**Find the Missing (Unaccounted) California Water**

(All charts and data from the California Department of Water Resources: ***California Water Today VOLUME 1 - THE STRATEGIC PLAN CHAPTER 3***

***2013 Update*)**

1AF = 1 acre-foot of water, about a football field with 1 foot of water spread across the top, approximately 326,000 gallons of water. 1MAF = 1 million acre-feet of water.

*Page 33 California Water Today updated for 2013* 2010 is closest to the average at 104%, use it for analysis, 205 MAF precipitation

The Precipitation range over the 10 years is 123MAF to 252MAF, 129MAF variance.

Salt Sinks are just two places in California, the San Joaquin Delta and Salton Sea. They are flushed regularly with fresh water to lessen salinity. Note the large yearly fresh water flows. Some are mandatory, the rest are not.

Do you believe California’s 38 million residential water customers are causing a water shortage? Let’s look at the data.

38 million residents at about 100 gallons per day will consume 4.22 MAF per year. 4.22 MAF is **only 2%** of 2010s’ 205MAF rainfall! 4.22MAF is only 3.27% of the 129MAF variability! Residential customers are insignificant; precipitation variability is over 10 times greater than residential consumption.

Taking all of residential consumption away would not make any difference in solving a shortage. One year’s rain variability could wipe out 30.5 years of residential consumption (129/4.22)!! At 150 gallons/day/resident, only 6.38MAF would be consumed by 38 million residents in a year, about 3% of 205MAF.

Balancing a water shortage on the backs of residential customers is absurd in the extreme; it is ridiculous, and impossible as the examples show!

Look at the non-mandatory Salt Sink allocation of 13.8MAF/yr. It is 13.8/4.22 = 3.27 times larger than residential consumption at 100 gallons/day/resident. 4MAF, less than 1/3 the SS amount would almost double the residential allocation. That is the way to compensate. To add salt to the wound read the following paragraph from the DWR.

***Too much Fresh Water*** is being released through the San Joaquin Delta!

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**First Approach to Estimate the Missing (Unaccounted) California Water**

**Step by Step Accounting of All Water Sources, Uses and Residual Groundwater Subsurface Outflow Available 2010:**

All numbers below are MAF, Millions of Acre-Feet for 2010, and Table 3-2 below:

205 (Precipitation 2010)

+0.9 (Inflow from Oregon & Mexico)

+4.7 (Inflow from Colorado River)

210.6 (Total Precipitation + Inflows 2010)

-25.0 (Consumptive use applied water - Agriculture, M&I, Wetlands)

- 1.1 (Outflow to Oregon, Nevada and Mexico)

-24.4 (Salt Sink 1 Statutory Reused Environmental Applied Water 24.4)

-13.8 (Salt Sink 2 Reused Environ App Water 38.7 – 24.4 = 13.8 w/0.5 Remainder)

146.3 (Remainder, SubTotal before adding the Overdraft)

+ 2.9 (Overdraft see bottom Table 3-2)

149.2 (Remainder, Total for the biggest account from Table 3-2)

-18.1 (EvapTranspiration from Part 1)

-32.8 (71-(24.4+13.8) = 32.8 Remain. Nat Runoff after removing Salt Sinks/Env. above)

-17.7 (42.7-25 = 17.7 Remaining Eff. Precipitation after removing Consump. use above)

80.6 (Remainder Groundwater Subsurface outflows +other out+ Net Inflows)

-7.4 (0.9+4.7 +2.9-1.1 = 7.4 Net Inflows after adding back 1.1 Oregon,Nev, Mex above)

**73.2** (Remainder: Groundwater Subsurface Outflows + other outflows –Net Inflows = **73.2MAF available for other uses after recapture *but UNACCOUNTED: Where Does it GO???)***

**Second Approach to Estimate the Missing (Unaccounted) California Water**

Note that 73.2MAF remaining water is **close to the 79MAF** of remaining water that was uncovered in my 2016 Website analysis ***See*** [***MooreForAssembly.com***](file:///C%3A%5CUsers%5CJD%5CDownloads%5CMooreForAssembly.com). ***UNACCOUNTED ---BUT Where does it GO???***

**Third Approach to Estimate the Missing (Unaccounted) California Water**

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Note above that all Applied uses of water for 2010 equaled only 80MAF.

Note above that all Developed sources of water 2010 equaled 80MAF.

Total Precipitation for 2010 = 205MAF, 205 – 80 = 125MAF Remaining for use.

Total Precip + Inflows – Outflows for 2010 = 210.6MAF, 210.6 – 80 = 130.6MAF remaining.

Recall total Rivers and Runoff = 71MAF from the Berkeley study

24.5 + 13.8MAF of Rivers and Runoff are included in the above 80MAF figure.

71 – (24.4+13.8) = 32.8MAF additional Rivers, 80 + 32.8 = 112.8MAF

210.6 – 112.8 = 97.8MAF remaining available for use 2010 OR

205 – 112.8 = 92MAF remaining available for use BUT UNACCOUNTED, ***Where does it GO????.***

**Review of the three estimates of missing (unaccounted) California Water**

1) – 73.2MAF unaccounted 2) – 79MAF unaccounted 3) – 92MAF unaccounted

 Note: 73.2 x 25yrs = 1.830**B**AF 79 x 25yrs = 1.975**B**AF 92 x 25yrs = 2.30**B**AF

**B**AF = 1Billion acre-feet

**Kang & Jackson Discover a New Aquifer Under Calif. Central Valle**y

In 2016, as I finished typing the last sentences on my Website study, 3 media sources announced the discovery of a new California aquifer by Stanford scientists Kang & Jackson. The new aquifer by their estimate contained 2,700 cubic kilometers of fresh water by California standards. An additional 1,000 cubic kilometers of brackish water lay below the fresh water.

2,700 cubic kilometers of water equals about 2.22**B**AF of fresh drinkable water.

Given the variability in California’s precipitation over the 10 year study, 123MAF to 251MAF per year, it is possible that the 2,700 cubic kilometers of fresh water could be recharged every 25 years. The entire 3,700 cubic kilometers of fresh and brackish water could be recharged 1/3 longer than 25 years.

Since we eliminated all other outflows of water (plants, trees, atmosphere, agriculture, urban, rivers and instream flows) in our accounting the only place for the missing water to go is in the ground. The DWR says it doesn’t account for underground water so it doesn’t make measure of it.

The DWR admits it doesn’t monitor deep aquifer water: ***“This water (percolated groundwater) is generally not counted as part of the dedicated water supplies”. That may imply no accounting of the source volume is required, though the 8MAF draw was accounted. (see the Table 3-2 definitions pg. 11)***

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***That is where the unaccounted water goes and that is why the DWR doesn’t talk about it***.

2,700 cubic kilometers of fresh water is enough for all of California’s human water needs (42.7MAF: urban, agricultural, industrial) for over 50 years. Add in the brackish water that is cheaper and faster to purify than seawater or sewage water and the time period is extended by about another 16 years, 50 + 16 = 66 years total.

I am not advocating we start drilling into the K&J aquifer. We don’t need that much water; we just need to capture some of the unaccounted water. Another 2 to 4MAF/yr would provide more than enough for residential customers. That number is well within the 10 year variance in rainfall from 2001 to 2010 as shown in the table above.

The aquifer can be used as underground storage, by pumping water down into it during flush times and withdrawing water during dry times. Still we have to remember there is no water shortage in our state, there is an abundance of water though we need some better tools to manage our water system.

This brief summary doesn’t include many other conclusions, solutions and data in the 20 page report. It does give the reader solid evidence that 1) California has plenty of fresh water and 2) Residential water customers are blameless of the charge of causing or even exacerbating California’s water shortage hoax. The State’s draconian residential water penalties of $1,000 to $10,000 are strictly punitive and completely unnecessary.

In the near future, 1.5 years ahead, every resident of California will face the grim mandate to decrease water consumption by 45% or receive heavy fines. This is unnecessary and is an opportunity for the Republican party to get ahead of the problem with a strategy to save the almost all the State’s residents.

The costly alternatives of desalination and reclamation of sewage water are not necessary. Their billion dollar price tags don’t have to be foisted on the taxpayers.