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No Response Required

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Ms. Mary Sanderson
U.S. Environmental Protection Agency
Waste Management Division
JFK Federal Building HPS-CAN 2
Boston, MA 02203-2211

Subject: ARCS I-EPA CONTRACT NO. 68-W9-0034
WORK ASSIGNMENT NO. 12-1L34
NEW BEDFORD HARBOR POST FS SUPPORT
ENGINEERING ESTIMATES - FS FOOTPRINT ADJUSTMENTS

Dear Ms. Sanderson:

The Ebasco ARCS I team has developed estimates of the cost components for FS Alternatives EST-3 and LHB-3 associated with remediation of sediments contaminated by PCB concentrations greater than the 10 ppm TCL and which lie directly underneath and within the "footprint" of those CDFs which may be required for implementation of these Alternatives. These cost calculations should be considered approximate in that the contaminated sediment volume calculations upon which they are based contain some uncertainty.

As is indicated in the Attachment, the results of these calculations indicate that a significant fraction of the overall costs for Alternatives EST-3 and LHB-3 may be associated with disposal of PCB contaminated sediments lying within the footprints of CDFs potentially required under these Alternatives. The actual costs associated with footprint sediment remediation would be dependent upon which suite of CDFs were ultimately selected for implementation under these Alternatives. The costs developed in the Attachment represent examples of the magnitude of the remediation costs which may be associated with CDF footprints. Ebasco has not attempted to evaluate the implementability of the arrays of CDFs which have been examined, nor to evaluate the costs associated with the matrix of all possible combinations of CDFs which might be utilized.

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It should also be noted that the footprint adjustment costs do not address dredging or operation and maintenance costs which may be associated with changes in the numbers and/or arrays of CDFs which might be utilized.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Lewis M Horzempa

Lewis M. Horzempa
Site Manager

LMH/mec

Enclosures

cc: N. Barmakian
R. Gleason
L. Seijido

FILE: ARCS PM 1.1

EBASCO

INTEROFFICE CORRESPONDENCE

DATE: September 10, 1991

DOC. #: M91-329

TO: Lew Horzempa

FROM: Alan S. Fowler ASF

SUBJECT: ARCS I - EPA CONTRACT NO. 68-W9-0034
WORK ASSIGNMENT NO. 12-1L34
NEW BEDFORD HARBOR POST FS SUPPORT
EVALUATION OF FOOTPRINT ADJUSTMENTS

Introduction

To assist EPA in evaluating the potential impact of not dredging contaminated sediment from areas beneath the proposed Confined Disposal Facility (CDF) locations, Ebasco has developed "footprint adjustments" to estimate the quantity of sediment that would not have to be removed. This conceptual approach was applied to the 10 ppm dredging and shoreline disposal alternatives for the Estuary and Lower Harbor/Bay areas. These alternatives are presented in the New Bedford Harbor Feasibility Study as alternatives EST-3 and LHB-3, respectively. A similar approach of footprint adjustments was utilized for alternatives SW-7, SW-8 and SW-9 in Volume III of the New Bedford Harbor Feasibility Study.

The footprint adjustment serves to decrease the quantity of sediment requiring dredging. Consequently, the footprint adjustment results in less dredging, water treatment, required CDF capacity and operation and maintenance (O&M) activity. Accordingly, the footprint adjustment also lowers the cost of each alternative. Since the cost to implement a dredging and shoreline disposal alternative is dominated by the construction costs for the sediment disposal facility, only those cost reductions have been considered herein. The cost reduction will be presented as a change in cost, relative to the cost to implement the combination of alternatives EST-3 and LHB-3.

Technical Analysis

The analysis was conducted as a two-step process including (1) an estimate of the footprint adjustment volumes for the CDFs used in alternatives EST-3 and LHB-3 and, (2) an estimate of the potential cost impact of applying the footprint adjustment to a 10 ppm action level scenario of dredging and shoreline disposal.

The first step involved an evaluation of the areas with PCB concentrations exceeding 10 ppm that were collocated with the CDFs identified to support alternatives EST-3 and LHB-3. The areas were then quantified and multiplied by the required dredging depths to obtain the footprint adjustment volumes. Consistent with the Feasibility Study, the dredging depths for the Estuary and Lower Harbor/Bay regions were two feet and one foot, respectively. A summary of CDF storage capacity, construction costs and footprint adjustment volumes to support alternatives EST-3 and LHB-3 is presented below in Table 1. The CDF locations and footprint adjustment areas and volumes are also presented in Figure 1.

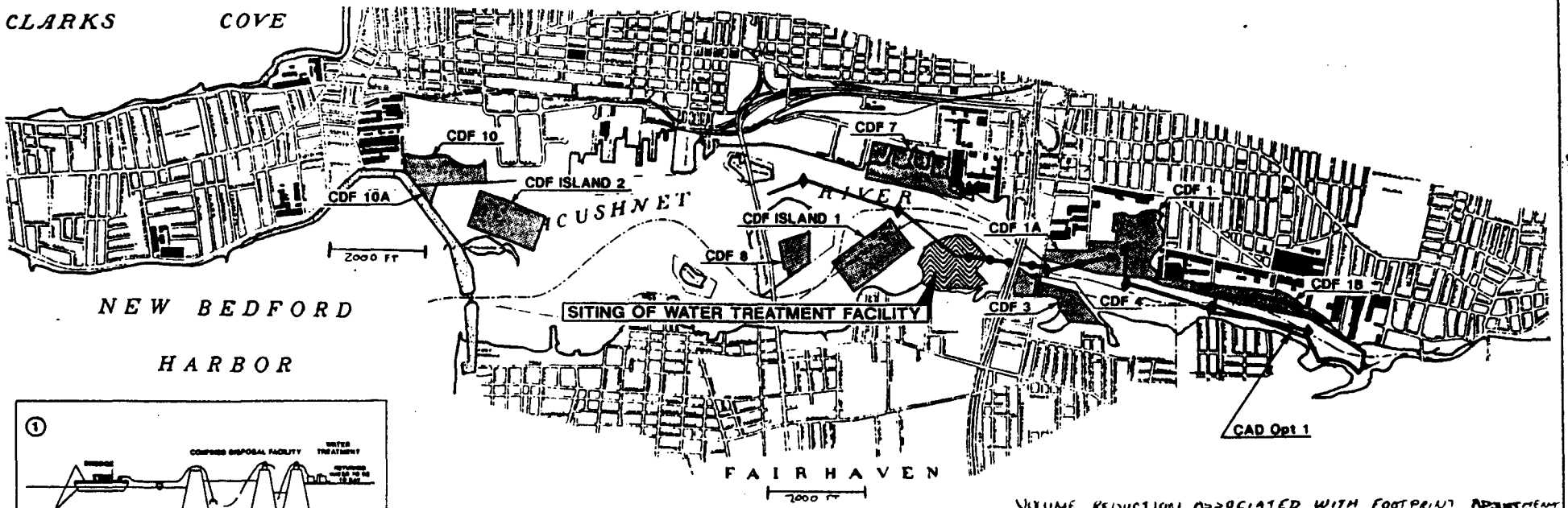
Table 1

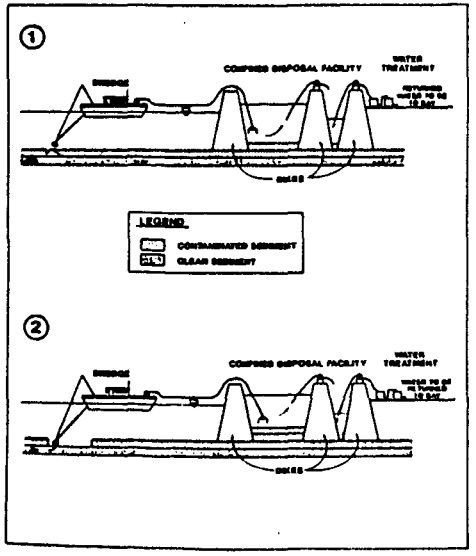
CDF FOOTPRINT ADJUSTMENTS

CDF Locations	Storage Capacity (yd^3)	Construction Costs ($ M)	Footprint Adjustment(yd^3) (Reduced Dredging Volume)
1	270,000	$ 5.1 M	75,400
1A	30,000	$ 5.2 M	15,900
1B	90,000	$ 7.4 M	40,500
3	134,000	$ 8.8 M	56,300
7	181,000	$ 9.5 M	34,200
8	42,000	$ 4.3 M	8,200
10/10A	267,000	$ 12.7 M	None
Island #1	354,000	$ 19.4 M	31,100

The second step included selecting CDFs to accommodate a revised sediment volume. The revised sediment volume was calculated using the 10 ppm action level volume presented in the Feasibility Study (i.e., 926,000 yd^3) and subtracting out the footprint adjustment volume associated with the selected CDFs. This volume was then multiplied by the bulking factor of 1.4 to yield the sediment volume required for disposal. The storage capacity was calculated as the sum of storage volumes for the selected CDFs. In all cases, the available storage capacity (i.e., CDF volume) must be greater in magnitude than the required capacity (i.e., the dredging volume multiplied by the bulking factor).

As demonstrated above, this process requires selection of the CDF configuration before calculating the required capacity. To simplify the process, combinations of CDFs that yielded footprint adjustments on the order of 200,000 yd^3 were initially selected. CDF locations were then added or subtracted to minimize the difference between the storage capacity and the required volume. While a large number of potential CDF configurations were possible, two such cases are presented herein for illustration purposes.





SCALE IN FEET
0 2,000 4,000

LEGEND

- POTENTIAL SHORELINE DISPOSAL SITES
- FLOATING HYDRAULIC PIPELINE WITH BOOSTER PUMP FOR DREDGED SEDIMENTS
- FLOATING PIPELINE FOR SUPERNATANT FEED TO TREATMENT

VOLUME REDUCTION ASSOCIATED WITH FOOTPRINT ADJUSTMENT

CDF	FOOTPRINT AREA (FT²)	SEDIMENT DEPTH	VOLUME REDUCTION (FT³)
1	1,017,500	2	75,400
1A	214,300	2	15,900
1B	546,100	2	40,600
3	759,600	2	56,300
7	924,200	1	34,200
8	220,600	1	8,200
10 & 10A	—	—	—
ISLAND 1	840,200	1	31,100

FIGURE 1
ALTERNATIVES EST-3 AND LHB-3
FACILITY SITING MAP
ESTUARY AND LOWER HARBOR AND BAY
FEASIBILITY STUDY
NEW BEDFORD HARBOR

CDF Configuration #1 - The first potential configuration which was considered consisted of CDFs 1, 1A, 1B, 3, 7, 8 and 10/10A. The revised sediment volume is 973,700 yd^3 ([926,000 yd^3 - 230,500 yd^3] * 1.4). The CDF eliminated relative to the combination of alternatives EST-3 and LHB-3 is CDF Island #1. The resulting storage capacity of 1,014,000 yd^3 is sufficient to accommodate the dredging volume of 973,700 yd^3. The estimated reduction in capital costs associated with the elimination of CDF Island #1 are approximately $19.4 million. Storage capacity, construction costs and footprint adjustments for this scenario are provided below in Table 2. In addition, there would be reduced dredging, water treatment and O&M costs associated with this scenario that have not been identified herein.

Table 2

CDF CONFIGURATION #1

CDF Location	Storage Capacity (yd^3)	Construction Costs ($ M)	Footprint Adjustment(yd^3) (Reduced Dredging Volume)
1	270,000	$ 5.1 M	75,400
1A	30,000	$ 5.2 M	15,900
1B	90,000	$ 7.4 M	40,500
3	134,000	$ 8.8 M	56,300
7	181,000	$ 9.5 M	34,200
8	42,000	$ 4.3 M	8,200
10/10A	267,000	$ 12.7 M	None
	1,014,000 yd^3	$ 53.0 M	230,500 yd^3

CDF Configuration #2 - The second potential configuration which was considered consisted of CDFs 1, 1A, 1B, 8, 10/10A and Island #1. The CDFs eliminated relative to the combination of alternatives EST-3 and LHB-3 are CDFs 3 and 7. The revised sediment volume is 1,056,860 yd^3 ([926,000 yd^3 - 171, 100 yd^3] * 1.4). This volume is essentially equal to the available storage capacity of 1,053,000 yd^3. Although the storage capacity is slightly smaller than the sediment volume, the difference is considered insignificant for Feasibility Study purposes. The estimated reduction in capital costs associated with the elimination of CDFs 3 and 7 are approximately $18.3 million. Storage capacity, construction costs and footprint adjustments for this scenario are provided below in Table 3. In addition, there would be reduced dredging, water treatment and O&M costs associated with this scenario that have not been considered herein.

Table 3

CDF CONFIGURATION #2

CDF Location	Storage Capacity (yd^3)	Construction Costs ($ M)	Footprint Adjustment(yd^3) (Reduced Dredging Volume)
1	270,000	$ 5.1 M	75,400
1A	30,000	$ 5.2 M	15,900
1B	90,000	$ 7.4 M	40,500
8	42,000	$ 4.3 M	8,200
10/10A	267,000	$ 12.7 M	None
Island #1	354,000	$ 19.4 M	31,100
	1,053,000 yd^3	$ 54.1 M	171,100 yd^3

Summary

At the 10 ppm action level, the quantity of material to be dredged can be reduced on the order of 200,000 yd^3 through footprint adjustments. The most significant impact of the footprint adjustment will be the subsequent reduction of required storage capacity. This reduced storage requirement translates into fewer CDFs, and hence, lower capital costs. Other less significant cost reductions will also occur for dredging, water treatment and O&M costs. The latter savings have not been included within this evaluation. For the two potential CDF configurations evaluated herein, the estimated reduction in construction costs relative to alternatives EST-3 and LHB-3 is on the order of $15 to 20 million.

It should be recognized that in addition to cost, many factors including implementability, access and public sentiment must be taken into consideration during the CDF selection process. Therefore, the potential cost reduction associated with the footprint adjustment will be a function of the ultimate CDF configuration chosen.

AF/mec

FILE: PM 1.3