

**Salton Sea Restoration Draft EIS/EIR
January 2000**

Pacific Institute Review Comments

(page numbers refer to hard copy version)

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
1.	ES-09	Flood flows	Given increasing upper basin use, continuing litigation over reserved rights, and new and proposed policies such as off-stream banking and interim surplus criteria, it is unlikely that flood release spill flows will be available as frequently in the future as they have been historically. The sentence should be changed to read "Colorado River flood flows are [currently] available . . ." The last sentence should be changed to read "Flood flows, <i>which currently sustain riparian habitat in the upper reaches of the Colorado River delta below Morelos dam and freshen wetland habitat further south</i> , are beyond . . ."	
2.	1-5	2 nd para	Please include a map showing the "primary study area" and use this designation consistently. Does the primary study area differ from the study area that includes canals and the Colorado River downstream from Imperial Dam?	
3.	1-08	1.4.1	The first objective is misleading and redundant. Maintaining a minimum elevation of the Sea is not relevant to this Goal; the objective more properly stated would be to limit the elevation of the Sea to a level required to ensure adequate drainage. The second objective better captures the sense of the need to allow ditches to drain; lower elevations do not limit the sea's role as an agricultural depository.	
4.	1-09	1.4.3	"Address selenium health advisories on eating fish" is ambiguous: does this mean that, based on a single study of limited scope, the Restoration Project intends to refute the State of California's health advisory?	
5.	1-17	Chart	Chart errata: units on y-axis caption should be mg/L; y-intercept of current conditions reference line should equal those of the alternatives; arrow for sea water reference points to wrong line.	
6.	2-6	Last para	As noted in comment #13 and in the attached narrative comments, the project alternatives will likely perform worse, rather than better, than the current model predicts. The salinity and elevation models make liberal assumptions about inflows from bank storage and fail to account for the precipitation of salts, overstating the alternatives' efficacy.	
7.	2-8	2.3	This section should include a general narrative overview of the changes that could occur if no project is implemented, summarizing the information provided in the subsequent sections on the affected environments.	
8.	2-9	5 th para	The use of the relative term "better" as applied to water quality, especially in the last sentence, is misleading – alternatives to pumpback systems could lead to better water quality relative to that resulting from pumpback systems, but drainwater under both scenarios will have higher salinity than current levels.	
9.	2-11	2.4.1	Please insert a table showing the relative costs of the alternatives and common actions, such as table 4 from the draft alternative appraisal report.	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
10.	2-26	4 th para	Description of CASI is inadequate. Is CASI discharge projected to be 4,400 mg/L at Phoenix, at Yuma, or at Salton Sea? 643 states that CASI salinity would be 5,000 mg/L; why the discrepancy? If CASI includes industrial wastewater, will it contain elevated levels of heavy metals and other contaminants, and if so, what efforts will be made to treat this water?	
11.	2-26	Last sentence	Identify sources that will be targeted if CASI water is not available.	
12.	2-27	Flood Flows	Description of diversion of flood flows is inadequate. Figure 3.1-8 (3-29) shows that less than 300,000 AF would be diverted from flood flows under some circumstances. What criteria will be used to determine how much water to divert from available flood flows? Why? These criteria should be described as part of the DEIS.	
13.	2-47	1 st para	Given that the IID transfer is expected to conserve 20,000 AF/y, much or most of which will be tailwater and thus approaching a 1:1 reduction in flows to the Sea, and given the list of other projected actions that could reduce inflows to the Sea, it is not appropriate to assume that inflows will be reduced by half the rate of the proposed IID transfer. As noted on 4-39, inflows from bank storage cannot be accurately predicted, suggesting that the decision to model them at 10,000 AF/y is arbitrary and insufficiently substantiated. The inaccuracy of the models suggests that projected benefits of the alternatives on salinity and elevation are overstated.	
14.	2-55	2.7.24	Please provide further information, including quantity of water treated and recorded selenium depletions, on the Duck Club Evaporative Ponds, which from the brief description here would appear to offer promise for meaningful improvement of the quality of Salton Sea inflows.	
15.	2-60	Noise effects	Alternatives 15 would be expected to have an indirect increase in noise levels due to increased vehicular traffic and watercraft use on the Sea.	
16.	3-2	3.1.2	This section should include information on monthly/seasonal fluctuations in inflow to the Sea, which can cause its elevation to vary more than one foot annually.	
17.	3-11ff	Last para	The failure of the salinity models to account for the solubility limits of calcium and magnesium sulfates and calcium carbonate undermines the models' utility in projecting the future salinity of the Sea. More importantly in terms of the Restoration Project alternatives, these constituents can be expected to re-enter solution as the alternatives are implemented, reducing the alternative's effectiveness and extending the amount of time required to reduce salinity to target levels. These effects must be assessed and integrated into the salinity models if the reader is to make an informed decision of the relative merits and utility of the different alternatives.	
18.	3-21	2 nd para	According to Reclamation Crop Production reports, irrigation water is distributed to 460,000 acres of farmland in the Imperial Valley, not "79,000 acres," and that 186,000 acres, not "30,000 acres," are dedicated to alfalfa.	
19.	3-21	3 rd para	In the sentence "This 'tailwater' has about the same composition as the applied water, although it tends to have a higher load of silt, pesticides, and nutrients . . .," "the same composition" is contradicted by the higher load of the listed elements and should be clarified.	
20.	3-22	3 rd para	The 525,000 acres under cultivation includes land with more than one crop rotation; actual acreage is about 460,000 acres (as noted above).	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
21.	3-23	4 th para	While there are currently no international treaty obligations to provide water for environmental purposes in Mexico, there are several proposals to do so, such as that submitted in November 1999 by thirty-five organizations from the US and Mexico. This section should note that there are several ongoing efforts to commit Colorado River flows to Delta restoration.	
22.	3-23	5 th para	That ~10% of flood flows were diverted in Mexico, while perhaps factually accurate, is misleading. Consumers in Mexico (and the US) do not divert flood flows on a percentage basis; they divert based on need and conveyance capacity. Thus, a significantly higher proportion of lower quantity flood releases could be expected to be diverted than of higher-quantity flood releases, meaning that little or no water would be expected to flow through the delta in years with low quantity flood release flows.	
23.	3-29	Fig 3.1-8	See comment #12.	
24.	3-33	3.2.3	Description of GW quality should note that GW might have elevated levels of arsenic (3-15). This is relevant for models projecting inflows from bank storage.	
25.	3-34	3.3.2	Geology section should include a description of crustal spreading in the study area. The west side of the Salton Sea is moving at about 8 cm/y relative to the east side, and ground level on the south shore of the Sea is subsiding at a rate of more than 2 cm/y. This could have significant impacts on structures such as dikes built in the area, increasing maintenance costs and compromising their long-term integrity and resilience in the face of seismic events.	
26.	3-40	3.3.4	Please include a map showing major earthquakes in the study area, such as Figure 11 from the draft Alternatives Appraisal Report. From 1900-1973, 15 earthquakes measuring 6.0+ on the Richter scale and another 45 of estimated magnitude 5.0+ occurred in or near the Salton Sea; another 8 earthquakes measuring 5.0+ have occurred since 1973. Such information is especially pertinent to the selection of an appropriate alternative and should be included in the DEIS.	
27.	3-77	3 rd para	A review of Patten's Salton Sea Bird Checklist suggests that fewer than 10% of species feed on fish in open waters, including species for which fish are but part of a more varied diet and including species designated as extremely rare at the Sea.	
28.	3-90	2 nd para ff	Please include a map depicting the habitat of special status bird species at the Sea. The description of Yuma clapper rail habitat indicates that some of this area would be inundated or otherwise altered by the displacement dike and other construction.	
29.	3-112ff	3.9.1	Why does the "primary study area" include land within five miles of the Sea (1-5), while the "Phase 1 study area" includes all of Riverside and Imperial counties and the "area of primary influence" extends to 15 miles? This is inconsistent and confusing.	
30.	3-114	Tab. 3.9-1	This socioeconomic data is too generalized to be relevant to the Restoration Project. Providing economic development opportunities (Goal 5) requires the compilation of a pertinent economic baseline of the "primary study area" or the "area of primary influence."	
31.	3-115		Insert a table quantifying and displaying the socioeconomic information described for the area of primary influence.	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
32.	3-115	2 nd para	Given that the population of the "study area" increased almost 22% from 1990-97, the statement that the number of workers in recreational-based industries is not expected to have changed substantially over the last 10 years is likely to be incorrect. Since recreational-based industries factor in 3 of the Restoration Project's goals, the DEIS should include more comprehensive and more recent data than that reported here.	
33.	3-115	Tab. 3.9-2	Table should disaggregate income by county and should also display incomes for the "primary study area" or the "area of primary influence."	
34.	3-115	Last para	A 1987 telephone survey is not a reliable indicator of the current visitor use-rate of the Salton Sea. The data from the 1995 NWR study are more reliable, and should be complemented with data from visitor use rates at the State Recreation Area and included in a table to reflect actual visitation rates and potential revenues generated.	
35.	3-116	3.9.3	Please provide the "average retail sales per capita in the area of primary influence," a more relevant figure than that of Imperial and Riverside counties combined.	
36.	3-116	4 th para	Please provide a table showing the total assessed value of property within the area of primary influence, broken down preferably by census tract and at least by county, for 1998 and for 1990 and 1980, to provide a historical perspective. Meeting Goal 5 requires an understanding of the current economic condition of the area.	
37.	3-117	Last para	Please provide the absolute number of total housing in communities around the Salton Sea, in addition to the relative increase.	
38.	3-118	3.10	Please provide a table summarizing and quantifying the land use classifications.	
39.	3-118	3.10.2	Is this 390,000 dry land acre study area the five mile buffer? 3-116 cites a 7.8 million acre study area.	
40.	3-118	Last para	What are the land holdings of IID within the study area? IID is a quasi-public agency that is closely tied to the Restoration efforts; its holdings should be included in this section, including land holdings that are presently inundated.	
41.	3-125	4 th para	Imperial valley land designations give incorrect acreages, according to fig 3.11-1.	
42.	3-126	3 rd para	Imperial County ag economics should include a description of land devoted to pasture, accounting for 146,000 acres in 1998, and the value of livestock for Imperial County, accounting for \$205 million in revenue in 1998. This is also important because of the effluent discharged from feedlots into the Salton Sea, contributing to nutrient loading.	
43.	3-128	Fig 3.12-1	Map should show boundaries of Upper Gulf/Colorado River Delta Biosphere Reserve in Mexico. Cuyamaca State Park is misspelled. Golfo de California should be italicized and indicate the Gulf, rather than the State of Sonora. Montague and Pelican islands should be shaded while the Gulf should be white.	
44.	3-130	3.12.3	Why do the "study zones" differ from the "study area"? Why is there a six-mile buffer for the "study zone," a five mile buffer for the "study area," and a 15 mile buffer for the "area of primary influence"?	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
45.	3-137	Table 3.12-1	Why do the last two annual visitation figures only give three significant figures while all previous records include six significant figures? Are these last two figures preliminary or estimates? If so, or if they were generated by different methods, they should be indicated as such.	
46.	3-141	1 st line	Please explain the statement that there is a potential for the development of 20,000 residential lots in the west zone. Is this simply based on available land, or based on the plans of previous efforts to develop the area?	
47.	3-153	3.14.5	Discussion of the potential threat posed by human consumption of Salton Sea fish with elevated levels of selenium is inadequate. The Sea provides subsistence fishing for Native Americans (3-113) and may also contribute to a significant portion of the diet of others in the area. The absence of reported cases of selenium poisoning does not mean that such incidents have not occurred, particularly given historic under-reporting and misdiagnoses of disease incidence in minority communities.	
48.	4-1	4.1.1	Rate of increase of salinity would not be constant due to precipitation of Ca, Mg, SO ₄ , and CO ₃ (3-11ff and 4-15) – see comment #17.	
49.	4-1	4.1.1	Summary should include potential impacts to surface water quality with reduced inflows, due to groundwater inflows that may contain elevated levels of arsenic (3-15) (see comment #24).	
50.	4-19	3 rd para	Assessment of potential impacts of dredging are inadequate and misleading. Even assuming potential impacts <i>per dredging site</i> are roughly equivalent to the impacts on turbidity from Alamo River inflows, the cumulative impacts of the four dredging sites would be far greater. The elevated levels of organic material in Salton Sea sediments would likely further decrease the already low concentrations of dissolved oxygen as a result of dredging operations (4-20), causing large-scale die-offs of fish and invertebrates in the area, in addition to creating odor problems and potentially hazardous conditions for workers.	
51.	4-20	Last para	6-3 states that “The ponds in Alternative 1 are assumed to be unusable for salinity control after 30 years under the assumption that they have failed due to seismic events.” The probability of dike failure figures prominently in the selection of an appropriate alternative, especially given that such a failure could “reverse the beneficial effects of salinity reduction,” wiping out the progress that had been made. The water balance accounting model should be adapted to predict potential dike failure due to earthquakes.	
52.	4-20	Last para	The description of the potential impacts of dike failure on the Sea’s biota is inadequate. Such a breach would do more than “reverse the beneficial effects of salinity reduction,” likely causing large-scale die-offs of fish and invertebrates in the area, in turn impacting avian species, and recreational and economic development.	
53.	4-25	Last para	Inadequate discussion of the potential impacts of dredging and resuspending 4.7 million cubic yards (2-13) of Salton Sea sediments for the construction of the displacement dike (see comment #46). Please describe the impacts of failure of this dike due to a seismic event.	
54.	4-28	6 th para	See comment #12.	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
55.	4-29	2 nd para	Is the comment “by diverting less of the future flood flows to agricultural uses, existing levels of flow to the lower Colorado River Delta could be maintained” a policy recommendation? If not, why is it included here? (A more relevant statement would be, “By not diverting future flood flows to the Salton Sea, existing levels of flow to the lower Colorado River Delta could be maintained.”	
56.	4-29	2 nd para	Inadequate discussion of impacts of diverting flood flows from the Colorado River delta. The upper reaches of the Colorado River delta currently sustain some 1400 ha of native willow thickets and cottonwood-willow gallery forests, home to endangered species such as the southwestern willow flycatcher. This native riparian vegetation evolved in response to occasional flood events; such flows must be replicated to ensure the continued viability of these flora and the fauna they support. Current research indicates that this reach of the delta requires flood flows of at least 260,000 AF every four years; diverting such flows to the Salton Sea would negatively impact this critical desert riparian corridor and threaten its long-term existence. Flows beyond this baseline would generate additional benefits, including freshening the Rio Hardy wetlands and the estuary at the mouth of the river.	
57.	4-34	4.1.10	Cumulative effects should include an assessment of the cumulative effects of the proposed actions themselves, such as the combined effects of constructing an evaporation pond, the displacement dike, and the common actions. Such a cumulative effects assessment should be included for each of the environmental consequences sections.	
58.	4-39	1 st para	Last line – if groundwater inflows cannot be accurately predicted, why are they modeled at 10,000 AF/y (while damping impacts of salt precipitates, with similar uncertainty, are ignored)?	
59.	4-40	3 rd para	How would the ponds be lined? With fine-grained soils, as stated here, or “using techniques similar to those used for conventional landfills” (2-28), generally understood to include impermeable clay and pvc liners? Please clarify.	
60.	4-69	8 th para	Please define “meaningful quantities.” How would such precipitates affect revegetation?	
61.	4-69	Last para	States that exposed seabed would be expected to revegetate, reducing air quality impacts, yet 4-118 states that high salinity levels would preclude revegetation. Please clarify this inconsistency.	
62.	4-73	1 st para	The first sentence is empirically incorrect – a visual inspection of the Salton Sea’s shorelines reveals extensive salt deposition. Although chlorides and sulfates are the dominant salts in the Sea, the absolute quantity of other salts present in the Sea, including salts with a high potential for wind erosion, suggests that the threat of windblown dust is real. This potential should be calculated as part of the EIS. 3-13 suggests that some sulfate salts may have already reached their solubility limit; the EIS should rigorously assess the potential for such salts to be dispersed via prevailing winds south over agricultural and urban areas.	
63.	4-96	Line 4	This premise is overly conservative and aspatial, negating the potential for fish reproduction and larval stages to occur in the estuarine conditions that will continue to exist near inflows. Such nursery areas can be expected to extend the presence of fish, in numbers diminished by an unknown but increasing magnitude, until the adult salinity threshold is reached, by which point the species will be significantly impacted.	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
64.	4-104ff	4 th para-	Effect of no action alternative with reduced inflows is cursory and inadequately describes changes in conditions at the Sea that are likely to occur. This section should include information on the extent of estuarine conditions that are expected to exist under future conditions and the biota that will likely continue to exist there. This section should also include a description of potential impacts arising from the transition to a brine-fly/brine-shrimp dominated system, as noted on 4-108.	
65.	4-116	4.6.11	Tilapia spawn 5-8 times/year (3-68), and the other sport fish spawn at some point from February through August (3-72). Not implementing construction during these times would significantly increase construction time beyond the projected four years.	
66.	4-119	Line 10	States that salinity would reach 80,050 mg/L in 30 years while on 4-104 states would reach 75,050 mg/L in 30 years and ">75,000 mg/L" on 4-15. Please explain this inconsistency.	
67.	4-120	2 nd para	Please provide an estimate of the total loss of habitat at the haul site and due to construction of the haul road, and the estimated time needed for conditions to return to their current status, bearing in mind that low desert is not known for rapid regeneration of habitat.	
68.	4-121	4.7.6 – last line	Discussion of the impacts of the Displacement Dike is inadequate. According to the significance criteria (4.7.2), the Displacement Dike could have significant long-term impacts on avian resources due to modification or destruction of habitat. The dike would significantly modify habitat in the very middle of the region designated as "areas of heaviest avian use" (Figure 3.7-1). The dike itself would disturb or occupy approx. 520 in-Sea acres (2-26) and would modify or destroy an estimated 8.5 miles of shoreline, significantly impacting an estimated 1,200 acres of valuable nearshore and shoreline avian habitat (see Figure 3.8-2), including area protected as part of the NWR and Yuma clapper rail habitat (3-90), potentially jeopardizing an endangered species. Evaporating water contained within the dike could also have impacts similar to those described for the evaporation ponds and pupfish pond (4-119-120). The displacement dike could be located at other sites that would have far less significant impacts on avian habitat.	
69.	4-127	4.7.12	What are the capital and OME&R costs of the EES site radar units and air cannon? Where is the description of these project elements?	
70.	4-136	4 th para	The magnitude of socioeconomic effects will also depend on the extent to which other issues, including unacceptable levels of bird and fish die-offs, high nutrient loading, and perceptions and concerns about pollution from selenium, other chemicals, and microbes (1-5), are successfully addressed. Simply addressing salinity and elevation will not significantly affect shoreline- and recreational-based developments.	
71.	4-137	4.9.3	The "area immediately adjacent to the Sea" appears to roughly correspond to the "study area," but the "local area" is a new designation, varying from the "area of primary influence" and the "Phase I Study Area." Please explain the use of these inconsistent designations, which challenge efforts to assess the impacts.	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
72.	4-138	4 th para	Alternatively, visitation levels presently are the highest they've ever been in the past thirty years, with the exception of the period from 1980-86 (Table 3.12-1), despite the decreasing numbers of corvina (3-70). The assumption that visitor counts have increased as a result of a resurgence of corvina sportfishing is not supported elsewhere and should be substantiated. Steve Horvitz, director of the Salton Sea State Recreation Area, has noted that the increase is due to increased marketing efforts.	
73.	4-138	4 th para	Does the "surrounding area" mean the "local area" as defined on 4-137? If so, it is unlikely that no action would depress property values in all of Coachella Valley and all of Imperial County.	
74.	4-140	3 rd para	Please quantify the number of residents that would have to be relocated.	
75.	4-238	4.19.1	3-115 states that <2% of persons in the area of primary influence are employed in businesses that cater to recreational visire 9 22.818 Tw ues	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
85.	6-3	4 th para	There would be a cumulatively increasing probability that the evaporation ponds would fail due to weakening impacts of sub-catastrophic events, as well as stress generated by differential movement along fault lines. Has probability of dike failure been modeled, or is the assumption stated on 6-3 arbitrary? Is this failure integrated into the models for salinity and elevation? Such failure would increase the time required to reduce and stabilize salinity and elevation, potentially making such objectives unachievable.	
86.	6-12	1 st para	Assessments of potential impacts on the Colorado River downstream of the point of diversion are inadequate, inaccurate, and unsubstantiated, such as "level of uncertainty of benefits." This premise is vague and ill-defined, and fails to recognize the scientific literature demonstrating the critical importance of occasional flood flows for the successful germination of native riparian vegetation in the upper reaches of the delta. Nor does this represent a "change in the location of the benefits," as native riparian vegetation does not exist to any significant degree in the Salton basin. The potential benefits foregone by diverting flood flows to the Salton Sea are different both in kind and magnitude from those that could be generated in the Colorado River delta and the Upper Gulf of California.	
87.	6-16	Birds	Export to the Upper Gulf could have adverse short and long-term adverse impacts to bird species and special status species, as an indirect effect of the potential adverse impacts described for lower trophic levels and for fish.	
88.	6-17	Operation	Export to Gulf could have adverse short and long-term adverse impacts as a result of degradation of water quality, potentially reducing fish and shrimp catch of local fishermen.	
89.	6-27	6.3.2	Golfo de Santa Clara is outside the Core Zone but still within the Buffer Zone of the Biosphere Reserve.	
90.	6-29	2 nd para	Stated discharge is 345:200 cfs or 173% of stated MODE discharge, not 2/3 MODE discharge. Actual annual MODE discharge is closer to 125 cfs; flow at the mouth of the Colorado River is effectively zero in most years. Thus, the salt loading rate into the Upper Gulf would be 28 – 56 times higher than the rate of existing inflows.	
91.	6-30	1	Previous sentence says that discharge could have a significant impact on local ground water. Given the high seismicity of the region, as noted by the probability of dike failure, why is discharge considered unlikely?	
92.	6-32	2 nd para	El Centro County (<i>s/c</i>)	
93.	6-43	1 st para	CASI water at 5,000 mg/l is not less saline than existing inflows to the Sea.	
94.	6-47	1 st line	"alternative, higher use" is not substantiated; freshening effects of CASI inflows to the Upper Gulf potentially could positively benefit endangered species there, as well as improve the shrimp catch, generating tangible economic benefits.	
95.	9-3	9.1.2	"first in line, first in right" is usually stated as "first in time, first in right," to avoid confusion with any precedence based on the geography of the claim.	
96.	12-2		"CASI" and "Displacement Dike" should be included in the index.	

Cmnt.#	Page #	Line #	Comment	Response (Contractor)
97.	fig 3.3-2		Legend should explain color scheme for soil associations.	