APPENDIX F, ATTACHMENT F2

Methodology for Estimating Selenium Concentrations in Surface Water, Sediment, Soil, and Biota

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SURFACE WATER

Surface water selenium concentrations (in micrograms per liter [µg/L]) for each habitat under Existing Conditions were based on selenium concentrations directly measured in each habitat. Surface water concentrations for each habitat in each future alternative were estimated as a function of selenium concentrations in inflowing source waters and the volume of water from each source to be delivered to that habitat. Selenium concentrations in inflowing source waters were assumed to be the following:

- New River: 4.6 µg/L (Existing Conditions as reported in Imperial Irrigation District [IID] [2002]);
- Alamo River: 10 µg/L (Existing Conditions as reported in IID [2002]);
- Direct Drains: 7.5 µg/L (based on August and October 2005 and January 2006 U.S. Geological Survey [USGS] sampling data);
- Whitewater River: 3.5 µg/L (CVWD, 2002);
- Local precipitation and drainage: 0.5 µg/L (a conservative assumption, based on 0.02-0.37 µg/L range reported by Kubota et al. [1975]);
- Brine: 2.15 µg/L (assumed based on measured data for Existing Conditions Salton Sea Open Water)1;
- Marine spill: 2.15 µg/L (assumed to be the same as brine); and
- Colorado River 2.5 µg/L (Existing Conditions as reported in IID [2002]).

Values for volume of water (thousand acre-feet/year) to be delivered from each water source to each habitat were derived from a CALSIM model run (Appendix H-2). The values from the SALSA model are similar to but not identical to the values evaluated in the Programmatic Environmental Impact Report (PEIR) alternatives. These inflows were proportioned into the various habitat areas based on proposed infrastructure facilities and anticipated operations in the year 2078. Inflows to each habitat from each source as thousand acre-feet /yr were converted to inflows as L/year by multiplying by $1.23*10^9$ ($1.23*10^6$ L per acre-foot $*10^3$ acre-feet). Selenium load (µg/year) input to each habitat from each source was estimated by multiplying the selenium concentration from inflowing source waters (µg/L) by the inflow volume (L/year) from each source. The resulting blended selenium concentration (µg/L) in surface water in each habitat as a result of the inflow from all sources was the total selenium load for a habitat (sum over input from all sources) divided by the total inflow (summed over all input sources).

Water inflows (thousand acre-feet /yr and L/yr) and selenium loadings (µg/yr) from each source to each habitat, and the resulting blended selenium concentrations in each habitat are summarized for all alternatives in Table F2-1. Acreage values were developed based upon preliminary descriptions of the

[1] The 2.15 µg/L value was the calculated EPC for Open Water (based on the 99 percent Chebyshev [Mean, Sd] UCL).

alternatives that have been refined. The values are similar to those described in Chapter 3 and can be used to compare conditions under the alternatives.

SEDIMENT

Selenium concentration data (mg/kg, dry weight [DW]) for Salton Sea sediments under Existing Conditions are based on both directly measured and estimated values. The directly measured values consist of samples derived from multiple sources and represent selenium concentrations in Salton Sea surface sediments generally 3 to 6 inches in depth. These measured values were used to generate estimated concentrations for the entire Salton Sea on a 200-meter grid. The method by which measured values were used to generate estimated concentrations consisted of an inverse distance weighted method, using the 12 nearest points. Measured and estimated selenium concentrations representing Existing Conditions are presented in Figure F2-1. The full dataset is presented in Attachment F-1.

For all future alternatives, both measured and estimated Existing Conditions selenium concentrations were modified based on an assumed behavior of selenium in lake or wetland environments, projected changes in the surface area of habitats, and assumed changes in annual influent selenium loads to the habitat. Selenium concentrations in future dried lakebed habitats (e.g., Exposed Playa [non-AQM] and Protective Salt Flat) were assumed to be the same as current selenium concentrations at those locations.

Under Existing Conditions, it was assumed that influent selenium loads are taken up by biota or adsorbed to particulates and settled to the surface sediment. Thus, the current selenium concentrations in sediment reflect the well-mixed total load to the surface sediment spread over the total surface area of bottom sediment. This is a simplified model of current conditions but it provides a method of estimating future sediment selenium concentrations for all future alternatives.

For all future modifications of the current lake habitats or creation of new habitats over existing lake sediments, selenium concentrations in sediment were estimated to be the simple average of existing concentrations and the selenium concentration of newly added sediment. Selenium concentrations in newly added sediment were estimated by multiplying the current measured or estimated selenium concentrations for sediment samples within each habitat area by a factor based on changes in waterborne selenium loading per unit of surface area that would be associated with creation of the future habitat.

This approach implicitly assumes equal mixing of existing and future sediments, while taking both load and area into account. For example, a reduction of lake area to one-fourth of the lake's current size (e.g., drawing down of Brine Sink) without changing the annual selenium inflow load would result in a four-fold increase in the selenium concentrations in newly deposited surface sediment. Similarly, any increase or decrease in annual selenium loading to the lake would result in a proportional change in sediment selenium concentrations (independent of change in lake area). The estimated loads to the new habitats were divided by their areas to create a load per unit area (e.g., kg Se/acre/year). That estimated loading was divided by the current, measured lake-wide average loading. The ratio of these two area-based loads provides an indication of the direction and magnitude of long-term changes in selenium concentrations associated with the new habitats, and was used as the multiplier to apply to existing estimates of sediment selenium concentration.

The future selenium concentration in surface sediment for all habitats associated with the various alternatives was estimated based on changing loads per unit area, as follows:

$$\mathrm{Sed}_{future} = \frac{\mathrm{Sed}_{current} + (\mathrm{Sed}_{current} * f)}{2}$$

Where:

Sed_{future}	=	Future sediment selenium concentration (Total Se, mg/kg, DW)
$Sed_{current}$	=	Current sediment selenium concentration (Total Se, mg/kg, DW)
f	=	proportional inflow change multiplier (expressed as (future kg Se/habitat acres/year)/(total current kg Se/total lake acres/year)

This simple proportional inflow change multiplier technique indicates that a greater future load to a particular habitat will increase future sediment selenium concentrations in that habitat. Values used to derive the proportional inflow change multiplier for each habitat in each alternative are presented in Table F2-2.

Evaluation of Initial Sediment Data under Each Alternative

A statistical evaluation was performed for the initial measured and estimated sediment selenium concentrations (Table F2-3). These data represent current selenium concentrations before application of the proportional inflow change multiplier to estimate future concentrations in sediment. This analysis was conducted to describe distributions of both measured and estimated selenium concentrations within each habitat under each alternative and to determine whether initial measured and estimated concentrations in sediment differed statistically from each other. The non-parametric Wilcoxon Rank-sum test was used to determine whether measured or estimated concentrations differ significantly. Two-tailed tests were conducted with differences considered significant when $p<0.05$.

In addition to these tests, the spatial area for each habitat in each alternative was divided by the number of measured samples to determine the number of acres each measured sample represented (i.e., acres per measured sample). This value provides an estimate of the uncertainty associated with sediment data for a given habitat within an alternative, and indicates the uncertainty in concentration values when compared across alternatives. As the number of acres per measured sample increases, uncertainty associated with sediment concentrations increases. Spatial distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea under Existing Conditions are presented in Figure F2-1. All subsequent analyses and alternatives are based on the data in this figure.

The locations of habitats under the No Action Alternative-CEQA Conditions were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-2). Six habitats would exist under the No Action Alternative-CEQA Conditions: Exposed Playa (AQM), Alamo, New, and Whitewater river estuaries, Open Water, and Shoreline and Shallow Water. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-3. Note that text for abbreviations used in all figures are summarized in Table F2-4. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment selenium concentrations was observed for only one habitat type, Exposed Playa (AQM), with measured concentrations exceeding estimated concentrations. No differences were observed for three habitats (New River Estuary, Open Water, and Shore Line). Measured data were lacking for two habitats (Alamo and Whitewater river estuaries). The number of acres per sample (based only on habitats with measured data) range from 85 acres for the New River Estuary to 4,148 acres for Open Water. The median area per measured sample for the No Action Alternative-CEQA Conditions is 142 acres.

The location of habitats under the No Action Alternative-Variability Conditions overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea are presented in Figure F2-4. Six habitats would exist under the No Action Alternative-Variability Conditions : Exposed Playa (AQM); Alamo, New, and Whitewater river estuaries;

Open Water; and Shore Line. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-5. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment selenium concentrations was observed only for Exposed Playa (AQM), with measured concentrations exceeding estimated concentrations. No differences were observed for Open Water and Shore Line. Measured data were lacking for the Alamo, New, and Whitewater river estuaries. The number of acres per measured sample (based only on habitats with measured data) range from 354 acres for Exposed Playa (AQM) to 6,068 acres for Open Water. The median area per measured sample for the No Action Alternative-Variability Conditions is 177 acres.

The locations of habitats under the Alternative 1 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-6). Four habitats would be created under Alternative 1: Exposed Playa (AQM), Brine Sink, Saline Habitat Complex-South (Rivers), and Saline Habitat Complex-South (Drains). Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-7. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment concentrations was observed for Brine Sink (measured concentrations exceeded estimated concentrations) and Saline Habitat Complex-South (Drains) (estimated concentrations exceeded measure concentrations). No differences were observed for Exposed Playa (AQM) and Saline Habitat Complex-South (Rivers). The number of acres per measured sample range from 338 acres for Saline Habitat Complex- South (Drains) to 7,011 acres for Brine Sink in this evaluation. The median area per measured sample for Alternative 1 is 385 acres.

The locations of habitats under Alternative 2 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-8). Five habitats would be created under the Saline Habitat Complex II alternative: Exposed Playa (AQM), Brine Sink, Saline Habitat Complex-North, Saline Habitat Complex-South, and Saline Habitat Complex-West. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-9. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment selenium concentrations was observed for Exposed Playa (AQM) (estimated concentrations exceeded measure concentrations) and Brine Sink (measured concentrations exceeded estimated concentrations). No differences were observed for Saline Habitat Complex-North, Saline Habitat Complex-South, and Saline Habitat Complex-West. The number of acres per measured sample range from 258 acres for Saline Habitat Complex-North to 5,761 acres for Brine Sink in this evaluation. The median area per measured sample for Alternative 2 is 533 acres.

The locations of habitats under Alternative 3 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-10). Four habitats would be created under Alternative 3: Exposed Playa (AQM), Brine Sink, First Ring, and Second Ring. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-11. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment selenium concentrations was observed for Exposed Playa (AQM) and the First Ring, with estimated concentrations exceeding measured concentrations, and for Brine Sink and the Second Ring, with measured concentrations exceeding estimated concentrations. The number of acres per measured sample range from 177 acres for the First Ring to 5,181 acres for Brine Sink in this evaluation. The median area per measured sample for Alternative 3 is 1,856 acres.

The locations of habitats under Alternative 4 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-12). Ten habitats would be created under Alternative 4: Brine Sink, Exposed Playas 1 through 5, and First Lake through Fourth Lake. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-13. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment selenium concentrations was observed for Exposed Playas 2, 3, and 4, and First Lake (estimated concentrations exceeded measured concentrations), and for Brine Sink, and Second Lake (measured concentrations exceeded estimated concentrations). No differences were observed for Exposed Playas 1 and 5, Third Lake, and Fourth Lake. The number of acres per measured sample range from 187 acres for both Exposed Playa 2 and First Lake to 11,130 acres for Fourth Lake in this evaluation. The median area per measured sample for Alternative 4 is 1,755 acres.

The locations of habitats under Alternative 5 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-14). Four habitats would be created under Alternative 5: Exposed Playa (AQM), Brine Sink, Marine Sea, and Saline Habitat Complex. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-15. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment concentrations was observed for Exposed Playa (AQM) (estimated concentrations exceeded measure concentrations). No differences were observed for Brine Sink, Marine Sea, or Saline Habitat Complex. The number of acres per measured sample ranged from 340 acres for Saline Habitat Complex to 5,260 acres for Brine Sink in this evaluation. The median area per measured sample for Alternative 5 is 965 acres.

The locations of habitats under Alternative 6 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-16). Four habitats would be created under Alternative 6: Exposed Playa (AQM), Brine Sink, Marine Sea, and Saline Habitat Complex. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-17. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. Significant differences between measured and estimated sediment concentrations were observed for Exposed Playa (AQM) and Marine Sea (estimated concentrations exceeded measured concentrations), and for Brine Sink (measured concentrations exceeded estimated concentrations). No differences were observed for the Saline Habitat Complex habitat. The number of acres per measured sample range from 437 acres for Marine Sea habitat to 1,515 acres for Brine Sink in this evaluation. The median area per measured sample for Alternative 6 is 942 acres.

The locations of habitats under Alternative 7 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-18). Eight habitats would be created under Alternative 7: Brine Sink, IID Freshwater Reservoir, Marine Sea (Recreational Saltwater and Recreational Estuary Lakes), Exposed Playas 1 and 2, Protective Salt Flat, Saline Habitat Complex-East, and Saline Habitat Complex-North. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-19. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. Significant differences between measured and estimated sediment concentrations were observed for Marine Sea, Exposed Playa 1, and Protective Salt Flat (estimated concentrations exceeded measured concentrations). No differences were observed for Exposed Playa 2, Brine Sink, IID Freshwater Reservoir, or both Saline Habitat Complex habitats in this evaluation. The number of acres per measured sample range from 210 acres for the Saline

Habitat Complex-North habitat to 7,183 acres for the Protective Salt Flat habitat in this evaluation. The median area per measured sample for Alternative 7 is 810 acres.

The locations of habitats under Alternative 8 were overlaid on the distribution of measured sediment samples and isopleths of estimated selenium concentrations for the entire Salton Sea (Figure F2-20). Four habitats would be created under Alternative 8: Exposed Playa (AQM), Brine Sink, Marine Sea, and Saline Habitat Comlex. Boxplots displaying the distributions of measured and estimated selenium concentrations in each of these habitats are presented in Figure F2-21. Summary statistics, results of Wilcoxon Rank-sum tests comparing measured and estimated values, and calculated acres per measured sample are presented in Table F2-3. A significant difference between measured and estimated sediment concentrations was observed for three habitat types: Exposed Playa (AQM) (estimated concentrations exceeded measured concentrations), and Marine Sea and Brine Sink (measured concentrations exceeded estimated concentrations). No differences were observed for the Saline Habitat Complex habitat. The number of acres per measured sample range from 354 acres for Marine Sea habitat to 10,348 acres for Brine Sink. The median area per measured sample for Alternative 8 is 4,828 acres.

Statistically significant differences between measured and estimated sediment selenium concentrations were observed for at least one habitat in any alternative. However, because the ranges of measured and estimated sample concentrations broadly overlap, these differences likely have limited influence on overall uncertainty associated with the underlying sediment data. The number of acres per measured sample for each habitat within an alternative and over all habitats within an alternative is a more important measure of uncertainty associated with the data used for the risk evaluation. The lower the number of acres per measured sample, the lower the uncertainty. Although the No Action Alternative-CEQA Conditions and No Action Alternative-Variability Conditions had the lowest median number of acres per measured sample across all habitats, and among the narrowest range of acres/sample ratios, both of these alternatives had at least two habitats that had no measured sediment samples. The complete absence of samples from some habitats creates substantial uncertainties for the range of conditions in the No Action Alternative. Among the remaining alternatives, Alternatives 1 and 2 had the lowest number of acres per measured sample (as both median and habitat-specific values), Alternatives 5 and 6 followed by Alternative 7 were intermediate, and Alternatives 3, 4, and 8 had the most (Table F2-3). Based on these data, uncertainty associated with underlying sediment data for each alternative was ranked in increasing order as follows:

> Alternative 1 = Alternative 2 < No Action Alternative-CEQA Conditions= No Action Alternative-Variability Conditions < Alternative 5 = Alternative 6 < Alternative 7 < Alternative 3 < Alternative 4 < Alternative 8.

SOIL

Concentrations of selenium in soil were needed only for the Exposed Playa (AQM), Exposed Playa (non-AQM), and/or Protective Salt Flat areas under each alternative. It was assumed that no selenium would be added to the sediments (future soils) before water levels recede to their future levels as a result of reduced inflows. As a consequence, soil selenium concentrations in these areas were assumed to be equivalent to Existing Conditions sediment concentrations for these areas.

BIOTA

Bioaccumulation models were needed to estimate selenium concentrations in biota based on either sediment or soil. Sediment bioaccumulation is described by biota-sediment accumulation factors (BSAFs). Soil bioaccumulation is described by bioaccumulation factors (BAFs). Development of these values is described below.

Sediment

BSAF values measure the relative accumulation of chemicals in the tissues of aquatic biota as compared to the concentrations of those same chemicals in co-located sediment. Values greater than 1.0 indicate a tendency of the organisms to accumulate the chemicals in exceedances of ambient environmental concentrations. BSAF values for selenium were needed for Salton Sea aquatic receptors as a simple model to link tissue and sediment concentrations so that future biota concentrations could be predicted from projections of future sediment quality.

The whole-body tissue selenium concentrations of aquatic receptors were compared to co-located sediment concentrations. Sediment samples were averaged from the immediate area where the biota were sampled as a means of creating an average sediment exposure over some estimate of the receptor's home range. Selenium concentrations in whole-body composite samples of tilapia were compared to sediment concentrations averaged over two different potential home ranges: 1) the four, approximately evenly-divided, entire lake quadrants, or 2) circular home ranges 5 miles in diameter. Invertebrate (and macroalgae) samples were compared to sediment results falling within a 1-mile diameter range around each tissue sampling point.

Once sediment concentration values corresponding spatially to biota samples had been identified, regression analyses were conducted to determine if linear relationships between sediment and biota concentrations were present. Only one group, corixid insects (water boatmen), showed a statistically-significant positive relationship between log whole-body selenium concentrations and log sediment selenium concentrations ($r^2 = 0.71$, $P < 0.05$). The BSAF relationship, useful for predicting change in Salton Sea corixid selenium concentration as a function of future sediment values is:

$$\text{Corixid Se conc. (mg/kg, DW)} = 10^{(0.239+(0.359*\text{Log Sediment Conc.})}$$

Data used to develop this relationship are presented in Table F2-5.

The other groups of aquatic biota did not show significant regression relationships as determined by variation in sediment selenium. Consequently, their BSAF values are best represented by the following simple ratio:

$$\text{BSAF (unitless)} = \text{(tissue concentration/sediment concentration)}.$$

Future tissue concentrations may be estimated by multiplying future sediment concentrations (mg/kg, DW) times the individual BSAF values. BSAFs for Salton Sea biota were estimated as follows:

- Tilapia: 4.6;
- Macroalgae: 0.4; and
- Pileworms: 4.9.

Data used to develop the Salton Sea-specific BSAFs for fish, macroalgae, and pileworms are presented in Tables F2-6 and F2-7.

Soil

Different sets of terrestrial bioaccumulation models were used to estimate uptake into invertebrates and small mammals in agricultural habitats adjacent to the Salton Sea and in the Exposed Playa (AQM), Exposed Playa (non-AQM), and Protective Salt Flat areas.

Published bioaccumulation models from Sample et al. (1999 and 1998) were used to estimate selenium uptake from soil into earthworms and small mammals. These models were:

$$\text{Earthworm} - \ln(\text{worm Se, mg/kg, DW}) = 0.733*(\ln[\text{soil Se mg/kg, DW}])-0.075$$

Small Mammal – ln (small mammal Se, mg/kg, DW) = 0.376*(ln [soil Se mg/kg, DW])-0.416

Conditions in the Exposed Playa (AQM), Exposed Playa (non-AQM), and Protective Salt Flat areas are expected to be inhospitable to both invertebrates and small mammals. High salinity and low moisture are likely to limit the invertebrate community so that earthworms would not be present and the community would be dominated by insects. Those conditions also suggest that the habitat would support the presence of small mammal species (such as kangaroo rats) that are adapted to arid conditions. Limited selenium bioaccumulation data for insects and small mammals have been collected in the Salton Sea area (Gersberg and Wright, unpubl. data). These data are summarized in Table F2-8. Because the degree of selenium bioaccumulation observed for insects from the Salton Sea was comparable to that observed for insects previously collected at Kesterson (Figure F2-22), the Kesterson insect bioaccumulation model was used for the Exposed Playa (AQM), Exposed Playa (non-AQM), and Protective Salt Flat habitats. This model is of the following form:

Insect – log (insect Se, mg/kg, DW) = 0.22*(log [soil Se mg/kg, DW])+0.8

Data from Kesterson for small mammals was well scattered and no clear linear relationship is evident for any species or for any trophic group. The limited Salton Sea data also displayed considerable scatter, with BAFs ranging from 1.1 to 6.7 (Table F2-8). Given the limited data available, site-specific values were considered most relevant. Consequently, the median BAF (3.5) from the Salton Sea data was selected for estimation of selenium concentrations in small mammals in the Exposed Playa (AQM), Exposed Playa (non-AQM), and Protective Salt Flat habitats.

TABLES

TABLE F2-1

Summary of Estimation of Selenium Concentrations in Inflow Waters, Flow Apportionment by Habitats, and Blended Water Concentrations by Habitats in Salton Sea Restoration Alternatives

		Se (ug/L) in inflow water[a]								
		New River	Alamo River	Direct Drains	Whitewater River	Local	Brine	Marine Spill		
		4.6	10	7.5	3.5	0.5	2.15	2.15		
Alternative	**Habitat Types by Alternative**	**Water Inflows by Source (TAF/yr)**							**Total**	**Blended Selenium Concentration by Habitat (ug/L)[b]**
No Action Alternative - CEQA Conditions	Exposed Playa (AQM)	15	10						25	
	Combined Open Water, Shoreline, and Estuary	271	399	69	138	21	0		898	
	Total TAF/yr	286	409	69	138	21	0	0	923	
		Water Inflows by Source (L/yr)[c]								
	Exposed Playa (AQM Area)	1.85E+10	1.23E+10	0	0	0	0	0	3.08E+10	
	Combined Open Water, Shoreline, and Estuary	3.33E+11	4.91E+11	8.49E+10	1.70E+11	2.58E+10	0	0	1.10E+12	
	Total (L/yr)	3.52E+11	5.03E+11	8.49E+10	1.70E+11	2.58E+10	0	0	1.14E+12	
		Input of Se Load (ug/yr)[d]								
	Exposed Playa (AQM)	8.49E+10	1.23E+11	0	0	0	0	0	2.08E+11	6.76
	Combined Open Water, Shoreline, and Estuary	1.53E+12	4.91E+12	6.37E+11	5.94E+11	1.29E+10	0	0	7.68E+12	6.96
	Total (ug Se/yr)	1.62E+12	5.03E+12	6.37E+11	5.94E+11	1.29E+10	0	0	7.89E+12	
No Action Alternative - Variability Conditions	Exposed Playa (AQM)	30	18						48	
	Combined Open Water, Shoreline, and Estuary	156	337	60	97	20	0		670	
	Total TAF/yr	186	355	60	97	20	0	0	718	
		Water Inflows by Source (L/yr)[c]								
	Exposed Playa (AQM)	3.69E+10	2.21E+10	0	0	0	0	0	5.90E+10	
	Combined Open Water, Shoreline, and Estuary	1.92E+11	4.15E+11	7.38E+10	1.19E+11	2.46E+10	0	0	8.24E+11	
	Total (L/yr)	2.29E+11	4.37E+11	7.38E+10	1.19E+11	2.46E+10	0	0	8.83E+11	
		Input of Se Load (ug/yr)[d]								
	Exposed Playa (AQM)	1.70E+11	2.21E+11	0	0	0	0	0	3.91E+11	6.63
	Combined Open Water, Shoreline, and Estuary	8.83E+11	4.15E+12	5.54E+11	4.18E+11	1.23E+10	0	0	6.01E+12	7.29
	Total (ug Se/yr)	1.05E+12	4.37E+12	5.54E+11	4.18E+11	1.23E+10	0	0	6.40E+12	

TABLE F2-1

Summary of Estimation of Selenium Concentrations in Inflow Waters, Flow Apportionment by Habitats, and Blended Water Concentrations by Habitats in Salton Sea Restoration Alternatives

		Se (ug/L) in inflow water[a]								
		New River	Alamo River	Direct Drains	Whitewater River	Local	Brine	Marine Spill		
		4.6	10	7.5	3.5	0.5	2.15	2.15		
Alternative	**Habitat Types by Alternative**	**Water Inflows by Source (TAF/yr)**							**Total**	**Blended Selenium Concentration by Habitat (ug/L)[b]**
Alternative 1 Saline Habitat Complex I	Saline Habitat Complex-South (Drains)			28		0	0	-5	23	
	Saline Habitat Complex South (Rivers)	57	66	32		2		-25	132	
	Exposed Playa (AQM)	13	15				13	-3	38	
	Brine Sink	118	276	0	97	18	20		529	
	Total TAF/yr	188	357	60	97	20	33	-33	722	
		Water Inflows by Source (L/yr)[c]								
	Saline Habitat Complex-South (Drains)	0	0	3.44E+10	0	0	0	-6.15E+09	2.83E+10	
	Saline Habitat Complex South (Rivers)	7.01E+10	8.12E+10	3.94E+10	0	2.46E+09	0	-3.08E+10	1.62E+11	
	Exposed Playa (AQM)	1.60E+10	1.85E+10	0	0	0	1.60E+10	-3.69E+09	4.67E+10	
	Brine Sink	1.45E+11	3.39E+11	0	1.19E+11	2.21E+10	2.46E+10	0	6.51E+11	
	Total (L/yr)	2.31E+11	4.39E+11	7.38E+10	1.19E+11	2.46E+10	4.06E+10	-4.06E+10	8.88E+11	
		Input of Se Load (ug/yr)[d]								
	Saline Habitat Complex-South (Drains)	0	0	2.58E+11	0	0	0	-1.32E+10	2.45E+11	8.66
	Saline Habitat Complex South (Rivers)	3.23E+11	8.12E+11	2.95E+11	0	1.23E+09	0	-6.61E+10	1.36E+12	8.40
	Exposed Playa (AQM)	7.36E+10	1.85E+11	0	0	0	3.44E+10	-7.93E+09	2.84E+11	6.09
	Brine Sink	6.68E+11	3.39E+12	0	4.17585E+11	1.11E+10	5.29E+10	0	4.54E+12	6.98
	Total (ug Se/yr)	1.06E+12	4.39E+12	5.54E+11	4.18E+11	1.23E+10	8.73E+10	-8.73E+10	6.44E+12	
Alternative 2 Saline Habitat Complex II	Saline Habitat Complex-South	65	136	60	0	6	13	-45	235	
	Saline Habitat Complex-West	47					3	-8	42	
	Saline Habitat Complex-North				51		3	-8	46	
	Exposed Playa (AQM)	11	9				16	-3	33	
	Brine Sink	66	213		46	14	48	-19	368	
	Total TAF/yr	189	358	60	97	20	83	-83	724	
		Water Inflows by Source (L/yr)[c]								
	Saline Habitat Complex- South	8.00E+10	1.67E+11	7.38E+10	0	7.38E+09	1.60E+10	-5.54E+10	2.89E+11	
	Saline Habitat Complex- West	5.78E+10	0	0	0	0	3.69E+09	-9.84E+09	5.17E+10	
	Saline Habitat Complex- North	0	0	0	6.27E+10	0	3.69E+09	-9.84E+09	5.66E+10	
	Exposed Playa (AQM)	1.35E+10	1.11E+10	0	0	0	1.97E+10	-3.69E+09	4.06E+10	
	Brine Sink	8.12E+10	2.62E+11	0	5.66E+10	1.72E+10	5.90E+10	-2.34E+10	4.53E+11	
	Total (L/yr)	2.32E+11	4.40E+11	7.38E+10	1.19E+11	2.46E+10	1.02E+11	-1.02E+11	8.91E+11	
		Input of Se Load (ug/yr)[d]								
	Saline Habitat Complex- South	3.68E+11	1.67E+12	5.54E+11	0	3.69E+09	3.44E+10	-1.19E+11	2.51E+12	8.69
	Saline Habitat Complex- West	2.66E+11	0	0	0	0	7.93E+09	-2.12E+10	2.53E+11	4.89
	Saline Habitat Complex- North	0	0	0	2.20E+11	0	7.93E+09	-2.12E+10	2.06E+11	3.65
	Exposed Playa (AQM)	6.22E+10	1.11E+11	0	0	0	4.23E+10	-7.93E+09	2.07E+11	5.11
	Brine Sink	3.73E+11	2.62E+12	0	1.98E+11	8.61E+09	1.27E+11	-5.02E+10	3.28E+12	7.24
	Total (ug Se/yr)	1.07E+12	4.40E+12	5.54E+11	4.18E+11	1.23E+10	2.19E+11	-2.19E+11	6.46E+12	

TABLE F2-1

Summary of Estimation of Selenium Concentrations in Inflow Waters, Flow Apportionment by Habitats, and Blended Water Concentrations by Habitats in Salton Sea Restoration Alternatives

		Se (ug/L) in inflow water[a]								
		New River	Alamo River	Direct Drains	Whitewater River	Local	Brine	Marine Spill		
		4.6	10	7.5	3.5	0.5	2.15	2.15		
Alternative	**Habitat Types by Alternative**	**Water Inflows by Source (TAF/yr)**							**Total**	**Blended Selenium Concentration by Habitat (ug/L)[b]**
Alternative 3 Concentric Rings	First Ring	8	8	60	97	16		-55	134	
	Second Ring	90	124				27	-61	180	
	Exposed Playa (AQM)	20	22				12	-5	49	
	Brine Sink	69	202	0	0	4	83		358	
	Total TAF/yr	187	356	60	97	20	122	-121	721	
		Water Inflows by Source (L/yr)[c]								
	First Ring	9840000000	9840000000	7.38E+10	1.1931E+11	1.97E+10	0	-6.77E+10	1.6482E+11	
	Second Ring	1.107E+11	1.5252E+11	0	0	0	3.32E+10	-7.5E+10	2.214E+11	
	Exposed Playa (AQM)	24600000000	2.706E+10	0	0	0	1.48E+10	-6.15E+09	60270000000	
	Brine Sink	84870000000	2.4846E+11	0	0	4.92E+09	1.02E+11	0	4.4034E+11	
	Total (L/yr)	2.3001E+11	4.3788E+11	7.38E+10	1.1931E+11	2.46E+10	1.50E+11	-1.49E+11	8.8683E+11	
		Input of Se Load (ug/yr)[d]								
	First Ring	45264000000	9.84E+10	5.54E+11	4.18E+11	9.84E+09	0	-1.45E+11	9.79142E+11	5.94
	Second Ring	5.0922E+11	1.5252E+12	0	0	0	7.14E+10	-1.61E+11	1.94451E+12	8.78
	Exposed Playa (AQM)	1.1316E+11	2.706E+11	0	0	0	3.17E+10	-1.32E+10	4.02272E+11	6.67
	Brine Sink	3.90402E+11	2.4846E+12	0	0	2.46E+09	2.19E+11	0	3.09696E+12	7.03
	Total (ug Se/yr)	1.05805E+12	4.3788E+12	5.54E+11	4.18E+11	1.23E+10	3.23E+11	-3.2E+11	6.42288E+12	
Alternative 4 Concentric Lakes	First Lake			39		2		-7	34	
	Second Lake	12	14	5	97	15	7	-21	129	
	Third Lake	60	60	5			21	-22	124	
	Fourth Lake	80	158	11		1	22	-24	248	
	Exposed Playa (1 - 5)								0	
	Brine Sink	35	123			2	24		184	
	Total TAF/yr	187	355	60	97	20	74	-74	719	
		Water Inflows by Source (L/yr)[c]								
	First Lake	0	0	4.80E+10	0	2.46E+09	0	-8.61E+09	41820000000	
	Second Lake	14760000000	1.722E+10	6.15E+09	1.19E+11	1.85E+10	8.61E+09	-2.58E+10	1.5867E+11	
	Third Lake	73800000000	7.38E+10	6.15E+09	0	0	2.58E+10	-2.71E+10	1.5252E+11	
	Fourth Lake	98400000000	1.9434E+11	1.35E+10	0	1.23E+09	2.71E+10	-2.95E+10	3.0504E+11	
	Exposed Playa (1 - 5)	0	0	0	0	0	0	0	0	
	Brine Sink	43050000000	1.5129E+11	0	0	2.46E+09	2.95E+10	0	2.2632E+11	
	Total (L/yr)	2.3001E+11	4.3665E+11	7.38E+10	1.19E+11	2.46E+10	9.10E+10	-9.1E+10	8.8437E+11	
		Input of Se Load (ug/yr)[d]								
	First Lake	0	0	3.60E+11	0	1.23E+09	0	-1.85E+10	3.42494E+11	8.19
	Second Lake	67896000000	1.722E+11	4.61E+10	4.18E+11	9.23E+09	1.85E+10	-5.55E+10	6.76008E+11	4.26
	Third Lake	3.3948E+11	7.38E+11	4.61E+10	0	0	5.55E+10	-5.82E+10	1.12096E+12	7.35
	Fourth Lake	4.5264E+11	1.9434E+12	1.01E+11	0	6.15E+08	5.82E+10	-6.35E+10	2.49284E+12	8.17
	Exposed Playa (1 - 5)	0	0	0	0	0	0	0	0	
	Brine Sink	1.9803E+11	1.5129E+12	0	0	1.23E+09	6.35E+10	0	1.77563E+12	7.85
	Total (ug Se/yr)	1.05805E+12	4.3665E+12	5.54E+11	4.18E+11	1.23E+10	1.96E+11	-1.96E+11	6.40793E+12	

TABLE F2-1

Summary of Estimation of Selenium Concentrations in Inflow Waters, Flow Apportionment by Habitats, and Blended Water Concentrations by Habitats in Salton Sea Restoration Alternatives

		Se (ug/L) in inflow water[a]								
		New River	Alamo River	Direct Drains	Whitewater River	Local	Brine	Marine Spill		
		4.6	10	7.5	3.5	0.5	2.15	2.15		
Alternative	**Habitat Types by Alternative**	**Water Inflows by Source (TAF/yr)**							**Total**	**Blended Selenium Concentration by Habitat (ug/L)[b]**
Alternative 5 North Sea	Saline Habitat Complex	26	107	60	0	2	44	-38	201	
	Marine Sea	110	203	0	97	4		-44	370	
	Exposed Playa (AQM)	20	23				13	-6	50	
	Brine Sink	31	23	0	0	14	31		99	
	Total TAF/yr	187	356	60	97	20	88	-88	720	
		Water Inflows by Source (L/yr)[c]								
	Saline Habitat Complex	3.20E+10	1.32E+11	7.38E+10	0	2.46E+09	5.41E+10	-4.67E+10	2.47E+11	
	Marine Sea	1.35E+11	2.50E+11	0	1.19E+11	4.92E+09	0	-5.41E+10	4.55E+11	
	Exposed Playa (AQM)	2.46E+10	2.83E+10	0	0	0	1.60E+10	-7.38E+09	6.15E+10	
	Brine Sink	3.81E+10	2.83E+10	0	0	1.72E+10	3.81E+10	0	1.22E+11	
	Total (L/yr)	2.30E+11	4.38E+11	7.38E+10	1.19E+11	2.46E+10	1.08E+11	-1.08E+11	8.86E+11	
		Input of Se Load (ug/yr)[d]								
	Saline Habitat Complex	1.47E+11	1.32E+12	5.54E+11	0	1.23E+09	1.16E+11	-1.00E+11	2.03E+12	8.23
	Marine Sea	6.22E+11	2.50E+12	0	4.18E+11	2.46E+09	0	-1.16E+11	3.42E+12	7.52
	Exposed Playa (AQM)	1.13E+11	2.83E+11	0	0	0	3.44E+10	-1.59E+10	4.15E+11	6.74
	Brine Sink	1.75E+11	2.83E+11	0	0	8.61E+09	8.20E+10	0	5.49E+11	4.51
	Total (ug Se/yr)	1.06E+12	4.38E+12	5.54E+11	4.18E+11	1.23E+10	2.33E+11	-2.33E+11	6.42E+12	
Alternative 6 North Sea Combined	Saline Habitat Complex	0	103	20			51	-28	146	
	Marine Sea	142	195	40	97	15		-51	438	
	Exposed Playa (AQM)	30	30				6	-6	60	
	Brine	16	28	0	0	5	28		77	
	Total TAF/yr	188	356	60	97	20	85	-85	721	
		Water Inflows by Source (L/yr)[c]								
	Saline Habitat Complex	0	1.27E+11	2.46E+10	0	0	6.27E+10	-3.44E+10	1.80E+11	
	Marine Sea	1.75E+11	2.40E+11	4.92E+10	1.19E+11	1.85E+10	0	-6.27E+10	5.39E+11	
	Exposed Playa (AQM)	3.69E+10	3.69E+10	0	0	0	7.38E+09	-7.38E+09	7.38E+10	
	Brine Sink	1.97E+10	3.44E+10	0	0	6.15E+09	3.44E+10	0	9.47E+10	
	Total (L/yr)	2.31E+11	4.38E+11	7.38E+10	1.19E+11	2.46E+10	1.05E+11	-1.05E+11	8.87E+11	
		Input of Se Load (ug/yr)[d]								
	Saline Habitat Complex	0	1.27E+12	1.85E+11	0	0	1.35E+11	-7.40E+10	1.51E+12	8.42
	Marine Sea	8.03E+11	2.40E+12	3.69E+11	4.18E+11	9.23E+09	0	-1.35E+11	3.86E+12	7.17
	Exposed Playa (AQM)	1.70E+11	3.69E+11	0	0	0	1.59E+10	-1.59E+10	5.39E+11	7.30
	Brine Sink	9.05E+10	3.44E+11	0	0	3.08E+09	7.40E+10	0	5.12E+11	5.41
	Total (ug Se/yr)	1.06E+12	4.38E+12	5.54E+11	4.18E+11	1.23E+10	2.25E+11	-2.25E+11	6.43E+12	

TABLE F2-1

Summary of Estimation of Selenium Concentrations in Inflow Waters, Flow Apportionment by Habitats, and Blended Water Concentrations by Habitats in Salton Sea Restoration Alternatives

		Se (ug/L) in inflow water[a]								
		New River	Alamo River	Direct Drains	Whitewater River	Local	Brine	Marine Spill		
		4.6	10	7.5	3.5	0.5	2.15	2.15		
Alternative	**Habitat Types by Alternative**	**Water Inflows by Source (TAF/yr)**							**Total**	**Blended Selenium Concentration by Habitat (ug/L)[b]**
Alternative 7 Combined North and South Lake	Saline Habitat Complex	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.30E+01	-7.00E+00	3.60E+01	
	Marine Sea	1.87E+02	3.29E+02	6.00E+01	9.70E+01	1.50E+01	0.00E+00	-6.50E+01	6.23E+02	
	Brine Sink		2.70E+01			5.00E+00	2.90E+01		6.10E+01	
	Total TAF/yr	1.87E+02	3.56E+02	6.00E+01	9.70E+01	2.00E+01	7.20E+01	-7.20E+01	7.20E+02	
		Water Inflows by Source (L/yr)[c]								
	Saline Habitat Complex	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.29E+10	-8.61E+09	4.43E+10	
	Marine Sea	2.30E+11	4.05E+11	7.38E+10	1.19E+11	1.85E+10	0.00E+00	-8.00E+10	7.66E+11	
	Brine Sink	0.00E+00	3.32E+10	0.00E+00	0.00E+00	6.15E+09	3.57E+10	0.00E+00	7.50E+10	
	Total (L/yr)	2.30E+11	4.38E+11	7.38E+10	1.19E+11	2.46E+10	8.86E+10	-8.86E+10	8.86E+11	
		Input of Se Load (ug/yr)[d]								
	Saline Habitat Complex	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E+11	-1.85E+10	9.52E+10	2.15
	Marine Sea	1.06E+12	4.05E+12	5.54E+11	4.18E+11	9.23E+09	0.00E+00	-1.72E+11	5.91E+12	7.72
	Brine Sink	0.00E+00	3.32E+11	0.00E+00	0.00E+00	3.08E+09	7.67E+10	0.00E+00	4.12E+11	5.49
	Total (ug Se/yr)	1.06E+12	4.38E+12	5.54E+11	4.18E+11	1.23E+10	1.90E+11	-1.90E+11	6.42E+12	
Alternative 8 South Sea Combined	Saline Habitat Complex	0	57	0			39	-15	81	
	Marine Sea	189	187	60	97	15		-57	491	
	Exposed Playa (AQM)	0	57				2	-6	53	
	Brine Sink		57			5	37		99	
	Total TAF/yr	189	358	60	97	20	78	-78	724	
		Water Inflows by Source (L/yr)[c]								
	Saline Habitat Complex	0	7.01E+10	0	0	0	4.80E+10	-1.85E+10	9.96E+10	
	Marine Sea	2.32E+11	2.30E+11	7.38E+10	1.19E+11	1.85E+10	0	-7.01E+10	6.04E+11	
	Exposed Playa (AQM)	0	7.01E+10	0	0	0	2.46E+09	-7.38E+09	6.52E+10	
	Brine Sink	0	7.01E+10	0	0	6.15E+09	4.55E+10	0	1.22E+11	
	Total (L/yr)	2.32E+11	4.40E+11	7.38E+10	1.19E+11	2.46E+10	9.59E+10	-9.59E+10	8.91E+11	
		Input of Se Load (ug/yr)[d]								
	Saline Habitat Complex	0	7.01E+11	0	0	0	1.03E+11	-3.97E+10	7.65E+11	7.67
	Marine Sea	1.07E+12	2.30E+12	5.54E+11	4.18E+11	9.23E+09	0	-1.51E+11	4.20E+12	6.95
	Exposed Playa (AQM)	0	7.01E+11	0	0	0	5.29E+09	-1.59E+10	6.91E+11	10.59
	Brine Sink	0	7.01E+11	0	0	3.08E+09	9.78E+10	0	8.02E+11	6.59
	Total (ug Se/yr)	1.07E+12	4.40E+12	5.54E+11	4.18E+11	1.23E+10	2.06E+11	-2.06E+11	6.46E+12	

a Inflow water concentrations were constant across all alternatives. Sources for concentration values are reported in text.

b total Se input (ug/yr) /total inflow (L/yr) by habitat

c note: 1 AF= 1.23e+6 L

d note: ug/yr loading = L/yr flow * Se (ug/L) in inflow water

TABLE F2-2

Summary of Parameters and Values Employed to Estimate Future Sediment Selenium Loading in the Salton Sea Under Current, and Various Alternatives

Alternative	Habitat	Habitat Area (acres)	Blended Water conc (ug/L)	Annual inflows (AF)	L / AF	L / yr (col J*col d)	µg Se / yr (col k*col c)	µg Se / acre /yr (col l /col b)	Proportional Inflow Change (alternative/ current)
Current	**All Habitats**	230135	5.99	1345164	1.23E+06	1.66E+12	9.94E+12	4.32E+07	
NAA-CEQA Conditions	Combined Open Water, Shoreline and Shallow Water, and Estuary	176067	6.96	898000	1.23E+06	1.11E+12	7.71E+12	4.38E+07	1.014
	Exposed Playa (AQM)	38460	6.76	25000	1.23E+06	3.08E+10	2.08E+11	5.42E+06	0.126
NAA-Variability Conditions	Combined Open Water, Shoreline and Shallow Water, and Estuary	138521	7.29	670000	1.23E+06	8.26E+11	6.02E+12	4.35E+07	1.007
	Exposed Playa (AQM)	76006	6.63	48000	1.23E+06	5.92E+10	3.93E+11	5.16E+06	0.120
Alternative 1 - Saline Habitat Complex I	**All Habitats**			722000					
	Saline Habitat Complex-South (drains)	7781	8.66	23000	1.23E+06	2.84E+10	2.46E+11	3.16E+07	0.731
	Saline Habitat Complex-South (rivers)	32113	8.4	132000	1.23E+06	1.63E+11	1.37E+12	4.26E+07	0.986
	Exposed Playa (AQM)	72829	6.09	38000	1.23E+06	4.69E+10	2.85E+11	3.92E+06	0.091
	Brink Sink	119186	6.98	529000	1.23E+06	6.53E+11	4.55E+12	3.82E+07	0.885
Alternative 2 - Saline Habitat Complex II	**All Habitats**			724000					
	Saline Habitat Complex-South	55059	8.69	235000	1.23E+06	2.90E+11	2.52E+12	4.58E+07	1.059
	Saline Habitat Complex-West	9585	4.89	42000	1.23E+06	5.18E+10	2.53E+11	2.64E+07	0.612
	Saline Habitat Complex-North	11108	3.65	46000	1.23E+06	5.67E+10	2.07E+11	1.86E+07	0.432
	Exposed Playa (AQM)	87057	5.11	33000	1.23E+06	4.07E+10	2.08E+11	2.39E+06	0.055
	Brink Sink	69135	7.24	368000	1.23E+06	4.54E+11	3.29E+12	4.75E+07	1.101
Alternative 3 - Concentric Rings	**All Habitats**			721000					
	First Ring	25426	5.94	134000	1.23E+06	1.65E+11	9.82E+11	3.86E+07	0.894
	Second Ring	36042	8.78	180000	1.23E+06	2.22E+11	1.95E+12	5.41E+07	1.252
	Exposed Playa (AQM)	126850	6.67	49000	1.23E+06	6.04E+10	4.03E+11	3.18E+06	0.074
	Brink Sink	56990	7.03	358000	1.23E+06	4.42E+11	3.10E+12	5.45E+07	1.261
Alternative 4 - Concentric Lakes	**All Habitats**			719000					
	First Lake	5615	8.19	34000	1.23E+06	4.19E+10	3.43E+11	6.12E+07	1.416
	Second Lake	22046	4.26	129000	1.23E+06	1.59E+11	6.78E+11	3.07E+07	0.712
	Third Lake	20099	7.35	124000	1.23E+06	1.53E+11	1.12E+12	5.59E+07	1.295
	Fourth Lake	44210	8.17	248000	1.23E+06	3.06E+11	2.50E+12	5.65E+07	1.309
	Brink Sink	22259	7.85	184000	1.23E+06	2.27E+11	1.78E+12	8.00E+07	1.853
Alternative 5 - North Sea	**All Habitats**			720000					
	Saline Habitat Complex	45844	8.23	201000	1.23E+06	2.48E+11	2.04E+12	4.45E+07	1.031
	Marine Sea	62171.5	7.52	370000	1.23E+06	4.56E+11	3.43E+12	5.52E+07	1.278
	Exposed Playa (AQM)	113356	6.74	50000	1.23E+06	6.17E+10	4.16E+11	3.67E+06	0.085
	Brink Sink	10519	4.51	99000	1.23E+06	1.22E+11	5.51E+11	5.24E+07	1.212
Alternative 6 - North Sea Combined	**All Habitats**			721000					
	Saline Habitat Complex	28306.4	8.42	146000	1.23E+06	1.80E+11	1.52E+12	5.36E+07	1.240
	Marine Sea	73771.5	7.17	438000	1.23E+06	5.40E+11	3.87E+12	5.25E+07	1.216
	Exposed Playa (AQM)	119218	7.3	60000	1.23E+06	7.40E+10	5.40E+11	4.53E+06	0.105
	Brink Sink	10604	5.41	77000	1.23E+06	9.50E+10	5.14E+11	4.85E+07	1.122
Alternative 7 - Combined North and South Lakes	**All Habitats**			720000					
	Saline Habitat Complex	12407	2.15	36000	1.23E+06	4.44E+10	9.55E+10	7.69E+06	0.178
	Marine Sea	99687	7.72	623000	1.23E+06	7.68E+11	5.93E+12	5.95E+07	1.378
	Brink Sink	12527	5.49	61000	1.23E+06	7.52E+10	4.13E+11	3.30E+07	0.764
Alternative 8 - South Sea Combined	**All Habitats**			724000					
	Saline Habitat Complex	16242	7.67	81000	1.23E+06	9.99E+10	7.66E+11	4.72E+07	1.092
	Marine Sea	80335	6.95	491000	1.23E+06	6.06E+11	4.21E+12	5.24E+07	1.213
	Exposed Playa (AQM)	129593	10.59	53000	1.23E+06	6.54E+10	6.92E+11	5.34E+06	0.124
	Brink Sink	51739	6.59	99000	1.23E+06	1.22E+11	8.05E+11	1.56E+07	0.360

TABLE F2-3

Summary of Measured and Estimated Sediment Selenium Concentrations for Various Habitat Types in the Salton Sea Under both No Action and Action Alternatives. Sediment Concentrations Represent Baseline Values Prior to Addition of

Alternative	Source	Habitat	n	mean	std	min	median	max	Wilcoxon Rank Sum Test	Area (acres)	Measured Samples/ Acre	Acres/ Measured Sample
NAA-CEQA	Estimated	Exposed Playa (AQM)	3903	1.54	1.07	0.06	1.21	7.37	p=0.0004	38459	0.005	199
NAA-CEQA	Measured	Exposed Playa (AQM)	193	1.94	1.47	0.055	1.5	7.6				
NAA-CEQA	Estimated	Estuary-Alamo River	25	0.29	0.03	0.25	0.28	0.38	NA	247	0	0
NAA-CEQA	Estimated	Estuary-New River	18	0.58	0.02	0.50	0.59	0.60	NS	170	0.012	85
NAA-CEQA	Measured	Estuary-New River	2	0.32	0.38	0.055	0.32	0.59				
NAA-CEQA	Estimated	Estuary-Whitewater River	4	2.12	0.39	1.61	2.16	2.56	NA	38	0	0
NAA-CEQA	Estimated	Open Water	16788	2.43	1.44	0.08	2.24	9.30	NS	165910	0.00024	4148
NAA-CEQA	Measured	Open Water	40	3.47	3.69	0.075	1.55	11				
NAA-CEQA	Estimated	Shoreline and Shallow Water	969	1.48	1.15	0.05	1.09	5.57	NS	9702	0.0011	882
NAA-CEQA	Measured	Shoreline and Shallow Water	11	0.94	0.95	0.05	0.7	3.4				
NAA-VA	Estimated	Exposed Playa (AQM)	6425	1.42	1.01	0.05	1.08	6.62	p=0.0001	76005	0.0028	354
NAA-VA	Measured	Exposed Playa (AQM)	215	1.85	1.49	0.05	1.5	7.6				
NAA-VA	Estimated	Estuary-Alamo River	29	0.35	0.02	0.31	0.36	0.37	NA	276	0	0
NAA-VA	Estimated	Estuary-New River	15	0.83	0.04	0.76	0.84	0.90	NA	146	0	0
NAA-VA	Estimated	Estuary-Whitewater River	5	3.70	0.72	2.71	3.68	4.68	NA	45.1	0	0
NAA-VA	Estimated	Open Water	12887	2.65	1.42	0.15	2.55	9.30	NS	127437	0.00016	6068
NAA-VA	Measured	Open Water	21	4.37	3.90	0.15	3.1	11				
NAA-VA	Estimated	Shoreline and Shallow Water	1091	1.86	1.33	0.10	1.49	7.88	NS	10617	0.00094	1062
NAA-VA	Measured	Shoreline and Shallow Water	10	3.53	3.93	0.085	1.45	11				
Alternative 1 - Saline Habitat Complex I	Estimated	Exposed Playa (AQM)	7235	2.01	1.22	0.09	1.72	7.88	NS	72829	0.0027	364
	Measured	Exposed Playa (AQM)	200	2.20	1.75	0.075	1.8	11				
	Estimated	Brine Sink	12063	2.70	1.42	0.15	2.59	9.30	p=0.02	119186	0.00014	7011
	Measured	Brine Sink	17	5.29	3.77	0.3	5.8	11				
	Estimated	Saline Habitat Complex-South (rivers)	3244	0.90	0.42	0.05	0.89	3.23	NS	32113	0.0025	401
	Measured	Saline Habitat Complex-South (rivers)	80	0.87	0.57	0.05	0.9	2.7				
	Estimated	Saline Habitat Complex-South (drains)	694	1.26	0.68	0.18	1.04	4.33	p=0.02	7781	0.0030	338
	Measured	Saline Habitat Complex-South (drains)	23	1.06	0.84	0.08	0.8	3.8				
Alternative 2 - Saline Habitat Complex II	Estimated	Exposed Playa (AQM)	8631	2.16	1.15	0.10	1.92	8.49	p=0.05	87057	0.0013	799
	Measured	Exposed Playa (AQM)	109	2.07	1.60	0.085	1.8	8.5				
	Estimated	Brine Sink	6990	3.05	1.49	0.31	2.96	9.30	p=0.03	69135	0.00017	5761
	Measured	Brine Sink	12	5.75	3.85	0.3	6.15	11				
	Estimated	Saline Habitat Complex-North	1108	3.49	1.00	1.08	3.36	7.88	NS	11108	0.0039	258
	Measured	Saline Habitat Complex-North	43	3.77	2.20	0.58	3.5	11				
	Estimated	Saline Habitat Complex-South	5540	0.94	0.46	0.05	0.94	3.82	NS	55059	0.0025	399
	Measured	Saline Habitat Complex-South	138	0.93	0.64	0.05	0.9	3.8				
	Estimated	Saline Habitat Complex-West	965	1.97	0.73	0.12	1.92	4.14	NS	9585	0.0019	533
	Measured	Saline Habitat Complex-West	18	2.18	1.30	0.09	2.05	4.2				
Alternative 3 - Concentric Rings	Estimated	Exposed Playa (AQM)	11333	2.06	1.26	0.079	1.77	8.49	p=0.005	126850	0.0003	3428
	Measured	Exposed Playa (AQM)	37	2.30	2.96	0.075	0.86	11				
	Estimated	Brine Sink	5752	3.11	1.49	0.31	3.03	9.30	p=0.035	56990	0.0002	5181
	Measured	Brine Sink	11	5.74	4.04	0.3	6.5	11				
	Estimated	Second Ring	3642	1.49	1.09	0.05	1.14	7.37	p=0.0002	36042	0.0035	284
	Measured	Second Ring	127	1.89	1.41	0.05	1.5	7.6				
	Estimated	First Ring	2507	1.67	1.01	0.10	1.38	6.78	p=0.003	25426	0.0057	177
	Measured	First Ring	144	1.63	1.40	0.08	1	7.1				

TABLE F2-3

Summary of Measured and Estimated Sediment Selenium Concentrations for Various Habitat Types in the Salton Sea Under both No Action and Action Alternatives. Sediment Concentrations Represent Baseline Values Prior to Addition of

Alternative	Source	Habitat	n	mean	std	min	median	max	Wilcoxon Rank Sum Test	Area (acres)	Measured Samples/ Acre	Acres/ Measured Sample
Alternative 4 - Concentric Lakes	Estimated	Brine Sink	2253	3.92	1.62	0.88	3.63	9.30	p=0.003	22259	0.00036	2782
	Measured	Brine Sink	8	7.35	3.42	1.4	8.9	11				
	Estimated	Exposed Playa 1	112	1.43	0.74	0.18	1.20	4.33	NS	1500	0.00067	1500
	Measured	Exposed Playa 1	1	1		1	1	1				
	Estimated	Exposed Playa 2	2076	1.81	1.08	0.10	1.54	6.78	p=0.01	22414	0.0054	187
	Measured	Exposed Playa 2	120	1.75	1.48	0.07	1.3	7.1				
	Estimated	Exposed Playa 3	2882	1.54	1.15	0.05	1.10	5.83	p=0.03	28591	0.00091	1100
	Measured	Exposed Playa 3	26	1.35	1.43	0.05	0.77	5				
	Estimated	Exposed Playa 4	1725	1.92	1.23	0.15	1.60	8.03	p=0.004	17158	0.00047	2145
	Measured	Exposed Playa 4	8	0.72	0.61	0.15	0.48	2.1				
	Estimated	Exposed Playa 5	4916	2.70	1.22	0.31	2.61	7.95	NS	48677	0.00012	8113
	Measured	Exposed Playa 5	6	3.16	3.18	0.3	2.08	8				
	Estimated	First Lake	577	1.26	0.71	0.12	1.05	3.79	p=0.002	5615	0.0053	187
	Measured	First Lake	30	1.05	0.95	0.08	0.8	4.1				
	Estimated	Second Lake	2224	1.50	1.06	0.06	1.18	7.37	p<0.0001	22046	0.0049	204
	Measured	Second Lake	108	2.00	1.41	0.055	1.6	7.6				
	Estimated	Third Lake	2053	1.75	1.24	0.10	1.36	7.88	NS	20099	0.0005	2010
	Measured	Third Lake	10	3.52	3.96	0.085	1.75	11				
	Estimated	Fourth Lake	4388	2.15	1.13	0.19	1.94	8.49	NS	22259	0.00009	11130
	Measured	Fourth Lake	2	5.05	4.88	1.6	5.05	8.5				
Alternative 5 - North Sea	Estimated	Exposed Playa (AQM)	11300	1.89	1.09	0.09	1.63	7.95	p=0.05	113356	0.0008	1246
	Measured	Exposed Playa (AQM)	91	1.77	1.43	0.075	1.5	8				
	Estimated	Brine Sink	1062	3.40	1.52	0.88	3.11	8.78	NS	10519	0.00019	5260
	Measured	Brine Sink	2	5.10	5.23	1.4	5.1	8.8				
	Estimated	Marine Sea	6270	3.42	1.25	0.33	3.21	9.30	NS	62171.5	0.0015	683
	Measured	Marine Sea	91	3.56	2.42	0.2	3	11				
	Estimated	Saline Habitat Complex	4602	0.98	0.48	0.05	0.96	3.82	NS	45844	0.0029	340
	Measured	Saline Habitat Complex	135	0.94	0.64	0.05	0.9	3.8				

TABLE F2-3

Summary of Measured and Estimated Sediment Selenium Concentrations for Various Habitat Types in the Salton Sea Under both No Action and Action Alternatives. Sediment Concentrations Represent Baseline Values Prior to Addition of

Alternative	Source	Habitat	n	mean	std	min	median	max	Wilcoxon Rank Sum Test	Area (acres)	Measured Samples/ Acre	Acres/ Measured Sample
Alternative 6 - North Sea Combined	Estimated	Exposed Playa (AQM)	11867	1.98	1.12	0.08	1.71	7.95	p<0.0001	119218	0.00072	1386
	Measured	Exposed Playa (AQM)	86	1.33	1.28	0.065	1	8				
	Estimated	Brine Sink	1070	4.49	1.90	1.48	4.08	9.30	p=0.003	10604	0.00066	1515
	Measured	Brine Sink	7	7.96	3.19	1.4	9	11				
	Estimated	Marine Sea	7419	2.74	1.30	0.07	2.83	8.49	p<0.0001	73771	0.0023	437
	Measured	Marine Sea	169	2.39	1.87	0.055	2	11				
	Estimated	Saline Habitat Complex	2880	0.82	0.33	0.05	0.88	1.99	NS	28306	0.002	497
	Measured	Saline Habitat Complex	57	0.86	0.51	0.05	0.9	2				
Alternative 7 - Combined North and South Lakes	Estimated	Brine Sink	1268	3.19	1.60	0.31	3.23	8.78	NS	12527	0.0002	4176
	Measured	Brine Sink	3	3.5	4.62	0.3	1.4	8.8				
	Estimated	IID Freshwater Reservoir	1098	0.56	0.27	0.07	0.48	1.48	NS	10830	0.001	985
	Measured	IID Freshwater Reservoir	11	0.47	0.45	0.065	0.43	1.5				
	Estimated	Marine Sea	10078	2.65	1.43	0.08	2.55	9.30	p=0.02	99687	0.001	755
	Measured	Marine Sea	132	2.72	2.31	0.055	2	11				
	Estimated	Exposed Playa 1	1713	1.76	0.99	0.12	1.51	6.03	p=0.0001	19175	0.004	234
	Measured	Exposed Playa 1	82	1.43	1.17	0.08	1	4.9				
	Estimated	Exposed Playa 2	1207	1.49	0.81	0.05	1.16	4.21	NS	12098	0.001	864
	Measured	Exposed Playa 2	14	1.52	0.97	0.05	1.55	3.22				
	Estimated	Protective Salt Flat	6538	1.97	1.19	0.12	1.78	7.95	p=0.008	64647	0.0001	7183
	Measured	Protective Salt Flat	9	1.85	2.93	0.09	0.46	8				
	Estimated	Saline Habitat Complex- East	1081	0.98	0.30	0.06	1.02	1.99	NS	10726	0.005	215
	Measured	Saline Habitat Complex- East	50	1.00	0.51	0.055	1	2.1				
	Estimated	Saline Habitat Complex- North	174	3.32	0.87	1.11	3.35	6.78	NS	1681	0.005	210
	Measured	Saline Habitat Complex- North	8	2.75	2.26	0.58	2.4	7.1				
Alternative 8 - South Sea Combined	Estimated	Exposed Playa (AQM)	12944	2.73	1.20	0.10	2.66	8.78	p<0.0001	129593	0.00063	1580
	Measured	Exposed Playa (AQM)	82	2.29	2.22	0.085	1.7	11				
	Estimated	Brine Sink	574	5.23	1.74	1.98	4.93	9.30	p=0.0005	51739	9.7E-05	10348
	Measured	Brine Sink	5	9.10	1.64	6.5	9.3	11				
	Estimated	Marine Sea	8072	1.22	0.93	0.05	0.97	7.37	p<0.0001	80335	0.0028	354
	Measured	Marine Sea	227	1.68	1.47	0.05	1.2	7.6				
	Estimated	Saline Habitat Complex	1645	1.72	0.77	0.12	1.41	4.21	NS	16242	0.00031	3248
	Measured	Saline Habitat Complex	5	1.41	1.25	0.09	0.95	3.22				

Notes

NS = Not significant

Table F2-4
Definitions of Habitat, Statistical, and Location Abbreviations

Abbreviation	Definition
NA	Not Applicable
NS	Not Significant
AQM	Exposed Playa (AQM[a])
ES	Estuary
AR	Alamo River
NR	New River
WR	Whitewater River
OW	Open Water
SL	Shoreline and Shallow Water
SHC	Saline Habitat Complex

[a] Air Quality Management

TABLE F2-5

Summary of Selenium Concentrations (mg/kg, DW) in Paired Sediment and Wholebody Corixid Samples from the Salton Sea

Sediment	Corixids	logsed	logcor
3.59	2.5	0.555	0.398
3.59	2.6	0.555	0.415
3.59	2.7	0.555	0.431
4.70	2.9	0.672	0.462
4.70	2.8	0.672	0.447
4.70	2.7	0.672	0.431
1.20	2.1	0.077	0.322
0.60	1.6	-0.222	0.204
0.60	1.6	-0.222	0.204
0.60	1.4	-0.222	0.146
1.06	1.8	0.027	0.255
1.06	1.6	0.027	0.204
1.06	1.7	0.027	0.230
0.84	2.2	-0.076	0.342
0.84	1.1	-0.076	0.041
0.84	1.3	-0.076	0.114
3.14	3.5	0.496	0.544
3.14	3.5	0.496	0.544
3.14	3.5	0.496	0.544
3.57	2.4	0.552	0.380
3.57	2.6	0.552	0.415
3.57	2.4	0.552	0.380

TABLE F2-6

Summary of Selenium Concentrations (mg/kg, DW) in Co-located Fish and Sediment from the Salton Sea

Fish Species	Fish Sample Numbers	Sediment Sample Numbers	Selenium Concentrations			BSAF
			Sediment	Fish	Mean Sediment	
tilapia	NE05F01,02,03	753NAN7-10	2.2	12	2.69	4.46
		747NAN5-10	2.6	14	2.69	5.20
		747NAN5-15	3.4	11	2.69	4.09
		740NAN3-5	2.4			
		741NAN3-10	2.1			
		742NAN3-15	4			
		735NAN1-10	1.6			
		736NAN1-15	3.9			
		771SPS1-10	2.6			
		NE27SD01	1.7			
		NW04SD02	3.1			
molly	NE06F01	771SPS1-10	2.6	4.9	2.85	1.72
		NW04SD02	3.1			
tilapia	NW08F01	585SCN12-15	5.3	10	3.5	2.86
		582SCN11-15	3.3			
		NW32SD01	1.7			
		NW05SD01	3.7			
tilapia	NW09F01,02,03	563SCN2-15	1	9.5	2.28	4.17
		562SCN2-10	1.6	11	2.28	4.82
		560SCN1-15	1.9	11	2.28	4.82
		559SCN1-10	2			
		333SCS0-5	1			
		334SCS0-10	5.9			
		335SCS0-15	1.8			
		NW06SD02	2			
		NW37SD01	1.4			
		339R3SCS	4.2			
tilapia	SW10F01,02,03	351r3scs	1.7	8.7	2.40	3.63
		351R3SCSFD		10	2.40	4.17
		352R3SCS	2.3	9.8	2.40	4.08
		354R3SCS	2.8			
		353R3SCS	4.2			
		356R3SCS	3.6			
		355R3SCS	1.9			
		360R3SCS	3.2			
		361R3SCS	3.2			
		365R3SCS	1.7			
		363R3SCS	1.7			
		SW04SD01	3.22			
		SW04SD02	0.67			
		SW04SD04				
		78SPS5-10	1.9			
		359SCS13-10	2.2			
		358SCS13-5	1.7			

TABLE F2-6

Summary of Selenium Concentrations (mg/kg, DW) in Co-located Fish and Sediment from the Salton Sea

Fish Species	Fish Sample Numbers	Sediment Sample Numbers	Selenium Concentrations			BSAF
			Sediment	Fish	Mean Sediment	
tilapia	SW11F01,02,03	372R3SCS	3.2	11	1.97	5.59
		371R3SCS	4.9	8.9	1.97	4.53
		373R3SCS	1.8	11	1.97	5.59
		378R3SCS	2			
		377R3SCS	3.8			
		381R3SCS	2.1			
		380R3SCS	2.9			
		379R3SCS	1.1			
		387R3SCS	1.8			
		386R3SCS	1.2			
		385R3SCS	2.3			
		391R3SCS	1.1			
		SW01SD01				
		37SCS19-15	2.9			
		374SCS19-10	4.1			
		376SCS20-5	1			
		382SCS22-5	0.7			
		383SCS22-10	0.5			
		384SCS22-15	1			
		390SCS24-15	0.7			
		389SCS24-10	1.2			
		388SCS24-5	1			
tilapia	SE18F01	626R3BBS	1.1	9.7	0.84	11.56
		SEE2SD01	0.67			
		SE13SD01	0.6			
		SE04SD02	0.75			
		SE04SD01	1.4			
		900BBS20-15	1.6			
		909BBS23-15	0.9			
		905BBS22-10	0.9			
		904BBS22-5	0.9			
		908BBS23-10	0.6			
		625BBS2415	0.6			
		624BBS24-10	0.5			
		628BBS25-10	0.6			
		629BBS26-5	0.7			
		630BBS26-10	0.5			
		633BBS27-5	0.8			
		632BBS27-10	1.5			
		627BBS25-15	1.3			
		631BBS26-15	0.2			
		634BBS27-15	1			
		511RED2-15	1.2			
		507RED1-15	1.3			
		506RED1-5	0.4			
		508RED1-10	0.2			
		509RED2-5	1			
		510RED2-10	0.6			

TABLE F2-6

Summary of Selenium Concentrations (mg/kg, DW) in Co-located Fish and Sediment from the Salton Sea

Fish Species	Fish Sample Numbers	Sediment Sample Numbers	Selenium Concentrations			BSAF
			Sediment	Fish	Mean Sediment	
tilapia	SE19F01,02	SEE2SD02	0.67	9.1	1.19	7.65
		SE14SD01	1.8	12	1.19	10.09
		SE03SD01	1.4			
		865	1			
		866	1.5			
		867	1.8			
		868620BBS9-10	0.8			
		871	1.4			
		872	0.9			
		873	1.7			
		623BBS11-10				
		877	0.7			
		878	2			
		879	1			
		882	1.6			
		883	1			
		884	1			
		887	1			
		888	1			
		889	0.8			
		890	1			
		893	0.9			
		Mean Concentrations		10.2	2.2	
		BSAF				4.6

TABLE F2-7

Summary of Selenium Concentrations (mg/kg, DW) in Co-located Biota (Algae and Pileworms) with Sediment from the Salton Sea

Selenium Concentrations		
Biota Type	**Biota**	**sediment**
algae	0.88	4.70
algae	0.94	4.70
algae	0.6	4.70
algae	1.1	1.20
algae	0.86	1.20
algae	0.79	1.20
algae	0.5	0.80
algae	0.5	0.80
algae	1.1	1.06
algae	1.2	1.06
algae	1	1.06
algae	0.6	0.84
algae	0.5	0.84
algae	0.4	0.84
algae	0.67	3.14
algae	0.89	3.14
algae	0.5	3.14
algae	2	3.57
algae	1.9	3.57
algae	1.9	3.57
Mean	0.9415	2.25
BSAF		0.4
pileworms	6.2	1.09
pileworms	4	1
Mean	5.1	1.05
BSAF		4.9

TABLE F2-8

Summary of Selenium Concentrations (mg/kg, DW) in Co-located Terrestrial Biota (Insects and Kangaroo Rats) with Soil from the Salton Sea

Site	Location	Mean Soil Se	Ant	Beetle	Kangaroo Rat (merriami) Muscle	Kangaroo Rat (deserti) Muscle	Mammal BAFs
a	next to Sea	0.26	5.29	1.86	0.99		3.81
a	1 km from sea	0.34	4.95	0.96	1.09		3.21
c	next to Sea	0.38	.	1.25	1.8		4.74
c	1 km from sea	0.65	28.31	3.01	1.61		2.48
d	next to Sea	0.41	5.16	0.83	1.86		4.54
d	1 km from sea	0.43	25.42	1.65		2.91	6.77
f	next to Sea	0.4	12.92	.	0.89		2.23
f	1 km from sea	0.52	8.17	1.19	0.57		1.10
						n	8
						mean	3.61
						minimum	1.10
						median	3.51
						maximum	6.77

FIGURES

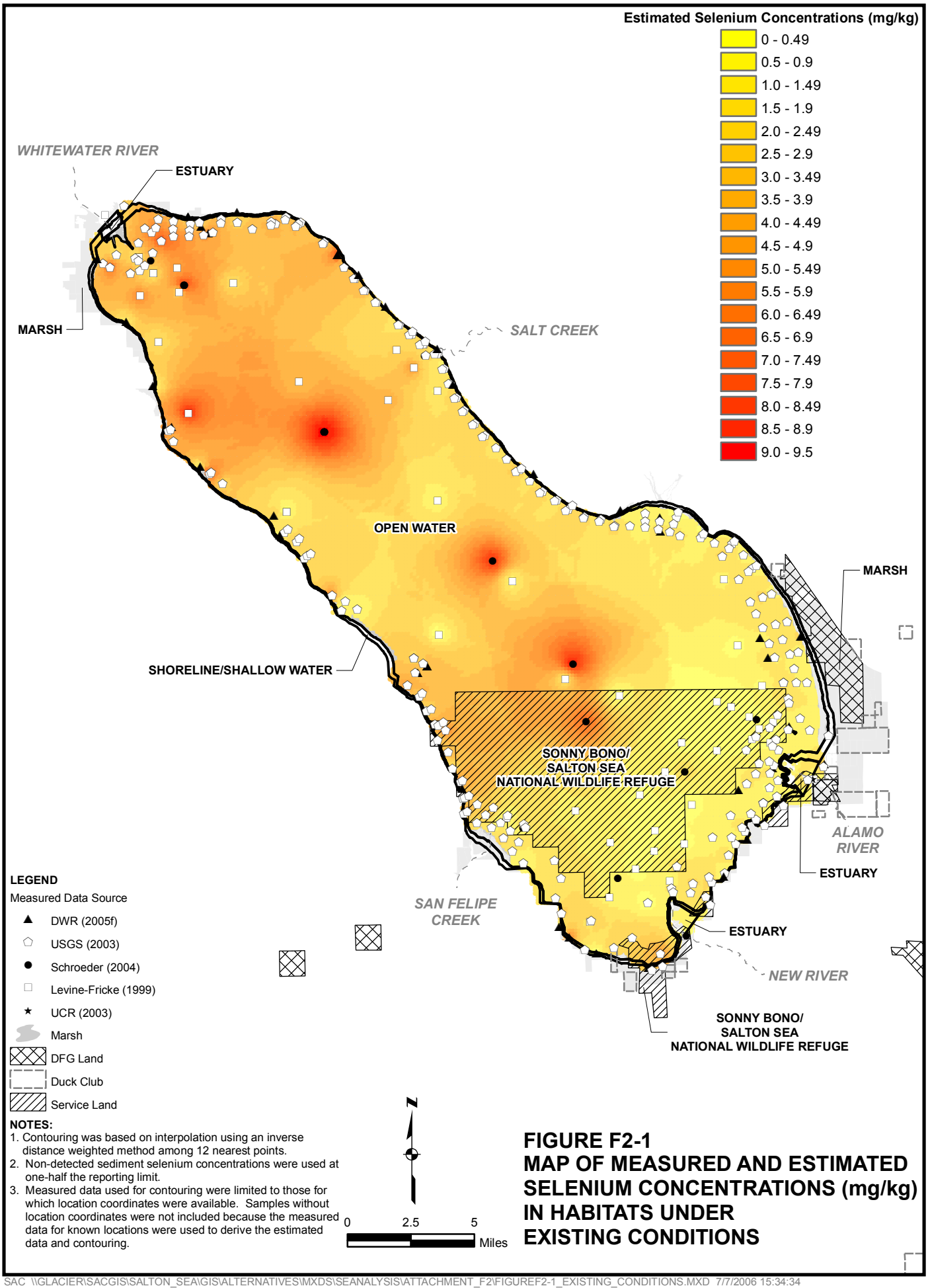
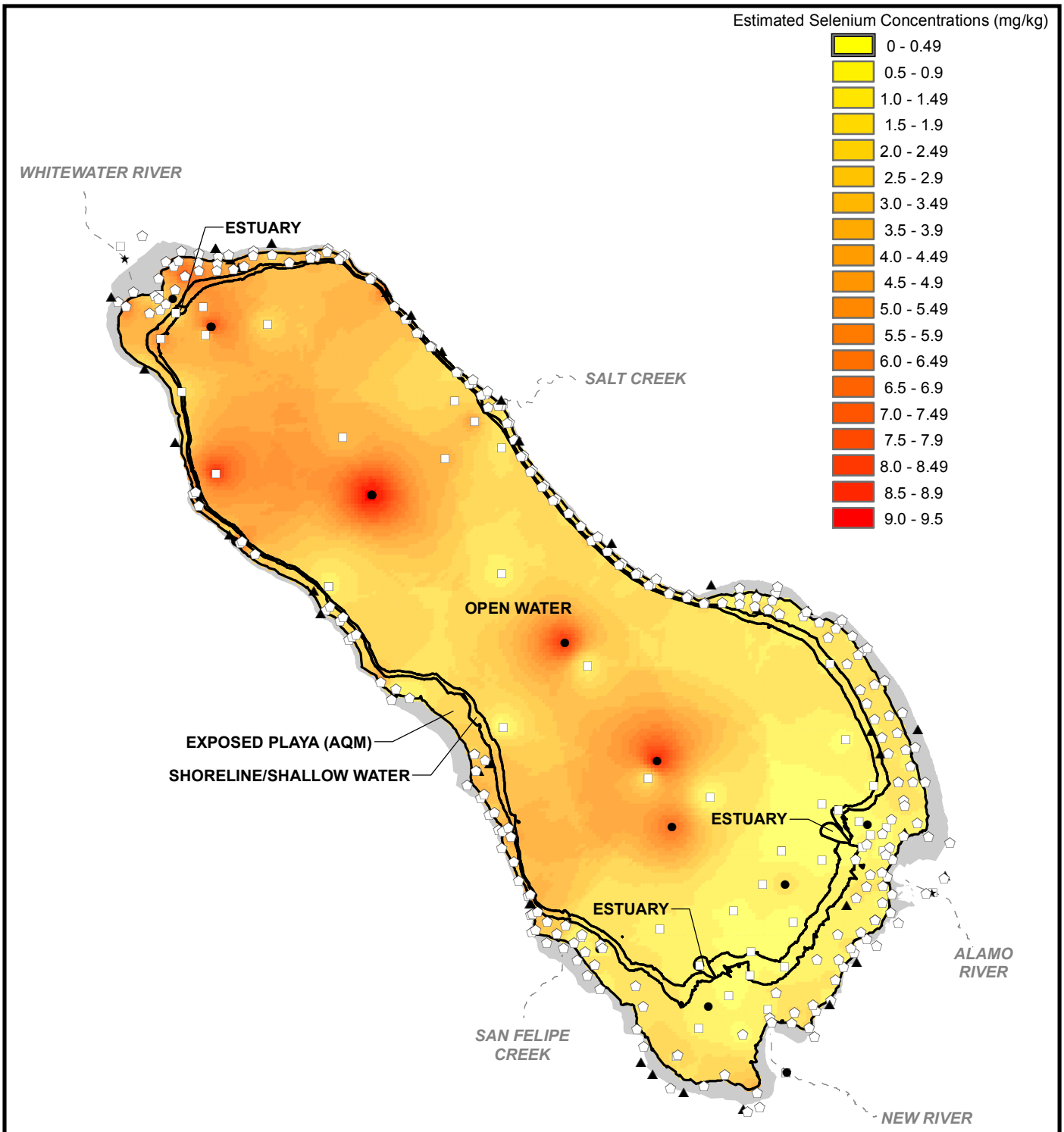


FIGURE F2-1
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER EXISTING CONDITIONS

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF2-1_EXISTING_CONDITIONS.MXD 7/7/2006 15:34:34



LEGEND

Measured Data Source

- ▲ DWR (2005f)
- ⬠ USGS (2003)
- ● Schroeder (2004)
- □ Levine-Fricke (1999)
- ★ UCR (2003)
- Existing Salton Sea

NOTES:

1. Contouring was based on interpolation using an inverse distance weighted method among 12 nearest points.
2. Non-detected sediment selenium concentrations were used at one-half the reporting limit.

N

0 2.5 5 Miles

FIGURE F2-2
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER NO ACTION ALTERNATIVE-CEQA CONDITIONS

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF-2_NAA_CEQA.MXD 6/28/2006 15:34:47

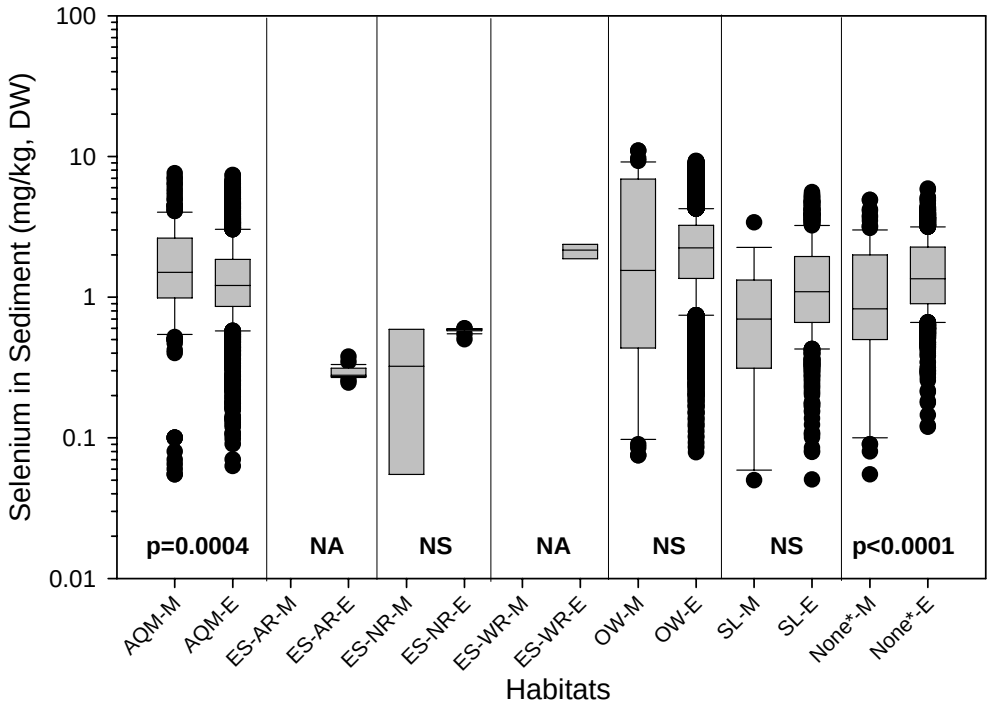
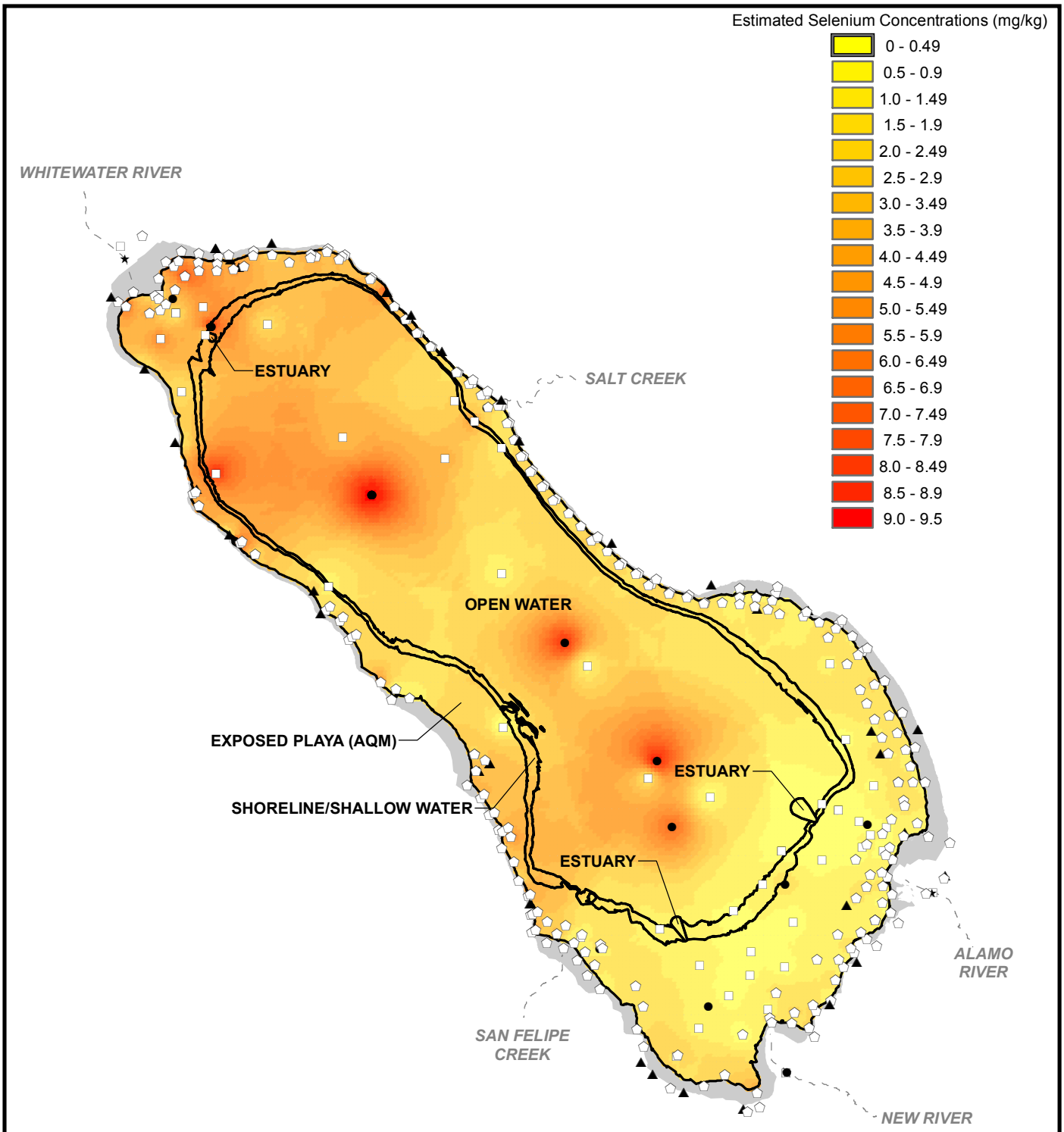


Figure F2-3. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under the No Action Alternative - CEQA Conditions.Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.



LEGEND

Measured Data Source

- ▲ DWR (2005f)
- ⬠ USGS (2003)
- ● Schroeder (2004)
- □ Levine-Fricke (1999)
- ★ UCR (2003)
- Existing Salton Sea

NOTES:

1. Contouring was based on interpolation using an inverse distance weighted method among 12 nearest points.
2. Non-detected sediment selenium concentrations were used at one-half the reporting limit.

N

0 2.5 5 Miles

FIGURE F2-4
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER NO ACTION ALTERNATIVE - VARIABILITY CONDITIONS

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF-4_NAA_VAR.MXD 6/28/2006 15:38:32

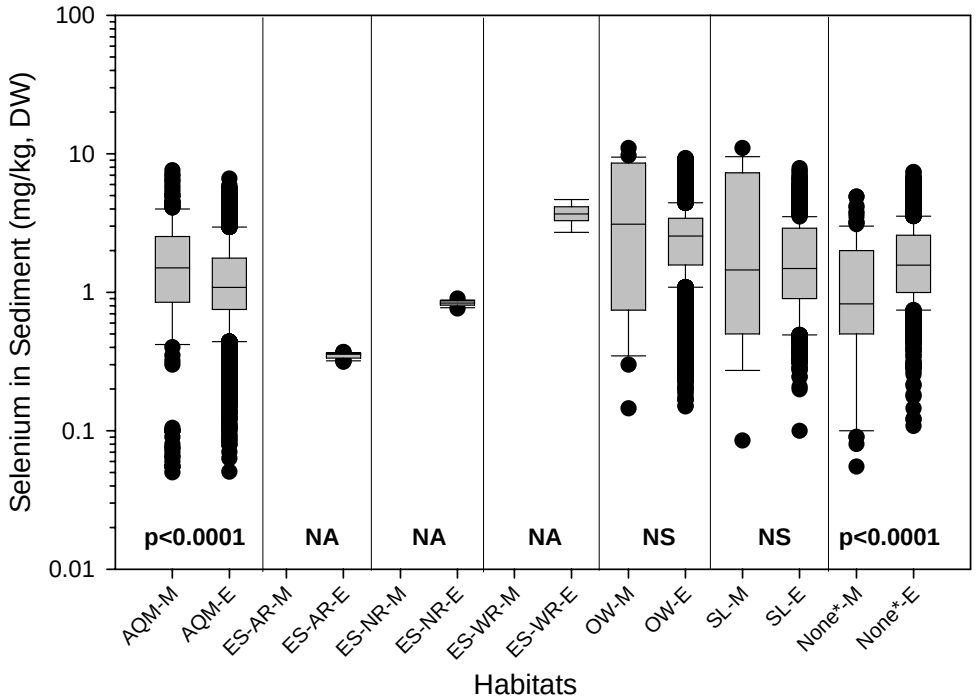
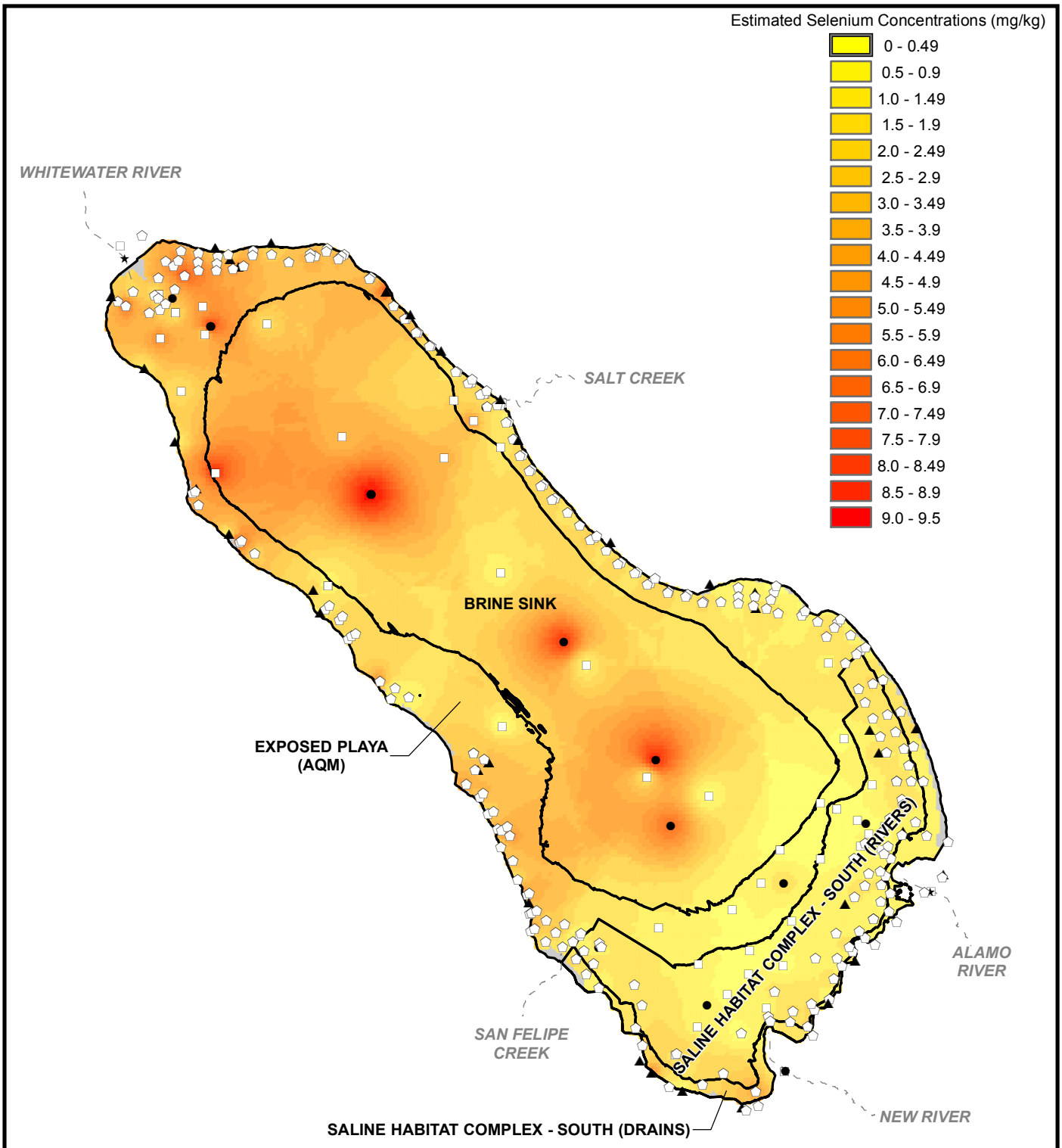


Figure F2-5. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under the No Action Alternative - Variability Conditions. Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.



LEGEND

Measured Data Source

- ▲ DWR (2005f)
- ⬠ USGS (2003)
- ● Schroeder (2004)
- □ Levine-Fricke (1999)
- ★ UCR (2003)
- Existing Salton Sea

NOTES:

1. Contouring was based on interpolation using an inverse distance weighted method among 12 nearest points.
2. Non-detected sediment selenium concentrations were used at one-half the reporting limit.

N

0 2.5 5 Miles

FIGURE F2-6
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER ALTERNATIVE 1: SALINE HABITAT COMPLEX I

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF-6_SHC_1.MXD 6/28/2006 15:46:15

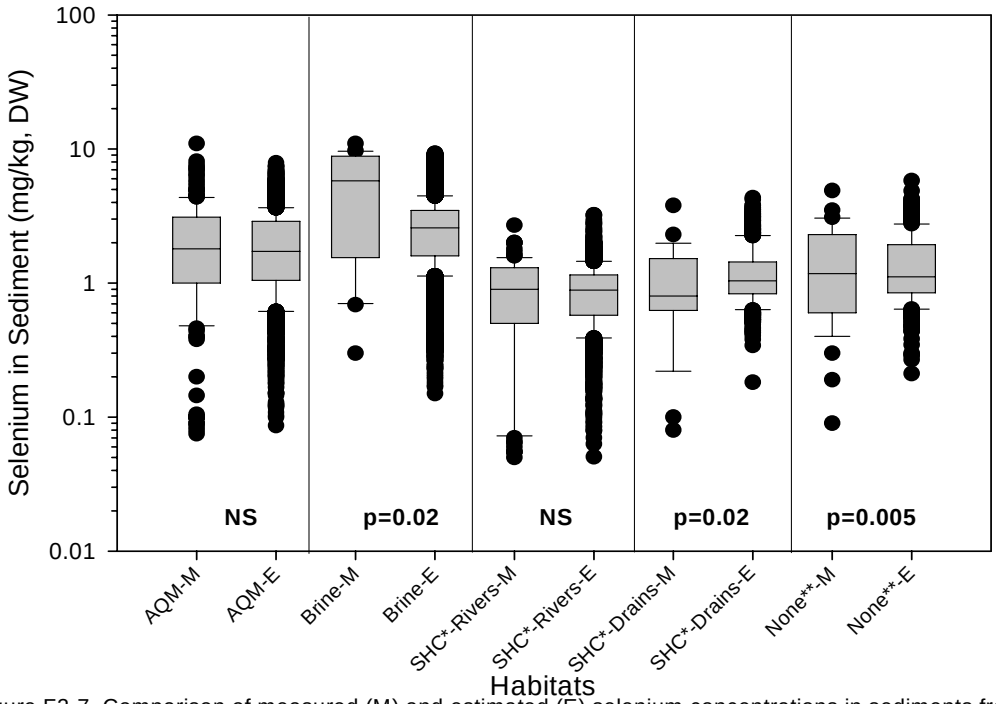


Figure F2-7. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 1 - Saline Habitat Complex I. Distributions compared using Wilcoxon Rank Sum Tests. *: Saline Habitat Complex-South. **: Represents samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.

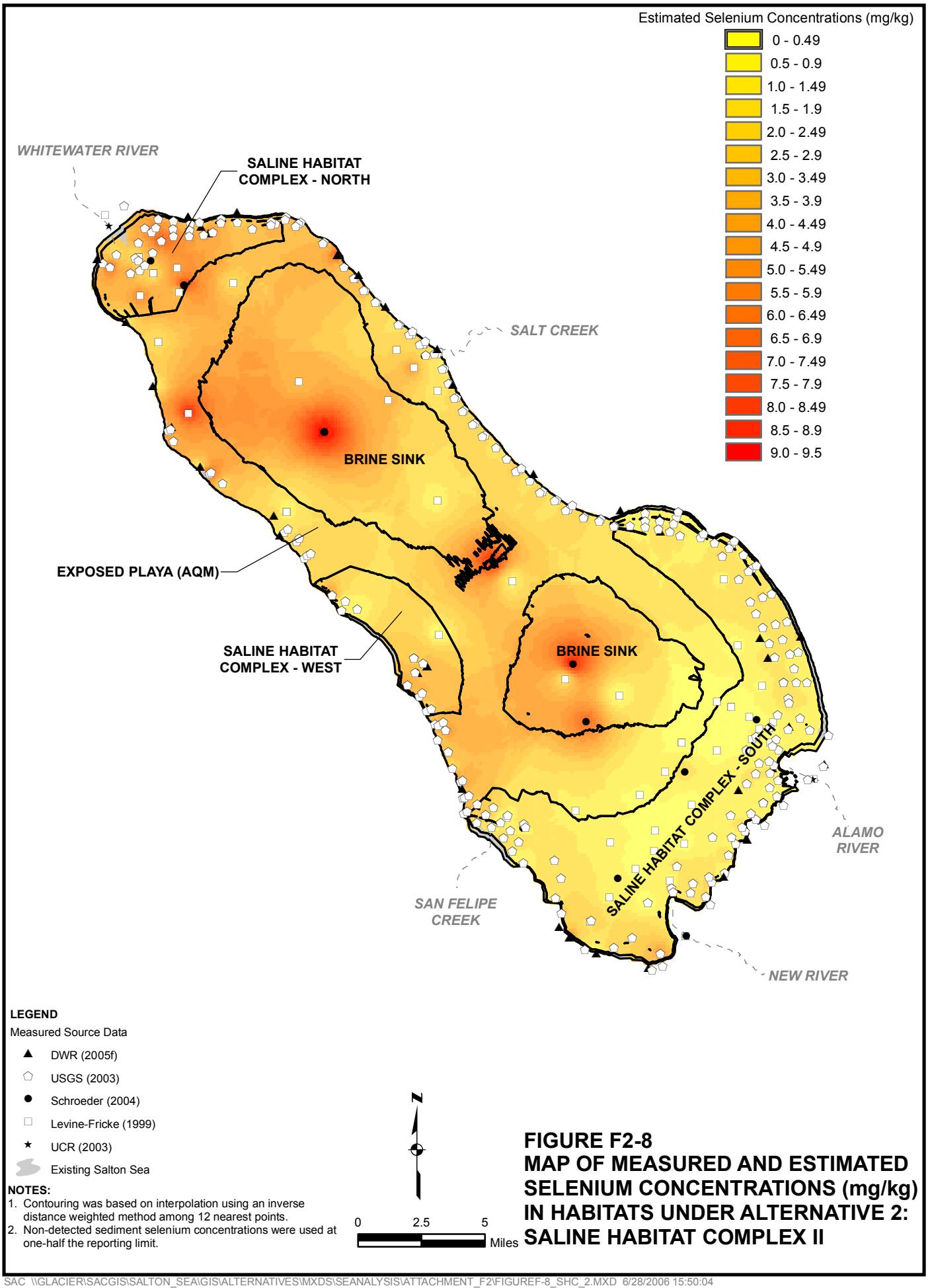


FIGURE F2-8
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER ALTERNATIVE 2: SALINE HABITAT COMPLEX II

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF-8_SHC_2.MXD 6/28/2006 15:50:04

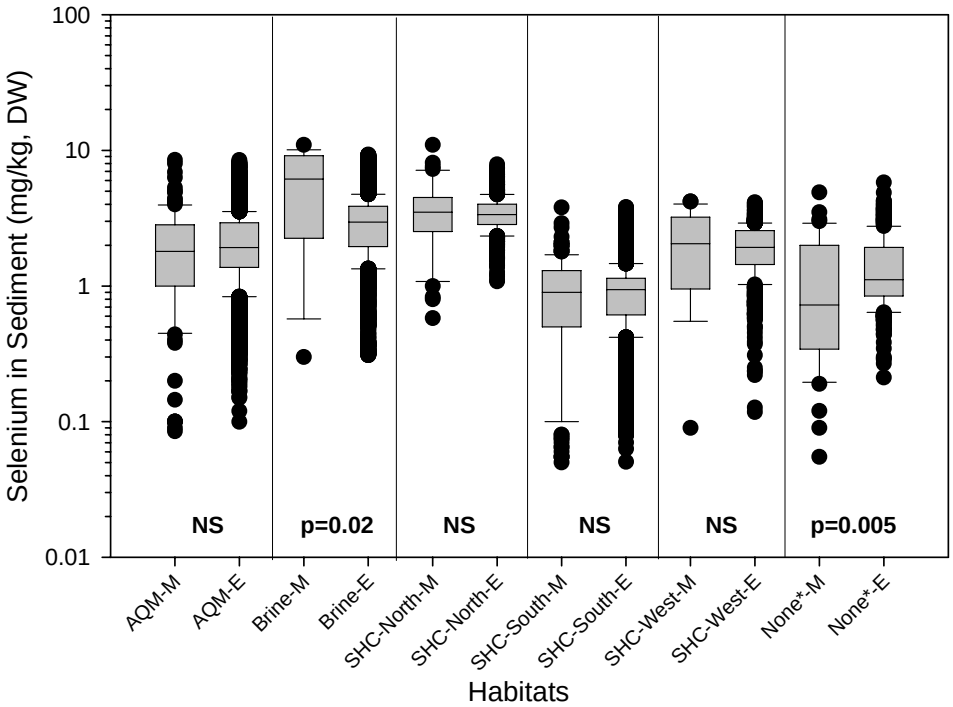


Figure F2-9. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 2 - Saline Habitat Complex II. Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.

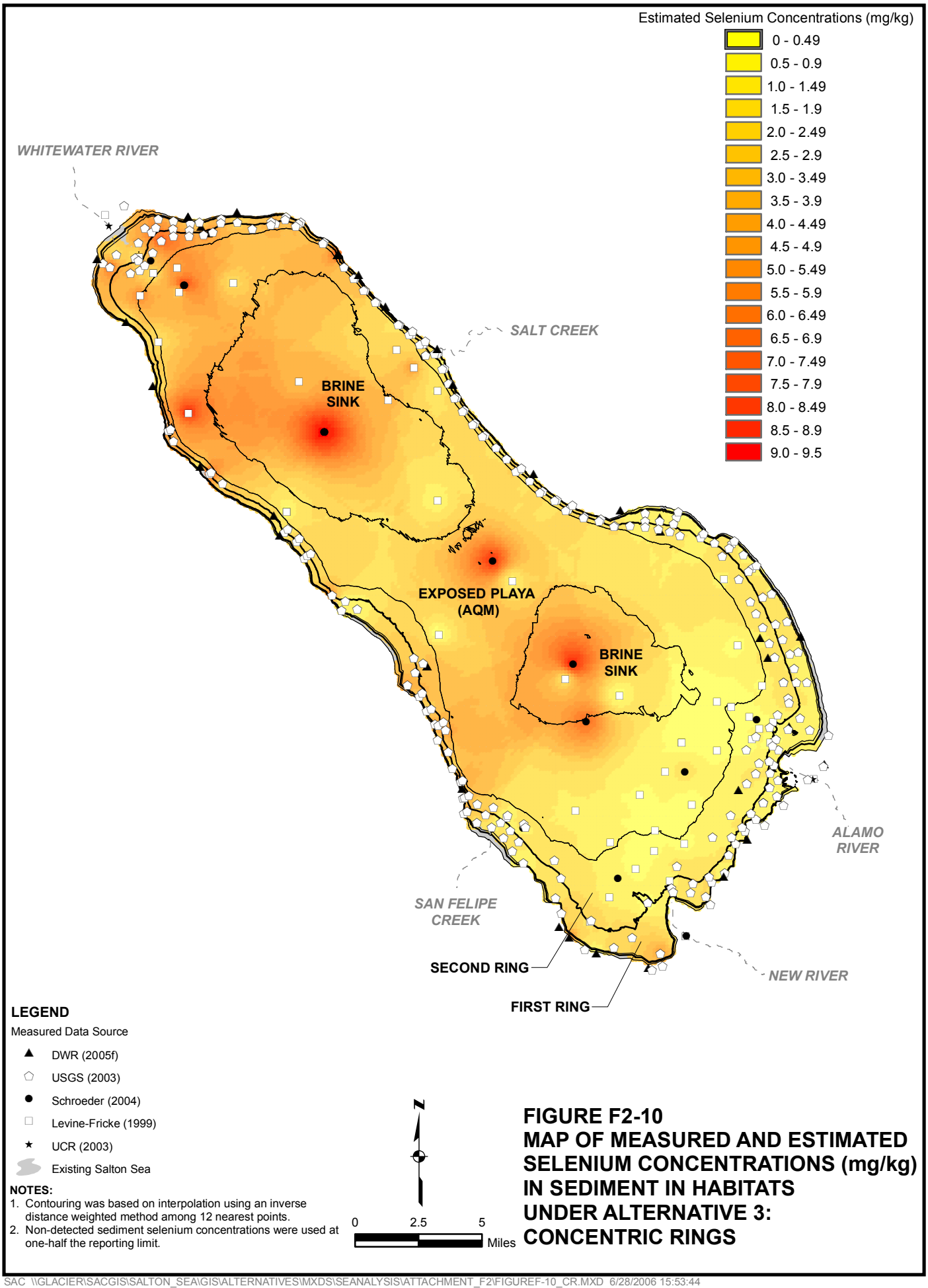


FIGURE F2-10
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN SEDIMENT IN HABITATS UNDER ALTERNATIVE 3: CONCENTRIC RINGS

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF-10_CR.MXD 6/28/2006 15:53:44

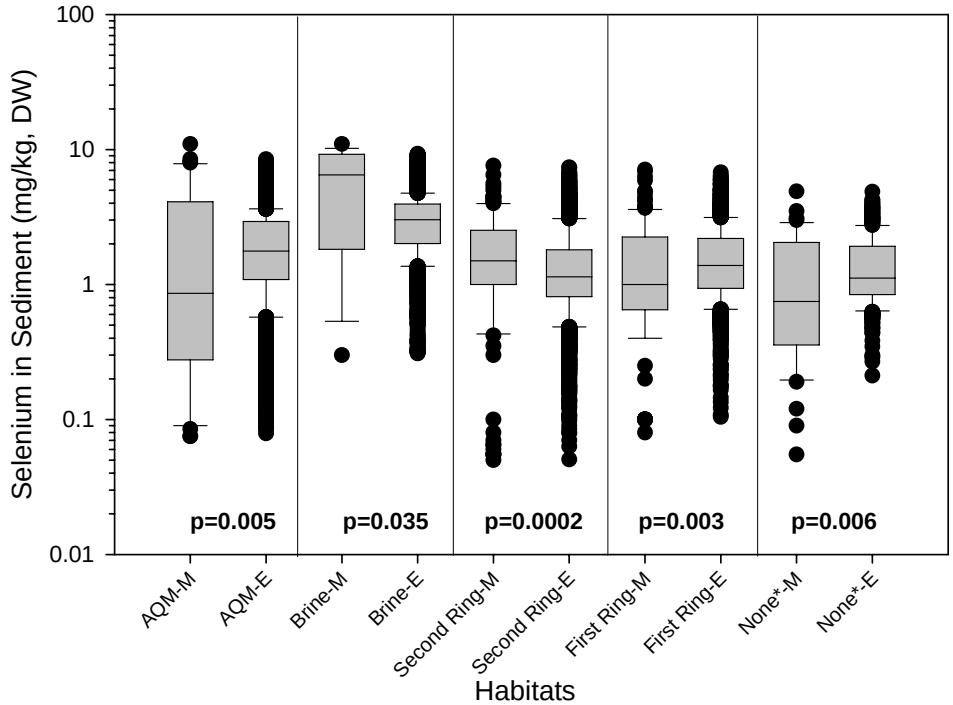


Figure F2-11. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 3 - Concentric Rings. Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.

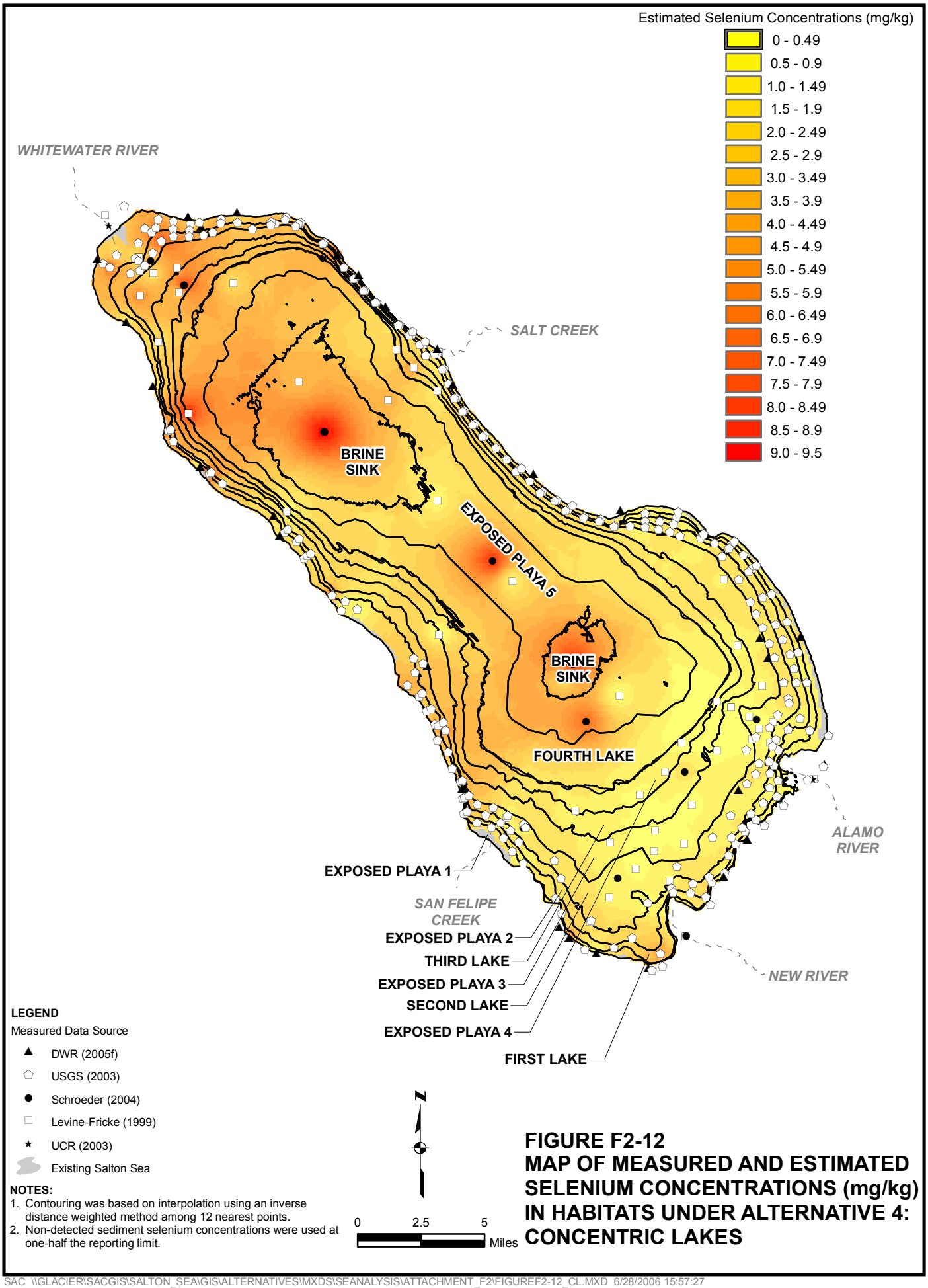


FIGURE F2-12
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER ALTERNATIVE 4: CONCENTRIC LAKES

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF2-12_CL.MXD 6/28/2006 15:57:27

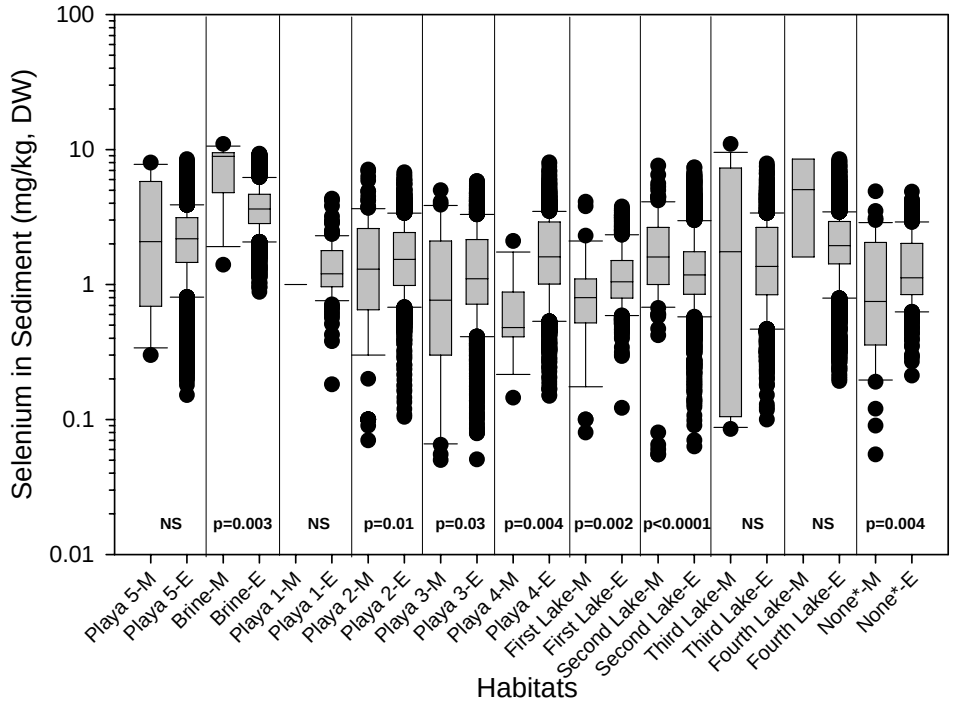


Figure F2-13. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 4 - Concentric Lakes. Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.

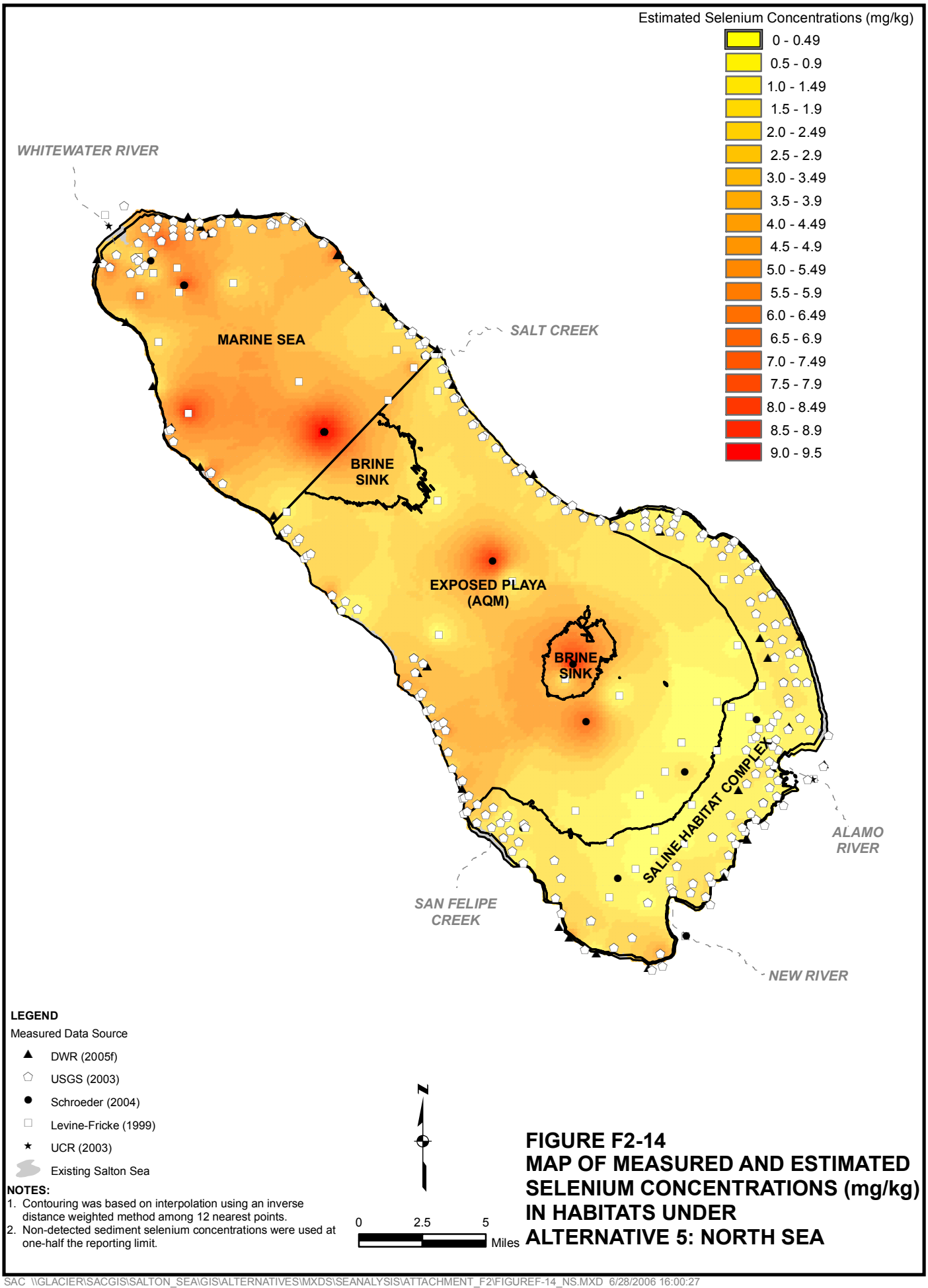


FIGURE F2-14
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER ALTERNATIVE 5: NORTH SEA

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF-14_NS.MXD 6/28/2006 16:00:27

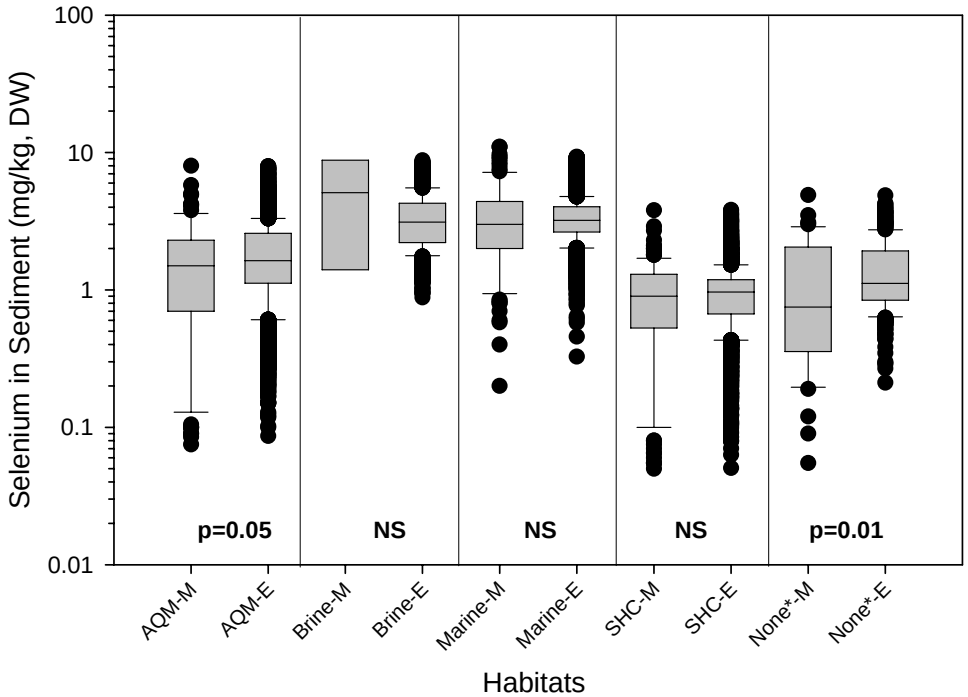


Figure F2-15. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 5 - North Sea. Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.

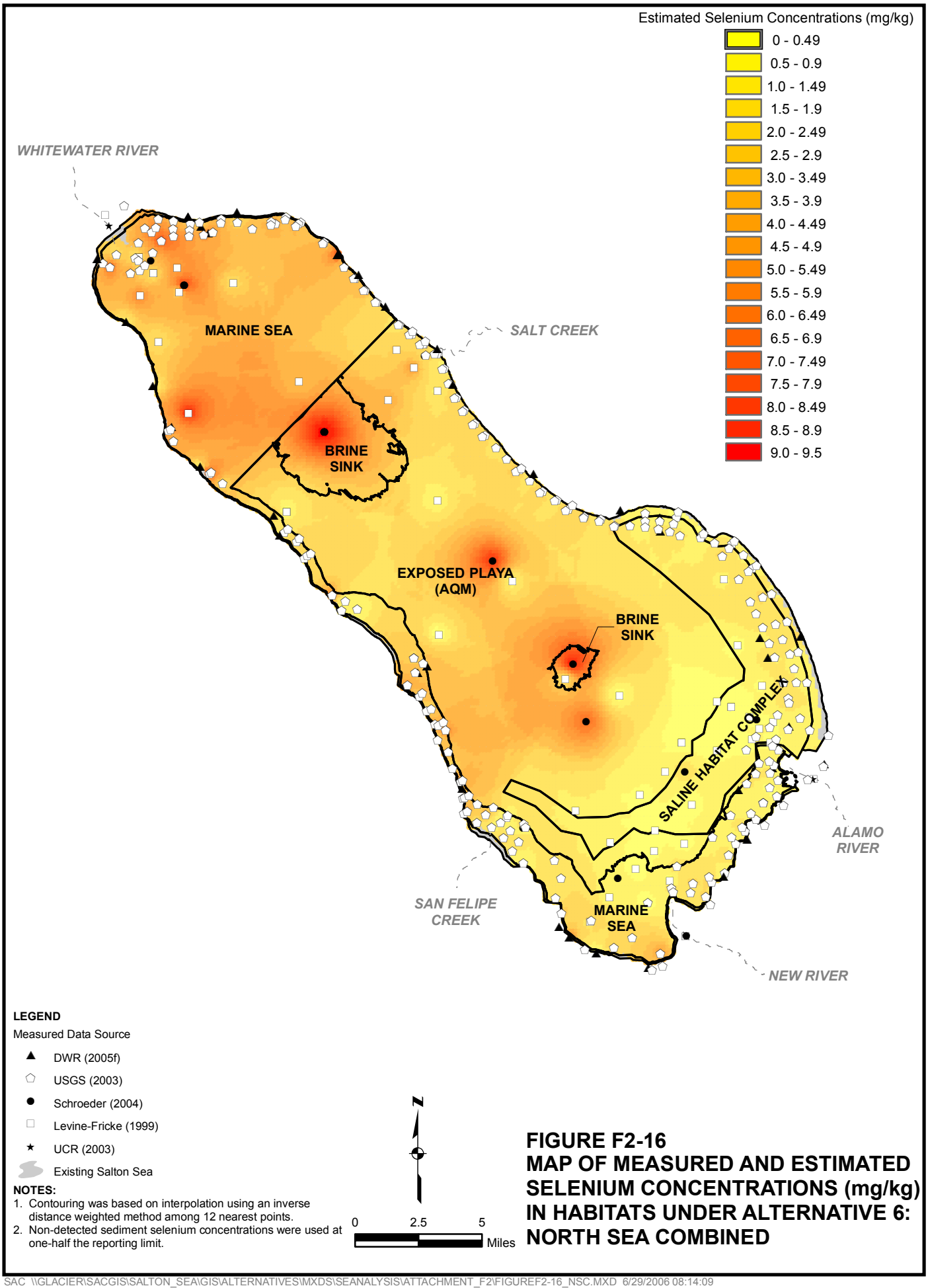


FIGURE F2-16
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER ALTERNATIVE 6: NORTH SEA COMBINED

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF2-16_NSC.MXD 6/29/2006 08:14:09

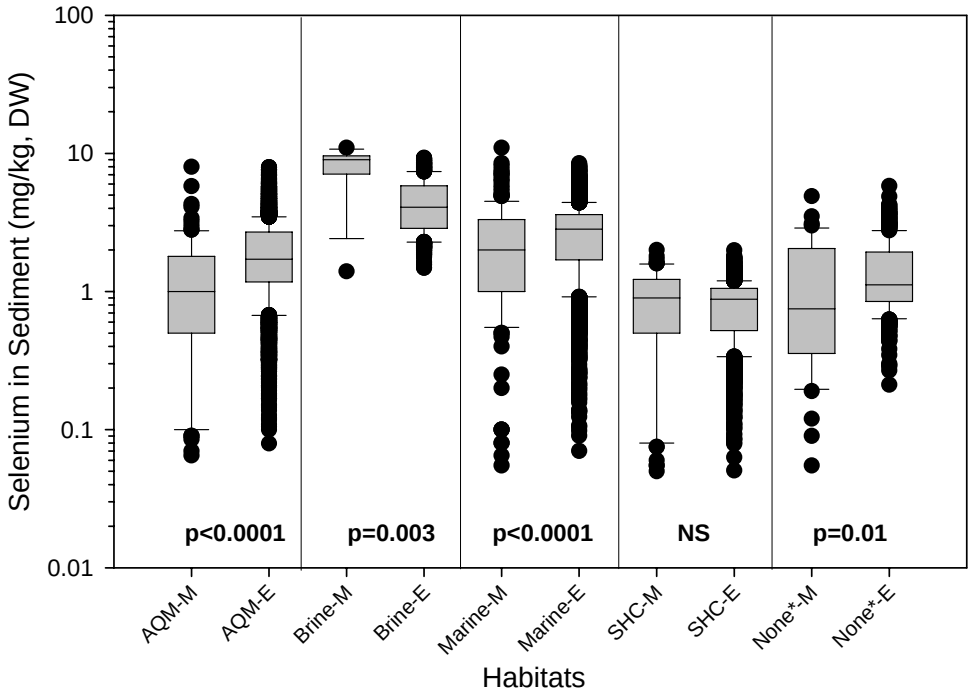
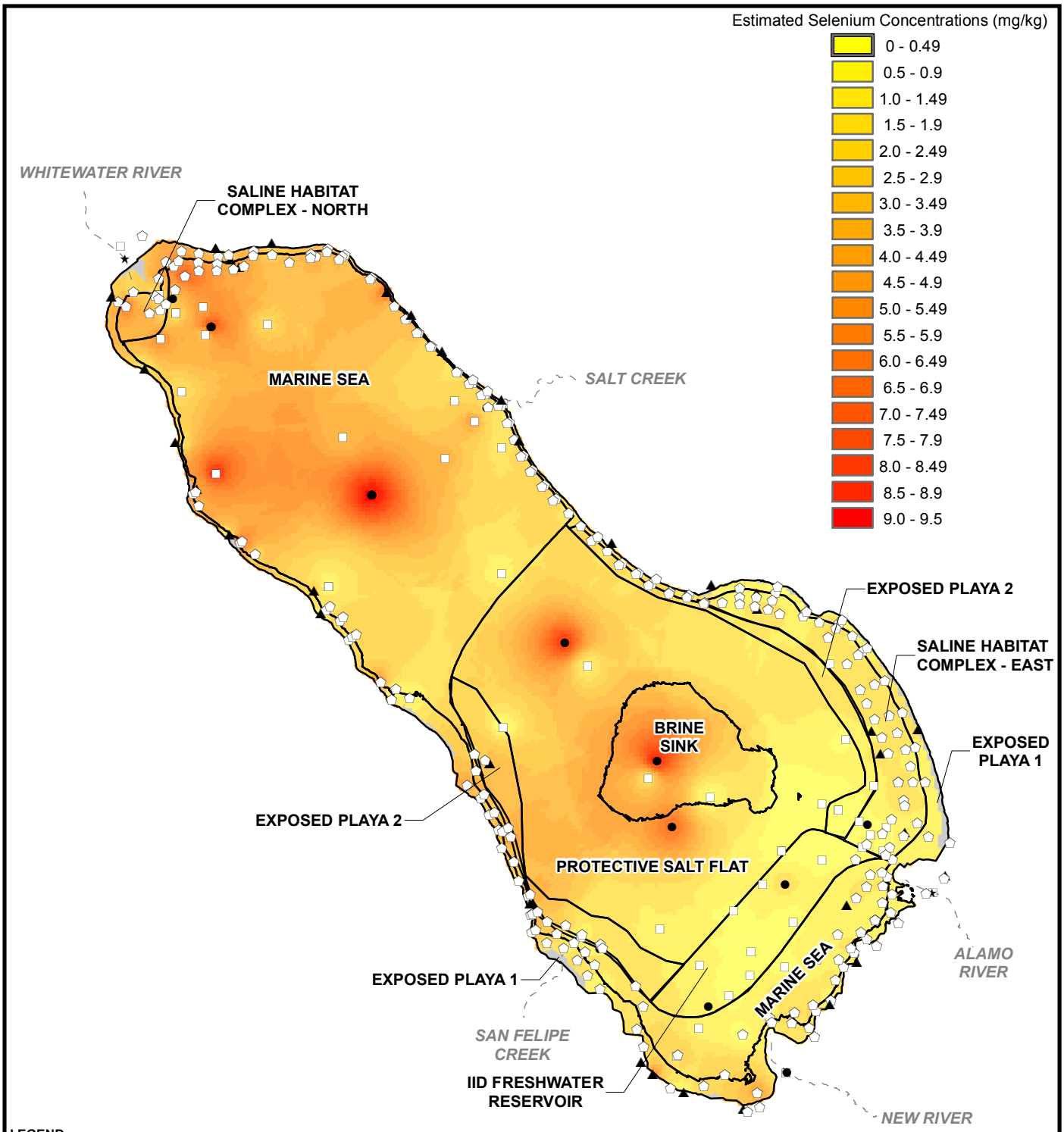


Figure F2-17. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 6 - North Sea Combined. Distributions compared using Wilcoxon Rank Sum Tests.*: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.



LEGEND

Measured Data Source

- ▲ DWR (2005f)
- ⬠ USGS (2003)
- ● Schroeder (2004)
- □ Levine-Fricke (1999)
- ★ UCR (2003)
- Existing Salton Sea

NOTES:

1. Contouring was based on interpolation using an inverse distance weighted method among 12 nearest points.
2. Non-detected sediment selenium concentrations were used at one-half the reporting limit.
3. Marine Sea includes both Recreational Saltwater Lake and Recreational Estuary Lake.

N

0 2.5 5 Miles

FIGURE F2-18
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN SEDIMENT IN HABITATS UNDER ALTERNATIVE 7: COMBINED NORTH AND SOUTH LAKES

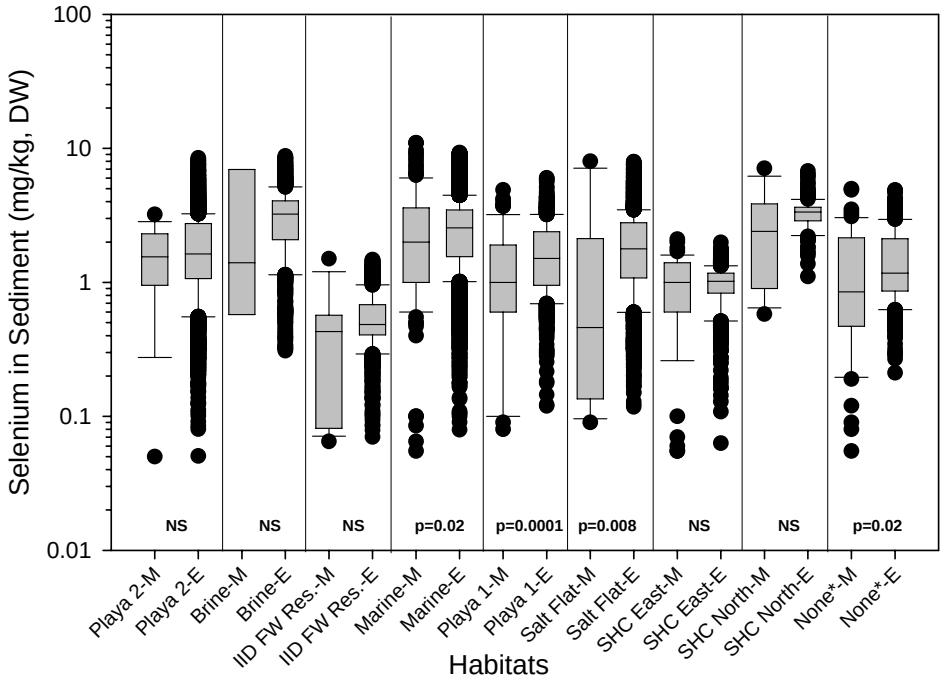
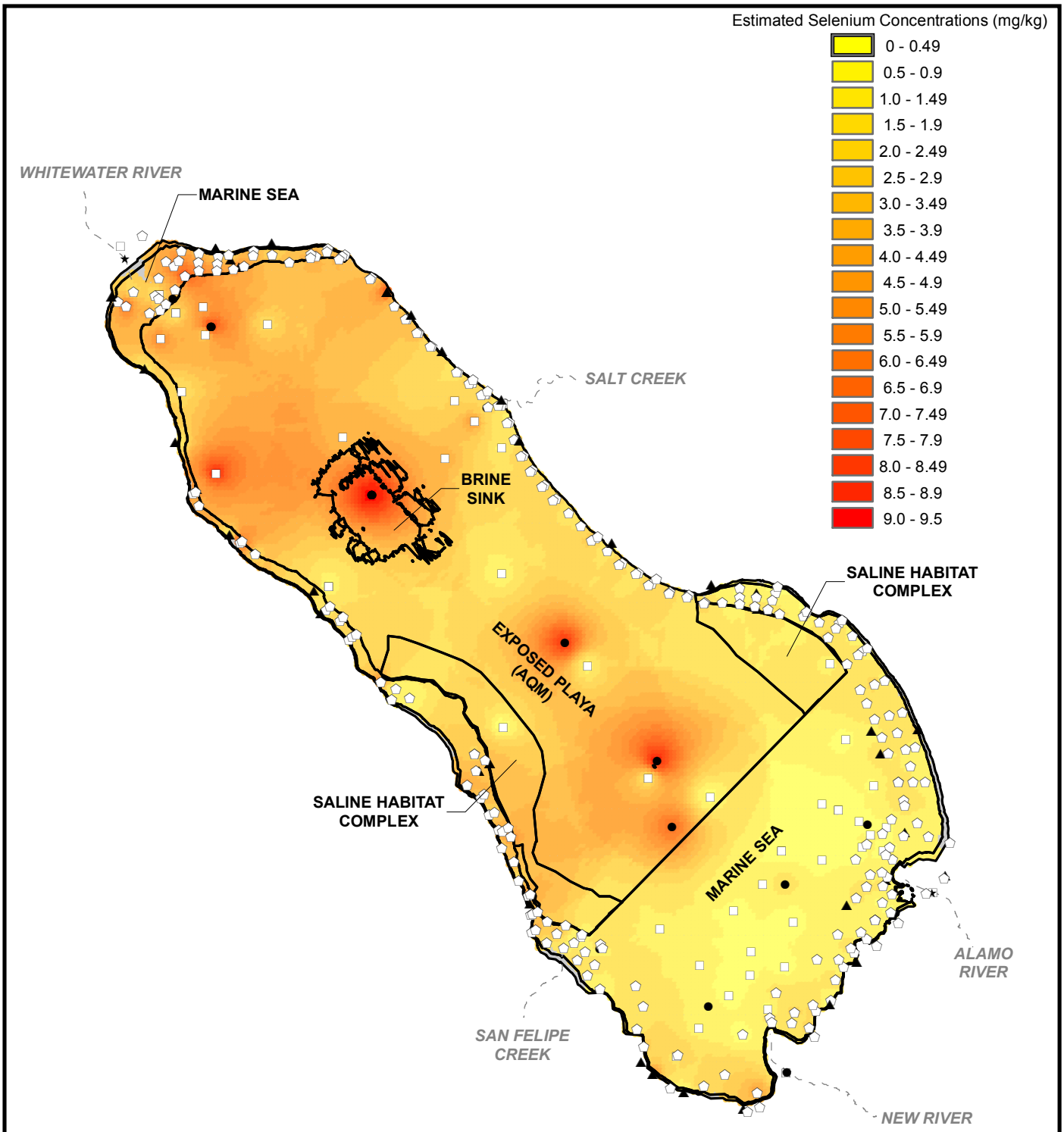


Figure F2-19. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 7 - Combined North and South Lakes. Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.



LEGEND

Measured Data Source

- ▲ DWR (2005f)
- ⬠ USGS (2003)
- ● Schroeder (2004)
- □ Levine-Fricke (1999)
- ★ UCR (2003)
- Existing Salton Sea

NOTES:

1. Contouring was based on interpolation using an inverse distance weighted method among 12 nearest points.
2. Non-detected sediment selenium concentrations were used at one-half the reporting limit.

N

0 2.5 5 Miles

FIGURE F2-20
MAP OF MEASURED AND ESTIMATED SELENIUM CONCENTRATIONS (mg/kg) IN HABITATS UNDER ALTERNATIVE 8: SOUTH SEA COMBINED

SAC \\GLACIER\SACGIS\SALTON_SEA\GIS\ALTERNATIVES\MXDS\SEANALYSIS\ATTACHMENT_F2\FIGUREF2-20_SSC.MXD 6/30/2006 09:12:18

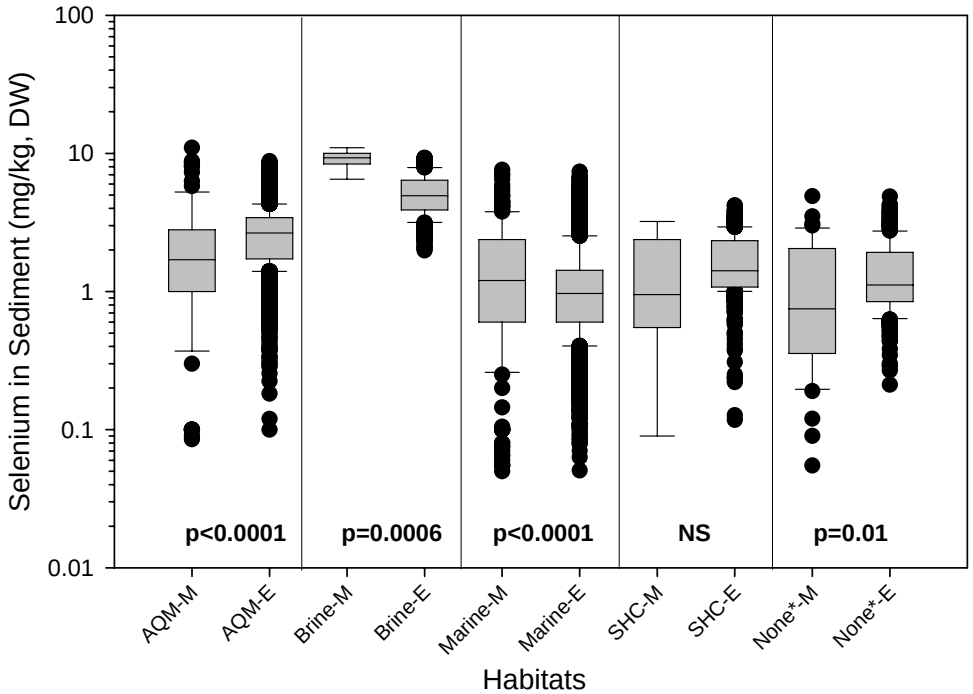


Figure F2-21. Comparison of measured (M) and estimated (E) selenium concentrations in sediments from the Salton Sea under Alternative 8 - South Sea Combined. Distributions compared using Wilcoxon Rank Sum Tests. *: Samples that although within the Salton Sea footprint under recent conditions fall outside the footprint of the sea in this future alternative. Abbreviations are explained in Table F2-4.

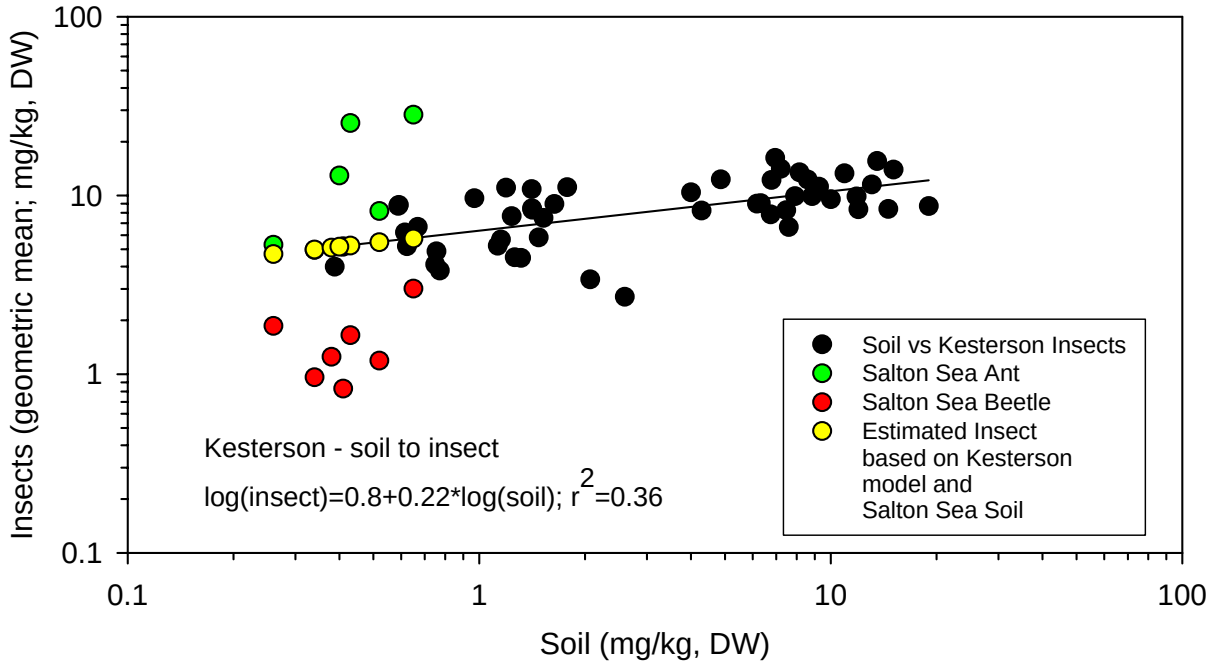


Figure F2-22. Scatterplot comparing selenium accumulation in insects from Kesterson Reservoir to selenium uptake in insects collected from the Salton Sea area. Data sources: Unpublished Kesterson Biological Monitoring Results, 1988 - 2001, CH2M HILL, Sacramento, CA; and Gersberg and Wright, unpubl. data.