

Impact Assessment for Ecological Risk



Advisory Committee
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Agenda

- ◆ **Methodology**
- ◆ **Data sources/evaluation**
- ◆ **Key assumptions**
- ◆ **Significance criteria for ecological risk**
- ◆ **Impact analysis for selenium risk**
- ◆ **Results**
- ◆ **Significance of results**

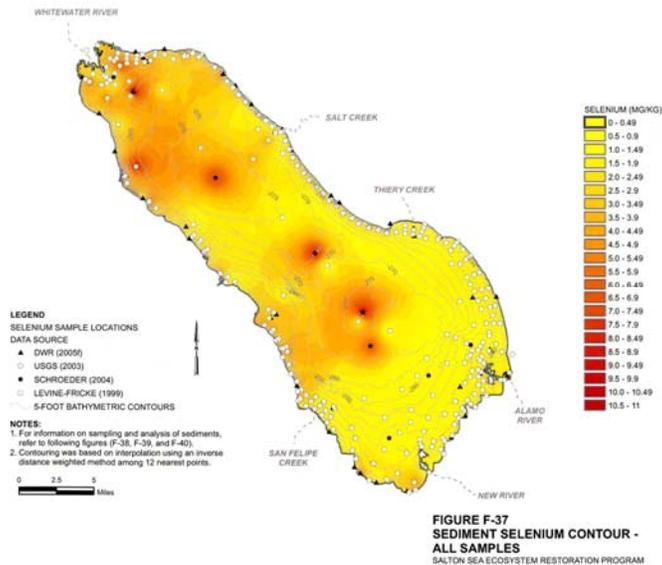
Methodology

- ◆ **Overall approach**
- ◆ **USEPA and California guidance**
 - **Problem formulation**
 - **Analysis**
 - ◇ Exposure characterization
 - ◇ Ecological effects characterization
 - **Risk characterization**
 - **Uncertainty analysis**

Data Sources/Evaluation

- ◆ **Historical data**
- ◆ **Sampling/studies conducted in 2005**
- ◆ **Estimated sediment selenium concentrations**
- ◆ **Inputs from hydrology/habitat designs**
- ◆ **Future conditions modeled, based on**
 - **Biota/water or sediment paired samples**
 - **Water inflow selenium concentrations**
 - **Selenium loading estimates to sediment**

Selenium in Salton Sea Sediment



Key Assumptions

- ◆ **Selenium behavior will be similar to that under current conditions**
- ◆ **Receptors evaluated are representative of other species in their guilds**
- ◆ **Exposure conditions depend mainly on selenium loading from inflow and on sediment selenium concentrations**
- ◆ **Transitional phases were not quantitatively evaluated**

Significance Criteria for Ecological Risk

◆ Selenium in water

- | | |
|--------------------|----------|
| ■ <2 ug/L (ppb) | Low |
| ■ 2 - 5 ug/L (ppb) | Moderate |
| ■ >5 ug/L (ppb) | High |

◆ Selenium in sediment

- | | |
|---------------------|----------|
| ■ <1 mg/kg (ppm) | Low |
| ■ 1 - 4 mg/kg (ppm) | Moderate |
| ■ >4 mg/kg (ppm) | High |

Significance Criteria for Ecological Risk

◆ Selenium in whole-body fish

- | | |
|----------------------------|----------|
| ■ <4 mg/kg (ppm, dw) | Low |
| ■ 4 - 7.91 mg/kg (ppm, dw) | Moderate |
| ■ >7.91 mg/kg (ppm, dw) | High |

◆ Selenium in birds

- Most species: Lowest observed adverse effect level
- Special-status species: No observed adverse effect level

Impact Analysis for Selenium Risk

◆ Exposure models

- **Concentration-based model**
 - ◆ Invertebrates, fish, birds (sediment)
- **Dosage-based model**
 - ◆ Birds (diet)
- **Tissue-based model**
 - ◆ Fish (whole body)
 - ◆ Birds (eggs)

Impact Analysis for Selenium Risk

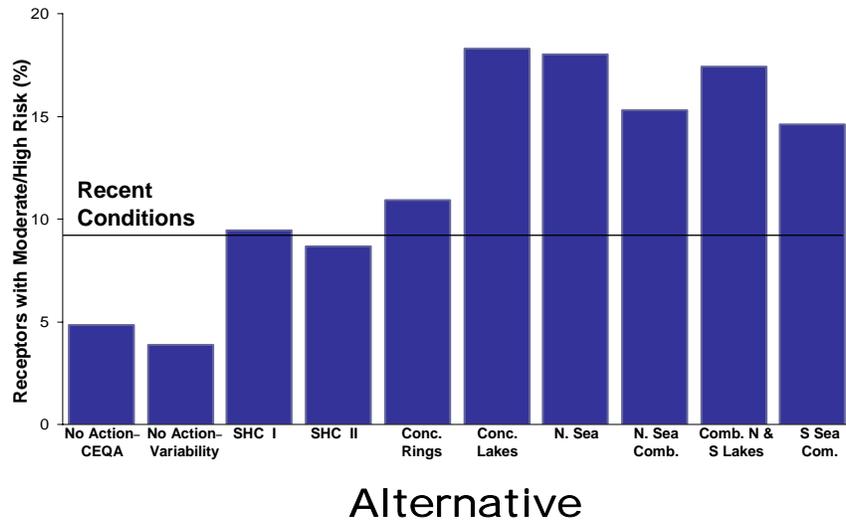
◆ Representative species for Salton Sea habitats

- **Community level**
 - ◆ Invertebrates
- **Population level**
 - ◆ Fish, common bird species
- **Individual level**
 - ◆ Special-status species

◆ Primary contributors to predicted risk

- **Sediment**
- **Water**

Results



Significance of Results

- ◆ Habitats created on sediment with high selenium concentrations will have higher risk
- ◆ Habitats created with water from Alamo and New rivers or IID drains that discharge directly to the Salton Sea will have higher risk

Comparison of Alternative 2
(Lowest Risk) and
Alternative 4 (Highest Risk)

| | | Alt 2: SHC II | Alt 4: Conc Lakes |
|------------------------|---|----------------------------------|----------------------|
| Habitat | Number of Receptors at Mod. to High Risk | Percentage of Area by Habitat | |
| Brine Sink | 5 or 6 | 17.5 | 1.5 |
| AQM Area | 0 | 44.1 | 0 |
| Saline Habitat Complex | 10 to 14 | 38.4 | 98.5 |