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**Toxicity Identification Evaluation Techniques for Determining Sediment Grain Size as a Confounding Factor in Testing with *Eohaustorius estuarius***

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**Abstract**

The influence of sediment grain size on toxicity to amphipods is an important concern, but there are few methods developed to investigate the influence of this factor in contaminated sediments. The Ballona Wetlands in Marina del Rey, California, USA is a highly modified urban estuary that was historically used for oil extraction activities. In the 1960s, dredged material from the building of an adjacent marina was deposited in the wetlands to a depth of as much as 20 feet. Restoration plans for the wetlands include removal of the dredged material and reintroduction of tidal exposure to the original sediments. Characterization of the former surface sediments from core samples detected toxicity to the amphipods *Eohaustorius estuarius*, but relatively little chemical contamination. A toxicity identification evaluation (TIE) study was conducted to determine the cause of toxicity. Initial testing showed a high level of toxicity with less than 30% survival at multiple stations. Observations during test termination indicated that the toxicity might be due to the highly compacted, fine grained and plastic nature of the sediment. Standard TIE treatments were conducted to determine the role of organics, metals, and ammonia as causes of toxicity. In addition, novel treatments were included to determine if sediment grain size/texture might be a cause of toxicity. The standard treatments showed no indication that chemical contaminants were the cause of toxicity. Treatments that increased the grain size and lowered particle adhesion reduced toxicity. Treatments of control sediment which reduced grain size and increased adhesion similar to the core sample increased toxicity. This evidence indicates that the physical characteristics of the sediment were a more likely cause of toxicity than chemical contamination.