

M E M O R A N D U M

TO: Board of Supervisors

FROM: Scott De Leon, Director
by Tom Smythe, Water Resources Engineer

SUBJECT: Groundwater Conditions
Late January 2014

DATE: February 13, 2014

Due to the current drought conditions, staff measured 83 water wells in the major groundwater basins between January 23 and 27, 2014. These are the wells that are normally measured in April and October of each year to assess groundwater conditions. Based on the current measurements, conditions within each groundwater basin are summarized. These summaries are general statements and due to varying aquifer conditions do not cover all conditions. Individual well owners may experience conditions substantially different than the general condition (some of our wells show markedly different conditions than other nearby wells) and problems are more likely with shallow wells.

Attached are maps of each major groundwater basin showing the wells measured. Each well is labeled as follows:

- Well Number: This is a number assigned by the State, for instance 14N-09W-32M1. The well number identifies the well by Township, Range, Section number and by lot within the section (there are 16 lots).
- S Avg: This is the average spring (April) water level, typically the highest of the year. Most wells were measured since the early or mid-1960's, however, some wells have data going back to the late 1940's and new wells have been added to the network. The long record can document changes in the physical groundwater condition (i.e. downcut stream channels lower the maximum possible groundwater level), changes in irrigation practices (i.e. changes in crop types and irrigation demands), and seasonal impacts (i.e. droughts).
- F Avg: This is the average fall (October) water level, typically the lowest of the year.
- Jan 14: This is the water level measured during the period of January 23 to 27, 2014. If no number is provided, this indicates we were unable to measure the well for some reason (i.e, the pump house was locked).

These maps only tell part of the story of each groundwater basin, as long term groundwater conditions due to changing water use and aquifer conditions can have a substantial effect the average spring and fall levels. Conditions are also different within different areas within a basin. We evaluated numerous hydrographs (plots of groundwater levels over time) within each basin to prepare the following summary. Some example hydrographs are attached.

Big Valley

Big Valley is the largest groundwater basin and the most complicated due to its geology (there are numerous aquifers, some of which have limited connection to adjacent aquifers), recharge characteristics (there are multiple sources of recharge) and differing land use and groundwater use patterns. From the maps, it looked like most of the basin had better than expected groundwater levels, however, after reviewing the hydrographs, we have identified some definite problem areas.

Wight Way: We have measurements on two wells along Wight Way. We do not anticipate problems with these wells, a records indicate lower groundwater levels in the 1960's (10-15 ft difference) than currently, probably due to higher irrigation demand at that time. Newer wells that may not be as deep could experience problems. Hydrograph 13N-09W-28J2 was felt to be most representative of the area.

Kelseyville Bench/Gold Dust Drive: This area is served by a deep aquifer of volcanic ash. Groundwater is showing a several year decline. Recharge of this aquifer is from runoff over the exposed ash layer, which is very limited in extent and in drought conditions gets very little recharge. The decline will continue, but it appears that groundwater levels will be above he levels experienced in the early 1990's. Hydrograph 13N-09W-22F1 was felt to be most representative of the area.

Western Valley Floor: This is the main portion of the valley floor to the west of Kelsey creek including areas along McGaugh Slough, Adobe Creek and Manning Creek. There has been very little recovery (increase) in groundwater levels since our October 2013 measurement. Many water levels are above the average fall level, as groundwater demands have decreased (probably due to the reduction of pear orchards and increase in vineyards). Fall 2014 water levels will probably be the lowest in the last decade, but in most cases be higher than those experienced during the 1976-77 and 1987-1992 droughts. Hydrographs 13N-09W-10E1, 13N-09W-16E2, 13N-09W-07A3 and 14N-09W-32G2 were felt to be most representative of the area.

Eastern and Northeastern Valley Floor: This is the area east of Kelsey Creek and north of Soda Bay Road east of Lakeside County Park. This area appears to be the most severely impacted area in Big Valley, with almost no recovery evident from Fall 2013. The most recent measurement of one well is at an all time low since 1960. This area could be severely impacted with low groundwater levels this summer. Hydrographs 13N-09W-02C2 and 13N-09W-12M2 were felt to be most representative of the area.

Collayomi Valley

Groundwater levels are generally within 3 feet of average fall levels, although since the average annual fluctuation in levels is 3 to 10 feet, the impact could be significant in some areas. The basin is at the confluence of four creeks (Putah, Long Valley, St. Helena and Dry Creeks) and consequently has varuied groundwater conditions.

South, west and east of Middletown (Wells 10N-07W-03M1, 11N-07W-33M1 and 10N-07W-

01A1) have had essentially no recovery from fall levels. Some wells have been subject to declining water levels. Without significant runoff, these areas could be severely impacted.

North of Middletown (Well 11N-07W-35E1) there has been some recovery from the Fall 2013 levels, however, severe drawdowns as occurred in 1976-77 are still possible.

Coyote Valley

Coyote Valley has several subbasins, including the main basin (includes Hidden Valley Lake), Crazy Creek basin and the east basin (Comstock and Luchetti).

Most of the water intensive development, including HVLCSD's water wells are within the main basin. Groundwater levels are very low in the main basin (Well 11N-06W-29M1) being 11 to 26 feet below the average fall level. There has been no recovery from Fall 2013 levels, and levels are near record lows. Record low groundwater levels could occur this summer. Groundwater shortages are likely, especially for shallower domestic wells.

Groundwater pumping has increased substantially in the Crazy Creek basin in the last 10 years, so it is difficult to determine potential impacts. In 2004, 2006 and 2008, spring level were lower than the current level.

The east basin has its lowest spring levels since 1992 (Well 11N-06W-27M1), however, recent annual water level fluctuations are less than in previous years, so record low groundwater levels are not anticipated.

High Valley

The well at the west end of the valley is at near full levels and annual groundwater levels have been fluctuating less the last ten year, so no shortages are anticipated. Water levels in the central portion of the valley to the east are below average, however, are at or above the elevations during the 1960's, therefore, no shortages are anticipated.

Scotts Valley

The main groundwater storage in in Scotts Valley is at the south end of the valley. One well (14N-10W-14E2) demonstrates the volume of storage. This well has shown little recovery from the fall measurement. As groundwater usage has been substantially reduced in the last 10 years (removal of pear trees), low groundwater levels should still be near the levels measured in the 1980's and 1990's. Hydrograph 14N-10W-14E2 was felt to be most representative of the area.

Upper Lake Valley

Bachelor Valley wells show no recovery from the fall levels (15N-10W-04B1). Record low groundwater levels are likely to occur this summer.

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In the Upper Lake area, the central portion of the valley immediately north of town has recovered slightly and is slightly above average fall levels (15N-09W-06K1). Less than a mile to the north (16N-09W-31Q1) water levels have fallen since the fall measurement. It appears that the further wells are from Upper Lake (both to the north and out Clover Valley), water levels are lower.

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