



NAPA COUNTY

CONSERVATION — DEVELOPMENT AND PLANNING DEPARTMENT

JEFFREY R. REDDING
Director

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AREA CODE 707/253-4416

MEMORANDUM

TO: Conservation, Development and Planning Commission

FROM: Jeffrey R. Redding, Director

SUBJECT: Public Works Department Report on Water Availability Analysis

DATE: February 27, 1991

In response to the Commission's concerns regarding water availability, the Department of Public Works has prepared a report outlining a three phase process. (see attached) The three phases are 1) a reconnaissance report required at the application stage for all use permits and parcel/subdivision maps; 2) study of the effects of additional water consumption on surrounding users based on a threshold level of water consumption; and 3) development of a contingency plan.

The report outlines the content of the Phase 1 Reconnaissance Report and the Phase 3 Contingency Plan; however, additional description is required for the Phase 2 Study. The water consumption thresholds need to be refined and criteria and guidelines must be developed for the study content and methodology. Based on comments from the Commission and the Departments of Conservation, Development and Planning and Environmental Management, Public Works will proceed with these changes.

RECOMMENDATIONS

1. The Commission approve, as an interim policy, the recommendations by Public Works for a three phase process to determine water availability for all use permits and parcel/subdivision maps.
2. The Commission direct staff to refine the water consumption thresholds and develop criteria and guidelines for the Phase 2 study.



NAPA COUNTY

DEPARTMENT OF PUBLIC WORKS

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HARRY D. HAMILTON
Director of Public Works
County Surveyor — County Engineer
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STAFF REPORT Water Availability Analysis

As a result of the environmental review process and the current drought conditions, the Napa County Planning Commission has expressed concern over water availability for Use Permit and Parcel Map applications. The availability of groundwater and the effects of pumping projected water demands of proposed facilities on the neighboring wells is of ultimate concern to both the Commission, neighbors and the applicant. In an effort to address these concerns, the Public Works Department has attempted to establish criteria by which the applicant can perform well tests to satisfactorily evaluate the effects of projected water use on the local groundwater aquifer. This Department contracted with J.M. Montgomery, the County's consultant for the Water Resources Study currently in progress, to help establish these criteria. The resulting letter report submitted by Montgomery engineers has revealed two basic flaws in this approach:

- 1 - The general nature of the criteria to include all types of applications may not give specific enough direction to the applicant or his consultant resulting in a general evaluation of the aquifer no more informative to the Commission than current information presently provided;
- 2 - The cost of such well studies may be prohibitive to applicants of small wineries or parcel maps.

While this Department is working to bring local experts together to refine these criteria and provide a more definitive result, it is apparent that some form of interim guidelines are required. Therefore, this staff report has been put together to provide the Commission with some basic information pertaining to water use, available groundwater, existing information and interim recommendations to assist the Commission's decision-making process. This report is comprised of the following sections:

- I. Existing Groundwater Studies and General Evaluation of Aquifers for Various Areas
- II. Projected Water Use of Various Applications
- III. Recommendations

I. Existing Groundwater Studies and General Evaluation of Aquifers for Various Areas

The most comprehensive study of groundwater in Napa County was done by the USGS in 1973. This study involved extensive monitoring of hundreds of wells within the Napa Valley floor from Calistoga south to the Oak Knoll Avenue. The Napa County Flood Control and Water Conservation District contracted the study and provided the monitoring program of these selected wells from 1962 to about 1975. The report concluded that the main Napa Valley aquifer was quite large, relatively stable and not in an overdraft situation. It was estimated that the basin contained about 200,000 acre-feet of water of which 24,000 acre-feet per year can be safely withdrawn without overdrafting the aquifer. The 1991 Montgomery study is suggesting a slightly lower "safe yield" for the basin of 22,000 acre-feet per year. Current usage is estimated at 16,000 acre-feet per year available before an overdraft occurs.

In 1972 a prior USGS study investigated the groundwater basin for the Lower Miliken-Sarco-Tulucay Creeks area east of the City of Napa. Based upon this study, the usable storage capacity of that basin is approximately 20,000 acre-feet per year. The aquifer in this area is considerably more confined than the main Valley floor with lower transmission rates (slower recharge of wells), fractured rock formations (segmenting of the aquifer) and generally a lower annual yield than the Valley floor. This annual yield is estimated at 3,000 acre-feet and pumpage at times is thought to exceed this amount.

Although no other extensive groundwater studies have been completed in the County, certain lesser investigations have been performed by the Flood Control and Water Conservation District. These investigations are primarily centered in areas with known groundwater problems and relative concentrated use. These areas are: Carneros, Coombsville (area discussed above), Dry Creek, Angwin, Mt. Veeder (and similar mountainous areas in volcanic formations), Pope/Chiles Valley, and Calistoga (mainly from a water quality standpoint). While no estimate of annual yield from these areas has been determined, they have been labeled as areas with groundwater problems that should be dealt with cautiously.

II. Projected Water Demand of Various Applications

It is extremely difficult to apply "across the board" criteria for evaluating water demand without first considering the relative consumptions of various uses for proposed sites. Some of these uses are currently regulated by the Planning Commission while some are not. Following is a table of various uses, their current average water demand and the County process, if any, that regulates that use.

USE	Projected Water Demand, (note units)	County Process
Residential:		
-primary residence	0.75 AC-FT/YR	BP
-secondary res.	0.33 AC-FT/YR	UP, BP
-farm labor dwell.	1.0 AC-FT/YR (6people)	UP, BP
Agricultural:		
-vineyards	1.0 AC-FT/AC-YR	None
-irrigated pasture	4.0 AC-FT/AC-YR	None
-orchards	4.0 AC-FT/AC-YR	None
-livestock (sheep or cows)	0.01 AC-FT/AC-YR	None
Winery:		
-process water	2.15 ac-ft/100kgalwine	UP, BP
-domestic & land.	0.5 " "	UP, BP
Industrial:		
-food processing	31.0 ac-ft/employee-yr	UP, BP
-Printing/Publishing	0.6 "	UP, BP
Commercial:		
-office space	0.01 ac-ft/employee-yr	UP, BP
-warehouse	0.05 "	UP, BP

From these estimated water usage numbers we can consider typical and "worst" case scenarios. For example, consider an 80 acre parcel currently in non-irrigated pasture land. If this parcel is used for grazing cattle or sheep, the water consumption will be approximately 1 ac-ft/yr for 320 head of sheep (or 80 cattle) on non-irrigated pasture. The parcel may also be irrigated to provide grazing for the same number of sheep and require 320 ac-ft/yr for irrigated pasture. Either of these situations would not require any County permit or land division process. The same 80 acre parcel planted in vineyard would require about 80 ac-ft/yr of water and would likewise not require County approval. A third scenario would be the split of the 80 acre parcel into two 40 acre pieces requiring the owner to apply for a parcel map with the County. If the proposed purpose was to construct two single family dwellings, the resulting water consumption would be approximately 2 ac-ft/yr. All three of these scenarios would most likely rely on groundwater for their water supply though cattle and vineyard operations many times build reservoirs to store surface waters. To take the worst case possible in these three development scenarios let's add a primary residence, secondary residence and farm labor residence all with ample landscaping. Then the water consumption may be as shown in the following table.

SCENERIO	DESCRIPTION	ANNUAL WATER USE ac-ft/yr
#1	320 sheep irrigated pasture primary residence secondary res. farm labor dwell.	324
#2	80 acre vineyard primary residence secondary res. farm labor dwell. 50,000 gal winer	83.5
#3	primary residence secondary res.	1.2

It is apparent from this analysis that certain unregulated uses of parcels can utilize far more groundwater than regulated parcel splits confined to permitted dwelling units. While water consumption for industrial and commercial uses vary greatly and are supplied almost exclusively by M & I suppliers, they do have an overall effect on water supply for the County and during drought periods such as the current one, will cause a shift from imported water to groundwater, the impact of which is difficult to gage.

III. Recommendations

In an effort to provide the Commission with an interim, workable evaluation procedure the Public Works Department proposes the following recommendations:

1. Establish a three phase policy at the application stage for all use permit and parcel/subdivision map applications. The initial phase would be a reconnaissance level letter report which would include;

- A. Site Map including
 - property boundaries
 - proposed building facilities
 - proposed agricultural development
 - existing and/or proposed water systems
 - adjoining neighbors
 - adjoining water systems

- B. Narrative on the proposed project with description of processes or land use intended. This should include
 - acreage of vineyard/agricultural development
 - gallons of wine to be produced
 - homesites and number of occupants
 - potential for future development

- C. Projected water consumption to include
 - total water requirement in acre-feet per year
 - peak demands and time of year
 - water source and delivery facilities
- D. Summary of available information on groundwater for the specific site and general evaluation of the groundwater basin to include
 - list of available published information
 - available history of wells or water service for site
 - probable effects on surrounding wells
 - proposed mitigation measures

2. Establish a threshold level of acceptance for various permit processes that would determine the need for further study by the applicant. This threshold level of water consumption would be expressed in acre-feet per year and could be on a sliding scale depending on the hydrologic conditions for that period of time. For example, during the current drought period an appropriate threshold level might be 1 acre-foot per year on the Napa Valley floor. This is the expected demand of an average vineyard. This consumption would have relatively little effect on neighboring wells. In hillside areas, where the aquifer is more fractured, an appropriate threshold level might be 1/2 acre-foot per year. The applicant would then be able to design their facilities to that level of water usage without having to provide a more extensive well study involving the drilling and testing of wells on the site. Applicants wishing to exceed these threshold levels, whether use permit, parcel map or building permit, could provide the phase two study to inform the Commission on the effects of additional water consumption on surrounding users. This concept during the current drought conditions could be applied to all applications including building permits, subdivision development, industrial use permits, etc. with a more extensive study being required for exceeding the threshold levels. In years of average or above rainfall, these thresholds could be adjusted upward and as such be less restrictive on water use. The applicants would have to make certain assumptions for land use of their development and may wish to provide two different scenarios: the most probable use of the property and the worst case (greatest water consumption) for the property. Certain standards for testing of wells for the phase two studies would be necessary and could be developed by this Department in cooperation with the Environmental Management Department which administers the County well ordinance.

Based upon the estimated water usage described in II above, the following threshold levels are suggested:

	Acceptable Water Usage ac-ft/ac-year			Below Average Rainfall (Current 1991) Applications			Rainfall at Average or Above		
	AREAS*			AREAS*					
	1	2	3	1	2	3	1	2	3
USE PERMIT									
M&I Supplied**	1	.5	0	3	2	0			
Well	1	.5	0	3	2	0			
PARCEL MAP									
M&I Supplied**	1	.5	0	3	2	0			
Well	1	.5	0	3	2	0			
Building Permits									
M&I Supplied**	1	.5	0	3	2	0			
Well	1	.5	0	3	2	0			

*AREAS: 1-valley floor
2-hillside
3-historically poor water areas
as identified by maps and records on
file with the Department of Public
Works

**Water supplied thru municipality or
District

3. Develop a contingency for water supply. Even the most exhaustive hydrogeologic study contains assumptions and evaluations which may or may not prove correct. In instances where the study does not accurately evaluate the effects of project water usage on surrounding wells or users, a contingency plan would be required. This may be as simple as implementation of water conservation measures on a permanent basis to adding storage facilities for use during peak demands. Implementation of this contingency plan would be achieved in one of a few different ways:

- application for modification of the permit use
- verified recordings of negative effects on neighboring uses as presented to the Commission through a formal complaint process similar to an appeal
- static well level deterioration documented by Flood Control District monitoring program
- determination by the Board of Supervisors as to a state of emergency requiring severe measures.

At the application stage, the initial phase one study would be required to be submitted to the Department of Public Works for review prior to public hearing or permit issuance. This Department would review the letter report to determine the accuracy of the proposed water usage and it's initial evaluation of the water source and, if acceptable, compare to the threshold levels appropriate at the time and location. The applicant would then be advised to either submit additional study (phase two) or the probable acceptance by the Commission. The phase one study could be performed by the applicant or his representative depending on its complexity. The phase two study would require hiring a professional groundwater expert from a list available in the Department or submit qualification of their chosen expert for prior Department approval. The content of the phase two studies would meet certain minimum requirements by this Department, as outlined by the JMMontgomery letter report attached, with the primary purpose to measure the effects of proposed well pumping or water use on surrounding existing users. Should the phase two study result in "significant" effects on surrounding users, then the applicant would be expected to mitigate to an acceptable level. If the study results in "possibly significant" effects, then the applicant would be required to do the phase three study and develop a contingency plan as described in paragraph #3 above. Implementation of this proposal could occur immediately after establishment of acceptable threshold levels of water use. These levels would be established by this Department after receiving input from the Departments of Conservation, Development and Planning and Environmental Management.