

CENPS -EN-PL-ER (400A) May 29, 1990

Memorandum for: RECORD

Subject: Wet Sieving Method for Percent Fines to Match Test Sediments and Reference Sediments

1. PSDDA requires running reference sediments which are matched against dredged material by percent fines (that is, the dry weight of sediment passing a standard 63 um sieve divided by the total dry weight of the sediment). This is difficult to do because the easily-obtained field measurements (wet weight, volume) are only surrogates for the dry-weight basis used in the laboratory. This memorandum describes an interim protocol for collecting field information that will allow a grain-size approximation.

2. The wet sieve method was developed by Dr. Tom Ginn, Dr. Scott Becker and Mr. John Green of PTI during studies conducted for EPA's PSEP. The technique (but not the figures used here) is described in a technical memorandum from PTI to EPA's Office of Puget Sound, titled "Reconnaissance Survey of Reference Area Sediments in Shallow Waters of Carr Inlet," dated February 1990. The following data and methods were verbally transmitted to John Wakeman of Seattle District by Scott Becker on May 29, 1990.

a. The method for the Carr Inlet cruise used a starting volume of 65 ml of sediment collected in a marked beaker. The sediment was gently washed on a 63 um sieve until the water passing the sieve was clear. The retained material was then carefully rinsed into a 100 ml graduated cylinder and allowed to settle until the supernatant water was also clear. For a sandy sediment this will occur quickly, within one minute; for a silty sediment, it may take up to 15 minutes. (Should colloidal materials remain in suspension after 15 minutes, then the sediment was not washed sufficiently on the sieve.) However, the endpoint is usually not determined by clarity, but instead the degree of compacted flocculated sediment. One should see at least a clear delineation between floc and supernatant water at endpoint.

b. Interpretation. Figure 1 shows the relationship that was developed by comparing field values with lab values. This relationship probably only holds for the Raft Island area. In general, the values appear to agree with the assumption that the wet density is equal to the dry weight: one would predict that 10% fines (=90% sands) would be $0.9 * 65\text{mL}$ (grams), or 58.5; the realized value is 56. For 89% fines (11% sands retained) $0.11 * 65 = 7.2$ predicted, and 9 were recovered.

3. EPA commissioned PTI to do further studies on reference areas, and they will be developing this technique further during the studies; they are now using a standard of 50 ml of material.

JOHN WAKEMAN

Biologist