

OCT 07 '96 15:47 FR DFG REGION-3

TO 87075433218

P.02/13

STATE OF CALIFORNIA - THE RESOURCES AGENCY

PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME

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October 7, 1996

Ms. Marie Meredith
 Department of Community Development
 City of Santa Rosa
 Post Office Box 1678
 Santa Rosa, California 95402-1678

CITY OF SANTA ROSA
 P.O. Box 1678
 Santa Rosa, CA 95402

OCT 07'1996

DEPARTMENT OF
 COMMUNITY DEVELOPMENT

Dear Ms. Meredith:

Santa Rosa Subregional Long-Term Wastewater Project
 Draft Environmental Impact Report/Environmental
 Impact Statement (DEIR/EIS), SCH No. 94103069

Department of Fish and Game personnel have reviewed the Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS) for the Santa Rosa Subregional Long-Term Wastewater Project. Our comments at this time will be limited to the adequacy of the DEIR/EIS. Comments on specific project alternatives will be submitted once we have received the final DEIR/EIS.

GENERAL COMMENTS

The Department commends the City of Santa Rosa for developing a thorough, rigorous evaluation of environmental impacts associated with the proposed project. The DEIR/EIS contains considerable new information covering a wide range of potential impacts over a large geographical area and is a valuable resource for the Department in understanding the environmental issues in the greater Santa Rosa area. 001

Despite the exhaustive treatment of potential impacts and extensive data collected for the analysis, the Department has the following specific comments relating primarily to water quality issues. Our comments are based on a review of the DEIR documents, review of past project related materials and discussions with the City and members of the project team over the past three years.

MITIGATION AND MONITORING PROGRAM

Page 2.21, Measure 2.2.1 - The City of Santa Rosa will control the application of reclaimed water on private agricultural lands through individual Irrigation Conservation and Management Programs (ICMP's). The ICMP is also intended to integrate other resource management needs, such as stream and wetlands protection. It is not clear, however, what, if any, review will 002

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Page 4.6-61, Salinity - The effects of municipal wastewater discharge to an estuary may also have significant effects upon aquatic habitat, locally decreasing the salinity within the ZID near the outfall. If this is a nearshore discharge, the daily changes in salinity can seriously impact benthic habitat for some distance from the discharge.

Page 4.6-61, Table 4.6-27, Turbidity - A 20 percent criteria for significance in turbidity, representing planktonic algal cells, even though based upon professional judgement, seems excessive. An actual change of >5 percent would seem more prudent, and significant, biologically. It appears the 20 percent criterion is based upon the model's ability to accurately predict change. If the model's predictions are only within +/- 20 percent, then any noted change should be considered significant.

Page 4.6-63, Table 4.6-27, Special site criteria - The project may cause water quality changes to occur in a "Area of Special Biological Significance" or Sanctuary. The criterion of "any (water quality) change" represents an unrealistic, and in this case undesirable extreme. While it may be prudent to identify negative water quality changes, and propose appropriate mitigation to eliminate or otherwise reduce potential negative or deleterious water quality conditions; yet, improvement in water quality conditions, especially in areas currently degraded, must be viewed as a positive benefit. No where else would an improvement in water quality be viewed as a negative; and it must not be so viewed in this case. The City should endeavor to improve the quality of aquatic habitat whenever, and wherever it can to offset the unavoidable, or unquantifiable degradation its discharge may have elsewhere.

Page 4.6-63, Table 4.6-27, Toxicity - Criteria for toxicity should be discussed in a more comprehensive manner. The discharge of materials, which alone or in combination, cause a toxic response in any segment of the aquatic food web must be eliminated. It is inadequate to merely limit the discharge to "any increase"

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Page 4.6-66 - Agricultural Irrigation - What effect is current application of animal waste from dairy operations having on ground and surface water quality; and how might application of the City's treated wastewater change the situation? 028

Page 4.6-68 - According to the DEIR/EIS, "project irrigation drainage from the Bay Flats area will be pumped into the Petaluma River Estuary during the fall/winter season, as managed by the Novato Sanitary District." The conclusion of the technical report on Bay Flats irrigation is that Bay Flats irrigation would have a slightly beneficial impact on water quality in the Petaluma River because of its reduced salinity. How will the lower salinity be beneficial? 029

Page 4.6-72 - As dissolved oxygen is a very critical water quality parameter for survival of fish and other aquatic life, any project-induced reduction in receiving water concentration must be viewed as significant. It is unclear from review of the second paragraph how much weight was given to prediction of absolute minimums 031

Average or mean concentrations of most water quality parameters are important evaluative considerations. However, fish and aquatic life respond less to average conditions and more to the extremes. Water quality criteria are established at thresholds below or above (depending upon constituent) which causes increasing distress until death occurs. Dissolved oxygen is one such parameter which must not be allowed to decrease below the criterion at any time without adverse physiologic effects on sensitive aquatic life. Thus, project evaluation and model predictions must look to identifying conditions with discharge alternatives which will either improve or degrade the dissolved oxygen concentration at any time. 032

The numeric criterion for ammonia, as stated in the EIR/EIS for the Russian River was adopted by the Regional Board to protect aquatic life from potential toxic effects. Thus, it should be equally applicable for evaluation to the waters of the Laguna as those of the Russian River. 033

As with dissolved oxygen, using average values for receiving water temperatures and pH to calculate un-ionized ammonia may significantly understate the situation. It is not uncommon for temperature, pH and ammonia-nitrogen maximums to occur simultaneously. A more careful assessment of un-ionized ammonia concentration in the laguna needs to be developed to evaluate a more accurate risk assessment for this important resource area. 034

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Page 4.6-76 Impact 6.1.1-4 No action alternative - Rather than state that "no mitigation is proposed," wouldn't it be more accurate to state that no mitigation is included, as this alternative is included for comparison only, and not an acceptable alternative. 035

Page 4.6-76 - Contrary to the DEIR/EIS assessment of urban irrigation on water quality, the urban irrigation component does have a significant impact on water quality. Without urban irrigation, more of the wastewater flow would be discharged to surface waters. 036

Page 4.6-80 - Change in flow in surface waterways. "The change in streamflow is expected to cause a water quality change in the esteros." The changes in streamflow should be discussed in a more informative manner. How will the siting of a reservoir change streamflow and existing water quality? Will these possible changes be beneficial or detrimental to fish and wildlife and their habitat within and upstream of the esteros? 037 038

Table 4.6-31 - How was the dissolved oxygen 5.0 mg/l point of significance determined for the West County alternative. Is this a reservoir standard, or general receiving water standard? Those streams having salmonids should be maintained at 7.0mg/l minimum. How might reservoir leakage or seepage affect downstream habitat value. 039 040

The fact that storage reservoirs for the west county alternative will cause water quality changes should be put in perspective by relating to what degree the changes will either positively or negatively impact existing water quality, and the suitability of fish and wildlife habitat value. 041

Page 4.6-89 Impact 6.7.3 - The effects of alternative 3 on salinity, ammonia, dissolved oxygen, planktonic algae, benthic algae, and metals should be discussed in full to put the effects in proper perspective 042

Page 4.6-97 Table 4.6-34 - Evaluation of discharge scenarios upon receiving water dissolved oxygen indicates that all alternatives currently being considered would not significantly affect receiving water dissolved oxygen without mitigation. However, it is unclear if the analysis was for minimum oxygen concentrations, or merely the daily, or monthly averages. How is this finding consistent with that of impact 6.9.2, relating to significant increases in adverse biostimulatory substances which will not be reduced to insignificance by mitigation? 043

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Page 4.6-112, Impact 6.9.2 Biostimulatory substances - It appears that all alternatives will significantly and adversely increase the algal growth potential within the Russian River and Laguna, even with proposed mitigation. How does the City propose to reconcile this difference with State Water Control Board Anti-degradation Resources Policy? 044

Page 4.6-112, Toxicity - Where does the 6.1 percent point of significance come from? Any increase in frequency of demonstrated toxicity should be considered significant. We note that the 5B alternative impact is listed as having 8.4 percent and 9.0 percent frequency, which would be reduced through mitigation. What mitigation will address this degree of effluent toxicity? 045
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Page 4.6-106, Impact 6.9.1, Conductivity - Regardless of the existence of numeric-based criteria, increasing conductivity of the receiving waters affects the habitat suitability for all species of fish and aquatic life. As a constituent, which is not removed through conventional waste treatment, the DEIR/EIS must discuss the impacts of salts in wastewater in the context of the State's Antidegradation Policy, and their effects upon fish, wildlife and agricultural productivity. 048

Page 4.6-110 - The acknowledgment that the receiving waters of the Laguna are "rarely in attainment of the Basin Plan objective for dissolved oxygen," would imply that some positive change is needed to correct this situation. Table 4.6-36, on-the-other-hand, using monthly averages, would lead the reader to conclude that the situation is not critical and would not significantly change under any of the proposed alternatives. It is more likely that the effects of discharge would be better reflected in an analysis of the frequency and duration of minimum and maximum concentrations of dissolved oxygen. Such an analysis would be more meaningful. Non-attainment of a numerical standard adopted to protect fish and aquatic life is unacceptable. 049

The impacts of discharge alternatives upon concentrations of dissolved oxygen within receiving water in the Laguna and Russian River cannot be adequately evaluated upon the basis of monthly averages. The diurnal effect of algal photosynthesis and respiration creates daily extremes which are not identified, or adequately considered by averaging the data set. The degree of stress imposed upon sensitive fish and aquatic life should be evaluated by careful evaluation of the minimum predicted concentrations in areas of known dissolved oxygen impairment. The 0.5mg/l criterion may be appropriate, but is too liberal for use on a data set composed of averages. 050
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- Would model simulations predict any of the proposed alternatives to significantly increase the average receiving water dissolved oxygen concentrations in the Laguna? 053
- Page 4.6-112 - If the predicted significant increases in biostimulatory substances creates the anticipated increases in algal biomass, why wouldn't such increases also create increased oxygen demand and thus significant impact on receiving water dissolved oxygen and pH. 054
- Page 4.6-114 Table 4.6-39 - The distinction between Table 4.6-37 and 4.6-39 is unclear. 055
- Page 4.6-115 - Secondary impacts of implementation of proposed mitigation are predicted to occur. We assume such impacts will be beneficial. 056
- Page 4.6-117 - The comment that predicted increase in the maximum ammonia concentration from Alternative 5B contingency discharge in one of the years that exceed the point of significance must be more specifically stated. Under what flow scenario, and in what month, and how might such exceedences affect fish and aquatic life? Is this comment referring to monthly, daily, or hourly average, or instantaneous ammonia-nitrogen concentrations, or that for toxic concentrations of un-ionized ammonia? If the latter, were predicted increases based upon average pH and average temperature? How might the magnitude of such exceedences change under extremes, rather than average conditions. 057
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- How might predicted increases in algal biomass affect minimum and maximum concentrations of dissolved oxygen and un-ionized ammonia? Wouldn't this create more significantly adverse effects on fish and aquatic life? How will proposed mitigation reduce the risk of deleterious effects to insignificance? 062
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- Water quality parameters are dynamic, with daily, monthly or seasonal fluctuations. Fish and aquatic life have adapted to the dynamics of their environment, but are limited to a relatively narrow range of water quality conditions, the stability of which plays a major role in defining the quality of the aquatic habitat. For this reason, alternatives analysis should more specifically identify temporal and spatial aspects of each parameter and its potential impact to the quality of aquatic habitat. 065
- The analyses of both beneficial and adverse effects on algal biomass is extremely confusing in this context. While Table 4.6-43 attempts to assign a net impact (either beneficial or adverse) to project alternatives, actual significance is not an 066

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average condition, but rather a spatial and temporal impact on the extremes of the data, or prediction of extremes. The base condition upon which assignments of beneficial or adverse impacts is evaluated is unclear. 066 (cont.)

Table 4.6-43 - Footnote 2 states that dissolved oxygen is not included because no criteria for beneficial impacts have been developed. It would seem that some sense of beneficial effects could be derived from careful evaluation of alternatives which, because of increased flow, lower residence time, reduced algal biomass, or other biostimulatory effects, raise minimum D.O., or stabilize wide fluctuation in dissolved oxygen concentrations within known areas of dissolved oxygen impairment, such as the Laguna. 067

Page 4.6-130-1 - Discussion of the West County Alternative on water quality of Stemple Creek/Estero de San Antonio must be characterized by parameter; and more importantly, as beneficial or adverse to achievement of the Stemple Creek/Estero de San Antonio Watershed Enhancement Plan. 068

Page 4.6-139 - Although conductivity standards have only been adopted by the Regional Water Quality Control Board for the Russian River proper, the effect of discharge alternatives upon receiving water conductivity within the Laguna is still of concern. 069

Page 4.6-150 Table 4.6-58 - The level of significance for the water quality impact (Impact 6.7.3) for Alternative 3 needs to be qualified, or re-evaluated as positively or negatively affecting water quality parameters. The significance of impact from an alternative which potentially improves water quality in receiving water areas must not be left to misinterpretation. 070

Page 4.6.154, Agricultural Irrigation Component - This section states that "the combined effect of reduced animal waste and slightly increased flow will have a small, but significant impact on water quality in the esteros." Is this an impact based on the criteria that any change is significant, or is there a **real** adverse impact on water quality? If it is only an impact based on the criteria that any change is significant, that should be clearly stated. If there is actually an adverse or beneficial impact to water quality, that also should be clearly stated. 071

This comment is applicable at many other places in the document; the clarifications should be made at all those locations. 072

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Table 4.6-60 - The manner in which the criteria that "any change is significant" is applied to this table makes it impossible to evaluate the true impacts, or benefits, of Alternative 3 on the esteros. Perhaps there could be two columns under "Esteros", one presenting the policy based criteria of the National Marine Sanctuary and one presenting the **real** adverse or beneficial impacts.]

073

TERRESTRIAL BIOLOGICAL RESOURCES

Page 4.8-72, Table 4.8-6 - The DEIR establishes a threshold of significance of loss of 25 percent of existing populations of California Native Plant Society (CNPS) List 2, 3 and 4 populations in Sonoma and Marin county. While we acknowledge that establishing significance criteria for loss of these populations in a project covering a large geographical area and considerable biological diversity is difficult, we recommend establishing two or more discrete categories of significance based on the statewide distribution of the target species or other criteria which account for the rarity of the particular species. For example, a threshold of significance for CNPS List 2, 3 and 4 plants, whose distribution are limited to Sonoma and Marin counties, might be 5 percent while those occurring in Sonoma, Marin and other counties might remain at 25 percent. Alternatively, the DEIR might consider an absolute area of plant population distribution as the basis for establishing significance thresholds (i.e., total plant populations occupying less than 100 acres might have a threshold of significance of 3 percent loss while loss of 10 percent of those occupying 100 - 300 acres might be considered significant.)]

074

Page 4.8-72, Table 4.8-6 - The above comment also applies to this significance criteria. The DEIR should, at a minimum, acknowledge the substantial diversity in the Sonoma and Marin county natural landscapes, and attempt to account for the potential loss of this diversity by using a significance threshold gradient or other mechanism which accounts for a particular natural communities distribution and abundance.]

075

The DEIR establishes a threshold of significance of loss of 25 percent of remaining Sonoma and Marin county acreage of "Sensitive Terrestrial Wildlife Habitat," and a threshold of significance of loss of 0 percent for "Sensitive Native Terrestrial Plant Communities." We can envision several examples in which a particular plant community, for example Valley Oak Riparian Woodland, might fit both categories. In these cases, the DEIR should assign the lower threshold of significance to that community.]

076

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Page 4.8-118, Impact 8.4C, Cumulative Impacts - The Department is 077
concerned that identification of a cumulative loss of 40 percent
of annual grassland in Sonoma and Marin counties as a significant
impact might suggest that less than 40 percent loss is
insignificant. Again, we acknowledge the difficulty in
establishing significant criteria for this project, but recommend
that the DEIR/EIS discuss this criteria further. Annual
grasslands have been lost at an alarming rate in California
leading to the state listing of grassland-dependent species such
as the Swainson's hawk (*Buteo swainsoni*). The cumulative loss
continues unmitigated at increasing rates. We believe a
cumulative loss of 40 percent in Sonoma and Marin counties may
lead to a reduction of habitat for some grassland mammals and
birds below levels necessary to sustain locally viable
populations. The DEIR should acknowledge the significance of
this loss and establish significance criteria at 20 percent or
less. Although a precise determination of significance is
impractical in the absence of detailed population level studies
of several grassland species, we believe a 20 percent point of
significance probably more accurately reflects the point at which
local populations may reach levels approaching non-viability.]

AQUATIC BIOLOGICAL RESOURCES

Table 4.9-3 - We are concerned about the justification for 078
Evaluation Criteria 3, 5 and 8, but unfortunately do not have any
good suggestions for alternative criteria. Criteria 3 and 5
establish thresholds of significance for the loss of aquatic
habitat in "local watersheds": 20 percent of aquatic habitat,
15 percent of perennial warmwater stream habitat, and 25 percent
of intermittent warmwater stream or pond habitat. These
percentages upon initial consideration seem to be too high for
establishing significance. In our review of the discussion of 079
Evaluation Criteria in Appendix L-7 we found a statement that the
fractional criteria presents a bias against project components in
small watersheds. This is probably because of the large
percentage of the aquatic habitat which could be impacted by even
a small project in a small watershed. We expect, however, that
there may be another bias presented by this fractional criteria.
In a large watershed, even a very large project might impact only
a small percentage of the available aquatic habitat. For
example, the Lake Sonoma project probably affected less than
15 percent of the Russian River watershed. While we accept that
the fractional criteria included in Evaluation Criteria 3 and 5
is probably appropriate for very small watersheds such as most of
the proposed reservoir sites, we are concerned that these
criteria may be applied to larger watersheds where they might not
be appropriate for defining a significant impact.]

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Evaluation Criteria 8, also in Table 4.9-3, defines a reduction in wet season streamflow of 50 percent, or more, as being significant. This criterion needs to be clarified as there is no clear understanding of the term "wet season flow." Flow in the wet season is highly variable; this term could apply to low flows during the wet season, storm generated peak flows, or to total discharge. A 50 percent reduction in peak flows in the small watersheds at the reservoir sites might be an appropriate standard of significance. For the low wet season flow, a 25 percent reduction is likely to be significant.]

080

JURISDICTIONAL WETLANDS

Page 2-82 - Mitigation measure 2.3.11, the Sensitive Resources Conservation Program, provides for the mitigation of sensitive habitats such as wetlands. In the discussion of the timing of this mitigation measure, completion is listed as "after 5 years or when performance criteria are met." A 5 year monitoring period may be suitable for some situations, but for others, such as the restoration of woodlands, a monitoring period of 15 years or more may be needed. To some extent, monitoring may have to continue indefinitely to ensure the survival of the mitigation site.]

081

Department of Fish and Game personnel are available to discuss our concerns and recommendations in further detail. To arrange a meeting, please call Bill Cox, Associate Fisheries Biologist, at (707) 823-1001; or Carl Wilcox, Environmental Services Supervisor, at (707) 944-5525.

Sincerely,

Cindy Catalano
for Brian Hunter
Regional Manager
Region 3

cc: Army Corp of Engineers
San Francisco

U. S. Fish and Wildlife Service
Sacramento

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DEPARTMENT OF FISH AND GAME

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10/7/96

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THIS FAX IS BEING SENT TO:

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ADDITIONAL INFORMATION:

STATE OF CALIFORNIA - THE RESOURCES AGENCY

PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME

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ST. JOSEPH'S ROSA
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Page 4.6-61, Table 4.6-27 - Proposed significance criteria of 5°F for temperature for freshwater, and 4°F for salt-water areas needs to be justified. Temperature is a major factor in both chemical and biological reactions, and as such plays a vital role in defining the suitability of aquatic habitat quality. As with most other water quality parameters, the mean or average condition is a poor indicator of impact. The effect of project alternatives upon the absolute data, as well as averages is vital to biological evaluation and the decision-making process.

Page 4.6-61, Salinity - The effects of municipal wastewater discharge to an estuary may also have significant effects upon aquatic habitat, locally decreasing the salinity within the ZID near the outfall. If this is a nearshore discharge, the daily changes in salinity can seriously impact benthic habitat for some distance from the discharge.

Page 4.6-61, Table 4.6-27, Turbidity - A 20 percent criteria for significance in turbidity, representing planktonic algal cells, even though based upon professional judgement, seems excessive. An actual change of >5 percent would seem more prudent, and significant, biologically. It appears the 20 percent criterion is based upon the model's ability to accurately predict change. If the model's predictions are only within +/- 20 percent, then any noted change should be considered significant.

Page 4.6-63, Table 4.6-27, Special site criteria - The project may cause water quality changes to occur in a "Area of Special Biological Significance" or Sanctuary. The criterion of "any (water quality) change" represents an unrealistic, and in this case undesirable extreme. While it may be prudent to identify negative water quality changes, and propose appropriate mitigation to eliminate or otherwise reduce potential negative or deleterious water quality conditions; yet, improvement in water quality conditions, especially in areas currently degraded, must be viewed as a positive benefit. No where else would an improvement in water quality be viewed as a negative; and it must not be so viewed in this case. The City should endeavor to improve the quality of aquatic habitat whenever, and wherever it can to offset the unavoidable, or unquantifiable degradation its discharge may have elsewhere.

Page 4.6-63, Table 4.6-27, Toxicity - Criteria for toxicity should be discussed in a more comprehensive manner. The discharge of materials, which alone or in combination, cause a toxic response in any segment of the aquatic food web must be eliminated. It is inadequate to merely limit the discharge to "any increase".

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Page 4.6-66 - Agricultural Irrigation - What effect is current application of animal waste from dairy operations having on ground and surface water quality; and how might application of the City's treated wastewater change the situation?

Page 4.6-68 - According to the DEIR/EIS, "project irrigation drainage from the Bay Flats area will be pumped into the Petaluma River Estuary during the fall/winter season, as managed by the Novato Sanitary District." The conclusion of the technical report on Bay Flats irrigation is that Bay Flats irrigation would have a slightly beneficial impact on water quality in the Petaluma River because of its reduced salinity. How will the lower salinity be beneficial?

Page 4.6-72 - As dissolved oxygen is a very critical water quality parameter for survival of fish and other aquatic life, any project-induced reduction in receiving water concentration must be viewed as significant. It is unclear from review of the second paragraph how much weight was given to prediction of absolute minimums.

Average or mean concentrations of most water quality parameters are important evaluative considerations. However, fish and aquatic life respond less to average conditions and more to the extremes. Water quality criteria are established at thresholds below or above (depending upon constituent) which causes increasing distress until death occurs. Dissolved oxygen is one such parameter which must not be allowed to decrease below the criterion at any time without adverse physiologic effects on sensitive aquatic life. Thus, project evaluation and model predictions must look to identifying conditions with discharge alternatives which will either improve or degrade the dissolved oxygen concentration at any time.

The numeric criterion for ammonia, as stated in the EIR/EIS for the Russian River was adopted by the Regional Board to protect aquatic life from potential toxic effects. Thus, it should be equally applicable for evaluation to the waters of the Laguna as those of the Russian River.

As with dissolved oxygen, using average values for receiving water temperatures and pH to calculate un-ionized ammonia may significantly understate the situation. It is not uncommon for temperature, pH and ammonia-nitrogen maximums to occur simultaneously. A more careful assessment of un-ionized ammonia concentration in the laguna needs to be developed to evaluate a more accurate risk assessment for this important resource area.

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Page 4.6-76 Impact 6.1,1-4 No action alternative - Rather than state that "no mitigation is proposed," wouldn't it be more accurate to state that no mitigation is included, as this alternative is included for comparison only, and not an acceptable alternative.

Page 4.6-76 - Contrary to the DEIR/EIS assessment of urban irrigation on water quality, the urban irrigation component does have a significant impact on water quality. Without urban irrigation, more of the wastewater flow would be discharged to surface waters.

Page 4.6-80 - Change in flow in surface waterways. "The change in streamflow is expected to cause a water quality change in the esteros." The changes in streamflow should be discussed in a more informative manner. How will the siting of a reservoir change streamflow and existing water quality? Will these possible changes be beneficial or detrimental to fish and wildlife and their habitat within and upstream of the esteros?

Table 4.6-31 - How was the dissolved oxygen 5.0 mg/l point of significance determined for the West County alternative. Is this a reservoir standard, or general receiving water standard? Those streams having salmonids should be maintained at 7.0mg/l minimum. How might reservoir leakage or seepage affect downstream habitat value.

The fact that storage reservoirs for the west county alternative will cause water quality changes should be put in perspective by relating to what degree the changes will either positively or negatively impact existing water quality, and the suitability of fish and wildlife habitat value.

Page 4.6-89 Impact 6.7.3 - The effects of alternative 3 on salinity, ammonia, dissolved oxygen, planktonic algae, benthic algae, and metals should be discussed in full to put the effects in proper perspective.

Page 4.6-97 Table 4.6-34 - Evaluation of discharge scenarios upon receiving water dissolved oxygen indicates that all alternatives currently being considered would not significantly affect receiving water dissolved oxygen without mitigation. However, it is unclear if the analysis was for minimum oxygen concentrations, or merely the daily, or monthly averages. How is this finding consistent with that of impact 6.9.2, relating to significant increases in adverse biostimulatory substances which will not be reduced to insignificance by mitigation?

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Page 4.6-112, Impact 6.9.2 Biostimulatory substances - It appears that all alternatives will significantly and adversely increase the algal growth potential within the Russian River and Laguna, even with proposed mitigation. How does the City propose to reconcile this difference with State Water Control Board Anti-degradation Resources Policy?

Page 4.6-112, Toxicity - Where does the 6.1 percent point of significance come from? Any increase in frequency of demonstrated toxicity should be considered significant. We note that the 5B alternative impact is listed as having 8.4 percent and 9.0 percent frequency, which would be reduced through mitigation. What mitigation will address this degree of effluent toxicity?

Page 4.6-106, Impact 6.9.1, Conductivity - Regardless of the existence of numeric-based criteria, increasing conductivity of the receiving waters affects the habitat suitability for all species of fish and aquatic life. As a constituent, which is not removed through conventional waste treatment, the DEIR/EIS must discuss the impacts of salts in wastewater in the context of the State's Antidegradation Policy, and their effects upon fish, wildlife and agricultural productivity.

Page 4.6-110 - The acknowledgment that the receiving waters of the Laguna are "rarely in attainment of the Basin Plan objective for dissolved oxygen," would imply that some positive change is needed to correct this situation. Table 4.6-36, on-the-other-hand, using monthly averages, would lead the reader to conclude that the situation is not critical and would not significantly change under any of the proposed alternatives. It is more likely that the effects of discharge would be better reflected in an analysis of the frequency and duration of minimum and maximum concentrations of dissolved oxygen. Such an analysis would be more meaningful. Non-attainment of a numerical standard adopted to protect fish and aquatic life is unacceptable.

The impacts of discharge alternatives upon concentrations of dissolved oxygen within receiving water in the Laguna and Russian River cannot be adequately evaluated upon the basis of monthly averages. The diurnal effect of algal photosynthesis and respiration creates daily extremes which are not identified, or adequately considered by averaging the data set. The degree of stress imposed upon sensitive fish and aquatic life should be evaluated by careful evaluation of the minimum predicted concentrations in areas of known dissolved oxygen impairment. The 0.5mg/l criterion may be appropriate, but is too liberal for use on a data set composed of averages.

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Would model simulations predict any of the proposed alternatives to significantly increase the average receiving water dissolved oxygen concentrations in the Laguna?

Page 4.6-112 - If the predicted significant increases in biostimulatory substances creates the anticipated increases in algal biomass, why wouldn't such increases also create increased oxygen demand and thus significant impact on receiving water dissolved oxygen and pH.

Page 4.6-114 Table 4.6-39 - The distinction between Table 4.6-37 and 4.6-39 is unclear.

Page 4.6-115 - Secondary impacts of implementation of proposed mitigation are predicted to occur. We assume such impacts will be beneficial.

Page 4.6-117 - The comment that predicted increase in the maximum ammonia concentration from Alternative 5B contingency discharge in one of the years that exceed the point of significance must be more specifically stated. Under what flow scenario, and in what month; and how might such exceedences affect fish and aquatic life? Is this comment referring to monthly, daily, or hourly average, or instantaneous ammonia-nitrogen concentrations, or that for toxic concentrations of un-ionized ammonia. If the latter, were predicted increases based upon average pH and average temperature? How might the magnitude of such exceedences change under extremes, rather than average conditions.

How might predicted increases in algal biomass affect minimum and maximum concentrations of dissolved oxygen and un-ionized ammonia? Wouldn't this create more significantly adverse effects on fish and aquatic life? How will proposed mitigation reduce the risk of deleterious effects to insignificance?

Water quality parameters are dynamic, with daily, monthly or seasonal fluctuations. Fish and aquatic life have adapted to the dynamics of their environment, but are limited to a relatively narrow range of water quality conditions, the stability of which plays a major role in defining the quality of the aquatic habitat. For this reason, alternatives analysis should more specifically identify temporal and spatial aspects of each parameter and its potential impact to the quality of aquatic habitat.

The analyses of both beneficial and adverse effects on algal biomass is extremely confusing in this context. While Table 4.6-43 attempts to assign a net impact (either beneficial or adverse) to project alternatives, actual significance is not an

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average condition, but rather a spatial and temporal impact on the extremes of the data, or prediction of extremes. The base condition upon which assignments of beneficial or adverse impacts is evaluated is unclear.

Table 4.6-43 - Footnote 2 states that dissolved oxygen is not included because no criteria for beneficial impacts have been developed. It would seem that some sense of beneficial effects could be derived from careful evaluation of alternatives which, because of increased flow, lower residence time, reduced algal biomass, or other biostimulatory effects, raise minimum D.O., or stabilize wide fluctuation in dissolved oxygen concentrations within known areas of dissolved oxygen impairment, such as the Laguna.

Page 4.6-130-1 - Discussion of the West County Alternative on water quality of Stemple Creek/Estero de San Antonio must be characterized by parameter; and more importantly, as beneficial or adverse to achievement of the Stemple Creek/Estero de San Antonio Watershed Enhancement Plan.

Page 4.6-139 - Although conductivity standards have only been adopted by the Regional Water Quality Control Board for the Russian River proper, the effect of discharge alternatives upon receiving water conductivity within the Laguna is still of concern.

Page 4.6-150 Table 4.6-58 - The level of significance for the water quality impact (Impact 6.7.3) for Alternative 3 needs to be qualified, or re-evaluated as positively or negatively affecting water quality parameters. The significance of impact from an alternative which potentially improves water quality in receiving water areas must not be left to misinterpretation.

Page 4.6.154, Agricultural Irrigation Component - This section states that "the combined effect of reduced animal waste and slightly increased flow will have a small, but significant impact on water quality in the esteros." Is this an impact based on the criteria that any change is significant, or is there a real adverse impact on water quality? If it is only an impact based on the criteria that any change is significant, that should be clearly stated. If there is actually an adverse or beneficial impact to water quality, that also should be clearly stated. This comment is applicable at many other places in the document; the clarifications should be made at all those locations.

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Table 4.6-60 - The manner in which the criteria that "any change is significant" is applied to this table makes it impossible to evaluate the true impacts, or benefits, of Alternative 3 on the esteros. Perhaps there could be two columns under "Esteros", one presenting the policy based criteria of the National Marine Sanctuary and one presenting the real adverse or beneficial impacts.

TERRESTRIAL BIOLOGICAL RESOURCES

Page 4.8-72, Table 4.8-6 - The DEIR establishes a threshold of significance of loss of 25 percent of existing populations of California Native Plant Society (CNPS) List 2, 3 and 4 populations in Sonoma and Marin county. While we acknowledge that establishing significance criteria for loss of these populations in a project covering a large geographical area and considerable biological diversity is difficult, we recommend establishing two or more discrete categories of significance based on the statewide distribution of the target species or other criteria which account for the rarity of the particular species. For example, a threshold of significance for CNPS List 2, 3 and 4 plants, whose distribution are limited to Sonoma and Marin counties, might be 5 percent while those occurring in Sonoma, Marin and other counties might remain at 25 percent. Alternatively, the DEIR might consider an absolute area of plant population distribution as the basis for establishing significance thresholds (i.e., total plant populations occupying less than 100 acres might have a threshold of significance of 3 percent loss while loss of 10 percent of those occupying 100 - 300 acres might be considered significant.)

Page 4.8-72, Table 4.8-6 - The above comment also applies to this significance criteria. The DEIR should, at a minimum, acknowledge the substantial diversity in the Sonoma and Marin county natural landscapes, and attempt to account for the potential loss of this diversity by using a significance threshold gradient or other mechanism which accounts for a particular natural communities distribution and abundance.

The DEIR establishes a threshold of significance of loss of 25 percent of remaining Sonoma and Marin county acreage of "Sensitive Terrestrial Wildlife Habitat," and a threshold of significance of loss of 0 percent for "Sensitive Native Terrestrial Plant Communities." We can envision several examples in which a particular plant community, for example Valley Oak Riparian Woodland, might fit both categories. In these cases, the DEIR should assign the lower threshold of significance to that community.

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Page 4.8-118, Impact 8.4C, Cumulative Impacts - The Department is concerned that identification of a cumulative loss of 40 percent of annual grassland in Sonoma and Marin counties as a significant impact might suggest that less than 40 percent loss is insignificant. Again, we acknowledge the difficulty in establishing significant criteria for this project, but recommend that the DEIR/EIS discuss this criteria further. Annual grasslands have been lost at an alarming rate in California leading to the state listing of grassland-dependent species such as the Swainson's hawk (*Buteo swainsoni*). The cumulative loss continues unmitigated at increasing rates. We believe a cumulative loss of 40 percent in Sonoma and Marin counties may lead to a reduction of habitat for some grassland mammals and birds below levels necessary to sustain locally viable populations. The DEIR should acknowledge the significance of this loss and establish significance criteria at 20 percent or less. Although a precise determination of significance is impractical in the absence of detailed population level studies of several grassland species, we believe a 20 percent point of significance probably more accurately reflects the point at which local populations may reach levels approaching non-viability.

AQUATIC BIOLOGICAL RESOURCES

Table 4.9-3 - We are concerned about the justification for Evaluation Criteria 3, 5 and 8, but unfortunately do not have any good suggestions for alternative criteria. Criteria 3 and 5 establish thresholds of significance for the loss of aquatic habitat in "local watersheds": 20 percent of aquatic habitat, 15 percent of perennial warmwater stream habitat, and 25 percent of intermittent warmwater stream or pond habitat. These percentages upon initial consideration seem to be too high for establishing significance. In our review of the discussion of Evaluation Criteria in Appendix L-7 we found a statement that the fractional criteria presents a bias against project components in small watersheds. This is probably because of the large percentage of the aquatic habitat which could be impacted by even a small project in a small watershed. We expect, however, that there may be another bias presented by this fractional criteria. In a large watershed, even a very large project might impact only a small percentage of the available aquatic habitat. For example, the Lake Sonoma project probably affected less than 15 percent of the Russian River watershed. While we accept that the fractional criteria included in Evaluation Criteria 3 and 5 is probably appropriate for very small watersheds such as most of the proposed reservoir sites, we are concerned that these criteria may be applied to larger watersheds where they might not be appropriate for defining a significant impact.

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Evaluation Criteria 8, also in Table 4.9-3, defines a reduction in wet season streamflow of 50 percent, or more, as being significant. This criterion needs to be clarified as there is no clear understanding of the term "wet season flow." Flow in the wet season is highly variable; this term could apply to low flows during the wet season, storm generated peak flows, or to total discharge. A 50 percent reduction in peak flows in the small watersheds at the reservoir sites might be an appropriate standard of significance. For the low wet season flow, a 25 percent reduction is likely to be significant.

JURISDICTIONAL WETLANDS

Page 2-82 - Mitigation measure 2.3.11, the Sensitive Resources Conservation Program, provides for the mitigation of sensitive habitats such as wetlands. In the discussion of the timing of this mitigation measure, completion is listed as "after 5 years or when performance criteria are met." A 5 year monitoring period may be suitable for some situations, but for others, such as the restoration of woodlands, a monitoring period of 15 years or more may be needed. To some extent, monitoring may have to continue indefinitely to ensure the survival of the mitigation site.

Department of Fish and Game personnel are available to discuss our concerns and recommendations in further detail. To arrange a meeting, please call Bill Cox, Associate Fisheries Biologist, at (707) 823-1001; or Carl Wilcox, Environmental Services Supervisor, at (707) 944-5525.

Sincerely,

Cindy Catalano
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cc: Army Corp of Engineers
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