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Bill Jennings
Deltakeeper Chapter of Baykeeper
3536 Rainier Avenue
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Dear Bill:

I have reviewed the April 8, 2005, letters from Ms. K. Kelly of DWR responding to your and my comments on the significant technical deficiencies of DWR's "Initial Study/Mitigated Negative Declaration" (IS/MND) for the SJR DWSC proposed demonstration aeration project. I find that Ms. Kelly's responses to our comments do not adequately and reliably address a number of key issues that we raised on the technical adequacy of the description of the potential environmental impacts of the proposed project. Further, her letters are replete with misleading statements that would tend to cause someone who does not understand the issues we raised to believe that the proposed project, and most importantly the full-scale project based on the proposed design, will have insignificant impacts on water quality in the DWSC. Ms. Kelly has relied on the limited expertise of one or more individuals to provide information which is clearly outside of her and her advisors' area of technical competence. The individual(s) who served as her advisor(s) for her letter should be identified so that others can be informed that this individual(s) will provide information on issues in which they have inadequate expertise.

The DWR IS/MND does not conform to CEQA Title 14, Chapter 3, Article 6 "Negative Declaration Process and Article 10, Section 15151 "Standards for Adequacy of an EIR," which states,

"An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure."

The standard of full disclosure is applicable to a negative declaration regarding the need for an EIR. Clearly, as documented in our original comments and below, the DWR proposed Negative Declaration is inappropriate where there are well-defined water quality impacts that are not being addressed.

Comments on the unreliable and inadequate information in Ms. Kelly's letters are presented below.

Ms. Kelly states,

"First and foremost, we have determined the preparation of an Environmental Impact Report for this project is not warranted because the potential impacts to the environment of the project can be mitigated to a less-than-significant level by incorporating specific design criteria."

As both you and I documented, the IS/MND is based on an inadequate technical review of the potential impacts of the proposed project. Several key topics were at best superficially addressed. Proposed violations of the CVRWQCB Basin Plan water quality objective governing the discharge of toxics to the waters of the State were largely ignored. As discussed in my comments, this issue could readily cause this project to have to be redeveloped to eliminate the violations that will occur if the project proceeds as currently proposed.

Ms. Kelly further states,

"This strategy was evaluated through a peer-review process in 2001 and 2002, and much work has been done to choose what we believe is an appropriate technology."

This is one of the numerous statements in her letter that is designed to mislead the reader. A proper statement on this issue would have included the fact that the peer reviewer chosen for this project did not have the expertise needed to address several of the types of issues I raised in my comments. Further, details of the proposed aeration approach were not adequately defined for the peer reviewers so that they could fully understand the proposed project.

According to Ms. Kelly,

"The IS/MND has been modified in response to your comments, as well as other comments we received, to clarify the diffuser description on page 37 and the intended mixing zone."

Who else submitted comments? Are these comments available for review? They should be made public as part of the CEQA process.

Further, with regard to Ms. Kelly's statement,

"The IS/MND has been modified in response to your comments, as well as other comments we received, to clarify the diffuser description on page 37 and the intended mixing zone. The outfall diffuser has been designed to mix the oxygenated water from the U-tube with the water of the ship channel at a 10:1 ratio within five feet of the diffuser."

In the original IS/MND, page 37, last paragraph, the statement is made,

“Oxygen will be discharged to the DWSC through a diffuser system. There is concern that high levels of oxygen in the discharge may be harmful to fishes. For example, the initial concentration of oxygen at the discharge would be 43 to 66 mg/l. However, the diffuser system will dilute initially high oxygen concentrations by a ratio of 10:1.”

In addition, in Ms. Kelly’s letter to me she states,

“These features include: use of 100 percent oxygen for aeration; an oxygen feed rate and operation pressures to provide a near saturated but not oxygen-supersaturated return water; and a discharge diffuser to distribute the oxygen-amended water at minimal velocity and at a maximum available depth.”

Will the water in the U tube still have DO concentrations up to 66 mg/L as stated in the original IS/MND? If so, a 10-to-1 dilution five feet from the diffuser will still be in violation of the CVRWQCB Basin Plan water quality objective (WQO) for the discharge of toxics. The DO concentration at the discharge point and likely at five feet from the diffuser release will be above the US EPA water quality criterion for dissolved gas saturation. A proper discussion of this issue would present the DO and the dissolved nitrogen concentrations in the outlet from the U tube, and the amount of dilution that will occur in the diffuser tube to the point of discharge. What is the expected concentration of oxygen and nitrogen in the off-gas from the U tube system? This information can then be used to calculate the amount of total dissolved gas saturation at the point of discharge from the diffuser ports. If the total dissolved gas in the diffuser discharge exceeds 110% (at the discharge point) then the discharge would be a violation of the CVRWQCB Basin Plan objective for the discharge of **toxics in toxic amounts**.

One of the most glaring examples of Ms. Kelly’s failing to address issues raised by me is the issue of violating the CVRWQCB Basin Plan objective for control of toxics in waters of the State. As I discussed, the U tube aeration approach, which relies on limited dilution in ambient waters to achieve nontoxic conditions, cannot be allowed by the CVRWQCB. Based on this situation alone, the IS/MND must be redrafted to conform to CEQA requirements of full disclosure, where a different approach is used than the U tube aeration/limited dilution approach for adding oxygen to the DWSC. By attempting to support a technically invalid approach for adding oxygen to the DWSC, DWR is delaying the development of a demonstration aeration project that can potentially be permitted by the CVRWQCB.

Ms. Kelly’s statement that, *“This design was discussed with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service,”* is another example of her failure to provide the information needed to properly assess whether DWR conducted a proper review of this issue. Ms. Kelly should identify the individuals from the fisheries agencies with whom this matter was reviewed. This would enable an assessment to be made as to whether these individuals are familiar with the US EPA total dissolved gas supersaturation criterion. While most fisheries experts are aware that supersaturation of dissolved gases can be harmful to fish, it is my experience that few fisheries experts are aware of the relatively small amount of total dissolved gas supersaturation that can be harmful to fish. For example, during the summer at the temperature of the DWSC near the Port of Stockton, concentrations above about 9 mg/L would be in violation of the US EPA total dissolved gas criterion. Further, it will be important to determine what DWR told the National Marine Fisheries Service and the U.S. Fish and Wildlife Service

staff about the proposed project. Were they adequately informed on the key issues that must be evaluated in properly reviewing this project for potential water quality impacts?

It should be noted that prior to submitting my comments to DWR on the significant deficiencies in the IS/MND, my draft comments were provided to NOAA and former DFG staff familiar with dissolved gas supersaturation impacts on fish. These experts concluded that raising the dissolved gas supersaturation issues I had proposed to raise was appropriate.

With regard to management of the groundwater that will need to be disposed of as part of developing the proposed project, Ms. Kelly stated,

“Regarding your concerns about dewatering the well borings, no changes to the Initial Study were made as it is not our intention to discharge any water from the boring into the San Joaquin River.”

Ms. Kelly fails to provide information on how the groundwater that will be encountered in the proposed project will be managed. Without this information it is not possible to evaluate the adequacy of the proposed groundwater management approach and its potential impacts.

Ms. Kelly stated,

“Those discussions centered on minimizing the exposure of aquatic life to elevated levels of dissolved oxygen (DO) by designing a multi-port diffuser to dilute the concentration of dissolved oxygen to less than saturation well within five feet of the diffuser.”

There is need to review the technical validity of the statement that such rapid dilution will occur within five feet of discharge. This appears to be very rapid dilution for this type of situation. At the summer temperatures of the DWSC in the mid-20 °C range, the change in density of water for small changes in temperature is very steep. Under these conditions, a difference of a few tenths of a degree C between the diffuser discharge and the ambient waters into which the discharge occurs can cause a significant barrier to mixing of the discharge waters and the DWSC waters. The reliability of the proposed mixing of the diffuser discharge in the area near the diffusion discharge needs to be reviewed by independent experts on hydrodynamics.

Ms. Kelly further stated,

“The Initial study was also not modified to include a discussion regarding exceedence of EPA Gold Book criteria for total dissolved gases because the use of a diffuser will mitigate this impact in a very short distance from the diffuser.”

This statement reflects a total disregard of the discussion of this issue as presented in my comments relative to the CVRWQCB Basin Plan WQO for control of toxics. The CVRWQCB is requiring all discharges of toxicity to be controlled. It would require an amendment of the CVRWQCB Basin Plan in order to allow this discharge to be permitted.

In addition, Ms. Kelly states, *“Please note that the EPA Gold Book criteria pertains to total gases, of which increased nitrogen is a concern.”* This is a misstatement of the US EPA criterion with respect to

focusing on dissolved nitrogen. As I discussed and is made clear in the Gold Book criterion, the US EPA dissolved gas criterion is based on total dissolved gas, which includes all gases.

Ms. Kelly has presented distorted information about my presentation on the Grand Coulee Dam situation, where she states on the second page of her letter to you,

“As per your comment, and that of Dr. Lee through incorporation by you, that this project is similar to the conditions that are described in the recent U.S. Geological Survey publication ‘Gas bubble disease in resident fish below Grand Coulee Dam,’ there are many differences worth noting.”

I did not say that the proposed aeration project was similar to the dissolved gas supersaturation situation at Grand Coulee Dam. I indicated that that study provides recent information that small amounts of dissolved gas supersaturation can be harmful to fish.

Further distorted information is presented by Ms. Kelly when she states,

“This particular study [Grand Coulee Dam] was conducted in direct response to fish kills during releases from Grand Coulee Dam in which the concentration of total DO was nearly 300 percent of saturation.”

The issue is not the 300 percent of saturation that is experienced at the Grand Coulee Dam; this is a distortion of my statement. The purpose in mentioning these studies was to demonstrate that recent studies have again shown that small amounts of dissolved gas supersaturation like those that are projected for the proposed aeration project can be harmful to fish.

With respect to the statement on the Grand Coulee Dam studies, Ms. Kelly states,

“Mr. Beeman confirmed that there are many differences, and that our situation is different than the one under his study. Mr. Beeman also offered to help design experiments in the next two years to ascertain the impact, if any, to fish using the ship channel during operation of the aerator.”

It would be inappropriate to spend the limited funds available on such studies. The US EPA total dissolved gas criterion is a well-established criterion that does not need further study. In connection with the current validity of the 110% criterion value, when this issue first surfaced last year I contacted the US EPA headquarters senior staff for water quality criteria to see if there was any new information that would cause a revision of the Gold Book criterion. I was informed that the 110% value is still the appropriate criterion.

Ms. Kelly lists three issues as substantive issues in your and my comments:

“In the other comments you make, three substantive issues are raised: 1) the possibility that this project could result in gas bubble disease for fish using the ship channel; 2) the potential for some fish (including predators) to congregate at the diffuser discharge; and 3) the possible increase in oxygen-derived free radicals and their associated impact to aquatic life.”

She states,

“As described in Dr. Lee’s synthesis report on page 140 under the heading ‘Support of Aeration Studies,’ it is not likely that the aeration demonstration project will cause oxygen levels in the ship channel to exceed the standards, let alone natural levels of saturation, as it is unlikely that the aeration project can meet the standard without the implementation of other actions. We have designed the aeration device so that the amount of oxygen being delivered to the ship channel can easily be reduced if and when conditions might warrant it.”

It appears that Ms. Kelly and her advisors did not read the materials that are on page 140 of the Synthesis Report in the section “Support of Aeration Studies.” This particular paragraph states,

*“**Support of Aeration Studies.** One of the primary areas of emphasis for the Phase I TMDL is that of gaining an understanding of the amount of aeration and how best to apply it to prevent DO, during Phase I, from going below the interim target of a seven-day running average of 5 mg/L, with no value less than 3 mg/L. As formulated now, these requirements will apply at all times and all locations. In order to determine if the requirements are met, a comprehensive monitoring program will need to be conducted. While some insight has been gained into when and where DO values in the channel are less than these values, it is not possible at this time to do more than generally predict when dissolved oxygen concentrations less than these values will occur at a particular location.”*

It appears that Ms. Kelly is attempting to discredit our comments by citing a section of Dr. Anne Jones-Lee and my “Synthesis Report.” However, her comments regarding our statements in support of the aeration studies have no relationship to what was actually said on page 140 of the Synthesis Report. This is more of the distorted information presented in her letter.

While Ms. Kelly discusses your comments about fish congregating near the diffuser outlets and thereby being subject to increased predation, this is an issue of concern; however, this is not the issue I raised in my comments. I specifically mentioned that the proposed discharge of supersaturated water could lead to fish gaining exposure to elevated dissolved gas concentrations which could be harmful to them. As with several other topic areas, Ms. Kelly has failed to discuss an important issue raised in my comments.

Ms. Kelly makes the statement,

“The periods of low DO in the fall are of most concern because they may inhibit migrating adult salmon from reaching their spawning grounds in tributaries of the San Joaquin River.”

While the potential for DO below 5 mg/L is of concern because it can potentially inhibit Chinook salmon migration through the DWSC to the SJR DWSC watershed east side streams, there is equal concern about DO concentrations below 5 mg/L being a violation of the WQO, which is adverse to other fish in the DWSC. These issues were discussed in Dr. Jones-Lee and my “Issues” and “Synthesis” reports which were referenced in my comments on the significant technical deficiencies in the IS/MND.

With respect to when the aeration system would be operated, Ms. Kelly states,

“It is anticipated however, that the device will be operated only during times of low DO when we would expect most fish to be in other areas containing higher levels of DO. Low DO episodes occur almost every year in the summer and fall.”

Her statement is not appropriate. The aerator will have to be operated any time that the DO in the DWSC at any location between the Port of Stockton and Turner Cut is below 6 mg/L during September through November and 5 mg/L for the rest of the year. If the aeration project is going to provide the needed information it will be necessary to address all conditions where DO concentrations are below the WQO.

Ms. Kelly further states,

“Regarding the third issue, we are cannot find [sic] any supporting evidence that the project would cause an increase in oxygen-derived free radicals. We are not producing ozone or singlet oxygen.”

It is clear that Ms. Kelly and her advisor(s) do not understand free radical impact issues and the origin of free radicals relative to DO concentrations. I did not claim that ozone was proposed to be used in this aeration project. I have been studying free radical reactions since the late 1950s when I took a course in free radical chemistry at Harvard University. Throughout my over-45-year professional career I have been involved in studying the significance of oxygen-derived free radicals on water quality. Over the past 20 years my studies have been concerned with oxygen-derived free radicals present in groundwaters that attack the integrity of high density polyethylene (HDPE) plastic membrane liners of landfills. Those who are familiar with the free radical literature know that this is currently understood to be the primary mechanism of HDPE liner degradation.

The inclusion of the potential for free radicals derived from the use of pure oxygen in the aeration project in my comments was based on comments by a representative of NOAA who reviewed my draft comments on the deficiencies in the IS/MND, who is knowledgeable on the impact of free radicals on animal tissue. Ms. Kelly’s statement on the free radical issue is another example of the gross technical deficiencies in her comments on my comments.

With regard to the DeltaKeeper and my participation in the DO TMDL workgroup meetings, Ms. Kelly states,

“These and many other issues are discussed at the DO TMDL technical work group meetings that are held every other month. As always, you are invited to participate in these work group sessions, and any input you would like to provide would be appreciated and welcomed.”

She failed to point out that those who are participating in these meetings are supported either by CBDA or their respective employers. Neither you (Bill Jennings) nor I have any support for participating in these meetings. Previously you indicated that, in order for you to actively participate in these meetings, support would be needed. While I had CALFED and other

support, I was active in the Technical Advisory Committee for the low-DO problem, including serving as the Chair of the Technical Advisory Committee for a year. However, during the past two years that my activities on SJR DO TMDL issues have been unsupported, I have sent two proposals to CALFED (Barbara Marcotte) for support that would enable me to again become active in this committee. I did not receive a response to my request for support. The lack of funding situation leaves both you and me with the alternative of reviewing the documents that are made available for public review and commenting on their deficiencies, as we did for the IS/MND.

Ms. Kelly stated in the final paragraph of her letter to you,

“We plan to begin the contracting process for construction of the aeration device in mid-April, and look forward to having the device constructed late this calendar year.”

Her comment leaves little doubt that DWR was planning to largely ignore comments submitted on the IS/MND, based on their planning to start contracting only a few days after responding to our comments. Ms. Kelly’s letter is dated April 8, 2005. It was not mailed until April 11 and was not received by me until late afternoon on April 12, 2005. To propose to proceed with a demonstration aeration project without adequately addressing the comments on its deficiencies could readily be significantly detrimental to developing and implementing a demonstration aeration project.

Ms. Kelly stated in her letter to me,

“Your comments on other specific issues have either been addressed in the letter to Mr. Jennings or incorporated into the IS/MND, as deemed appropriate.”

It appears, based on this statement, that a revised IS/MND has been prepared. If this is the case it should be made available for public review and comment.

Overall, DWR has developed a Mitigated Negative Declaration for the proposed project that is not justified. Ms. Kelly, in her attempt to defend the credibility of the IS/MND, has presented numerous technically invalid statements on the issues that must be addressed to develop a CEQA document that will stand the scrutiny of a court review. I would hope that DWR management would instruct Ms. Kelly to proceed with the redesign of the proposed aeration approach to eliminate the discharge of toxics to waters of the State. DWR management should also instruct Ms. Kelly to begin to develop a credible EIR for the proposed project that will conform to CEQA requirements for full disclosure of the potential water quality impacts of the proposed project.

G. Fred Lee, PhD, DEE