Thursday, March 17, 2011

Report of the Safe Yield Committee

I. INTRODUCTION

In accordance with a policy directive (PF1.1) in the General Plan Update 2030 (revised draft, October 2010), which brought forward a similar but unfulfilled directive from the 1993 General Plan, the City Council on December 14, 2010 appointed the Safe Yield Committee ("the Committee") to ascertain the annual safe yield of the St. Helena potable water system at the present time. The ultimate goal of the Committee was to determine whether, at the present time, potable water usage was below, above, or equal to the safe yield of the potable water supply system.

The Committee consisted of Alan Galbraith, Tim Nieman, and John Sales. The Committee met a total of seven times. The Committee was supported by the Public Works Director, John Ferons. The Committee reviewed its work with Jim Connell of West Yost Associates, the City's outside consulting firm on water supply. This report states the findings, conclusion, and immediate recommendations of the Committee.

The Committee is pleased to report that Mr. Ferons and Mr. Connell are in concurrence with the Committee's calculations of water supply from each water supply source, given the definition of "safe yield" immediately below. They also agree with the Committee's recommendations in Section VII. They take no position on the definition of "safe yield' itself as it is a policy-level issue.

II. DEFINITION OF SAFE YIELD

The meaning of "safe yield" was not defined in the 1993 General Plan. In connection with the general plan update process, the Planning Commission undertook to define the meaning of "safe yield." The City Council approved the definition recommended by the Planning Commission.

The definition of "safe yield" is as follows: **"The safe annual yield of the St. Helena water supply system is that quantity of water which can be reliably delivered on an annual basis through most rainfall years, including a Dry Year (rainfall at 22" to 25.9") without undue hardship on water customers through water shortage restrictions. It is recognized that the safe annual yield, as so defined, could place significant hardship on water customers in a Critically Dry Year (rainfall at 21.9" or less) or in periods of two or more consecutive Dry Years."**

The initial task of the Safe Yield Committee was to quantify the "safe yield" of the City's potable water supply system *under current operating conditions.*

III. THE SAFE YIELD OF THE ST. HELENA WATER SUPPLY SYSTEM

Based on current operating conditions, the annual safe yield of the St. Helena potable water supply system is estimated to be 1950 AF.

The Committee's modeling shows that if the City experiences a dry year (22 inches of rainfall) following a series of normal rainfall years, the City can make it through this single dry year with, potentially, the necessity for Phase III restrictions during at least some months in the dry year. This is not deemed an "undue hardship," even though the imposition of Phase III restrictions would require mandatory rationing and is clearly a significant hardship. The Committee considers "undue hardship" to be Phase IV or V restrictions, or three or more consecutive months of Phase III restrictions.

The basic supply assumptions behind the Committee's modeling are as follows: (1) the City purchases all Napa water available to it, including the option water (200 AF over 600 AF) in years when it can be purchased; (2) the City limits groundwater production to a long-term average not to exceed 450 AF/yr; (3) the City manages Bell Canyon reservoir as it is currently being managed. The Committee's model assumes that the City at all times meets its bypass obligations as set forth in Permits 9157 and 14810 from the State Water Resources Control Board.

Detailed computer modeling provides the factual basis for the safe yield finding of the Committee. The models used are extensions of models constructed and used by West Yost Associates. All inputs are based on the best data available; where the data are incomplete, the uncertainties are captured as probabilities and/or examined via sensitivity analysis to gain additional confidence in the stability of the results.

IV. THE NET SAFE YIELD OF THE ST. HELENA WATER SYSTEM

In order to assess total potable water supply of the City's Water Enterprise that is actually available for sale to customers, it is necessary to subtract from the total supply that amount of water that is not actually available for delivery ("unavailable water"). The safe yield of the St. Helena Water System less unavailable water equals the *net* safe yield of the system.

"Unavailable water" consists of "unaccounted for water," which is metered water that enters the water supply distribution system but cannot be sold to customers due to loss in the distribution system, metered water necessarily lost in connection with the filtration process at

the Water Treatment Plant at Bell Canyon, and metered water lost in well backwashing at the Stonebridge Well Complex.

The quantity of unavailable water was determined through careful analysis of potable water production and potable water sales in calendar year 2010 (ending December 31, 2010). This data was deemed more reliable than prior year data on account of completion of the meter replacement program prior to 2010. Unavailable water is best expressed as a percentage of production.

Based on calendar year 2010 data, total unavailable water, expressed as a percentage of production, was determined to be 14.96% (15.0% rounded). Of this amount, 14.47% was unaccounted for water loss. The remainder (0.49%) was water lost in production at Bell Canyon and at the Stonebridge complex.

Accordingly, at the current annual safe yield of the potable water supply system at 1950 AF, the *net* safe yield of the potable water supply system is 1658 AF (1950AF – (1950 AF x 15.0%)).

V. CURRENT SYSTEM POTABLE WATER USAGE

Due to the numerous factors that can impact water usage in any single year (total rainfall, seasonality of rainfall, state of economic activity, water restrictions, *etc.*), the Committee, the Public Works Director, and West Yost Associates determined that the most accurate picture of water usage is presented by using a *five-year*, rolling average. Use of any shorter time period carries the serious risk of presenting a skewed picture of "current" usage.

The Committee uses "rainfall year" usage data (July 1 through June 30). A rainfall year coincides with the City's fiscal year. The City summarizes usage data on a fiscal year basis.

Total potable (metered) water usage was 1853 AF in FY 2006, 2026 AF in FY 2007, 1894 AF in FY 2008, 1807 AF in FY 2009, and 1581 AF in FY 2010.

The current five-year average of metered usage is therefore 1833 AF. Adding in the estimates of unavailable water gives an estimate of total average water usage of 2156 AF (1833 ÷ .85).

VI. THE CURRENT SUPPLY/USAGE BALANCE

Current total usage, 2156 AF, is above the safe yield of the St. Helena water supply system of 1950 AF. The difference is 206 AF.

VII. CONCLUSIONS AND RECOMMENDATIONS

The Committee concludes that the St. Helena potable water supply system, under current conditions, is *not* currently in balance under the definition of safe yield adopted by the City Council. In future years, estimates of total usage should be updated on an annual (fiscal year) basis using the most recent five-year rolling average to re-evaluate the supply/usage balance.

Apart from contracting for new sources of water, the Committee recommends that the City consider two immediate steps to augment potable water supply.

First, the City should seek an amendment to the Napa contract. The current contract with Napa uses a trigger date of April 15 for determining the delivery quantities available to the City, and is based on the allocation of water from the State Water Project ("SWP") to Napa on that date. The SWP allocation to Napa is often updated after April 15, usually as an increase. The new amendment will seek to change the effective trigger date to June 30. It should provide that if the SWP increases it allocation to Napa in the period between April 15 and June 30, and the increase would have triggered the City's obligation to purchase 200 AF over the base 400, then Napa will deliver and St. Helena will pay for the additional 200 AF. Similarly, if the SWP increases its allocation to Napa in the period between April 15 and June 30, and the increase would have triggered the City's option to purchase 200 AF over 600 AF, then Napa will provide St. Helena with the option to purchase 200 AF over 600 AF. The Committee estimates that this change in the Napa contract will increase the annual safe yield of the water supply system by approximately 75 AF.

Second, the safe yield of the system can be increased by giving the Public Works Department more opportunity to attempt to optimize its operations. Specifically, if the pumping capacity of groundwater wells were increased, Bell Canyon could be drawn down more during normal years (less carryover water) but with the ability to produce more groundwater in drought years. The overall anticipated effect would be to increase the total yield of the system and, at the same time, reduce over the long run the City's average groundwater production from the Stonebridge Wells. Although further study is needed, initial modeling estimates that such a change in operations would increase the annual safe yield of the water supply system.

The Committee has the following **two additional recommendations**:

Third, City should retain West Yost Associates to develop a new system for triggering water emergencies. The current system, developed at a time when Bell Canyon was the City's primary source of water and at a time when the yields from Bell Canyon were materially greater than they are today, is out-of-date, and a poor indicator of actual conditions. A new system

would take into account that the City has three sources of water, and would give the Public Works Director authority to recommend to City Council an appropriate level of emergency water restrictions in the context of the total supply situation as it exists or is reasonably forecasted to exist. The Committee remains willing to work with West Yost Associates and the Public Works Director on this difficult assignment if deemed appropriate.

Fourth, the City should re-determine the usage/supply balance at the end of each fiscal year in the ordinary course of business of the Water Enterprise. This will require recalculation each year of the forward-rolling, five-year average total potable water usage. It should also take into account any change in supply conditions.

Respectfully submitted,

Alan Galbraith
Tim Nieman
John Sales