

PROJECT MEMORANDUM

Project Name: Santa Clara River Estuary Special Studies **Date:** March 7, 2011
Client: City of San Buenaventura
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Subject: Response to Stakeholder Comments on Draft Synthesis Report

INTRODUCTION

The City of San Buenaventura (City) has been required to conduct special studies to meet NPDES permit requirements established for the Ventura Water Reclamation Facility (VWRF). The purpose of the special studies is to evaluate what is the best use of the treated water resource from VWRF in order to protect the health of the Santa Clara River Estuary. Workplans for the special studies were developed with Stakeholder input and were submitted and approved by the Regional Water Quality Control Board (RWQCB) in September 2008. In brief summary, the scope and schedule of the special studies included:

- Estuary Subwatershed Study –Evaluate the physical and biological function of the Estuary affected by the discharge to determine whether the discharge to the Estuary provides an ecological enhancement now or under different conditions such as a decreased discharge to the Estuary. Due March 2011.
- Treatment Wetlands Feasibility Study –Evaluate the feasibility of implementing a constructed treatment wetland to further improve the water quality of the VWRF tertiary discharge. Due March 2010.
- Recycled Water Market Study (Phase 1) –Evaluate and quantify the feasibility of expanding the City’s existing reclaimed water system through evaluation of potential users within a five-mile radius of the VWRF (study area). Due March 2010.

COMMENTS RECEIVED ON DRAFT SYNTHESIS REPORT

A series of five public workshops were held to present and discuss the findings of the three special studies. On February 10, 2011, the fifth workshop was held and the major findings of the Estuary Subwatershed Study - Draft Synthesis Report were presented. Following the workshop, stakeholders submitted comments on the draft report in writing, which are included in their entirety at the end of this memorandum and summarized in the matrix below. The comments are listed in the matrix by author and in the order they appear in the original letters from which they were extracted. The matrix also shows the

response to each comment, which ranged from no action to report text revisions. Stakeholder comments made at workshops and on previously released documents, including the Monitoring Plan in July 2009 and the Year One Data Summary in January 2010, were already incorporated into this Synthesis Report, as feasible.

In a letter to the City dated March 2, 2011, the RWQCB extended the comment period to July 1, 2011 and requested the submission of an amended Final Synthesis Report that addresses comments received during this extension by September 1, 2011. Therefore, the comments given here represent a portion of the total comments that will be received. A revised final compilation of comments and associated responses will accompany the amended Final Synthesis Report.

Comment #	Commenter	Comment	Action/Response
1.1	Ventura Audubon Society (Reed Smith)	Section 4.2.2.3 - We believe the evaporation rates derived are high. The difficulty arises from using the United Water temperature data from El Rio-Saticoy. That area in the spring and summer months is often 15 degrees Fahrenheit higher than the condition at the SCRE. The El Rio-Saticoy area is also free of coastal fog most of the spring and summer. This increase in temperature and solar radiation would skew the calculated evaporation rate upwards.	Comment noted. Although we very much agree with this comment, we had to use available data. The lack of evaporation data for the SCRE, and the lack of a defensible method for adjusting near-by data to reflect conditions at the SCRE, forced us to use evaporation data recorded at the El Rio-Saticoy gage.
1.2	Ventura Audubon Society (Reed Smith)	Section 11.5 - Mentions that Least Terns are not affected by small water quality changes. Such changes can bring about increased algal blooms. The resulting algal mats can significantly reduce the clear water surface area available for Least Terns to forage in.	Text added. New text has been added to Section 11.
1.3	Ventura Audubon Society (Reed Smith)	Throughout the document there are references to high water levels in the estuary reducing non-contact recreational opportunities. In fact most of the mentioned recreational activities are still available but with one less access point. People can still park at the north end of the estuary and walk down the beach to enjoy hiking, surfing, birdwatching, nature observation, swimming and sunbathing. The activity that is limited by high water is sleeping by the estuary as the campground is closed. This also represents an economic loss to State Parks.	Text added. Text in Section 9.2.6 and in Section 11 has been updated to clarify the limitation of the Recreational use to camping.
1.4	Ventura Audubon Society (Reed Smith)	An assumption is made that the Wildlife Ponds will be maintained if Alternative 6 is chosen and there is no discharge to the estuary. Since the Regional Boards compliance point is before the Wildlife Ponds we do not believe that this assumption is valid. Loss of the ponds would be a loss of 1 MGD sub-surface flow to the estuary and would significantly reduce the size of the estuary. A	Text added. A brief discussion of the effect of removing ponds on modeled SCRE stage and volume was added to Section 11.3.

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		section should be added giving the impacts of this possibility.	
1.5	Ventura Audubon Society (Reed Smith)	One useful addition would be maps showing the extent of the estuary under the various discharge alternatives. It is difficult to visualize this from just data on the height of the surface water or volume of water entering the estuary.	Comment noted. While we can see some benefit in providing this figure, the reader can refer to Figure 3-1 to see the current SCRE wetted extent associated with each modeled stage.
2.1	US Fish & Wildlife Service (Jeff Phillips)	We recommend incorporating a more clear discussion of uncertainty in the sections that describe the results of habitat projections. We also recommend including error bars in Figures 11-2 through 11-5 that would visually convey the entire range of habitat extent projected by the model.	Comment noted. We have included a discussion of uncertainty in Section 11.2 that provides the reader with the appropriate information needed to view the results in the proper context. This discussion clearly states that the modeling results and habitat area projects should be viewed relative to each other and not as absolute values, thereby already addressing the issue of uncertainty.
2.2	US Fish & Wildlife Service (Jeff Phillips)	Because of the inherent uncertainty of the models used to project changes in habitat that would result from reduced VWRP discharges, we recommend a phased implementation approach that monitors changes to the estuary that result from incrementally reducing fresh water input.	Comment noted.
2.3	US Fish & Wildlife Service (Jeff Phillips)	We would like to see an analysis of discharge and nutrient loading scenarios that build from the results of the two other interrelated studies (i.e., Treatment Wetlands Feasibility Study and Recycled Water Market Study).	Comment noted and it is anticipated that revised scenarios exploring different discharge and nutrient loading than those presented here will be addressed following input from the LARWQCB.
2.4	US Fish & Wildlife Service (Jeff Phillips)	At the February 10, 2011, meeting we expressed the concern that global temperature increases have exceeded even the most extreme scenarios developed by the Intergovernmental Panel on Climate Change, and questioned whether the use of a median projection was	Comment noted. The analysis presented in the report found that evaporation rates were not very sensitive to projected increases in air temperature. Therefore, we chose to just present the evaporation increase associated with the median of projected air temperature increase

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		appropriate for the purposes of the Subwatershed study.	(2°C)
2.5	US Fish & Wildlife Service (Jenny Marek) [Follow-up email]	We just received this great concise climate change report and I wanted to forward it to you and your SCRE consultants since one of our comment addresses climate change. I didn't have a chance to read through the climate change discussion in the Subwatershed study, but from the discussion we had in the February 10 meeting, I think the results of this report align well with the scenario that were used in your study. I thought this might be a good reference for the subwatershed study and thought I would forward it on.	Text added. Referenced in text and in Reference section
3.1	Surfrider Foundation (Paul Jenkins)	Habitat 'quality' is not considered in this assessment, including the potential for improvements in water quality with reduced algae, DO, and other parameters. It is also important to consider the enhancement in habitat quality resulting from the reduced likelihood of artificial unseasonal breaching with reduced estuary stage.	Concur. Reductions in unseasonal breaching are shown as benefits to all reduced flow scenarios (Scenarios 4–6)
3.2	Surfrider Foundation (Paul Jenkins)	The analysis also misrepresents the fundamentally dynamic nature of a coastal estuary. While we recognize that major flood events completely 're-set' the estuarine ecosystem, a permanent reduction in stage resulting from reduced wastewater discharge could lead to many changes that could potentially enhance steelhead habitat. Such enhancement may occur with vegetation changes such as willow recruitment, which during moderate discharge events from the Santa Clara River could result in scour pools containing overhanging root wads and other cover for steelhead. Because such habitat succession is not possible under the current conditions, a reduction in wastewater discharge could enhance habitat for steelhead in ways not	Comment noted. As the comment notes, the structure of the marsh and riparian edge habitat of the SCRE will continue to be "re-set" following major storm events. As the text notes, a change in equilibrium water levels under various water removal scenarios would be accompanied by a change in the relative extent of open water area, but it is unlikely that the future lagoon morphology or vegetation structure would differ greatly from current conditions. That is the linear extent of structural habitat features providing cover and feeding stations for focal species will likely not differ from current conditions.

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		predicted by the simplified analysis presented.	
4.1	Heal the Bay (Kirsten James)	The Study states that “[r]eduction in the amount of flow to the SCRE has been caused by the installation of water-supply dams, agricultural practices within the Santa Clara River floodplain, and urbanization throughout the watershed. Flow regulation by tributary water supply dams has reduced flow to the Santa Clara River by approximately 25%. This reduction can be most prominent during the dry months when water supply dams impound flow that would otherwise be a significant component of total surface flow to the SCRE. On the mainstem Santa Clara River, the installation of Freeman Diversion Dam has resulted in the diversion up to 375 cfs of flow bound for the SCRE and an estimated 12% reduction of the freshwater volume to the SCRE during storm events (U.S. Bureau of Reclamation EIR, as cited in Swanson et al. 1990).” However the discussion ends here. It very important to include additional information on upstream issues to get a complete picture of the Estuary impacts and as alternatives are developed.	Comment noted. Although conditions in the Santa Clara River upstream of the SCRE have an impact on sediment supply, water quantity, and quality, as well as species emigration and immigration, conditions upstream of the SCRE have been well summarized elsewhere and were not included in the LARWQCB Order.
4.2	Heal the Bay (Kirsten James)	An important factor that is needed in the analysis is a month by month assessment of SCR flows versus diversion volumes over the last decade.	Comment noted. This study was concerned with how much water is entering the SCRE. Conditions upstream of the SCRE have been well summarized elsewhere and were not included in the LARWQCB Order.
4.3	Heal the Bay (Kirsten James)	The NPDES Permit requires that the Study include a continuation of the “Fish Survey” and “Macroinvertebrate Monitoring Plan” to assess population and number trends (An Index of Biological Integrity score or other widely accepted ecological health index should be calculated from annual macroinvertebrate surveys). This information is	Text added. Results from annual BMI and Fish surveys have been included in Sections 5.2.23, 7.1, and 9.2.4. Annual reports from ABC Laboratories provide common BMI community metrics (e.g., richness, diversity, etc.). Although no multi-metric for estuaries has been accepted that reliably predicts site conditions,

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		absent from the Study and should be included.	available data do not suggest large spatial differences attributable to the VWRP, but rather due to salinity inputs from breaching events as well as flood scour.
4.4	Heal the Bay (Kirsten James)	The Study states that “[d]aily observations of the SCRE mouth berm made by the City of Ventura from 1984 to 2010 indicate that Santa Clara River mouth has been open approximately 61% of days in the recent past, with 2009 having the lowest open-mouth frequency (16% of days in the year) and 1993 and 1995 having the highest open-mouth frequency (96% of days in each year).” How does this compare to estimated historical (pre -POTW) conditions for the Lagoon?	Comment noted. Data related to the historical frequency of mouth closure is not available. However, the report does include a brief discussion regarding the likely differences in dry season mouth breaching characteristics for current and historical conditions (see Section 4.1.5)
4.5	Heal the Bay (Kirsten James)	The Study provides a definition of “enhancement.” Where does this definition come from? The Regional Board should be the ones defining what constitutes enhancement, not the consultants or dischargers.	Question noted. Definition provided was developed from excerpts of SWRCB Water Quality Order No. 79-20.
4.6	Heal the Bay (Kirsten James)	The Study appropriately points out that the 2009-2010 water balance study year is considered a wet year that produced river discharge volumes well over the median. Was any water balance analysis performed on an average year? If so, what were the results? If not, that analysis needs to be completed.	Comment noted. The data collection period for this study occurred within a relatively “wet” water year (WY 2010), therefore the water balance reflects these “wetter-than-average” conditions. However, the water balance was modified to reflect average, or “normal,” conditions during the drier months (June-Sept) for the alternatives analysis in Section 11.
4.7	Heal the Bay (Kirsten James)	These two statements appear to be in conflict. Please provide clarification. o “Overall, Santa Clara River flow comprised approximately 80% of the total inflow volume, VWRP effluent discharge comprised approximately 8%, tidal flow into the SCRE through an open mouth comprised approximately 7%, unmeasured groundwater flow	Comment noted. The top statement is for the entire water balance period (Oct 2009 – Sept 2010) and the bottom statement is for closed-mouth, wet months (Oct 2009 – Jan 2010). This has been described in the text.

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		<p>comprised approximately 4%, and all other inflow volume components each comprised $\leq 1\%$ of the total inflow volume. Combined, these data fit into an overall understanding that storm events drive the dominant sources of both water inflow (from increased river discharge) and water outflow (from sustained open-mouth periods), and that VWRf effluent discharge dominates water inflow to the SCRE only during low-flow conditions.”</p> <p>o “As expected during the wetter months of the year, the volume of water coming into the SCRE was predominantly from the Santa Clara River (approximately 45% of the total inflow volume), although VWRf effluent discharge combined with groundwater flow from the VWRf Wildlife Ponds was not that much less, accounting for approximately 35% of the total inflow volume.”</p>	
4.8	Heal the Bay (Kirsten James)	Water quality data from the VWRf discharge itself should be included in the Study. If the point is to evaluate whether water quality of the estuary might be influenced by the discharge, then it is essential to have the water quality data for the discharge for comparison. For example, if we want to know if the discharge is changing the nitrate concentration in the estuary, nitrate values for the estuary itself cannot address this question. As it is, none of the preliminary results can really be evaluated for the goals of the study since that essential information is missing.	Concur. However, because NPDES sampling of the VWRf discharge is required at the ETS, and not the Pond discharge, water quality assessment focused upon receiving water measurements. VWRf discharge data was used to inform nutrient balance as well as for Treatment Wetlands Feasibility Study. Annual VWRf analysis reports have been included in Appendix B.
4.9	Heal the Bay (Kirsten James)	How does the existing estuary water quality compare to previous years?	Question noted. Although current nutrient levels in the VWRf discharge have been relatively similar for the past 5 years, assessment includes averaging to include data from past 10 years.

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4.10	Heal the Bay (Kirsten James)	The Study states that “the degree to which the VWRf facility has contributed to changes in historical water quality cannot be readily determined.” However, no attempt was made to compare actual effluent water quality and the SCRE water quality.	Disagree. The majority of the water quality assessment centers upon the impacts of residual nutrients from the VWRf discharge to the SCRE, including spatial, seasonal and diurnal comparisons. Although the dynamic nature of the SCRE sediment loadings and discharge may underlie the weak associations of the VWRf discharge with trace metals and other contaminants, historical NPDES violations are noted in the report.
4.11	Heal the Bay (Kirsten James)	What was the frequency of the nutrient sampling in 2009-2010? At a minimum monthly nutrient data should be assessed, as nutrients have been described as a pollutant of concern in the SCRE and discharge.	Question noted. As described in the Final Monitoring Plan, eight synoptic nutrient samples were planned for 2009–2010. In all, seven survey events were carried out and seasonal data compiled over the past 10 years.
4.12	Heal the Bay (Kirsten James)	The Study should provide a 24-hour time series to pick-up any low DO conditions pre-dawn (peak respiration) when we have algal bloom or potential algal bloom conditions. Summer months are likely to contain these critical conditions. This low oxygen stressful situation may be a key stressor for larval fish and invertebrates.	Comment noted. This analysis is included in Section 5.1.2.
4.13	Heal the Bay (Kirsten James)	The Study states that “[e]xcess nitrogen may result in excessive aquatic growth (biostimulatory substance) and pose a human health risk.” Although the nitrogen limit of 10 mg/l is based on a drinking water standard for human health, it is critical to note that excessive nitrogen is also a major threat to aquatic life. Aquatic life is much more sensitive to increases in total nitrogen concentrations and the potential impacts resulting from nutrient increases in waterbodies such as algal growth. Of note, the Machado Lake Nutrient TMDL includes a total nitrogen numeric target of 1.0 mg/L as a monthly average concentration. In addition the current Nutrient TMDL for Malibu Creek,	Comment noted. Although SCR nutrient TMDL is not yet underway, these and other nutrient criteria are discussed in the context of the existing Basin Plan requirements, background conditions, and regional reference levels.

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		adopted by USEPA in 2003, provides summer season water quality objectives of 1.0 mg/l total nitrogen and 0.1 mg/l of total phosphorus.	
4.14	Heal the Bay (Kirsten James)	The Study lacks a sufficient discussion of over summering / rearing estuary lagoon habitat needed by steelhead smolt, of sufficient water quality needed for steelhead smolt and adults, and of healthy macroinvertebrate populations needed for steelhead smolt rearing.	Comment noted. Water quality requirements for steelhead rearing are included in the report (Section 7.2.1.3) . In addition, updated text discussing steelhead use of the SCRE in summer/fall has been added (Section 7.2.1.4). Updated text including BMI results has been added to the report (Sections 7.1.1, 7.2.1.2, 7.2.2.2).
4.15	Heal the Bay (Kirsten James)	Emerging contaminants should be discussed in the Study, as their discharge may negatively impact the SCRE.	Disagree. Although emerging contaminant removals are discussed as part of the Treatment Wetlands Study, as discussed at several Stakeholder workshops, there is no consensus on what compounds represent emerging contaminants in the VWRf discharge, acceptable levels in the Basin Plan, impacts to focal species, etc. We are not confident in the ability to establish linkages between any EDC measurements and population level effects to SCRE species.
4.16	Heal the Bay (Kirsten James)	While the “critical period” for the SCRE may be the summer, it is inappropriate to only look at alternatives during this period. [“... it is anticipated that management actions involving effluent flow reductions and water quality improvements would only be necessary during summer months”]. The State Water Board’s Enclosed Bays and Estuaries Policy, which calls for discharge elimination unless enhancement is demonstrated, does not only apply to the summer period or critical conditions. Further there are periods of low rainfall and closed mouth conditions in the winter. Using the Study’s own assumption here, the discharge should be completely eliminated during the winter as there is obviously no benefit to the SCRE.	Comment noted. Although maintenance of the side-channel high flow refuge by the VWRf outfall channel may be shown to provide an enhancement of existing aquatic habitat uses for endangered tidewater goby and steelhead (RARE), as discussed in Section 4, fall and winter conditions in the SCRE are dominated by river flows and the VWRf effluent has little effect upon breaching, flooding, or other potential impacts during fall and winter.

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4.17	Heal the Bay (Kirsten James)	Why was a discharge of 5 mgd used for alternatives 1-3 (Table 11-1), when the Study states that the average summer discharge was 9 mgd?	Text Changed. Text in Section 4.2.2.8 says average summer VWRf effluent Q is 9 cfs, not 9 MGD. The MGD values have been added to the cfs numbers to provide more clarity.
4.18	Heal the Bay (Kirsten James)	Habitat quality must be considered when discussing habitat area. The fact that current water quality conditions may limit steelhead habitat must be used to qualify statements indicating that steelhead habitat will decrease with less discharge to the SCRE. Also is habitat area currently a limiting factor for steelhead? What data are provided to support the consultants' assumption that steelhead habitat in the lagoon is limited?	Comment noted. Water quality conditions for steelhead are discussed in Section 7.2.1.3 as well as in Section 11. With regards to limiting factor comment, regardless of upstream limiting factors, improvements in forage area, food supply, etc. in the SCRE may still lead to increased smolt survival and subsequent spawning returns. Although the relative importance of multiple limiting factors in the Santa Clara River is not assessed in this report, providing suitable habitats for multiple life-history strategies (e.g., lagoon vs. stream reared) will improve population resiliency.
4.19	Heal the Bay (Kirsten James)	Table 9-1 suggests that low DO levels (sometimes reaching below 1 mg/l) are a moderate impact. We believe that this should be changed to "high" impact. This change would be consistent with conclusions in the report that states: "At both locations, DO is below suitable levels for aquatic organisms (< 7mg/L) for some portions of the day in both cooler and warmer times of year (Figures 5-2 and 5-3; Table 5-6), although this effect is more pronounced at the North sonde (SCR1)."	Concur. Table updated. However, the focal aquatic species are found within the SCRE despite these low DO levels.
4.20	Heal the Bay (Kirsten James)	Evaluating Alternative 1 (status quo) does not make sense, as the NPDES permit/TSO require the upgrade to be completed by early this year.	Comment noted. Study examines conditions encountered during 2009–2010 monitoring period, as well as from recent monitoring data (2001–2010)
4.21	Heal the Bay (Kirsten James)	The only partial flow reduction that was evaluated in the Study (Alternatives 4&5) was a 30% reduction. The basis	Comment noted. Alternative 6 provides an assessment of 100% flow reduction. Although the scenarios were

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	James)	for this selection was that “the VWRP effluent flow rate was reduced to values that would decrease the threshold SCRE stage associated with the onset of ground saturation at McGrath State Beach during dry season, closed-mouth conditions, but at the same time would not have a negative impact on the habitat available to focal species.” This is not a logical approach. Greater reduction values should be explored.	developed from stakeholder input, additional intermediate flow reductions scenarios may be requested by the LARWQCB in the future.
4.22	Heal the Bay (Kirsten James)	The following statement is not substantiated: “It is not anticipated that the improved water quality conditions under Alternative 5 associated with treatment upgrades would greatly improve habitat conditions for other focal species due to their relative insensitivity to water quality conditions.” Please provide greater detail.	Comment noted. Additional water quality improvement benefits to Least Tern foraging habitat have been included in Section 11.
4.23	Heal the Bay (Kirsten James)	Blanket statements such as the following are inappropriate: “...decreases in SCRE stage have been shown to limit potential rearing habitat for steelhead, suggesting that the VWRP flows provide some degree of enhancement relative to the expected lower SCRE stage under a complete flow removal alternative.” Again, rearing habitat for steelhead cannot be looked at in a silo. Also, where is the analysis that demonstrates that rearing habitat is even limited? Water quality impacts and other factors associated with greater discharge can decrease habitat quality and need to be assessed.	Comment noted. The analysis shows: A. larger area creates larger amounts of habitat for fish and foraging least tern, B. high water levels produce negative impacts to Recreational uses due to flooding, and C. existing water quality is impacted by excess nutrients arriving from the VWRP discharge. These benefits and impacts are discussed thoroughly in Section 11.
4.24	Heal the Bay (Kirsten James)	While we understand that Table 11-1 is an attempt to simplify the study results, it is misleading and should be removed. The table is subjective and overly simplistic. To simply note that steelhead habitat area goes down significantly with alternatives 4, 5 and 6 does not provide	Disagree. Table 11-1 is not the results of the Study, the entire report is. Table 11-1 allows the reader to compare the relative benefits to habitat area and due to water quality conditions for each species under each alternative.

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		the complete picture. For example as stated multiple times in the Study DO and nutrients reduce the habitat quality in the SCRE. Also, no adequate explanation is provided for the relative significance or what data merit one, two or three arrows.	
5.1	Ventura CoastKeepers (Jason Weiner)	In analyzing the future available habitat under different discharge scenarios for the Southern California Steelhead, Tidewater Goby, Western Snowy Plover, and California Least Tern (“Focal Species”), VCK feels that it would be appropriate to also factor in SCRE habitat restoration potential/projects that would give stakeholders an idea of potential SCRE habitat suitability under different discharge scenarios.	Comment noted. While the longevity and self-maintenance of any in-channel or floodplain restoration projects should be weighed within the context of Santa Clara River flood frequency prior to their proposal or implementation, such projects are not planned or included as part of the scope of this study.
5.2	Ventura CoastKeepers (Jason Weiner)	To be sufficiently comprehensive it appears that the Focal Species’ habitat availability/suitability analysis should also analyze the effect of the VWRf discharge on: 1.) food sources for steelhead and tidewater goby, such as macroinvertebrates, and 2.) allowing the SCRE to support non native species that prey on, and compete with, steelhead smolt and tidewater goby.	Text added. Additional text has been added to Section 7.1 and Focal Species write-ups to describe benthic macroinvertebrate (BMI) studies of the SCRE. The text discusses native and introduced species in Section 7.2 and the influence of the VWRf on providing habitat for non-native (and predator) species for each alternative is well documented in Section 11.
5.3	Ventura CoastKeepers (Jason Weiner)	In addition, VCK objects to not including water quality as a component of the habitat area and availability analysis. Without adequate water quality, the Focal Species do not have adequate habitat for survival and are in jeopardy.	Disagree. Water Quality is thoroughly discussed in Section 5 and the water quality effects on the focal species are included in the assessment of the discharge alternatives in Section 11.
5.4	Ventura CoastKeepers (Jason Weiner)	The Draft Report does not analyze the importance of macroinvertebrates as a critical food source for Southern California Steelhead smolt, and does not analyze the effect of the VWRf discharge on the SCRE’s macroinvertebrate	Comment noted. Updated text including BMI results has been added to the report (Sections 7.1.1, 7.2.1.2). Although local distribution of BMI within the vicinity of the outfall channel may change under a 100% flow

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		populations under the 6 different discharge scenarios, including a no discharge scenario. Why?	reduction scenario, BMI community structure appears to be largely controlled by salinity inputs and flood-scour event frequency.
5.5	Ventura CoastKeepers (Jason Weiner)	The Draft Report does not analyze the effect of predation and competition from the SCRE's non native species on steelhead, tidewater goby, and the other focal species. The Draft Report also does not analyze the effect of the VWRP discharge on the SCRE's non native species under the 6 different discharge scenarios, and the corresponding effect or benefit for the Focal Species. Why?	Disagree. Section 7.1 describes current fish community and Section 11 discusses the benefits of flow reductions in promoting native fish populations over non-native freshwater predator species.
5.6	Ventura CoastKeepers (Jason Weiner)	For purposes of evaluation, it would be useful if the Draft/Final Report contained/s the data imputed (such as SCRE berm substrate porosity, hydrological conductivity, etc.) into the hydrological model	Comment noted. These data are already in the report and can be found in Sections 4.2.2.5 – 4.2.2.7.
5.7	Ventura CoastKeepers (Jason Weiner)	<p>...evaluate how high and low tides influence SCRE stage and SCRE depth in absence of a discharge and under different discharge alternatives</p> <p>...[evaluate] how quickly tidal influence would fill the estuary to a stage of approximately eight feet in absence of a discharge</p> <p>...[evaluate] and how low and high tides contribute to changes in estuary stage in between tides</p>	Comment noted. The stage data presented in Figure 11.1 reflect the impact of adjacent tidal elevation on SCRE stage under the different alternatives (i.e., these curves have not been smoothed to filter out any fluctuations due to changes in tidal elevation).
5.8	Ventura CoastKeepers (Jason Weiner)	At each estuary stage level, it would be useful to include an analysis showing different water depths in different parts of the estuary and the different habitat features available for focal species at different water depths	Comment noted. As discussed at the February 10, 2011 Stakeholder workshop and presented in this report, very little structural habitat features are present in the SCRE and the resulting comparisons would be solely based upon water depth and distance to cover along the

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			emergent marsh edge. The existing SCRE bathymetry is presented in Figures 3-1, 7-2, 7-4, 8-1, and 8-3
5.9	Ventura CoastKeepers (Jason Weiner)	In addition, incorporating a habitat re-vegetation model in analyzing habitat at different SCRE stages would be useful for analyzing habitat availability/suitability for the Focal Species under the six different discharge scenarios.	Comment noted. Vegetation recruitment and evolution modeling was not required as part of this study nor included in the approved Study Plans.
5.10	Ventura CoastKeepers (Jason Weiner)	The Draft/Final Report should examine the SCRE's naturally occurring salinity levels in absence of the VWRf discharge.	Comment noted. Salinity in the SCRE during the closed mouth period would approach levels of the Santa Clara River within 1-2 months following ceasing discharge.
5.11	Ventura CoastKeepers (Jason Weiner)	The Draft/Final Report should examine the effect of the discharge on the SCRE's salinity. Under the six discharge scenarios, the Draft/Final Report should explain whether, to what extent, and where spatially, the VWRf discharge causes SCRE salinity fluctuations and / or a deviation from the natural salinity of the SCRE, and whether these salinity fluctuations or deviations from the SCRE's natural salinity adversely affect the Focal Species, their habitat, or their food sources, such as macroinvertebrates in the SCRE.	Comment noted. Salinity effects are included in Section 11.
5.12	Ventura CoastKeepers (Jason Weiner)	For alternative 6 (no VWRf discharge) the report should discuss the salinity benefits or impacts of no VWRf discharge to the SCRE and its native species, including the southern California Steelhead.	Comment noted. See responses to comments 5.10 and 5.11.
5.13	Ventura CoastKeepers (Jason Weiner)	The alternatives analysis should also analyze the impact of the VWRf discharge outside of June -September, and during the wet season, when the discharge can still contribute greatly to habitat conditions in the estuary for steelhead smolt, residing adult steelhead, and other species during closed mouth/lagoon conditions.	Comment noted. Although additional text has been added discussing steelhead use of the SCRE during winter (Section 11), algal growth due to nutrient inputs is generally limited by lower solar insolation as well as by more frequent mouth breaching.

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5.14	Ventura CoastKeepers (Jason Weiner)	The Draft Report should analyze the effects of the VWRP discharge on the SCRE's bed substrate, especially around the berm, and the potential for the discharge to scour sand into the SCRE.	Comment noted. Bed substrate data within the VWRP effluent channel is provided in Section 3.1.2. There is likely little impact of VWRP effluent discharge on bed substrate conditions around the mouth berm.
5.15	Ventura CoastKeepers (Jason Weiner)	<p>The Draft/Final Report should analyze and describe the actual and potential sub-lethal effects of low, high, and fluctuating Dissolved Oxygen ("DO") levels on steelhead smolt and adults, and tidewater goby.</p> <p>The Final Report should discuss how long steelhead smolt and adults can be exposed to the DO levels found in the Draft/Final Report without suffering acute or sub-lethal impacts.</p> <p>In addition to providing single recordings of low or high DO levels, the Draft/Final Report should also provide stakeholders with amount of time or the duration in which the DO levels were below 7.0 mg/l and above 10 mg/l during the Estuary Special Studies period.</p>	Comment noted. Although steelhead are capable of surviving for extended periods of time at low DO, data gaps, deployment issues related to dewatering as well as other QC issues in the continuous monitoring data do not allow the construction of duration curves for various DO levels.
5.16	Ventura CoastKeepers (Jason Weiner)	The Draft/Final Report should analyze the sub-lethal effects of metals and emerging contaminants on the SCRE's Southern California Steelhead smolt and adults, and on other native aquatic species.	Disagree. Available metal sampling data for the SCRE are discussed in the report (Section 5). The low number of positive detections of trace metals limits the ability to discern spatial patterns or confirm any effects that may be associated with the VWRP. In addition, existing data on fish exposure timing is not available to construct a potential exposure history for any rearing or resident species. See comment 4.15 for discussion of EDCs.
5.17	Ventura CoastKeepers (Jason Weiner)	The Draft/Final Report should provide the monitoring results for all monitored constituents by date of sample, in both the SCRE and the VWRP's effluent transfer station as reported monthly by Ventura to the Regional Board.	Concur. Data provided as a separate data CD in Appendix B.

Comment #	Commenter	Comment	Action/Response
5.18	Ventura CoastKeepers (Jason Weiner)	The Draft/Final Report should consider these reports (also attached) to analyze the sub-lethal impacts of the metals contained in, and the emerging contaminants more than likely contained in, the VWRF's discharge on Southern California Steelhead: 1.) NOAA Technical Memorandum NMFSC-83, An Overview of Sensory Effects on Juvenile Salmonids Exposed to Dissolved Copper: Applying a Benchmark Concentration Approach to Evaluate Sublethal Neurobehavioral Toxicity, October 2007; 2.) Lower Columbia River and Estuary Partnership. 2007. Lower Columbia River and Estuary Ecosystem Monitoring: Water Quality and Salmon Sampling Report.	Comment noted. Although the City NPDES violations for Copper have been addressed through upstream control measures (Section 5.2.23), dissolved copper ranges cited in reports closely match existing CTR criteria, which are shown to be exceeded within and upstream of the SCRE (Tables 5-7 through 5-10; Appendix B). However, because dissolved metals in the SCRE appear unrelated to the VWRF discharge, it is likely that SCRE conditions under 100% discharge elimination would continue to exhibit dissolved Cu levels cited in the reports.
5.19	Ventura CoastKeepers (Jason Weiner)	<p data-bbox="514 784 1220 946">Do the species utilized and referenced in the Draft/Final Report for toxicity analysis adequately represent the sensitivity of the SCRE's steelhead smolt and tidewater goby to the WRF discharge and any water quality conditions in the SCRE?</p> <p data-bbox="514 987 1211 1117">Please include all VWRF outfall or effluent transfer station toxicity analysis so stakeholders can analyze the toxicity of the VWRF discharge based on the data Ventura has available.</p>	<p data-bbox="1245 784 1902 914">Comment noted. Yes, test organisms are selected by the LARWQCB as the most sensitive indicators to other aquatic species. For more information, see: http://water.epa.gov/scitech/swguidance/methods/wet/</p> <p data-bbox="1245 954 1881 1052">Toxicity test results are included as part of the VWRF Annual Report of Analysis (See Appendix B data compilation).</p>
5.20	Ventura CoastKeepers (Jason Weiner)	For Alternative 6 (no discharge alternative) and for the other alternatives with discharge reductions, the Draft/Final Report should analyze the ability of ocean inputs / tidal inputs to dilute concentrations of nutrients and other contaminants present in groundwater, surface water inputs, and VWRF discharges into the SCRE.	Concur. Ocean exchanges are discussed as part of the nutrient balance (Section 5.5)
5.21	Ventura	The Draft/Final Report should discuss food source for	Comment noted. See response to Comment 5.4 above

Comment #	Commenter	Comment	Action/Response
	CoastKeepers (Jason Weiner)	steelhead smolt food residing in the SCRE.	
5.22	Ventura CoastKeepers (Jason Weiner)	The Draft Report's discussion seemingly minimizes the importance of SCRE lagoon habitat to steelhead smolt rearing and survival, by merely stating that: "Lagoon systems, therefore, can provide a potential demographic boost in two ways... First, lagoons may relax to some degree the density dependent bottleneck occurring in stream habitat." To make this assertion in the Final Report, please provide a citation to a study that shows steelhead smolt tend to only migrate to estuary lagoon habitat when streams are over crowded.	Disagree. Citations provided in Sections 7.2.1.2, and also discussed in the Hayes et al 2008 paper accompanying the Ventura Coast Keeper comments provided to this report.
5.23	Ventura CoastKeepers (Jason Weiner)	Please provide all the underlying data for Tables 5-4 through Table 5-10 of the Draft Estuary Synthesis Report in the Final Report's Appendixes. VCK would like to analyze the underlying data from these tables that shows the concentrations or levels of the different constituents present in the SCRE and the VWRP discharge from each sampling event from 1997 to 2010.	Concur. Data will be included as CD (Appendix B)
5.24	Ventura CoastKeepers (Jason Weiner)	Where does the Draft Report produce its definition of "enhancement", and on what scientific basis can the Draft Report or Final Report conclude that that VWRP has historically provided an enhancement to the SCRE and its native species, including to steelhead smolt and adults?	Comment noted. See response to Comment 4.5 above.
5.25	Ventura CoastKeepers (EXPERTS)	While this is indeed a useful approach to assess impacts from discharge on the broader estuarine community, we are curious as to why only Endangered species were selected	Comment noted. See response to comment 5.49. Although species were determined by the LARWQCB in the Study planning process, the ecosystem functions approach used here should address needs for other estuarine species using the SCRE.

Comment #	Commenter	Comment	Action/Response
5.26	Ventura CoastKeepers (EXPERTS)	In the discussion about changes to the morphology, the authors argue there has been little gross morphologic changes between 1900 and 2005. It is somewhat unclear if their reference to current conditions is from the 2005 LiDAR surveys or from more recent (i.e. 2010) surveys of the site.	Comment noted. The report does not argue there has been little geomorphic change between 1900 and 2005. Section 3.2 addresses historical changes to the SCRE morphology.
5.27	Ventura CoastKeepers (EXPERTS)	It seems reasonable to conduct another LiDAR survey of the estuary	Comment noted. Approved study plan included use of existing data.
5.28	Ventura CoastKeepers (EXPERTS)	...the authors can improve upon [the discussion of the historic hydrogeomorphology of the system] with a clearer explanation as to their sources of information for these goings on. Clearly the historic imagery from the Watershed Protection District and historic rainfall data have played a major part. But a clearer citation of their sources is called for.	Text added. More citations within the introductory paragraph of Section 3.2.
5.29	Ventura CoastKeepers (EXPERTS)	while the role of dam failures and other watershed goings on have correctly been mentioned [in the discussion of the historic hydrogeomorphology of the system], there is no discussion of perhaps the most important (after leveeing) hydrological constraints: the Freeman Diversion. Please add this to your otherwise robust contextual background.	Comment noted. A brief discussion of the impacts of Freeman Diversion Dam on river flow and sediment discharge is provided in Section 4.1.1. Also, conditions upstream of the SCRE have been well summarized elsewhere and were not included in the LARWQCB Order.
5.30	Ventura CoastKeepers (EXPERTS)	The general tendency of southern Californian estuaries to now be “wet” all the time due to anthropogenic inputs into these systems has facilitated the invasions of many non native or nuisance species and is partially to blame for the increasing preponderance of species of concern. While the net aggregate influence of the water volume introduced via the VWRP may be a net benefit, it is not simply an issue of dumping more and more water into this system now robbed of water via the Freeman Diversion. This needs	Comment noted. The report discusses native and introduced species in Section 7.2 and the influence of the VWRP on providing habitat for non-native (and predator) species is discussed in section 11.

Comment #	Commenter	Comment	Action/Response
		to be better articulated.	
5.31	Ventura CoastKeepers (EXPERTS)	There is no Lower Santa Clara River flow data for the key 2005 high flow period. Figure 4 1 (p.37) has a critical data gap from 2005 2007.	Comment noted. This data gap is real and is a result of the USGS at Montalvo (USGS 11114000) shutting down in 2005 and the VCWPD gage at Victoria Ave. bridge (VCWPD Stn 723) coming on-line in 2008.
5.32	Ventura CoastKeepers (EXPERTS)	“Seasonal variability in ETS flows is possibly driven by infiltration and inflow of the collection system, since effluent flows are higher on average in the wetter winter months (January, February, and March) than the other months of the year” p. 39. This is a strange statement. Don’t we know the sources of variability of the outflows?	Comment noted. No I&I reports were reviewed as part of this study.
5.33	Ventura CoastKeepers (EXPERTS)	The synthesis report does note that the SCRE likely had a lower frequency of berm breaching. However, it is somewhat surprising that the report seems to focus on the length of the mouth berm rate, and consequent seepage rate, rather than the increase in water inflow due to the VWRf.	Comment noted. The report discusses the impact of berm length on breaching in Sections 4.1.5 and discusses the impact VWRf effluent discharge on berm breaching in Section 9.2.1.
5.34	Ventura CoastKeepers (EXPERTS)	It is also good that an effort was made to estimate the unmeasured groundwater flows (p. 68), although we would appreciate a better explanation of the assumptions made.	Text added. Text was added help clarify the methods used and assumptions involved in determining unmeasured groundwater flow.
5.35	Ventura CoastKeepers (EXPERTS)	The DO values (p. 87) from daytime grab samples are not very useful, but the values from the continuously recording data sondes could be very helpful for looking at DO minima – but Table 5 6 does not take advantage of that opportunity. The influence of algal productivity is discussed at the bottom of p 87, and DO is even mentioned, but nothing about low DO conditions, which are so important for the ecology of the estuary. As it turns out, a better analysis is presented on p. 90. It would be useful if something about this issue and later	Concur. Text added to Section 5.1.1.

Comment #	Commenter	Comment	Action/Response
		analysis was mentioned earlier.	
5.36	Ventura CoastKeepers (EXPERTS)	<p>The axis for Fig 5.6 (p. 91) is not labeled. It appears to be % saturation. We like the figure – we haven't seen this method of presenting continuous data before. However, the selection of just a few cases doesn't allow us to understand how representative each case is, or really how much of problem low DO is in the estuary.</p> <p>We would have liked to see a much more thorough analysis of this important parameter – although the footnote mentions a limitation in the data. Still, we think more could have been done.</p>	Concur. Polar plot axis is in Time of day, but contours show %DO saturation as noted in the Caption. Unfortunately, periods of non-operation, dewatering, and other QA issues limited the ability to make comparisons with both sondes in operations under all SCRE conditions.
5.37	Ventura CoastKeepers (EXPERTS)	The discussion of nutrients on p. 92 is simple but perhaps too concise. There is very little attempt to put the nutrient concentrations in context – are these high or low, for example? There is one sentence about the possible contribution of VWRP to phosphorus concentrations, and that is all (although the outfall channel concentrations are mentioned elsewhere). That sentence, incidentally, seems to imply (perhaps inadvertently) that only phosphorus is contributing to algal growth, which is not correct.	Concur. Section 5.1.3 text updated to refer reader to trophic status discussion on nutrient limitations (Section 5.4) and nutrient balance results (Section 5.5).
5.38	Ventura CoastKeepers (EXPERTS)	Although bacteria concentrations are not a major concern, they are practically ignored in the text, with no mention even if they exceed water quality standards. Also, no mention is made about whether this is the expected temporal pattern, and the postulated explanations are vague and unsubstantiated.	Disagree. Bacteria data summaries are provided in Section 5.1.3, Tables 5-7 through 5-10, Section 5.2.2, with discrete sample results included in Appendix B. Estuaries are known to regularly exceed bacterial standards for total coliform and a detailed source identification study would be required to associate observed Fecal coliform and <i>Enterococcus</i> levels with VWRP.
5.39	Ventura CoastKeepers (EXPERTS)	The discussion about ammonia (p. 104) is generally good, but some more explanation could be included. How much NH ₃ enters via the river versus the outfall? It is implied	Comment noted. Relative sources of TIN are also discussed in Section 5.5. Algal levels are shown to be lower under open mouth conditions (Tables 5-7 through

Comment #	Commenter	Comment	Action/Response
		that open mouth conditions remove accumulated algae from the SCRE, but is there any evidence for this? If so, it should be cited here.	5-10) as would be expected due to flushing.
5.40	Ventura CoastKeepers (EXPERTS)	The bacteria exceedances (p. 105) are asserted to be due to “the influences of migratory and resident bird populations and local runoff,” but this is by no means proven or even necessarily true. Bacteria source identification can be complicated and this simple explanation isn’t supported by enough evidence or even logic (though there is the beginning of a logical argument in noting higher proportion of exceedances when the mouth was open).	Concur. Text updated and reference to current bacterial TMDL for Santa Clara River included.
5.41	Ventura CoastKeepers (EXPERTS)	The discussion of chemical constituents (p. 106) leaves the impression that there are no concentrations that could be considered harmful, but it focuses exclusively on drinking water supplies. This is too narrow a focus. The evaluation should be done with respect to ecological impacts.	Disagree. Other constituents with a direct ecological impact (e.g. ammonia, pesticides) are directly addressed in other sections, including analysis of effluent and receiving water toxicity (Section 5.2).
5.42	Ventura CoastKeepers (EXPERTS)	It is great you were able to get access to the draft versions of the so-called t-sheet historical ecological conditions analyses. Please note that these data have now been publically released and are available (at http://www.caltsheets.org/socal/index.html) and so your reference should be updated. While the authors are continuing to work on peerreviewed publications related to this dataset, it should no longer be considered “in preparation.”	Concur. Text and Reference list updated.
5.43	Ventura	Table 6-1 and 6-2 (p. 123) should be unified, terms unified,	Disagree. Tables 6.1 and 6.2 are best displayed

Comment #	Commenter	Comment	Action/Response
	CoastKeepers (EXPERTS)	etc. for easier comparison in one location. Placement of Fig 6-1 (p. 119) is strange in that it is not referenced or discussed for several pages.	independently as a one-to-one comparison between these historical sources and 2009 vegetation conditions is not feasible. Placement of Figure 6.1 is actually after the first reference to the figure, in the paragraph above.
5.44	Ventura CoastKeepers (EXPERTS)	Section 6.2 is a good discussion of historic vegetation, reconstructed as best we can. We recognizing that a direct comparison between oblique historic photography and a modern vegetation mapping effort has its challenges. It would still be instructive, however, to include representative photos to illustrate your points. At a minimum you need to properly reference/document these sources.	Comment noted. The information provided is properly cited and mapped, therefore it was determined that photographs were not necessary to convey the information.
5.45	Ventura CoastKeepers (EXPERTS)	The suggestion (p. 125) that the overall extent of vegetation has changed little, but that rather the distribution of that wetland vegetation needs further articulation.	Concur. Text changed. The report text was updated to clarify the change in vegetation characteristics over time.
5.46	Ventura CoastKeepers (EXPERTS)	Please cite a reference for the original historic use of <i>Arundo</i> in the SC River watershed (p. 126). We have often heard this explanation, but know of no rigorous documentation of farming here.	Concur. Text changed. The report text edited to reflect the fact that there is no rigorous documentation of this information.
5.47	Ventura CoastKeepers (EXPERTS)	We suggest that Fig 7-3 (p. 137) be augmented to show potential “core” goby habitat of depths ~1m or less, as reflected in your seines. We too have tended to find them closer in towards banks (shallower areas) than out in the middle of main stem channels per se. This would in effect create bounding conditions for their potential habitat in the SCRE.	Comment noted. This revision could be considered following LARWQCB review as distance to cover is a plausible mechanism explaining goby habitat use. However, this change would not change the conclusions of the report. That is, overall habitat area increase with stage would continue to be observed, albeit at a lower total. Further, since the majority of deepwater habitat at higher stage are not near existing emergent vegetation, it is likely that the area reductions at the highest stage would not be observed, or only to a minor extent.

Comment #	Commenter	Comment	Action/Response
5.48	Ventura CoastKeepers (EXPERTS)	Section 7.3 has some well articulated and key caveats. This seems to warrant somewhat more attention and discussion.	Comment noted.
5.49	Ventura CoastKeepers (EXPERTS)	Again, as previously stated, we do not believe that these focal bird species are the optimal indicator/focal species for the SCRE. Owing to human and human- related disturbance being a major if not the major determinant of nest site selection, hatching success, etc. why were they chose as in indicator or discharge into the estuary?	Concur. Focal species are typically selected from a list of candidate species that currently occur or historically occurred in the SCRE, based on their status under state and federal Endangered Species Acts, the occurrence of suitable habitat and the ecological niche they represent. Although species were determined by the LARWQCB in the Study planning process, the ecosystem functions approach used here should address needs for other estuarine species using the SCRE.
5.50	Ventura CoastKeepers (EXPERTS)	Why no historic data on SCRE plovers (ala Fig 8-5 for terns?)	Comment noted. Although historical bird count data is available, no congruent nesting data for WSP beyond 2007–2009 is available that corresponds to Figure 8-5 for CA Least tern. The 2007-2009 data is discussed in text.
6.1	Elise Kelley	Pages 121 and 128, at the top of each page. I did not conduct vegetation or saltwater fish surveys during my 2008 study. My references to plants and other fish species were from other sources and those were cited. Please have those sources, rather than my work, referenced in your report.	Concur. Reference removed.
6.2	Elise Kelley	Page 128, last paragraph. Please do not cite me in this paragraph since my 2008 work did not express any expectations regarding the use of the SCRE as just a migration corridor. My 2008 study is only one season of data, and more work should be done to answer this question. Also, since my 2008 work focused only on smolts, and there isn't data on adult usage, including a citation to my 2008 report is misleading; we don't know if adults use the estuary only as a migration corridor. Finally,	Concur. Removed reference and revised text to include observations of stranded <i>O. mykiss</i> in October 2010.

Comment #	Commenter	Comment	Action/Response
		<p>as the September 2010 breach of the SCRE showed, smolts were over-summering in the estuary. I think that the final sentence in that paragraph should be removed, and its conclusion restated to reflect what is known.</p>	
6.3	Elise Kelley	<p>On page 132, my 2008 study is referenced prior to the following statement:</p> <p>Although closed-mouth conditions may force extended periods of lagoon rearing, it is apparent from the discussion above that only low numbers of individual steelhead are currently using the SCRE for rearing, which may have consequences for the Santa Clara River population.</p> <p>I would remove this sentence since my work was not extensive enough to make it “apparent” that low numbers of steelhead are using the SCRE, nor is it clear to me what population consequences would arise from low or high numbers of steelhead using the SCRE.</p>	Concur. Sentence removed.

The Ventura Audubon Society, Inc.

P.O. Box 24198, Ventura, CA 93002 www.venturaaudubon.org

February 14, 2011

Karen Waln
City of Ventura
Environmental and Water Resources Division

Dear Ms. Waln,

The following are Ventura Audubon's comments on the draft synthesis report on the Santa Clara River Estuary study.

Section 4.2.2.3 - We believe the evaporation rates derived are high. The difficulty arises from using the United Water temperature data from El Rio-Saticoy. That area in the spring and summer months is often 15 degrees Fahrenheit higher than the condition at the SCRE. The El Rio-Saticoy area is also free of coastal fog most of the spring and summer. This increase in temperature and solar radiation would skew the calculated evaporation rate upwards.

Section 11.5 - Mentions that Least Terns are not affected by small water quality changes. Such changes can bring about increased algal blooms. The resulting algal mats can significantly reduce the clear water surface area available for Least Terns to forage in.

Throughout the document there are references to high water levels in the estuary reducing non-contact recreational opportunities. In fact most of the mentioned recreational activities are still available but with one less access point. People can still park at the north end of the estuary and walk down the beach to enjoy hiking, surfing, birdwatching, nature observation, swimming and sunbathing. The activity that is limited by high water is sleeping by the estuary as the campground is closed. This also represents an economic loss to State Parks.

An assumption is made that the Wildlife Ponds will be maintained if Alternative 6 is chosen and there is no discharge to the estuary. Since the Regional Boards compliance point is before the Wildlife Ponds we do not believe that this assumption is valid. Loss of the ponds would be a loss of 1 MGD sub-surface flow to the estuary and would significantly reduce the size of the estuary. A section should be added giving the impacts of this possibility.

One useful addition would be maps showing the extent of the estuary under the various discharge alternatives. It is difficult to visualize this from just data on the height of the surface water or volume of water entering the estuary.

Thank you for your consideration of our concerns. Please contact me if you have questions. We look forward to receiving in writing your reactions to them.

A handwritten signature in blue ink, reading "Reed V. Smith", is written over a horizontal line. The signature is cursive and stylized.

Reed V. Smith, Science Chair



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
81440-2011-CPA-0074

February 23, 2011

Dan Pfeifer, Wastewater Utility Manager
City of Ventura
Ventura Water Reclamation Facility
P.O. Box 99
Ventura, California 93002-0099

Subject: Santa Clara River Estuary Subwatershed Study, City of Ventura, Ventura County,
California

Dear Mr. Pfeifer:

This letter provides our preliminary comments on the City of Ventura's (City) Estuary Subwatershed Study (Subwatershed study). The Subwatershed study was required by the Los Angeles Regional Water Quality Control Board (Water Board), as one of three special studies intended to assist in the determination of whether or not discharge from the Ventura Water Reclamation Facility (VWRF) provides an enhancement to the Santa Clara River Estuary as defined in the Enclosed Bays and Estuaries Policy. The Santa Clara River estuary supports habitat for the federally endangered tidewater goby (*Eucyclogobius newberryi*), California least tern (*Sterna antillarum browni*), and the federally threatened western snowy plover (*Charadrius alexandrinus nivosus*).

We received notification via electronic mail (email) that the Subwatershed study was made available on your website on February 9, 2011. On February 10, 2011 we attended the stakeholder meeting held at the VWRF to discuss the study. At the conclusion of the meeting, you requested written comments by February 21, 2011 (a review period of 7 working days) in order to allow the City time to incorporate comments and submit the Subwatershed study to the Water Board by March 6, 2011. In an email to you on February 15, 2011, I requested an extension through March 31, 2011, to review and provide comments on the Subwatershed study, which you indicated you would forward to the Water Board to justify an extension. During a phone conversation between you and Jenny Marek of our staff on February 18, 2011, you granted an extension until February 23, 2011, to submit comments. The following comments do not represent a full review of the Subwatershed study, and we reiterate our request of an extension of the comment period through March 31, 2011. Furthermore, because the minutes that were taken during the February 10, 2011, stakeholder meeting were not made available by the City until February 22, 2011, we were not able to review them in time to ensure our questions and comments were captured accurately. Therefore, we will reiterate our most pressing questions and comments in this letter.



The U.S. Fish and Wildlife Service's (Service) responsibilities include administering the Endangered Species Act of 1973, as amended (Act), including sections 7, 9, and 10. Section 9 of the Act and its implementing regulations prohibits the taking of any federally listed endangered or threatened species. Section 3(19) of the Act defines take to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Service regulations (50 CFR 17.3) define harm to include significant habitat modification or degradation which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harassment is defined by the Service as an intentional or negligent action that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. The Act provides for civil and criminal penalties for the unlawful taking of listed species. Exemptions to the prohibitions against take may be obtained through coordination with the Service in two ways: through interagency consultations for projects with Federal involvement pursuant to section 7 of the Act or through the issuance of an incidental take permit under section 10(a)(1)(B) of the Act.

As discussed during the February 10, 2010, stakeholder meeting, we believe there is significant uncertainty associated with the model that was used to project the extent of habitat for federally listed species under the three VWRF discharge scenarios of 5 million gallons per day (MGD), 3.5 MGD, and 0 MGD. The model projected that the extent of habitat for tidewater gobies and foraging habitat for California least terns would change very little between these three discharge scenarios. The summary chart shown in Table 11-3 of the Subwatershed study portrays absolutely no difference in tidewater goby or California least tern habitat between the three scenarios. We are concerned that the habitat projections that resulted from a model with such great inherent uncertainty will be taken as fact and used to discount the impact of the VWRF discharge on the tidewater goby and California least tern habitat at the Santa Clara River estuary. We recommend incorporating a more clear discussion of uncertainty in the sections that describe the results of habitat projections. We also recommend including error bars in Figures 11-2 through 11-5 that would visually convey the entire range of habitat extent projected by the model.

Because of the inherent uncertainty of the models used to project changes in habitat that would result from reduced VWRF discharges, we recommend a phased implementation approach that monitors changes to the estuary that result from incrementally reducing fresh water input. For example, if it is decided that the VWRF may discharge at a rate that would result in a 3.5 MGD input of freshwater into the estuary, we recommend that this decrease is implemented gradually, at a rate that is determined sufficient to observe the new equilibrium state of the Santa Clara River estuary system. We also recommend that flexibility is retained to halt the decrease if adverse effects to federally listed species are apparent during the gradual decrease in freshwater input into the estuary.

During the February 10, 2010, stakeholder meeting the Service requested additional information as to how the three special studies (i.e., Subwatershed study, Treatment Wetlands Feasibility Study and Recycled Water Market Study) would be integrated. Having not received any clear

answer, it is our impression that the three individual studies will be submitted to the Water Board as independent documents, and no further analysis will be voluntarily conducted. We feel that the City is missing an opportunity to truly evaluate the question of enhancement by not consolidating and analyzing the results of all three studies.

We would like to see an analysis of discharge and nutrient loading scenarios that build from the results of the two other interrelated studies (i.e., Treatment Wetlands Feasibility Study and Recycled Water Market Study). For example, the Treatment Wetlands Feasibility Study identified various locations where wetlands could be sited, and the Recycled Water Market Study developed a range of projections for recycled water demand. We recommend that the City build “alternative” scenarios that combine the most viable wetland options and the most viable recycled water demand projections, and evaluate the potential enhancement resulting from the implementation of these combinations.

We did not have an opportunity to review the discussion of climate change that was presented in the Subwatershed study, but will reiterate the comments that we provided at the February 10, 2011, meeting, based on the presentation at that meeting. We are pleased that climate change was considered in the subwatershed study, but are concerned with the use of median projections for climate warming scenarios. At the February 10, 2011, meeting we expressed the concern that global temperature increases have exceeded even the most extreme scenarios developed by the Intergovernmental Panel on Climate Change, and questioned whether the use of a median projection was appropriate for the purposes of the Subwatershed study.

We are happy to discuss these comments with you in more detail, and look forward to the opportunity to fully review the subwatershed study. If you have any questions concerning this letter, please contact Jenny Marek of our staff at (805) 644-1766, extension 325.

Sincerely,

/s/: Chris Dellith, for

Jeff Phillips
Deputy Assistant Field Supervisor

cc:

Stan C. Glowaki, National Marine Fisheries Service
Dan Blankenship, California Department of Fish and Game
Michael Lyons, Los Angeles Regional Water Quality Control Board



Surfrider Foundation

Ventura County Chapter

PO Box 1028, Ventura, CA 93002 (805) 667-2222

February 23, 2011

Karen Waln
Environmental and Water Resources Division
City of Ventura
via email: kwaln@ci.ventura.ca.us

RE: SCRE Special Studies - Feb. 10, 2011 - Meeting

Dear Ms. Waln:

Thanks for the opportunity to formally submit the following comments regarding the SCRE Special Studies:

We are concerned that the representation of Steelhead Habitat is potentially inaccurate and misleading. The habitat comparison table represents a gross estimate of habitat 'quantity' based upon water depth at select estuary stages with the current bathymetry.

Habitat 'quality' is not considered in this assessment, including the potential for improvements in water quality with reduced algae, DO, and other parameters. It is also important to consider the enhancement in habitat quality resulting from the reduced likelihood of artificial unseasonal breaching with reduced estuary stage.

The analysis also misrepresents the fundamentally dynamic nature of a coastal estuary. While we recognize that major flood events completely 're-set' the estuarine ecosystem, a permanent reduction in stage resulting from reduced wastewater discharge could lead to many changes that could potentially enhance steelhead habitat. Such enhancement may occur with vegetation changes such as willow recruitment, which during moderate discharge events from the Santa Clara River could result in scour pools containing overhanging root wads and other cover for steelhead. Because such habitat succession is not possible under the current conditions, a reduction in wastewater discharge could enhance habitat for steelhead in ways not predicted by the simplified analysis presented.

Surfrider concurs with similar comments from HTB and VCK relating to steelhead habitat, and we do not support the use of the current analysis in decision-making regarding future operations at the Ventura Wastewater Treatment Plant.

Sincerely,

A. Paul Jenkin, M.S.
Environmental Director, Surfrider Foundation - Ventura County Chapter
(805) 648-4005 pjenkin@surfrider.org



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February 18, 2011

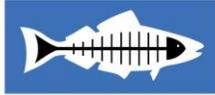
Karen Waln
Management Analyst II
Environmental and Water Resources Division
City of Ventura
via email: kwaln@ci.ventura.ca.us

Dear Ms. Waln:

On behalf of Heal the Bay, I submit the following comments on the City of Ventura's Draft Estuary Subwatershed Study ("Study") dated February 2011. Due to the fact that stakeholders were given only six business days to review and comment on the lengthy technical document, we will likely have additional comments after the report is submitted to the Los Angeles Regional Water Quality Control Board. Also as the appendices were not included in the document provided on Ventura's website, I was unable to provide review of these sections.

Study Components

- As Heal the Bay has stated since the Workplan development phase, the Estuary Hydrology and Morphology Survey should also consider upstream hydrology (i.e. diversions). The Study states that "[r]eduction in the amount of flow to the SCRE has been caused by the installation of water-supply dams, agricultural practices within the Santa Clara River floodplain, and urbanization throughout the watershed. Flow regulation by tributary water supply dams has reduced flow to the Santa Clara River by approximately 25%. This reduction can be most prominent during the dry months when water-supply dams impound flow that would otherwise be a significant component of total surface flow to the SCRE. On the mainstem Santa Clara River, the installation of Freeman Diversion Dam has resulted in the diversion up to 375 cfs of flow bound for the SCRE and an estimated 12% reduction of the freshwater volume to the SCRE during storm events (U.S. Bureau of Reclamation EIR, as cited in Swanson et al. 1990)." However the discussion ends here. It very important to include additional information on upstream issues to get a complete picture of the Estuary impacts and as alternatives are developed.
- An important factor that is needed in the analysis is a month by month assessment of SCR flows versus diversion volumes over the last decade.
- The NPDES Permit requires that the Study include a continuation of the "Fish Survey" and "Macroinvertebrate Monitoring Plan" to assess population and number trends (An Index of Biological Integrity score or other widely accepted ecological health index



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should be calculated from annual macroinvertebrate surveys). This information is absent from the Study and should be included.

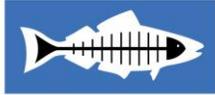
- The Study states that “[d]aily observations of the SCRE mouth berm made by the City of Ventura from 1984 to 2010 indicate that Santa Clara River mouth has been open approximately 61% of days in the recent past, with 2009 having the lowest open-mouth frequency (16% of days in the year) and 1993 and 1995 having the highest open-mouth frequency (96% of days in each year).” How does this compare to estimated historical (pre –POTW) conditions for the Lagoon?
- The Study provides a definition of “enhancement.” Where does this definition come from? The Regional Board should be the ones defining what constitutes enhancement, not the consultants or dischargers.

Water Balance

- The Study appropriately points out that the 2009-2010 water balance study year is considered a wet year that produced river discharge volumes well over the median. Was any water balance analysis performed on an average year? If so, what were the results? If not, that analysis needs to be completed.
- These two statements appear to be in conflict. Please provide clarification.
 - “Overall, Santa Clara River flow comprised approximately 80% of the total inflow volume, VWRf effluent discharge comprised approximately 8%, tidal flow into the SCRE through an open mouth comprised approximately 7%, unmeasured groundwater flow comprised approximately 4%, and all other inflow volume components each comprised \leq 1% of the total inflow volume. Combined, these data fit into an overall understanding that storm events drive the dominant sources of both water inflow (from increased river discharge) and water outflow (from sustained open-mouth periods), and that VWRf effluent discharge dominates water inflow to the SCRE only during low-flow conditions.”
 - “As expected during the wetter months of the year, the volume of water coming into the SCRE was predominantly from the Santa Clara River (approximately 45% of the total inflow volume), although VWRf effluent discharge combined with groundwater flow from the VWRf Wildlife Ponds was not that much less, accounting for approximately 35% of the total inflow volume.”

Water Quality Monitoring

- Water quality data from the VWRf discharge itself should be included in the Study. If the point is to evaluate whether water quality of the estuary might be influenced by the discharge, then it is essential to have the water quality data for the discharge for comparison. For



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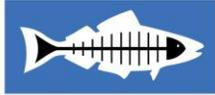
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example, if we want to know if the discharge is changing the nitrate concentration in the estuary, nitrate values for the estuary itself cannot address this question. As it is, none of the preliminary results can really be evaluated for the goals of the study since that essential information is missing.

- How does the existing estuary water quality compare to previous years?
- The Study states that “the degree to which the VWRP facility has contributed to changes in historical water quality cannot be readily determined.” However, no attempt was made to compare actual effluent water quality and the SCRE water quality.
- What was the frequency of the nutrient sampling in 2009-2010? At a minimum monthly nutrient data should be assessed, as nutrients have been described as a pollutant of concern in the SCRE and discharge.
- The Study should provide a 24-hour time series to pick-up any low DO conditions pre-dawn (peak respiration) when we have algal bloom or potential algal bloom conditions. Summer months are likely to contain these critical conditions. This low oxygen stressful situation may be a key stressor for larval fish and invertebrates.
- The Study states that “[e]xcess nitrogen may result in excessive aquatic growth (biostimulatory substance) and pose a human health risk.” Although the nitrogen limit of 10 mg/l is based on a drinking water standard for human health, it is critical to note that excessive nitrogen is also a major threat to aquatic life. Aquatic life is much more sensitive to increases in total nitrogen concentrations and the potential impacts resulting from nutrient increases in waterbodies such as algal growth. Of note, the Machado Lake Nutrient TMDL includes a total nitrogen numeric target of 1.0 mg/L as a monthly average concentration. In addition the current Nutrient TMDL for Malibu Creek, adopted by USEPA in 2003, provides summer season water quality objectives of 1.0 mg/l total nitrogen and 0.1 mg/l of total phosphorus.
- The Study lacks a sufficient discussion of over summering / rearing estuary lagoon habitat needed by steelhead smolt, of sufficient water quality needed for steelhead smolt and adults, and of healthy macroinvertebrate populations needed for steelhead smolt rearing.
- Emerging contaminants should be discussed in the Study, as their discharge may negatively impact the SCRE.

Alternatives Analysis

- While the “critical period” for the SCRE may be the summer, it is inappropriate to only look at alternatives during this period. [“... it is anticipated that management actions involving effluent flow reductions and water quality improvements would **only** be necessary during summer months”]. The State Water Board’s Enclosed Bays and Estuaries Policy, which calls for discharge elimination unless enhancement is demonstrated, does not only apply to the summer period or critical conditions. Further



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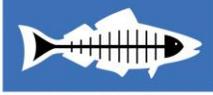
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there are periods of low rainfall and closed mouth conditions in the winter. Using the Study's own assumption here, the discharge should be completely eliminated during the winter as there is obviously no benefit to the SCRE.

- Why was a discharge of 5 mgd used for alternatives 1-3 (Table 11-1), when the Study states that the average summer discharge was 9 mgd?
- Habitat quality must be considered when discussing habitat area. The fact that current water quality conditions may limit steelhead habit must be used to qualify statements indicating that steelhead habitat will decrease with less discharge to the SCRE. Also is habitat area currently a limiting factor for steelhead? What data are provided to support the consultants' assumption that steelhead habitat in the lagoon is limited?
- Table 9-1 suggests that low DO levels (sometimes reaching below 1 mg/l) are a moderate impact. We believe that this should be changed to "high" impact. This change would be consistent with conclusions in the report that states: "At both locations, DO is below suitable levels for aquatic organisms (< 7mg/L) for some portions of the day in both cooler and warmer times of year (Figures 5-2 and 5-3; Table 5-6), although this effect is more pronounced at the North sonde (SCR1)."
- Evaluating Alternative 1 (status quo) does not make sense, as the NPDES permit/TSO require the upgrade to be completed by early this year.
- The only partial flow reduction that was evaluated in the Study (Alternatives 4&5) was a 30% reduction. The basis for this selection was that "the VWRF effluent flow rate was reduced to values that would decrease the threshold SCRE stage associated with the onset of ground saturation at McGrath State Beach during dry season, closed-mouth conditions, but at the same time would not have a negative impact on the habitat available to focal species." This is not a logical approach. Greater reduction values should be explored.
- The following statement is not substantiated: "It is not anticipated that the improved water quality conditions under Alternative 5 associated with treatment upgrades would greatly improve habitat conditions for other focal species due to their relative insensitivity to water quality conditions." Please provide greater detail.
- Blanket statements such as the following are inappropriate: "...decreases in SCRE stage have been shown to limit potential rearing habitat for steelhead, suggesting that the VWRF flows provide some degree of enhancement relative to the expected lower SCRE stage under a complete flow removal alternative." Again, rearing habitat for steelhead cannot be looked at in a silo. Also, where is the analysis that demonstrates that rearing habitat is even limited? Water quality impacts and other factors associated with greater discharge can decrease habitat quality and need to be assessed.
- While we understand that Table 11-1 is an attempt to simplify the study results, it is misleading and should be removed. The table is subjective and overly simplistic. To



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simply note that steelhead habitat area goes down significantly with alternatives 4, 5 and 6 does not provide the complete picture. For example as stated multiple times in the Study DO and nutrients reduce the habitat quality in the SCRE. Also, no adequate explanation is provided for the relative significance or what data merit one, two or three arrows.

Thank you for the opportunity to comment. If you have any questions, please contact me at 310-451-1500.

Sincerely,

Kirsten James
Water Quality Director



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February 21, 2011

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VIA EMAIL

Re: Ventura Coastkeeper's Comments on the City of Ventura's Estuary Subwatershed Study - Draft Synthesis Report

Dear Mrs. Waln:

On behalf of the Wishtoyo Foundation's Ventura Coastkeeper Program ("VCK") and our 700 plus members who desire an ecologically healthy Santa Clara River Estuary, we appreciate the opportunity to submit comments on the City of Ventura's Estuary Subwatershed Study - Draft Synthesis Report ("Draft Report"). Because the stakeholders were given only seven business days to comment on the Draft Report, VCK anticipates having additional comments after the Subwatershed Study/Synthesis Report ("Final Report") is submitted to the Regional Board on March 6th and after the stakeholders are provided with the Draft/Final Report's underlying data that is included in the appendixes not yet available to the stakeholders.

I. Habitat Availability and Suitability Analysis

- a. **Re-colonization of edge habitat and inundated vegetation habitat:** For the Ventura Water Reclamation Facility (VWRF) discharge alternatives that analyze the habitat availability and suitability of the Santa Clara River Estuary ("SCRE") for the study's focal species, including Southern California Steelhead and Tidewater Goby, why does the habitat suitability analysis and habitat availability curves for these focal species under these different discharge regimes not factor in or not consider re-colonization of edge habitat and inundated vegetation habitat? Should the habitat analysis



and availability curves utilize, for instance, a vegetation evolution model? As is, the habitat availability curves and habitat availability/suitability analysis for VWRP discharge alternatives that result in a decrease or no VWRP discharge into the SCRE only consider the initial SCRE inundated vegetation habitat and edge habitat that would be lost with a decrease in VWRP discharge, and do not consider the re-colonization of SCRE inundated vegetation habitat and edge habitat would occur upon a reduction of or absence of a VWRP discharge.

- b. **Factoring in restoration potential for open water habitat, inundated vegetation habitat, and edge habitat:** Under all discharge alternatives, the Draft Report's habitat analysis and habitat availability curves for the Focal Species do not consider or discuss the potential for SCRE restoration or expansion projects to increase open water habitat, inundated vegetation habitat, or edge habitat these habitats by: creating more structural complexity, inundated vegetation, deeper open water pockets, additional side channels/backwater habitat, and additional native edge habitat/overhanging vegetation. For instance, what would the effect on open water habitat, edge habitat, or inundated vegetation habitat for Southern California Steelhead or Tide Water Goby be in scenarios where the VWRP discharge was reduced or phased out to zero discharge if State Parks relocated their McGrath Campground and conducted an SCRE restoration project in its place, or for instance, if a SCRE restoration project was conducted on the north side of the Estuary? In analyzing the future available habitat under different discharge scenarios for the Southern California Steelhead, Tidewater Goby, Western Snowy Plover, and California Least Tern ("Focal Species"), VCK feels that it would be appropriate to also factor in SCRE habitat restoration potential/projects that would give stakeholders an idea of potential SCRE habitat suitability under different discharge scenarios.
- c. **Comprehensiveness of Habitat Availability/Suitability Analysis:** To be sufficiently comprehensive it appears that the Focal Species' habitat availability/suitability analysis should also analyze the effect of the VWRP discharge on: 1.) food sources for steelhead and tidewater goby, such as macroinvertebrates, and 2.) allowing the SCRE to support non native species that prey on, and compete with, steelhead smolt and tidewater goby. In addition, VCK objects to not including water quality as a component of the habitat area and availability analysis. Without adequate water quality, the Focal Species do not have adequate habitat for survival and are in jeopardy.

- II. **Macroinvertebrate Analysis:** The Draft Report does not analyze the importance of macroinvertebrates as a critical food source for Southern California Steelhead smolt, and does not analyze the effect of the VWRP



discharge on the SCRE's macroinvertebrate populations under the 6 different discharge scenarios, including a no discharge scenario. Why?

- III. **Competition and Predation from Non Native Species:** The Draft Report does not analyze the effect of predation and competition from the SCRE's non native species on steelhead, tidewater goby, and the other focal species. The Draft Report also does not analyze the effect of the VWRF discharge on the SCRE's non native species under the 6 different discharge scenarios, and the corresponding effect or benefit for the Focal Species. Why?
- IV. **Hydrological Model:** For purposes of evaluation, it would be useful if the Draft/Final Report contained/s the data imputed (such as SCRE berm substrate porosity, hydrological conductivity, ect.) into the hydrological model used to:
- evaluate how high and low tides influence SCRE stage and SCRE depth in absence of a discharge and under different discharge alternatives
 - how quickly tidal influence would fill the estuary to a stage of approximately eight feet in absence of a discharge
 - and how low and high tides contribute to changes in estuary stage in between tides

This information along with answers to these questions, would be useful for evaluation of habitat suitability for various focal species under different discharge alternatives. Please provide this information in the Final Report.

- V. **Estuary Depth, Stage, and Habitat Maps:** At each estuary stage level, it would be useful to include an analysis showing different water depths in different parts of the estuary and the different habitat features available for focal species at different water depths. In addition, incorporating a habitat re-vegetation model in analyzing habitat at different SCRE stages would be useful for analyzing habitat availability/suitability for the Focal Species under the six different discharge scenarios.

- VI. **Salinity**
- The Draft/Final Report should examine the SCRE's naturally occurring salinity levels in absence of the VWRF discharge.
 - The Draft/Final Report should examine the effect of the discharge on the SCRE's salinity. Under the six discharge scenarios, the Draft/Final Report should explain whether, to what extent, and where spatially, the VWRF discharge causes SCRE salinity fluctuations and / or a deviation from the



natural salinity of the SCRE, and whether these salinity fluctuations or deviations from the SCRE's natural salinity adversely affect the Focal Species, their habitat, or their food sources, such as macroinvertebrates in the SCRE.

- c. For alternative 6 (no VWRP discharge) the report should discuss the salinity benefits or impacts of no VWRP discharge to the SCRE and its native species, including the southern California Steelhead.

VII. Alternatives Analysis: The alternatives analysis should also analyze the impact of the VWRP discharge outside of June -September, and during the wet season, when the discharge can still contribute greatly to habitat conditions in the estuary for steelhead smolt, residing adult steelhead, and other species during closed mouth/lagoon conditions. After breach events, the SCRE receives a large percentage of flow from the VWRP during all seasons.

VIII. Bed Substrate: The Draft Report should analyze the effects of the VWRP discharge on the SCRE's bed substrate, especially around the berm, and the potential for the discharge to scour sand into the SCRE.

IX. DO / Emerging Contaminants / Metals

- a. The Draft/Final Report should analyze and describe the actual and potential sub-lethal effects of low, high, and fluctuating Dissolved Oxygen ("DO") levels on steelhead smolt and adults, and tidewater goby. The Final Report should discuss how long steelhead smolt and adults can be exposed to the DO levels found in the Draft/Final Report without suffering acute or sub-lethal impacts. In addition to providing single recordings of low or high DO levels, the Draft/Final Report should also provide stakeholders with amount of time or the duration in which the DO levels were below 7.0 mg/l and above 10 mg/l during the Estuary Special Studies period.
- b. The Draft/Final Report should analyze the sub-lethal effects of metals and emerging contaminants on the SCRE's Southern California Steelhead smolt and adults, and on other native aquatic species.
- c. The Draft/Final Report should provide the monitoring results for all monitored constituents by date of sample, in both the SCRE and the VWRP's effluent transfer station as reported monthly by Ventura to the Regional Board. Concentration of constituents such as copper in these discharge reports have been documented by researchers to have sub-lethal impacts on juvenile salmonid.
- d. The Draft/Final Report should consider these reports (also attached) to analyze the sub-lethal impacts of the metals contained in, and the



emerging contaminants more than likely contained in, the VWRF's discharge on Southern California Steelhead: 1.) NOAA Technical Memorandum NMFSC-83, An Overview of Sensory Effects on Juvenile Salmonids Exposed to Dissolved Copper: Applying a Benchmark Concentration Approach to Evaluate Sublethal Neurobehavioral Toxicity, October 2007; 2.) Lower Columbia River and Estuary Partnership. 2007. Lower Columbia River and Estuary Ecosystem Monitoring: Water Quality and Salmon Sampling Report.

- X. **Toxicity analysis:** Do the species utilized and referenced in the Draft/Final Report for toxicity analysis adequately represent the sensitivity of the SCRE's steelhead smolt and tidewater goby to the WRF discharge and any water quality conditions in the SCRE? The Draft Report is not clear as to whether the referenced toxicity analysis were performed both in the estuary and at the VWRF outfall. Please include all VWRF outfall or effluent transfer station toxicity analysis so stakeholders can analyze the toxicity of the VWRF discharge based on the data Ventura has available.
- XI. For Alternative 6 (no discharge alternative) and for the other alternatives with discharge reductions, the Draft/Final Report should analyze the ability of ocean inputs / tidal inputs to dilute concentrations of nutrients and other contaminants present in groundwater, surface water inputs, and VWRF discharges into the SCRE. This analysis will allow stakeholders to analyze the water quality and habitat benefits for the aquatic focal species in a reduced or zero discharge scenario.

XII. Southern California Steelhead Habitat:

- a. The Draft/Final Report should discuss food source for steelhead smolt food residing in the SCRE.
- b. **Lagoon Habitat:** The Draft Report's discussion seemingly minimizes the importance of SCRE lagoon habitat to steelhead smolt rearing and survival, by merely stating that: "Lagoon systems, therefore, can provide a potential demographic boost in two ways... First, lagoons may relax to some degree the density dependent bottleneck occurring in stream habitat." To make this assertion in the Final Report, please provide a citation to a study that shows steelhead smolt tend to only migrate to estuary lagoon habitat when streams are over crowded.

"Steelhead Growth in a Small Central California Watershed: Upstream and Estuarine Rearing Patterns", by Sean A. Hayes, et. al, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, (2008) (see attached) suggests the existence of three juvenile life history pathways: upper-watershed rearing, estuary-lagoon rearing, and



combined upper watershed and estuary–lagoon rearing, and does not indicate that steelhead smolt access Estuary lagoon habitat only when habitat bottleneck conditions exist upstream. This study also suggests that some steelhead smolt exhibit survival strategies that include downstream migration before age two to take advantage of lagoon growth opportunities. Further, this study constructs a growth model showing size at age for each freshwater life history pathway observed. The study shows that for the Scott Creek watershed:

“the majority of fish reaching typical steelhead ocean entry sizes (150–250 mm FL; age 0.8–3.0) were estuary–lagoon reared, which indicates a disproportionate contribution of this habitat type to survival of Scott Creek steelhead. In contrast, steelhead from higher latitudes rear in tributaries during summer, taking several years to attain ocean entry size.”¹

XIII. **Appendixes:** Please provide all the underlying data for Tables 5-4 through Table 5-10 of the Draft Estuary Synthesis Report in the Final Report’s Appendixes. VCK would like to analyze the underlying data from these tables that shows the concentrations or levels of the different constituents present in the SCRE and the VWRP discharge from each sampling event from 1997 to 2010.

XIV. **Enhancement Definition and Study Usage:**

- a. Where does the Draft Report produce its definition of “enhancement”, and on what scientific basis can the Draft Report or Final Report conclude that that VWRP has historically provided an enhancement to the SCRE and its native species, including to steelhead smolt and adults? The first sentence, first full paragraph - page 4 of the Draft Report states: “The primary purpose of this Estuary Subwatershed Study (Study) is to confirm that VWRP effluent discharge to the SCRE provides an enhancement of existing beneficial uses as compared to the absence of discharge”. According to the VWRP’s own discharge and SCRE monitoring reports, current and past discharges from the VWRP (which constitute an anthropogenic input of water of a different chemistry than natural/historic inputs) have displayed levels of nutrients (causing eutrophic conditions documented in this Draft/Final Report) and metals that have according to scientific literature, have imparted acute, chronic, and sub-lethal toxicity threats to Southern California Steelhead.

¹ “*Steelhead Growth in a Small Central California Watershed: Upstream and Estuarine Rearing Patterns*”, by Sean A. Hayes, et. al, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, (2008).

- b. Furthermore, because the Estuary Subwatershed Study was shaped to or designed to “confirm that VWRP effluent discharge to the SCRE provides an enhancement of existing beneficial uses as compared to the absence of discharge”, VCK is concerned that the Draft and Final Report was not focused on the critical questions and research questions government stakeholders charged with protecting the ecological integrity and endangered species in the SCRE (such as the Southern California Steelhead and Tidewater Goby) need to determine the ecological impacts of the VWRP discharge on the SCRE and its populations of Southern California Steelhead and Tidewater Goby under the VWRP’s current discharge regime and discharge regime under the six different discharge scenarios.

Thank you for considering our comments. Please feel free to contact us with any questions.

Sincerely,



Jason Weiner, M.E.M.
Associate Director & Staff Attorney
Ventura Coastkeeper



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February 28, 2011

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VIA EMAIL

Re: Second Set (February 28, 2011 set) of S. S. Anderson & R. F. Ambrose unified comments on Stillwater Sciences' February 2011 Administrative Draft of their Estuary Subwatershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary, Ventura County, California

Wishtoyo Foundation's Ventura Coastkeeper Program ("VCK") retained independent objective experts Dr. Richard Ambrose¹ and Dr. Sean Anderson² to conduct an independent expert review of the City of Ventura's Estuary Special Studies and the environmental effects of the City's Tertiary Treated Flow discharge to the Estuary to provide stakeholders with an independent expert evaluation of the affect of the City's water treatment operation on the Santa Clara River Estuary's water quality and aquatic life. Dr. Ambrose's and Dr. Anderson's first task was to submit comments to VCK on Ventura's Estuary Special Studies that were publically available for their review and analysis as of January 20, 2011.

¹ DR. RICHARD F. AMBROSE, Ph.D.; Director and Professor, UCLA Environmental Science and Engineering Program; Ph.D. in Marine Ecology, UCLA; B.S. Biological Sciences, University of California, Irvine.

² DR. SEAN ANDERSON, Ph.D.; Assistant Professor of Environmental Science and Resource Management California State University Channel Islands; Postdoctoral Fellow, Center for Conservation Biology, Stanford University; Ph.D. in Marine Population Biology, UC Los Angeles; B.S. in Ecology and Evolution & in Environmental Studies, UC Santa Barbara.



Dr. Richard Ambrose's and Dr. Sean Anderson's comments below add to their comments previously submitted to Ventura by VCK on February 21, 2011 that were based on the portions of the Draft Estuary Special Studies publically available for their review and analysis as of January 20, 2011. However, Dr. Anderson and Dr. Ambrose need more time to provide their full and complete objective scientific analysis and review of the findings, methodology, analysis, and management recommendations contained in the Draft Synthesis Report, and need more time to analyze and review the Draft Synthesis Report's synthesis and discharge alternative sections. Dr. Ambrose and Dr. Anderson also need the Appendices to the Synthesis Report to complete their review.

Dr. Anderson and Dr. Ambrose expect to complete their Independent Expert Review of the City's Estuary Special Studies and the environmental effects of the City's Tertiary Treated Flow ("TTF", "VWRF", or "VWRF Discharge") by May 31, 2011. This final independent review will contain their complete comments on the Ventura's Final Synthesis Report/Estuary Specials Studies.

Please address and incorporate Dr. Anderson's and Dr. Ambrose's comments contained in this letter into Ventura's Final Estuary Special Studies / Synthesis Report that will be submitted to the Los Angeles Regional Water Quality Control Board on March 6, 2011.

Comments on Stillwater Sciences February 2011 Administrative Draft of their Estuary Subwatershed Study Assessment of the Physical and Biological Condition of the Santa Clara River Estuary, Ventura County, California

S. S. Anderson & R. F. Ambrose unified comments February 28, 2011

Focal Species Selection

While this is indeed a useful approach to assess impacts from discharge on the broader estuarine community, we are curious as to why only Endangered species were selected. While steelhead and tidewater goby are natural selections based on their natural history, there are a host of other organisms that could have been selected to assess impacts that were better focal species than plovers and terns. The relatively low numbers (and regional downward trend) of both snowy plovers and least terns and the disproportionate impact of human disturbance on their abundance and distribution make them curious selections for a study on the effect so wastewater discharges. While indeed a part of this ecosystem, there were better



candidate species spanning infauna, epifauna, vegetation, and estuarine vegetation-dependent birds.

Section 3: Geomorphology

In the discussion about changes to the morphology, the authors argue there has been little gross morphologic changes between 1900 and 2005. It is somewhat unclear if their reference to current conditions is from the 2005 LiDAR surveys or from more recent (i.e. 2010) surveys of the site.

It seems reasonable to conduct another LiDAR survey of the estuary. This would yield excellent time series: the 1990 Study, the 2000 Bathymetry from Entrix, the 2005 LiDAR Data, and now a purported 2010/2011 LiDAR survey. It would serve to bolster and confirm the author's arguments that little has changed in the system and that major (but rare) storm events are the major drivers of the hydrogeomorphology of this system.

Excellent discussion of the historic hydrogeomorphology of the system. This a much more thorough discussion of this issue than in most similar reports, and it is very appreciated and helps put the current situations in context. Having said that, the authors can improve upon this with a clearer explanation as to their sources of information for these goings on. Clearly the historic imagery from the Watershed Protection District and historic rainfall data have played a major part. But a clearer citation of their sources is called for. In addition, while the role of dam failures and other watershed goings on have correctly been mentioned here, there is no discussion of perhaps the most important (after leveeing) hydrological constraints: the Freeman Diversion. Please add this to your otherwise robust contextual background.

Table 3-1 at first seemed to suggest perhaps some significant differences in sediment characteristics between sampling dates, but our exploration shows no or effectively no statistically significant differences within segments or between years and supports the authors claims.

Section 4: Hydrology & Hydraulics

Generally there is an emphasis on the "wetting" of the estuary. To be sure this is an important component of riparian/estuarine functioning. However, one of the most important hydrodynamic components of our southern Californian estuaries was the



shift from relatively wet to relatively dry periods on a seasonal basis. This, for example, was one method by which invasive or noxious organisms were limited in our historic estuaries and is the environment within which our organisms evolved. The general tendency of southern Californian estuaries to now be “wet” all the time due to anthropogenic inputs into these systems has facilitated the invasions of many non-native or nuisance species and is partially to blame for the increasing preponderance of species of concern. While the net aggregate influence of the water volume introduced via the VWRP may be a net benefit, it is not simply an issue of dumping more and more water into this system now robbed of water via the Freeman Diversion. This needs to be better articulated.

There is no Lower Santa Clara River flow data for the key 2005 high flow period. Figure 4-1 (p.37) has a critical data gap from 2005-2007.

“Seasonal variability in ETS flows is possibly driven by infiltration and inflow of the collection system, since effluent flows are higher on average in the wetter winter months (January, February, and March) than the other months of the year” p. 39. This is a strange statement. Don’t we know the sources of variability of the outflows?

The dynamics of estuary breaching (p. 46) is a critical dimension of the estuary ecology. It would be ideal if a historical ecology study (which is being completed) would provide a better characterization of the pre-development dynamics. The synthesis report does not that the SCRE likely had a lower frequency of berm breaching. However, it is somewhat surprising that the report seems to focus on the length of the mouth berm rate, and consequent seepage rate, rather than the increase in water inflow due to the VWRP.

We have previously commented on the assumptions behind the water balance study (e.g. p. 48). The assumptions with the greatest likelihood of leading to an inaccurate estimate include the use of the 2005 bathymetry, use of pan evaporation measures from a site 6 miles inland, and estimated groundwater exchange based only on the monitoring wells south of the Estuary (although flow from the VWRP Wildlife Ponds are included in this report). In the previous report, estimates of subsurface flow across the mouth berm seemed fairly simplistic and did not seem to incorporate all available information. In the Synthesis Report, the estimates have been refined, although there are still some questionable assumptions (e.g., including basing the hydraulic conductivity in part on sediment samples from the southern floodplain GW wells). It is good that an attempt was made to provide an independent estimate of the mouth berm seepage rate, although of course this, too, has significant assumptions (mainly that it is the only unconstrained estimate). It is also good that



an effort was made to estimate the unmeasured groundwater flows (p. 68), although we would appreciate a better explanation of the assumptions made.

In general, the offered water budget seems reasonable, and shows a good match between estimated and observed volume values. The water budget provides a good perspective on the contribution of the VWRP during closed-mouth conditions, especially during the dry season.

Section 5: Water Quality

Interesting that salinity (p. 79) near the mouth was only 15-16 ppt when the SCRE mouth was open. This is quite low, suggesting limited ocean exchange. We noticed the maximum was 37 ppt, so sometimes there is full exchange with the ocean, but a mean of 15 ppt (during winter) means that much of the time the exchange is quite limited (or river flow high). Also a bit surprising that the middle estuary always has low salinity (max 11 ppt and mean of 3 ppt when open).

The DO values (p. 87) from daytime grab samples are not very useful, but the values from the continuously recording data sondes could be very helpful for looking at DO minima – but Table 5-6 does not take advantage of that opportunity. The influence of algal productivity is discussed at the bottom of p 87, and DO is even mentioned, but nothing about low DO conditions, which are so important for the ecology of the estuary.

As it turns out, a better analysis is presented on p. 90. It would be useful if something about this issue and later analysis was mentioned earlier.

The axis for Fig 5.6 (p. 91) is not labeled. It appears to be % saturation. We like the figure – we haven't seen this method of presenting continuous data before. However, the selection of just a few cases doesn't allow us to understand how representative each case is, or really how much of problem low DO is in the estuary. Perhaps as a result of this, the cases presented don't really match my experience with diurnal DO patterns in systems like this (high DO during the day, low in early morning, shown in only one of the graphs and not when we would have expected it). We would have liked to see a much more thorough analysis of this important parameter – although the footnote mentions a limitation in the data. Still, we think more could have been done.

The discussion of nutrients on p. 92 is simple but perhaps too concise. There is very little attempt to put the nutrient concentrations in context – are these high or low,



for example? There is one sentence about the possible contribution of VWRP to phosphorus concentrations, and that is all (although the outfall channel concentrations are mentioned elsewhere). That sentence, incidentally, seems to imply (perhaps inadvertently) that only phosphorus is contributing to algal growth, which is not correct.

Although bacteria concentrations are not a major concern, they are practically ignored in the text, with no mention even if they exceed water quality standards. Also, no mention is made about whether this is the expected temporal pattern, and the postulated explanations are vague and unsubstantiated.

It is good to see section 5.2 (p. 103) provide some of the context for the water quality results we asked for above. However, here and elsewhere the caveat is added that historical data may not be reflective of current conditions. Of course that is always true, but to be repeated so prominently, we think some examples should be given for what has changed that would make current conditions likely to be different.

The discussion about ammonia (p. 104) is generally good, but some more explanation could be included. How much NH_3 enters via the river versus the outfall? It is implied that open mouth conditions remove accumulated algae from the SCRE, but is there any evidence for this? If so, it should be cited here.

The bacteria exceedances (p. 105) are asserted to be due to “the influences of migratory and resident bird populations and local runoff,” but this is by no means proven or even necessarily true. Bacteria source identification can be complicated and this simple explanation isn’t supported by enough evidence or even logic (though there is the beginning of a logical argument in noting higher proportion of exceedances when the mouth was open).

The discussion of chemical constituents (p. 106) leaves the impression that there are no concentrations that could be considered harmful, but it focuses exclusively on drinking water supplies. This is too narrow a focus. The evaluation should be done with respect to ecological impacts.

The discussion of DO on p. 108 is appropriate for the standard, but the daytime samples really are not representative of the biologically relevant occurrences of low DO, which is more likely in pre-dawn samples.

The report appropriately highlights the concerns about toxicity due to high levels of a number of parameters (p. 111).



Section 6: Vegetation

It is difficult to assess some of these arguments without the appendices (i.e. species lists). While we have no reason to doubt the rigor of the vegetation inventorying, we can nevertheless provide only circumspect comments on the aggregate plant data. Your most recent vegetation surveys are consistent with our current understanding of the SCRE flora, but neither of us has experience conducting historic vegetation surveys here (pre-2005) and so this wish for additional detail is mostly directed at your pre-2009 surveys.

It is great you were able to get access to the draft versions of the so-called t-sheet historical ecological conditions analyses. Please note that these data have now been publically released and are available (at <http://www.caltsheets.org/socal/index.html>) and so your reference should be updated. While the authors are continuing to work on peer-reviewed publications related to this dataset, it should no longer be considered “in preparation.”

Table 6-1 and 6-2 (p. 123) should be unified, terms unified, etc. for easier comparison in one location. Placement of Fig 6-1 (p. 119) is strange in that it is not referenced or discussed for several pages.

Slightly unclear as to the historic condition of *Arundo*. Your bullet list suggests that “large, dense patches of non-native invasive giant reed” (p. 121) were present in all surveys, but you also report that the oldest study (Swanson *et al.* 1990) actually conducted wetland classification rather than species surveys. Was *Arundo* present and present in essentially the same locations as in the subsequent 3 surveys? This is later clarified on p. 126, but an earlier clarification will help the reader.

Your comments about aquatic vegetation (p. 122) are consistent with our experience. It is curious as most of the 29 other estuaries sampled during Bight '08 did have aquatic vegetation. The general hydrogeomorphology of the system suggests that we should have aquatic vegetation. Do you hazard a guess as to whether or not this was the pre-modification condition?

Section 6.2 is a good discussion of historic vegetation, reconstructed as best we can. We recognizing that a direct comparison between oblique historic photography and a modern vegetation mapping effort has its challenges. It would still be instructive, however, to include representative photos to illustrate your points. At a minimum you need to properly reference/document these sources. We trust some of these are the Fairchild Archival Collection. There are also various collections/photos at



the Ventura County Museum of Art and History (particularly those after the dam failure in the upper watershed) which may or may not be of assistance here.

The suggestion (p. 125) that the overall extent of vegetation, has changed little, but that rather the distribution of that wetland vegetation needs further articulation. There must have been at least moderate salt marsh vegetation in/around the estuary historically (even if the SFEI-led effort couldn't well articulate this vegetation category). This needs to be better explained in a section discussing wetlands (not "freshwater" wetlands). We consider this change significant and one that should not merely be subsumed within the "changed distribution" rubric. Especially give the focal species you have selected for discussion.

Please cite a reference for the original historic use of *Arundo* in the SC River watershed (p. 126). We have often heard this explanation, but know of no rigorous documentation of farming here.

While *Arundo* removal may be beneficial in the SCRE, we have serious reservations as to the value of removal efforts here that are not integrated with (and subsequent to) upper watershed efforts.

Section 7: Aquatic Habitats and Focal Species

We feel that there is a more extensive literature of the effects of estuary condition and state upon steelhead that would add to this report. It would be beneficial to conduct a more wider-ranging survey of the literature (e.g. for p. 127)

Fig 7-1 (p. 133) could benefit from different color choices for each variable.

We suggest that Fig 7-3 (p. 137) be augmented to show potential "core" goby habitat of depths ~1m or less, as reflected in your seines. We too have tended to find them closer in towards banks (shallower areas) than out in the middle of main stem channels per se. This would in effect create bounding conditions for their potential habitat in the SCRE.

The tidewater goby is characterized as a weak disperser. While this is true in some senses, it is also true that the tidewater goby population is highly dynamic and extirpated goby populations are commonly re-populated.

Section 7.3 has some well articulated and key caveats. This seems to warrant somewhat more attention and discussion.



Section 8: Wildlife Habitats and Focal Species

Again, as previously stated, we do not believe that these focal bird species are the optimal indicator/focal species for the SCRE. Owing to human and human-related disturbance being a major if not the major determinant of nest site selection, hatching success, etc. why were they chose as in indicator or discharge into the estuary?

Why no historic data on SCRE plovers (ala Fig 8-5 for the terns).

Section 9: Functioning of SCRE

Table 9-1 confirms the lack of utility of the avian focal species for selection in this study.

Thank you for considering Dr. Ambrose's and Dr. Anderson's comments. Please feel free to contact us with any questions,

Sincerely,



Jason Weiner, M.E.M.
Associate Director & Staff Attorney
Wishtoyo Foundation's Ventura Coastkeeper Program



February 23, 2011

Karen Waln
Public Works Dept.
City of San Buenaventura
P.O. Box 99
Ventura, CA 93002-0099

Dear Karen:

I apologize for not submitting these comments before the deadline but as you may be aware I have responsibilities that currently keep me focused on the upper, rather than the lower, Santa Clara River. That said, I would appreciate this letter being included as comments on the draft. I was not able to read the entire document, but focused mainly on the areas that cited my work. I would appreciate it if the following corrections were made:

1. Pages 121 and 128, at the top of each page. I did not conduct vegetation or saltwater fish surveys during my 2008 study. My references to plants and other fish species were from other sources and those were cited. Please have those sources, rather than my work, referenced in your report.
2. Page 128, last paragraph. Please do not cite me in this paragraph since my 2008 work did not express any expectations regarding the use of the SCRE as just a migration corridor. My 2008 study is only one season of data, and more work should be done to answer this question. Also, since my 2008 work focused only on smolts, and there isn't data on adult usage, including a citation to my 2008 report is misleading; we don't know if adults use the estuary only as a migration corridor. Finally, as the September 2010 breach of the SCRE showed, smolts were over-summering in the estuary. I think that the final sentence in that paragraph should be removed, and its conclusion restated to reflect what is known.
3. On page 132, my 2008 study is referenced prior to the following statement:
Although closed-mouth conditions may force extended periods of lagoon rearing, it is apparent from the discussion above that only low numbers of individual steelhead are currently using the SCRE for rearing, which may have consequences for the Santa Clara River population.

I would remove this sentence since my work was not extensive enough to make it "apparent" that low numbers of steelhead are using the SCRE, nor is it clear to me what population consequences would arise from low or high numbers of steelhead using the SCRE.

Lastly, I understand that you work with consultants, and perhaps you could stress to them that if my work is to be quoted and referenced, to please make sure it is in accordance with the work I've done, and that the conclusions drawn from my work reflect my own statements and conclusions.

Thank you for this opportunity to comment.

Sincerely,

Elise Kelley, Ph.D.
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