Review of the Sacramento River Watershed Program
Annual Monitoring Report 2000-2001 (Administrative Draft)

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Prepared by Larry Walker & Associates
Comments Submitted by G. Fred Lee, PhD, DEE
G. Fred Lee & Associates, El Macero, California
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I note on the bottom of the pages beginning with page 1, *"Comments Due March 18;"* yet on page i, the due date for written comments on the administrative draft is March 22.

Overall

The third monitoring year draft report is considerably improved over the first and second year monitoring reports. However, it still has a number of the same problems, such as continuing to try to use median concentrations of a water quality characteristic, and inadequate editing of the report before submission for review. A number of other issues that need to be addressed are discussed below.

Specific Comments

In the list of acronyms and abbreviations on page iii, there is need to add "EPA = US EPA." Further, the document needs to be reviewed carefully, and all other acronyms and abbreviations that are used (such as "EPA") that are not listed, should be listed.

Page v, first paragraph, fourth line from the bottom, the term "watershed" is too broad. We are not assessing the impairment of the Sacramento River watershed. We are assessing certain waters in the Sacramento River watershed. This problem needs to be corrected throughout the document.

Page v, second paragraph, third line, it is not "organochlorine compounds," but "organochlorine pesticides and PCBs." There are many organochlorine compounds that we are not addressing in these studies.

Page v, under Mercury, fourth line, it should be "US EPA," with "EPA" after that in parentheses if desired. I prefer to leave it "US EPA," because there is a California EPA that needs to be distinguished, which has its own criteria. Since a numeric value is given, it is probably appropriate at this point to put a reference to that mercury criterion value of 0.3 mg/kg.

Page vi, second paragraph, third line, "USEPA" is listed. This report (like previous reports produced by LWA) is not adequately edited before submitting it for review. You should not be using "EPA" for the US EPA one time, and then "USEPA" the next time. It should be consistent throughout the report.

Page vi, last line, I believe "Council" should be capitalized, since it is a proper name.

Page viii, second paragraph, first and second lines, where it says, *"... relatively new pesticides,"* the pesticides such as pyrethroids are not "new." They have been around for a long time and have been used substantially. The issue of concern is increased use.

Page viii, under Drinking Water Parameters of Concern, the first and second lines, it should be, "... water supplies for municipal, industrial and agricultural use in the Sacramento River Basin and downstream in the Delta." The issues will not be what is in the Basin, but what happens downstream. Further, in that same paragraph, it is misleading to say that they are able to treat the water without discussing the fact that this treatment results in increased costs. Further, in that same paragraph, there is need to mention nutrients as they relate to algal growth, which in turn relate to taste and odor problems. Further, in the same paragraph, TDS is far more important than just taste and palatability. The principal reason that the MWD and other Southern California exporters of Delta water are concerned about TDS is groundwater recharge, where it limits the ability to recharge the groundwaters because of the total increase in salts, which would mean that they would have to treat to remove salts before recharge.

Page ix, in the first paragraph below the bullets, where it talks about *"The parameters of greatest concern for drinking water quality (TOC, TDS, and pathogens),"* I would add nutrients, because ultimately nutrients, as they impact domestic water supplies, may control nutrient concentrations in the Delta and its watershed, through the nutrient criteria.

Page ix, under PCBs and Organochlorine Pesticides in Fish Tissue, first line, I would add organochlorine "pesticides" in fish tissue. In that same paragraph, what is meant by *"relatively low risk from organochlorines in fish tissue"*? Low to whom? The person who gets cancer from eating the fish? That is a pretty high risk. As discussed in the past, whenever comparative statements like this are made, you need to specify what you are comparing against. LWA's interpretation of low risk may not be the same as others'.

Page x, first paragraph, next to last line, again it should be "organochlorine pesticides."

I have not reviewed the Table of Contents or Lists of Tables and Figures. Also, I have not checked all the references against the citations in the text to be sure that they are, in fact, listed in the reference list and properly cited in the text. Someone should carefully review these to be sure that they have been set up properly.

Page 1, second paragraph, next to last line, it should be "potentially" toxic pollutants.

Page 1, third paragraph, second line, we again have an inconsistency in how the US EPA is listed. It should be consistent throughout the report.

Page 2, last paragraph, next to last sentence states,

> *"Evaluating the available information and identifying gaps in the data needed to assess the degree to which beneficial uses are achieved or potentially impaired in the watershed ..."*

This is a misstatement of what we have been doing. We have never really done that. All we have done is compare concentrations found to water quality objectives. There has never been a proper assessment of impairment of beneficial uses in the Sacramento River Watershed Program.

Page 3, under the first bulleted item, we are not discussing the watershed. The watershed includes the land. We are only considering certain waterbodies in the watershed. The second bullet mentions "relative health." This again is the issue I have raised before, in that we use this term without ever providing any guidance as to what it means. We should either stop using it or define it.

Page 4, first paragraph, at the end, we need a reference to US EPA Recommended Water Quality Criteria. Is this the April 1999 reference? If so, that reference should be put in there. If it is not, put whatever the reference is meant to be. It should be the April 1999 specification, since that is the latest version.

Page 5, while Claus was not involved at the time, this Sacramento River Watershed Program monitoring program was set up on an Evaluation Monitoring approach. This was the original approach that I proposed. It was agreed that this approach would be used. It has never been followed through, however, beyond the initial monitoring. We are still doing the same kind of monitoring for constituents without ever examining what the real impaired uses are.

Page 5, under Sampling Sites, "gauging" (second bullet) in this type of context is typically spelled "gaging."

Page 7, under the table, I would close up the space in the report.

Page 9, second paragraph states that, *"... certain organic contaminants (including DDT and PCBs) readily accumulate through the food web ..."* With respect to DDT, there is a direct uptake from the water through the gills, which does not involve food web, that needs to be considered. In fact, it may be more important than the food web accumulation in many situations.

Page 9, the paragraph entitled "Mercury, PCBs, and chlorinated pesticides in fish tissue," the real reason that we monitor fish is to assess the hazard. These constituents are not a hazard except through bioaccumulation. That is the bottom-line issue that should be measured. All the other items mentioned in this paragraph are ancillary to this issue.

Page 9, the paragraph entitled "Mercury in water," the last sentence is not true. We cannot couple concentrations in water to adversely impacting beneficial uses. We do not know the linkage. We need to examine this. The more we study this, the worse it gets in terms of understanding it.

Page 10, the first paragraph, last line, we need to add the word "potentially." It should be, "...potentially adversely affecting uses." We cannot use concentration data to assess adverse impacts.

Page 10, the paragraph entitled "Toxicity in water," the statement mid-paragraph about the effects may occur rapidly, which is defined as "acute," or over longer periods, which is defined as "chronic." Usually "acute" and "chronic" relates to death and impaired reproduction or growth. That concept needs to be introduced. There can be impaired reproduction over short times, as well.

Page 10, under "Toxicity in water," the next to last sentence about *"... results from these weight-of-evidence investigations,"* "weight-of-evidence" is misused there. Weight-of-evidence is a combination of aquatic organism assemblage information, aquatic chemistry focusing on TIE information, and toxicity. Assemblage information is missing from the list presented above that sentence.

Page 14, Table 3 has some printing problems in the boldface subheadings printed sideways.

Page 15, the last paragraph on the page indicates that if there were no exceedances of the water quality objective, this was interpreted to mean not causing impairment, and *"... spatial and temporal trends were not evaluated for that parameter."* As I discussed with reference to previous years' monitoring reports, this approach is not valid. For those parameters where there is an increase in trend, but has not yet exceeded a water quality objective, the evaluation should be made for all parameters, and the results presented, paying particular attention to any parameter that is showing a potential upward trend of a concentration which could lead to an exceedance of an objective at some time in the future.

Page 16, the first paragraph mentions a comparison of the data to the EPA maximum contaminant levels for drinking water. Comparisons should also be made to the OEHHA and DHS guidelines. The DHS MCLs are incorporated by reference into the Basin Plan objectives. Even though they are not listed there, they are part of the Basin Plan, and comparisons should be made to these, especially in light of the fact that the DHS MCLs are often more stringent than US EPA MCLs. This report needs to be expanded to discuss this issue.

Page 16, middle paragraph under Spatial and Temporal Trends, as I have suggested for several years, the group continues to use the word "trends," as though we are going to detect changes. However, because of the nature of the data we are collecting and its variability, the likelihood of detecting a statistically significant (valid) "trend" is remote. I feel that we have sufficient data now so that this issue can and should be examined so that we do not fool ourselves into thinking we are going to see trends in the data, based on the monitoring programs that have or could likely be conducted in the future. Of particular significance is the computation of the number of samples that would have to be taken for a particular parameter and location in order to detect a trend with a 95-percent reliability.

At the bottom of page 17, the blank space should be eliminated by moving text.

Page 23, under Threshold Values, line 6, are we certain that those are California Department of Fish and Game screening values? I thought I understood that those were US EPA values that were used by the San Francisco Regional Water Quality Control Board.

On page 30 (and elsewhere), this report has the same problems trying to discuss trends in data based on median concentrations. Median concentrations are not a reliable indicator of trends. As I have discussed previously, the LWA reports presenting an analysis of median concentrations are significantly deficient in addressing issues that should be addressed. The LWA approach can provide highly unreliable information to stakeholders on key issues. The least that needs to be done is to include information on the scatter about the median.

Page 37, Figure 3, it is not clear to me what the lines which increase with "length" mean. Are those for a particular fish? We need some way to tie that to something. I am sure that, if I am having trouble, then others may also have trouble understanding this figure. The same comment applies to Figure 4 on page 38. It is not clear which line goes with which set of points.

In Figure 6 on page 40, there is need to explain what the bars are. That same comment applies to all the figures where these types of plots are used. A legend needs to be included which would discuss the components of each of the values.

Page 44, there is need to close up the blank space.

With respect to the information on the pesticide data beginning on page 43, it seems like last year I made this same suggestion, of being certain to include the statement that the organochlorine "legacy" pesticides, such as DDT, toxaphene, chlordane, etc., were not examined for in the water, unless in fact this was done. Such information is going to be important in terms of attempting to address the organochlorine pesticide TMDLs that have to be addressed.

Since GC scans were made for certain pesticides, a listing of all of those that were scanned for and the detection limits used should be included. That way, those who review this will know that certain pesticides have been looked for and not found.

Page 50, first paragraph, near the bottom, the statement is made that the diazinon toxicity is to zooplankton which are key organisms in the ecosystem. We do not know that. We say that, and we assume it, but to know that killing *Ceriodaphnia* deprives larval fish or any other organism of food that is essential and not available from other types of organisms, is not known. However, lacking information on this issue, we have to assume that this is the case. This issue needs to be discussed.

Page 52 mentions "Group A Pesticides." To my knowledge no mention has been made earlier about these pesticides. They need to be listed, and indicate the detection limits used to search for them, if they were looked for, or provide some additional information as to what their significant concentrations are. This could be filled in on page 51 in all the blank space there.

Page 53, under the Organophosphate pesticides, second line, we need a table in the text indicating what was looked for and the detection limits used in EPA Method 8141.

Page 54, under Carbamate pesticides, the third and fourth lines, "EPA Method 8321" needs to be included as a table, with respect to pesticides looked for and detection limits used. The information in the last sentence on page 54 is not sufficient. The table would provide the information that could be used by others to judge the adequacy of the search.

Page 55, third line, EPA Method 619 also needs to have a similar table.

Page 57, Table 15 (and possibly elsewhere), there are no units on the toxic concentrations. This needs to be corrected.

An issue that needs to be added to the Pesticides section to properly convey the potential hazards of pesticides, especially with reference to those that have only been detected once or twice, is that a single detection of a highly toxic pesticide can potentially have a significant adverse impact on the beneficial uses of the waterbody. This can occur if that toxic pulse is toxic to critical organisms, such as larval fish or larval fish food, at a certain time. It is, therefore, important not to assume that, just because a particular pesticide was only found once above detection limits, this represents little or no harm. There could readily be significant adverse impacts by a single pesticide toxic pulse, which may or may not be detected at the maximum concentrations or detected at all by the analytical programs used.

Page 60, first paragraph, first line, we need to mention that this toxicity is "aquatic life toxicity." There are many other toxicities to other kinds of organisms, which were not assessed.

Page 63, second paragraph, third line, I would add in parentheses after *Ceriodaphnia*, "zooplankton;" after *Pimephales*, "fish larvae," and after *Selenastrum*, "algae," to remind the reviewers what these names mean. The current version of the sentence has no close-parenthesis.

Table 17 on page 64 has, under "Cause for Listing," "Unknown Toxicity." I do not remember seeing it in the text. If it is listed in the table, it needs to be discussed in the text as to what is meant. It is "unknown-caused toxicity." A paragraph or so should be added as to what that is all about, and the nature and summary of the work proposed to be done on that.

Page 65, third bulleted item needs to mention that this significant adverse reproductive effect occurred with *Ceriodaphnia*.

Page 65, last paragraph, with respect to the section on PBO additions, what should have been done (and maybe it was, but is not discussed here) is to assess whether all of the toxicity was removed by PBO, or whether there was toxicity that was not controllable by PBO, such as due to pyrethroid toxicity. A good place to add the discussion about a single pulse of toxicity being significant would be at the bottom of page 66. We could move Table 18 down on page 67.

Page 74, in the second paragraph about attainment of beneficial uses if MCLs are met, focusing on treated water, if the MCLs are not met in the raw water, then the water utility and its consumers may be spending considerable additional funds in treating the water so that it does comply

with MCL requirements. This notion should be added to this paragraph so that those who read this understand that the statement about MCLs applying to treated water has important implications when considered in terms of cost of treatment.

Page 74, last paragraph before the bullets discusses that median concentrations are presented in Table 23. Again, median concentrations are not reliable indicators of water quality. This is a chronic problem with LWA's presentation in these reports. The maximum concentrations are more important than the medians.

Page 74, the first bulleted item mentions the DHS MCLs. As I mentioned earlier, DHS MCLs should have been listed in the list of regulatory limits that are important.