TEHAMA COUNTY AB3030 GROUNDWATER MANAGEMENT PLAN
TECHNICAL ADVISORY COMMITTEE
FEBRUARY 25, 2002

1. Call to Order at 2:00 P.M. by Vice-Chair Gary Antone.

2. Introductions: Vice-Chair, Gary Antone; Bob Steinacher; Bill Richardson; Steve Kimbrough; Tom Heffernan; Jim Lowden; Roger Sherrill; Kevin Borror. Absent: Serge Birk.

   Visiting: Delrae Violetti, Public Works; Bob Vince of Camp, Dresser and McKee Consultants; and Toccoy Dudley of DWR.

3. Public Comment:

   Ernie Ohlin distributed information concerning the March 8th Local Assistance Workshop and the DWR meeting regarding the California Water Plan update in Red Bluff.

4. Approval of January 2002 minutes: Motion by Roger Sherrill and second by Bill Richardson to approve as presented. Carried 8-0 with 1 absent.

5. Subsidence in the Northstate: Toccoy Dudley gave his presentation on describing subsidence as beginning in the 90's. The cause of most subsidence is people utilizing their overlying right to pump groundwater to put it to a beneficial use on their own property. They are not pumping groundwater as part of a water transfer or as part of any conjunctive use program.

$ Subsidence studied by Toccoy Dudley for 10 years. DWR has monitored groundwater levels since 50's.
$ Early evidence of Subsidence first noticed in City of Woodland Area.
$ South Mill Valley where water bank activities began.
$ California is “King” of land subsidence in the U.S.
$ Subsidence is the lowering of the elevation of ground surface over time.

Example: San Joaquin Valley has experienced up to 30' of land lowering through subsidence. In San Jose as much as 12' of subsidence has occurred and a dyke was built to keep seawater from intruding into the City. Basically, the whole City lowered below sea level.

$ The City of Woodland storm drains began running backwards due to subsidence.
$ Land subsidence can destroy water wells by collapsing the casing.
$ Once the clay particles compress there is no way to repair damage
$ In the Sacramento Valley the maximum amount known is 60' about in the Yolo/Zamora Water District area. Subsidence in Zamora area extends almost to Willows. North of Willows, no subsidence.
$ Subsidence in Sacramento Valley is restricted to west side.
$ 1990 in Woodland, an Extensometer was installed which measures the rate of subsidence. Operated until 1994, abandoned by City due to funding, DWR has taken

over and operated to date. In one year, readings showed the ground went down 4/10 of a foot in one irrigation season and then after everyone turned off pumps, it came back up 2/10 of a foot.

$ To the best of DWR knowledge, subsidence is not a problem in Tehama County. However, very little research or data exists.

In Zamora area, their summer/spring to fall change in groundwater levels is nearly 100'. It was not Toccoy Dudley's belief that anywhere in Tehama County was there that magnitude of drawdown.

Ernie Ohlin noted that in Tehama County, 2001 data reflects that in the location of the tree farm west of I-5 was 35' of drawdown and the El Camino Irrigation District 40' of groundwater drawdown.

Mr. Dudley continued:
Subsidence, why and how: In areas we experience land subsidence, it is important to realize what is actually subsiding. Most people believe it is the aquifers collapsing, but according to Mr. Dudley, that is untrue. It is the clay beds between the aquifers consolidating. For example, if a saturated specimen of clay was taken and a light load was put on it, then released, the clay will come back up to the same height. If you put a heavier load on, it will lower a little bit further and will return to the same height. But, there is a point that when a load is applied, where water will expel from that clay. Once the pressure occurs, the clay will undergo a volumetric reduction. It will not be the same size ever again. Basically, what you are doing is loading the clays underneath the ground surface and squeezing water out of the clay, going into the aquifer and is pumped out.

What causes the water to be squeezed out of the clay? When pumping groundwater frequently, you change what they call the effective stress within the aquifer. Clay undergoes a volumetric reduction when they reach pre-consolidation pressure. As long as you do not create an effective stress in the aquifer system that does not exceed the pre-consolidation pressure, you should not experience subsidence.

Re-hydration and why it is not possible: When the clay, which is a platelet structure, undergoes the volumetric reduction, once squeezed, will collapse. Therefore, when subsidence stops, you are not squeezing water out of the clay, but your well levels may diminish due to lack of recharge from no more water being squeezed from the clays. The damage is permanent. In the Three Rocks area of San Joaquin Valley, they have thin clays and sand which consolidates rapidly. Thick clays can be loaded and the clays will consolidate slowly. Repair is not possible, but you can mitigate it. Building levees higher, replace wells and reconstructing your surface water infrastructure may be required.

Measurement: Done by an Extensometer. Glenn County will install, with their AB303 Grant, three dedicated monitoring wells and one Extensometer to measure for subsidence. They have a monitoring network for acceptable water levels, network for water quality, but nothing for subsidence. The Extensometer is a 1,000 foot deep well with filled with Betenite. Leaving the bottom of the well open, a 200 pound weight with a cable will be dropped to the bottom of the well. When subsidence occurs, the ground goes down, but the weight hasn't changed elevation. The cable will give the appearance of actually coming out of the ground as the ground subsides. Examining Exhibit "D" showing the cable going across a series of pulley's,

and down to counterweights and showing how it keeps the cable taut. As subsidence occurs, the weights will appear to fall down closer to the ground. With a Stevens recorder, a record is made of subsidence.

There are two types of Extensometer's. The cable Extensometer, for a cost of approximately $100,000, is accurate to about a "couple of tenths of a foot". A pipe Extensometer is measurable up to one-thousands of a foot and extremely expensive to install. The Extensometer will give you very site specific and accurate subsidence measurements. If you are in effect, starting to measure subsidence, then the next step is establishing a network of benchmarks around the area. With GPS the best accuracy achieved, using the most rigorous method, is only 2-1/2 cm (1 inch). It costs almost as much to do a survey as to install an Extensometer and a GPS survey would have to be done twice to measure subsidence.

Much discussion took place from the TAC members. Mr. Dudley was thanked for his presentation.

6. Review Draft TAC Annual Report: Copies were distributed to members prior to the meeting for review and comment.

Bill Richardson suggested the addition of the AB303 Grant added to the report including what the TAC and staff has done to get this far.

Delete "Membership" due to redundancy at end of document with "Respectively Submitted by".

Staff will change the wording of Tehama County Public Works to Tehama County Flood Control and Water Conservation District.

All comments to be submitted to the Secretary before March 11th for submittal to the TCFC&WCD Board by March 26.

No action taken on this item.

7. Staff report:

$ March monitoring of groundwater levels will begin shortly. Al Leggs from Gerber Community Service District has contacted staff requesting three wells be monitored. Los Molinos Mutual Water Company would also like to be considered to have their wells monitored.

$ Staff has been working on the RFP for the Groundwater Inventory Analysis. A timeline was distributed. Consultants have already expressed interest.

$ A second AB303 Grant has also been applied for $200,000 which would fund DWR to conduct a detailed Groundwater Data Analysis. Results should be forthcoming.

$ NCWA Managers Report was distributed

8. Next meeting date March 18, 2002

9. With no further business the meeting adjourned.