15,244	15,217	4,738	3,316	**96,541**	-29,986	629,626
2025	4,691	0	19,386	1,282	6,820	7,738	2,464	**42,381**	600	58,287	16,750	15,475	4,928	2,273	**98,313**	-55,932	573,694

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700 AFY.

- Agricultural Groundwater Pumping increase by 1.5%/yr
- Rural/Small Community Groundwater Pumping increase by 1.7%/yr
- Small Commercial Groundwater Pumping increase by 4%/yr
- Vineyard water use 0.75-1.00 acre-feet/year/acre
- Rural pumping 1.7 acre-feet/year/acre

Attachment 9
Paso Robles Groundwater Basin
Scenario 5

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,218	4,961	6,109	1,421	**32,119**	600	55,362	14,720	12,219	2,841	1,728	**87,470**	-55,351	-55,351
2011	11,810	339,592	108,688	1,255	5,062	6,317	1,534	**474,258**	600	57,023	13,970	12,634	3,069	6,390	**93,686**	380,572	325,221
2012	7,577	321	51,092	1,292	5,111	6,532	1,657	**73,582**	600	58,734	14,606	13,064	3,314	3,938	**94,256**	-20,673	304,548
2013	8,828	3,373	68,771	1,331	5,194	6,754	1,790	**96,041**	600	60,496	13,677	13,508	3,579	4,660	**96,520**	-479	304,068
2014	12,511	318,645	103,408	1,371	5,317	6,984	1,933	**450,168**	600	62,310	15,141	13,967	3,866	6,784	**102,668**	347,500	651,568
2015	5,142	0	26,644	1,412	5,437	7,221	2,088	**47,944**	600	64,180	15,107	14,442	4,175	2,533	**101,037**	-53,093	598,475
2016	6,876	12	44,369	1,454	5,561	7,467	2,255	**67,993**	600	66,105	16,066	14,933	4,509	3,536	**105,749**	-37,756	560,719
2017	7,573	8,986	35,181	1,498	5,687	7,720	2,435	**69,080**	600	68,088	13,503	15,441	4,870	3,936	**106,438**	-37,358	523,361
2018	3,626	0	14,269	1,543	5,817	7,983	2,630	**35,867**	600	70,131	12,860	15,966	5,259	1,659	**106,475**	-70,608	452,753
2019	4,599	0	41,206	1,589	5,950	8,254	2,840	**64,439**	600	72,235	14,859	16,509	5,680	2,220	**112,103**	-47,664	405,089
2020	3,943	0	12,734	1,637	6,085	8,535	3,067	**36,001**	600	74,402	14,528	17,070	6,135	1,842	**114,576**	-78,575	326,514
2021	13,033	214,856	98,220	1,686	6,225	8,825	3,313	**346,158**	600	76,634	15,230	17,650	6,625	7,085	**123,825**	222,333	548,847
2022	8,751	12,997	49,650	1,737	6,368	9,125	3,578	**92,205**	600	78,933	15,699	18,250	7,155	4,615	**125,253**	-33,047	515,800
2023	3,510	0	1,500	1,789	6,515	9,435	3,864	**26,613**	600	81,301	15,922	18,871	7,728	1,592	**126,014**	-99,401	416,399
2024	6,499	316	41,834	1,842	6,665	9,756	4,173	**71,086**	600	83,740	15,244	19,513	8,346	3,316	**130,759**	-59,673	356,726
2025	4,691	0	19,386	1,898	6,820	10,088	4,507	**47,389**	600	86,252	16,750	20,176	9,014	2,273	**135,065**	-87,675	269,051

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700 AFY.

- Agricultural Groundwater Pumping increase by 3.0%/yr
- Rural/Small Community Groundwater Pumping increase by 3.4%/yr
- Small Commercial Groundwater Pumping increase by 8.0%/yr
- Vineyard water use 1.00-1.25 acre-feet/year/acre
- Rural pumping 1.7 acre-feet/year/acre

Attachment 10

Paso Robles Groundwater Basin

Scenario 6

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,026	4,961	6,109	1,421	**31,927**	600	46,621	14,720	12,219	2,841	1,728	**78,729**	-46,802	-46,802
2011	11,810	339,592	108,688	1,056	5,062	6,317	1,534	**474,060**	600	48,020	13,970	12,634	3,069	6,390	**84,683**	389,377	342,575
2012	7,577	321	51,092	1,088	5,111	6,532	1,657	**73,378**	600	49,460	14,606	13,064	3,314	3,938	**84,982**	-11,604	330,971
2013	8,828	3,373	68,771	1,121	5,194	6,754	1,790	**95,830**	600	50,944	13,677	13,508	3,579	4,660	**86,968**	8,862	339,833
2014	12,511	318,645	103,408	1,154	5,317	6,984	1,933	**449,952**	600	52,472	15,141	13,967	3,866	6,784	**92,830**	357,122	696,954
2015	5,142	0	26,644	1,189	5,437	7,221	2,088	**47,721**	600	54,047	15,107	14,442	4,175	2,533	**90,904**	-43,183	653,771
2016	6,876	12	44,369	1,225	5,561	7,467	2,255	**67,764**	600	55,668	16,066	14,933	4,509	3,536	**95,312**	-27,548	626,223
2017	7,573	8,986	35,181	1,261	5,687	7,720	2,435	**68,844**	600	57,338	13,503	15,441	4,870	3,936	**95,688**	-26,844	599,379
2018	3,626	0	14,269	1,299	5,817	7,983	2,630	**35,624**	600	59,058	12,860	15,966	5,259	1,659	**95,402**	-59,778	539,601
2019	4,599	0	41,206	1,338	5,950	8,254	2,840	**64,188**	600	60,830	14,859	16,509	5,680	2,220	**100,698**	-36,510	503,091
2020	3,943	0	12,734	1,378	6,085	8,535	3,067	**35,743**	600	62,655	14,528	17,070	6,135	1,842	**102,829**	-67,087	436,004
2021	13,033	214,856	98,220	1,420	6,225	8,825	3,313	**345,892**	600	64,534	15,230	17,650	6,625	7,085	**111,725**	234,167	670,171
2022	8,751	12,997	49,650	1,462	6,368	9,125	3,578	**91,931**	600	66,470	15,699	18,250	7,155	4,615	**112,790**	-20,859	649,312
2023	3,510	0	1,500	1,506	6,515	9,435	3,864	**26,331**	600	68,465	15,922	18,871	7,728	1,592	**113,177**	-86,847	562,465
2024	6,499	316	41,834	1,551	6,665	9,756	4,173	**70,795**	600	70,518	15,244	19,513	8,346	3,316	**117,537**	-46,742	515,723
2025	4,691	0	19,386	1,598	6,820	10,088	4,507	**47,090**	600	72,634	16,750	20,176	9,014	2,273	**121,447**	-74,357	441,366

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700 AFY.

- Agricultural Groundwater Pumping increase by 3.0%/yr
- Rural/Small Community Groundwater Pumping increase by 3.4%/yr
- Small Commercial Groundwater Pumping increase by 8.0%/yr
- Vineyard water use 0.75-1.00 acre-feet/year/acre
- Rural pumping 1.7 acre-feet/year/acre

Attachment 11
Paso Robles Groundwater Basin
Scenario 7

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,409	4,961	3,535	1,368	**29,682**	600	64,023	14,720	7,069	2,736	1,728	**90,877**	-61,194	-61,194
2011	11,810	339,592	108,688	1,430	5,062	3,595	1,423	**471,599**	600	64,984	13,970	7,190	2,846	6,390	**95,979**	375,621	314,426
2012	7,577	321	51,092	1,451	5,111	3,656	1,480	**70,688**	600	65,958	14,606	7,312	2,960	3,938	**95,374**	-24,686	289,740
2013	8,828	3,373	68,771	1,473	5,194	3,718	1,539	**92,896**	600	66,948	13,677	7,436	3,078	4,660	**96,399**	-3,503	286,238
2014	12,511	318,645	103,408	1,495	5,317	3,781	1,601	**446,758**	600	67,952	15,141	7,562	3,201	6,784	**101,240**	345,517	631,755
2015	5,142	0	26,644	1,517	5,437	3,846	1,665	**44,250**	600	68,971	15,107	7,691	3,329	2,533	**98,231**	-53,981	577,774
2016	6,876	12	44,369	1,540	5,561	3,911	1,731	**64,000**	600	70,006	16,066	7,822	3,462	3,536	**101,492**	-37,492	540,283
2017	7,573	8,986	35,181	1,563	5,687	3,977	1,800	**64,768**	600	71,056	13,503	7,955	3,601	3,936	**100,650**	-35,882	504,400
2018	3,626	0	14,269	1,587	5,817	4,045	1,872	**31,216**	600	72,122	12,860	8,090	3,745	1,659	**99,075**	-67,859	436,541
2019	4,599	0	41,206	1,610	5,950	4,114	1,947	**59,426**	600	73,203	14,859	8,227	3,895	2,220	**103,004**	-43,578	392,963
2020	3,943	0	12,734	1,635	6,085	4,184	2,025	**30,605**	600	74,301	14,528	8,367	4,050	1,842	**103,689**	-73,084	319,879
2021	13,033	214,856	98,220	1,659	6,225	4,255	2,106	**340,354**	600	75,416	15,230	8,510	4,212	7,085	**111,053**	229,301	549,181
2022	8,751	12,997	49,650	1,684	6,368	4,327	2,190	**85,968**	600	76,547	15,699	8,654	4,381	4,615	**110,496**	-24,529	524,652
2023	3,510	0	1,500	1,709	6,515	4,401	2,278	**19,913**	600	77,695	15,922	8,801	4,556	1,592	**109,167**	-89,254	435,398
2024	6,499	316	41,834	1,735	6,665	4,476	2,369	**63,894**	600	78,861	15,244	8,951	4,738	3,316	**111,710**	-47,817	387,581
2025	4,691	0	19,386	1,761	6,820	4,552	2,464	**39,673**	600	80,044	16,750	9,103	4,928	2,273	**113,698**	-74,024	313,557

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700 AFY.

- Agricultural Groundwater Pumping increase by 1.5%/yr
- Rural/Small Community Groundwater Pumping increase by 1.7%/yr
- Small Commercial Groundwater Pumping increase by 4%/yr
- Vineyard water use 1.25-1.50 acre-feet/year/acre
- Rural pumping 1.0 acre-feet/year/acre

Attachment 12
Paso Robles Groundwater Basin
Scenario 8

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	Total Outflow (acre-feet)	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	3,746	0	14,664	1,429	4,961	3,594	1,421	**29,815**	600	64,969	14,720	7,188	2,841	1,728	**92,046**	-62,231	-62,231
2011	11,810	339,592	108,688	1,472	5,062	3,716	1,534	**471,875**	600	66,918	13,970	7,432	3,069	6,390	**98,379**	373,495	311,264
2012	7,577	321	51,092	1,516	5,111	3,842	1,657	**71,117**	600	68,926	14,606	7,685	3,314	3,938	**99,069**	-27,952	283,312
2013	8,828	3,373	68,771	1,562	5,194	3,973	1,790	**93,491**	600	70,994	13,677	7,946	3,579	4,660	**101,456**	-7,966	275,346
2014	12,511	318,645	103,408	1,609	5,317	4,108	1,933	**447,531**	600	73,124	15,141	8,216	3,866	6,784	**107,730**	339,800	615,147
2015	5,142	0	26,644	1,657	5,437	4,248	2,088	**45,215**	600	75,317	15,107	8,495	4,175	2,533	**106,228**	-61,012	554,134
2016	6,876	12	44,369	1,707	5,561	4,392	2,255	**65,171**	600	77,577	16,066	8,784	4,509	3,536	**111,072**	-45,901	508,234
2017	7,573	8,986	35,181	1,758	5,687	4,541	2,435	**66,161**	600	79,904	13,503	9,083	4,870	3,936	**111,896**	-45,734	462,499
2018	3,626	0	14,269	1,811	5,817	4,696	2,630	**32,848**	600	82,301	12,860	9,392	5,259	1,659	**112,071**	-79,223	383,276
2019	4,599	0	41,206	1,865	5,950	4,855	2,840	**61,316**	600	84,770	14,859	9,711	5,680	2,220	**117,840**	-56,525	326,751
2020	3,943	0	12,734	1,921	6,085	5,021	3,067	**32,771**	600	87,313	14,528	10,041	6,135	1,842	**120,459**	-87,688	239,063
2021	13,033	214,856	98,220	1,979	6,225	5,191	3,313	**342,816**	600	89,933	15,230	10,383	6,625	7,085	**129,856**	212,961	452,024
2022	8,751	12,997	49,650	2,038	6,368	5,368	3,578	**88,749**	600	92,631	15,699	10,736	7,155	4,615	**131,436**	-42,686	409,337
2023	3,510	0	1,500	2,099	6,515	5,550	3,864	**23,038**	600	95,410	15,922	11,101	7,728	1,592	**132,352**	-109,314	300,024
2024	6,499	316	41,834	2,162	6,665	5,739	4,173	**67,388**	600	98,272	15,244	11,478	8,346	3,316	**137,256**	-69,868	230,156
2025	4,691	0	19,386	2,227	6,820	5,934	4,507	**43,565**	600	101,220	16,750	11,868	9,014	2,273	**141,725**	-98,160	131,996

Shaded areas represent outflows greater than safe yield.
Safe yield is 97,700 AFY.

- Agricultural Groundwater Pumping increase by 3.0%/yr
- Rural/Small Community Groundwater Pumping increase by 3.4%/yr
- Small Commercial Groundwater Pumping increase by 8.0%/yr
- Vineyard water use 1.25-1.50 acre-feet/year/acre
- Rural pumping 1.0 acre-feet/year/acre

Attachment 13
Atascadero Subbasin

Water Year	Subsurface Inflow (acre-feet)	Precipitation Percolation (acre-feet)	Streambed Percolation (acre-feet)	Irrigation Return Flow (acre-feet)	Urban Wastewater Discharge (acre-feet)	Rural/Small Community Wastewater Discharge (acre-feet)	Small Commercial Wastewater Discharge (acre-feet)	Total Inflow (acre-feet)	Subsurface Outflow (acre-feet)	Agricultural Groundwater Pumping (acre-feet)	Urban Groundwater Pumping (acre-feet)	Rural/Small Community Groundwater Pumping (acre-feet)	Small Commercial Groundwater Pumping (acre-feet)	Phreatophyte Extraction (acre-feet)	**Total Outflow (acre-feet)**	Annual Storage Change (acre-feet)	Cumulative Storage Change (acre-feet)
2010	398	0	6,966	33	1,542	924	244	**10,107**	150	1,492	10,673	1,848	487	81	**14,732**	-4,625	-4,625
2011	1,203	14,712	17,591	33	1,547	940	253	**36,279**	150	1,515	10,306	1,880	507	301	**14,658**	21,621	16,996
2012	781	1,548	11,083	34	1,554	956	263	**16,219**	150	1,538	11,385	1,912	527	185	**15,696**	523	17,519
2013	905	5,439	13,080	34	1,560	972	274	**22,264**	150	1,561	10,362	1,944	548	219	**14,784**	7,481	25,000
2014	1,273	16,893	16,994	35	1,571	989	285	**38,039**	150	1,584	11,692	1,977	570	320	**16,293**	21,746	46,746
2015	538	11	8,320	35	1,577	1,005	296	**11,783**	150	1,608	11,519	2,011	593	119	**15,999**	-4,216	42,530
2016	711	509	10,323	36	1,583	1,022	308	**14,493**	150	1,632	12,337	2,045	616	166	**16,946**	-2,454	40,077
2017	780	1,537	9,285	36	1,588	1,040	321	**14,587**	150	1,656	10,629	2,080	641	185	**15,341**	-754	39,322
2018	386	0	6,922	37	1,593	1,058	333	**10,329**	150	1,681	9,837	2,115	667	77	**14,527**	-4,198	35,124
2019	483	0	9,965	38	1,599	1,075	347	**13,507**	150	1,706	11,683	2,151	693	104	**16,488**	-2,981	32,143
2020	418	0	6,748	38	1,603	1,094	361	**10,261**	150	1,732	11,195	2,188	721	86	**16,072**	-5,810	26,333
2021	1,325	18,515	16,408	39	1,607	1,112	375	**39,381**	150	1,758	11,736	2,225	750	334	**16,953**	22,428	48,761
2022	898	5,198	10,920	39	1,611	1,131	390	**20,188**	150	1,784	12,040	2,263	780	217	**17,234**	2,954	51,715
2023	375	0	5,071	40	1,615	1,151	406	**8,657**	150	1,811	12,093	2,301	811	74	**17,240**	-8,583	43,131
2024	673	332	10,036	40	1,619	1,170	422	**14,292**	150	1,838	11,241	2,340	844	156	**16,569**	-2,277	40,855
2025	493	0	7,500	41	1,623	1,190	439	**11,286**	150	1,866	12,567	2,380	877	106	**17,946**	-6,660	34,194

Shaded areas represent outflows greater than safe yield.
Safe yield is 16,400 AFY.

- Agricultural Groundwater Pumping increase by 2.5%/yr
- Rural/Small Community Groundwater Pumping increase by 0.5%/yr
- Small Commercial Groundwater Pumping increase by 3%/yr
- Vineyard water use 1.25-1.50 acre-feet/year/acre
- Rural pumping 1.7 acre-feet/year/acre

Attachment 14

Winery Water Conservation Best Management Practices
Prepared for the Paso Robles Wine Community
By the Wine Industry Water Committee established July 20th, 2010

1. Conducting a Water Audit:

Water usage should be measured and tracked annually through a Water Audit to increase the potential for saving water by identifying areas where water is wasted or could be reused. The following steps should be used as a general guide to conducting a water audit.

- Identify the major water lines. Determine the quality, quantity, and temperature of water carried by each line.
- Identify all points where water is used, including hose connections. Determine the quantity of water used at each point.
- Determine the capacity and frequency of emptying for each water-containing unit.
- Determine the capacity of each continuous discharge not yet being reused.
- Determine flow rates in floor gutters and whether in the flows are adequate to prevent accumulation of solids.
- Review water use in visitor-serving areas (restrooms, kitchen, and outdoor paved areas).

Results of the audit should be used to make decisions on maintenance, capital improvements and employee training.

2. Employee Training:

Employees, managers, and operators should be encouraged to practice good water conserving measures and taught the importance of water conservation from a resource and business standpoint. Feedback on performance (i.e. monthly water usage) needs to be shared and discussed regularly.

3. Winemaking Operations:

Water conserving measures should be used for activities during the winemaking process including crush operations, press, tank, and barrel washing and barrel soaking. These measures should include, but not be limited to: a) conducting crush and press activities outside and covered wherever feasible to reduce "baking" of waste material on equipment surface; b) pre-cleaning with appropriate tools (e.g. a stiff brush or squeegee) should occur to loosen and remove large material before wash-down; c) use of a timing system, shut-off valve and/or hot water on high pressure washers or hoses for cleaning processing equipment, tanks, floors, etc. should be installed wherever feasible; d) wash down and barrel soaking is conducted with knowledge of wastewater or septic system capacity.

4. Written Procedures:

All written winery procedures should have water conservation elements included with specifics spelled out for rinse times, wash down, water conserving measures, etc.

5. Landscape:

a) Landscaping is drip-irrigated from recycled water, whenever feasible, and has automatic irrigation that is set to water all of the plants on an alternating day frequency; b) Irrigation lines are checked monthly for leaks, as well as defective emitters and sprinkler heads; c) 50% of the landscaping utilizes drought-tolerant plants; d) Mulch or compost is applied once a year; e) Turf is minimized.