

San Luis Obispo County
Master Water Plan
Rural Water Needs - Current and Projected

Rural Demand has been defined as water use required by the remaining community areas within the County which fall outside of the categories of either 1) incorporated cities or the purveyors which serve those cities, or 2) unincorporated communities (listed in the urban demand discussion). This demand does not include agriculture. Most of the demand is from rural residential development. There are small amounts of commercial demand as well as some golf courses, which are not included in the demand estimates.

The calculation of water needs for the Rural Areas was fairly straightforward and based primarily upon the number of rural dwelling units, or “ranchettes” multiplied by a water duty developed for each of the Water Planning Areas (WPAs). A number of assumptions were used for development of the water duties based on professional knowledge of the County and development of rural demands in adjacent counties. Interior household water use was assumed to be similar to a household in town. The average is about 1/3-acre feet per acre. This number may go down somewhat in the future as new homes are built with greater water saving devices. However, the change will not result in a significant modification of the estimates of water demand by rural residences.

The calculation of exterior water needs is the more complex. Acreage varies considerably from ranchette to ranchette, ranging from approximately 2 1/2 acres on up to 20 acres or more. Looking at numerous rural developments, it was determined that most places "cultivate" about an acre around the dwelling, leaving the remaining acreage unimproved or in its natural state, or for use as a corral. This is generally true no matter how large the parcel. Most of the exterior water use is within that acre of cultivation. Watering lawns, small orchards, gardens, and stock varies widely from parcel to parcel. However, a reasonable range of 1/2 AFY to 3 AFY per ranchette was developed. For this estimate, total water use of 1.3 AFY was assigned for the coastal areas and 1.8 AFY for inland areas. Coastal areas were presumed to use less because of the cooler, moister climate. Studies have been completed for Monterey County (by members on the Master Water Plan team) and Santa Barbara County for similar water use and these guidelines appear reasonable based upon historical use in the area. Given the relatively small percentage of total demand that constitutes rural demand (approximately 3%), overall figures are not greatly affected by this assumption.

On the following tables, estimates of current and projected water need have been prepared based on the above methodology and have been determined and listed for rural areas within each of the 12 WPAs.

Current Rural Demand - 1995

WPA	NAME	POPULATION	POP/DU	HOUSES	DUTY ac-ft/ac	DEMAND ac-ft/yr
1	North Coast	866	2.57	337	1.3	440
2	Cayucos	1,020	2.57	397	1.3	520
3	Los Osos/Morro Bay	1,223	2.57	476	1.3	620
4	SLO/Avila	1,452	2.44	595	1.3	770
5	Five Cities	6,729	2.86	2,353	1.3	3,060
6	Nipomo	8,370	2.86	2,927	1.3	3,800
7	Cuyama	708	2.86	248	1.7	420
8	California Valley	1,235	2.86	432	1.7	730
9A	Salinas	9,356	2.92	3,204	1.7	5,450
9B	Creston	6,832	2.92	2,340	1.7	3,980
9C	Shandon	1,235	2.92	423	1.7	720
10	Nacimiento	2,700	2.92	925	1.7	1,570

Projected Rural Demand - 2020

WPA	NAME	POPULATION	POP/DU	HOUSES	DUTY ac-ft/ac	DEMAND ac-ft/yr
1	North Coast	1,564	2.57	609	1.3	790
2	Cayucos	1,340	2.57	521	1.3	680
3	Los Osos/Morro Bay	1,538	2.57	598	1.3	780
4	SLO/Avila	2,056	2.44	843	1.3	1,100
5	Five Cities	8,675	2.86	3,033	1.3	3,940
6	Nipomo	13,073	2.86	4,571	1.3	5,940
7	Cuyama	820	2.86	287	1.7	490
8	California Valley	1,836	2.86	642	1.7	1,090
9A	Salinas	12,775	2.92	4,375	1.7	7,440
9B	Creston	10,703	2.92	3,665	1.7	6,230
9C	Shandon	1,836	2.92	629	1.7	1,070
10	Nacimiento	5,179	2.92	1,774	1.7	3,020

Source: Population = San Luis Obispo County
 Pop/DU = California Department of Finance.

Data Deficiencies

The following additional data would improve the accuracy of this study:

- **Commercial.** No commercial use is included in this demand analysis. Very few commercial activities exist in the rural areas that were not accounted for in the urban demand. It represents a very small percentage of the total water used.
- **Golf Courses.** A number of golf courses are in the rural areas. These use between 1.5 to 2.5 acre feet/acre/year. An 18-hole course would have approximately 100 acres of irrigated turf, resulting in the use of between 150 and 250 acre feet per year. Return flow from golf course irrigation is estimated to be 15%. This information should be added to the rural demand.
- **Dwelling Units.** The study was based upon population numbers, with an estimate of dwelling units derived from population figures divided by persons per household. Using the actual number of dwelling units would develop a more accurate estimate. This would require assigning assessor information to the 12 WPAs.

Assumptions

Water Duty Factors. Water demand was estimated by multiplying the number of dwelling units in WPAs by a water duty factor. A water duty factor is an estimated volume of water used annually by a particular activity. It is measured in acre-feet per year. Water duties are necessarily estimated averages. Water consumption varies in a number of regards. Over the course of the year, water use is high in the summer and low in the winter. Use varies from residence to residence, depending on number of persons in the dwelling and the intensity of outdoor landscaping. A difference is expected in consumption between development near the coast and development inland. Coastal development is expected to require less water and lose less to evapotranspiration. An estimated half acre-foot differential was applied to the two areas.

Most of the development in the rural portions of the WPAs will take place on relatively large parcels (between one and 40 acres). The exceptions are golf courses and a small amount of commercial development. In this report, the larger parcels are referred to as ‘ranchettes’, a commonly used term. Specific water duty factors (see below) were developed for these parcels. Water duty factors will decline somewhat for new construction because of conservation requirements contained in the Uniform Building Code.

Future Dwelling Units. Water conservation measures are required of new dwelling construction. These include low flow showerheads and toilets. Showerheads now dispense between 1.5 and 2.5 gallons per minute. Previously they sprayed up to 8 gallons per minute. For a ten-minute shower, water consumption has dropped from 80 gallons to 20 gallons. Old toilets released approximately 7 gallons per flush and are now required to release no more than 1.6 gallons. The landscaping or yard requirement of new dwellings was assumed to remain relatively constant.

Ranchettes. This term, for the purposes of this report, denotes parcels one acre and larger. There are considerable numbers of parcels in this size range that could be developed. Their development usually includes a residence, accessory buildings, extensive gardening and small orchards, and a few livestock. To make comparable analysis with smaller lot residential parcels possible, the water use was divided into three factors; interior of the house, immediate exterior or yard, and the irrigated activities beyond the yard that comprises the ranch-like activities. There are several advantages to this approach. The interior and yard water use is assumed to be similar no matter the size of the parcel. This allows comparison of ranchettes to typical suburban lots. Further, the least predictable water use from parcel to parcel is that beyond the house and yard. This is also the water most likely to be curtailed during a period of shortage, and therefore provides a cushion to both the supply and the analysis.

- **Interior.** The water duty for inside the residence is estimated to be similar to suburban dwellings. All of these units are serviced by individual septic systems and thus the recharge rate for the interior of the residence is estimated at 80%. Water use records from a number of sources were investigated to determine interior dwelling use. The water duty factor is based upon an average of 350 gallons used in the average residence per day.
- **Yard.** Landscaping immediately surrounding the residence is estimated to be similar to any other residence. This number represents a percentage of the total water applied by homes in several subdivisions in the area. According to the Department of Water Resources, 47% of the water used in the average residence is applied outside (DWR, 1984).
- **Ranching/Farming.** What differentiates the ranchette from the residence is the additional water used for gardening, livestock and other activities beyond the immediate residence. This water duty is the most difficult to estimate. Because this water is used outside, and most is lost to evapotranspiration, its percentage of recharge is considerably less, estimated to average 20%. Water use for all portions of ranchettes beyond the residence and landscaping can vary considerably from parcel to parcel, but for the purposes of analysis, the average consumed was estimated to be one acre foot per year (above that used for the residence and yard). This amount is used in the analysis for all parcels within the size range analyzed. The water use is assumed to be similar because the amount of land given over to water consuming activities is usually similar. The larger parcels are not developed much more (and sometimes less) than the smaller ones. The remaining land on the larger parcels in the county is usually left to non-irrigated grazing and provides a buffer to the residence. Water use tends to increase for several years after initial construction as more water applications are developed on the property.

Sources

Johnson, M.J. (1983), Ground Water in North Monterey County, California, U.S. Geological Survey Water Resources Investigations Report 83-4023, Sacramento, California.

Santa Clara Valley Water District (1979), Methodology for Projecting Water Needs in Santa Clara Valley.

Water Conservation in California (1984), Bulletin 198-84, Department of Water Resources, p. 21, July.