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WATER DISTRICT

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To: Elaine Archibald, Brown and Caldwell

From: Richard A. Denton *R.A.D.*

Date: January 11, 1994

Subject: Draft Memorandum No. 2A and 2B,
CUWA Study of Drinking Water Quality in Delta
Tributaries

I noted the following points when reviewing the two draft memoranda.

2A: Mine Drainage

- The term "adit" used on page 4 and "adit releases" used on page 7 need to be defined.
- As noted on page 12, "the primary concern of mine discharges remains to aquatic life or to reaches immediately below the discharge..." because concentrations are well below drinking water quality standards, "... with the possible exception of arsenic". The cleanup of mine drainage should continue to be supported. Releases in winter to dilute mining drainage for the protection of aquatic life may have an indirect effect on Delta tributary drinking water quality through a corresponding reduction in releases during the summer when seawater intrusion is greatest.
- The memorandum does note the potential significance of mining drainage as a source of arsenic in the Sacramento River. As such it may not be wise to completely discount mine drainage as a significant source of contaminants.

2B: Delta Agriculture

- The values referred to in Figure 2 (page 5) and subsequent figures as outliers are in most cases valid data points and merely reflect the maximum observed values for the period of record. The data records from different locations should always be compared to ensure that a peak in salinity at one location is reflected by similar rises in salinity at a neighboring station. If not, then maybe the data point is a false reading and

should be discarded. The observed highest readings at a given location merely reflect periods when there was the most salinity intrusion or agricultural drainage. I understand outlier to mean an unusual or unrepresentative point well away from the expected range of data. I am not sure that the data in Figure 2 are unrepresentative.

- There needs to be a map in Memorandum 2B showing the specific benchmark locations.
- The Memorandum discusses how the proportions of contaminants coming from seawater intrusion and agricultural drainage are different depending on the time of year and location within the Delta. However, the EC and bromide data plotted in Figures 3 and 4, respectively, tend to lump these two effects together.

It might be more illustrative to plot bromide versus EC at one or two stations to show the different proportions of bromide and other contaminants from the two different sources. This follows Amy's fingerprinting approach. The attached figures give examples of MWQI grab sample measurements of bromide, sulphate, TDS and EC plotted against electrical conductivity. In the case of bromide, sulphate and chloride there is a clear demarcation between predominantly seawater samples (Mallard Island and Jersey Point) and San Joaquin Valley drainage samples (Vernalis). The demarcation for total dissolved solids is much smaller.

The final figure shows 14-day averages of EC and Cl at Rock Slough. The linear fits of the MWQI data from the Mallard Island and Vernalis stations are consistent with the demarcation between periods of seawater intrusion and agricultural return flows at Rock Slough. Note that the periods of agricultural return flows appears to correspond to periods of large outflow from the San Joaquin River (QWEST > 4000 cfs, where QWEST used as a surrogate for San Joaquin outflow).

Minutes of July 14, 1993 (dated July 21, 1993)

The description of Contra Costa Water District (CCWD) - Austin Nelson, states "In the forebay, the water is blended with water from other sources." There are no other significant sources of water going into Mallard Reservoir, the forebay for the Bollman Water Treatment Plant other than Rock Slough and Mallard Slough, except for small amounts of local drainage. Water being taken into

Elaine Archibald
CUWA Study of Drinking Water Quality
January 11, 1994, Page 3

the Treatment Plant typically has a different instantaneous concentration than the water being diverted at Rock Slough because of the residence time of the canal and Mallard reservoir system.

Suggested replacement language would be:

"Water from these two sources is mixed together in Mallard Reservoir, the forebay to the Bollman Water Treatment Plant.