

Table 5-6. Comparison of Roseville Water Demand Analysis to PCWA Analysis

	Initial Roseville analysis* ac-ft/yr	Revised Roseville analysis** ac-ft/yr	PCWA analysis (Scenario 2) ac-ft/yr	Notes
Existing Roseville	47,670	51,620	50,114	Roseville value includes areas served by PCWA and SJWD
West Roseville	6,800	7,491	15,856	PCWA value includes MOU 1 and 2
MOU 1 and 2	4,960	5,432	--***	
Roseville PCWA	--	--	1,070	
Roseville SJWD	--	--	962	
Total:	59,430	64,543	68,002	

Notes:

* City of Roseville, Evaluation of Water System Capacity – Water Demands Evaluation Technical Memorandum, MWH (February 26, 2002)

** City of Roseville, Evaluation of Water System Capacity – Water Demands Evaluation Technical Memorandum - Revised, MWH (November 6, 2002)

*** Included in West Roseville estimate.

ac-ft/yr = acre-feet per year

Total water demands indicate a five percent difference between the revised Roseville and the PCWA projections. Although the Roseville residential land use categories do not directly correlate with the land use categories in this analysis, the residential unit water demand factors are approximately equal. The Professional Office and Industrial land use category unit water demand factors are approximately equal, with Roseville’s Commercial category unit water demand slightly higher than the factor used in the PCWA analysis (2,598 gpd/ac versus 2,228 gpd/ac, respectively). The difference in total demands is attributed to the differences in land use designations and land use groupings between the two analyses, and to a higher West Roseville recycled water use in the PCWA analysis.

5.3.2 San Juan Water District

SJWD is currently developing a wholesale master plan and a retail master plan. The draft retail master plan developed ultimate build out demands for its retail area. The SJWD retail area covers both Placer County and the Sacramento County. The Placer County portion of the SJWD retail area includes the same areas that were evaluated in this Plan. Demand projections from both studies are summarized below in Table 5-7. As the table indicates, the two projections are within two percent, indicating the two studies are consistent in expected demands.

Table 5-7. Comparison of SJWD Water Demand Analysis to PCWA Analysis

	SJWD Draft Retail Master Plan	PCWA analysis (Scenario 2)	Notes
Areas included	Lower Granite Bay Upper Granite Bay Bacon Crown Point Sierra	Granite Bay, SJWD City of Roseville, SJWD	PCWA analysis area “Granite Bay CP” not used in comparison because SJWD analysis does not report this area separately. Total SJWD demand is 16,411 ac-ft/yr when this area is included
Gross acreage	8,475	8,195	
Net acreage	6,450	5,832	
Projected demand	15,930 ac-ft/yr	16,415 ac-ft/yr	PCWA projection is for buildout. SJWD projection is for 2025, but is expected to be at or near build out.

Note:

Values are for portion of SJWD service area in Placer County.

ac-ft/yr = acre-feet per year

CHAPTER 6 SURFACE WATER SUPPLIES

This chapter describes the watersheds within the west slope of Placer County and surface water supplies from the watersheds that are utilized in west Placer County.

6.1 Watersheds

Placer County lies within nine watersheds as defined by the California River Assessment (CARA) program initiated by the California Resources Agency. The nine watersheds and the Placer County boundary are shown in Figure 6-1. PCWA's contracted surface water supplies for western Placer County communities are obtained from three of these watersheds; the American River, the Yuba River, and the Bear River. The other surface water suppliers in Placer County, which are Nevada Irrigation District, Camp Far West Irrigation District, and South Sutter Water District, all receive their surface water supplies from the Bear River system (Upper and Lower Bear River). Figure 6-2 depicts the pertinent Sierra foothill watersheds and water agencies.

The American River watershed is divided into three main sub-watersheds above Folsom Lake, the North Fork, the Middle Fork, and the South Fork. PCWA only obtains its water supply from the North Fork and the Middle Fork. All of PCWA's water rights are within the American River watershed boundaries, but it does have contracts for water in the Yuba and Bear watersheds. All of PCWA's power system watershed boundary is within the Middle Fork watershed.

The Yuba River watershed is divided into the Upper Yuba and the Lower Yuba. Only the Yuba River South Fork of the Upper Yuba area is within PCWA's water source area. The Lower Yuba does not serve as a source for PCWA water. PCWA only receives water from a small portion of the Upper Yuba South Fork watershed, where the Drum-Spaulding Yuba-Bear project uses a series of reservoirs, canals, and tunnels to deliver water to the PCWA service area.

The Bear River watershed is divided into the Upper Bear and the Lower Bear. The Bear River serves as the boundary between Placer County and Nevada County, and also as the northern boundary of PCWA's service area. Portions of the Upper Bear River watershed are within PCWA's water source area. The Upper Bear River is also part of the Spaulding-Drum project on the Yuba and Bear rivers that brings water to PCWA's service area. The Lower Bear River watershed begins downstream of the Camp Far West Reservoir where Zone 5 is the only PCWA service area within its watershed boundary.

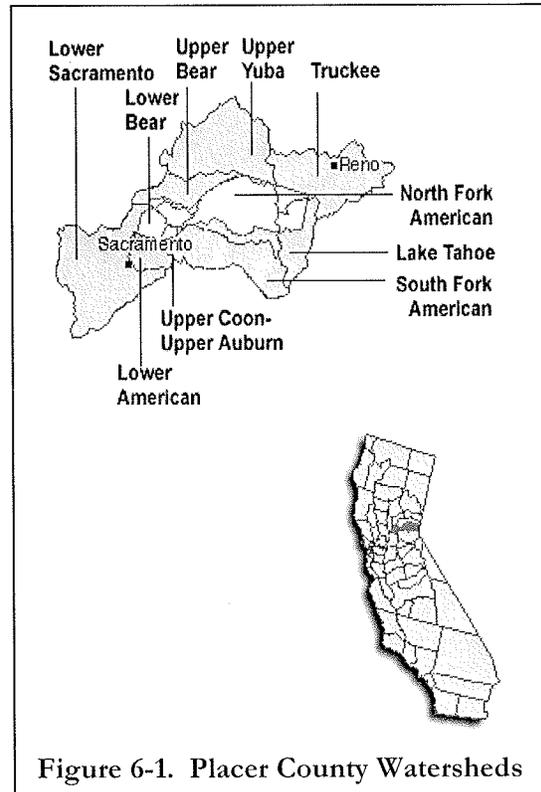
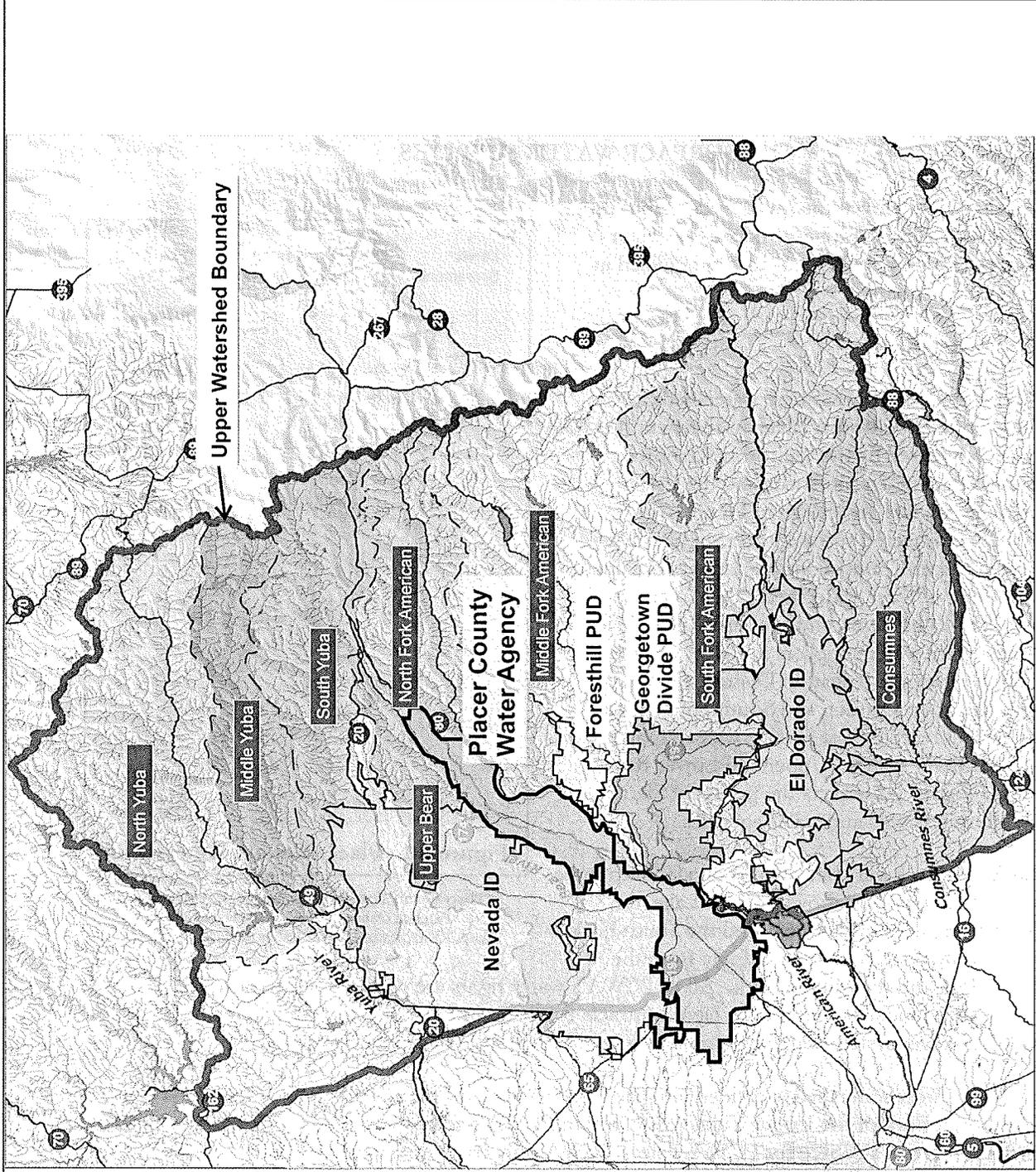


Figure 6-1. Placer County Watersheds

"Placer County Watershed" [Sacramento River Watershed Program Online Resource](http://www.sacriver.org/education/county_placer.html). 8 December 2004
http://www.sacriver.org/education/county_placer.html



BROWN AND CALDWELL	PROJECT	26233-023	SITE TITLE Integrated Water Resources Plan, Placer County Water Agency Watershed Boundaries and Water Agencies	Figure 6-2
	DATE	8-2-06		

General characteristics of each PCWA contracted supply watershed are summarized in Table 6-1 below.

Table 6-1. PCWA Supply Watershed Characteristics

	North Fork and Middle Fork American River	Upper Yuba River	Upper Bear River
Area	647,155 ac	842,718 ac	259,032 ac
Naturally Occurring Waterways	1,318 miles	1,725 miles	565 miles
Average Annual Precipitation	59 inches	61 inches	42 inches
Average Annual Precipitation Volume	3,182,000 ac-ft	4,284,000 ac-ft	907,000 ac-ft
Percent Area Above 15% Slope	39%	31%	9%

Notes:

1. These are total watersheds and encompass areas larger than PCWA area.
 2. Data per CARA database www.ice.ucdavis.edu/newcara.
 3. North Fork American River at Folsom Lake includes Middle Fork subbasin.
- ac = acres
 ac-ft = acre-foot

6.2 PCWA Surface Water Supplies

PCWA’s water supply sources consist of water purchased from PG&E from the Yuba and Bear Rivers, Middle Fork Project water from the American River and Central Valley Project water from the American River. These supplies, Water Forum implications, and dry year impacts are described in this section. These supplies, Water Forum implications, and dry year impacts are described in this section. Water rights and contracts for all of west Placer County are summarized in Table 6-2. Figure 6-3 depicts schematically PCWA’s water supply sources.

Table 6-2. Water Rights and Contract Entitlements Used in West Placer County

Water supply	State number or contract number	Maximum use, ac-ft/yr
PCWA¹		
Middle Fork Project	A018085	120,000
Central Valley Project	Contract w/USBR	35,000 ²
PG&E	Contract w/PG&E	100,400 ³
PCWA Subtotal:		255,400
City of Lincoln ⁴	Agreement w/NID	3,300
City of Roseville	Contract w/USBR	32,000
Nevada Irrigation District (Placer and Nevada Counties)	Multiple contracts and rights	228,700 estimated based on runoff
	Agreement with PG&E	59,361
NID Subtotal:		288,061⁵
South Sutter Water District	11120, 11118, 4653,	Total of 620 cfs and/or 98,370 depending on season and right
Bear River, Coon Creek, East Side Canal and tributaries, and Yankee Slough	11121, 12587	
Camp Far West Irrigation District	unknown	13,000

Notes:

¹PCWA wholesales part of this supply to the City of Roseville and San Juan Water District.

²Can be possibly increased to 117,000 ac-ft/yr. See text.

³Does not include the 25,000 ac-ft/yr for Zone 3.

⁴Lincoln also receives treated water deliveries from PCWA’s water supplies.

⁵Includes both Placer and Nevada Counties.

ac-ft/yr = acre-feet per year

cfs = cubic feet per second

6.2.1 PG&E (Yuba/Bear River System)

PCWA's main source of water is from the Yuba and Bear Rivers. This supply comes from Lake Spaulding and is purchased from PG&E. PCWA has two water supply contracts with PG&E, providing options to purchase up to 125,400 ac-ft annually from PG&E's rights to water for consumptive purposes from the Yuba and Bear River systems. This water source is used to supply treated and raw water customers in Zones 1, 3, and 5. Zones 1 and 5 are supplied up to 100,400 ac-ft/yr and Zone 3 is supplied up to 25,000 ac-ft/yr.

The rights to this water were developed by PG&E and its predecessors by appropriation prior to 1914, with the place of use for this water being western Placer County and PCWA's Zone No. 3, which extends along the Colfax Ridge up to Alta, California. One of these contracts has no term limit and the other, for 100,400 ac-ft annually, terminates in 2013, at which time it will come up for renewal for an adjustment in the price to be paid for the water.

6.2.2 Middle Fork American River System

PCWA has permits obtained from the California State Water Resources Control Board allowing it to divert from the American River between Auburn and Folsom Reservoir up to 120,000 ac-ft of water annually for consumptive use. This water is available from releases from PCWA's Middle Fork American River Project, which was completed in 1967, and from direct diversions from the American River system. The place of use under those permits is western Placer County and a portion of northeastern Sacramento County. PCWA has entered into wholesale contracts to provide portions of the Middle Fork water to the San Juan Water District (SJWD), the City of Roseville, and the Sacramento Suburban Water District (SSWD). These contracts give PCWA the right to reduce supply in the event of water shortages. The contracts between PCWA and SJWD provide for a maximum of 25,000 ac-ft annually. SJWD diverts this water at Folsom Lake and uses its own facilities to provide treatment and delivery. The contract between PCWA and Roseville provides for a maximum of 30,000 ac-ft annually. The City of Roseville diverts water at Folsom Lake and uses its own facilities to provide treatment and delivery.

The contract between PCWA and SSWD provides for a maximum of 29,000 ac-ft annually by 2015 on a build-up schedule. No water is available for SSWD from the American River in dry years. The agreement with SSWD increases from 7,000 ac-ft per year in the year 2000 to 29,000 ac-ft per year in the fifteenth year. The 29,000 ac-ft per year will be maintained through the twenty-fifth year of the agreement. The term of the agreement can be extended by mutual consent of both parties. The water to SSWD is diverted at Folsom Lake, wheeled through SJWD's water treatment plant, and then delivered through the cooperative transmission pipeline.

6.2.3 Central Valley Project

PCWA has a contract with the United States Bureau of Reclamation (USBR) for a maximum of 117,000 ac-ft of Central Valley Project (CVP) water annually to be available on a build-up schedule which began with 15,000 ac-ft in 1992, building up to the maximum of the 117,000 ac-ft in 2007. However, prior to delivering more than 35,000 ac-ft/yr, the USBR and PCWA must meet to determine to what extent, if any, the USBR is obligated to deliver more than 35,000 ac-ft annually to PCWA in the absence of an Auburn Dam. PCWA does not plan to use any of its CVP entitlement

prior to putting to use the full amount of the 120,000 ac-ft available to it annually from the American River pursuant to its water right permits. The Agency's CVP contract was amended in February 2002 to provide for just 35,000 ac-ft with an option to increase the contract amount if Auburn Dam is built.

6.2.4 Water Forum Impacts

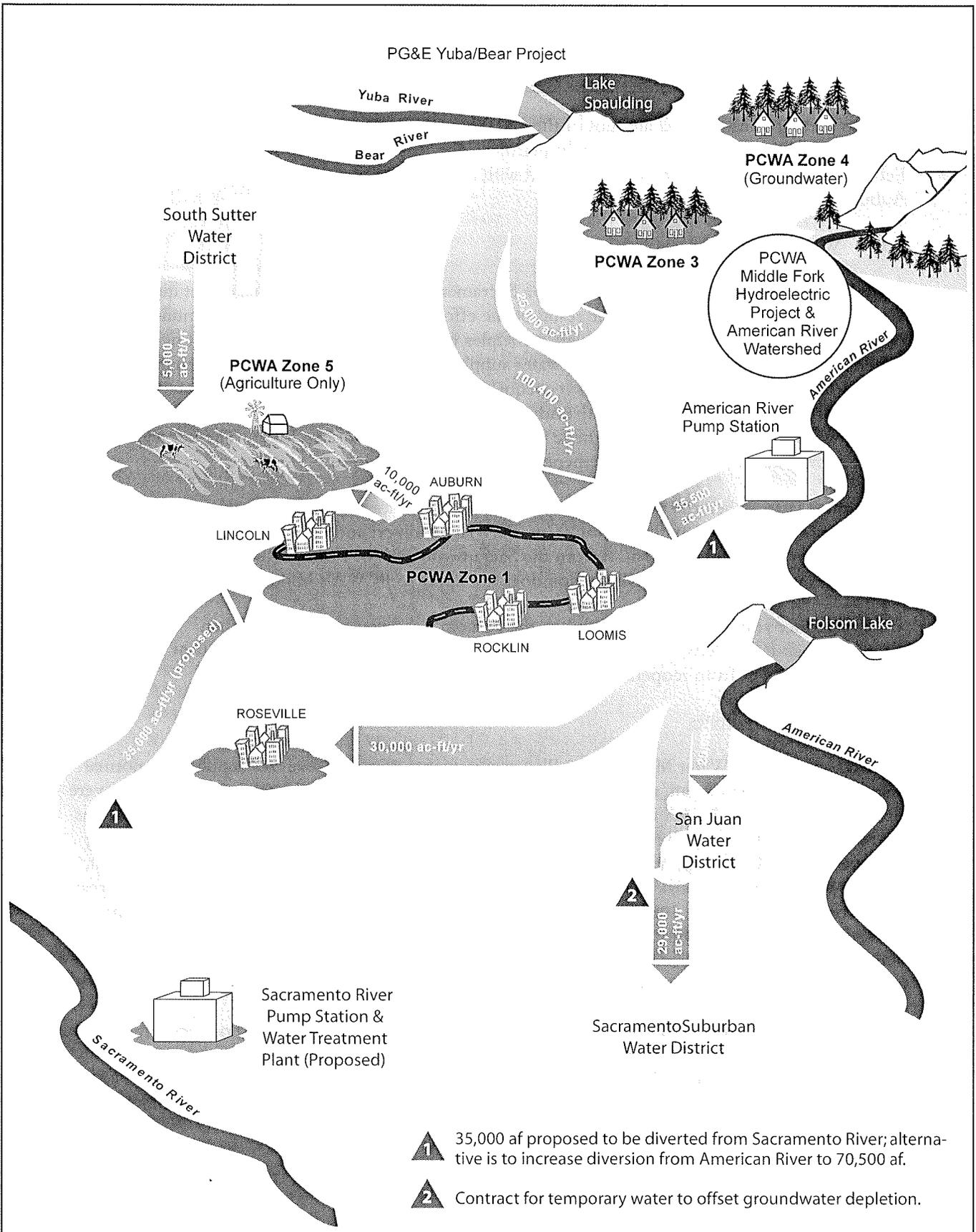
PCWA is a stakeholder in the Water Forum, a Sacramento regional water management initiative. The Water Forum Agreement was the result of the efforts of a diverse group of community organizations formed in 1994 to formulate principles for a regional solution to protecting the lower American River and providing for future water supply. The Water Forum is a comprehensive package that was designed to achieve two coequal objectives: Provide a reliable and safe water supply for the region's economic health and planned development to the year 2030; and preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River. The key water supply provisions in the specific agreement for PCWA are as follows.

- In most years, when the projected March through November unimpaired inflow to Folsom Reservoir is greater than 950,000 ac-ft/yr, PCWA will divert and use up to 35,500 ac-ft from the American River and 35,000 ac-ft from the Sacramento and/or Feather Rivers with certain conditions. The 35,000 ac-ft limitation does not apply to PCWA's Middle Fork water supply.
- In the drier years and driest years, when the Folsom Reservoir inflow is less than 950,000 ac-ft/yr, PCWA would divert 35,500 ac-ft plus replace up to 27,000 ac-ft of water in the American River from reoperation of the Middle Fork Project reservoirs.

6.2.5 Dry Year Supplies

Similar to the Urban Water Management Plan requirements, this plan analyzes supplies for normal years, a single dry year event, and a multiple dry year event. In 1977, California experienced a severe drought. At the time, PCWA relied exclusively on the PG&E supply. The 1976 - 1977 drought was the worst drought on record to date. PCWA assumes this is the single dry year event for planning purposes. The PG&E supply was reduced to approximately 50,000 ac-ft during the 1977 drought, and PCWA assumes a similar supply reduction from 100,400 to 50,000 ac-ft during a single dry year. The drought from the late 1980s to early 1990s is the benchmark for a multi year drought for most watersheds in the state. During that time, the PG&E supply was not cut back for PCWA, as ample supply was available. However, for a conservative estimate, the PG&E contract is assumed to be reduced 25 percent for each year of the multiple dry year condition.

The CVP supply is subject to water shortage restriction in a manner similar to shortages imposed on other CVP contractors. The USBR has indicated that reductions of up to 25 percent may be necessary during dry years. Although it may be reduced even more during a severe drought, PCWA assumes that a reduction of 25 percent will be imposed for the single dry year and the multiple dry year planning event.



- ▲ 1 35,000 af proposed to be diverted from Sacramento River; alternative is to increase diversion from American River to 70,500 af.
- ▲ 2 Contract for temporary water to offset groundwater depletion.

P:\26000\26233 PCWA\GRAPHICS\FIGURES

BROWN AND CALDWELL	PROJECT 26233-023	SITE	Integrated Water Resources Plan Placer County Water Agency Placer County Water Agency Water Supply Schematic	Figure 6-3
	DATE 8-3-06	TITLE		

PCWA has completed computer modeling of the Middle Fork Project to determine the reliability of its water supply under the 70 years of available hydrologic record. That report concluded the Middle Fork Project could have supplied the full 120,000 ac-ft in all the years of record, and could provide full deliveries even in an assumed worst case three year consecutive event, which is a repeat of 1976, 1977, and with a third year a repeat of 1977. Therefore, there is no assumed supply reduction of the Middle Fork Project American River supply during the dry year planning event. The Roseville USBR contract supply is also assumed to be reduced by 25 percent during a dry year planning event. Dry year supplies are summarized in Table 6-3.

Table 6-3. Assumed Dry Year Supplies in West Placer County

Water supply	Normal year supply, ac-ft/yr	Multiple dry year supply, ac-ft/yr	Single dry year supply, ac-ft/yr
PCWA			
Middle Fork Project	120,000	120,000	120,000
Central Valley Project	35,000	26,250	26,250
PG&E	100,400	75,300	50,000
City of Lincoln (from NID)	3,300	2,475	1,650
City of Roseville – Central Valley Project	32,000	24,000	24,000
South Sutter Water District	5,000	0	0
Total:	295,700	248,025	221,900

Note:
 ac-ft/yr = acre-feet per year

6.3 City of Roseville

The City of Roseville does not own surface water rights. Roseville meets its water needs through surface water contracts for 32,000 ac-ft/yr of CVP water with the USBR and for 30,000 ac-ft/yr with PCWA, and with groundwater and reclaimed water. All of Roseville’s surface water is diverted from Folsom Lake and treated at the Roseville-owned water treatment plant. Roseville is also a signatory of the Water Forum Agreement. Current Water Forum commitments for drier years include decreasing its total diversion from the American River from 54,000 ac-ft to 39,800 ac-ft in a stepped fashion. In the driest years, it would only divert up to 39,800 ac-ft and meet the balance of needs through groundwater, additional conservation, reclaimed water, and possibly diversions from the Sacramento River. The CVP water is assumed to be reduced by 25 percent during dry years. For purposes of this report we have assumed that the Roseville demand is not reduced in dry years and we have allocated sufficient surface water to meet the demand remaining after planned utilization of reclaimed water and groundwater. It is assumed Roseville will lead the effort to construct the necessary infrastructure to access the allocated surface water supply.

6.4 City of Lincoln

Lincoln does not own surface water rights. Lincoln meets its water needs through wholesale agreements with PCWA and NID, and with groundwater and reclaimed water. PCWA delivered 4,800 ac-ft to Lincoln in 2003. In 2003, NID supplied Lincoln with 3,300 ac-ft water, although that water was wheeled through PCWA facilities as NID currently does not have treatment infrastructure to deliver potable water to Lincoln. It is assumed the NID 3,300 ac-ft is available during a dry year planning event. Lincoln is not a member of the Water Forum.

6.5 San Juan Water District

SJWD supplies retail and wholesale customers. SJWD owns pre-1914 water rights for 33,000 ac-ft/yr of American River water, contracts with the USBR for 11,200 ac-ft/yr and 13,000 ac-ft/yr from the CVP, and contracts with PCWA for 25,000 ac-ft/yr. PCWA water can only be used in Placer County. The 13,000 ac-ft/yr contract can only be used in Sacramento County. All of SJWD's surface water supply is diverted from Folsom Lake and treated at the SJWD-owned Peterson water treatment plant. SJWD is a member of the Water Forum and is subject to surface water reductions during dry years. For purposes of clarity, only the Placer County water supply is carried forward in this discussion. Similar to Roseville, this report allocates the full amount of the projected buildout demand of surface water in dry years and leaves issues of delivery for SJWD to resolve.

6.6 Nevada Irrigation District

NID supplies irrigation, retail, and wholesale customers in Nevada and Placer counties. The NID service area covers Nevada County and a portion of Placer County. Water is collected and stored in a series of reservoirs and canals, which mostly are fed by water from the Middle and South Forks of the Yuba River, Deer Creek, and the Bear River. NID's surface water supplies consist of pre-and post-1914 water rights and contract water from PG&E. The PG&E contract entitlement is for 59,361 ac-ft/yr, although existing infrastructure limits the amount that can actually be delivered, and is restricted in dry year to 23,591 ac-ft/yr per the contract.

6.7 South Sutter Water District

South Sutter Water District supplies only irrigation water to its customers in west Placer County. South Sutter Water District has five water rights to supply its customers. Some of the water rights are flow-based, and some are flow-based plus volume based, depending on time of year. The water rights total 620 cfs and/or 98,370 ac-ft/yr depending on season and individual right. There are no known restrictions on the supply. In an average year, South Sutter Water District supplies about 40 percent of its member landowner agricultural demands with surface water delivered out of Camp Far West Reservoir. The remaining 60 percent of demand within the District is met with groundwater.

6.8 Camp Far West Irrigation District

Camp Far West Irrigation District supplies only irrigation water to its customers immediately around the Camp Far West Reservoir in Placer and Nevada Counties. Supply contract research is incomplete, but it did identify at least one right for 13,000 ac-ft.

CHAPTER 7 GROUNDWATER SUPPLIES

This chapter focuses primarily on the western portion of Placer County, though briefly discusses the eastern portion, and describes the groundwater basin, water quality, major groundwater users, domestic and agricultural groundwater supply and demand, groundwater level trends, overdraft, and safe yield conditions.

7.1 North American Groundwater Sub-basin No. 5-21.64

Western Placer County lies within the northeastern section of the North American Groundwater sub-basin, which is designated as 5-21.64 (Figure 7-1). The North American sub-basin lies in the eastern part of the Sacramento Groundwater Basin. The North American sub-basin comprises approximately 351,000 acres of which 39 percent, or approximately 133,000 acres, are within Placer County's boundaries.

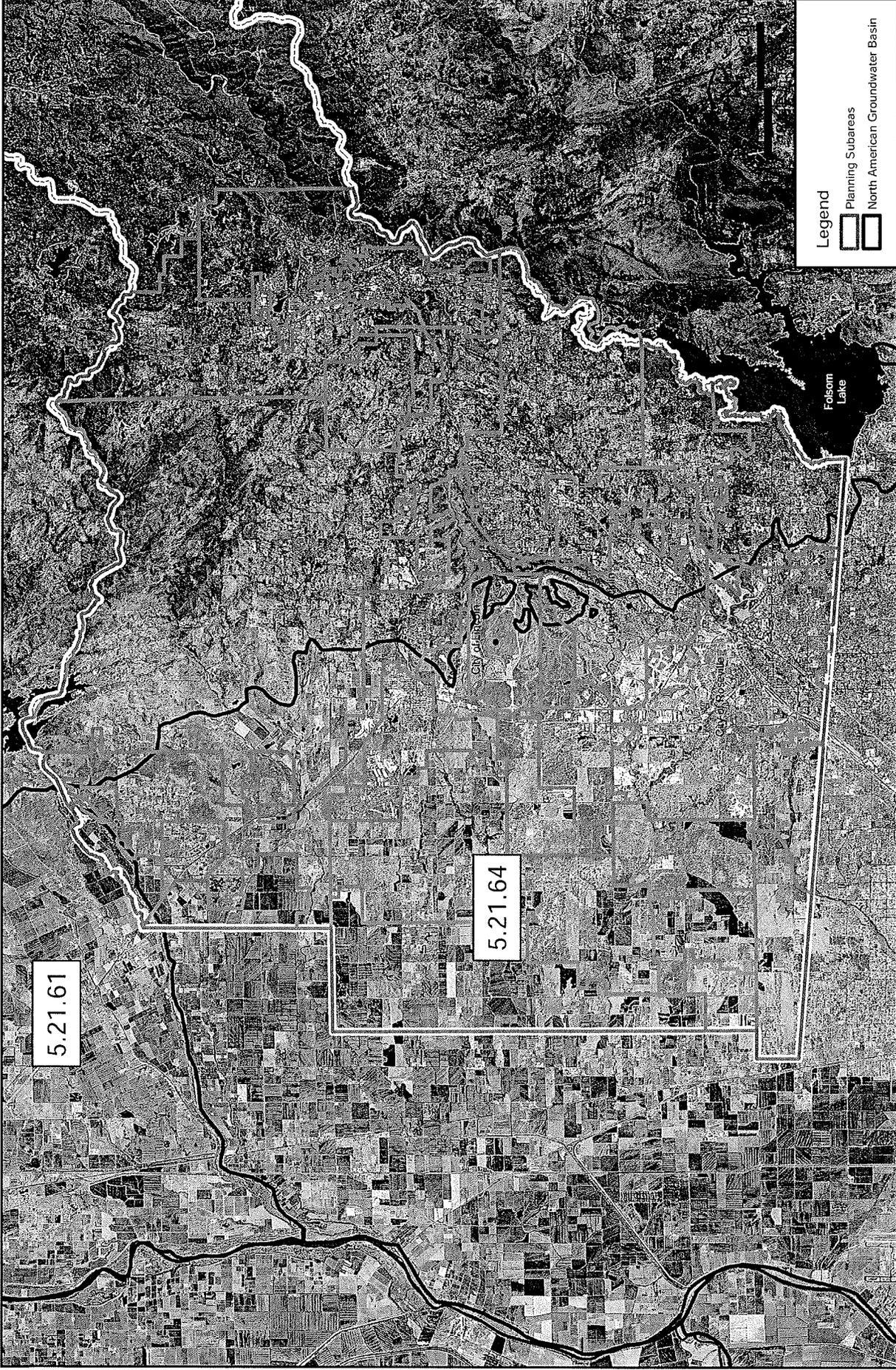
Included within the sub-basin are sections of western Placer, south Sutter, and northern Sacramento Counties. The basin is bounded on the north by the Bear River, to the west by the Feather and Sacramento Rivers, and to the south by the American River. The eastern boundary can be represented by a line extending north-south from the Bear River to Folsom Lake about 2 miles east of the City of Lincoln. This eastern boundary also represents the approximate location of the edge of the alluvial basin from the Sierra Nevada (DWR Bulletin 118, 2004).

The North American Sub-basin's approximate total storage is 4.9 million ac-ft of water, assuming an aquifer thickness of 200 feet across the total 351,000 acres of the basin and a specific yield of 7 percent (DWR Bulletin 118, 2004).

7.1.1 Groundwater Quality

The majority of the North American sub-basin groundwater is of good quality. However, in portions of the basin, groundwater quality is marginal. There are three major types of groundwater based on water quality: magnesium calcium bicarbonate or calcium magnesium bicarbonate; magnesium sodium bicarbonate or sodium magnesium bicarbonate; and sodium calcium bicarbonate or calcium sodium bicarbonate (DWR, 2003).

Some locations of the sub-basin have elevated levels of total dissolved solids (TDS), specific conductance, chloride, sodium, bicarbonate, boron, fluoride, nitrate, iron, manganese, and arsenic, when compared with drinking water quality standards and guidelines for irrigation. High TDS levels exist in an area along the Sacramento River and away from the Placer County boundary (DWR Bulletin 118, 2003). In fact, recent drilling logs and water quality samples from wells between the City of Lincoln and the City of Roseville indicated brackish water with chloride levels near 3,000 milligrams per liter (mg/L) (MWH, 2003).



BROWN AND CALDWELL	PROJECT	26233-023	SITE	Integrated Water Resources Plan Placer County Water Agency		Figure 7-1
	DATE	8-15-06	TITLE	Groundwater Basin Boundary		

7.1.2 Groundwater Level Trends

Under pre-development conditions, water levels were very shallow throughout the western Placer County area with west-southwest flow toward the Feather and Sacramento Rivers. Historical agricultural, municipal, and industrial pumping have produced groundwater level declines, especially in the southwest portion of the study area, where pumping centers have produced depressions over 20 feet below sea level and local reverse (eastward) gradients. Previous groundwater level declines of approximately one foot per year in wells in southern western Placer County stabilized in the 1980s and 1990s (MWH, 2003, Figure 3.6). Groundwater levels in other parts of the study area have fluctuated but are relatively stable overall.

7.1.3 Groundwater Overdraft

Groundwater overdraft is defined as “the condition of a groundwater basin or sub-basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which the water supply conditions approximate average conditions” (DWR, 2003). Declines in water levels during drought years are typically normal, but failure to recover during wet cycles is evidence of overdraft. DWR identified two basins in the state with critical conditions of overdraft in 1980, but the North American sub-basin was not among them, and the list was not updated in Bulletin 118-2003 Update (DWR, 2003). Such a determination is left to local groundwater basin managers.

7.2 **Western Placer County Groundwater Use**

Several water utilities serving Placer County residential and irrigation needs pump from the groundwater basin. This section describes each major utility and their respective groundwater pumping usage. Groundwater usage is summarized in Table 7-1.

Table 7-1. Western Placer County Groundwater Use

Entity	2003 Groundwater used (acre per foot)
PCWA Zone 2 ¹	64
City of Roseville ²	0
City of Lincoln ³	610
Sheridan ⁴	188
Small Water Systems	9
Private Residential Wells (see text)	6,500
Agricultural Wells ⁵	90,000
Total:	97,371

Notes:

- ¹PCWA Urban Water Management Plan (2000)
- ²Roseville Urban Water Management Plan (2003)
- ³City of Lincoln Groundwater Management Plan (2003)
- ⁴2002 DHS System Annual Reports
- ⁵West Placer County Groundwater Storage Study (2005)

7.2.1 Placer County Water Agency

The Placer County Water Agency is divided into five service zones throughout Placer County. Zones 2 and 4 are the only zones that pump ground water. Zone 2 is located in the North American Groundwater sub-basin, and is pumping at a constant rate of 64 ac-ft/yr. In 2003, Zone 2 was converted to surface water and is now considered operationally equivalent to Zone 1. Zone 4 is located in the Martis Valley Groundwater Basin near Lake Tahoe, and is not addressed in this discussion.

7.2.2 City of Roseville

The City of Roseville is currently supplied completely with surface water contracts. Limited amounts of groundwater are available along Roseville's western margin. Roseville is currently meeting its water needs without the use of groundwater. Roseville maintains four wells, primarily for backup water supply. However, one is contaminated while the other three are capable of producing 6,000 ac-ft/yr. Roseville is currently conducting studies regarding the feasibility of aquifer storage and recovery (ASR), which will utilize the aquifer for storage for treated surface water.

7.2.3 City of Lincoln

The City of Lincoln uses some groundwater to meet their total demand. Between the years of 1996 and 2000, groundwater use maintained about 500 ac-ft/yr (Lincoln UWMP, 2002) from a total of six wells. In 1999, Spectrum-Grasch completed a study on the groundwater condition for the Lincoln region. Their study estimated a total recoverable groundwater volume of 47,250 ac-ft/yr.

7.2.4 Sheridan

Water service to Sheridan is provided by Placer County. Data for groundwater use was obtained using the DHS 2002 annual reports dated May 2003. For the purposes of this study, the 2002 report data was projected to 2003 as the area has been under a growth moratorium. Sheridan uses approximately 200 ac-ft/yr, which is completely supplied by groundwater.

7.2.5 Small Water Systems

Small water systems are facilities servicing less than 200 service connections. Chapter 2 and Appendix A provide more detailed information on these systems. The amount of groundwater pumped in 2002 to eastern Placer County small systems was 30 ac-ft, and 260 ac-ft in the western Placer County area.

7.2.6 Private Wells

The domestic groundwater use was calculated from both large and small system data. The population served by each system was summed and subtracted from the total county population. The remainder is therefore the population that is not served by any public system. This population was divided by the 2004 City/County population and housing estimate for persons per household.

The number of households was then multiplied by a standard of 1 ac-ft/yr/household to obtain an estimated 6,500 ac-ft/yr of domestic groundwater supply.

7.2.7 Agricultural Land Conversion to Urban Use - Impacts on Supply

The predominant historical use of groundwater in western Placer County has been for agriculture. The estimated historical average annual agricultural groundwater demand in western Placer County has been about 90,000 ac-ft/yr. Under these pumping conditions the groundwater levels at the southern end of the western Placer County basin have been stable since about 1982 (following a steady decline of about 1 ½ feet per year from 1950 to 1982), and at the northern end of the basin the levels have risen slightly since completion of Camp Far West Reservoir in 1974. These stable groundwater levels indicate that groundwater pumping is currently in balance with the natural groundwater recharge rate.

Many of the new developments in western Placer County will be replacing existing groundwater irrigated agriculture lands with urban development. Removing agricultural lands from production will decrease the demand on groundwater within the basin and result in in-lieu recharge. This study did not conduct a detailed analysis of land use and agriculture groundwater demand for each proposed study area. However, a review of existing studies and proposed development plans provides an estimate of the probable decrease in agriculture groundwater demands for the developments in question.

The Water Master Plan for the Regional University Project (West Yost, April 8, 2005) investigated the existing agricultural groundwater demand within its study area. Results indicate that the 1,000 acres irrigated with groundwater consume approximately 2,740 ac-ft of water per year, or 2.7 ac-ft/acre. Roseville's Reasons Farms investigation (MWH, June 2003) estimated the groundwater demand for 1,000 acres at approximately 3,851 ac-ft, or 3.8 ac-ft/acre. The City of Lincoln reported an average annual demand for rice and non-rice agriculture combined of 21,400 ac-ft/yr. With an estimated 7,850 acres in production, this translates to 2.7 ac-ft/acre. Each of these studies included a mixture of rice, pastures, field crop, and grain and hay production lands. However, the resulting irrigation demands of 2.7-3.8 ac-ft/ac are relatively low, as standard evapotranspiration rates for these types of crops generally range from 4 to 6 ac-ft per acre (DWR). It was unclear in each study if factors were included for irrigation efficiency. This study assumes an average crop demand of 3.0 ac-ft/acre.

Buildout development in western Placer County in growth Scenario 2b is used to estimate the potential decrease in agriculture groundwater pumping. Study areas Placer Vineyards, Curry Creek, and West Lincoln are considered for the analysis. It is assumed that neither of the Sunset planning subareas have any significant agriculture irrigation demand. These planning subareas were compared to the aforementioned studies to estimate agriculture lands in each study area that would be converted to urban development. Lacking parcel by parcel detailed information, estimates of agriculture land are based on general comparisons of the figures of agriculture lands to the planning subarea figures. Specific figures compared are Figure 5-1 from the Lincoln Water Recycling Study and Facilities Plan (ECO:Logic, May 2003), and Figures 2-6 and 2-8 from the West Placer County Groundwater Storage Study, Technical Memorandum 1 (MWH, June 2005). Using these figures, it is estimated that approximately 50 percent of the acreage within the Placer Vineyard, Curry Creek, and West of Lincoln study areas are agricultural lands that have been irrigated with groundwater.

The total acreage projected for development in the three study areas is 13,763 acres under Growth Scenario 2b. Assuming 50 percent is the agricultural irrigated land with an average demand of 3.0 ac-ft/acre results in a total groundwater demand of 20,000 ac-ft/yr. Therefore, urban development in these three areas is estimated to reduce agriculture groundwater pumping by 20,000 ac-ft/yr.

7.3 Safe Yield and Dry Year Supply

Safe yield is defined as the amount of groundwater that can be continuously withdrawn from a basin without adverse impact (DWR, 2003). It is commonly expressed as an annual average in terms of ac-ft/yr. Safe yield may be qualitatively indicated by stable groundwater levels over a period of years, although a detailed groundwater budget is needed to accurately quantify safe yield.

Safe yield is not a static number, but a value that should be modified through time to reflect changing conditions in the basin. The most recent evaluation of the west Placer County groundwater basin safe yield is reported in Groundwater Storage Study, Final Report, December 2005 (MWH, 2005). The Groundwater Storage Study lists the estimated sustainable safe yield as 95,000 ac-ft/yr for the west Placer County portion of the North American Groundwater Sub-Basin, which is assumed for this analysis.

In preparing an integrated water resources strategy, it is anticipated that some portion of groundwater will be used during dry years in conjunction with demand reductions in order to meet demands when surface water supply is reduced. It is anticipated that groundwater pumping exceeding the safe yield during dry periods is feasible as long as the long term (multiple years) average does not exceed the safe yield of 95,000 ac-ft/yr.

CHAPTER 8 RECLAIMED WATER SUPPLIES

This chapter provides information on historical reclaimed water use, current availability of reclaimed water, and future potential reclaimed water supplies. Reclaimed water is considered an integral part of the water supply as it can be used to offset potable water demand through substitution for irrigation and other uses. Reclaimed water can also offset raw water and/or groundwater demand for agriculture uses.

8.1 Current Reclaimed Water Use

Reclaimed water use is divided into two types, direct and indirect. Direct reuse consists of supplying treated wastewater effluent without mixing with other waters. Indirect reuse consists of supplying treated wastewater effluent after mixing with other waters. There are currently two wastewater utilities providing treated effluent for direct reuse; the City of Lincoln and the City of Roseville. Table 8-1 lists the current reuse application types, area, and flows for the two utilities.

Table 8-1. Existing Reclaimed Water Direct Reuse Summary

Utility	Reuse type	Area	Average daily use, mgd	Annual use, ac-ft
City of Lincoln	Fodder crop land application	382 acres (2002), decreased to 222 acres after WWTP decommissioning	1.8	2,000 previous 1,200 current
City of Roseville (as of 2000)	Urban irrigation	Golf course, parks, streetscape, and City facilities	1.0	1,100

Notes:
ac-ft = acre-feet
mgd = million gallons per day

There are currently two discharges for indirect reuse, Placer County's SMD 1 Auburn WWTP, and the City of Auburn's WWTP. Effluent from the SMD 1 plant is discharged to Coon Creek which feeds many of NID's downstream canals for delivery to irrigation customers. Effluent from Auburn's plant is discharged to the Auburn Ravine which feeds some of NID's downstream canals for delivery to irrigation customers. The other WWTPs in the County may contribute to indirect reuse supply through leach field runoff, high flow discharges, creek diversions, or other surface water uses, but these are not a direct or consistent use. Consistent in-stream indirect reclaimed water supply is summarized in Table 8-2.

Table 8-2. Consistent In-Stream Indirect Reuse Summary

Source	Average daily use, mgd	Annual use, ac-ft	Receiving stream
SMD 1 Auburn WWTP	2.6	2,900	Coon Creek
City of Auburn WWTP	1.3	1,400	Auburn Ravine
Total:	3.9	4,300	

Notes:
Source:
NPDES permit for each respective facility.
ac-ft = acre-feet
mgd = million gallons per day

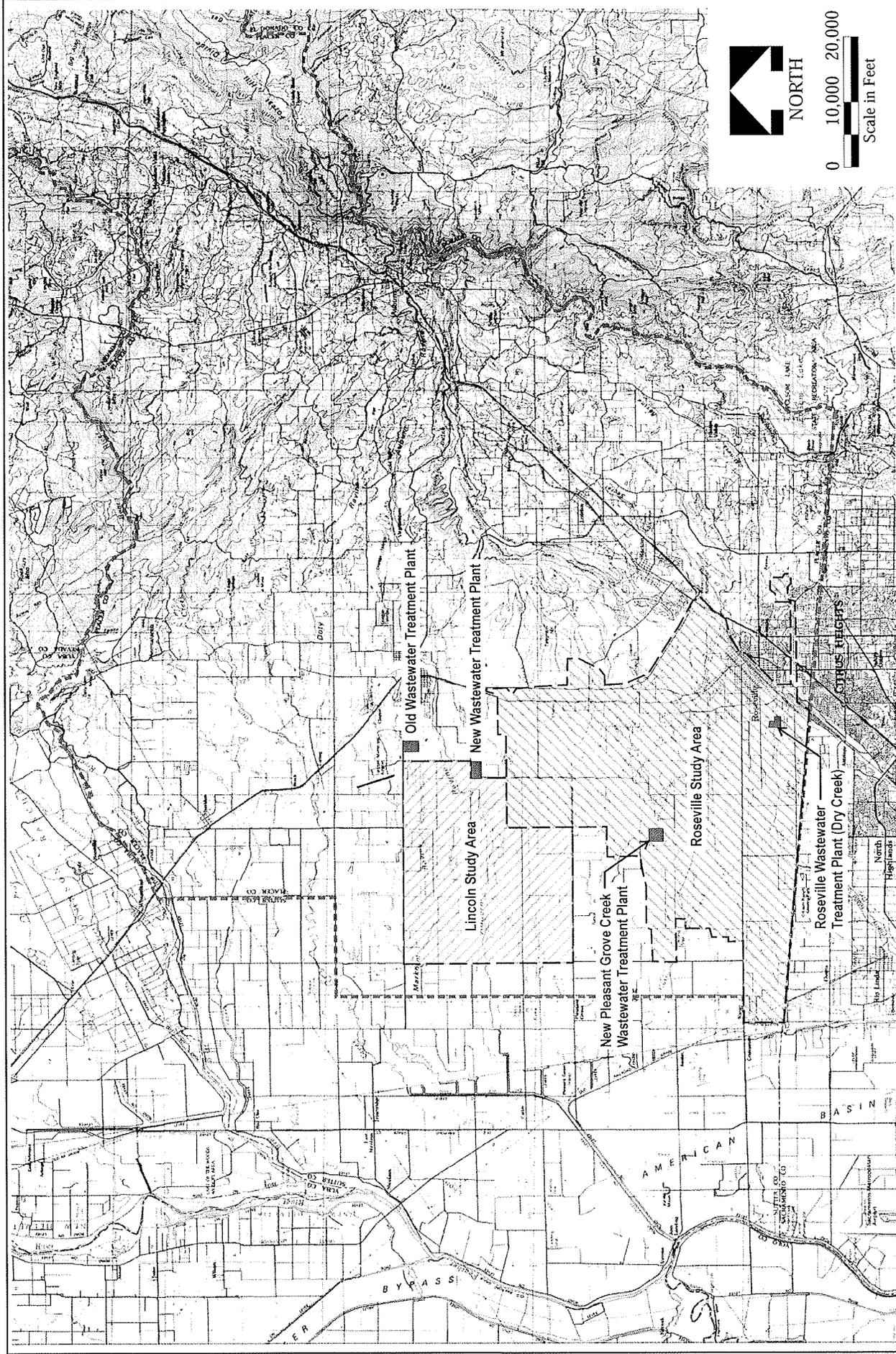
8.2 City of Lincoln

The City of Lincoln has recently completed new wastewater treatment facilities that provide reclaimed water to supply reuse opportunities. In 2002, The City of Lincoln completed the upgrade of their previous WWTP to a capacity of 2.4 mgd using aerated ponds for treatment. Effluent from this plant was used at four irrigation sites. A separate new wastewater treatment and reclamation facility was completed in 2004, using newer treatment technology that meets DHS criteria for unrestricted effluent reuse. The new facility does not include effluent storage, as the older WWTP did, to allow for storage during non-irrigation periods. Upon completion of the new treatment plant, the older treatment plant was decommissioned and all flow is now treated at the newer facility. With the new reclamation facility, the City of Lincoln also eliminated the ability to land apply reuse water at the older WWTP and the Airport site. This results in a decrease of 160 acres to an available land application acreage of 222 acres.

The new facility has an average daily flow (ADF) capacity of 3.3 mgd, and is planned for expansion up to 12 mgd by 2020 to meet Lincoln's treatment needs. This plant can also be expanded up to 25 mgd depending on its potential use as a regional facility for the Placer-Nevada Wastewater Authority and surrounding entities.

Lincoln completed a Wastewater Reclamation Study (Draft City of Lincoln Wastewater Reclamation Study, ECO:Logic Engineering) in 2003, that investigated future potential reuse application sites, customers, and demands for the area shown in Figure 8-1. The study also investigated potential reclaimed water demand at industrial sites outside of the area that included among others; Placer County Landfill, Sierra Pacific Lumber Mill, and Rio Bravo Power Plant. The other industrial sites were near each of these three main potential users. At the time of the study, the study area contained 840 acres of pasture and 970 acres of field crops. Lincoln did not anticipate any residential development in the area. The total potential reuse demand and supply are summarized in Table 8-2. The report estimated existing agricultural demand using the reduced available land application acres as a result of closing the older treatment plant, versus the higher demand reported in Table 8-1.

The reclaimed water demand calculated for Lincoln service areas in this report assumes normal urban demands. The industrial demands are not included for Lincoln as they are accounted for in Roseville's reclaimed water demand projections. The other large demand, agricultural, is also not included as the recycled water would be replacing groundwater or raw water, not treated water. See Chapter 5 for a summary of the recycled demands projected for Lincoln. As listed in Table 8-3, Lincoln has more than sufficient supply (28,000 ac-ft) to meet the projected urban reclaimed water demands.



BROWN AND CALDWELL	PROJECT	26233-023	SITE	Integrated Water Resources Plan, Placer County Water Agency	Figure 8-1
	DATE	7-21-06	TITLE	Recycled Plan Study Boundaries	

**Table 8-3. City of Lincoln Wastewater Reclamation Study
 Potential Reclaimed Water Demand**

Reclaimed water use	Annual demand, ac-ft
Existing	
Agricultural (non-rice)	1,200
Potential	
Agricultural (non-rice)	3,200
Agricultural (rice)	18,200
Golf course	350
Landfill/MRF	85
Parks	90
Industrial	1,500
Total Demand:	24,624
Total Supply:	28,000

Notes:

Reference:

From Draft City of Lincoln Wastewater Reclamation Study (ECO:Logic Engineering) Table 5-5 and updated for discontinued use of WWTP and Airport application sites.

ac-ft = acre-feet

8.3 City of Roseville

The City of Roseville completed a Recycled Water Distribution System Feasibility Study in April, 2000, that evaluated potential reuse markets, demands, and infrastructure requirements. Roseville has completed many technical memorandums that update the recycle water planning efforts as part of their wastewater master plan update. The technical memorandums are used as the basis for most of the information presented in this section.

Roseville produces recycled water at each of its wastewater treatment plants, the older Dry Creek WWTP, and the recently completed Pleasant Grove WWTP. The study area identified in the Recycled Water Distribution System Feasibility Study and both plant sites are indicated in Figure 8-1. The Dry Creek WWTP has a current treatment capacity of 18 mgd average dry weather flow (ADWF), and Pleasant Grove WWTP has an ADWF capacity of 12 mgd. The reuse customers and annual demand as of 2000 are listed in Table 8-4. The Pleasant Grove WWTP was not significantly contributing to the recycled water system at this time.

Table 8-4. April 2000 Roseville Reuse Customers (Dry Creek WWTP only)

Customer	Average daily use, mgd	Annual use, ac-ft
Woodcreek Oaks Golf Course	0.36	408
Del Webb Community	0.58	647
Morgan Creek Golf Course	0.50	565
Diamond Oaks Golf Course	0.30	333
Junction Blvd. Streetscape	0.00	5
Elliot Park	0.03	29
Diamond Creek Ranch	0.02	18
Dry Creek WWTP Irrigation	0.02	18
Total:	1.81	2,045

Notes:
 Source: From Market Assessment for Recycled Water Distribution System TM
 (November 29, 2005), Table 1.
 ac-ft = acre-feet
 mgd = millions gallons per day

The Market Assessment for Recycled Water Distribution System TM (November 29, 2005) identified near future and ultimate potential users both in and outside Roseville’s boundaries. The ultimate recycled water demands are listed in Table 8-5. Near future customers are those that Roseville has made supply commitments to and/or are in the advanced stages of planning. Ultimate potential demands include those in the Urban Growth Areas (UGAs). Roseville defines UGAs as the major specific plan areas. All of the UGAs are outside of the current Roseville city boundary except the West Roseville Specific Plan area. Some of the existing near future customers are in Sacramento County and account for 1,803 ac-ft/yr of demand. The planning subareas served by Roseville are City of Roseville, City of Roseville West, Sunset Industrial Area Zone 1, Sunset Industrial Area Zone 5, Placer Vineyards, Dry Creek East, and Curry Creek.

Table 8-5. City of Roseville Ultimate Recycled Water Demand Summary

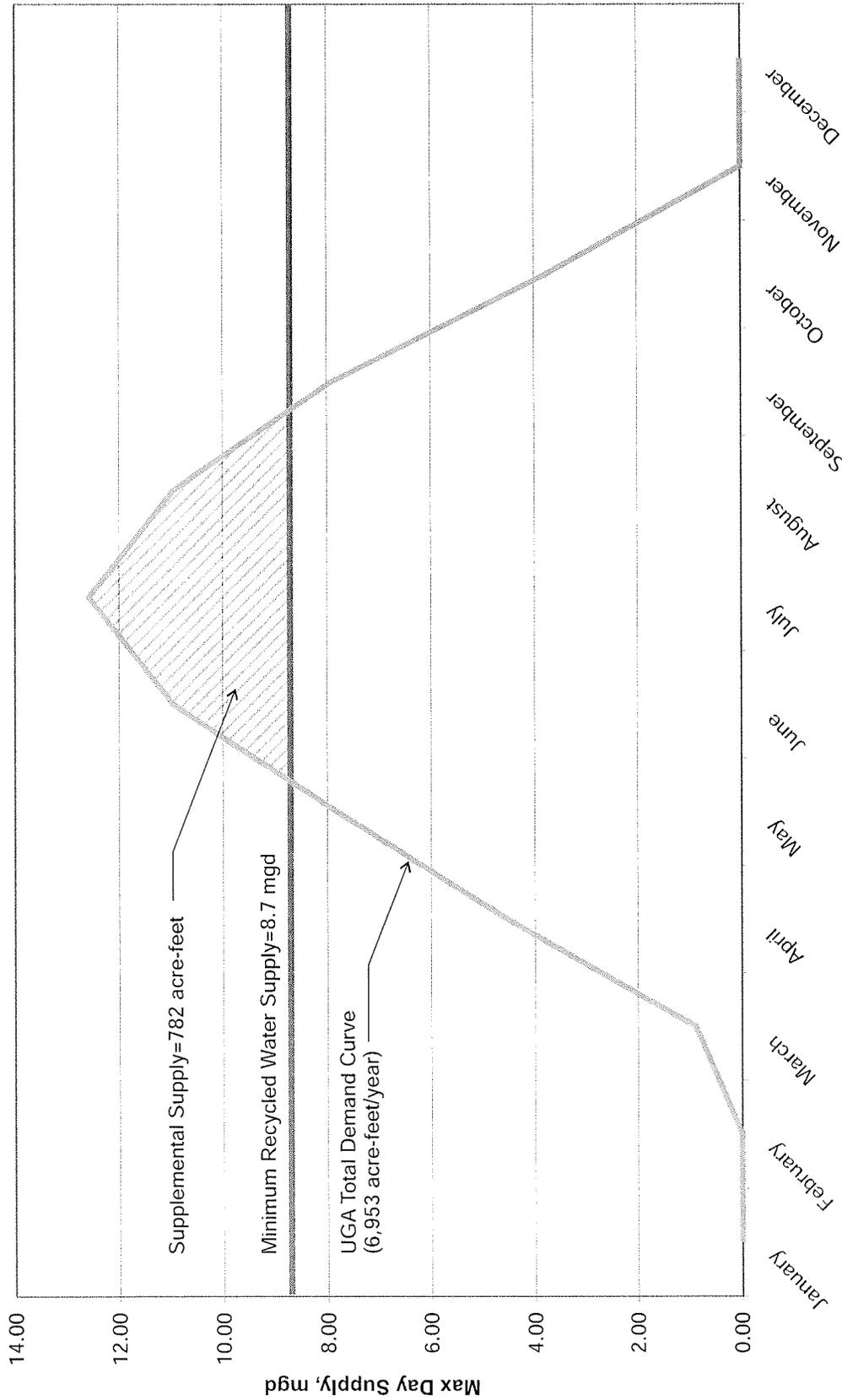
Demand	Annual, ac-ft
Existing Customers	2,045
Existing Near Future	6,550
Existing Potential	1,713
UGAs	
Placer Vineyards (Scenario 2)	1,580
Regional University	724
Placer Ranch	1,504
Curry Creek	1,860
West Roseville Specific Plan MOU (Creekview and Sierra Vista)	1,090
UGA Subtotal:	6,953
Total:	17,261

Notes:
 1. From Market Assessment for Recycled Water Distribution System TM (November 29, 2005)
 2. Placer Vineyards supply and demand from Draft Recycled Water Master Plan (June, 2006).
 3. Regional University supply and demand from West Yost correspondence on 6/27/06.
 4. Placer Ranch supply and demand from HydroScience correspondence on 7/6/06.
 ac-ft = acre-feet

Roseville defines the available recycled water supply as the ADWF provided by each respective UGA. The ADWF is compared to the peak day demand in July to determine if supply can meet demand. For all the UGAs, the peak day demand exceeds the ADWF from each respective area. Therefore, a supplemental supply is required to meet the recycled water system demands during peak days. Figure 8-2 illustrates the supplemental supply required for the combined demand of all the UGAs for Scenario 2. Individual supply and demand calculations for each UGA are presented in Table 8-6. As shown in Table 8-5, the total supplemental supply required for the assumed recycled water use is 782 ac-ft/yr. The MOU areas are not included in this calculation as Roseville will be meeting the supplemental supply requirements within their boundaries with either their own surface water or groundwater. This supplemental supply needed to fully meet seasonal reclaimed water demands outside of Roseville is not included in the supply to demand comparisons in Chapter 9.

This analysis of supplemental recycled water supply requirements for the Roseville service area differs slightly from the analysis for potable demand. The analysis uses a mixture of the Roseville analysis and the planning subarea approach. Instead of analyzing each planning subarea, the recycled water demand analysis is based on specific developments analyzed in Roseville's study. This approach is taken as the recycled water demands and supply are more detailed at the development-specific level, as opposed to the planning subareas used for the potable water analysis. The potable water demand analysis does not estimate wastewater flows, which are required to determine the available supply from Roseville. However, recycled water demands are back calculated into the planning subareas in order to remain consistent in the demand calculation methodology throughout this plan. In other words, the recycled water demand factors in the planning subareas are adjusted to equal the development-specific demands projected by Roseville. The total demands projected by Roseville are 15,458 ac-ft/yr for their recycled service area within Placer County. The resulting total demands for the planning subareas is 15,358 ac-ft/yr, approximately equal to Roseville's projections.

The City of Roseville has recently begun a pilot study of a groundwater recharge system as part of a conjunctive use investigation entitled the Dry Creek Recycled Water Recharge Feasibility Study. If successful and permitted by the State, the recharge system would use Dry Creek as a means to convey recycled water to irrigation users downstream, and would use recharge basins and/or wells to directly recharge the groundwater basin depending on current water resources needs. Potential reuse demand resulting from this project is not included in demand summary in Table 8-6.



BROWN AND CALDWELL	PROJECT	Integrated Water Resources Plan, Placer County Water Agency		Figure 8-2
	SITE	126233-023	Recycled Demand Versus Supply Sources for UGAs	
	DATE	7-21-06		

Table 8-6. Supplemental Supply Requirements

Month	(% of peak month demand)	Placer Vineyards				Regional University				Placer Ranch		
		Peak day demand, mgd	Supplemental supply peak day, mgd	Supplemental supply monthly, ac-ft	Peak day demand, mgd	Supplemental supply peak day, mgd	Supplemental supply monthly, ac-ft	Peak day demand, mgd	Supplemental supply peak day, mgd	Supplemental supply monthly, ac-ft		
January	0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0
February	0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0
March	7%	0.25	0.00	0.0	0.11	0.00	0.0	0.24	0.00	0.0	0.00	0.0
April	36%	1.26	0.00	0.0	0.58	0.00	0.0	1.21	0.00	0.0	0.00	0.0
May	62%	2.17	0.00	0.0	1.00	0.00	0.0	2.08	0.03	3.2	0.03	3.2
June	87%	3.05	0.25	22.6	1.41	0.25	23.0	2.92	0.87	80.4	0.87	80.4
July	100%	3.50	0.70	66.6	1.62	0.46	42.4	3.36	1.31	120.7	1.31	120.7
August	87%	3.05	0.25	22.6	1.41	0.25	23.0	2.92	0.87	80.4	0.87	80.4
September	63%	2.21	0.00	0.0	1.02	0.00	0.0	2.12	0.07	6.2	0.07	6.2
October	30%	1.05	0.00	0.0	0.49	0.00	0.0	1.01	0.00	0.0	0.00	0.0
November	0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0
December	0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.0
Total Supplemental:				112			88					291
Peak Day Demand:		3.5 mgd			1.62 mgd			3.36 mgd				
Peak Day Reuse Supply		2.8 mgd	0.7 mgd		1.16 mgd	0.46 mgd		2.05 mgd	1.31 mgd			

Notes:

Percent of peak month demand from Typical Local Irrigation Demands from Recycled Water Distribution System Feasibility Study (April, 2000)

Placer Vineyards supply and demand from Draft Recycled Water Master Plan (June, 2006).

Regional University supply and demand from West Yost correspondence on 6/27/06.

Placer Ranch supply and demand from Hydrosience correspondence on 7/6/06.

Curry Creek supply and demand from Roseville Market Assessment for Recycled Water Dist. System TM, November 2005, Table 6.

ac-ft = acre-feet

mgd = million gallons per day

Table 8-6. Supplemental Supply Requirements (continued)

Month	(% of peak month demand)	Curry Creek			Total UGA		
		Peak day demand, mgd	Supplemental supply peak day, mgd	Supplemental supply monthly, ac-ft	Peak day demand, mgd	Supplemental supply peak day, mgd	Supplemental supply monthly, ac-ft
January	0	0.00	0.00	0.0	0.00	0.00	0.00
February	0	0.00	0.00	0.0	0.00	0.00	0.00
March	7%	0.29	0.00	0.0	0.88	0.00	0.00
April	36%	1.48	0.00	0.0	4.53	0.00	0.00
May	62%	2.54	0.00	0.0	7.80	0.03	3.16
June	87%	3.57	0.88	80.8	10.94	2.24	206.73
July	100%	4.10	1.41	129.9	12.58	3.88	359.50
August	87%	3.57	0.88	80.8	10.94	2.24	206.73
September	63%	2.58	0.00	0.0	7.93	0.07	6.15
October	30%	1.23	0.00	0.0	3.77	0.00	0.00
November	0	0.00	0.00	0.0	0.00	0.00	0.00
December	0	0.00	0.00	0.0	0.00	0.00	0.00
Total Supplemental:				291			782
Peak Day Demand:		4.1 mgd			12.58 mgd		
Peak Day Reuse Supply:		2.69 mgd	1.41 mgd		8.7 mgd	3.88 mgd	

Notes:
 Percent of peak month demand from Typical Local Irrigation Demands from Recycled Water Distribution System Feasibility Study (April, 2000)
 Placer Vineyards supply and demand from Draft Recycled Water Master Plan (June, 2006).
 Regional University supply and demand from West Yost correspondence on 6/27/06.
 Placer Ranch supply and demand from Hydroscience correspondence on 7/6/06.
 Curry Creek supply and demand from Roseville Market Assessment for Recycled Water Dist. System TM, November 2005, Table 6.
 ac-ft = acre-feet
 mgd = million gallons per day

CHAPTER 9 INTEGRATED WATER SUPPLY STRATEGY

This chapter presents an integrated water supply strategy for normal, single dry, and multiple dry years for west Placer County. Water demands are compared to water supplies to develop the water supply strategy. Water demand projections are developed in Chapter 5 based on the growth scenarios discussed in Chapter 3. Water supplies including surface water, groundwater, and reclaimed water, are presented in Chapters 6 through 8.

The water supply to demand comparison is based on Scenario 2b. Scenario 2b is assumed to be the most likely representation of the buildout of western Placer County. If future development were to follow Scenario 3, the resulting buildout water demands would be similar to Scenario 2b because the supply to demand comparison is for the areas that are and will be served with PCWA water supplies. Therefore, the comparison does not include the demands and supplies in the remainder area and the NID service area where Scenario 3 demonstrates the greatest differences. The remainder area consists of several planning subareas in the northwest portion of west Placer County.

An important element in the development of the supply strategy during dry years is the allocation of water shortages to customers. The PG&E water supply from the Yuba-Bear system is subject to the largest dry year cutbacks.

9.1 Allocation of Water Shortages from the Yuba-Bear River System

Surface water supplies are subject to reductions during single and multiple year dry periods. The water supply that comes from the Yuba-Bear River system, the PG&E supply, is subject to significant reductions during dry periods. Most of PCWA's raw water customers are supplied from the Yuba-Bear River System. Due to the physical layout of PCWA's water supply and delivery system, dry year reductions cannot be reasonably mitigated with other sources of supply. As a result, raw water customers that are supplied by the Yuba-Bear River System will be subject to more significant supply reductions than other customers.

PCWA currently takes delivery of up to 105,400 ac-ft/yr of water annually for delivery to Zones 1 and 5 from the Yuba-Bear River system through PG&E's Bear River Canal and its downstream canal network. 100,400 ac-ft/yr is delivered pursuant to the PCWA's existing Zone 1 PG&E water supply contract, and 5,000 ac-ft/yr is delivered pursuant to a surplus water supply contract between the PCWA and South Sutter Water District; however the South Sutter Water District water is actually surplus NID water that also originates in the Yuba-Bear River System.

Historically, the PG&E supply was the only source of water for PCWA's treated and raw water customers. PCWA's total demand has only exceeded the PG&E contract supply within the last decade. In 2005, about 5 percent of PCWA's total demand was supplied from its MFP entitlement. The initial use of PCWA's MFP supply has been to replace historic deliveries from the PG&E canal system into the Auburn Ravine to meet the demands of the PCWA's Zone 5 agricultural customers and to provide a backup supply to the Foothill WTP through the second lift Auburn Tunnel Pump Station during the annual PG&E canal system maintenance outage.

The only year since the American River pump station was originally installed in which there was a drought severe enough to reduce PG&E deliveries below demands was in 1977, when PCWA was

only able to obtain a 50 percent supply from PG&E. The pumps were first re-installed in the American River by the USBR in 1977, and used to deliver water into the Auburn Ravine in an exchange agreement with NID to increase Zone 1 supplies. However, PCWA was still forced to impose significant restrictions on both treated and raw water deliveries that year.

PCWA anticipates that it will only receive 75 percent of its PG&E supply and none of the South Sutter Water District supply in a moderate or multi-year drought scenario. And in the worst case single driest year, that it will only receive 50 percent of its PG&E contract supply.

It is important to understand how these shortages during droughts would have to be allocated to the raw and treated water systems at buildout. Water that is delivered from the Yuba-Bear River serves a geographical area that will continue to be mostly separated from PCWA's other water sources as they are developed to meet the urban development proposed in western Placer County. There are physical, environmental, and economic constraints that would likely prevent supplying any significant backup water from other sources to supply PCWA's raw water system.

An analysis was done to help define how water shortages would be allocated. Figure 9-1 presents graphically the distribution of water supplies during normal and dry years at a time in the future when the Bowman, Auburn, Foothill, Sunset, and Ophir WTPs, and the ARPS would be operating at capacity.

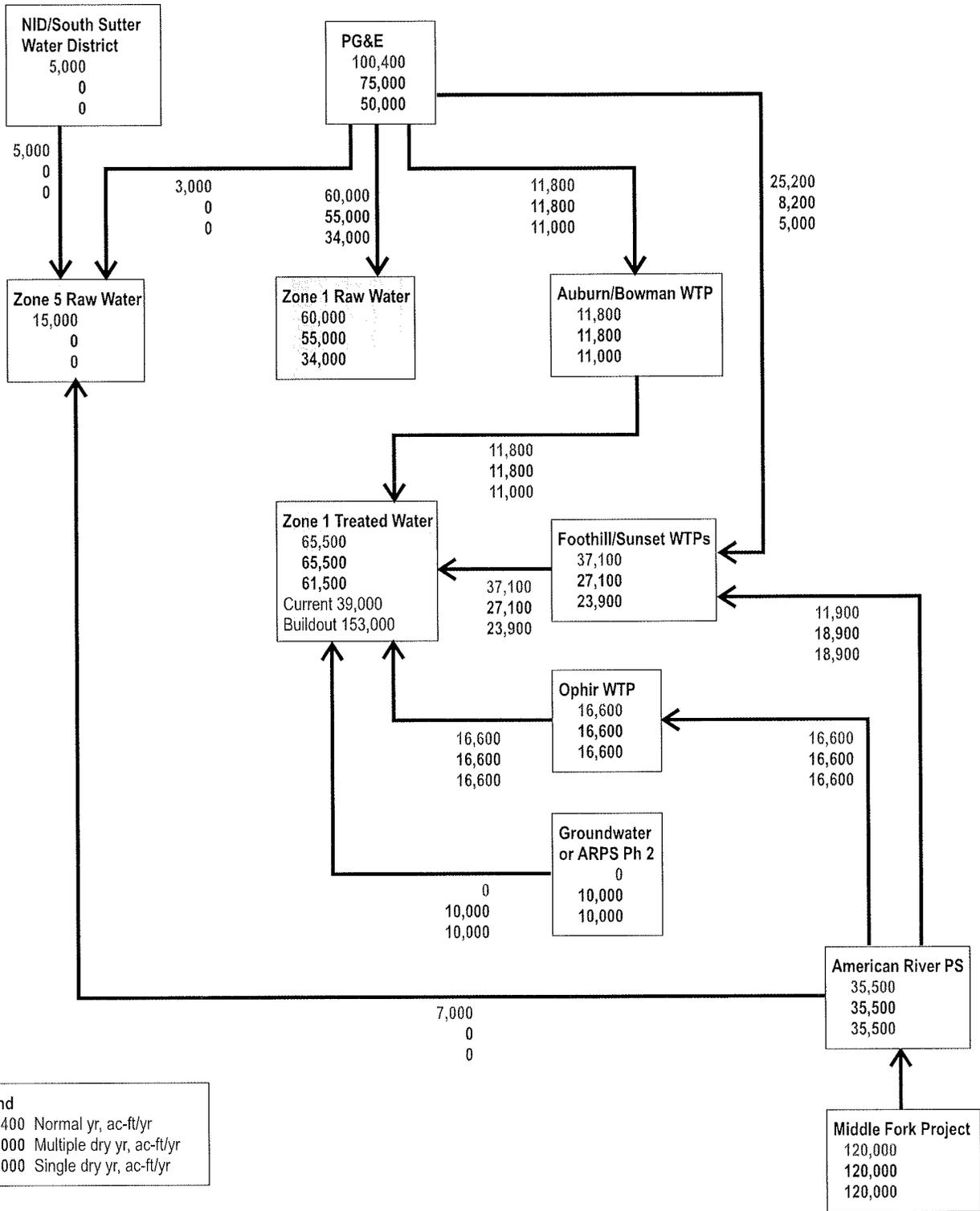
Table 9-1 presents the allocation of the available water supply resources to meet the "2004-05 Standard" demands. These supplies consist of 100,000 ac-ft/yr from PG&E, 5,000 ac-ft/yr from South Sutter/NID, and 9,000 ac-ft/yr from the MFP through the temporary American River Pump Station (ARPS).

Table 9-2 "Normal Year at buildout of Foothill/Sunset/Ophir" assumes the construction of the 30 mgd Ophir WTP and that treated water demands are increased to the capacity of each of the facilities. The treated water demand is 65,500 ac-ft/yr with the 26,500 ac-ft/yr increase comprised of 4,800 ac-ft/yr in the Auburn/Bowman system, 5,100 ac-ft/yr in the Foothill/Sunset system, and 16,600 ac-ft/yr to the new Ophir WTP. Raw water demands remain at 75,000 ac-ft/yr.

The Foothill WTP gets what is left over in the PG&E system after meeting the Auburn/Bowman system treated water and the raw water system demands. The result is that PG&E water delivered to the Foothill WTP decreases from 30,000 ac-ft/yr at present to 25,200 ac-ft/yr at buildout of these facilities, and the amount that must be delivered from the American River to the Foothill WTP increases to 11,900 ac-ft/yr. This is 21.3 mgd assuming the delivery is on a typical municipal and industrial (M&I) pattern. The total demand on the MFP supply is 35,500 ac-ft/yr.

Table 9-3 presents allocation of the PG&E supply during a 75 percent supply shortage, which is anticipated during a multi-year drought. On the supply side, no water from SSWD and only 75,000 ac-ft/yr from PG&E is assumed, for a total shortfall of 30,000 ac-ft/yr. The amount of PG&E water delivered to treated water uses is reduced by 17,000 ac-ft/yr and the supply to raw water is reduced by 13,000 ac-ft/yr. Zone 5 deliveries are cut by 15,000 ac-ft/yr to 0, with 8,000 ac-ft/yr from the canal system lost and 7,000 ac-ft/yr of MFP supply shifted from Zone 5 to treated water. Many of the Zone 5 customers have access to groundwater and will not be left without any supply. The net loss to Zone 1 raw water is 5,000 ac-ft/yr (8.3 percent).

P:\26000\26233 PCWA\GRAPHICS\FIGURES\Fig9-1-PGE-supply-chart.cdr



Legend
 100,400 Normal yr, ac-ft/yr
 75,000 Multiple dry yr, ac-ft/yr
 50,000 Single dry yr, ac-ft/yr

- Water Supply Source
- Pump Station or WTP
- Customer Demand (Demands shown equate to WTP capacity)

This figure is intended to depict how PCWA's available water supplies will likely be allocated in PCWA's Zone 1 in normal and dry years at such time as the treated and raw water demand is equal to the available supply from the American River Pump Station and the Yuba/Bear Rivers pursuant to PCWA's PG&E water supply contract. This is a less than buildout situation and time frame. Not shown on this Figure are the wholesale deliveries of PCWA's MFP and CVP supplies to San Juan Water District, the City of Roseville, Sacramento Suburban Water District, and additional PCWA diversions to meet its additional projected retail demands from the proposed Sacramento River diversion and water treatment plant project.

BROWN AND CALDWELL	PROJECT 26233	SITE Integrated Water Resources Plan Placer County Water Agency	Figure 9-1
	DATE 9-13-06	TITLE Zones 1 and 5 Allocation of PG&E Supply at Completion of Foothill/Sunset/Ophir WTPs	

Table 9-1. Current (2006) Normal Year, Zone 1 & 5 Allocation of PG&E Supply

	Zone 1 Treated Water, ac-ft/yr	Zone 1 Raw Water, ac-ft/yr	Zone 5 Raw Water, ac-ft/yr	Total Raw Water, ac-ft/yr	Total ac-ft/yr	Remarks
PG&E Supply to Raw Water		60,000	3,000	63,000	63,000	
PG&E Supply to Auburn/Bowman WTPs	7,000				7,000	
PG&E Supply to Foothill/Sunset	30,000				30,000	100,000 PG&E Total
NID/South Sutter Water District Supply			5,000	5,000	5,000	5,000 South Sutter Water District
MFP to Raw Water			7,000	7,000	7,000	
MFP to Foothill/Sunset WTP	2,000			0	2,000	
MFP to Ophir WTP					0	9,000 MFP Total
Total	39,000	60,000	15,000	75,000	114,000	

Note:
 ac-ft/yr = acre-feet per year

Table 9-2. Normal Year at Completion of Foothill/Sunset/Ophir, Zone 1 and 5 Allocation of PG&E Supply

	Zone 1 Treated Water, ac-ft/yr	Zone 1 Raw Water, ac-ft/yr	Zone 5 Raw Water, ac-ft/yr	Total Raw Water, ac-ft/yr	Total ac-ft/yr	Remarks
PG&E Supply to RW		60,000	3,000	63,000	63,000	
PG&E Supply to Auburn/Bowman	11,800				11,800	
PG&E Supply to Foothill/Sunset	25,200				25,200	100,000 PG&E Total
NID/South Sutter Water District Supply			5,000	5,000	5,000	5,000 South Sutter Water District
MFP to RW			7,000	7,000	7,000	
MFP to Foothill/Sunset	11,900			0	12,400	
MFP to Ophir WTP	16,600				16,600	35,500 MFP Total
Total	65,500	60,000	15,000	75,000	140,500	

Notes:
 Changes in spreadsheet from "Current Normal Year" to "Normal Year at buildout" - Increased Auburn system demand by 4,800 ac-ft/yr; Reduced PG&E supply to Foothill by the same amount (4,800 ac-ft/yr); Added Ophir WTP demand of 16,600 ac-ft/yr (30 mgd); Added Foothill WTP demand of 5,100 ac-ft/yr.
 ac-ft/yr = acre-feet per year

Table 9-3. Multi-Year Drought at Completion of Foothill/Sunset/Ophir -- 75% Supply

	Zone 1 Treated Water, ac-ft/yr	Zone 1 Raw Water, ac-ft/yr	Zone 5 Raw Water, ac-ft/yr	Total Raw Water, ac-ft/yr	Total ac-ft/yr	Remarks
PG&E Supply to RAW		55,000	0	55,000	55,000	
PG&E Supply to Auburn/Bowman	11,800				11,800	
PG&E Supply to Foothill/Sunset	8,200				8,200	75,000 PG&E Total
NID/South Sutter Water District Supply			0	0	0	0 South Sutter Water District
MFP to R/W			0	0	0	
MFP to Foothill/Sunset	18,900		0	0	18,900	
MFP to Ophir WTP	16,600				16,600	35,500 MFP Total
Groundwater	10,000				10,000	10,000 GW Total
Total	65,500	55,000	0	55,000	120,500	

Notes:

Changes from "normal year" to multi-year" - Cut Zone 5 to 0; reduced Zone 1 raw water by 5,000 ac-ft/yr (92 percent of normal supply); Auburn system delivery unchanged; Remaining PG&E supply delivered to Foothill WTP (reduced from 25,200 ac-ft/yr to 8,200 ac-ft/yr); Must supply the Foothill/Sunset/Ophir system with 10,000 ac-ft/yr from either Groundwater or from the Sacramento River to balance treated water demands.

Both multi-year and 50% supply scenarios require construction of capacity to convey up to 18,900 ac-ft/yr from the American River to the Foothill WTP.
 ac-ft/yr = acre-feet per year

The net surface water loss to the treated water system is 10,000 ac-ft/yr, which must be replaced by groundwater. Groundwater pumping of 10,000 ac-ft/yr, 17.9 mgd on M&I pattern, between PCWA and Lincoln, is required to meet the Zone 1 treated water demands. It is concluded that the amount of capacity required in the facilities to convey water from the American River to the Foothill WTP increases to 18,900 ac-ft/yr, or 33.8 mgd on and M&I pattern.

An alternative would be to assume that the ARPS can be expanded beyond 35,500 ac-ft/yr. Another 17,000 ac-ft/yr of diversion capacity would allow PCWA to continue to deliver 7,000 ac-ft/yr to Zone 5 and to deliver another 10,000 ac-ft/yr into the treated water system, eliminating the need for groundwater. The raw water transfer capacity from the Ophir WTP to the Foothill WTP would have to be increased to 29,400 ac-ft/yr, or 52.5 mgd on pattern. The South Canal is probably the only practical means to convey this much water from the Ophir WTP to the Foothill WTP.

Table 9-4 presents the allocation of the PG&E supply during a 50 percent supply drought, which is anticipated during a worst case single-year drought event. On the supply side, no water from South Sutter Water District and only 50,000 ac-ft/yr from PG&E are assumed, for a total shortfall of 55,000 ac-ft/yr. The amount of PG&E water delivered to treated water uses is reduced by 21,000 ac-ft/yr and the supply to raw water is reduced by 29,000 ac-ft/yr. Zone 5 deliveries are still cut to 0 ac-ft. With 7,000 ac-ft/yr shifted from Zone 5 to treated water, the net loss to treated water is 14,000 ac-ft/yr, which is replaced by 10,000 ac-ft/yr of groundwater and 4,000 ac-ft/yr in mandated cutbacks through implementation of the drought emergency plan identified in the Agency's Urban Water Management Plan. The net loss to Zone 1 raw water is 26,000 ac-ft/yr.

The most significant question raised in this analysis is, is there any practical way to reduce the burden on raw water customers that results from reduced PG&E deliveries? To significantly reduce this burden would require delivering MFP water into the raw water system. There are a number of obstacles to this, which include environmental problems as that temperature effects on fish have been identified in connection with any increased delivery of MFP water into the Auburn Ravine for delivery to Zone 5. However, continued delivery of the historic 7,000 ac-ft/yr from the MFP to Zone 5, as discussed above, would probably be environmentally acceptable. Another obstacle is that the cost of lifting water from the American River to the Zone 1 delivery system at Ophir is about \$75/ac-ft just for the energy, compared to the average sales price for raw water, which is just \$34/ac-ft. If the additional delivery costs are passed on to the customer it would mean a tripling of the raw water rates. If any additional delivery facilities were required to deliver water into the raw water system, a funding source would have to be identified for those facilities.

Table 9-4. Multi Single Dry Year Drought at Completion of Foothill/Sunset/Ophir - 50% Supply

	Zone 1 Treated Water, ac-ft/yr	Zone 1 Raw Water, ac-ft/yr	Zone 5 Raw Water, ac-ft/yr	Total Raw Water, ac-ft/yr	Total ac-ft/yr	Remarks
PG&E Supply to RW		34,000	0	34,000	34,000	
PG&E Supply to Auburn/Bowman	11,000				11,000	
PG&E Supply to Foothill/Sunset	5,000				5,000	50,000 PG&E Total
NID/South Sutter Water District Supply			0	0	0	0 South Sutter Water District
MFP to RW			0	0	0	
MFP to Foothill/Sunset	18,900		0	0	19,400	
MFP to Ophir WTP	16,600				16,800	35,500 MFP Total
Groundwater (or Auburn Phase 2)	10,000				10,000	10,000 GW Total
Total	61,500	34,000	0	34,000	96,200	

Notes:
 Changes from "Normal year" to "50% Supply" - Assume treated water demands cut to 94%, Zone 1 raw water cut to 57% of normal and Zone 5 cut to 0; Zone 1 raw water reduced from 60,000 ac-ft/yr to 34,000 ac-ft/yr; Auburn system delivery reduced from 11,800 ac-ft/yr to 11,000 ac-ft/yr; Foothill/Sunset delivery reduced from 25,500 ac-ft/yr to 5,000 ac-ft/yr with 10,000 ac-ft/yr makeup water from either groundwater or the Sacramento River system.
 Both multi-year and 50% supply scenarios require construction of capacity to convey up to 18,900 ac-ft/yr from the American River to the Foothill WTP.
 ac-ft/yr = acre-feet per year

An analysis of the allocation of the PG&E supply indicates that in a future multi-year drought, the reduction in deliveries through the Yuba-Bear system would be 30,000 ac-ft/yr. Figure 9-1 depicts graphically the allocation of Zone 1 and 5 water supplies. Although it would be the subject of Board policy at the time it occurs, it is assumed in the modeling that raw water cutbacks would be allocated as follows:

- Raw water to Zone 5 would be cut to zero first because they have greatest access to groundwater to replace PCWA deliveries.
- Zone 1 raw water customers would be cut to 92 percent of their normal supply (55,000 ac-ft versus 60,000 ac-ft).
- 10,000 ac-ft/yr of treated water demands in the Foothill/Sunset system would be supplied by groundwater.

This conjunctive use of groundwater recognizes the physical limitations of the raw water system and benefits both treated and raw water customers. Zone 1 raw water customers would see limited demand reductions because less PG&E water would be supplied to the treated water customers, and instead would be supplied to raw water demands. Zone 1 treated water customers would see no demand reductions, even though the PG&E supply would be greatly reduced, because groundwater would be used to make up the difference. The conjunctive strategy provides the greatest drought supply reliability for the PCWA system overall, and for the raw water and treated water systems individually.

In the single driest year, the reduction in Yuba-Bear system deliveries would be 55,000 ac-ft/yr. The modeling for this scenario is driven primarily by the inability to shift much additional water within the Yuba-Bear system from treated water deliveries to raw water deliveries. Between the multi-year and the single year scenarios, the amount of Yuba-Bear system water supplied to treated water uses at the Foothill WTP is reduced from 8,200 ac-ft/yr to 5,000 ac-ft/yr (from 25,200 ac-ft/yr in a normal year), respectively. All of the rest of the loss in Yuba-Bear supply must be allocated to the raw water system. The result is that raw water deliveries are reduced from a normal year supply of 75,000 ac-ft/yr to only 34,000 ac-ft/yr (57 percent in Zone 1, 45 percent overall) in a single driest year event.

9.2 Water Supply Strategy

This section presents how PCWA could serve the projected buildout of Scenario 2b under normal, multi-year dry, and single year dry events through the integrated use of surface water, recycled water, and groundwater.

Table 9-5 identifies the total demands that must be met with the available supplies. The raw water demands are carried forward from the Yuba-Bear allocation tables (Tables 9-1 to 9-4). Assumed treated water demand reductions in the single dry year drought scenario are only applied to PCWA demands. Roseville and SJWD demands are assumed to remain at 100 percent to be conservative. Table 9-5 also identifies the total supply needed and/or available for the west Placer study area. No groundwater is required in the PCWA/Lincoln system under the normal climate year event.

Table 9-5. West Placer County Supply to Demand Comparison, Scenario 2b, ac-ft/yr

Supply	Normal ac-ft/yr	Multi Dry Years ac-ft/yr	Single Driest Year ac-ft/yr
PCWA			
MFP	120,000	120,000	120,000
CVP	35,000	26,250	26,250
PG&E	100,400	75,000	50,000
South Sutter WD	5,000	0	0
Lincoln			
NID	3,300	2,475	1,650
Roseville			
CVP	32,000	24,000	24,000
Total Recycled	21,261	21,261	21,261
Private Groundwater	5,273	5,273	5,273
Groundwater			
Roseville	0	6,790	6,790
Lincoln/PCWA	0	10,000	10,000
Total	322,234	291,049	265,224
Demand			
Treated water demand factor	100%	100%	97% ^a
Raw water demand factor	100%	73%	45%
PCWA			
Auburn	12,188	12,188	11,822
Lincoln	44,243	44,243	42,916
Rocklin	27,841	27,841	27,006
Loomis/Granite Bay	16,284	16,284	15,795
West Placer	52,125	52,125	50,561
Roseville	65,970	65,970	65,970
San Juan Water District	16,415	16,415	16,415
Treated water subtotal	235,066	235,066	230,485
Raw water	75,000	55,000	34,000
Total	310,066	290,066	264,485
West Placer net	12,168	983	739
Groundwater recharge sale to SSWD	29,000	29,000	29,000
Net	-16,832	-28,017	-28,261

Notes:
^a Applied only to PCWA demands.
 ac-ft/yr = acre-feet per year

An issue is that groundwater pumping is required in the Yuba-Bear allocation tables but not in the Scenario 2b buildout tables. This is because the Yuba-Bear allocation tables looked at infrastructure limitations at less than buildout conditions (no Sacramento River project and no enlargement of the ARPS) and the Scenario 2b tables only evaluate water right limitations at buildout demands. PCWA has adequate water rights to not have to pump groundwater in dry years, but the infrastructure required to make this a reality.

It is assumed that the demands of the raw water system are significantly reduced in dry years. The infrastructure is assumed to not exist that would allow MFP or CVP entitlements to be delivered to the raw water system. So the raw water demands are limited to the amount that can be delivered to these existing customers.

Table 9-6 shows that Roseville’s supply and demand under buildout conditions in dry years. The demands assume buildout of the remainder MOU areas. No drought restrictions on demand in normal and dry years is assumed. In the single driest year Roseville’s CVP supply may be cut in excess of 25 percent due to Water Forum constraints, in which case they could increase groundwater pumping and/or impose mandatory cutbacks on customers. These dry year conditions or alternatives for Roseville were not modeled.

Table 9-6. City of Roseville Water Demand to Supply Comparison, ac-ft/yr

Supply/Demand	Normal ac-ft/yr	Multi Dry Years ac-ft/yr	Single Driest Year ac-ft/yr
Supply			
CVP	32,000	24,000	24,000
MFP	26,095	27,305	27,305
Recycled water	7,875	7,875	7,875
Groundwater	0	6,790	6,790
Total Supply	65,970	65,970	65,970
Demand	65,970	65,970	65,970
Net	0	0	0

Note:
 ac-ft/yr = acre-feet per year

Table 9-7 for SJWD is included for completeness. No drought restrictions on demand is assumed to be conservative.

Table 9-7. San Juan Water District Supply to Demand Comparison, ac-ft/yr

Supply/Demand	Normal ac-ft/yr	Multi Dry Years ac-ft/yr	Single Driest Year ac-ft/yr
Supply			
CVP	0	0	0
MFP	16,415	16,415	16,415
Recycled water	0	0	0
Groundwater	0	0	0
Total Supply	16,415	16,415	16,415
Demand	16,415	16,415	16,415
Net	0	0	0

Note:
 ac-ft/yr = acre-feet per year

Table 9-8 for PCWA (including Lincoln) shows how the remaining supplies and demands compare, after subtracting Roseville and San Juan. In normal years there is some excess surface water entitlements above Placer County demands. This is water that would be available to meet some of the SSWD demands in northern Sacramento County.

Table 9-8. PCWA (including Lincoln) Supply to Demand Comparison, ac-ft/yr

Supply/Demand	Normal ac-ft/yr	Multi Dry Years ac-ft/yr	Single Driest Year ac-ft/yr
Supply			
MFP	77,490	76,280	76,280
CVP	35,000	26,250	26,250
PG&E	100,400	75,000	50,000
NID to Lincoln	3,300	2,475	1,650
South Sutter WD	5,000	0	0
Recycled water	13,386	13,386	13,386
Private residential groundwater	5,273	5,273	5,273
Groundwater	0	10,000	10,000
Total Supply	239,849	208,664	182,839
Demand			
Treated water	152,681	152,681	148,101
Raw water	75,000	55,000	34,000
Total demand	227,681	207,681	182,101
PCWA net	12,168	983	738
Groundwater recharge sale to SSWD	29,000	29,000	29,000
Net	-16,832	-28,017	-28,262

Note:
 ac-ft/yr = acre-feet per year

9.3 Summary and Conclusions

The Agency prepared this IWRP to bridge the water supply planning gap between the level of development that was proposed in 2000 and evaluated in the Agency's 2001 Discussion Paper, and the currently proposed development projects in western Placer County. Several conclusions can be made based on the analysis presented in this study:

1. Using an integrated resources approach that combines surface water, reclaimed water, and groundwater, there is adequate water supply to reliably meet all of the projected PCWA western Placer County service area demands under normal climate, multiple year, and single year drought conditions.
2. Under multiple year (moderate) drought conditions, PCWA would be required to implement drought restrictions on raw water customer usage sufficient to reduce raw water demands to balance supply and demand.
3. Under single year (severe) drought conditions, PCWA would be required to implement drought restrictions on treated and raw water customer usage sufficient to reduce demands to balance supply and demands

4. Under drought conditions, raw water customers would likely experience a larger cutback than treated water customers because of physical limitations of the PCWA water delivery system.
5. Under drought conditions PCWA, Roseville, and Lincoln will all need to rely on groundwater to improve the reliability of their system.
6. Reclaimed water supply is an important supply source, and its use is required to meet buildout demands.
7. The buildout of the existing Placer County General Plan within the San Juan Water District service area will not require all of the 25,000 ac-ft/yr currently contracted to San Juan Water District to serve that area.
8. The surface water being supplied to the Sacramento Suburban Water District will be reduced in normal years but not eliminated as water demands increase within Placer County.

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APPENDIX A

Placer County Water Systems

Table A-1
Placer County Water Systems
Small Systems

Item	Location to Colfax	System ID	System Name	Service Area	Number of Connections	Population served		Unit Use, gpp ^a	Total Use, gpd	Annual MG	Water Source
						Permanent	Transient				
Community Ground Water Systems											
1	east	WA0003320	Michigan Bluff Mutual Water Co	Foothill	14	24		100	2,400	0.0	
2	east	WA0003309	Washoe Heights Mutual Water	Tahoe City	14	20		60	1,200	0.4	
3	west	WA0003190	Winding Way Mutual Water Co	North of City of Auburn	8	22		80	1,760	0.6	
4	east	3110032	Lake Forest Water Company	Lake Forest	115	50	150		10,890	4.0	
5	west	3110043	Madden Creek Water Company	Homewood	153	125	600		136,712	49.9	
Community Surface Water Systems											
6	east	WA0003192	Alpine Meadows Property Owners Association	East of Colfax	110	152		80	12,160	4.4	Boardman Canal
7	east	WA0003321	Dutch Flat Mutual Water Co	Dutch Flat	94	240		80	19,200	7.0	Boardman Canal
8	west	WA0003232	Heather Glen Community Service District	Applegate, South of I-80	86	250		80	20,000	7.3	Canal tributary to Clipper Creek
9	east	WA0003262	Shady Glen Community Water System	North Colfax	120	336		80	26,880	9.8	Boardman Canal
Community Ground Water Systems											
10	west	WA0003197	Auburn Valley Community Service District	North of City of Auburn	42	120		80	9,600	3.5	
11	east	WA0003198	Baker Ranch Water Company	Forest Hill	54	150		80	12,000	4.4	
12	west	WA0003310	Emigrant Gap Mutual Water Co	Emigrant Gap	43	125		50	6,250	2.3	
13	east	WA0003224	Glen Oaks Mobile Home Park	Auburn	47	131		50	6,550	2.4	
14	west	WA0003226	Glenbrook Mobile Estates	East of Newcastle	100	280		50	14,000	5.1	
15	west	WA0003276	North Eden Valley	between Weimar and Colfax	16	45		50	2,250	0.8	
16	west	WA0003246	Ophir Gardens	between Newcastle and Auburn	16	45		50	2,250	0.8	
17	west	WA0003281	Rockanna Royale Mobile Home Park	between Newcastle and Auburn	22	59		50	2,950	1.1	
18	west	WA0003258	Rosecrest Mutual	Roseville	15	35		100	3,500	1.3	
19	west	WA0003263	Sierra Meadows Apartment	Rocklin	31	87		55	4,785	1.7	
20	east	WA0003308	Tahoma Meadows Mutual Water Com	Homewood, Tahoe	43	120		60	7,200	2.6	
21	east	WA0003307	Timberland Tract Water Co	Tahoe City	105	200		60	12,000	4.4	
Community Wholesale Purchased Systems											
22	west	WA0003229	Gold Hill Mobilehome Park	Roseville	31	75		50	3,750	1.4	
23	west	WA0003227	Golden Hills Mutual Water Co	Loomis	30	84		80	6,720	2.5	PCWA lower / Zone 1 treated water system
24	west	WA0003836	Hidden Valley Community Association	Granite Bay	150	600		100	60,000	21.9	PCWA lower / Zone 1 treated water system

Notes:

a. Water use requirements are maximum values. From Small and Decentralized Wastewater Management Systems, Cines-Uchobangbong, Table 4-1

Unless otherwise noted, information is taken from DHS System 2002 Annual Report.

gpp - gallons per person

Table A-2
Placer County Water Systems
Large Systems

Item	Location to Cofax	System Number	System Name	Community	Service Area Location	Number of Connections	Population served		2002 Annual Production, MG			Water Source
							Permanent	Transient	Ground Water	Surface Water	Purchased	
1	west	3110001	Cadell-West Placer	Newcastle	Newcastle	200			127.8			Boardman Canal after Foothill treatment plant
2	west	3110033	Castle City Mobile Home Park	Auburn	North Auburn	541	2,000		182.7			Boardman Canal
3	west	3110034	Christian Valley Park/CSD	Forest Hill	Unincorporated Forest Hill	1,726	5,000		324.1		308	Sugar pine dam, north shirt tail canyon creek, 2 wells
4	west	3110003	Foothill PUD	Forest Hill	Lincoln	6,197	16,141		46		1,324	Wells
5	west	3110004	Lincoln, City of Zone A	Lincoln	Lincoln	1,462	4,000		186.7			Wells
6	west	3110030	Lincoln, City of Zone B	Auburn	North Auburn	2,457	5,700		656			Rock Creek Reservoir
7	west	3110026	Nevada Irrigation District-North Auburn	Auburn	Sheridan	227	600		61.4			2 wells
8	west	3110048	Placer County Service Area #28-Sheridan	Applegate	Applegate	60	198		10.3			Boardman Canal
9	west	3110050	Placer County Water Agency - Applegate	Auburn	Auburn/Bowman	7,484	24,697		12.25			7 connections included in Auburn data
10	west	3110005	Placer County Water Agency - Bowman	Bowman	Auburn/Bowman				1,742			
11	west	3110040	Placer County Water Agency - Bonchi Estates	Roseville		46	152		25.5			
12	west	3110006	Placer County Water Agency - Colfax	Colfax	Colfax	844	2,785		199.187			FC&E Wise/South Canal
13	west	3110025	Placer County Water Agency - Foothill	Newcastle	Newcastle	19,423	64,066		7,731.993		40	FC&E Wise/South and Caperton Canals, MFP during peak demands months
14	west	3110025	Placer County Water Agency - Foothill	Newcastle	Newcastle	19,423	64,066		7,731.993		40	FC&E Wise/South and Caperton Canals, MFP during peak demands months
15	west	3110124	Placer County Water Agency - Sunset	Rocklin	Rocklin	same as Foothill	58		15,448			Unnamed tributary to Orr Creek from NID
16	west	3110046	Placer County Water Agency - Monte Vista	Auburn	Monte Vista	18	80					
17	west	3110008	Roseville, City of	Roseville	Roseville	31,479	85,772		9,683		38.1	Currently 60 mgd 75 mgd (2006) 100 mgd (2010)
18	west	3110035	Weimar Water Company	Weimar	Weimar	423			153			Surface Water (PCWA-Folsom Lake, plus inlets with S.J.M.D, CAWC and CHWD) also CVP (Reclamation)
19	east	3110012	Agate Bay Water Company	Tahoe area	Agate Bay Community	570	2,500		114			Boardman Canal
20	east	3110029	Alpine Springs County Water District	Alpine Meadows	Alpine Meadows	796	300	4,000	99.5			1 well, Lake Tahoe
21	east	3110015	Fullon Water Company-Main	Tahoe City	Alpine Meadows	900			140			7 wells primarily groundwater with some surface (lake Tahoe) water in the summer.
22	east	3110022	Mc Kinney Water District	Tahome	Cedar Flats, North Tahoe	240	1,000		30			2 wells
23	east	3110009	Meadow Vista County Water District	Meadow Vista	Tahome	240	3,400		405.8		33.24	Boardman Canal purchased from PCWA
24	east	3110041	Midway Heights County Water District	Meadow Vista	Meadow Vista	1,239	1,000					Treatment provided by Weimar Water Company, PCWA for raw water
25	east	3110023	North Tahoe PUD-Carnelian Woods	Tahoe Vista	Colfax	269	600	900	32.78			groundwater
26	east	3110036	North Tahoe PUD-Dollar Cove	Tahoe Vista	Tahome	271	600	1,600			29.9	groundwater from Tahoe PUD
27	east	3110001	North Tahoe PUD-Main	Tahoe Vista	Dollar Cove	3,091	5,000	10,000	98.28			ground and surface water (Lake Tahoe)
28	east	3110028	Northstar Community Services District	Truckee	Kings beach, lake vista	86	930		105.3			
29	east	3110024	Placer County Water Agency - Alta	Auburn	Northstar Area	217	716		53.77			
30	east	3110051	Placer County Water Agency - Labonian	Truckee	Alta	515	1,700		1.74			
31	east	3110017	Sierra Lakes County Water District	Soda Springs	Truckee	671	138	3,079	47.99			Upper Lake-Sorena groundwater
32	east	3110020	Squaw Valley County Water District	Olympic Village	Olympic Village	746	926	6,077	146.67			
33	east	3110019	Squaw Valley Mutual Water Co.	Tahome	Olympic Village	1,025	2,850		165.5			
34	east	3110043	Tahoe Cedars Water Company	Tahome	Tahome	1,025	2,850		165.5			Groundwater
35	east	3110044	Tahoe City PUD-Alpine Peaks	Tahome	Ward Valley/Alpine Peaks	82	10	250	13.4			6 Groundwater Wells (primary), surface water
36	east	3110010	Tahoe City PUD-Main	Tahome City	North Lake Tahoe	2,675	3,300	20,000	517.3			Groundwater, Future surface water in planning phase
37	east	3110011	Tahoe City PUD-Quail McKinley	Tahome City	North Lake Tahoe	445	750	1,600	68.3			Groundwater
38	east	0910012	Tahoe City PUD-Rubicon System	Tahome City	Chamberlains area (West Shore)	566	250	1,200	87.12			Groundwater
39	east	3110018	Tahoe Park Water Company-Main	Tahome City	Rubicon and Tahoe Hills	421	330	1,000	4			
40	east	3110149	Tahoe Park Water Company-Nelson	Tahome City	Tahome	67	40	121	2			Nelson Well, Elizabeth Lake Intake
41	east	3110049	Tahoe Park Water Company-Skyland	Tahome City	Tahome	67	40	121	2			Nelson Well, Elizabeth Lake Intake
42	east	3110042	Tahoe Swiss Village Utility, Inc	Homeewood	Homeewood		300		63.32		2.2	
43	east	3110047	Tahome Record Improvement District	Homeewood	Homeewood		300		63.32		2.2	
44	east	3110031	Ward Well Water Company	Tahome City	Tahome City	212	375	650	29			wells

Note:
Values are in acre-feet, unless noted otherwise.
MG = million gallons
mgd = million gallons per day

APPENDIX B

Existing Reports and Planning Documents

**Table B-1
Placer County Document Review Summary**

Document	Date	Content Summary	Notes
Placer County General Plan	August 1994	Summarizes planning implementation from other community plans. Presents Dry Creek/West Placer Community Plan in an amendment to GP.	
Granite Bay Community Plan	1989, amended 1996	Plan projects up to 2000 only. Provides housing/population projections up to 2000. Provides specific land use policies. Describes land use districts. Plan provides framework to maintain rural status. Describes wastewater services. Describes water services.	
Carmelian Bay Community Plan Auburn/Bowman Community Plan	1996 1994, updated 1999	Area on north shore of Lake Tahoe. Projects up to 2010. Overrides Auburn General Plan for areas outside city limits and sphere of influence boundaries. Provides housing/population projections up to 2010. Land use descriptions. Plans goals are to increase density in Auburn area and maintain rural character in other areas. Describes wastewater services, with agency map. Describes water services, with agency map.	Not part of PCWA IWRP study area.
Foresthill Divide Community Plan	2003, still in Draft form	Projects up to 2022. Area planned to maintain rural, low density character. Provides housing/population projections up to 2020. Land use descriptions. No central sewage treatment, all on site or septic systems. Water supply/infrastructure summary.	Not part of PCWA IWRP study area.
Meadow Vista Community Plan	1996	Projects up to 2010. Provides housing/population projections up to 2010. Land use descriptions. Plan goals are to maintain rural character and resort community development. Describes wastewater services. Issues for town center discharge, with three options presented. Describes water services with map.	Not part of PCWA IWRP study area.

**Table B-1 (cont.)
Placer County Document Review Summary**

Document	Date	Content Summary	Notes
Horseshoe Bar/Penryn Community Plan	1994	Projects up to 2010. Provides housing/population projections up to 2010. Land use descriptions. Plan goals are to maintain rural character but allow higher density near infrastructure. Describes wastewater services. Describes water services.	
Placer Legacy Open Space and Agricultural Conservation Program	2000	Summary of program to implement open space recommendations from PC General Plan. Summary of urban growth trends and agriculture in PC.	
Western Placer County Agricultural Land Assessment and Agricultural Land Conservation Criteria	2002	Summary of agriculture trends in PC. Williamson Act impact on zoning. Good review of water and infrastructure in PC. Land use and growth trends.	
Placer County Economic and Demographic Profile	2004	Projects population/households/labor to 2020. Summarizes other demographic studies such as SACOG and SRRI.	
North Tahoe Community Plan	April 1996	Community Plans for Carnelian Bay, Kings Beach, Tahoe Vista, Kings Beach Industrial, North Stateline, and North Tahoe Area General Plan.	Not part of PCWA IWRP study area.

Table B-2
City of Auburn Document Review Summary

Document	Date	Content Summary	Notes
City of Auburn General Plan	1993	Projects up to 2012. Provides population/housing projections.	

Table B-3
City of Rocklin Document Review Summary

Document	Date	Content Summary	Notes
Draft – City of Rocklin General Plan Background Report	October 2002	Provides a good description of the following topics: Priority demographic information is summarized in the document introduction. Existing land uses Pending development projects Population and household characteristics Description of potable water services provided by PCWA taken from the <i>PCWA Discussion Paper</i> .	
Draft – City of Rocklin General Plan – Constraints, Opportunities and Options Report	October 2002	Provides a good description of the following topics: Population and growth trends from 1940 to 2000. Projected population growth through 2010 with moderate and high growth scenarios. Summarizes SACOG population projection from 2005 to 2025 Growth Projection Scenarios Planning areas and sub-area descriptions. Land use analysis Current City area and sphere of influence areas for Rocklin, Lincoln, Roseville, and Loomis.	
City of Rocklin Administration – Draft – General Plan Update	Unpublished 7/06/2004	Provides a good description of the following topics: Population growth scenarios from 2000 to 2025 at build-out of sphere of influence area. General land use policies/goals. Description of potable water services provided by PCWA taken from the <i>PCWA Discussion Paper</i> . Description of future water available through PCWA Description of wastewater conveyance by SPMUD to Dry Creek WWTP.	Not yet adopted by the City.

**Table B-4
Town of Loomis Document Review Summary**

Document	Date	Content Summary	Notes
Town of Loomis General Plan	July 2001	Provides a good description of the following topics: Population and housing unit changes from 1198 to 2020. Long-term growth potential analysis. Land use designations and changes.	
Town of Loomis General Plan Update and Technical Background Report.	August 1998	Provides a good description of the following topics: Population estimates from present to 2020. Population characteristics and demographics. A summary of land use areas for existing and build-out conditions. Population projections through 2020. General description of SPMUD capacity in conjunction with Roseville WWTP expansion. General description of available PCWA water supply. Zone 1 service area description of service area distribution and storage facility, including figure of water distribution network. PCWA future plans to meet required water capacity. General description of groundwater capacity and water quality.	
Town of Loomis Comprehensive General Plan Update: Final Environmental Impact Report	May 2001	Provides a detailed description of the following topics: Summary of land usage with projections to 2020, new development, and max build-out. PCWA Zone 1 distribution and storage system, in addition to future PCWA plans for expansion of water treatment capacity. Mitigations and impacts to PCWA at full build-out and PCWA plan for future water treatment requirements. Wastewater system and services. Full build-out wastewater requirements and SPMUD plans to meet future wastewater requirements.	

**Table B-5
City of Colfax Document Review Summary**

Document	Date	Content Summary	Notes
Wastewater Treatment Plant Facilities Plan	2003	Presents three alternatives for future ww treatment, land disposal, surface disposal, and regional system. Alternatives will not be selected until completion of environmental documents.	Not part of PCWA IWRP study area.

Table B-6
SACOG Document Review Summary

Document	Date	Content Summary	Notes
Blueprint Project		Projects residential and employment population for the seven-county area in the Sacramento region. SACOG provided database of various projections for use in this PCWA analysis.	

Table B-7
NID Document Review Summary

Document	Date	Content Summary	Notes
Raw Water Master Plan			
Urban Water Management Plan	2001	Discussion of supply, demand, reliability, water recycling and other standard plan requirements.	Recycled water is WWTP effluent mixed with creeks then diverted into NID canals.
North Auburn Treated Water System Master Plan Update	1987	Summary of engineering analysis for area master plan, including treatment capacity, fire flow, and peak hour needs.	

Table B-8
South Sutter Water District Document Review Summary

Document	Date	Content Summary	Notes
Water Management Plan	November 2003	Description of infrastructure, operations, water rights, and delivery history.	Does not mention 5,000 AF wheeling from NID to PCWA.
Un-named document	unknown	MBK was hired to evaluate system analysis with purpose of increasing surface water supplies to decrease groundwater pumping.	Document unknown, but mentioned in Water Management Plan.

Table B-9
San Juan Water District Document Review Summary

Document	Date	Content Summary	Notes
Urban Water Management Plan		Standard UWMP requirements	
Bureau of Reclamation Water Supply Plan	May 2004	Standard requirements	

Table B-10
American River Basin Cooperating Agencies Document Review Summary

Document	Date	Content Summary	Notes
Regional Water Master Plan Phase 1 Final Report	June 1999	Review of water resources and infrastructure in Sacramento County and southern Placer County, projected water demand, and proposed regional project alternatives to meet demands, and analytical tools and evaluation criteria.	
Regional Water Master Plan	2003	Review of water resources in Sacramento County and southern Placer County, Water Forum impacts, and proposed regional project alternatives to meet demands.	

Table B-11
City of Lincoln Review Summary

Document	Date	Content Summary	Notes
City of Lincoln Amended Public Facilities Element. Prepared by City of Lincoln.	October 1998	Provides statements, goals, and policies of public facilities. Provides a general description of existing facilities. Water services provided by PCWA and wastewater treatment by City owned facilities. Current and future land use descriptions including population, water/wastewater services estimates for 2010 and build-out demands.	Good source for City requirements projected to 2010 and ultimate build-out in text and table formats. Summary of PCWA plans to provide water to Lincoln to meet City build-out requirements.
City of Lincoln General Plan. Prepared by the Sacramento Area Council of Governments.	September 1988	Outdated information related to population projections/demands and City infrastructure.	This General Plan has been updated with the following reports: General Plan Background Report Alternatives Report
City of Lincoln General Plan Background Report. Prepared by Mintier & Associates, URS in association with EPS and ESA.	December 2002	Report Provides: Projected Regional Growth estimates through 2025 for Placer County, Roseville, Rocklin, and Lincoln. Land use information is incomplete. Description of current water demands. Wastewater capacity. Water supply availability: PCWA, NID General descriptions of surface and groundwater resources.	

**Table B-11 (cont.)
City of Lincoln Review Summary**

Document	Date	Content Summary	Notes
City of Lincoln General Plan, Goals and Policies Report. Prepared by Mintier & Associates, URS in association with EPS and ESA	September 2003	Report contains itemized governmental goals and policies. Does not provide description of water systems, population land use estimates.	
City of Lincoln General Plan Update, Alternatives Report.	September 2003	Update provides: Description of General Plan Amendments for changes to land uses. Figure showing land uses. Sphere of influence expansion alternatives with figure and build-out population estimates.	
City of Lincoln Housing Element. Prepared by Parsons. September 2002. Amended. City Council Resolution No. 2003-231.	November 2003	Provides an evaluation of the 1996 Housing Element, goals and policies taken by the City. General discussion of City housing needs and characterization. Appendix A provides population trend predictions and characterization (240% increase between years 2000 and 2010). City and Placer County SACOG population projections to 2020.	
City of Lincoln Urban Water Management Plan. Adopted	December 2002	This document includes: A thorough description of all things water including future demand requirements, water sources/contracts, plans to meet future water needs, water resource reliability, wastewater and recycled water supply and uses through 2020. SACOG population and water demand estimates to 2020. Groundwater basin description for regional groundwater movement, aquifers, and recharge. Amount, location, of sufficiency of groundwater to be pumped by water suppliers. Copies of water contracts	

**Table B-12
City of Roseville Review Summary**

Document	Date	Content Summary	Notes
Recycled Water Distribution System Feasibility Study	2000	Standard study, include maps of current and potential customers around Roseville area. Recycle demands and supply water balance. Recommends distribution system requirements.	
City of Roseville Recycled Water Distribution System Initial Study/Mitigated Negative Declaration	2000	Neg dec for recycle master plan, only contains standard elements.	
West Roseville Specific Plan Area – Master Water Study	May 2003	Evaluation of water demand and infrastructure requirements to provide water to new MOU area. Appendix has TMs from MMH that address unit water demands and future water demands and supply requirements for all of Roseville's future service area, including surface, ground, and recycled.	See the Appendix for updated land use and land use-based unit demands in Roseville area.
City of Roseville 2002 Urban Water Management Plan – Update.	November 2003.	Standard supply/demand analysis. Includes copy of west county groundwater management plan in appendix – good source for groundwater information.	
City of Roseville General Plan, 2010.	November 18, 1992	Provides a description of the following topics through 2010: Information is outdated and not useful for projection estimates. Land use projections Water, Wastewater and Recycled water systems. Population characterization	
City of Roseville Water Model Update. Prepared by West Yost and Associates,	July 2003.	Provides a description of the following topics: General background description of existing service area, water supply and treatment, distribution system. Water supply/consumption from 1980 to 2002. Unit water demand factors for land use designation. Max day peaking factors Comparison between existing and build-out annual water demands based on land use areas.	

**Table B-12 (cont.)
City of Roseville Review Summary**

Document	Date	Content Summary	Notes
Environmental Impact Report for the West Roseville Specific Plan and Sphere of Influent Amendment (State Clearinghouse No. 2002082057). Volume I, Chapters 1, 2, 3, and 4 (Sections 4.1 through 4.10). Prepared by EIP Associates.	September 15, 2003.	Purpose of EIR: Bring in 5,527 acres into City Sphere of influence. Annexation of 3,162 acres (part of the 5,527 acres) into City jurisdiction. Provides standard EIR related impacts related to Environmental issues. Pertinent information includes the following: Description of the future land use of the newly annexed property. Description of future water and wastewater infrastructure. Description of water recycling system with figure. Chapter 4 provides a detailed description of land use changes resulting from annexation. Provides a detailed description of population projection and characterization to 2020 in Placer County and Roseville.	
Environmental Impact Report for the West Roseville Specific Plan and Sphere of Influent Amendment (State Clearinghouse No. 2002082057). Volume II, Chapters 4 through 10.	September 15, 2003.	Provides public utilities description including water and wastewater. Provides surface water hydrology description and surface water quality. Regional and local groundwater characterization. Groundwater use and quality. Storage capacity and aquifer recovery. Additional information is related to other standard EIR topics.	
Recycled Water Study for West Roseville Specific Plan Area (Fiddymont Ranch/Westpark Properties). Prepared by HydroScience Engineers, Inc.	May 21, 2003.	Provides a description of the following topics: Recycled water distribution system. Roseville recycled water supply at both WWTPs. Recycle water demands Existing city ultimate recycle water demand at build-out.	
Groundwater Impact Analysis for Proposed Reasons Farm Land Retirement Plan	June, 2003	Evaluation of change in groundwater pumping and impacts to groundwater supply.	
Water-related MWH Technical Memorandums	varies	TM 1 – Evaluation of Water System Capacity – Water Demands, February 26, 2002. TM Task 1 – Unit Water Demand Factor Revision, November 6, 2002. TM 4 – Evaluation of Water System Capacity – Water Supply Alternatives, February 11, 2002. TM Task 7 – Water Supply Strategy, November 6, 2002	

**Table B-13
Specific Development Plans Review Summary**

Document	Date	Content Summary	Notes
Bickford Ranch Specific Plan	September 1, 2004	Table providing projected land use and density.	
Placer Ranch Plan	unknown	Table providing projected land use and density.	Fax from County on April 18, 2005
Whitney Ranch Plan	September 28, 2004	Map and table providing projected land use	Map faxed from City of Rocklin Planning
De La Salle Specific Plan, Appendix F Water Supply Master Plan	April 8, 2005	Presents demand projections and supply sources, including potable and reclaimed water.	

APPENDIX C

Land Use Update Data

Table C-1
Alternative 2 Only Hardcode Changes

Sub Area	Land Use	New Gross Acres	Corresponding DU
Curry Creek Community Plan	Agricultural or Timberland 80 Ac. Min.	11	
	High Density Residential 15.1-20.0 DU/Ac.	383	5,950
	Medium Density Residential 5.1-7.0 DU/Ac.	450	3,150
	Low Density 3.1-5.0 DU/Ac.	1,036	4,973
	Recreation Conservation	400	
	Professional Office	400	
	Open Space	850	
	Public	700	
	Total:	4,219	14,073
Sunset Industrial PCWA Zone 1	High Density Residential 10.1-15.0 DU/Ac.	20	214
	High Density Residential 15.1-20.0 DU/Ac.	37	657
	High Density Residential 20.1 + DU/Ac.	13	786
	Medium Density Residential 5.1-7.0 DU/Ac.	79	450
	Medium Density Residential 7.1-10.0 DU/Ac.	98	781
	Low Density 3.1-5.0 DU/Ac.	4	
	Professional Office	620	
	Commercial	356	
	Recreation Conservation	529	
	Public	204	
	Industrial	2,107	
	Agricultural or Timberland 80 Ac. Min.	69	
	Open Space	281	
	Total:	4,417	2,887
Sunset Industrial PCWA Zone 5	High Density Residential 10.1-15.0 DU/Ac.	20	214
	High Density Residential 15.1-20.0 DU/Ac.	37	657
	High Density Residential 20.1 + DU/Ac.	13	786
	Medium Density Residential 5.1-7.0 DU/Ac.	979	450
	Medium Density Residential 7.1-10.0 DU/Ac.	498	781
	Low Density 3.1-5.0 DU/Ac.	-	
	Professional Office	420	
	Commercial	136	
	Recreation Conservation	229	
	Public	154	
	Industrial	1,047	
	Agricultural or Timberland 80 Ac. Min.	600	
	Open Space	194	
	Total:	4,327	2,887
City of Roseville, West	Agricultural or Timberland 20 Ac. Min.	-	
	Agricultural or Timberland 80 Ac. Min.	-	
	High Density Residential 15.1-20.0 DU/Ac.	194	3,123
	Medium Density Residential 7.1-10.0 DU/Ac.	252	1,873
	Low Density Residential 3.1-5.0 DU/Ac.	2,642	9,774
	Commercial	60	
	Professional Office	226	
	Industrial	176	
	Public	265	
	Recreation/Conservation	502	
	Open Space	1,205	
	Total:	5,521	14,770
Future City of Lincoln, West	High Density Residential 20.1 + DU/Ac.	90	2,121
	High Density Residential 15.1-20.0 DU/Ac.	380	5,477
	Medium Density Residential 7.1-10.0 DU/Ac.	1,610	9,929
	Low Density Residential 3.1-5.0 DU/Ac.	740	2,530
	Low Density Residential 0.1-1.0 DU/Ac.	1,110	382
	Professional Office	160	
	Commercial	170	
	Recreation/Conservation	310	
	Public	310	
	Open Space	7,720	
	Total:	12,600	20,439

**Table C-2
Alternative 1 and 2 Hardcode Changes**

Sub Area	Land Use	New Gross Acres	Corresponding Dus
City of Rocklin (Whitney Ranch)	Industrial	0	
	Low Density Residential -3.1-5.0 DU/Ac.	129	298
	Medium Density Residential 5.1-7.0 DU/Ac.	633	2,677
	Medium Density Residential 7.1-10.0 DU/Ac.	27	212
	High Density Residential 20.1 +	58	1,150
	Open Space	194	
	Professional Office	10	
	Recreation/Conservation	60	
	Public	80	
	Commercial	34	
	Total:	1,224	4,337
City of Roseville, West	Agricultural or Timberland 20 Ac. Min.	91	
	Agricultural or Timberland 80 Ac. Min.	2,309	
	High Density Residential 15.1-20.0 DU/Ac.	110	1,774
	Medium Density Residential 7.1-10.0 DU/Ac.	143	1,064
	Low Density Residential 3.1-5.0 DU/Ac.	1,501	5,552
	11. Regional Retail	34	
	Professional Office	128	
	Industrial		176
	Public	150	
	Recreation/Conservation	285	
	Open Space	685	
Open Space	111		
	Total:	5,548	8,566
Bickford Ranch	Low Density Residential 1.0-3.0 DU/Ac.	150	262
	Medium Density Residential 7.1-10.0 DU/Ac.	17	172
	Rural Residential	259	56
	Low Density Residential 3.1-5.0 DU/Ac.	338	1,400
	Professional Office	10	
	Public	7	
	Recreation/Conservation	386	
	Open Space	771	
	Industrial	4	
	Total:	1,942	1,890
Dry Creek/ West Placer (Placer Vineyard)	Agricultural or Timberland 80 Ac. Min.	3	
	Medium Density Residential 5.1-7.0 DU/Ac.	1,105	6,080
	Open Space	1,040	
	High Density Residential 15.1-20.0 DU/Ac.	274	4,060
	Low Density Residential 0.1-1.0 DU/Ac.	931	291
	Low Density Residential 3.1-5.0 DU/Ac.	1,066	3,731
	Professional Office	294	
	Public	220	
	Recreation Conservation	229	
	Total:	5,163	14,162

Table C-3
Alternative 2b Hardcode Changes
(also includes all other changes from Table C-1)

Sub Area	Land Use	New Gross Acres	Corresponding Dus
Dry Creek/ West Placer (Placer Vineyards)	High Density Residential 15.1-20.0 DU/Ac.	400	7,437
	Medium Density Residential 5.1-7.0 DU/Ac.	1,552	10,820
	Low Density Residential 3.1-5.0 DU/Ac.	777	3,113
	Low Density Residential 0.1-1.0 DU/Ac.	934	261
	Professional Office	161	
	Commercial	151	
	Recreation/Conservation	260	
	Public	376	
	Open Space	552	
		Total:	5,163

APPENDIX D

Unit Water Use Analysis

Single Family Data Analysis

GIVEN:

23,863 Total Records
 8,211 Single Family Records with valid APN
 1,340 General Commercial Records

Table D-1. Number of Matched Residential Records by Land Use and Zone

PCWA LU	Count		Percent	
	Upper	Lower	Upper	Lower
< 1 DU/Ac	284	586	10%	11%
1 - 2 DU/Ac.	295	288	10%	5%
2 - 3 DU/Ac.	513	379	18%	7%
3 - 4 DU/Ac.	437	488	15%	9%
4 - 5 DU/Ac.	542	895	19%	17%
5 - 7 DU/Ac.	487	1711	17%	32%
7 - 10 DU/Ac.	271	819	9%	15%
10 - 16 DU/Ac.	50	176	2%	3%
TOTAL	2,879	5,342		

Notes:

Upper is area defined by Auburn and Newcastle within Zone 1. Lower is defined by all other areas within Zone 1.
 Total Records Evaluated = 8,221

Figure D-1. Number of Matched Records in each Land Use Category

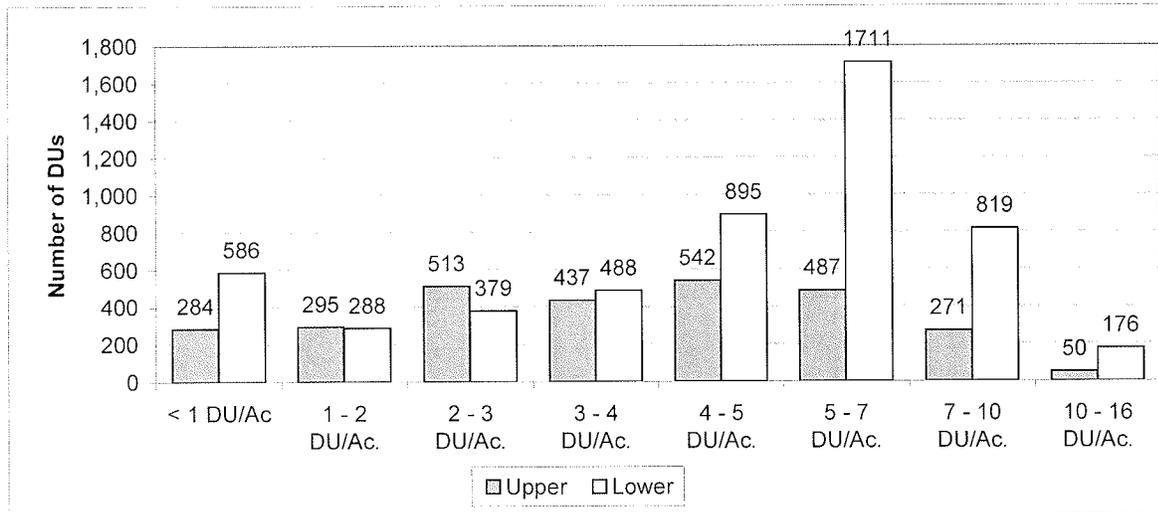


Table D-2. Density and Lot Size by Land Use Category

PCWA LU	Mid Point DU/acre	Average DU/Acre		Median DU/Acre		Average Acre/DU	
		Upper Area	Lower Area	Upper Area	Lower Area	Upper Area	Lower Area
< 1 DU/Ac	0.5	0.37	0.34	0.42	0.43	2.68	2.90
1 - 2 DU/Ac.	1.5	1.44	1.45	1.47	1.54	0.69	0.69
2 - 3 DU/Ac.	2.5	2.54	2.49	2.63	2.52	0.39	0.40
3 - 4 DU/Ac.	3.5	3.52	3.50	3.58	3.57	0.28	0.29
4 - 5 DU/Ac.	4.5	4.40	4.52	4.38	4.54	0.23	0.22
5 - 7 DU/Ac.	6	5.79	5.82	5.85	5.80	0.17	0.17
7 - 10 DU/Ac.	8.5	7.88	7.84	7.80	7.69	0.13	0.13
10 - 16 DU/Ac.	13	10.92	10.88	10.86	10.92	0.09	0.09

Note:

Upper is area defined by Auburn and Newcastle within Zone 1. Lower is defined by all other areas within Zone 1.

Table D-3. Comparison of 1999 and 2004 Unit Water per DU

PCWA LU	2004 ^a Average gpd/DU			1999 ^b gpd/DU		Relative Percent Difference	
	Upper Area	Lower Area	All	Upper Area	Lower Area	Upper Area	Lower Area
< 1 DU/Ac	621	806	746	754	1200	-19%	-39%
1 - 2 DU/Ac.	641	737	689	645	946	-1%	-25%
2 - 3 DU/Ac.	627	657	640	624	749	0%	-13%
3 - 4 DU/Ac.	519	605	564	485	671	7%	-10%
4 - 5 DU/Ac.	476	548	520	474	594	0%	-8%
5 - 7 DU/Ac.	400	491	471	350	507	13%	-3%
7 - 10 DU/Ac.	355	435	415	284	446	22%	-3%
10 - 16 DU/Ac.	289	312	307	199	276	37%	12%

Note:

Upper is area defined by Auburn and Newcastle within Zone 1. Lower is defined by all other areas within Zone 1.

a. Water Use per net acre without normalization and mark-up for inaccounted water

b. SPINK. 2000, PCWA Technical Memorandum Unit Water Demands

Figure D-2. Water Use per Lot by Density

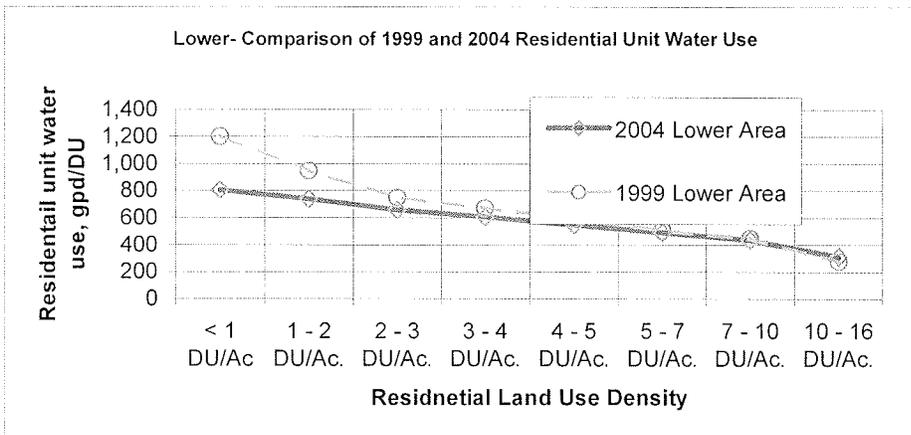
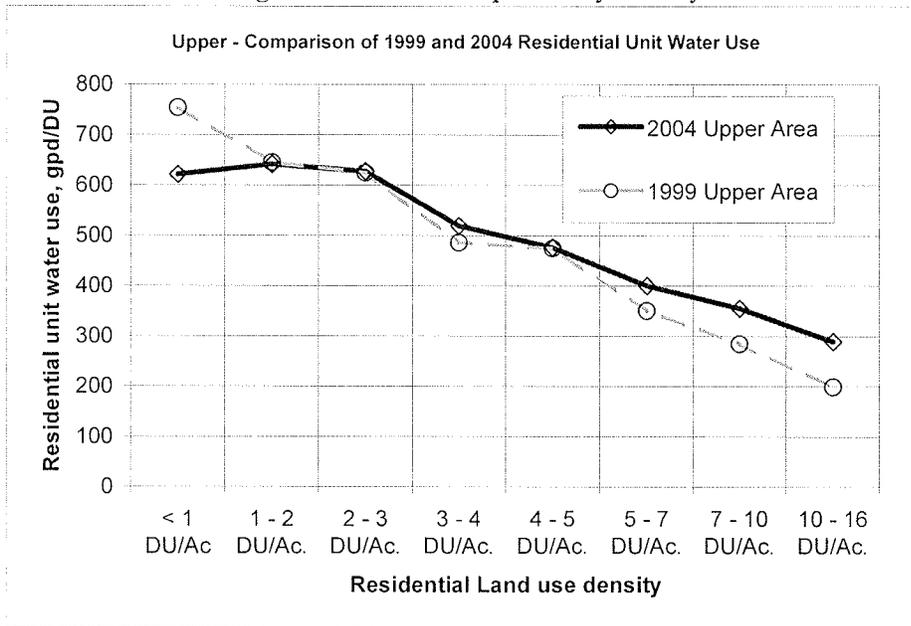


Table D-4. 2004 Consumption Based on Average Consumption and Median Density per Land Use Category

PCWA LU	Annual Acre-ft/acre		Median DU/Acre		Annual Acre-ft/DU		gpd/DU	
	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
< 1 DU/Ac	0.3	0.4	0.42	0.43	0.70	0.90	621	806
1 - 2 DU/Ac.	1.1	1.3	1.47	1.54	0.72	0.83	641	737
2 - 3 DU/Ac.	1.8	1.9	2.63	2.52	0.70	0.74	627	657
3 - 4 DU/Ac.	2.1	2.4	3.58	3.57	0.58	0.68	519	605
4 - 5 DU/Ac.	2.3	2.8	4.38	4.54	0.53	0.61	476	547
5 - 7 DU/Ac.	2.6	3.2	5.85	5.80	0.45	0.55	400	491
7 - 10 DU/Ac.	3.1	3.7	7.80	7.69	0.40	0.49	355	435
10 - 16 DU/Ac.	3.5	3.8	10.86	10.92	0.32	0.35	289	312

Note:

Upper is area defined by Auburn and Newcastle within Zone 1. Lower is defined by all other areas within Zone 1.

Figure D-3. Comparison of Upper and Lower Unit Water Demands

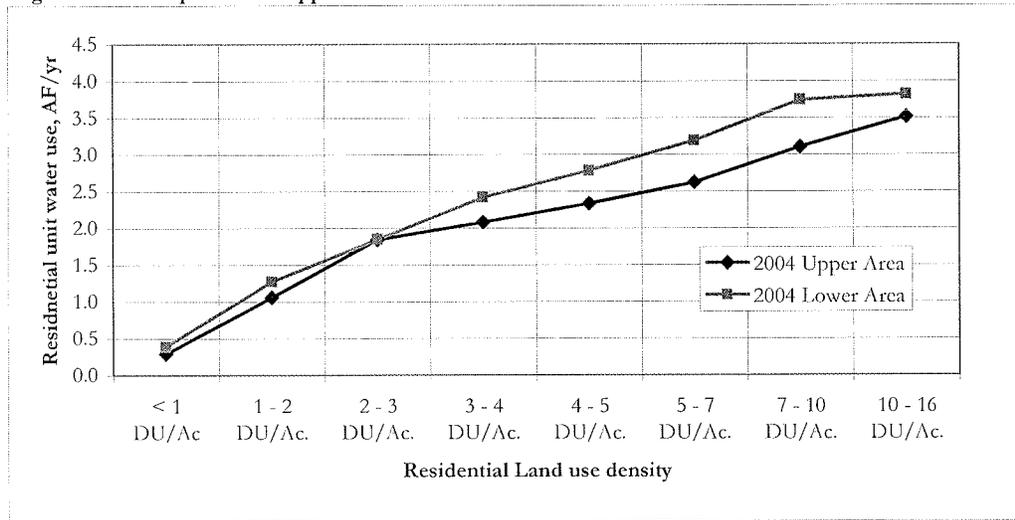


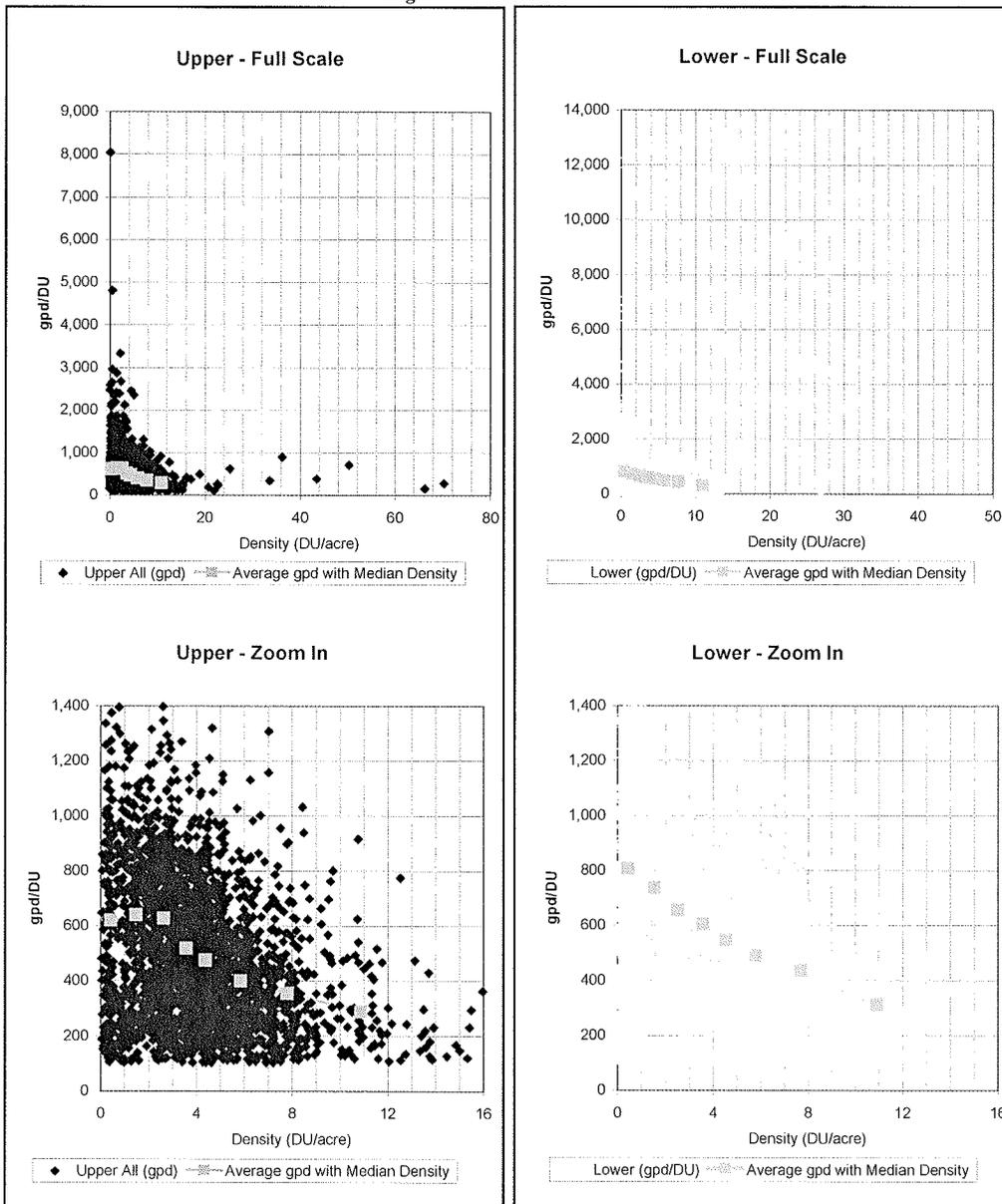
Table D-5. Analysis of All Residential Connections by PCWA Land use Categories

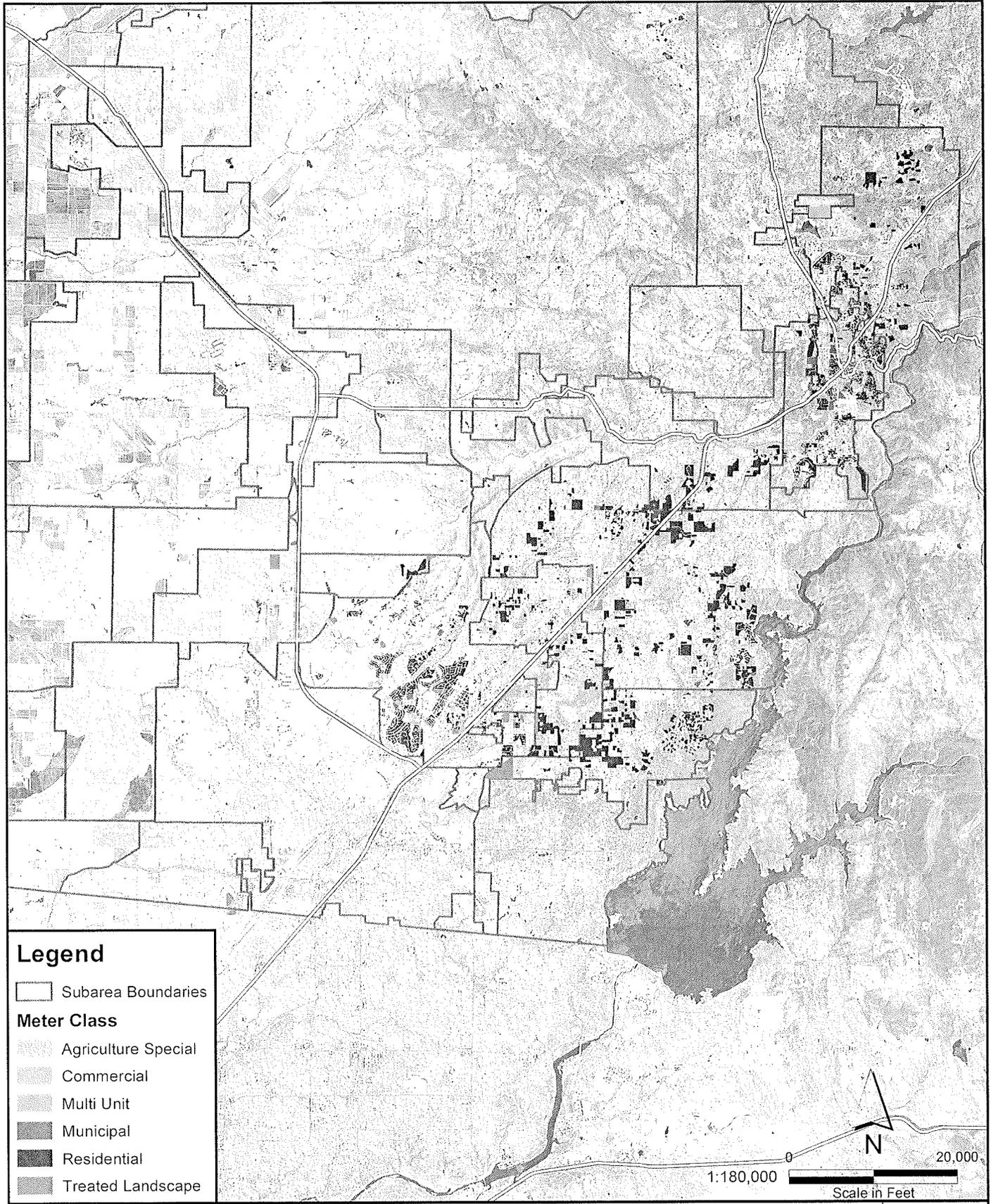
PCWA LU	Mid Point DU/acre	Median DUperAcre		Average gpd/DU		
		Upper	Lower	Upper	Lower	ALL
< 1 DU/Ac	0.5	0.42	0.43	621	806	746
1 - 2 DU/Ac.	1.5	1.47	1.54	641	737	689
2 - 3 DU/Ac.	2.5	2.63	2.52	627	657	640
3 - 4 DU/Ac.	3.5	3.58	3.57	519	605	564
4 - 5 DU/Ac.	4.5	4.38	4.54	476	548	520
5 - 7 DU/Ac.	6	5.85	5.80	400	491	471
7 - 10 DU/Ac.	8.5	7.80	7.69	355	435	415
10 - 16 DU/Ac.	13	10.86	10.92	289	312	307

Note:

Removed all account records with demand < 50 CCF/DU (102 gpd/DU)

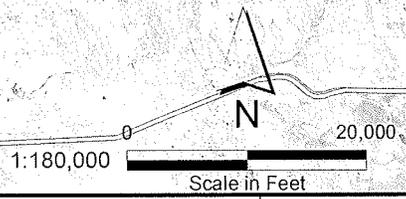
Figure D-4. Residential Data





Legend

- Subarea Boundaries
- Meter Class**
- Agriculture Special
- Commercial
- Multi Unit
- Municipal
- Residential
- Treated Landscape



BROWN AND CALDWELL	PROJECT 126233	CLIENT Placer County Water Agency	Figure D-5
	DATE 7-20-06	TITLE Parcels by Class Analyzed for Unit Water Demands	

Multi-Family Data Analysis

Given:

- 632 MultiFamily Meters
- 287 MultiFamily meters with matching APN Numbers
- 229 Parcels, i.e. 58 out of 287 meters shared the same parcel

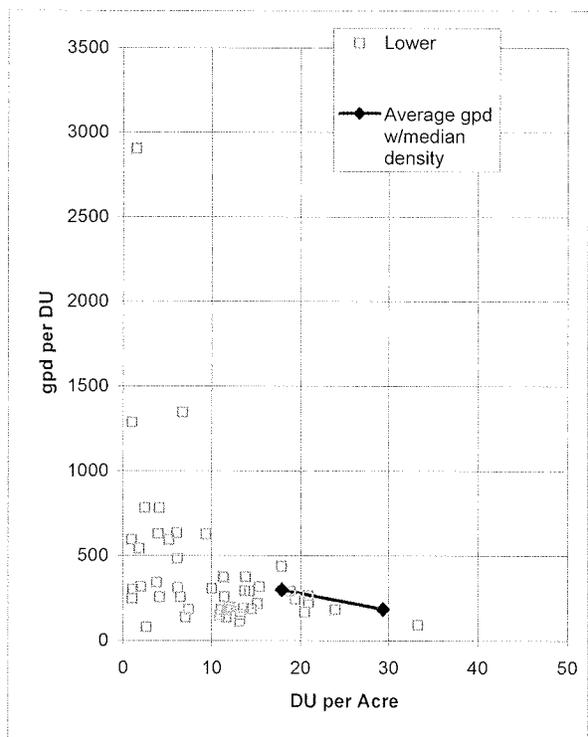
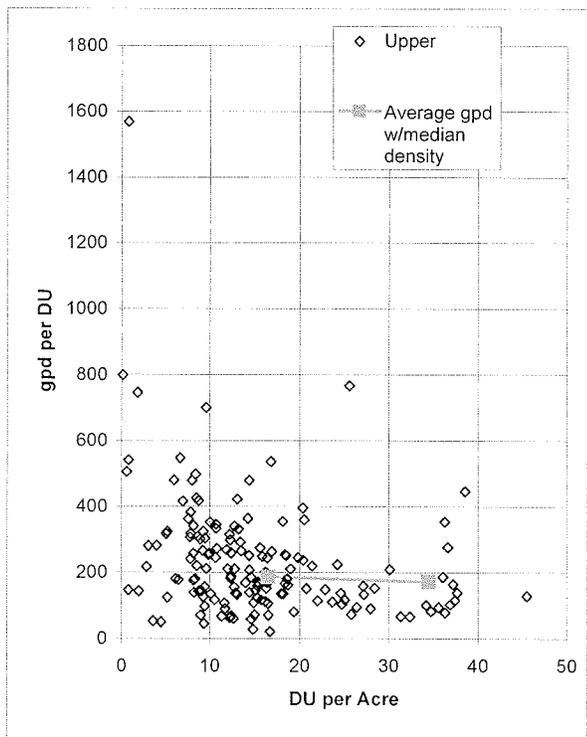
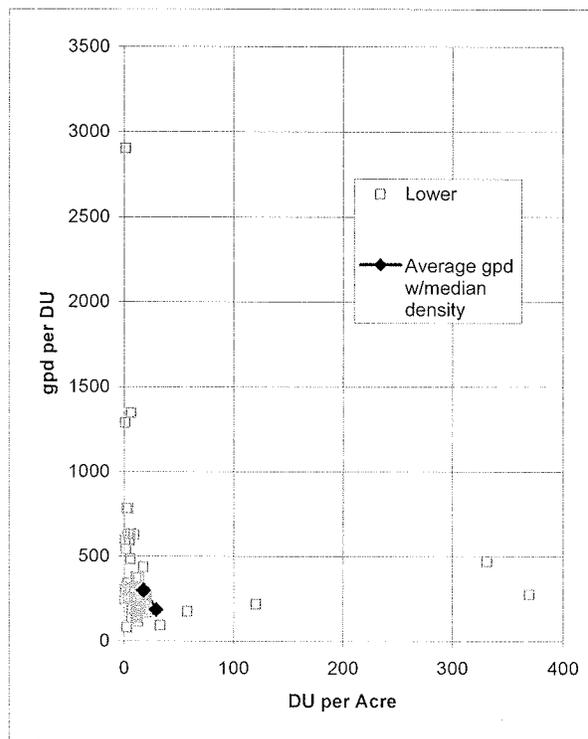
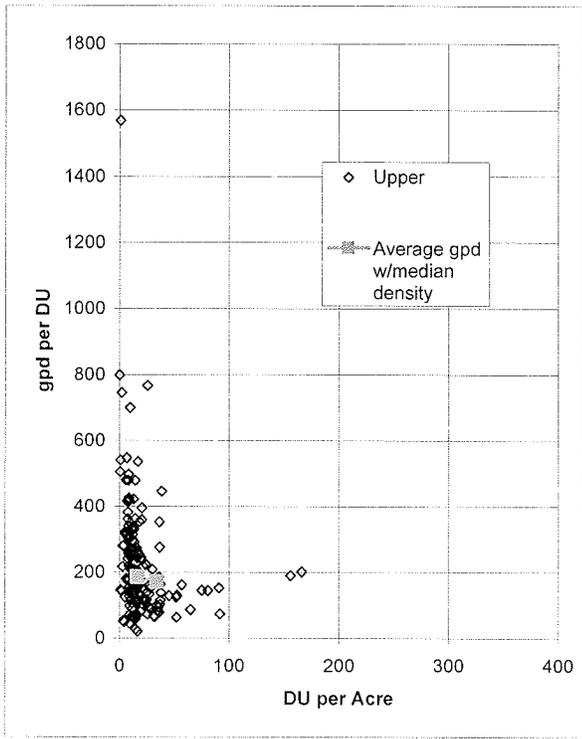
Table D-6. Multi-family Data Summary

Zone	PCWA LU	Count of data points	Median density (DU/acre)	Consumption 2004 average (gpd/DU)
Upper	15-20	31	16	187
Upper	20.1+	46	34	171
Lower	15-20	5	18	300
Lower	20.1+	12	29	186

94

Note:

Accounts eliminated that were less than 15 DU/Ac



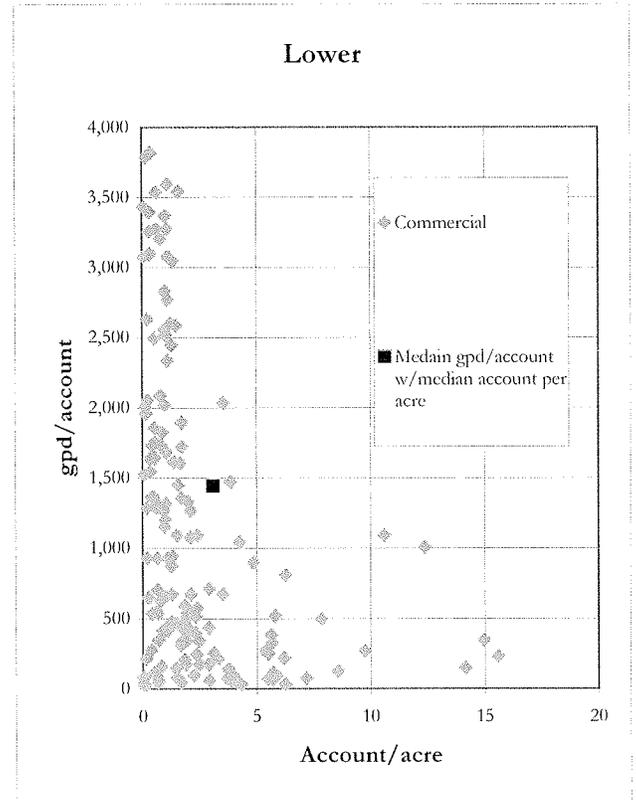
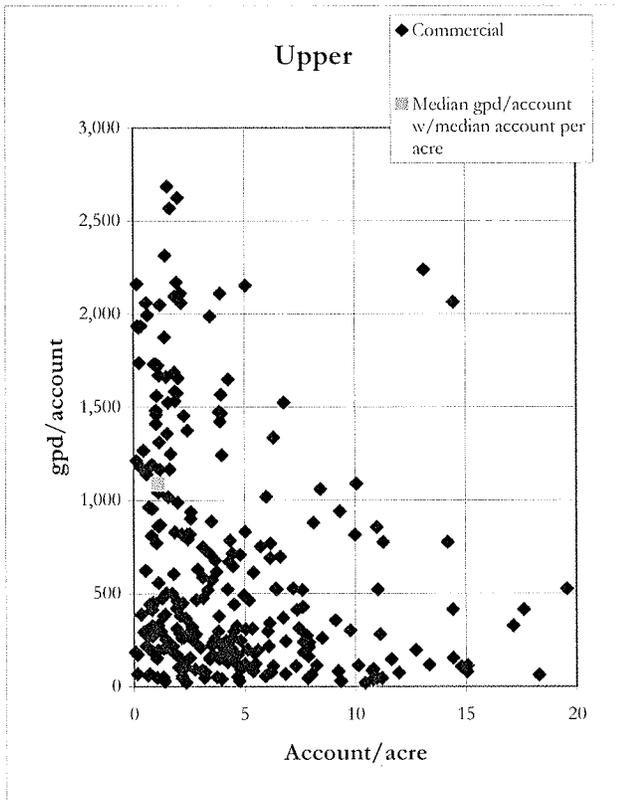
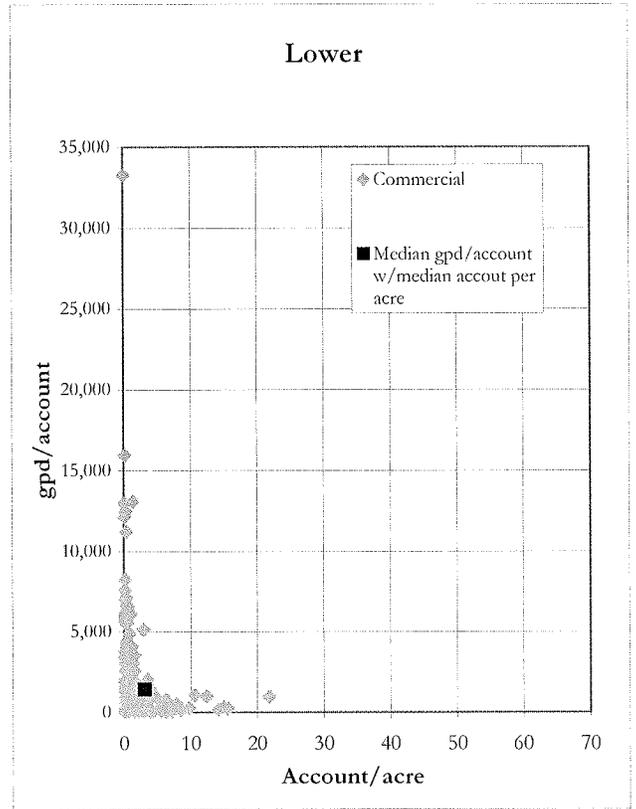
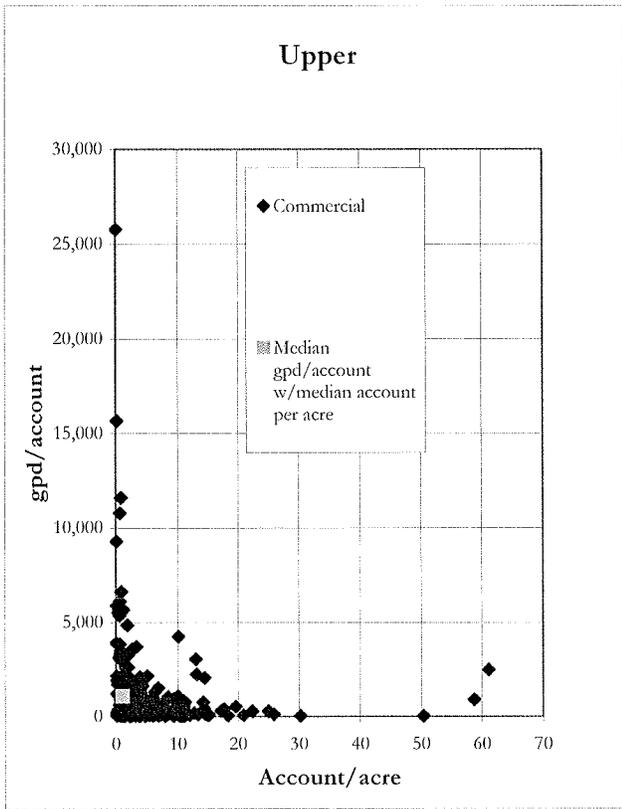
Commercial Data Analysis

Given:

- 1340 Commercial Meters
- 491 Commercial meters with matching APN Numbers and valid consumption volume
APN necessary to match lots to acreage in parcel database
- 383,147 Total consumption (CCF)
- 763 Total acres

Table D-7. Commercial Data Summary

Zone	PCWA LU	Count of data points	Median lot size (acres)	Consumption	
				2004 median (ac-ft/yr per acre)	2004 average (gpd/ac)
Lower	Commercial	188	1.1	1.21502	1,085
Upper	Commercial	303	3.1	1.61461	1,442



APPENDIX E

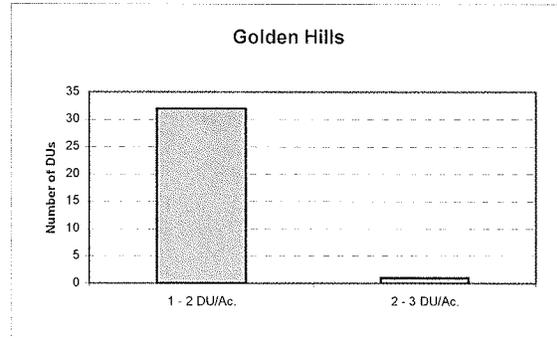
Neighborhood Specific Unit Water Use Analysis

PCWA Integrated Water Resources Plan Master Meter Neighborhood Analysis

Number of Matched Residential Records by Land Use and Neighborhood

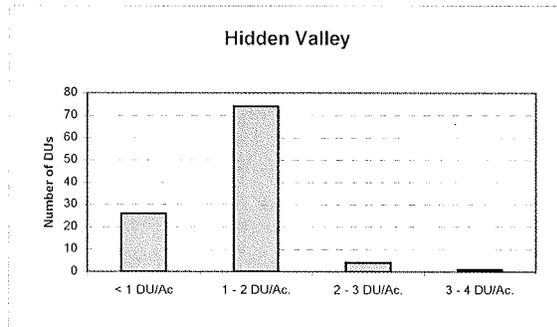
Golden Hills

PCWA LU	Count	Percent
1 - 2 DU/Ac.	32	97%
2 - 3 DU/Ac.	1	3%
Total	33	



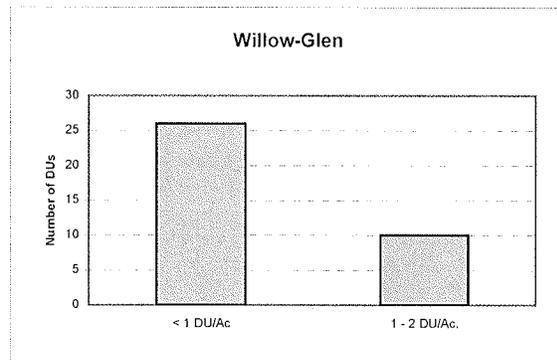
Hidden Valley

PCWA LU	Count	Percent
< 1 DU/Ac	26	26%
1 - 2 DU/Ac.	74	74%
2 - 3 DU/Ac.	4	4%
3 - 4 DU/Ac.	1	1%
Total	100	



Willow-Glen

PCWA LU	Count	Percent
< 1 DU/Ac	26	72%
1 - 2 DU/Ac.	10	28%
Total	36	



Density and Lot Size by Land Use and Neighborhood

Golden Hills

PCWA LU	Avg DU/Ac	Avg Ac/DU	Median DU/Ac
1 - 2 DU/Ac.	1.49	0.68	1.48
2 - 3 DU/Ac.	2.04	0.49	2.04

Hidden Valley

PCWA LU	Avg DU/Ac	Avg Ac/DU	Median DU/Ac
< 1 DU/Ac	0.84	1.33	0.91
1 - 2 DU/Ac.	1.14	0.89	1.08
2 - 3 DU/Ac.	2.52	0.40	2.55
3 - 4 DU/Ac.	3.71	0.27	3.71

Willow-Glen

PCWA LU	Avg DU/Ac	Avg Ac/DU	Median DU/Ac
< 1 DU/Ac	0.69	1.71	0.74
1 - 2 DU/Ac.	1.08	0.93	1.10

Unit Water Use by Neighborhood Based on a Master Meter

Area	Consumption	Total gpd	DUs	gpd/DU
Golden Hills	14626	29977.29	33	908.40
Hidden Valley	31504	64570.25	100	645.70
Willow-Glen	4231	8671.81	36	240.88

PCWA LU	Consumption	Annual Ac-ft	Total Ac	Annual Ac-ft/Ac	DU/Ac	Annual Ac-ft/DU
Golden Hills	14626	33.58	22.40	1.50	1.47	1.02
Hidden Valley	31504	72.32	227.96	0.32	0.44	0.72
Willow-Glen	4231	9.71	53.91	0.18	0.67	0.27

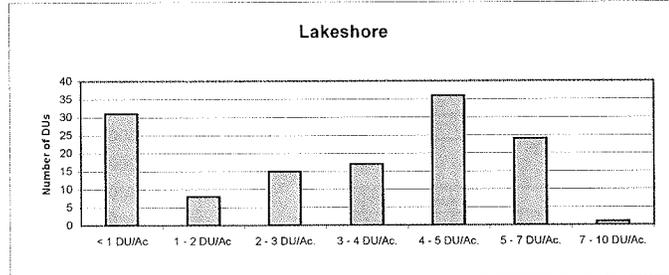
PCWA LU	DU/Ac	gpd/DU
Golden Hills	1.47	908.40
Hidden Valley	0.44	645.70
Willow-Glen	0.67	240.88

PCWA Integrated Water Resources Plan Master Meter Neighborhood Analysis

Number of Matched Residential Records by Land Use and Neighborhood

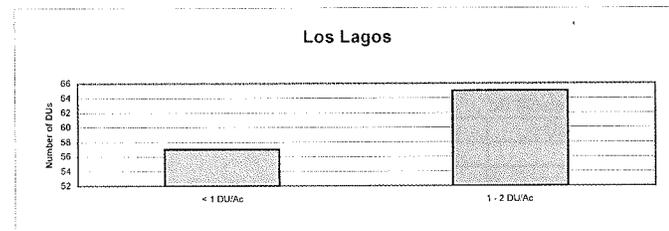
Lakeshore

PCWA LU	Count	Percent
< 1 DU/Ac	31	23%
1 - 2 DU/Ac.	8	6%
2 - 3 DU/Ac.	15	11%
3 - 4 DU/Ac.	17	13%
4 - 5 DU/Ac.	36	27%
5 - 7 DU/Ac.	24	18%
7 - 10 DU/Ac.	1	1%
Total	132	



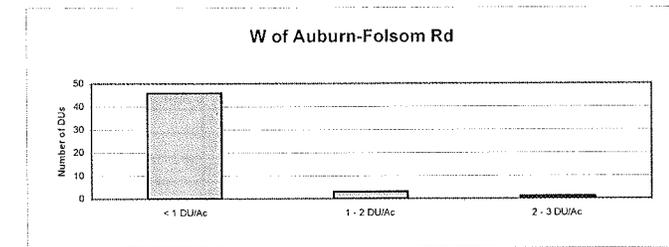
Los Lagos

PCWA LU	Count	Percent
< 1 DU/Ac	57	47%
1 - 2 DU/Ac.	65	53%
Total	122	



Sterling

PCWA LU	Count	Percent
< 1 DU/Ac	36	100%
Total	36	



W of Auburn-Folsom Rd

PCWA LU	Count	Percent
< 1 DU/Ac	46	92%
1 - 2 DU/Ac.	3	6%
2 - 3 DU/Ac.	1	2%
Total	50	

Density and Lot Size by Land Use and Neighborhood

Lakeshore

PCWA LU	Avg DU/Ac	Median DU/Ac	Avg Ac/DU
< 1 DU/Ac	0.63	0.44	1.91
1 - 2 DU/Ac.	1.12	1.10	0.90
2 - 3 DU/Ac.	2.42	2.38	0.42
3 - 4 DU/Ac.	3.62	3.63	0.28
4 - 5 DU/Ac.	4.51	4.58	0.22
5 - 7 DU/Ac.	5.59	5.66	0.18
7 - 10 DU/Ac.	7.69	7.69	0.13

Los Lagos

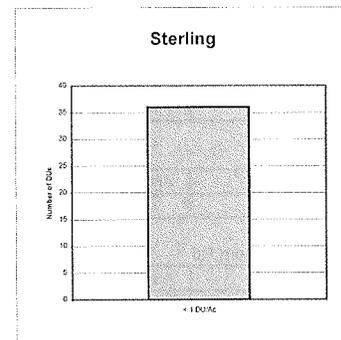
PCWA LU	Avg DU/Ac	Median DU/Ac	Avg Ac/DU
< 1 DU/Ac	0.80	0.83	1.33
1 - 2 DU/Ac.	1.24	1.19	0.83

Sterling

PCWA LU	Avg DU/Ac	Median DU/Ac	Avg Ac/DU
< 1 DU/Ac	0.70	0.75	1.55

W of Auburn-Folsom Rd

PCWA LU	Avg DU/Ac	Median DU/Ac	Avg Ac/DU
< 1 DU/Ac	0.42	0.35	3.26
1 - 2 DU/Ac.	1.47	1.38	0.69
2 - 3 DU/Ac.	2.74	2.74	0.36



Unit Water Use by Land Use and Neighborhood

Lakeshore

PCWA LU	Ave gpd/DU
< 1 DU/Ac	845.29
1 - 2 DU/Ac.	673.03
2 - 3 DU/Ac.	667.21
3 - 4 DU/Ac.	451.39
4 - 5 DU/Ac.	510.63
5 - 7 DU/Ac.	454.84
7 - 10 DU/Ac.	596.43

Los Lagos

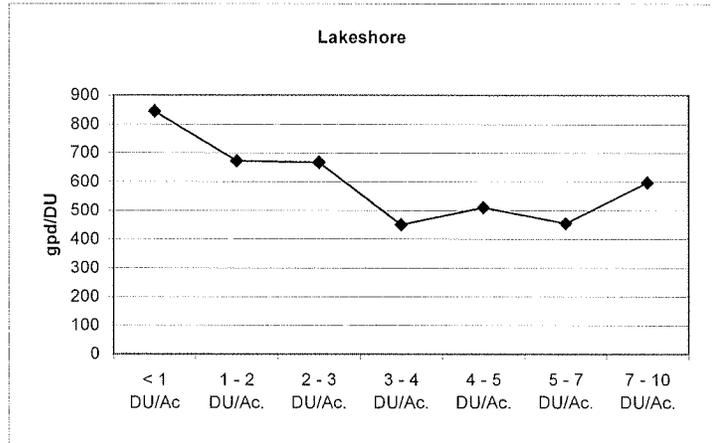
PCWA LU	Ave gpd/DU
< 1 DU/Ac	1,441.04
1 - 2 DU/Ac.	1,285.72

Sterling

PCWA LU	Ave gpd/DU
< 1 DU/Ac	1,164.11

W of Auburn-Folsom Rd

PCWA LU	Ave gpd/DU
< 1 DU/Ac	759.24
1 - 2 DU/Ac.	537.68
2 - 3 DU/Ac.	715.31



Consumption Based on Average Consumption and Median Density per Land Use

Lakeshore

PCWA LU	Annual Ac-ft/Ac	Median DU/Ac	Annual Ac-ft/DU
< 1 DU/Ac	0.57	0.44	1.28
1 - 2 DU/Ac.	0.84	1.10	0.76
2 - 3 DU/Ac.	1.78	2.38	0.75
3 - 4 DU/Ac.	1.85	3.63	0.51
4 - 5 DU/Ac.	2.57	4.58	0.56
5 - 7 DU/Ac.	2.84	5.66	0.50
7 - 10 DU/Ac.	5.13	7.69	0.67

Los Lagos

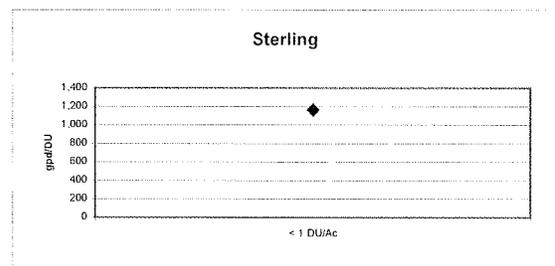
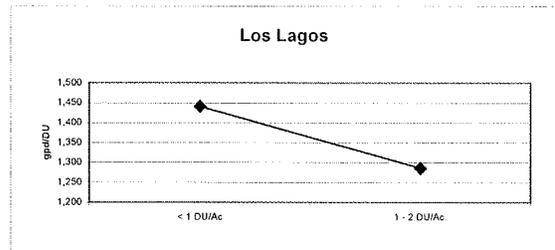
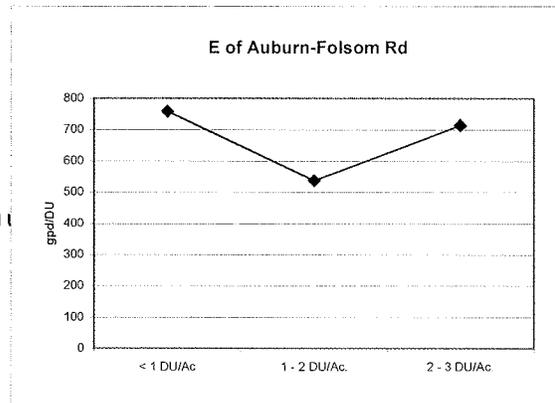
PCWA LU	Annual Ac-ft/Ac	Median DU/Ac	Annual Ac-ft/DU
< 1 DU/Ac	1.25	0.83	1.50
1 - 2 DU/Ac.	1.75	1.19	1.47

Sterling

PCWA LU	Annual Ac-ft/Ac	Median DU/Ac	Annual Ac-ft/DU
< 1 DU/Ac	0.90	0.75	1.20

W of Auburn-Folsom Rd

PCWA LU	Annual Ac-ft/Ac	Median DU/Ac	Annual Ac-ft/DU
< 1 DU/Ac	0.32	0.35	0.91
1 - 2 DU/Ac.	0.94	1.38	0.68
2 - 3 DU/Ac.	2.20	2.74	0.80



Average Consumption by Land Use and Neighborhood

Lakeshore

PCWA LU	Median DU/Ac	Ave gpd/DU
< 1 DU/Ac	0.44	845.29
1 - 2 DU/Ac	1.10	673.03
2 - 3 DU/Ac	2.38	667.21
3 - 4 DU/Ac	3.63	451.39
4 - 5 DU/Ac	4.58	510.63
5 - 7 DU/Ac	5.66	454.84
7 - 10 DU/Ac	7.69	596.43

Los Lagos

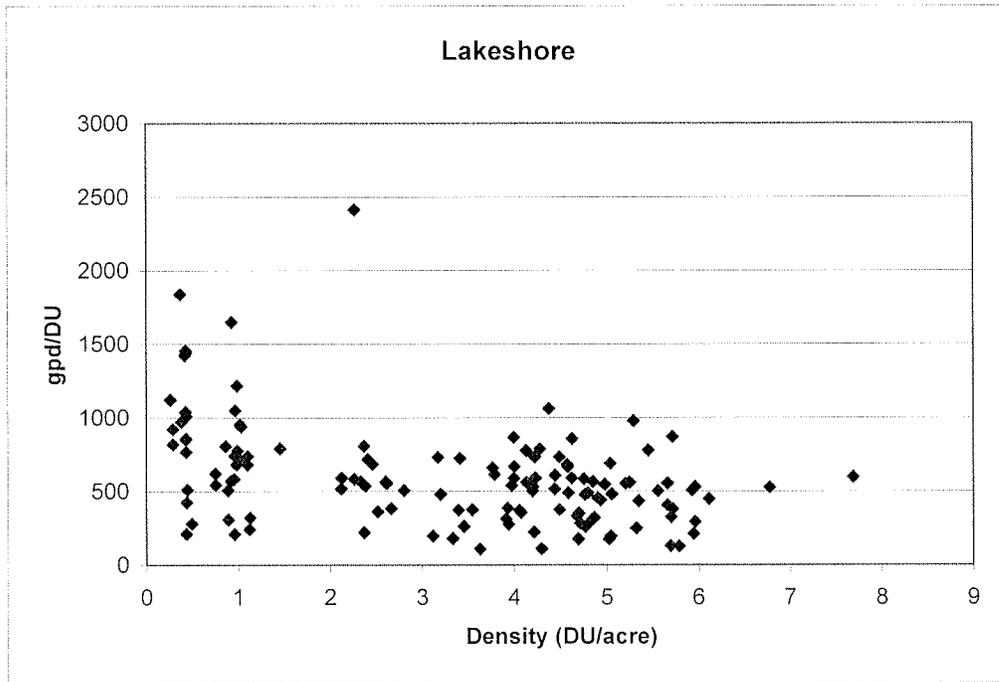
PCWA LU	Median DU/Ac	Ave gpd/DU
< 1 DU/Ac	0.83	1,441.04
1 - 2 DU/Ac	1.19	1,285.72

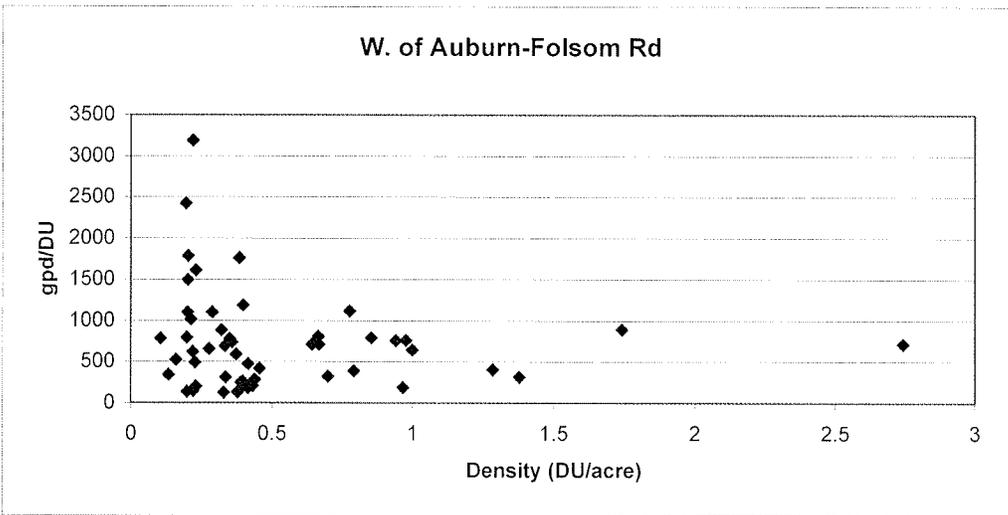
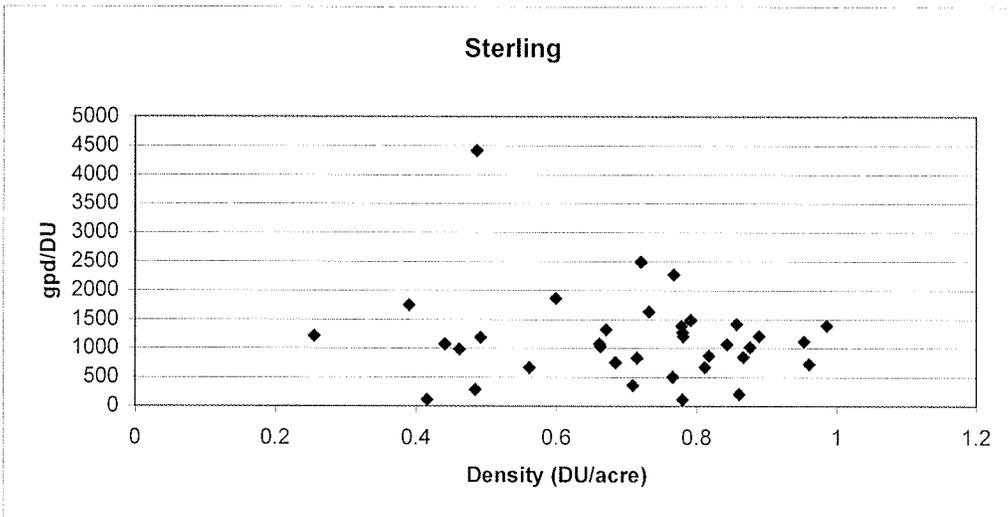
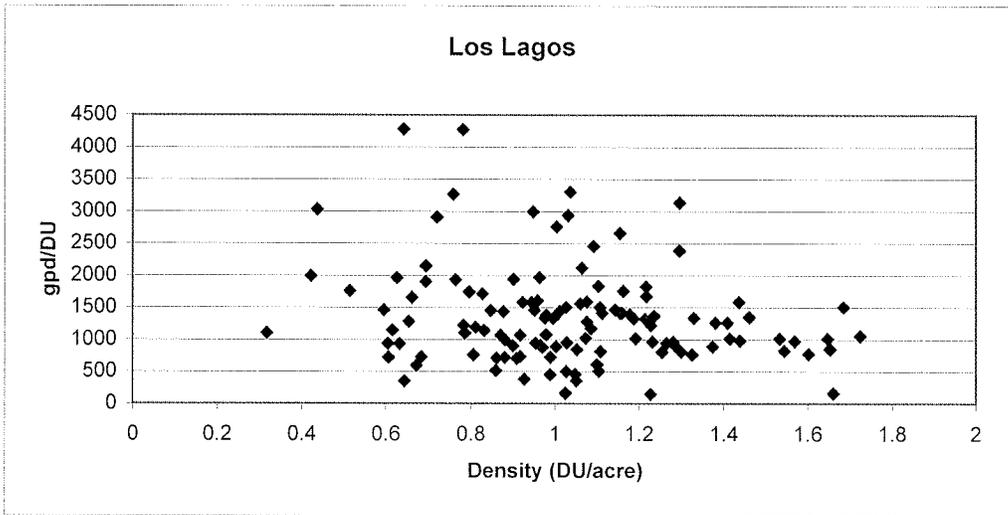
Sterling

PCWA LU	Median DU/Ac	Ave gpd/DU
< 1 DU/Ac	0.75	1,164.11

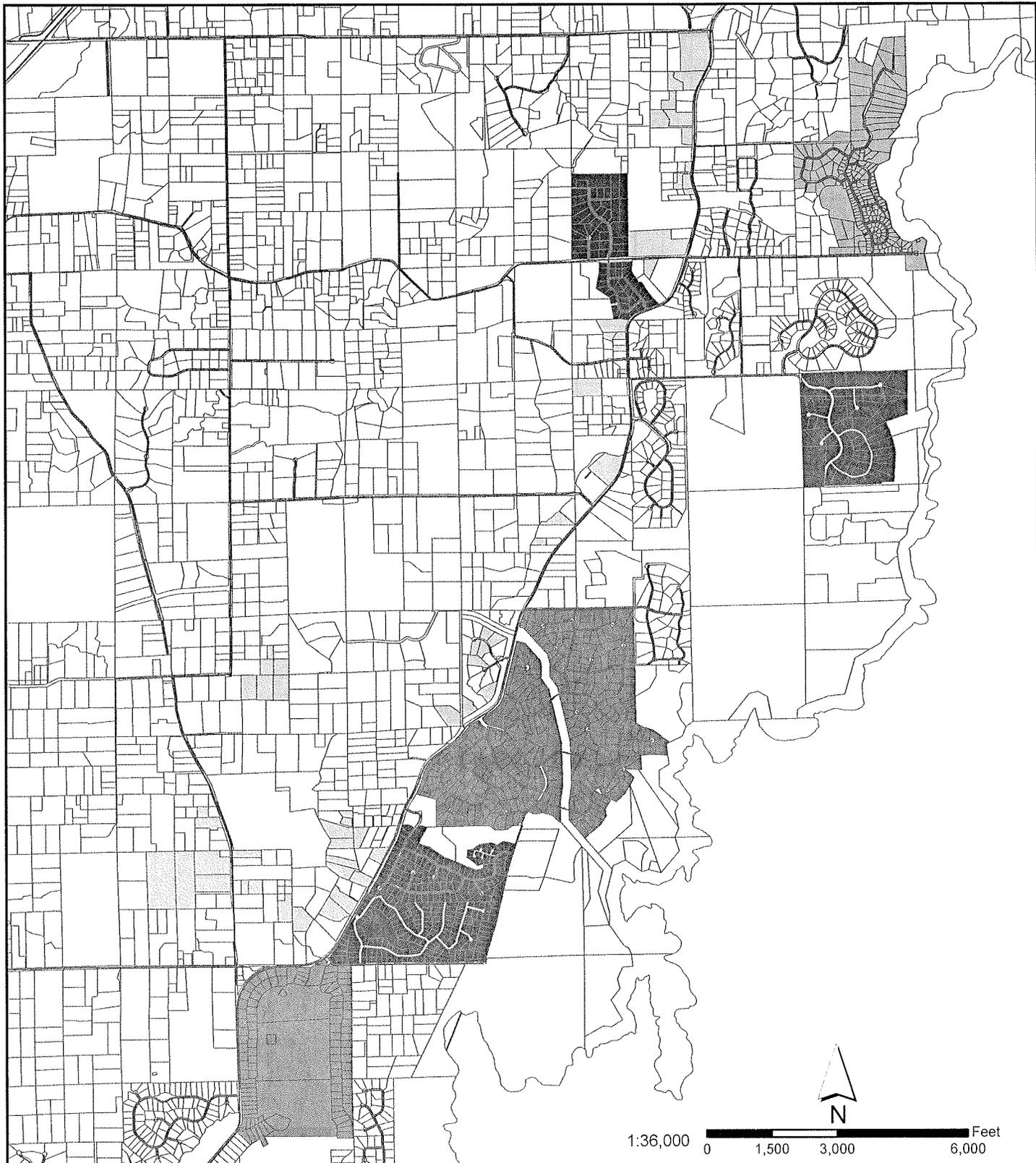
W of Auburn-Folsom Rd

PCWA LU	Median DU/Ac	Ave gpd/DU
< 1 DU/Ac	0.35	759.24
1 - 2 DU/Ac	1.38	537.68
2 - 3 DU/Ac	2.74	715.31



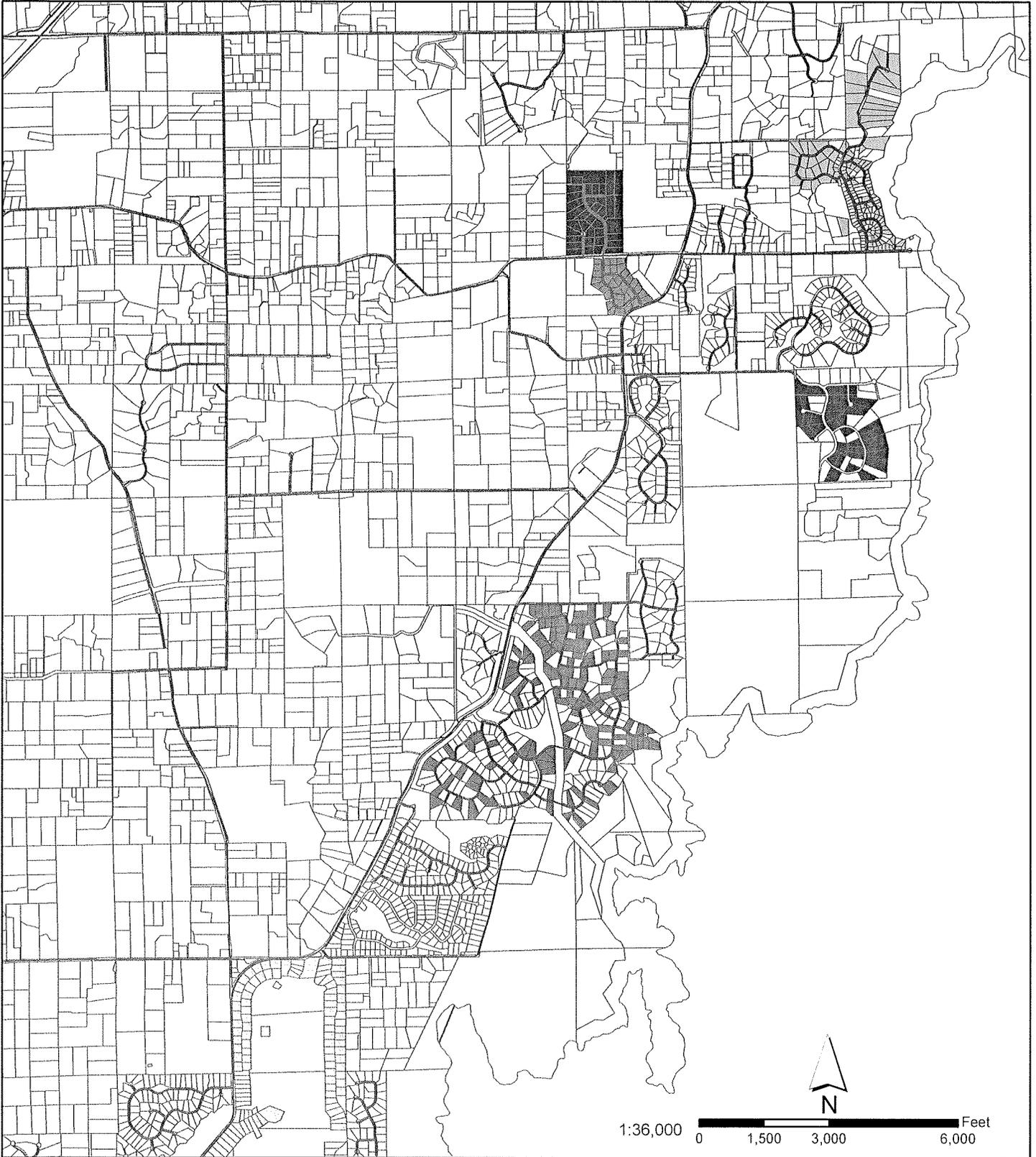


Neighborhood - Specific Analysis



BROWN AND CALDWELL	Legend				CLIENT Placer County Water Agency	Figure E-1
	Golden Hills	Lakeshore	Sterling	West of Auburn-Folsom Road	PROJECT 126233	

Parcels Included in Neighborhood Analysis



	Legend				CLIENT Placer County Water Agency	Figure E-2
	Golden Hills	Lakeshore	Sterling	Willow Glen	PROJECT 126233	
	Hidden Valley	Los Lagos	West of Auburn-Folsom Road			

APPENDIX F

Water Demand Calculations

Summary of Projected Water Demands for PCWA Supply Area
Scenario 1

PCWA Demand Areas	DUs	Total Acres	Net Acres	Demand AF/yr				Total	2001 Discussion	
				Treated	Groundwater		Reclaimed		Raw Water	Treated Water
					Municipal	Private				
Auburn										
City of Auburn	7,264	4,200	1,906	5,103	0	0	0	5,103	3,000	6,260
City of Auburn (Airport)	2	284	227	675	0	1	0	676		
Auburn/Bowman CP	5,985	11,903	6,251	5,454	0	319	0	5,774	5,300	6,185
Newcastle/Ophir	189	1,173	938	528	0	106	0	634	1,900	979
<i>Subtotal:</i>	<i>13,439</i>	<i>17,560</i>	<i>9,322</i>	<i>11,762</i>	<i>0</i>	<i>426</i>	<i>0</i>	<i>12,188</i>	<i>10,200</i>	<i>13,424</i>
Lincoln										
City of Lincoln, NID	6,598	2,842	1,873	6,471	0	0	0	6,471		
City of Lincoln, PCWA	16,800	10,248	5,374	18,543	0	2	727	19,271	5,600	35,041
Future City of Lincoln, West	131	12,606	1,145	110	0	31	4,076	4,217	17,000	
<i>Subtotal:</i>	<i>23,528</i>	<i>25,696</i>	<i>8,392</i>	<i>25,123</i>	<i>0</i>	<i>33</i>	<i>4,803</i>	<i>29,959</i>	<i>22,600</i>	<i>35,041</i>
Rocklin										
City of Rocklin	30,857	9,373	6,303	24,533	0	5	0	24,538	1,900	27,726
City of Rocklin (Whitney Ranch)	4,337	1,224	806	3,005	0	0	0	3,005		
Sierra Community College	19	341	243	15	0	9	0	23		
Unincorporated Area - A	342	102	82	274	0	0	0	274		
<i>Subtotal:</i>	<i>35,556</i>	<i>11,041</i>	<i>7,434</i>	<i>27,826</i>	<i>0</i>	<i>14</i>	<i>0</i>	<i>27,841</i>	<i>1,900</i>	<i>27,726</i>
Roseville										
City of Roseville	45,023	17,803	15,798	48,373	0	0	1,868	50,241		
City of Roseville, West	8,390	5,724	2,471	6,317	0	0	1,265	7,583		
<i>Subtotal:</i>	<i>53,413</i>	<i>23,527</i>	<i>18,268</i>	<i>54,691</i>	<i>0</i>	<i>0</i>	<i>3,134</i>	<i>57,824</i>	<i>0</i>	<i>0</i>
Loomis/Granite Bay										
Town of Loomis	2,635	4,660	3,496	2,826	0	742	0	3,568	8,700	2,598
Bickford Ranch Specific Plan	2,035	1,942	976	3,461	0	0	0	3,461	1,600	1,454
Granite Bay, PCWA	950	5,232	4,019	549	0	427	0	975	600	1,645
Horseshoe Bar/ Penryn CP	4,009	16,529	11,902	2,711	0	979	0	3,690	26,100	2,851
Unincorporated Area - B	126	464	246	77	0	48	0	125		
Unincorporated Area - C	2,180	6,870	4,710	2,525	0	870	0	3,394	9,500	
City of Roseville, PCWA	1,056	377	318	1,065	0	0	5	1,070		
<i>Subtotal:</i>	<i>12,991</i>	<i>36,073</i>	<i>25,667</i>	<i>13,214</i>	<i>0</i>	<i>3,065</i>	<i>5</i>	<i>16,284</i>	<i>46,500</i>	<i>8,548</i>
San Juan Water District										
Granite Bay, SJWD	7,584	7,796	5,513	15,215	0	0	0	15,215		
Granite Bay CP	201	362	289	238	0	0	0	238		
City of Roseville, SJWD	842	382	319	959	0	0	4	962		
<i>Subtotal:</i>	<i>8,627</i>	<i>8,540</i>	<i>6,122</i>	<i>16,411</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>16,415</i>	<i>0</i>	<i>0</i>
West Placer Development Areas										
Sunset Industrial Area (Zone 1)	14	4,447	2,897	8,353	0	0	1,813	10,167		12,297
Sunset Industrial Area (Zone 5)	0	4,350	1,167	3,444	0	0	742	4,186		
Dry Creek/West (Placer Vineyards)	14,162	5,163	3,319	9,923	0	0	1,589	11,512		12,626
Dry Creek/East	3,698	3,857	2,521	2,989	0	1,163	43	4,196		1,997
Curry Creek Community Plan	101	4,221	17	69	0	0	0	69		
<i>Subtotal:</i>	<i>17,976</i>	<i>22,037</i>	<i>9,921</i>	<i>24,778</i>	<i>0</i>	<i>1,163</i>	<i>4,188</i>	<i>30,129</i>	<i>0</i>	<i>26,920</i>
Remainder Area										
Sheridan CP	1,263	1,825	1,308	0	982	216	0	1,198		2,429
South Sutter Water District North	0	3,650	0	0	0	0	0	0		
South Sutter Water District South	0	15,532	0	0	0	0	0	0		
PCWA Zone 5, North	0	11,713	48	0	0	147	0	147		
PCWA Zone 5, South	144	10,144	264	0	0	124	0	124		
Camp Far West	0	2,754	0	0	0	0	0	0		
<i>Subtotal:</i>	<i>1,407</i>	<i>45,617</i>	<i>1,621</i>	<i>0</i>	<i>982</i>	<i>487</i>	<i>0</i>	<i>1,469</i>	<i>0</i>	<i>2,429</i>
NID Demand Areas										
Auburn/Bowman NID	5,273	12,789	7,233	4,582	0	381	0	4,963		
Future City of Lincoln, NID	405	5,024	1,352	1,706	0	191	0	1,897		
Newcastle/Ophir NID	685	4,343	3,291	187	0	388	0	575		
NID Service Area	1,973	55,197	4,595	245	0	1,675	0	1,920		
<i>Subtotal:</i>	<i>8,335</i>	<i>77,353</i>	<i>16,472</i>	<i>6,720</i>	<i>0</i>	<i>2,634</i>	<i>0</i>	<i>9,355</i>	<i>0</i>	<i>0</i>
Total:	175,272	267,444	103,220	180,526	982	7,822	12,134	201,463	81,200	114,088

Summary of Projected Water Demands for PCWA Supply Area
Scenario 2

PCWA Demand Areas	DUs	Total Acres	Net Acres	Demand AF/yr			Total	2001 Discussion		
				Treated	Groundwater			Reclaimed	Raw Water	Treated Water
					Municipal	Private				
Auburn										
City of Auburn	7,264	4,140	1,848	4,774	0	0	0	4,774	3,000	6,260
City of Auburn (Airport)	2	284	227	675	0	1	0	676		
Auburn/Bowman CP	5,985	11,903	6,251	5,454	0	319	0	5,774	5,300	6,185
Newcastle/Ophir	189	1,173	938	528	0	106	0	634	1,900	979
<i>Subtotal:</i>	<i>13,439</i>	<i>17,499</i>	<i>9,264</i>	<i>11,432</i>	<i>0</i>	<i>426</i>	<i>0</i>	<i>11,858</i>	<i>10,200</i>	<i>13,424</i>
Lincoln										
City of Lincoln, NID	6,598	2,842	1,873	6,471	0	0	0	6,471		
City of Lincoln, PCWA	18,278	10,495	5,626	19,544	0	2	727	20,272	5,600	35,041
Future City of Lincoln, West	20,438	12,600	4,609	12,040	0	360	5,099	17,500	17,000	
<i>Subtotal:</i>	<i>45,314</i>	<i>25,937</i>	<i>12,107</i>	<i>38,055</i>	<i>0</i>	<i>362</i>	<i>5,826</i>	<i>44,243</i>	<i>22,600</i>	<i>35,041</i>
Rocklin										
City of Rocklin	30,857	10,111	6,302	24,527	0	5	0	24,533	1,900	27,726
City of Rocklin (Whitney Ranch)	4,337	1,224	806	3,005	0	0	0	3,005		
Sierra Community College	19	341	243	15	0	9	0	23		
Unincorporated Area - A	342	102	82	274	0	0	0	274		
<i>Subtotal:</i>	<i>35,556</i>	<i>11,778</i>	<i>7,432</i>	<i>27,821</i>	<i>0</i>	<i>14</i>	<i>0</i>	<i>27,835</i>	<i>1,900</i>	<i>27,726</i>
Roseville										
City of Roseville	44,975	19,105	15,750	47,536	0	0	2,578	50,114		
City of Roseville, West	14,770	5,522	4,415	10,559	0	0	5,297	15,856		
<i>Subtotal:</i>	<i>59,745</i>	<i>24,627</i>	<i>20,165</i>	<i>58,095</i>	<i>0</i>	<i>0</i>	<i>7,875</i>	<i>65,970</i>	<i>0</i>	<i>0</i>
Loomis/Granite Bay										
Town of Loomis	2,635	4,662	3,497	2,826	0	742	0	3,568	8,700	2,598
Bickford Ranch Specific Plan	2,035	1,942	976	3,461	0	0	0	3,461	1,600	1,454
Granite Bay, PCWA	949	5,228	4,014	548	0	426	0	974	600	1,645
Horseshoe Bar/ Penryn CP	4,008	16,437	11,897	2,711	0	978	0	3,689	26,100	2,851
Unincorporated Area - B	126	464	246	77	0	48	0	125		
Unincorporated Area - C	2,173	6,839	4,686	2,491	0	866	0	3,357	9,500	
City of Roseville, PCWA	1,056	401	318	1,065	0	0	5	1,070		
<i>Subtotal:</i>	<i>12,981</i>	<i>35,972</i>	<i>25,634</i>	<i>13,179</i>	<i>0</i>	<i>3,061</i>	<i>5</i>	<i>16,245</i>	<i>46,500</i>	<i>8,548</i>
San Juan Water District										
Granite Bay, SJWD	7,584	7,799	5,513	15,215	0	0	0	15,215		
Granite Bay CP	201	367	289	238	0	0	0	238		
City of Roseville, SJWD	842	396	319	959	0	0	4	962		
<i>Subtotal:</i>	<i>8,627</i>	<i>8,563</i>	<i>6,122</i>	<i>16,411</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>16,415</i>	<i>0</i>	<i>0</i>
West Placer Development Areas										
Sunset Industrial Area (Zone 1)	2,901	4,417	3,095	11,255	0	0	2,570	13,825		12,297
Sunset Industrial Area (Zone 5)	2,888	4,327	2,758	6,042	0	0	846	6,889		
Dry Creek/West (Placer Vineyards)	14,162	5,163	3,319	9,846	0	275	1,376	11,496		12,626
Dry Creek/East	3,667	3,825	2,500	2,910	0	1,163	40	4,113		1,997
Curry Creek Community Plan	13,907	4,230	2,777	10,104	0	0	2,650	12,754		
<i>Subtotal:</i>	<i>37,525</i>	<i>21,963</i>	<i>14,449</i>	<i>40,157</i>	<i>0</i>	<i>1,438</i>	<i>7,483</i>	<i>49,078</i>	<i>0</i>	<i>26,920</i>
Remainder Area										
Sheridan CP	1,263	1,824	1,308	0	982	216	0	1,198		2,429
South Sutter Water District North	-	3,649	-	0	0	0	0	0		
South Sutter Water District South	-	15,529	0	0	0	0	0	0		
PCWA Zone 5, North	286	11,711	97	0	0	311	0	311		
PCWA Zone 5, South	138	10,136	266	29	0	105	0	134		
Camp Far West	-	2,754	-	0	0	0	0	0		
<i>Subtotal:</i>	<i>1,687</i>	<i>45,602</i>	<i>1,672</i>	<i>29</i>	<i>982</i>	<i>632</i>	<i>0</i>	<i>1,643</i>	<i>0</i>	<i>2,429</i>
NID Service Areas										
Auburn/Bowman NID	5,273	12,783	7,233	4,582	0	381	0	4,963		
Future City of Lincoln, NID	405	5,024	1,352	1,706	0	191	0	1,897		
Newcastle/Ophir NID	685	4,343	3,291	187	0	388	0	575		
NID Service Area	1,990	55,179	4,592	256	0	1,673	0	1,929		
<i>Subtotal:</i>	<i>8,353</i>	<i>77,329</i>	<i>16,469</i>	<i>6,732</i>	<i>0</i>	<i>2,632</i>	<i>0</i>	<i>9,364</i>	<i>0</i>	<i>0</i>
Total:	223,226	269,270	113,314	211,911	982	8,565	21,193	242,650	81,200	114,088