RETURN TO UAO AR INDEX

SITE New Bedford
6.6
289324

Total Environmental Restoration Contract

New England Division

USACE Contract No. DACW33-94-D-0002

FOSTER WHEELER ENVIRONMENTAL CORPORATION

SDMS DocID 289324

USACE CONTRACT NO. DACW33-94-D-0002
TASK ORDER NO. 017
TOTAL ENVIRONMENTAL RESTORATION CONTRACT

DRAFT
DREDGING, EXCAVATION, RESTORATION AND DEWATERING DESIGN WORK PLAN
MODIFICATION NO. 20
TO THE WORK PLAN
FOR REMEDIAL DESIGN
FOR OPERABLE UNIT #1
NEW BEDFORD HARBOR SUPERFUND SITE
New Bedford, Massachusetts

May 2001

Prepared for

U.S. Army Corps of Engineers
New England District
Concord, Massachusetts

2001-017-0093
5/1/01

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Concord, Massachusetts

Prepared by

Foster Wheeler Environmental Corporation
133 Federal Street
Boston, MA 02110

Revision	Date	Prepared By	Approved By	Pages Affected
0	5/1/01	J. Holwell	G. Willant	All

2001-017-0093
5/1/01

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Appendix E	Restoration Design Preliminary List of Drawings and Specifications
Appendix F	Remedial Design Baseline Project Schedule
Appendix G	Submittal Register

LIST OF ACRONYMS AND ABBREVIATIONS

AIHA	American Industrial Hygiene Association
APE	area of potential effect
ARARs	Applicable or Relevant and Appropriate Requirements
BAFO	Best and Final Offer
BD/DA	Basis of Design/Design Analysis
CDF	confined disposal facility
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CPM	Critical Path Method
CSO	combined sewer overflow
CSP	Certified Safety Professional
CQCP	Construction Quality Control Plan
cy	cubic yards
DGPS	differential global positioning system
DOD	U.S. Department of Defense
DOT	U.S. Department of Transportation
ESCP	Erosion and Sedimentation Control Plan
EEO	Equal Employment Opportunity
EMI	electromagnetic induction
EPA	U.S. Environmental Protection Agency
Foster Wheeler	Foster Wheeler Environmental Corporation
GC/MS	gas chromatograph/mass spectrometer
GIS	geographical information system
GPR	ground penetrating radar
HBCU/MIs	Historically Black Colleges and Universities/Minority Institutions
HELP	Hydraulic Evaluation of Landfill Performance
HLA	Harding Lawson Associates
HTRW	Hazardous, Toxic, and Radioactive Waste
IDW	investigation derived waste
MADEP	Massachusetts Department of Environmental Protection
MIS	Management Information System
MLW	mean low water
MRD	USACE Missouri River District
MS/MSD	matrix spike/matrix spike duplicates
MSWM	Massachusetts Solid Waste Management
NCP	National Contingency Plan
NCTL	Notched Constant Tensile Load
NE TERC	New England Total Environmental Restoration Contract
NG	Natural Gas
NOAA	National Oceanographic and Atmospheric Administration
NPL	National Priorities List
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
OU#1	Operable Unit #1
PCB	polychlorinated biphenyl
P.E.	Professional Engineer
PHSM	Project Health and Safety Manager
PPE	personal protective equipment

ppm	parts per million
PUF	polyurethane foam
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QCSM	Quality Control System Manager
RCP	Regulatory Compliance Plan
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RFI	request for information
ROD	Record of Decision
ROE	right of entry
SAP	Sampling and Analysis Plan
SB/SDB	small business/small disadvantaged business
SCS	Soil Conservation Service
SD	storm drain
SHPO	State Historic Preservation Office
SIM	selected ion monitoring
SLLP	Site Layout and Logistics Plan
SOW	Statement of Work
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TEF	toxicity equivalent factor
TSCA	Toxic Substance Control Act
TTSP	Transportation and Temporary Storage Plan
USACE	U.S. Army Corps of Engineers
WBS	Work Breakdown Structure
WES	Waterways Experiment Station
WHO	World Health Organization
WTP	water treatment plant

1.0 INTRODUCTION

Foster Wheeler Environmental Corporation (Foster Wheeler) has prepared this Work Plan Modification for the Remedial Design (RD) of Operable Unit #1 (OU#1), Upper and Lower Harbor, New Bedford Harbor Superfund Site, New Bedford, Massachusetts under Task Order No. 17 of the U.S. Army Corps of Engineers (USACE) for the New England Total Environmental Restoration Contract (NE TERC) No. DACW33-94-D-0002 in response to USACE Request For Proposal (RFP) No. 63 dated March 19, 2001. This Work Plan Modification is required due to several changes in the overall scope of the project (e.g., the incorporation of mechanical dewatering of sediments) and to ensure the utilization of the best available resources to implement the remaining design activities. The remedial design tasks driving this Work Plan Modification are Task 20, Remedial Design and Task 21, Special Studies. Remedial Design includes the design of dredging (Subtask 20.91), excavation (Subtask 20.92), restoration (Subtask 20.94) and dewatering (Subtask 20.93). Special Studies include real estate (Subtask 21.04) and material balance (Subtask 21.96) efforts, which are aimed towards supporting the Remedial Action (RA) for the future implementation of the RD, and specific value engineering efforts (Subtask 21.99) which are aimed towards improving the overall efficiency of the RD/RA. Other investigatory and evaluation tasks (Task 06, 08, 10 and 11) are also included in support of design.

The Work Plan Modification is divided into five sections. Section 1.0 provides an introduction and overview of the project including a summary of the project background; a brief description of the project's major work elements; a description of the roles and responsibilities of the EPA, USACE, and Foster Wheeler; and assumptions/issues that affect development of the Work Plan for the project. Section 2.0 is a detailed description of the approach to work using the Hazardous, Toxic, and Radioactive Waste (HTRW) Series 32 Code of Accounts for remedial design activities. The overall management plan for staffing, project execution, project scheduling, and cost control is discussed in Section 3.0. The Project Schedule and Cost Estimate are discussed in Sections 4.0 and 5.0, respectively.

1.1 Purpose

This document and the accompanying Project Schedule and Cost Estimate present Foster Wheeler's approach for performing the March 8, 2001 Scope of Work as amended and clarified by the March 28, 2001 Scoping Meeting, the April 4, 2001 Transportation and Disposal (T&D) Kickoff Meeting and other review meetings, site visits, and conference calls between EPA, USACE, and Foster Wheeler. The approach described in this Work Plan Modification and Cost Estimate allows portions of the remedial design to start as early as practical. As work is performed, this Work Plan Modification and Cost Estimate will be amended as necessary to include activities that were outside of the basis of work detailed in this Work Plan and estimate. The accompanying schedule includes the detailed activities for the entire remedial design effort. This schedule will be expanded to include a general overview of the sequence of construction activities as part of Work Plan comment resolution following negotiations.

1.2 Site Description

The Site Description is provided in Section 1.2 of the original Work Plan submitted in April 1999. The overall site location map is included as Figure 1.1 and the approximate area of contamination is included as Figure 1.2.

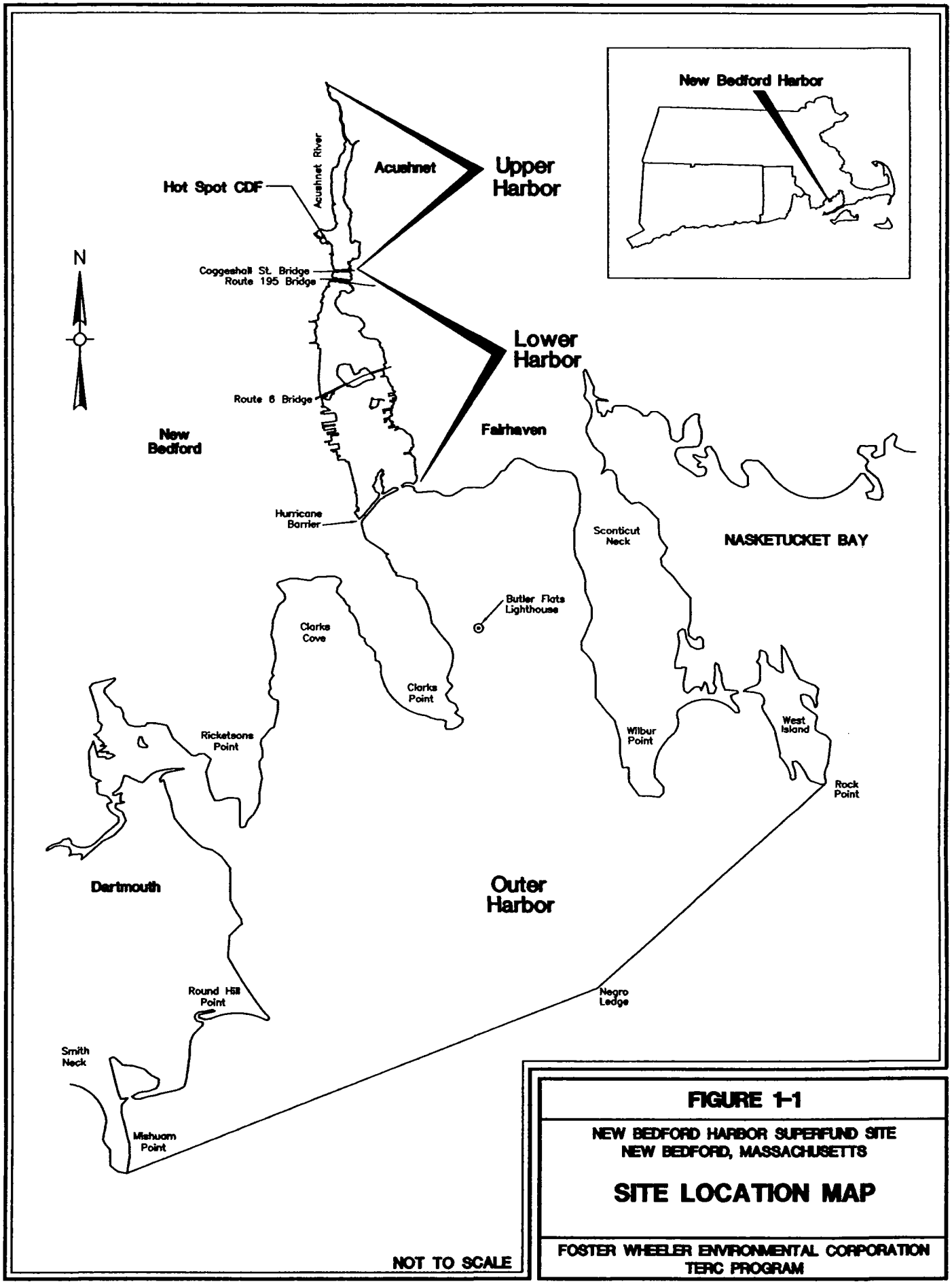


FIGURE 1-1

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

SITE LOCATION MAP

FOSTER WHEELER ENVIRONMENTAL CORPORATION
TERC PROGRAM

CADDFILE: SUPERFUNDSITE.DWG

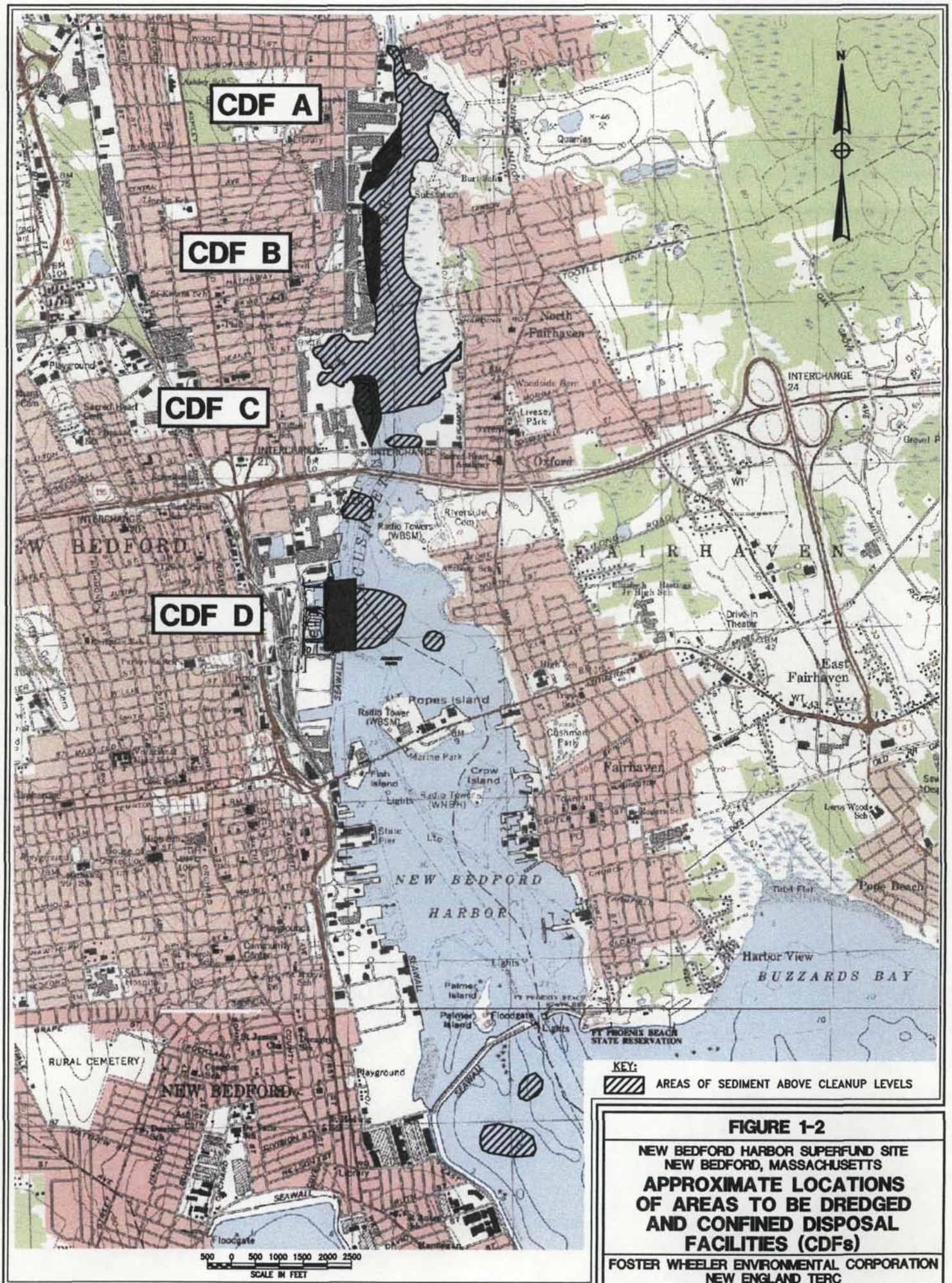


FIGURE 1-2

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

APPROXIMATE LOCATIONS OF AREAS TO BE DREDGED AND CONFINED DISPOSAL FACILITIES (CDFs)

FOSTER WHEELER ENVIRONMENTAL CORPORATION
NEW ENGLAND TERC

CADDFILE: 5197NB13.DWG

1.3 Background Information

The project background up until the initiation of TO 17 under the TERC is discussed in the original Work Plan submitted in April 1999. The following is an update/revision of that background based on events that have occurred since the submittal of that Work Plan and the requirements of RFP No. 63.

Based on design alternatives evaluated to date, dredged sediments will be removed from the harbor and pumped to a dewatering facility located on the southern lobe of area D as shown in Figure 1-3. These dewatered sediments will be transported offsite for disposal or permanently confined onsite in one or more CDFs. The CDFs will be used to permanently isolate the sediments from the public and the marine environment. The areas to be dredged and the approximate locations of the four CDFs are shown in Figure 1-2. Note that wetland areas subject to beachcombing and areas adjacent to residential areas that may require remediation have not been identified for the Lower Harbor. Accordingly, these are not shown in Figure 1-2. Each of the CDFs will be capped following the completion of dredging operations and an appropriate period for sediment consolidation.

The CDFs in the Upper Harbor include A, B, and C. The conceptual design for CDFs A, B, and C includes a sheet pile wall with an earthen embankments on the water side and sheet pile walls and/or earthen berms on the land side (see Figure 1-4). The structures will isolate the sediments from the environment through a combination of sediments with inherently low permeability and flexible membrane liner (FML) material placed on the interior slopes of the CDFs.

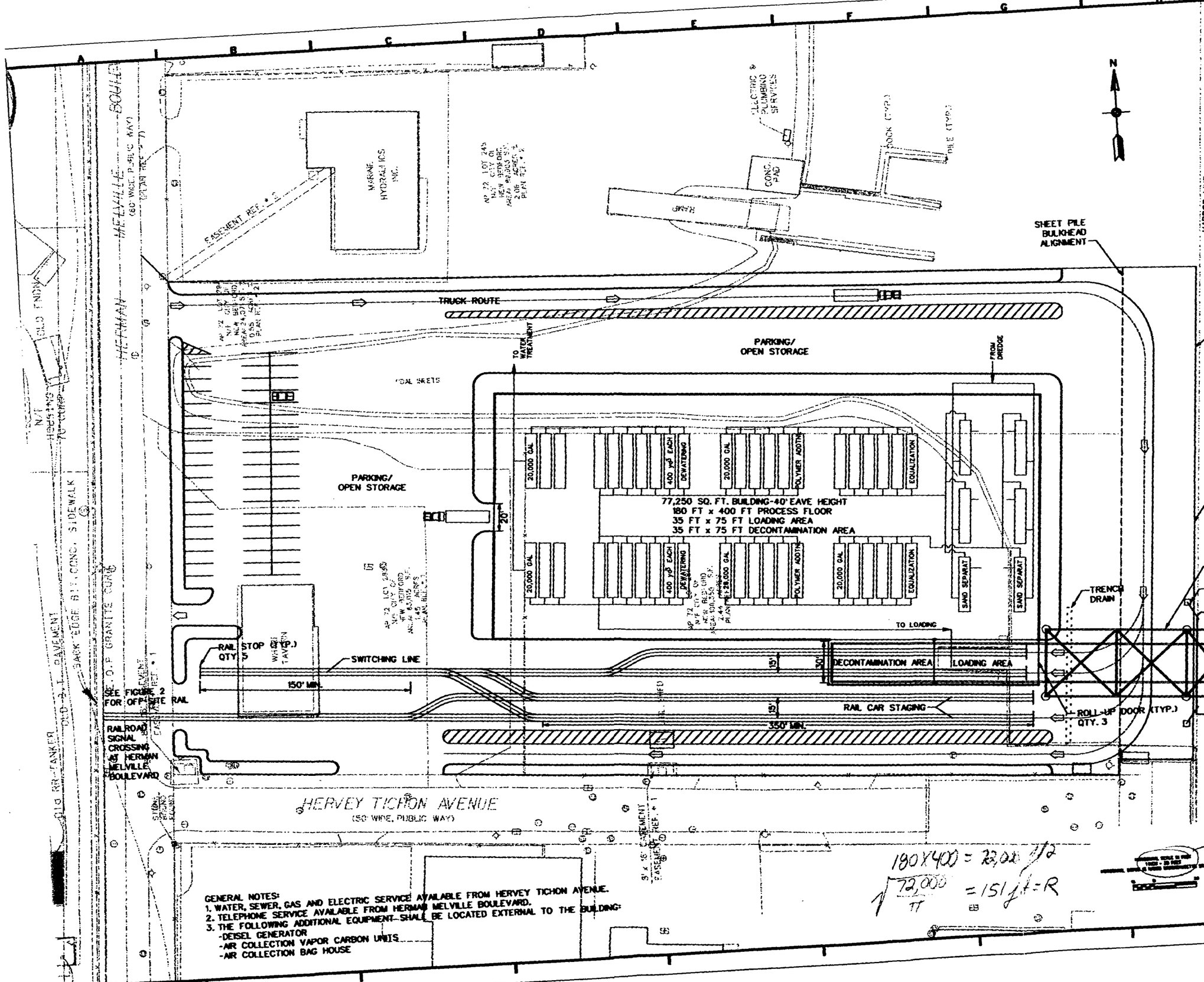
The largest CDF (CDF D) will be located in the Lower Harbor as shown in Figure 1-5, with a cross section as depicted in Figure 1-6. The conceptual design for this facility includes a rockfill dike to ensure structural stability. The containment dike would include a vertical cutoff wall or a geomembrane on the inside slope of the disposal area. The sand and stone dike replaces the originally envisioned steel sheet pile walls and represents an option that is easier to construct and with lower installation costs, but provides a smaller capacity for dewatered sediment. The long-term objective for this CDF is to facilitate economic development of the New Bedford Harbor waterfront.

In support of the remedy, the scope includes construction and operation of a water treatment facility to treat the water generated during the dredging and sediment dewatering processes. Treatment of water will be accomplished through a combination of physical and chemical treatment processes.

To further delineate the areas of contamination, additional sampling was conducted from 1999 through 2000. During this sampling period, several locations within the intertidal zone were identified as containing elevated levels of PCBs relative to residential and beach combing standards. Based upon these results, EPA subsequently fenced off portions of the harbor to prevent access to the contaminated areas. One of these areas, known as "Early Action Area 1" or "The Acushnet Dock Area", has been excavated to remove contamination in early 2001. Show figure

The following field activities were conducted during 2000:

- A Pre-design Dredging Field Test (PDFT) for a segment of the Acushnet River to determine the effectiveness of dredging technology.
- Bench-Scale Dewatering Tests to determine the feasibility of dewatering.
- Geophysical investigations to better characterize the subsurface conditions within New Bedford Harbor.



GENERAL NOTES:
1. WATER, SEWER, GAS AND ELECTRIC SERVICE AVAILABLE FROM HERVEY TICHON AVENUE.
2. TELEPHONE SERVICE AVAILABLE FROM HERMAN MELVILLE BOULEVARD.
3. THE FOLLOWING ADDITIONAL EQUIPMENT SHALL BE LOCATED EXTERNAL TO THE BUILDING:
-DEISEL GENERATOR
-AIR COLLECTION VAPOR CARBON UNITS
-AIR COLLECTION BAG HOUSE

US Army Corps of Engineers New England District

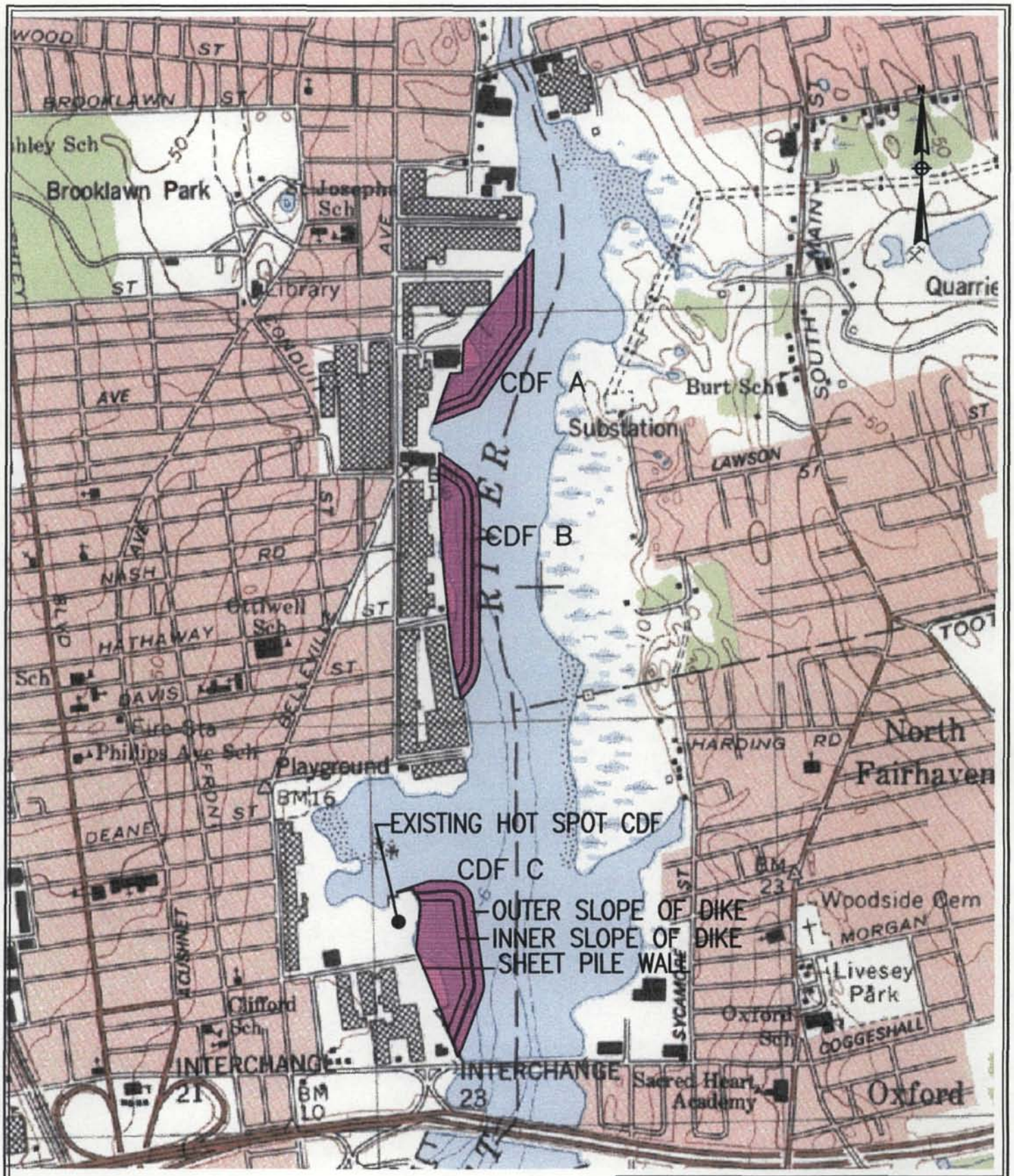
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS CONCORD, MASSACHUSETTS

FOSTER WHEELER ENVIRONMENTAL CORP. 133 FEDERAL STREET BOSTON, MASSACHUSETTS

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

DEWATERING AREA
CONCEPTUAL SITE PLAN

Reference number: FIGURE 1-3
Sheet 1 of 1



500 0 500 1000 1500 2000

SCALE IN FEET

FIGURE 1-4

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

SITE LOCATION MAP OF UPPER HARBOR CDFs A, B, AND C

FOSTER WHEELER ENVIRONMENTAL CORPORATION
NEW ENGLAND TERC

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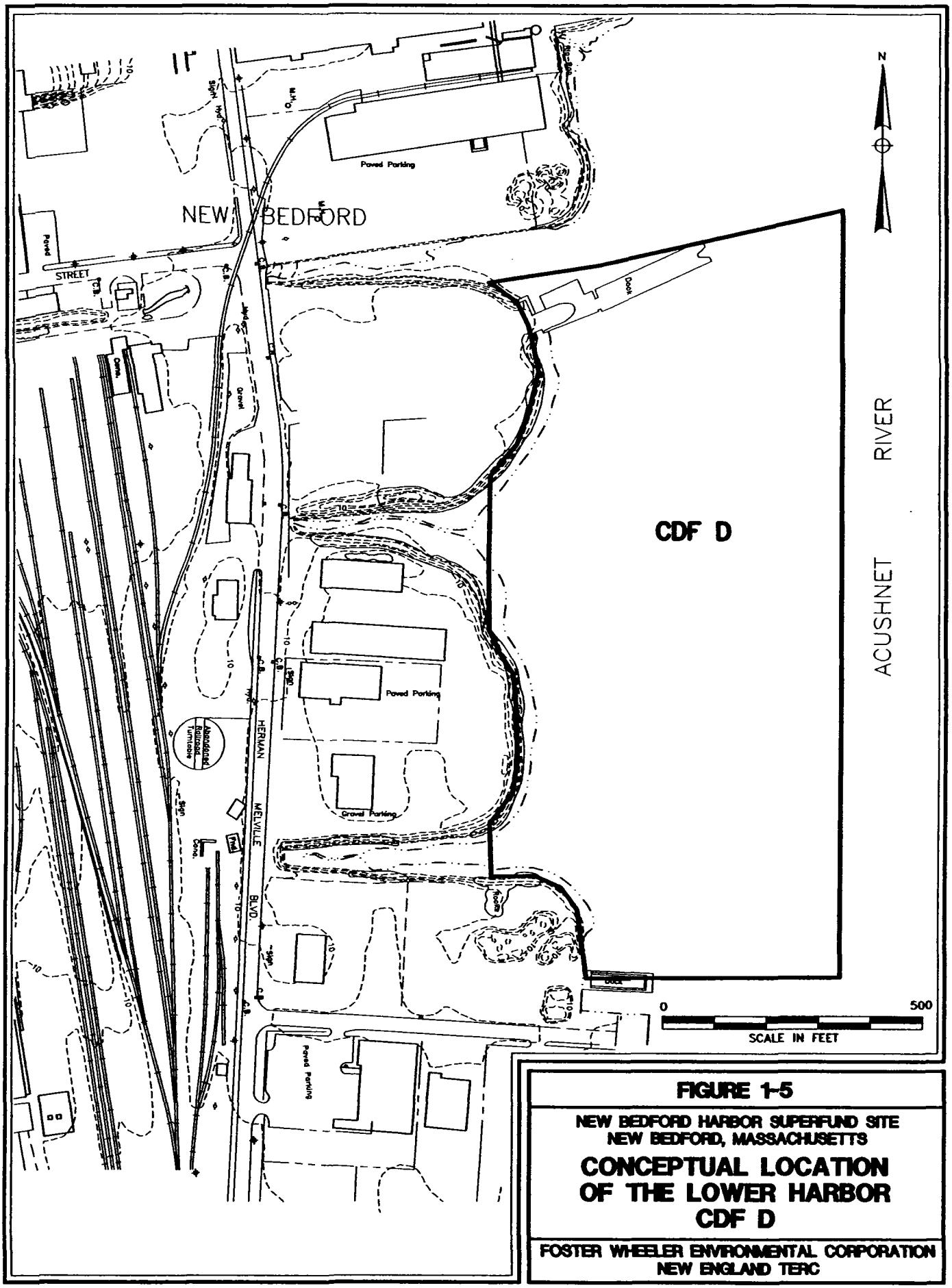


FIGURE 1-5

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CONCEPTUAL LOCATION OF THE LOWER HARBOR CDF D

FOSTER WHEELER ENVIRONMENTAL CORPORATION
NEW ENGLAND TERC

CADDFILE: 5197NB11.DWG

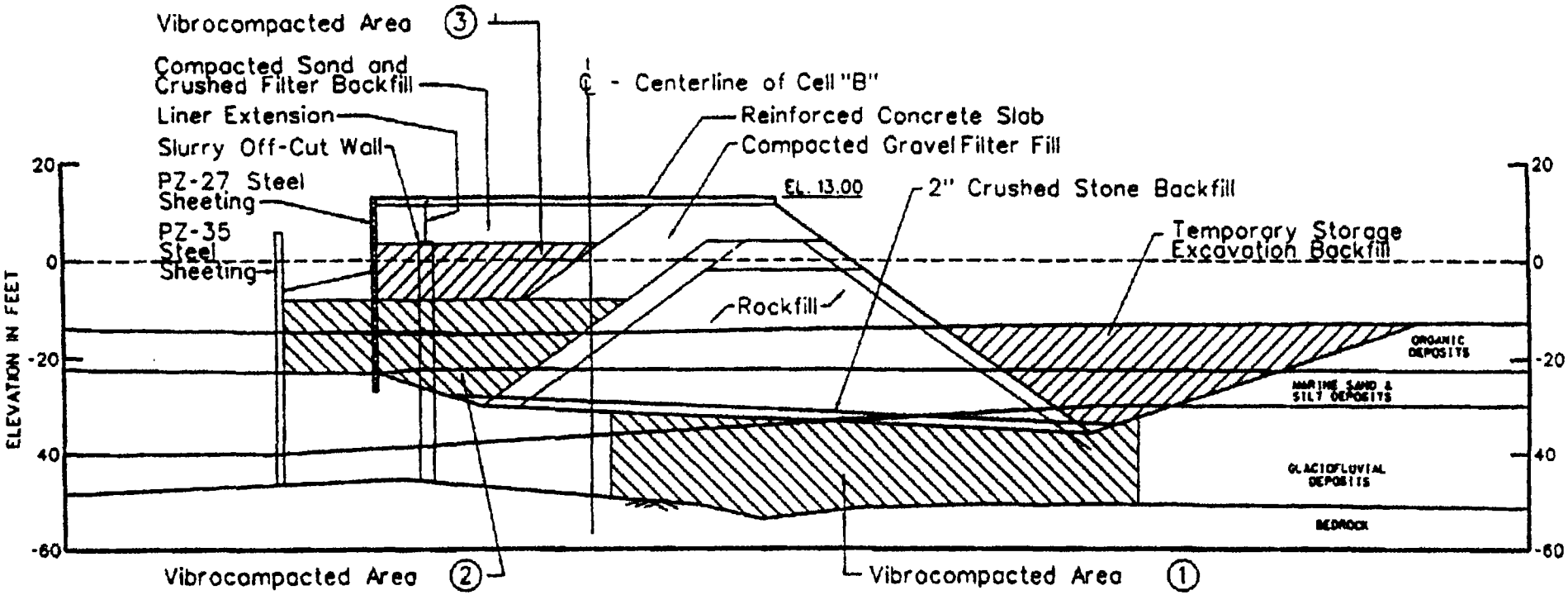


FIGURE 1-6

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CONFINED DISPOSAL FACILITY D
ROCKFILL DIKE ALTERNATIVE
TYPICAL SECTION

FOSTER WHEELER ENVIRONMENTAL CORPORATION
[redacted] NEW[redacted]LAN[redacted]RC [redacted]

Other activities conducted at the site include baseline ambient air and groundwater modeling from 1999 through 2000.

Additionally, the following technical evaluations were conducted during 2000/early 2001:

- Water Treatment Plant 90% Design
- CDF D Alternatives Analysis
- Off-Site Disposal Options Report

Figure 1-7 is a Remedial Action Flow Chart. This chart indicates the major components of work and the interrelations between these components. It should be noted that the components of work represented on this chart is independent of disposal options and represent the RD/RA work that is required to be performed to support the ultimate disposition decision (onsite vs. offsite).

1.4 Summary of the Remedial Design Scope of Work

The EPA and USACE entered into an Inter-Agency Agreement in February 1998 that gives the USACE responsibility to provide technical assistance to EPA on New Bedford Harbor. In October 1998, EPA authorized the USACE to perform remedial design activities associated with the Upper and Lower New Bedford Harbor cleanup.

The USACE has requested Foster Wheeler to prepare a Work Plan, Cost Estimate, and Project Schedule for a number of pre-engineering and engineering design tasks required to implement the selected cleanup remedy. In a teaming approach with Foster Wheeler, USACE will be performing a number of the design tasks concurrently as described in this section.

One of the unique features of this Task Order (No. 17) is that the OU#1 remedial design will be a collaborative effort between the USACE and Foster Wheeler. This approach allows the project to take advantage of the NE TERC Program by using the most qualified individuals and specialists in both organizations to prepare and implement the design in a cost effective manner. Table 1-1 shows details of the Division of Design Responsibilities between USACE and Foster Wheeler and is based on a table provided by the USACE. Table 1-1 was developed by the USACE as part of the original Work Plan to describe the division of design responsibilities between USACE and Foster Wheeler. This chart has been revised and updated to reflect the work that has been performed to date as well as the design responsibilities delineated in RFP No. 63. Changes from the original table are made in italics.

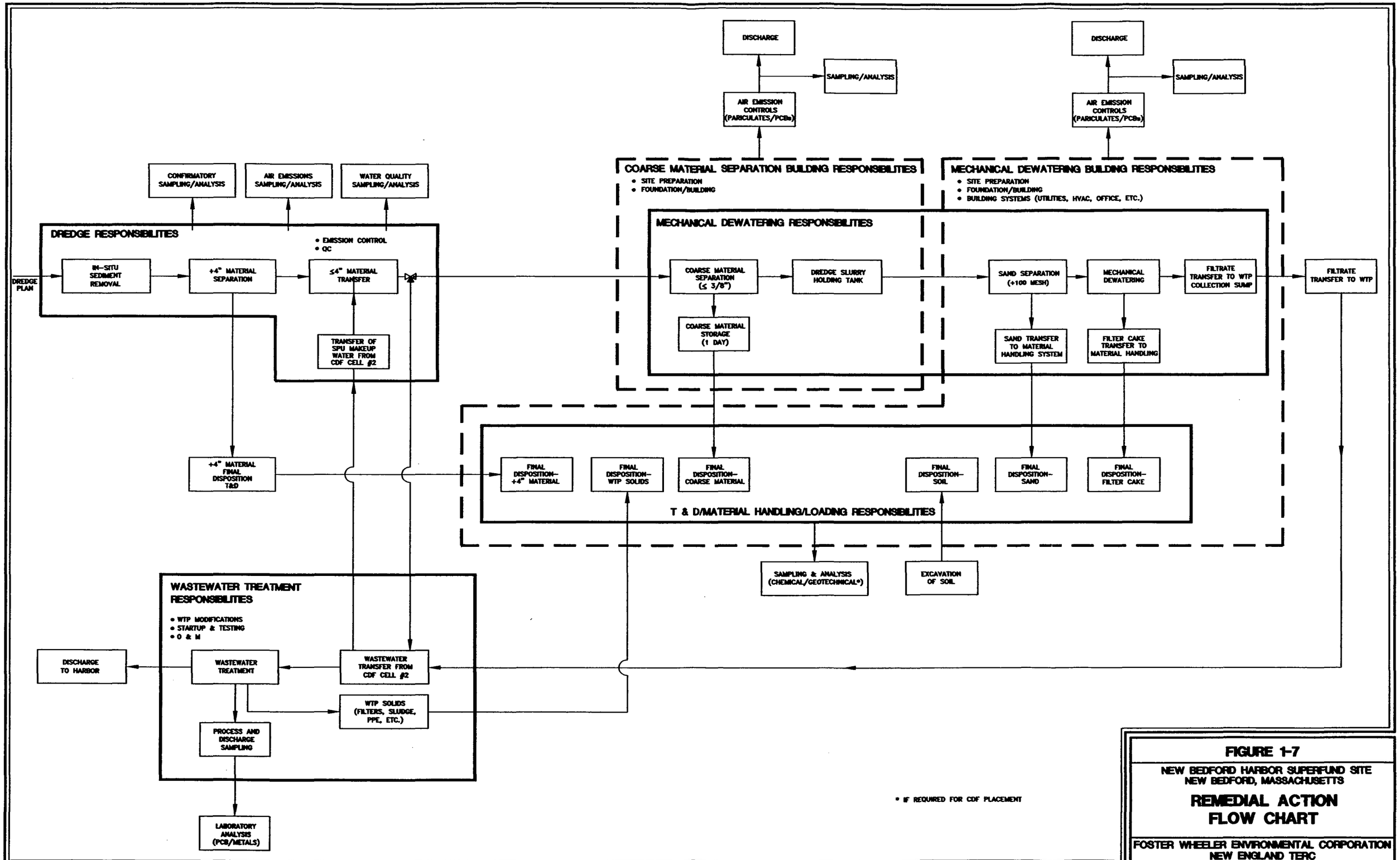


FIGURE 1-7

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

REMEDIAL ACTION FLOW CHART

FOSTER WHEELER ENVIRONMENTAL CORPORATION
NEW ENGLAND TERC

CAD FILE: WTP-PFD-2.DWG

Table 1-1
Remedial Design Responsibilities – May 1, 2001

Legend: L=Lead; S=Support; R=Review	NAE Design Br.			Geotech & Hydr Br.		Corps	Foster
Task	Civil Sec.	General	Cost Eng	Geotech	Hydrog.	Others	Wheeler
1 DREDGING							
1.1 Prepare SOW for Sampling Harbor	S			L			S
1.2 Prepare SOW for Hydro Surveys & Plates	L						
1.3 Obtain Hydro Surveys	L						R
1.4 Collect & Lab Eval Harbor Samples				R			L
1.5 Plot Harbor Samples	L						
1.6 Eval & Plot Grids, Harbor Dredge Area	***S***						***L***
1.7 Compute Harbor Dredg. Quantities	L						
1.8 Develop Confirmatory Sampling Criteria/***Plan***		S					***L***
1.9 Prepare Harbor Dredging Spec	S	***S***					***L***
1.91 Eval Dredge Depth	L			S	S		S
1.92 CDF Storage, Water Vol							L
1.92 Eval Alt Dredging Heads, New technology	S					ConDiv-R	L
1.93 Prepare Govt Estimate, Dredging	S		L				
2 WETLAND EXCAVATION							
2.1 Prepare SOW for Sampling Wetlands	S			L		S	
2.2 Delineate Wetlands &Collect Samples				R		Env-R	L
2.3 Lab Eval Wetland Samples				R			L
2.4 Plot Wetland Samples	L						
2.5 Prep. Wetland Topo/Survey Scope	L					Env-S	S
2.6 Wetland Topo/ Survey Contract	R					Env-R	L
2.7 Coord w/Public Wetland Excavation	S					Env-L	
2.8 Eval & Plot Grids, Wetland Excav. Areas	L						***S***
2.9 Compute Wetland Excav. Quantities	L						***S***
2.91 Eval Alts for Excavating Wetland Areas	L						
2.92 Prepare Wetland Excav. Spec	S	***S***		S			***L***
2.93 Prepare Govt Estimate, Wetland Excav.	S		L				
2.94 Spot Check Wetland PCBs Prior to Excav						Env-R	L
3 WETLAND RESTORATION							
3.1 Design/Coord. Wetland Restoration						Env-***S***	***L***
3.2 Prepare Spec for WetlandRestoration	S	***S***		S		Env -S	***L***
3.3 Prepare Plans for Wetland Restoration	***S***						***L***
3.4 Prep. Quantities for Wetland Restoration	***S***						***L***
3.5 Prepare Govt Est., Wetland Restoration	S		L	S		Pln-S	

Table 1-1
Remedial Design Responsibilities – May 1, 2001 – *Continued*

Legend: L=Lead; S=Support; R=Review	NAE Design Br.			Geotech & Hydr Br.		Corps	Foster
Task	Civil Sec.	General	Cost Eng	Geotech	Hydrog.	Others	Wheeler
4 MAINTAIN MASS BALANCE OF QUANTITIES	S						L
CONFINED DISPOSAL FACILITIES (CDFs)							
5 CDFS A,B & C: DIKES, WALLS, COVERS & LAYOUTS							
5.1 Prep SOW, CDF Explorations & Surveys	R	R		R			L
5.2 Contract CDF Explorations & Surveys				R			L
5.3 Eval. Alter. Dike/Wall Designs, CDFs A,B,C	R	R		R			L
5.4 Design CDFs A, B & C	R	R		R			L
5.5 Prep. Plans, CDFs A, B & C	R	R		R			L
5.6 Prep. Specs, CDFs A, B & C	R	R		R			L
5.7 Prep. Quantities, CDFs A, B & C	R			R			L
5.8 Prep. Proposal (Govt Est), CDF A, B & C	S/R		L/R	S			L
6 CDF D: WALLS, COVERS & LAYOUT: (Corps Lead)							
6.1 Conduct Hydro Modeling all CDFs					L		S
6.2 Coord. Future Use/Layout w/ City, CDF D	L						
6.3 Prepare SOW for Explorations, CDF D				L			
6.4 Contract Explorations, CDF D				R/S			L
6.5 Prep. SOW for Land/Hydro Surveys, CDF D	L						
6.6 Contract Land Surveys & Plates, CDF D	R						L
6.7 Design CDF D (SSP Walls, Covers et al)	R	L		S			
6.8 Prep. Plans CDF D	L			S			
6.9 Prep Abbreviated Specs for CDF D	S	L		S			
6.91 Prep. Quantities for CDF D	L						
6.92 Prep. Govt Est, CDF D	S	S	L				
7 COMBINED SEWER OVERFLOWS (CSOS) FOR CDFS B&C *(Area D is being done by the City of New Bedford per agreement between EPA and the City.)*							
7.1 Coord Plans of Others for CSO Reloc.s	R				R	ConDiv-R	L
7.2 Design CSO Relocations	R				R	ConDiv-R	L
7.3 Prep. Plans CSO Relocations	R				R	ConDiv-R	L
7.4 Prep Specs for CSO Relocations	R					ConDiv-R	L
7.5 Prep. Quantities for CSO Relocations	R						L
7.6 Prep. Proposal (Govt Est), CSO Relocations	S		L				L
8 DRAINAGE OUTFALL/UTILITY RELOCATIONS FOR ALL CDFS							
8.1 Investigate Shoreline for Utility Relocations	R				R		L
8.2 Design Drainage Relocations, Incls Site RO)	R				R		L
8.3 Prep. Plans Drainage Relocations	R						L
8.4 Prep Specs for Drainage Relocations	R						L
8.5 Prep. Quantities for Drainage Relocations	R						L
8.6 Proposal (Govt Est), Drainage Relocations	S		L				L

Table 1-1
Remedial Design Responsibilities – May 1, 2001 – *Continued*

Legend: L=Lead; S=Support; R=Review	NAE Design Br.			Geotech & Hydr Br.		Corps.	Foster
Task	Civil Sec.	General	Cost Eng	Geotech	Hydrog.	Others	Wheeler
9 WATER TREATMENT PLANTS							
9.1 Design Water Treatment Plants				S/R	R	ConDiv-R	L
9.2 Prep. Plans & Spec , Quantities	R			S/R	R	ConDiv-R	L
9.3 Proposal (Govt Est.), Water Treat. Plants	S	S	L	S	S	ConDiv-R	L
10 REAL ESTATE (Foster Wheeler Lead)							
10.1 Rights of Entry		*L*				RE Div-R	*S*
10.2 Real Estate Planning		*L*				RE Div-R	*S*
11 CULTURAL INVESTIGATIONS							
11.1 Cultural Investigations, Phase 1						Pln Br-R	L
12 AIR & GROUNDWATER MONITORING PROGRAM:				R	R	ConDiv-R	L
13 LONG TERM & DREDGING WATER QUALITY MONITORING (TBD Lead)						Pln Div-R	
14 PLANNING REPORTS & SCHEDULES (Foster Wheeler Lead)							
14.1 Prep Design Work Plan	R	R	R	R	R	All-R	L
14.2 Prep Construction Work Plan	R	R	R	R	R	All-R	L
14.3 Prep. Planning Reports for Construction	R	R	R	R	R	All-R	L
14.4 Prep/Maintain Design Schedule						All-R	L
14.5 Prep/Maintain Construction Schedule						All-R	L
14.6 Prep/Maintain Design Cash Flow						All-R	L
14.7 Prep/Maintain Construction Cash Flow						All-R	L
14.8 Prep Procurement Packages						All-R	L
15 COMELEC'S POWER CABLES (ComElec Lead)				R		ConDiv-R	
16 BIDABILITY/CONSTRUCTIBILITY REVIEW							
All features							
17 VALUE ENGINEERING TOTAL DESIGN							

1.4.1 OU#1 Remedial Design Elements

The following provides an overview of the major elements of work included in this Work Plan/Cost Estimate Modification. These include activities that will be performed by both Foster Wheeler and USACE.

1.4.1.1 Preparation of Plans

Foster Wheeler is responsible for the preparation of this Work Plan Modification, Cost Estimate, and Project Schedule as well as the planning documents that are required prior to the startup of work in accordance with Section C of the NE TERC basic contract. This includes amendments to key planning documents including the Sampling and Analysis Plan (SAP) (two amendments), Site Safety and Health Plan (SSHP) and Regulatory Compliance Plan (RCP). Foster Wheeler is responsible for the preparation and submittal of these plans for USACE review and approval. However, as described below in Field Investigations, the USACE is responsible for providing input for the SAP on harbor and sediment sampling locations, analytical methods, and validation procedures.

1.4.1.2 Field Investigations

Field investigations are being performed to provide data for dredging, excavation, restoration and dewatering designs and to decrease the uncertainty of the quantity of material requiring removal by further defining the limits of sediments and intertidal areas requiring cleanup. Harbor sediment analytical data will be collected to supplement existing information characterizing the extent of PCB contamination exceeding action levels specified in the ROD at select locations to better define the vertical and horizontal extent of dredging/excavation, and to verify assumptions regarding the correlation between chemical and physical properties to support the development of a visual dredging approach for specific areas of the Upper and Lower Harbor. Also, geotechnical and geophysical investigations (as required) will be performed to provide information in support of design tasks. Wetlands Delineation and Stage 1B Cultural resource Surveys will also be performed over approximately 65 acres indicated by USACE, as depicted on Figure 1-8. Land surveys will be conducted as part of this effort in order to prepare topographic maps for detailed wetland design efforts.

Foster Wheeler is responsible for planning and conducting the field programs with input from the USACE on the harbor/intertidal sampling locations plan and the geotechnical data requirements to support the bulkhead design of the dewatering system in Area D. Data collected during these field investigations will be reported to the USACE for use in developing the dredging/excavation plan for the harbor and design of the bulkhead at the south lobe of Area D.

1.4.1.3 Engineering Design Tasks

The following are the major engineering design tasks associated with this Work Plan and Cost Estimate Modification:

- Dredging of areas of PCB contamination above the ROD limits will be designed based upon the results of existing and planned investigatory data. The approximate area and depth of dredging is as depicted in Figure 1-1 and is anticipated to be updated by USACE based upon the results of further investigations described above. There is a shared responsibility for this Task between USACE and Foster Wheeler as more fully described below.

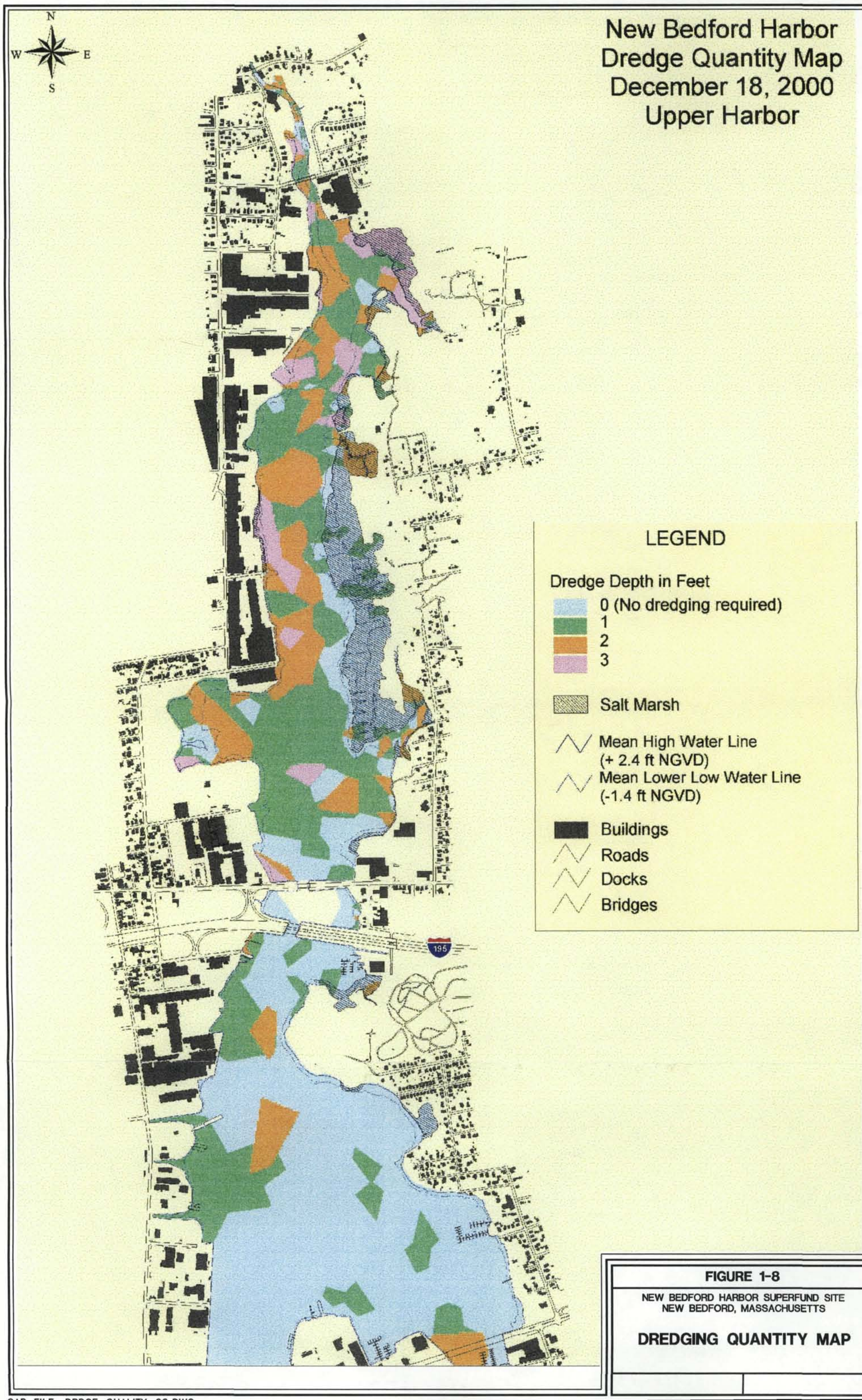


FIGURE 1-8

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

DREDGING QUANTITY MAP

- Excavation of areas of PCB contamination above the ROD limits will be designed based upon the results of existing and planned investigatory data. The approximate area and depth of excavation is as depicted in Figure 1-1 and is anticipated to update by USACE based upon the results of further investigations described above. There is a shared responsibility for this Task between USACE and Foster Wheeler as more fully described below.

- Restoration of dredged and excavated areas design will be completed based upon the areas that are identified for dredging or excavation. It is presently assumed that this area will encompass approximate 65 acres as shown in Figure 1-8. Foster Wheeler is responsible for this Task.

- Design of the mechanical sediment dewatering facility required to desand and dewater sediment dredged and pumped to shore. Foster Wheeler is responsible for this Task, except for the design of the dredging, filling and bulkhead required for foundation design and facility construction. The USACE is responsible for that design.

- Foster Wheeler is responsible for the preparation of a material balance for establishing quantitatively the relationship of sediment dredged and soil excavated, material handling and process requirements, and ultimate disposition offsite (anticipated material characterization, volume and weight) or onsite (CDF capacity required). Foster Wheeler plans to develop this methodology in concert with USACE utilizing an approach similar to that used in the CDF D Alternatives Analysis.

- Specific Value Engineering (VE) tasks aimed towards improving the overall efficiency of the RD/RA. Presently, VE tasks include evaluation of use of an on-site laboratory, wetlands restoration alternatives evaluation and development of a confirmatory sampling approach. Foster Wheeler is leading each of these efforts with input anticipated from EPA and USACE.

- As part of the design activities, the USACE and Foster Wheeler will address acquisition strategy at the completion of the 30% Design of each element. Additionally, the USACE and Foster Wheeler will conduct value engineering and constructability reviews for their respective design responsibilities as part of the 90% Design of each element.

1.4.1.4 Dredging and Wetland Excavations/Restoration

The USACE is preparing the harbor, shoreline, and wetlands dredging and excavation plan. This includes identifying locations for pre-design sediment sampling to be conducted by Foster Wheeler, performing a hydrographic survey, and plotting the areal extent and depth of contaminated areas to be dredged/ excavated. Based upon this input, Foster Wheeler will prepare the detailed dredging design and develop dredging and excavation quantities.

Dredging and excavation quantities will be input to the overall mass balance calculation described above.

1.4.1.5 Real Estate Acquisition

The implementation of field investigations for the design tasks, and ultimately construction of the CDFs and associated facilities, will require obtaining rights of entry (ROEs) and temporary and permanent easements. Foster Wheeler is responsible with EPA/USACE assistance for obtaining ROEs prior to fieldwork and developing and implementing a property acquisition strategy for acquiring the land for use during construction and operation of project facilities.

1.4.1.6 Project Management/Cost and Schedule Control/Procurement

Both the USACE and Foster Wheeler will provide their respective project management and support for scheduling work and tracking progress for the duration of the project. Foster Wheeler will provide subcontract management support for the procurement of Team subcontractors or other subcontractors necessary to complete RD activities such as field investigation tasks, survey, real estate access, and cultural/historic resources surveys included in this Work Plan Modification.

Schedule preparation and updating will be an ongoing process to plan future funding and develop a procurement and construction schedule. Foster Wheeler will develop and maintain a project schedule for the design, procurement and construction efforts that will track the progress of project activities including those being performed by the USACE.

1.4.2 Work Plan Remedial Design Tasks

Since the remedial design for OU#1 is a large effort that will span several years, it had been decided in meetings with the USACE to include in the original RD Work Plan and Cost Estimate only those Foster Wheeler investigative and design tasks that had to be initiated immediately (within approximately the first year of the design) in order to start construction of CDF C. It was agreed that this approach would allow detailed design to begin in January 1999 to meet the construction start date while allowing the Project Team to benefit from experience gained on the initial design in subsequent design and construction activities. This Work Plan Modification includes detailed design of components required to support commencement of harbor dredging in Early 2003. It is understood that the Work Plan and Cost Estimate may be amended if additional design tasks are identified as part of the presently on-going efforts to support EPA decisions as to the details of the final remedy. A detailed discussion of the Foster Wheeler design tasks included in this Work Plan Modification and Cost Estimate is provided in Section 2.0.

1.5 Assumptions/Issues

This Work Plan Modification, Cost Estimate, and Project Schedule were developed to address the March 18, 2001 Scope of Work. To prepare this Work Plan Modification, Cost Estimate, and Project Schedule several major assumptions were made. Section 1.5.2 discusses the major issues that either need to be resolved as the project progresses or that need to be closely monitored by the Project Team to successfully complete the overall design.

This Work Plan Modification includes the efforts required to perform those critical path design activities necessary to start harbor dredging in early 2003. Subsequent amendments to the Work Plan and Cost Estimate will address the remaining design tasks for completion of the remedial design. To continue this large project on such an expedited schedule, a number of key assumptions were made to plan and estimate the work. In addition, a number of key issues need to be addressed and monitored in order to most efficiently execute the project. Section 1.5.1 lists the major assumptions used in developing the Work Plan, Cost Estimate, and Project Schedule. Section 1.5.2 discusses the major issues that either need to be resolved as the project progresses or that need to be closely monitored by the Project Team to successfully complete the overall design.

1.5.1 Assumptions

The general assumptions discussed in this section apply to the approach, logic, and sequence of activities discussed in this Work Plan Modification. The details of the work are included in Section 2.0 of this Work Plan Modification. Additional detailed cost estimating assumptions are included as Appendix G.

- As discussed at the March 28, 2001 scoping meeting, Foster Wheeler has made assumptions during Work Plan and estimate preparation about various properties of the in-situ material based upon the existing sampling data and information in our possession and have included an initial effort in the Work Plan to review the GIS data when received. It is assumed that the information will be sufficient with only a minimal amount of data collection/processing. Foster Wheeler will process an FCN if a significant effort, beyond that included in this Work Plan and Cost Estimate, is required to process or use the data.

- A BD/DA with 100% Design Plans and Specifications has been included for each of the four designs. No efforts for Statement of Work (SOW) preparation or procurements are included in this Work Plan Modification although a contracting strategy has been included as the initial activity of 90% design development. It is anticipated that SOW preparation and procurements will be included as part of the future Remedial Action Work Plan under TO 24.

- Foster Wheeler has included an initial review and analysis of existing geophysical data in this Work Plan Modification to determine if geophysics can be utilized to better define the contaminated sediment layer. Based upon the results of these reviews, an FCN will be processed to address the follow-on work once it is better defined.

- This Work Plan Modification and schedule identifies two sampling rounds (IIIB and IIIC) that are presently planned to be conducted. Based upon the required date for completion of design, it has been assumed that these sampling rounds will be sufficient to proceed with design. If additional sampling is found to be required, an FCN would be processed at that time. Note: Round IIIA is sampling to be conducted under Work Plan Modification No. 18 options previously negotiated with the USACE.

- As discussed at the April 4, 2001 meeting with EPA, the appropriate design basis for the maximum number of dredges to be considered is as follows:

  - One Mechanical Excavating Hydraulic Transport (MEHT) (Bean type) dredge operating in the middle of the river operating up to 150 ISCY/Hr
  - One MEHT or Amphibex type dredge operating at up to 25 ISCY/Hr
  - Both dredges operating at up to 20 hours/day, 6 days per week

  The maximum sustainable production rate should be finalized as part of the dredging design process.

- It is assumed that the USACE, in conjunction with EPA, will continue to perform the GIS modeling to determine the areal extent and depth of contamination, and that GIS data delineating the area and depth of contamination based on northing, easting, and elevation in NGVD will be provided to Foster Wheeler for dredge/excavation design.

- The collection and processing of analytical data in this Scope of Work requires the development and implementation of a GIS database. As agreed upon with R. Simeone,

USACE Engineering Manager, the cost of the development and testing of this GIS database is to be included in a forthcoming Electronic Integrated Database Management System (EIDMS) RFP from the USACE. The only costs included in this Cost Estimate are for the processing and evaluation of the data once it is received from the analytical laboratories.

1.5.2 Major Issues

Final Components of Work

As directed at the April 4, 2001 meeting with EPA, for schedule and estimating purposes, this Work Plan Modification has been developed based upon Plan E2, which is the off-site disposal of all material by rail. It is anticipated that the final decision of building individual CDFs will be made by EPA prior to initiating the 90% Design. Foster Wheeler has structured the sequence of work to the extent practical to provide data to assist in this decision making process.

Finalization of Design Criteria

As discussed at the April 4, 2001 meeting with EPA, the following five (5) key documents set the parameters for the design of the rest of the project.

- Pre-Design Dredging Field Test (PDFT)
- Sediment Dewatering Technical Memorandum
- Water Treatment Plant 90% Design
- CDF D Alternatives Analysis
- Off-Site Disposal Options Report

The first three address the interrelated mass balance and key system sizing of the three major processes; the remaining two address overall material balance and evaluation of alternatives. It has been assumed that comment resolution and finalization of these five (5) key documents will be achieved prior to initiation of detailed design efforts. This has been reflected in the overall project schedule.

Physical Location of Dewatering and Water Treatment Equipment

As discussed at the April 4, 2001 meeting with EPA, the northern lobe at Area D might also be considered for the location of the slurry tank and coarse material (<3/8" to 4") separation process equipment located between the dredge effluent and the dewatering system influent. Per EPA's direction during the April 4, 2001 meeting, this Work Plan Modification assumes that all equipment required will be able to be located on the southern lobe of Area D and/or at Area C. It has been assumed that sufficient geotechnical information is available at area C to support any required facilities and that we will not have to use the North Lobe for any of the facilities.

Interfacing With CSX, MBTA and the City of New Bedford

As discussed at the April 4, 2001 meeting with EPA, it is critical to determine if the rail spur from the existing CSX mainline could be altered to minimize re-grading requirements for Herman Melville Boulevard and the site and that coordination would be required to decide upon the actual entry point and grade of the rail into the site to allow commencement of the detailed design. Coordination between EPA, CSX and MBTA will be required to ensure that the provisions required for projects planned by each entity are integrated into an overall plan that will support technical, logistical and schedule requirements.

It has been assumed that this coordination will take place prior to commencement of detailed design of the Dewatering Facility at Area D.

Funding Scenario

As discussed at the April 4, 2001 meeting with EPA, in order to size the dewatering system and to define the extent of dredging areas (i.e. – Dredge Management Units for Measurement and Payment), annual funding limitations must be established. As reflected in the project schedule, the final decision regarding funding levels will be required from EPA to support contracting strategy development prior to commencing 90% Design.

Chemical Data Validation

As required in the RFP No. 63, Foster Wheeler will develop a data validation process such that formal reporting of the data can be made within 30 days of receipt of analytical results from the contract laboratory. The level of effort is based on the validation process agreed upon by USACE, EPA, and Foster Wheeler in the development of the first Work Plan in 1999. Given the information/data collected to date, USACE/EPA/Foster Wheeler may want to meet to determine if that level of data quality review is still warranted for the project with the intent of saving additional cost and schedule in the data validation process.

2.0 WORK APPROACH AND TASK PLAN

This section of the Work Plan Modification presents the approach to Foster Wheeler's field investigations and OU#1 remedial design tasks. Section 2.1 is a generalized summary of the approach to the project and Section 2.2 provides a more detailed presentation of the work to be performed, organized according to the Work Breakdown Structure (WBS). Foster Wheeler has developed a WBS for the entire OU#1 remedial design process based on the HTRW Series 32 Code of Accounts. However, only those elements of the WBS that are included in this Work Plan Modification are discussed in Section 2.1. The complete WBS for the full design effort is provided in Appendix A, with the items included in this Work Plan Modification highlighted in bold print. WBS tasks previously completed or presently in progress have been included in the original Work Plan and previous modifications. Those final WBS tasks not included in this Work Plan Modification will be discussed in subsequent amendments to this Work Plan Modification and Cost Estimate.

2.1 General Approach to Work

Foster Wheeler's approach to the this design phase of the project is to schedule the field investigations and initial design tasks to support a construction start date for dredging in early 2003. This was initiated through the development of this Work Plan Modification, Cost Estimate, and Project Schedule. During development of this Work Plan Modification, Foster Wheeler has identified several critical path activities that will need to commence immediately upon Notice to Proceed or sooner (see Section 4.0) in order to support the overall Project Schedule. These include the following:

- Preparation of amendments to the SAP, SSHP and RCP
- Acquire site access for field investigations
- Procure the following subcontractors and suppliers:
  - Drillers
  - Equipment for field investigations
  - Analytical laboratories for geotechnical, and sediment analyses
- Defining sampling areas in intertidal, shoreline, and wetland areas and developing the harbor/ intertidal sampling plan
- Review of Chemical and Bathymetric GIS data provided by USACE to support identification of sample locations
- Compilation and review of existing geotechnical and soil type data to support identification of sample locations
- Initial review of existing Geophysical data to determine additional areas to be sample to confirm both the geophysical data interpretation and the correlation between PCB contamination and sediments
- Defining geotechnical sampling requirements to support design at Area D and developing the associated sampling plan
- Procurement of Land Surveyor to support surveys of area subject to restoration
- Procurement of a cultural resource subcontractor and start intensive (Phase 1B) cultural resources reviews
- Preparation for Wetlands Delineation

Obtaining ROEs and negotiating for temporary and permanent easements to construct the dewatering facilities at Area D are critical activities for maintaining the Project Schedule. Foster Wheeler will be working in conjunction with the EPA and USACE to obtain access agreements to perform the field investigations.

Following the planning and procurement activities, the geotechnical investigations will be conducted at Area D to provide the subsurface data necessary to begin the design of the dewatering facility.

The following field work may start concurrently or shortly after the geotechnical investigations:

- Sediment sampling round IIIB
- Phase IB cultural resource literature and data reviews
- Wetlands delineation surveys

Once the two rounds (IIIB and IIIC) of harbor/intertidal sampling program are complete and the sample results reviewed and compiled by Foster Wheeler, the USACE and EPA will evaluate the data and develop a harbor dredging and wetland excavation plan. This plan will also be used to delineate those areas of the detailed dredging, excavation and restoration designs.

Concurrent with the initiation of the field work, work on engineering studies and portions of the 30% Design packages for dredging, excavation and restoration will also begin.

As these design efforts start, Foster Wheeler will set up a material balance for dredged material and CDF volume so it can be used to determine the cost effectiveness of each CDF design. The material balance will also be used for estimating the volume and material balance for sediment dredged and excavated, dewatering and Water Treatment plant requirements. The purpose of this phase is to assist EPA in making final decisions as to the components and approach for the remediation of New Bedford Harbor.

At the end of the 30% Design phase, prior to commencing 90% design is when an acquisition strategy and make/buy analysis for the construction of each design component will be conducted. The make/buy analysis will determine which elements of the design will be subcontracted as fixed priced subcontracts and which elements will be self-performed by Foster Wheeler to support RA portion of the project. The acquisition strategy will develop the contracting strategy and vendor qualifications for the work that will be subcontracted. A more detailed explanation of the acquisition strategy and make/buy analysis is provided in Section 3.0. The purpose of performing the acquisition strategy and make/buy analysis at this stage of the design is to define the format and detail that is required in the 90% and 100% Design packages. In general, work that will be subcontracted and managed as fixed price contracts to outside vendors requires more detailed plans and specifications than that to be self-performed by the Foster Wheeler Project Team. On self-performed components of work, the design can be developed as work packages that can immediately be implemented in the field by the Foster Wheeler design/build team.

Following submittal of the 30% Design, Foster Wheeler will begin the development of the 90% Design. At the start of the 90% Design, decisions will be made in conjunction with the USACE/EPA as to whether portions of the design should be separated from the rest and scheduled for completion in order to start construction as early as possible. During the 90% Design phase, it is anticipated that there will be number of on-board design reviews with the USACE technical staff to review key assumptions, calculations, and approaches in order to facilitate the review of the 90% Design submittal. Prior to the completion of the 90% Design, Foster Wheeler will conduct value engineering and constructibility reviews of the design packages. When submitted to the USACE the 90% Design will have a BD/DA, a full set of specifications, and completed drawings. Once comments by USACE and EPA on the 90%

Design are addressed, Foster Wheeler will prepare the 100% Design submittal to be issued for construction after signing and stamping by a Professional Engineer (P.E.).

While Foster Wheeler is designing the dewatering facility at Area D, the USACE will begin the planning and design of bulkhead at this location. Foster Wheeler will provide the results of the geotechnical investigation and sampling program to the USACE for their design. Foster Wheeler will also participate in peer review of the USACE 30%, 90%, and 100% Design packages for this design component, to ensure consistency, overall integration with the other design elements, and constructibility reviews.

The USACE sediment dredging and excavation plan will include preparation of plans showing areas and depths to be dredged and excavated (shoreline, intertidal zones). Based upon this input, and EPA provided estimated funding scenario, Foster Wheeler will prepare grid size and layout, specifications for dredging equipment and operations, post-dredging confirmation sampling procedures, and estimated dredging quantities. Foster Wheeler will coordinate the Material Balance Subtask (21.96) with USACE's dredging plan design to be consistent in planning areas to be dredged first, characteristics of sediment, hours per day of dredging, volume of dredged material, water to be treated, and CDF capacity. Results of dredging technology evaluation will be incorporated in the specification of dredging equipment, dredging quantities, and material balance calculations.

2.2 Task Plans

This section of the Work Plan Modification presents the approach to Foster Wheeler's field investigations and initial OU#1 remedial design tasks. Foster Wheeler has developed a Work Breakdown Structure (WBS) for the entire OU#1 remedial design process based on the HTRW Series 32 Code of Accounts. However, only those elements of the WBS that are included in this Work Plan Modification are discussed. The complete WBS for the full design effort is provided in Appendix A, with the items included in this Work Plan Modification highlighted in bold print. Those final WBS tasks not included in this Work Plan Modification have been or will be discussed in subsequent amendments to this Work Plan Modification and Cost Estimate.

Task 01 - Preparation of Plans

Planning documents will continue to be prepared as controlled documents, issued using a sequential numbering system. The system for managing changes and additions established for the project will be utilized for the updates required to planning documents as more fully described below. After the addition or change has been through the review and approval process, the pages containing the change will be distributed to each holder of the controlled copies. Each recipient will be supplied with replacement and/or additional pages, instructions for removing/replacing specific pages, and a cumulative list of revisions for inclusion at the front of the document.

For estimating purposes, it has been assumed that three (3) plans will be required to be updated in addition to this Work Plan Modification. It has also been assumed that Foster Wheeler will receive a single set of consolidated comments from the USACE.

Subtask 01.01 - Work Plan

Foster Wheeler is responsible for the preparation of this Work Plan Modification, Cost Estimate, and Project Schedule as well as the planning documents that are required prior to the startup of work in accordance with Section C of the NE TERC basic contract. Foster Wheeler will prepare addendums to the existing Sampling and Analysis Plan (SAP), Site Safety and Health Plan (SSHP), and Regulatory Compliance Plan (RCP) as required to support efforts associated with this Work Plan Modification.

This Draft Work Plan Modification, subsequent revision, and associated meetings and conference calls are included under this Subtask. The purpose of the Draft Work Plan Modification is to define the work activities and tasks by the associated WBS at a planning level appropriate for establishing the Cost Estimate and associated Project Schedule.

Based upon the breadth of activities and the interrelationships of USACE and Foster Wheeler technical efforts, it has been assumed that two meetings will be required to finalize this Work Plan Modification, schedule and estimate. Following issuance of this Draft Work Plan Modification, a meeting will be held with the Corps to discuss technical comments, assumptions and Project Schedule. Following this meeting, negotiations will be scheduled and a meeting held to finalize the estimate. Following negotiations and receipt of consolidated comments from the Corps, Foster Wheeler will prepare the Final Work Plan Modification. It has been assumed that comments will be able to be resolved within approximately two weeks following the Work Plan Meetings.

Subtask 01.03 - Sampling and Analysis Plan (SAP)

This Subtask includes the efforts to prepare two (2) SAP/QAPP revisions to address sediment sampling Phase IIIB and the proposed geotechnical boring program for the southern lobe at CDF D and sediment sampling Phase IIIC. Other geotechnical requirements for sediment samples from the harbor will also be identified in this Subtask. It is assumed that sediment sampling Phase IIIA will be conducted under some or all of the four Options included under previous Work Plan Modification #18. As has been done for this project in the past, these modifications will be relatively simple addressing changes to sampling or analytical methodologies and documenting the proposed locations and associated analytical work that will be performed during upcoming activities.

Subtask 01.04 - Site Safety and Health Plan (SSHP)

The Site-Specific Health and Safety Plan (SSHP) for the NBH Project currently consists of a document containing a Master SSHP and Supplemental SSHPs specific to major project tasks which have encompassed the scope of the project from inception.

As part of this Work Plan Modification, efforts have been included to review the SSHP and edit as needed to ensure that information in the SSHP is current and that planned field activities are addressed. Foster Wheeler, in consultation with the USACE Industrial Hygienist has determined that some modifications to the SSHP content and format be made. Some of these modifications include:

- Expanding the generic content of the Master SSHP to the extent practical to enable the Task Specific SSHPs to be more condensed and concise.
- Include additional information on water work such as dredging and marine construction.
- Update contaminant information, action levels, physical examination requirements, and personal protective equipment requirements for upcoming tasks based on sampling data generated since the original SSHP was developed.
- Revise and expand the Emergency Response Plan with most current information and best practices and place under separate cover as a stand-alone document to enhance usability and facilitate edits and modifications.

Subtask 01.08 - Transportation and Temporary Storage Plan (TTSP)

No effort is foreseen under this Subtask. During the development of this Work Plan Modification, no new waste streams were identified and, therefore, waste transportation, storage and handling requirements applicable to the field investigation conducted to support the dredging/excavation design phase of the project have been assumed to be similar to previous work performed.

Subtask 01.91 - Regulatory Compliance Plan (RCP)

The existing RCP will be amended to include regulatory requirements applicable to the design of the dredging and excavation phases of the project, as well as those requirements applicable to the dewatering system design. The basis for the RCP is the regulatory framework presented in the ROD for OU#1. Also, environmental compliance checklists that were completed during initial planning will be used to identify additional compliance issues.

For on-site activities, CERCLA Section 121 provides relief from compliance with federal, state, and local administrative permit requirements for CERCLA sites. However, the substantive regulatory requirements for these on-site activities are still applicable and will be addressed in the amendment.

Task 02 - Project Management/Support/Administration

Subtask 02.01 - Project Management

Activity 02.01.01 - Conduct Project Management

This Activity includes the additional distributive effort for work performed by project management staff in support of this Modification to the New Bedford Harbor Task Order. Modification 19 to this Task Order provided for the level of effort required to manage the design components of the project including interfacing with EPA and USACE counterparts in meetings, teleconferences, etc.; maintaining schedule, cost control, and budget projections; preparation of weekly and monthly progress reports; oversight of contractual and technical issues on the project; governmental property management; and supervision and maintenance of project staffing with the assumption that the project distributive efforts, such as Project Management and Cost Cost/Schedule Controls would be transitioned into the Construction Task Order (TO 24) as of July 2001 based upon target schedules for CDF C and WTP C Construction. Given the recent changes in project direction by EPA, there is a significant potential that construction of CDF C and the WTP will be delayed to later 2001/early 2002. With the potential reduction of level of effort under TO 24 and the increased design efforts associated with this RFP, additional costs are required for Project Management under TO 17. These costs are included in this Cost Estimate for the period of July – December 31, 2001. Subsequent modification for TO 24 will be made to adjust for the associated unused cost and fee under TO 24.

Based upon the breadth of investigatory and design efforts scheduled to be performed during the period of performance of this Modification, limited services of a Deputy Project Manager to augment the Chief Project Manager has been included to coordinate these efforts. In addition, a limited amount of time is included for the Engineering and Sciences resource managers to assist the Chief Project Manager and project team during weekly meetings in coordination of staffing requirements and to ensure maintenance of schedule and technical quality.

Activity 02.01.02 - Cost Estimate

Under this Activity, Foster Wheeler has prepared the estimate for activities described in this Draft Work Plan Modification. Additionally, the level of effort required to update the Cost Estimate based upon negotiations, concurrent with Work Plan Modification finalization, is included in this Activity.

Activity 02.01.03 - Cost/Schedule Control Systems

Similar to the Project Management Subtask, Cost/Schedule Control System costs had been estimated based upon a transition into the Construction Task Order as of July 2001. In order to support the breadth of investigatory and design efforts, some additional efforts have been included to augment those forecast via Modification 19.

Subtask 02.02 - Subcontracting Support

Activity 02.02.01 - Procurement Activities

This Activity includes administrative activities associated with placing new subcontracts for support of efforts described in this Work Plan Modification, and ongoing administration of existing and new subcontracts. This effort includes the work required by office personnel for procurements ranging from material procurement to specialty subcontractors. The effort for development of technical specifications and SOWs is considered part of the technical effort and budgeted under the appropriate technical task. The effort included in this Activity is for procurement activities, such as issuing requests for proposals, evaluation of bids for USACE consent, and subcontract award for the estimated procurements required for the remedial design effort described in this Work Plan Modification.

This Activity also includes post-award efforts to administer subcontracts and purchase orders, including voucher review for conformance with subcontract requirements and modification of subcontractor scopes of work. Some limited effort is also included for the Procurement Lead to assist in make/buy analyses during the 30% Design phase of the Dewatering, Dredging, Excavation and Restoration designs. However, no costs have been included for the post-design procurement effort. This will be planned and estimated in subsequent amendments and Task Orders.

As part of the efforts described in this Work Plan Modification, Table 2-1 presents thirty-nine (39) additional subcontracts and/or subcontract-level task orders are anticipated to be placed.

Table 2-1
List of Anticipated Procurements

WBS Number	Task Description Subtask Description	Type	Comments
02	Project Management/Support/Administration		
02. 02. 01	Procurement Activities		
	Existing MOA Management (3) for one year	FP	Non Team Members
	5 Misc. Task Orders to existing MOA's	FP	Not Yet Defined
02. 91. 01	Health and Safety Support		
	PPE	FP	Material Purchase
	Health & Safety Air Monitoring Analysis	FUP	
02. 91. 02	Regulatory Compliance/Waste Management		
06	Field Investigations		
06. 01	Site Reconnaissance (Land Surveying)		
	SAI - Task Order	FP	
06. 03	Conduct Geological Investigations (Soil/Sediment)		
	Vibracore Subcontractor - MOA	FP/FUR	
	Vibracore Subcontractor - Task Order	FP/FUR	
	Geoprobe Subcontractor	FP/FUR	
	Kevric Task Order	FP	
	Hand Held Computer & Software	FP	
	GPS Rental	FP	
	Hand Augers Material Purchase	FP	Material Purchase
	Expendable Items - 3 Purchase Orders	FP	

WBS Number	Task Description Subtask Description	Type	Comments
	Immunassay Field Screen Kits	FP	
	Drying Oven	FP	
	Freezers	FP	
	2 - Truck Rentals	FP	
06. 08. 01	Conduct Geophysical Investigations - Marine		
	Analysis of Data - Apex Environmental	FP	
06. 09. 01	Wetlands & Habitat Evaluation		
	Bio Engineering - Task Order	FP	
	GPS Rental	FP	
06. 91	Conduct Geotechnical Investigations		
	Onshore Drilling Subcontract	FP/FUR	
	Offshore Drilling Subcontract	FP/FUR	
	Kevric Task Order	FP	
06. 92. 02	Cultural Resources - Stage II Survey		
	John Milner Associates - Task Order	FP	
08	Off-Site Laboratory Sample Analysis		
08. 04. 01	Analyze Soils and Sediment Samples - Geotech		
	Geotechnical Laboratory	FP/FUR	
08. 04. 02	Analyze Soils & Sediment Samples-Chemical		
	Chemical Laboratory - Sediment Congeners	FP/FUR	
	Chemical Laboratory - Sediment Homologue	FP/FUR	
	Chemical Laboratory - Soil Full Suite Analysis	FP/FUR	
10	Analytical Support/Sample Mgmt/Data Validation		
10. 05. 91	Validate Soil/Sediment Chemical Data		
	Clark Atlanta - Task Order	FP	
11	Data Evaluation		
11. 02	Data Reduction, Tabulation and Evaluation		
11. 02. 01	Evaluate Soil/Sediment Data		
	Battelle - Task Order	FP	
20. 94.	Restoration Design Support		
	Bio Engineering - Task Order	FP	
21	Value Engineering/Special Studies		
21. 04. 01	Real Estate		
	SE Services - Task Order	FP	
21 99	Specific Value Engineering Efforts		
21 99. 02	Wetlands Restoration Alternatives Evaluation		
	Bio-Engineering - Task Order	FP	

FP = Fixed Price
FUR = Fixed Unit Rates
MOA = Master Ordering Agreement
TO = Task Order

The procurement estimate includes Foster Wheeler Environmental Corp's labor costs (pre-qualification, solicit, award, administration, changes and closeout), necessary for task completion. The estimate also includes costs for other direct costs such as copying, standard postage, Fed-Ex, GBC and PC usage.

Administrative cost has been estimated based on the difficulty of the procurement and period of time it will be in place during the Period of Performance of this Work Plan Modification. Change management has been estimated by the number of changes most probable during the length of the procurement and the difficulty level in putting the change in place. Closeout is based on the difficulty of the procurement.

Incidental costs have been calculated based on the difficulty of the procurement, time period in place and expected number of vendors requested to submit proposals.

Subtask 02.91 - Other Distributive Support

Other activities included under this project management task include those that are distributive over site activities and will continue throughout the project, including into the construction phase. Currently included under this Subtask are safety and health field efforts, regulatory compliance, and waste management activities. These are discussed in further detail in the following subsections.

Activity 02.91.01 - Health and Safety Support

This Activity includes the additional distributive effort for work performed by project health and safety staff in support of this Modification to the New Bedford Harbor Task Order. Modification 19 to this Task Order provided for the level of effort required to provide project health and safety support with the assumption that this project distributive effort would be transitioned into the construction task order (TO 24) as of July 2001 based upon target schedules for CDF C and WTP C Construction. Given the recent changes in project direction by EPA, there is a significant potential that construction of CDF C and the WTP will be delayed to later 2001/early 2002. With the potential reduction of level of effort under TO 24 and the increased design efforts associated with this RFP, additional costs are required for health and safety support under TO 17. These costs are included in this Cost Estimate for the period of July – December 31, 2001. Subsequent modification for TO 24 will be made to adjust for the associated unused cost and fee under TO 24.

Activity 02.91.02 - Regulatory Compliance/Waste Management

This Activity includes environmental compliance support for waste handling and characterization, including review of analytical data to properly characterize waste for off-site shipment, preparation of waste profiles and review of shipping papers. The only waste currently expected to require off-site disposal is waste PPE, assumed to be characterized as non-hazardous.

Also included in this Activity is one environmental compliance inspection during the field investigation phase. The environmental compliance inspection will evaluate compliance with waste management activities including waste containerization, transportation from the generation site to storage areas and temporary storage prior to either on- or off-site disposal based on the requirements identified in the RCP, TTSP and SAP.

Task 06 - Field Investigation

Included under this Task are those field activities providing input to the CDF design package and conducting baseline monitoring of air and groundwater prior to construction. Activities to be conducted during the field investigation program include the field work required to provide the following data:

- Topographic survey of the wetland area.
- Sediment and intertidal data to supplement the design of the dredging and excavation plan.
- IDW waste (used PPE) data for characterization and determination of disposal options.
- Geophysics data review/analyses to verify the feasibility of a visual approach to dredging.
- Cultural resources investigation data to identify possible construction constraints.
- Wetlands delineation for impact into excavation/restoration design.

The activities to be conducted under this Task are described in more detail in the following subsections.

Subtask 06.01 – Site Reconnaissance (Land Surveying)

Activities under this Subtask include the preparation of a Survey Task Order, land surveying conducted by the Surveyor of Record for the Project and field oversight by Foster Wheeler to support the land survey effort. No invasive field work will be performed under this Subtask. This Subtask is one of the schedule controlling tasks needed to be completed to support the design activities described further in this Work Plan under Task 20. The surveying activities to be considered under this Subtask are described in this section. Foster Wheeler's cost estimate and the survey subcontract estimate are based on surveying 65 acres of wetland area properties.

Foster Wheeler will prepare a Task Order for the Land Surveying to be performed by the Surveyor of Record. The location and general information of land parcels to include in the survey work shall be provided by Foster Wheeler. It is expected that not all of the properties indicated will require topographic survey and/or all features of the property basis, most likely in groups or blocks determined in part by defined units of dredging and excavation work. In general, the Surveyor of Record scope of work will include:

- Property and Easement Survey

  The Survey Subcontractor will perform the required research at the New Bedford City Hall, Land Court Engineering Office, Registry of Deeds, etc. as necessary to accurately define the existing property line and easement boundaries, and perform a metes and bounds survey of property lots, showing liens of record, liens of possession, existing easement boundaries, coastal features, manmade structures, existing utilities, and other physical features as indicated by Foster Wheeler.

- Topographic Survey

  The survey subcontractor will perform a topographic survey of the lots at a one-foot contour interval, including wetland areas as delineated by Foster Wheeler.

- Plans

  Prepare a topographic site plan and a survey plan of the subject lots. Survey work will be performed by a Land Surveyor licensed in the State of Massachusetts, and all recordable deliverables are to be stamped/sealed by the Subcontractor.

Subcontractor services furnished will be in accordance with all applicable State, Federal and local codes and standards as established for the project in Section 3.0 CODES AND STANDARDS in the Statement of Work for Land Surveying Services, dated March 1999.

Foster Wheeler will perform quality control review and provide part-time field oversight of the surveying subcontractor. The reviews will verify that the required submittal information is complete and accurate. The control and documentation of survey information developed and compiled will also be monitored. Corrective actions will be recommended and implemented as deemed necessary.

Subtask 06.03 - Conduct Geological Investigations (Soils/Sediments)

Approximately 500 sediment cores will be advanced to a depth of at least 4 feet in areas of the upper, lower, and outer harbor. Sampling locations will be chosen to add information to identified data gaps and to test the hypothesis that the contamination is limited to the upper-most black organic sediment. The locations of these cores will be determined based on the findings of the existing data review. Currently two separate mobilizations are planned (Phase IIIB and IIIC, Phase IIIA will be conducted under the Options presented in Work Plan Modification #18). Approximately 250 cores will be completed in the intertidal area, and 250 will be completed in the subtidal area. Sediment cores will be logged in the field to determine soil types and strata breaks. Sample information, including location coordinates, date collected, sample identifiers, soil type, and relevant comments will be entered into a database at the point of sample collection through the use of a handheld computer. This step will allow for field collected data to be uploaded into the project database (GIS format) at the end of each field day, reducing the amount of data reduction needed at the end of the program, and allowing for data to be mapped as the program progresses.

A hand auger, split core sampler, or geoprobe shall be used to collect sediment/soil samples in areas of the intertidal zone or flood plain that cannot be reached by boat, and a Vibracore subcontractor will be procured for the collection of other samples. Sampling devices and methods are discussed in detail in the SAP in section 4.8.3. Locations will be surveyed using Global Positioning Systems (GPS) equipment with submeter accuracy. We anticipate the collection of the 500 locations (1500 samples) to be done by a two-person field crew with approximately half-time field chemistry support.

Physical and chemical samples will be collected from 6" composite intervals, to be determined by a geologist in the field, based on soil types. For each sediment core, the lowest 6" of the black organic sediment, and the uppermost 6" of the underlying gray sediments will be sampled provided this contact is present, and is recognizable in the core. Compositing of more than one soil type shall be avoided. Additionally, a third 6" composite sample will be collected from each core. Sample locations will be chosen based on present soil types at the discretion of the geologist.

Samples will be selected for PCB chemical analysis, grain size, organic content, and atterberg limits from locations/depths to be developed in the SAP/QAPP. Samples not selected for off-site analysis will be archived (frozen) on-site until analytical results are reported and reviewed by USACE and EPA. For cost estimating purposes, it is assumed this testing will be performed on 50% of the vibracore locations, or approximately 750 samples. Analytical costs are included in Task 8.

In addition, the field program will include the field screening of approximately 200 samples for PCB concentration using SDI PCB RaPID Assay screening kits, proposed to be capable of detecting 0.5 ppm PCB (as Aroclor 1254) in soil. Data will be used to determine if field screening has some potential for providing rapid, cost-effective results for future sampling activities, especially for confirmatory sampling, and if so, what the potential practical limitations of the screening process are. One of the anticipated limitations of the screening is the effect of high moisture/high organic content on the reported concentrations. To reduce the potential negative effects, a low temperature drying oven will be used to prepare high moisture soils before screening.

Activity 06.08.01 - Marine Surveys

This Activity involves the replay and re-interpretation of previously collected (1999-2000) geophysical data from New Bedford Harbor. The geophysical data will be reviewed in order to determine if specific surface sediment layers can be differentiated using the existing data collected from the harbor. The data will be reviewed in order to assess the accuracy and applicability of the geophysical data previously

collected relative to the question of defining the upper contaminated layer presence and thickness. The geophysical data includes digital marine Sub-bottom Profiler data collected with an Edgetech "*X-Star*" Sub-bottom Profiler system during the summer/fall field season of 1999 by Foster Wheeler Environmental.

The following activities are anticipated as part of this Work Plan:

- Play back of the Sub-bottom data collected during the summer 1999 field program;
- Identify the position of the data lines within the harbor (using the tagged lat-long coordinate markers resident in the data files and navigation files);
- Enhance the upper several feet of data (below the mud-line), so that the best resolution possible is obtained for the shallow sediment layers;
- Identify (if possible) the surficial soft sediment layer on the digital playback data records;
- Compare the results of the re-interpretation of the Sub-bottom data identifying soft sediment thickness with other existing data concerning the thickness of the Recent Organic (OH) sediments;
- Compare the re-interpreted Sub-bottom data with results of borings conducted in the harbor by Foster Wheeler (and subcontractors);
- Compare results with other investigator's data, including probes and borings conducted by other researchers (Foster Wheeler to provide information to geophysics subcontractor);
- Calibrate the geophysical re-interpretations of the Sub-bottom data based upon the available boring and probe information;
- Identify areas of significant discrepancy between the re-interpreted soft sediment layer from the Sub-bottom data and the (OH) layer identified from available boring and probe information;
- Prepare cross-sections and a map of the re-interpreted Sub-bottom data indicating the presence (or absence) of soft bottom sediments which may be indicative of Recent Organic (OH) sediments;
- Prepare cross-sections of each of the Sub-bottom profiler lines re-interpreted showing the thickness of the soft bottom sediments (where identifiable), possibly indicating the presence of Recent Organic (OH) sediments;
- Prepare an isopach (thickness) map of the soft bottom sediment thickness, showing the presence and approximate thickness of the layer in the areas covered by the existing Sub-bottom data;
- Identify on the maps and cross sections areas where the re-interpreted data is either significantly inconsistent with other data sources, or shows that no soft bottom sediments (possibly indicative of Recent Organic (OH) sediments) exist; and
- If warranted, make recommendations concerning potential additional future data collection to fill-in, augment, or recollect data to enhance the existing data set.

Where applicable, maps and cross-section information will be prepared in GIS compatible format. These will be used with the Phase III sediment data to evaluate the overall implementation of the "observational approach" (see Activity 11.02.01).

Foster Wheeler Environmental anticipates subcontracting Apex Environmental Inc. to conduct the sub-bottom data review and re-interpretation. The project will be managed by Jay Borkland, a former Foster Wheeler Environmental employee who was instrumental in the collection of the 1999 marine geophysical data, and who is an expert in the processing and interpretation of sub-bottom profiler data. Mr. Borkland is familiar with the specific sediment type of interest for this study in New Bedford Harbor and fully understands the various project objectives. Foster Wheeler will oversee the phases of the work completed by the subcontractor. Foster Wheeler will provide the raw data to the subcontractor for the interpretation, and will review the subcontractor's progress toward analyzing and re-interpreting the data at periodic project task review sessions.

Subtask 06.09 - Conduct Ecological Investigation

Activity 06.09.01 - Wetland and Habitat Delineation

The efforts to conduct wetland delineation of areas to be affected by remedial activities are included under this Activity. The effort to prepare a single wetland delineation and functional assessment report is also included under this Activity.

The approach to work is based on the following assumptions.

- The areas delineated will include dredge areas in the upper harbor as shown on the December 18, 2000 Dredge Quantity Map (Figure 1-8), and will include approximately 20 acres of ACE-jurisdictional wetlands. Based on these maps, 45 acres of intertidal areas are mudflats and do not require delineation. The delineation will not include areas required to be disturbed during access to the site for dredging/excavation. These access areas will be delineated following completion of the 90% Excavation design drawings.
- Delineation will use routine onsite determination as described in *the Corps of Engineers Wetlands Delineation Manual*, January, 1987.
- The upper limit of non-vegetated intertidal areas (e.g., mud flats) will be field delineated. The lower limit of these areas will not be field delineated, but will be determined by elevation.
- Where more than one distinct vegetated wetland cover type occurs within a wetland area (e.g., high salt marsh/low salt marsh), the boundary between cover types will be delineated.
- The location of wetland boundaries will be digitally recorded using GPS in a format compatible with civil survey and engineering design drawings.
- Delineation will be conducted by a three-person Foster Wheeler team, consisting of two wetland biologists and a GPS specialist.
- Delineation effort will take approximately 3 weeks in the field.
- A single Wetland Delineation and Functional Assessment report will be prepared to address wetland areas delineated. The report will be in a format similar to that prepared for the Early Action Soil and Sediment Removal (Early Action) activities. USACE review and comment of the report will be similar to that conducted for the Early Action report.
- After the 90% Excavation Design is completed, an additional wetland delineation may be required to assess construction access roads, laydown areas, etc. that are defined in the 90% Design. This effort will be included as a modification to this Work Plan and Estimate, if required.
- Back pack GPS unit, mapping grade (e.g., Trimble Pro XRS), with necessary software. Rental for approximately 4 weeks (assumes 3 weeks of delineation, 1 week total for pre-delineation set up and post-delineation download and QC of data).

Subtask 06.91 - Conduct Geotechnical Investigations

This Subtask describes the geotechnical investigation that will be performed to support the design and construction of the mechanical dewatering facility. This facility is described in detail in Subtask 20.93 of this Work Plan.

For purposes of this Work Plan and cost estimate, it is assumed that 10 geotechnical borings will be completed to support the 90% design effort for the mechanical dewatering facility proposed for the Southern Lobe at CDF D. Assumptions made in the Draft Off-Site Transportation and Disposal Option E1 vs. E2 Report (March 2001) concerning the existing site conditions will need to be verified. These assumptions include the need for piles for building foundation support and the potential removal of 3 feet of RCRA classified soils.

Prior to the boring program, geotechnical data, including boring logs, and test pits, collected during the design investigation of CDF D will be examined to determine the need for additional borings and geotechnical samples in order to guide the field investigation. This data evaluation is discussed in Activity 11.02.91 of this Work Plan.

The geotechnical field program is anticipated to be comprised of ten borings, eight on-shore and two off-shore in the swale north of the southern lobe. Bedrock is assumed to be located 60 feet below ground surface. In each boring, split-spoon samples will be collected continuously in the first ten feet, and then every 5 feet thereafter (140 total). Approximately 25% of the spoons (35 samples) will be analyzed for Particle Size by ASTM D 422. It is anticipated three shelby tubes will be collected in each boring for possible geotechnical analysis to characterize the cohesive sediments underlying the Southern Lobe. Cohesive sediment from each tube will be analyzed for Atterberg Limits by ASTM D 4318. Approximately half of the collected shelby tubes will be analyzed for consolidation by ASTM D 2436 (15 tests) and/or Triaxial Shear (15 tests). Analytical costs are included in Activity 08.04.01. To assess foundation conditions for potential pile locations, 20 feet of rock coring will be advanced in each boring. Split spoon samples and rock cores will be logged by the attending Foster Wheeler geologist in accordance with the SAP. Additionally, samples will be collected from each boring (16 total) for laboratory analysis of TAL metals, TCL organics, and PCBs (Activity 08.04.02).

Subtask 06.92 – Cultural Resources Survey

Activity 06.92.01 - Stage IB (Intensive) Survey

Lessons learned from the Pilot Study (JMA 2001) conducted as part of the New Bedford Harbor Superfund Site Project indicate that areas along the New Bedford Harbor, Acushnet River, have withstood various episodes of shoreline change due to deposition, erosion, and natural development. Over time, these changes have affected the archeology of New Bedford Harbor by influencing potential archeological site preservation. The Pilot Study indicated that all shoreline areas within the harbor do not have equal potential to contain intact cultural resources. The approach to archeological survey proposed herein involves performance in six increments. Implementation of this approach will be contingent upon mutual acceptance of this approach by the USACE, Massachusetts Historical Commission (State Historic Preservation Office), the Massachusetts Board of Underwater Archaeaology, and the Wampanoag Indians of Gay Head. The work described below will be undertaken in accordance with Massachusetts State Historic Preservation Plan, Massachusetts Historical Commission (950 CMR 70.00) guidelines, U.S. Army Corps of Engineers guidelines and regulations, CERCLA and OSHA requirements, and the Foster Wheeler Environmental project-specific Health and Safety Plan.

The six steps to this survey are as follows:

1. Identify shoreline areas through paleoenivronmental reconstruction that have the most potential to contain cultural resources;
2. Conduct pedestrian survey of the entire intertidal Area of Potential Effect (APE) to look for possible surface indications of the presence of cultural resources (e.g., surface scatters of prehistoric or historic artifacts greater in age than 50 years old). The area included in the APE is the dredge area in the upper harbor as shown on the December 18, 2000 Dredging Quantity map (Figure 1-8);
3. Perform subsurface investigations of areas identified as having high-to-medium potential to contain buried cultural resources that may be affected by the proposed dredging activities;
4. Perform subsurface investigation of a selected sample of areas categorized as having low potential to contain buried cultural resources as a means of verifying the modeled predictions of the paleoenvironmental reconstruction;
5. Conduct analysis of data collected during the previously noted Tasks (including laboratory analysis of artifacts collected during fieldwork); and
6. Produce a report that includes writeup of the methods applied, results of steps 1-5, and recommendations for followup investigations if appropriate.

In addition, the efforts to keep close and frequent communication among the USACE, EPA, Foster Wheeler, and other interested parties such as the Wampanoag of Gay Head are included under this Activity. It also involves Foster Wheeler's management time and technical oversight of the cultural resources subcontractor, John Milner Associates. It is anticipated that there will be a minimum of one meeting with the Massachusetts Historical Commission prior to the initiation of the work in this overall Activity. The purpose of the meeting will be to obtain concurrence of the SHPO, USACE, and the Wampanoag of Gay Head on the field approach that will be taken for this Activity and to keep everyone informed as to the upcoming cultural resources program. Additional meetings may be necessary depending upon findings of the field investigation.

Step 1 - Paleoenivronmental Reconstruction

The purpose of this step will be to provide a scientific basis for limiting the amount of actual subsurface field investigation that will be conducted within the APE. The benefit to the project may be in cost savings on expenditures for subsurface field investigations and associated laboratory and report writeup time that may not be scientifically grounded (or fruitful).

This process will involve identification of shoreline areas that have the most potential to contain cultural resources. This identification will use data previously collected for the Project (e.g., geophysics data and soils information) and information (e.g., about sea-level rise in New England) available in published and possibly unpublished sources. Issues to be researched include: knowledge of thicknesses of glacial, marine, and estuarine sediments within the APE; reconstruction of the drowned portion of the Acushnet River channel and depth to bedrock. These data will assist the archeological team in identifying areas within the APE that have the potential to contain intact buried cultural resources that may be disturbed by the proposed project.

A map will be developed showing the APE and the predicted high-to-medium archeological sensitivity areas and the predicted low archeological sensitivity areas. This map will be used as a basis for discussion with the ACE, MHC, MBUAR, and the Wampanoag Indians of Gay Head of proposed subsequent fieldwork (described below).

Step 2 - Pedestrian Reconnaissance of APE

The purpose of this step is to view the intertidal APE to identify surface indications of the presence of cultural resources related to the prehistoric and historic time periods. This Activity will also identify obvious areas of prior disturbance that would preclude the presence of intact cultural resources and thus be a basis for eliminating the area from further investigation.

This Activity will involve a team of archeologists who will walk over the APE, systematically recording observations and noting areas of disturbance or areas that warrant subsurface inspection because of the presence of surface artifacts or environmental characteristics that suggest that potential cultural resources may be found in the location.

This work assumes that the Lead Archaeologist may need to spend time meeting with local Native American representatives and will take time to report in to JMA and Foster Wheeler on a daily basis about progress and observations. The efforts also include participation by the JMA Project Manager in terms of field effort, possible meetings by telephone, and general management.

Step 3 - Perform Subsurface Investigation in High-to–Medium Archeological Sensitivity Areas

The purpose of this step is to examine areas within the APE that meet criteria (defined in step 1) as having high-to-medium archeological sensitivity for possibly containing subsurface intact cultural resources. It is anticipated that these areas will correlate with non-mudflat areas within the harbor (e.g., primarily salt marsh).

It is assumed that approximately 25 acres will be categorized as having high-to-medium archeological sensitivity. The field approach may involve excavation of hand-held cores using an Eijkelkamp "Dutch" gouge-type auger or equivalent. Soils obtained will be examined for demonstrated stratigraphy, soils types, and possible presence of cultural artifacts.

Cores will be placed at 8-meter intervals along transects approximately perpendicular to the shore. It is anticipated that approximately 64 cores will be excavated per acre. In areas where positive results are recorded in the cores, i.e., cultural resources are found, then additional cores, placed in the cardinal directions around the positive core location, will be excavated at 2-m intervals. This will provide a possible way of distinguishing isolated artifact finds from subsurface sites and will provide a means of mapping the approximate distribution of artifacts and the extent of subsurface sites. For the purposes of this estimate, it is assumed that no more than five archeological sites will be located within the high-to-medium archeological sensitivity areas of New Bedford Harbor project area. This would mean that approximately 1660 cores may be excavated in the high-to-medium archeological sensitivity areas.

Step 4 - Perform Subsurface Investigation in Selected Low Archeological Sensitivity Areas

The purpose of this step is to test the predictive archeological sensitivity model developed as a result of the environmental reconstruction conducted in Step 1. If archeological site density is found to be higher than one site within the selected sample areas, then discussions with the ACE, MHC, MBUAR, and Wampanoag Indians will be held and the survey methodology under this Activity will be refined and reconfigured. Need for additional field testing may be reassessed (and would require reconsideration of designated funding).

It is assumed that approximately 40 acres of the APE will be categorized as having low archeological sensitivity due to the presence of previously documented disturbance or due to criteria as defined in Step 1. Of these areas, approximately 8 acres will be selected for examination through subsurface investigation as a test of the paleoenvironmental reconstruction model developed in Step 1. These areas will be tested using the same methodology described for Step 3.

For these low archeological sensitivity areas, it is assumed that only one archeological site may be identified. It is assumed that approximately 524 cores may be excavated within the selected low archeological sensitivity areas.

Step 5 - Analyze Data Collected in Steps 2, 3, and 4

This step will involve processing and analysis of artifacts collected during field investigations of the APE. Following initial cleanup of artifacts at the Sawyer Street facility, the artifacts will be brought to JMA's archeological lab for identification and interpretation. At the conclusion of the Project, artifacts collected will be prepared for curation in previously agreed-upon facility or returned to landowners, if so requested.

The estimated budget for this Activity assumes that approximately 7 archeological sites are discovered with collections from each that require standard processing (cleanup, drying, labeling, examination, analysis, and interpretation)

Step 6 - Report Preparation

A Stage IB Cultural Resource Investigation of Intertidal Area of Potential Affects will be prepared that will describe the methods applied, results of the environmental reconstruction, results of the field investigations and artifact analyses, and will offer recommendations for further investigations if appropriate

After the 90% Excavation Design is completed, an additional cultural resource survey may be required to assess construction access roads, laydown areas, etc. that are defined in the 90%. This effort will be included as a modification to this Work Plan and Estimate, if required.

Task 08 - Off-Site Laboratory Sample Analysis

Subtask 08.04 - Analyze Soil and Sediment Samples

Activity 08.04.01 - Geotechnical Testing

Physical testing for geotechnical engineering parameters is needed for design, bidding, dredging, and dewatering of sediments from the Upper and Lower Harbor. Sediment samples taken from cores will be analyzed for moisture content, grain size, organic content, specific gravity of dry solids, and Atterberg Limits. These tests are "index properties" that are commonly used to determine performance and behavior during dredging and disposal.

Two important sediment properties are in-situ dry unit weight and wet unit weight. (dry unit weight is weight of oven-dried sediment per unit volume – wet unit weight is weight of saturated sediment per unit volume). These unit weights will be calculated based on moisture contents and solids specific gravity. Unit weights can also be directly measured from "undisturbed" core tube or shelby tube samples by weighing a section of core and calculated the cylinder volume. The accuracy of direct measurements depends on how much sediment samples are compressed or expanded during sampling. Unit weights will made on selected high-quality samples for comparison to weights calculated from index properties.

Results of geotechnical tests will be shown on data sheets prepared by the laboratories. A summary of the data will be entered into an electronic database for the project. The summary data fields should include:

- Sediment type (i.e., OH, CH, ML, SM)
- Sediment color
- Moisture content (percent dry weight basis)
- Solids content (weight percent)
- Percent gravel
- Percent sand
- Percent silt
- Percent clay
- Organic content in percent
- Specific gravity of solids
- Liquid limit
- Plasticity Index

The cost estimate is based on the assumption that there will be 1,500 samples taken from 500 cores.

Standard Penetration Tests (SPT) are performed by counting the number of blows to drive a standard-sized sampler one foot into soil or sediment. SPT values are the most common field test used to characterize the strength and density of soil and sediment and provide information useful for dredging. Drilling rigs are needed to handle the weight of the sampler and 140 pound hammer. For off-shore exploration, an anchored, barge-mounted drill rig is required to perform SPT tests, which costs significantly more than vessels needed for sediment cores.

There is extensive existing SPT data at the four CDF sites and some existing data in the Upper Harbor dredge areas. The data consistently shows that the near-surface contaminated sediment is very soft with blow counts of less than one to two per foot. The native organic silt is so soft, that the sampler generally sinks several feet into the sediment under the weight of the drill rod. There is essentially no difference between very soft sediment with blow counts of less than 1 up to 2 blows per foot. Since the

contaminated sediment is near the existing mudline surface where additional SPT data would not provide useful information, additional SPT tests are not recommended.

There is a potential to reduce costs by reducing the number of physical tests. Sediment physical properties can be correlated with visual descriptions, so it is common practice to group samples with similar visual descriptions and test representative samples in each group. Also, an understanding of the natural variation in geologic deposition at a specific site provides insight into potential consistency or variation over a site. Recommendations for reducing the number of physical sample tests will be presented below under Activity 11.02.01 Evaluate Geotechnical Data.

Activity 08.04.02 - Analyze Soils and Sediment Samples - Chemical

The efforts to coordinate and manage subcontractor laboratories, to coordinate with USACE and with the designated QA laboratory are included under this Activity in addition to the laboratory costs. Because of the large amount of analytical work scheduled for this program, it will be necessary to prepare and solicit new laboratory subcontracts specific to this work. The technical efforts to prepare scopes of work and to review laboratory proposals are included under this Activity. Subcontract and procurement personnel time is included under Activity 02.02.01.

PCB analytical methods were selected by the project team to provide accurate data, comparable to earlier field efforts, and to be cost effective. Phase III samples will be analyzed for NOAA congeners by ECD as the primary analysis. The congener by ECD method was chosen as the most appropriate because it offered accurate data less susceptible to weathering or degradation problems and that could be readily compared with data collected by EPA Narragansett and other monitoring programs. NOAA congener data will be used to calculate total PCBs as discussed in the sediment correlation report(s) prepared for previous sampling events. Samples will also be collected for total homologue groups and the data used to maintain the correlation equation for these Phase III data (see Activity 11.02.01).

In addition to the primary analysis for NOAA congeners by ECD, samples will be split at a frequency of approximately 7.5% and analyzed for total homologue groups by low resolution GC/MS operating in SIM mode. In addition, it is expected that some samples from selected areas will require rapid (two-week) turnaround analyses in order to expedite the remediation design schedule and/or other concerns. A total of 1800 samples for total NOAA congeners (182 samples for two-week TAT) and 137 for total homologue groups, including QC were used for cost estimating purposes.

In addition to the PCB analyses discussed above, approximately 16 samples plus QC collected from the southern lobe of CDF D will also be analyzed for full suite TCL/TAL analyses (VOC, SVOC, pesticides, PCBs and TAL inorganics).

Task 10 - Analytical Support/Sample Management/Data Validation

Field activities associated with the packing, shipping, handling, and documentation of samples and coordination with the analytical laboratories are included under the individual field investigation Subtasks (Task 06). Data validation activities as described below are included under this Task. The scope and associated level of effort for the data validation Subtasks are dependent on the number of samples analyzed, the analytical method, the end use of the data, and on the other QA/QC measures of data quality that ensure data are acceptable for its intended use.

Subtask 10.05 - Perform Data Validation

The data to be collected for this project will be used to support design activities and to provide baseline data for comparison during construction activities. The sampling, analysis, and data validation tasks will be conducted to ensure that the data are representative of site conditions and will be comparable with data to be collected during construction. In anticipation of future construction activities, efforts will be made during these initial investigation activities to expedite the process of sample analysis and data review/validation for those matrices which may require rapid turnaround in the future.

To expedite the process of determining whether data are usable for project objectives, the data QA/QC process will focus on the implementation of an overall program that ensures that the systems are in place to provide data of acceptable quality. This program will rely heavily on the inter-laboratory calibration process, USACE MRD laboratory validation, and periodic QA (split or co-located) sample comparisons. A data review process, as described in the following subsections, will be used as an additional periodic check of the laboratory data. However, the overall QA/QC program will be designed and implemented to expedite the data review/validation process does not become a time critical step during construction activities.

Activity 10.05.91 - Validate Soil/Sediment Chemical Data

Under this Activity, sediment data from Activity 08.04.02 will undergo a data review QC check to ensure that QC objectives were met and that the data are appropriate for the intended use(s). In addition, approximately 10 percent of the samples analyzed will undergo a Region I Tier II validation in accordance with *Region I, EPA-NE Data Validation Guidelines for Evaluating Environmental Analysis,* December 1996.

Foster Wheeler recognizes the critical nature of the project schedule and will make every effort to expedite this time consuming step and provide usable data in as short a time frame as practical. To achieve this objective, we will continue to look for ways to reduce the time and effort in the validation process and continue to maintain the high level of quality established by USACE, EPA, and Foster Wheeler at the beginning of this project. Some possible options for reducing the validation efforts are to develop some electronic data checks that can be executed immediately upon receipt of laboratory data and to reduce the level of text write-up prepared for each data package reviewed. Data review checklists will continue to be prepared and will document the review conducted; however validation memoranda will be prepared that combine several reviews into a single memorandum highlighting significant concerns only. This level of review is appropriate when the same laboratory is routinely analyzing large numbers of samples. Systematic QC issues will be identified in the data review/Tier II process, and if required, can be investigated further prior to the reporting of data.

Based on the actual sequence of field work and the associated volume of sample data that will require validation and review within 30 days of receipt from the laboratory, Foster Wheeler anticipates the potential to subcontract some or all of the data package review efforts. The efforts to procure and manage

qualified subcontractors and maintain appropriate chain of custody and documentation procedures are included in the associated cost estimate for this Activity.

Another alternative to reducing the effort and schedule associated with the data review/validation process may be to rely more heavily on other QA/QC measures, such as the comparison of split samples (congeners/homologues) and government quality assurance samples. Modifications to the overall review approach should be discussed in detail with the interested parties and documented in the QAPD. These efforts are not included in this Work Plan Modification.

Activity 10.05.96 - Validate Geotechnical Data

Geotechnical data validation will include the following elements:

- Check completeness by comparing list of tests ordered with test completed;
- Check laboratory reports for correct reporting format;
- Compare physical classification with visual descriptions on field core logs; and
- Check data summary database to original laboratory reports.

One visit will be made to the geotechnical testing laboratory prior to sample testing to review laboratory sample storage, handling, testing and testing results reporting.

Task 11 - Data Evaluation

Data management and reporting activities are included under this Task. The following subsections describe the types of written reports and the frequency of submittals. It is expected that data will also be compiled electronically in a database system and be available to the various Project Team members (EPA, USACE, Foster Wheeler) as needed.

Subtask 11.02 - Data Reduction, Tabulation and Evaluation

Activity 11.02.01 - Evaluate Soil/Sediment Data

The Data Evaluation Task will include preparation of Phase III data reports including tables, maps, data review documentation and a brief write-up summarizing the program. To meet the schedule requested of USACE, it is proposed that data tables and the associated Microsoft Access (*.mdb) file be prepared concurrently with the data review/validation Activity (10.05.91) and submitted weekly following completion of the data review and within 30 days of receipt of laboratory data. Maps and sampling location coordinates will be updated following each significant piece of the field program (i.e., following the field portion of Phase IIIB and IIIC) and forwarded to USACE as available (within 30 days of finishing that component of the field work). Final sediment data reports including compilation of complete data tables, final maps, and other associated data will be completed and submitted following completion of each practical (IIIB, IIIC) component of the program.

In addition to providing data reports for inclusion into GIS, data from earlier programs and from the Phase III program will be further evaluated relative to the project objectives. This will include a review of existing physical and chemical soil and sediment data in order to identify data gaps in the upper and lower portions of New Bedford Harbor. Data will be examined to identify previous sample locations that did not extend deep enough to reach non-contaminated soil. It is estimated there are approximately 200 such locations. Further analysis will determine areas where estimated dredge depths are controlled by an inadequate number of samples in order to reduce the uncertainty of data interpolation for dredging design. GIS mapping and interpolation will be reviewed concurrently with USACE to understand the basis for defining dredging/excavation limits. Specific areas (i.e., mosquito ditches) will be evaluated to determine whether they warrant an independent interpolation method.

General observations of the data has led to the development of a hypothesis that contamination is limited to a black organic sediment coating the bottom of the harbor floor, and that the underlying material is not contaminated. A detailed look at soil type versus PCB concentrations will be conducted as a part of this data review.

Approximately 10 geologic cross-sections will be prepared using existing geologic data from Phase I and Phase II of the sediment sampling program and Phase I and II of the Geotechnical program. PCB data will then be plotted on these cross-sections to determine whether there is a correlation between soil type and contamination.

Concurrent with this data evaluation, existing geophysical data will be reanalyzed to determine whether it is viable to use geophysics to distinguish between organic and inorganic sediments. The geophysical interpretation task is detailed in Activity 06.08.01 of this Work Plan. Results of the geophysical data interpretation will be compared to existing and Phase III sediment data.

A technical memorandum will be prepared assessing the correlation between the reinterpretation of the geophysics sub-bottom profiler data and existing geotechnical and sediment sampling data. Approximately 10 cross-sections will be prepared illustrating existing soil types and corresponding PCB

values. The geophysics data will be overlain on these cross-sections to determine where the re-interpretation of the sub-bottom data is inconsistent with the existing boring data. In areas where geophysics data is consistent with boring data, the data will be further evaluated to determine if the correlation of soil type to PCB data warrants further geophysical investigation. It is anticipated that maps will be prepared that show the following areas:

- Areas where geophysics data correlates with boring data, including areas where:
  - PCB data concentrations correlate to soil type, supporting a visual based approach to dredging; and
  - PCB data does not support a visual based approach to dredging;
- Areas where existing geophysics data appear to indicate that further field geophysics survey may provide useful data; and
- Areas where geophysics data can not be reinterpreted and no further geophysics investigations are warranted.

Recommendations will be made based on the size of the three areas described above, as well as an evaluation of areas where existing data is incomplete. A cost analysis will be included to determine if an additional field geophysical investigation is warranted.

Other efforts included under this Activity include preparation of the final Correlation Report, incorporating Phase II data into the regression analysis. Phase III data will also be incorporated into the data set and the regression analysis performed as was done for earlier data sets. It is expected that the results from the larger data set will be generally consistent with earlier findings and will require only a brief summary write-up. The Phase III correlation report will also review the immunoassay field screening results for comparability to the other methods for reporting total PCBs.

Activity 11.02.91 - Evaluate Geotechnical Data

Evaluation of geotechnical data includes both existing physical data and data collected in Task 08. To support design, bidding, dredging, and dewatering, it is important to have the data organized to match the dredge management units. As described in Subtask 20.91, Dredging Design Support, the dredge area will be divided into the following dredging zones:

- "Deep" or Subtidal
- Intertidal
- Emergent

Within each zone, dredge management units (DMUs) will be established under Subtask 20.91. The size of DMUs will be determined during implementation of Task 20. Each specific DMU will be entirely within one zone and will not have areas of two different zones. This is necessary since different dredge or excavation methods will be required in different zones. For illustration and planning, a five (5) acre DMU with an average dredge depth of three (3) feet would have a volume of approximately 24,000 cubic yards (cy).

For environmental dredging projects, the number of physical samples required is typically one per 2,000 cy to one per 10,000 cy. Given the levels of contamination and the construction costs for New Bedford sediment, one sample per 2,000 cy is recommended. If this were done, then there would be 12 sets of physical data for a 5-acre DMU, or 2 to 3 per acre. This would be sufficient to provide reliable data for design, bidding, dredging and dewatering the sediment within a 5-acre DMU.

In order to coordinate physical data evaluation with DMUs, it is important that all existing data and new data be included in a project GIS database. With the sampling location coordinates and mudline elevation and data fields listed above in WBS 08.04.01 (i.e., Sediment type, Sediment color, Moisture content (percent dry weight basis), Solids content, Percent gravel, Percent sand, Percent silt, Percent clay, Organic content in percent, Specific gravity of solids, Liquid limit and Plasticity Index), data evaluation would be done separately with only the data from individual DMUs.

After the data is separated into individual DMUs, data evaluation will be performed. Data evaluation will include calculation of dry unit weight and wet unit weight for each sample and basic statistical analysis to show minimum, mean and maximum for each of the database fields. The information will be summarized on tables for use in the Dredging, Excavation and Dewatering Basis of Design Reports.

Since the DMUs will be determined during the design process, data evaluation will have to be done in multiple iterations. The first iteration should be done during the time the sampling and analysis plans are being written to evaluate spatial distribution of existing data. The data would be separated into assumed 5-acre DMUs and the number of data sets compared to the criteria described above. Additional samples would be needed in those areas where there are less than 2 samples per acre. In some areas where there are 2 or more samples per acre, additional samples may be needed to represent different depths of dredging or excavation.

The second iteration would be done concurrently with 30 percent dredging and excavation design. At this time, data would be separated and summarized to match the DMUs defined in the design process.

Depending on changes between 30 percent and 90 percent design, a third iteration may be needed. If so, data from the GIS database would be sorted, evaluated and summarized to support design of dredging, excavation and dewatering.

The geotechnical data evaluation will also include preparation of a geotechnical data report that summarizes the chemical/geotechnical/geophysical data collected for the Southern Lobe of CDF D. The report will include drawings showing final boring locations, preparation of geological cross-sections, and reduction of geotechnical data collected under this Activity. This Activity is separate from the Basis of Design/Design Analysis (BD/DA) preparation (Activity 20.93.02) and the report will be used to develop the allowable bearing loads for the surface soils.

Activity 11.02.99 - GIS Data Management

Concurrently with development of this Work Plan and in anticipation of an RFP for EIDMS data management, Foster Wheeler has begun to update and optimize the project database for the more efficient handling of large amounts of data as required by this project. With concurrence from USACE, the initial steps of this process will be conducted under an FCN (FCN-53) until the complete details of the EIDMS scope are developed. Accordingly, costs associated with database development and operation are not included in this Work Plan Modification. In addition, for the purposes of this estimate, it is assumed that the USACE, in conjunction with EPA, will continue to perform the GIS modeling to determine the extent and depth of contamination.

The efforts included under this specific Activity include only those efforts to initiate the Foster Wheeler GIS to support design efforts by incorporating the USACE GIS data being supplied concurrent with the Notice to Proceed, which includes PCB and bathymetric data into the Foster Wheeler database and GIS system. These data will be used under other tasks to support the assessment of differentiating PCB

contamination within identifiable sediment layers and to assess chemical and physical data gaps for developing additional field sampling programs.

It is assumed that USACE GIS database will be similar in format and design to the Microsoft Access (*.mdb) file provided by Foster Wheeler and that it will be readily incorporated into the existing database and ArcView formats. Data will be presented in formats and structure compatible with current project database (e.g., sample numbering system, analyte reporting units). It is assumed that historical data (pre-ROD) that USACE input into database format do not require additional verification by Foster Wheeler. It is also assumed that all data will be in georeferenced file format and will include complete x, y, and z coordinate information, based on NGVD.

Foster Wheeler will also review USACE supplied bathymetric and topographic data to be used in the dredging/excavation design support. Survey data gaps will be identified in this Activity, and a brief technical memo will be directed to the USACE delineating which addition areas require surveys. Suitable survey data will be incorporated into the GIS database.

Other costs associated with migrating database information into GIS, preparing GIS maps and using the GIS information to evaluate data are included under those specific tasks as further discussed in the relevant sections of this Work Plan.

Task 20 - Remedial Design

This Task includes the information assembly, design analyses, conceptual design, detailed and final design and documentation (BD/DA) Foster Wheeler will perform to support design elements for dredging (water-based dredging equipment work), excavation (land-based equipment work), wetland restoration and mechanical sediment dewatering (infrastructure required to support dewatering operations).

The following sections describe the work scope and details of each design element. Assumptions for this work scope are provided along with the design activities and deliverables for the 30%, 90% and 100% designs.

As discussed during scoping and planning meetings, the Dredging and Excavation Designs (Subtasks 20.91 and 20.92) will be a team effort with the USACE.

The planned division of responsibilities for Dredging and Excavation Design is:

USACE

- Develops dredge/excavation quantities.
- Prepares the Scope of Work and accompanying construction drawings for Foster Wheeler to perform the design for preparing the dredging and excavation procurement package.

USACE/Foster Wheeler

- Evaluates data, define areas to be dredged/excavated and removal depths.
- Evaluates dredge/excavation technologies to be employed for remedial construction.
- Develops dredge/excavation prisms showing areas, depths of materials to be removed.

Foster Wheeler

- Develops dredging/excavation work plan; acceptance areas (Dredge Management Units [DMUs]); specifications defining dredge performance requirements, construction sequence; acquisition strategy; dredging SOW for procurement, including payment terms and dredging/excavation schedule.

Subtask 20.91 - Dredging Design (Support)

This Subtask describes the scope and approach for the portions of the dredging design that Foster Wheeler will provide.

Assumptions

- USACE will provide to Foster Wheeler the existing information (data, maps, electronic files) that define the extent of contamination horizontally and vertically in the Acushnet River, New Bedford Harbor and adjacent wetland and shoreline areas.
- The division of responsibilities described above is Foster Wheeler's current understanding based on discussions to date with USACE. It is recognized these will develop and evolve as work proceeds. Any new responsibilities assigned to Foster Wheeler may require modifications to this Work Plan and estimate.

- During the 90% design for dredging and excavation, the areas and depths of contamination to be removed will be defined and kept fixed for preparing 100% design submittals.
- Dredge management units (DMUs) will be defined and based on five (5) acre areas.
- Dredging design will be based on funding assumptions that will be developed with USACE and be kept fixed for completion of the 100% design.

The Dredging Design includes the following work elements:

Data Acquisition and Review

Foster Wheeler will review and evaluate existing data for the New Bedford Harbor Superfund Site obtained to date and acquire other needed information, in addition to the geotechnical, chemical, and survey data to be accumulated and evaluated under Task 11 of this SOW. Data will be reviewed and evaluated for use in developing the dredging design.

Design Criteria

Foster Wheeler will develop and summarize design criteria including general parameters, functional and technical requirements, as defined by the ROD, USACE regulations and requirements, ARARs, and other guidance. The technical and functional requirements that will be incorporated in the dredging design include project phasing due to funding, sequence of work, required cleanup levels, and confirmation sampling.

Dredge Technology Assessment and Selection of Performance Requirements

Final dredge technology evaluations and selection of dredge performance requirements for application on the full-scale cleanup will be performed. The dredging zones, currently defined to be the deep zone (below –3.0 ft. MLLW) and the intertidal zone (0.0 ft. to –3.0 ft. MLLW) for the purposes of dredge performance evaluation, may dictate that different dredge plant, systems and support equipment be used in both the Upper Harbor and Lower Harbor. Performance data from the Pre-Design Field Test Report, Dredge Technology Review, and Phase 2 - Detailed Evaluation of Dredge Technology Report, in addition to findings of the Data Acquisition and Review subtask will be used to summarize and evaluate the performance capabilities of dredge technologies best suited to complete the full scale cleanup, in deep and intertidal zones. The Final Dredge Technology Assessment and Selection of Performance Requirements Task will include further investigation of up to ten (10) dredge technologies and systems, requiring both contact with equipment manufacturers and contractors, and travel to conduct field evaluations. These will encompass both deep and shallow water dredge types, but focus on shallow water dredge types as less empirical performance results are available for this technology. Our proposal includes budget for approximately four (4) field evaluations, conducted by a Foster Wheeler Supervising Engineer and Consulting Engineer. The dredge technology assessment work will be conducted with close coordination with the USACE. A separate technical memorandum summarizing the findings of the Final Dredge Technology Assessment and performance requirements selection will be prepared concurrent with development of the 30% BD/DA.

Dredging Approach and Methodology

Based on establishment of the project design criteria, the findings of Dredge Technology Assessment and Performance Requirements Selection, the Pre-Design Field Test results, and knowledge of the operational parameters of candidate dredge technologies to be used on the full-scale cleanup, the 30% BD/DA will

develop the dredging approach and methodology. The dredging approach and methodology to be employed across the full scale cleanup area, will incorporate, as a minimum, the following:

- Project Design Criteria – Applicable USACE standards, requirements of the ROD, and other ARARs;
- Horizontal and vertical extent of dredging - based on chemical and physical sediment characterization as determined by collection and review of geotechnical, geophysical, and sediment chemical sampling in Task 11;
- Dredge operational parameters – Maintenance of optimum dredge efficiency, number of dredges; and dredge capabilities (deep/intertidal/emergent zones); and
- Site hydrographic and meteorological conditions – Tidally driven currents, wind, waves, rainfall, freezing.

The dredging and excavation approach(es) will be evaluated with development of the confirmation sampling approach. The confirmatory sampling approach will be coordinated with the dredging and excavation approach such that the dredging performance and production are not impacted adversely by the confirmation sampling. For each of the different dredging zones (deep/intertidal/emergent), and depending on dredge area geometry and bottom conditions, an optimum dredge pattern will be established by the contractor. The confirmatory sampling effort should 1) provide the contractor confirmatory results of the effectiveness of the dredging operations in meeting the cleanup goals of an area; and 2) not impact the dredging performance or production by collecting the confirmatory samples in a manner that does not impede dredge progress, while providing results back to the contractor while still in the dredge area and capable of repositioning efficiently to perform additional sweeps, if required.

Also key to development of the dredging and excavation approach will be determination of whether or not the visual dredging approach is feasible on a full-scale project. By the visual approach, the depth of cut is determined based on the real-time observation of the apparent contamination horizon, a distinct breakpoint between the soft black contaminated silt and the 'clean' underlying native material. The visual dredging approach will be further assessed in the 30% BD/DA, and incorporate the results of Task 6, Field Investigations.

Construction Cost Estimate

A cost estimate will be prepared for the full scale dredging contract, based on the 30% dredging design.

Meetings

Monthly coordination and review meetings will be conducted for the Dredging Design with the USACE. Participation on the 30% Dredging Design has been budgeted for five (5) coordination and one (1) on-board review meetings in this Subtask.

Activity 20.91.01 - 30% Design – Basis of Design/Design Analysis

30% Dredging Design

Based on the Tasks accomplished above, the 30% Dredging Design will:

- Establish the horizontal boundaries of the dredge areas to be accomplished with different technologies (floating, amphibious, land-based).

- Establish the vertical extent of dredging based on dredge capabilities, and sediment characterization.
- Compute neatline and overdepth dredge volumes for the different dredge zones (deep/intertidal/emergent), for up to six(6) site dredging alternatives, depending on selected disposal alternatives and dredging approaches.
- Develop dredge management units (DMUs), that reflect the dredge approaches and methodologies established earlier in this Activity, and based on dredge depth, sediment type (physical and chemical), area geometry, optimal dredge efficiency, and project funding constraints.
- Using the site characterization and bathymetric/topographic data available, develop 30% design drawings. This proposal is based on development of 36 plan view sheets and 36 typical cross section sheets. Drawings for the 30% design will include the base maps and survey data only.
- The anticipated specifications and proposed performance requirements will be outlined as part of the 30% submittal. Twenty (20) specification sections will be outlined.
- Develop 30% (planning level) dredging construction cost estimate.

Activity 20.91.02 - 90% Dredging Design (Support)

Foster Wheeler will advance the 30% Dredging Design towards a final dredging design in this Activity. A teaming approach between Foster Wheeler and the USACE will continue as the design evolves and contract documents are developed. Multiple on-board reviews will be scheduled with USACE to jointly develop the dredging design. The work elements proposed to be accomplished in the 90% Dredging Design are described below:

A final dredge technology assessment and selection of performance requirements for application on the full scale cleanup will be amended as necessary, should new information be acquired during the 90% Design. The different dredging zones, currently defined to be the deep zone (below –3.0 ft. MLLW), the intertidal zone (0.0 ft. to –3.0 ft. MLLW) and the emergent zone (0.0 to +4.0 ft. MLLW, will also be more accurately defined in the 90% Dredging Design.

Dredging Approach and Methodology

Based on amendments to the Project Design Criteria, the findings of Final Dredge Technology Assessment, the Pre-Design Field Test results, and knowledge of the operational parameters of candidate dredge technology to be used on the full-scale cleanup, the 90% Design will develop the dredging approach and methodology.

The dredging design will continue to be coordinated with the confirmation sampling approach. The confirmatory sampling approach will accommodate the dredging and excavation approach such that the dredging performance and production are not impacted adversely by the confirmation sampling.

The visual dredging approach will also be established, or eliminated, during the 90% design, based on review of the findings of Tasks 11 and 6.

90% Engineer's Estimate

A 90% Engineer's Estimate will be prepared for the full scale dredging contract, based on the 90% dredging design.

Meetings

Monthly coordination and review meetings will be conducted for the Dredging Design with the USACE. Participation on the 90% Dredging Design has been budgeted for four (4) coordination and two (2) on-board review meetings in this Activity.

90% Dredging Design (Support)

The 90% dredge design will update the work initiated in the 30% BD/DA, including:

- Establish the horizontal boundaries of the dredge areas to be accomplished with different technologies (floating, amphibious, land-based).
- Establish the vertical extent of dredging based on dredge capabilities and sediment characterization.
- Compute neatline and overdepth dredge volumes for the different dredge zones (deep/intertidal/emergent), for a number of Dredge Management Units (DMUs).
- Develop DMUs that reflect the dredge approaches and methodologies established earlier in this Activity, and based on dredge depth, sediment type (physical and chemical), area geometry, optimal dredge efficiency, and project funding constraints.
- Using the site characterization and bathymetric/topographic data available, develop design drawings. This proposal is based on development of 36 plan view sheets and 72 cross section sheets. Each plan view sheet will encompass approximately 5 acres of dredge / excavation area, and show bathymetric/topographic contours in 1 ft. intervals, core boring locations, and other structures or utilities that effect the dredging process. Two section view sheets, showing pre-dredge survey, depth of contamination, and allowable overdredge, as defined by the dredge prism, will be generated for each plan view sheet.

90% Dredging Specifications

The contract specifications will be developed and assembled in the 90% Dredging Design (Support) Activity. The Specifications will be prepared using SPECS INTACT as the base. A list of specifications anticipated to be included for the dredging work is included in Appendix B. This list may have specifications added or removed as the design process proceeds.

Procurement Evaluation

Foster Wheeler, working with the USACE, will develop a strategy for procurement of the New Bedford Harbor Full Scale Cleanup that reflects the intent of the design, and best accommodates a construction schedule based on phased funding.

Activity 20.91.03 - 100% Dredging Design (Support)

Foster Wheeler will complete the 100% dredging design in this Activity. A teaming approach between Foster Wheeler and the USACE will continue as the design is completed, USACE comments are addressed and the design is prepared for procurement. The work elements proposed to be accomplished in the 100% Dredging Design (Support) are described below:

The 100% dredge design will update the work completed in the 90% design based on review comments including:

- Establish the final horizontal boundaries of the dredge areas to be accomplished with different technologies (floating, amphibious, land-based).
- Establish the final vertical extent of dredging based on dredge capabilities, sediment characterization.
- Develop final DMUs that reflect the dredge approaches and methodologies established earlier in this Activity, and based on dredge depth, sediment type (physical and chemical), area geometry, optimal dredge efficiency, and project funding constraints.
- Using the site characterization and bathymetric/topographic data available, develop final design drawings. This proposal is based on development of 36 plan view sheets and 72 cross section sheets. Each plan view sheet will encompass approximately 5 acres of dredge/ excavation area, and show bathymetric/topographic contours in 1 ft. intervals, core boring locations, and structures or utilities that effect the dredging process. Two section view sheets, showing pre-dredge survey, depth of contamination, and allowable overdredge, as defined by the dredge prism, are anticipated to be generated for each plan view sheet.
- Compute final neatline and overdepth dredge volumes for the different dredge zones (deep/intertidal/emergent), for acceptance areas (DMUs).

100% Contract Specifications

Final contract specifications will be prepared based on revisions made to 90% Contract Specifications.

100% Engineer's Estimate

A 100% (Final) Engineer's Estimate will be prepared for the full scale dredging contract, based on the 100% dredging design.

Procurement

Foster Wheeler, working with the USACE, will develop a final procurement strategy for the New Bedford Harbor Full Scale Cleanup that reflects the intent of the design, and best accommodates a construction schedule based on phased funding.

Subtask 20.92 – Excavation Design

The Excavation Design Subtask is for the wetlands excavation that will be performed by land-based equipment. As with the dredging design, this will be a team effort with the USACE. The planned division of responsibilities will be the same as described under Subtask 20.91 Dredging Design (Support).

Assumptions

- Sixty five (65) acres of wetland areas will require excavation.
- Excavated material will be transported via public roadways to a disposal site at the CDF D railyard location; disposal facility design will be done under Subtask 20.93.
- Eleven (11) access routes will be required for entrance and removal of excavated wetlands areas.
- Six (6) individual decontamination areas will be required for removal of excavated materials.
- Design labor for the 30% and 90% designs are based on one cycle of changes for alternatives of each design phase.

The excavation design includes the following work elements.

Data Acquisition and Review

Foster Wheeler will review and evaluate existing data obtained to date and acquire other needed information in addition to the new data obtained under Task 11. Applicable data and information will be reviewed and evaluated for use in developing the excavation design.

Design Criteria

Foster Wheeler will develop and summarize design criteria for excavation including general parameters, functional and technical requirements from USACE regulations and requirements, ARARs, and other guidance. The technical and functional requirements that will be incorporated in the excavation design include project phasing due to funding, sequence of work, interface with dredging work, required cleanup levels and confirmation sampling.

Excavation Technology Assessment and Selection of Performance Requirements

Foster Wheeler will research and evaluate land-based excavation systems for use in emergent, marsh and intertidal areas of the site. Low ground pressure tracked-, rubber tire- and other less intrusive excavator types will be sought out and evaluated for selection of performance requirements for application on the full-scale cleanup. Material transportation systems, including access and haul road types, will also be evaluated for performance. The evaluation and selection of land-based excavation systems will dovetail with the dredge technology assessment completed in the Dredging Design (Support) Task. The upper elevations of suitable performance by floating and amphibious dredge systems will likely dictate the boundary at which the land based excavation will begin. The Excavation Technology Assessment and Selection task will include evaluation of land-based excavation technologies and systems, requiring both contact with equipment manufacturers and contractors, and travel to conduct field evaluations. Our proposal includes budget for approximately four (4) field evaluations, conducted by a Foster Wheeler Supervising Engineer and Consulting Engineer. The excavation technology assessment work will be conducted with close coordination with the USACE. A separate technical memorandum summarizing the

findings of the Excavation Technology Assessment and Performance Requirements Selection will be prepared concurrent with development of the 30% BD/DA.

Excavation Approach and Methodology

The design elements of excavation include:

- Identification on contour maps of the areas and depths for wetlands and soils to be excavated.
- Selection of equipment entrance and exit locations with decontamination facility locations.
- Selection of excavation and transport equipment routes and disposal locations.
- Design of equipment travel roadways that will allow efficient transport of excavated materials while minimizing impact to wetlands and other affected areas.
- Restoration of land areas affected by access roadways, decontamination facilities and other excavation activities.

For purposes of quantifying the activities for this Work Plan, Foster Wheeler assumed that eleven (11) separate access areas and main routes will need to be designed and developed. Each will have a roadway/access way with up to six individual decontamination facilities. The decontamination facilities will include site preparation (earth work, grading) roadways, fencing and the temporary decontamination facility.

The areas requiring excavation will be examined and the excavation methodology developed. Consideration will be given to separation of vegetation material from soil/sediment. Also the most efficient/least disruptive access methods (constructed roadways, wetland mat roadways, marsh specific equipment) will be considered.

Meetings

Monthly coordination and review meetings will be conducted for the Excavation Design with USACE. One (1) on-board review meeting will be held with USACE prior to the 30% submittal.

Activity 20.92.01 – 30% Design - Excavation

The 30% Excavation Design submittal will include:

- Base map and site plans for eleven (11) excavation areas with one typical cross section for each area showing access details and erosion control details;
- Typical temporary decontamination facility plan;
- Discussion of physical differences in area to be excavated;
- Discussion of alternatives evaluated for means of access, excavation, transport and decontamination facility;
- Outlines of specifications for excavation erosion control, decontamination, access methods and restoration for access routes, decontamination facilities and other areas;
- A Basis of Design/Design Analysis (BD/BA) Report will be prepared which describes 30% activities, analyses and provides calculations and documentation; and

- A planning level cost estimate will be prepared for the full-scale excavation based on the 30% Design.

Meetings

Monthly coordination and review meetings will be conducted for the Excavation Design with USACE. Two (2) on-board review meetings will be held with USACE prior to the 90% submittal.

Activity 20.92.02 – 90% Design - Excavation

The 90% excavation design will update the work initiated in the 30% BD/DA The 90% design will incorporate decisions on alternatives following the 30% Design review and decisions from comments and discussion during on-board progress reviews with USACE. Foster Wheeler will schedule two (2) on-board reviews during the 90% design.

The 90% design submittal will include the following detailed drawings:

- Six (6) separate decontamination areas showing road access, earthwork and grading, fencing and location of the decontamination facility with details.
- Six (6) drawings showing the eleven (11) separate excavation areas with cross sections including access roads and decontamination facilities. Placement/removal details will be included for the roadways. Details of the excavation and hauling equipment will be included.
- A 90% Design Engineer's Estimate will be prepared for the full-scale excavation based on the 90% Design.

A list of drawings and specifications anticipated to be included in this Activity is included as Appendix C. This list may have specifications added or removed as the design process proceeds.

The 90% BD/DA will update analyses and evaluations completed subsequent to the 30% submittal with final design calculations.

Activity 20.92.03 – 100% Design – Excavation

Final design will consist of:

- Resolution and response to USACE and EPA comments on the 90% Design submittal. A response to comments package will be prepared.
- The 100% submittal will include final specifications, P.E. signed and stamped drawings and final BD/DA.

Subtask 20.93 – Dewatering Design

This Subtask describes the scope and approach for the design and layout of a mechanical dewatering system on the southern lobe of CDF D (Southern Lobe). This design will be based on the project requirements for dewatering (i.e., placement of dewatered material in CDFs and/or off-site disposal) and technology evaluations completed to date. These technology evaluations include Technical Memorandum – Feasibility Investigation of Sediment Dewatering Alternatives (January 2001), Draft Pre-Design Field Test Report (March 2001), Draft Alternatives Analysis for Confined Disposal Facility (CDF) D (March 2001), and Draft Off-Site Transportation and Disposal Option E1 vs. E2 Report (March 2001).

The Dewatering Design is based on the following key assumptions.

- Dewatering Design will include efforts required to develop a 100% design package from which subsequent statements of work can be developed.
- Draft Off-Site Transportation and Disposal Option E1 vs. E2 (March 2001) Report is considered to be the 30% basis of design submittal for the Mechanical Dewatering Design. Therefore, no costs are included in Activity 20.93.01 – 30% Design.
- The 90% design activities will not begin until the Response to Comments package for the Draft Off-Site Transportation and Disposal Option E1 vs E2 Report is accepted by the USACE/EPA. Costs associated with developing the Response to Comments package are not included in this Work Plan scope of work.
- USACE will be responsible for developing a bulkhead plan to enlarge the existing area of the South Lobe of CDF D in order to accommodate the proposed mechanical dewatering facility.
- Coarse material separation (4" > x > 1") will take place at the Sawyer Street location or at Area D, whichever has more room.
- Filtrate and process waters from the dewatering system will be pumped to a water treatment facility to be located at CDF C.
- Additional subsurface soil samples will need to be collected at the southern lobe in order to verify geotechnical and chemical assumptions made in the Draft Off-Site Transportation and Disposal Option E1 vs. E2 Report (March 2001).
- The design and upgrade of the off-site rail system will be the responsibilities of CSX.
- Final location of on-site rail spur will be confirmed by EPA/CSX/MBTA/City of New Bedford prior to Foster Wheeler beginning design.
- Dewatering system components are to be designed for a 20-year life (approximate length of project considering the low funding scenario, mobilization and demobilization).
- Under the unlimited funding scenario, the number of dredges is limited only by the logistics involved in coordinating multiple dredging operations. It was assumed that three (3) dredges could be utilized during the initial stages of remediation. One (1) deep dredging operation to handle the material in the lower harbor at 75 in-situ yd^3 /hr would take about one year. Concurrently, two (2) dredges would operate in the upper harbor: one in the intertidal, and one in the lower – both operating at about 25 in-situ yd^3 /hr, with only minimal cubic yards of sediment being removed at 75 in-situ yd^3 /hr.
- The limited funding scenario would only utilize one (1) dredge for the majority of the 10-year dredging operation. However, two (2) dredges would be utilized for the initial two years of remediation.

see page 1-18 also check note from last conf call.

- Based on the mass balance calculations contained in the Draft Technical Memorandum – Feasibility Investigation of Sediment Dewatering Alternatives (January 2001): a dredging rate of 25 in-situ yd^3 /hr near the shoreline with an assumed 80% by weight in-situ solids content would produce approximately the same amount of 15% solids by weight of slurry (800 gpm) as that produced by a dredge operation in deep water at 75 in-situ yd^3 /hr and 40% by weight in-situ solids.
- Areas of the site subject to potential spillage due to dewatering activities are required to be protected to avoid further contamination of underlying soil and that surface water needs to be collected and appropriately handled.
- The overall site layout for the dewatering facility should minimize impact on CSX/MBTA plans and impact on local traffic.

The following provides a brief description of the individual design elements as they relate to the overall mechanical dewatering system design:

Characterization of Existing Site Conditions

Following USACE/EPA acceptance of the Response to Comments package for the Draft Off-Site Transportation and Disposal Option E1 vs E2 Report, assumptions made in the report concerning the existing site conditions will need to be verified. These assumptions include the need for piles for building foundation support and the removal of 2 to 3 feet of RCRA classified soils.

Existing chemical, geotechnical, and geophysical data for the subsurface soils of the southern lobe will be evaluated to determine if it is adequate for characterization and foundation design.

Following review/collection of the Southern Lobe chemical/geotechnical/geophysical data, the Geotechnical Data Report will be prepared under Activity 11.02.91 - Evaluate Geotechnical Data that summarizes the data collected. The Geotechnical Data Report will be used to develop the allowable bearing loads (pounds per square foot) for the surface soils. Utilizing the information provided in the geotechnical report, Foster Wheeler will also prepare a cost benefit analysis to determine which foundation design (spreadfooting vs. pile supported) is most cost effective. Following USACE acceptance of the cost benefit analysis, Foster Wheeler will proceed with the foundation design.

where will this sediment be placed?

Bulkhead Wall Design

As shown in Figure 2-1, in order to accommodate a dewatering facility in Area 2/the Southern Lobe, a bulkhead will be constructed to enlarge the existing area of the South Lobe. The bulkhead walls will be designed as an anchored sheet pile wall retaining clean engineered backfill and capable of carrying a uniform load of 750 pounds per square foot (psf) on the backfill. All of the organic sediments behind the bulkhead will be removed (average depth of 5 feet) prior to placement of the engineered backfill.

The east wall will consist of steel sheeting fronted by a 40-foot wide steel pile supported pier. The pier will be designed to restrain the top of the sheet pile wall. A stone berm is required in front of the steel sheet pile wall (beneath the pier) to provide lateral support to the bulkhead. The North wall will consist of steel sheeting anchored near the top (EL. +5.0 feet) with tie rod and concrete deadman system. No berm is required in front of this wall section.

The bulkhead wall design will be conducted by the USACE-NED with input from Foster Wheeler as to the structural requirements of the mechanical dewatering facility.

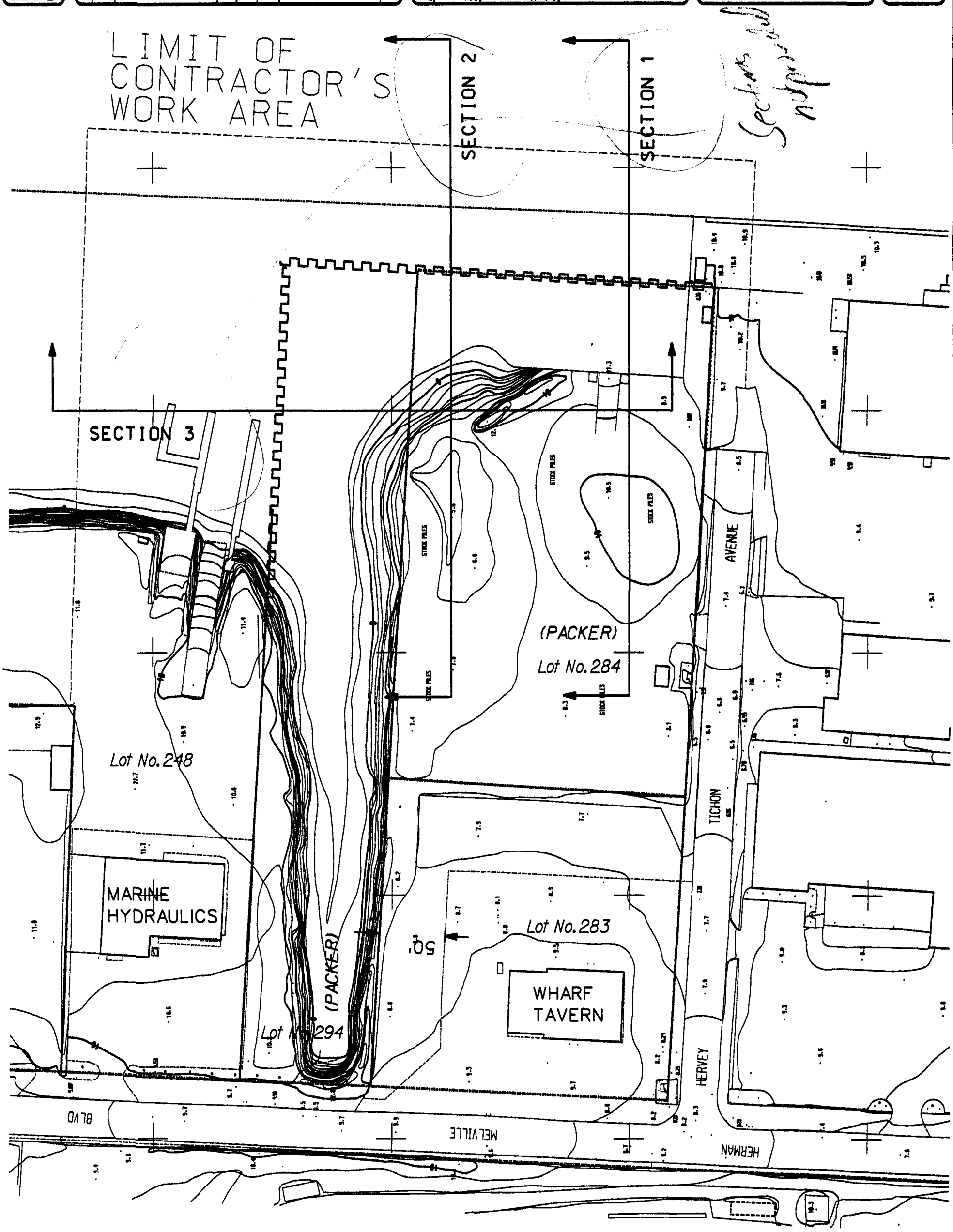
US Army Corps of Engineers New England District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

NEW BEDFORD HARBOR SUPER FUND SITE
NEW BEDFORD, MASSACHUSETTS

DEMATTERING AREA
CONCEPTUAL BULKHEAD ALIGNMENT
PLAN

FIGURE 2-1



NOTE: CONCEPTUAL ALIGNMENT - FOR REAL ESTATE PLANNING PURPOSES ONLY

Site Layout

The site layout developed for the Draft Off-Site Transportation and Disposal Option E1 vs. E2 (March 2001) Report, Figure 1-3, was designed to allow for maximum project flexibility. Therefore, disposal of the separated materials and filter cake can be via truck, train or barge.

A uniform 750 psf loading criteria was established throughout the site in accordance with standard Federal guidelines for facilities of this type and which will allow for container storage at any open location providing for flexibility during remediation implementation. Adequate parking is to be provided for twice the number of personnel required for site operations to allow for needs during change of shift.

Site drainage will be divided into three (3) areas: Containment, Roof, and Open areas. Runoff from the containment areas where exposure to contaminated material or spills may occur, as well as collection systems within the building, are collected and pumped to the water treatment facility at CDF C. Runoff from open areas where vehicle traffic and other activity occurs is collected and discharged to the Acushnet River following on-site treatment. Roof drainage is considered clean and directly discharged to the Acushnet River.

The site layout provided in the Draft Off-Site Transportation and Disposal Option E1 vs. E2 Report (March 2001) also includes a barge facility for the transportation of materials on-site and to minimize costs by eliminating truck traffic onto public roads and the associated manifesting requirements. Anticipated transportation activities by barge include delivery of large material (> 4") removed during dredging operations and the initial coarse material (> ½") screening process. Additionally, filter cake produced to fill CDF C can be potentially delivered by barge. Therefore, the Mechanical Dewatering design includes an evaluation of the benefits of installation of barge facilities.

The EPA has indicated that the CSX/MBTA/City of New Bedford may want to place the proposed on-site rail spur on the northern portion of the southern lobe in order to support the site's future development plans. Therefore, Foster Wheeler will not proceed with the design of the mechanical dewatering facility until the EPA/CSX/MBTA/City of New Bedford have come to an agreement on the location of the on-site rail spur.

has this been resolved

Foundation Design

Based on the results and conclusions provided in the Geotechnical Report for the Southern Lobe and the Cost Benefit Analysis for the Dewatering Building Foundation, the foundation for the mechanical dewatering system and support facilities will be designed. It has been assumed that the building will need to be constructed on a foundation with a pile-supported spread footing arrangement to avoid excavating the existing soil which has unknown geotechnical qualities and known contamination and buried debris.

Building Design

Currently, a building size of 400 feet long, 180 feet wide with a 40-foot eave height was selected to provide sufficient space for the mechanical dewatering system. This building size is based on the Koester Environmental Services, Inc. dewatering system design. The building will have an open floor plan with a uniform loading criteria and overhead load-bearing steel members to maximize the flexibility of the placement of the dewatering system equipment and to support mechanical and electrical appurtenances.

The building will also contain segregated vehicle loading and decontamination areas to allow for decontamination and exit of one vehicle while another is being loaded. Space has been allocated to accommodate a conveyor and hopper system to transport the dewatered cake to the loading area. Due to

importance of system reliability, a centrally located traveling crane will also be provided to optimize operation, maintenance, and equipment replacement capability.

Building Systems

In order to control emissions from the dewatering system, the building will be designed to include negative pressure ventilation system and air treatment systems. The air treatment system will include particulate control (i.e., baghouse) and vapor phase carbon adsorption. The building will also include a heating, ventilation and air conditioning system.

The dewatering design will include air modeling calculations to determine the air quality requirements within the building, the air emission requirements for the air control system, and the air emission requirement for the dredge slurry holding tank. Based on the results of these modeling efforts the design of the HVAC system, air emissions control system and holding tank can be completed.

No effort has been included for a dispersion modeling to determine off-site impacts. This will be done as a modification to the Work Plan and Estimate, if required.

Desanding/Dewatering Process Equipment

Will Hockey look at options for generic equipment

The Koester Environmental Services, Inc. sand separation and sediment dewatering system which was presented in the Draft Technical memorandum – Feasibility Investigation of Sediment Dewatering Alternatives (January 2001) (FI Report) was utilized as a basis for to determine the footprint required for the process equipment. Based on the FI Report, the Koester system was determined to have the largest footprint requirement. The desanding/dewatering system is anticipated to include a dredge slurry holding tank (located at CDF C), sand separation, equalization tanks, polymer blending, sediment dewatering, material handling and filtrate transfer.

175?

Layout is based upon a maximum dredge rate of 125 in-situ yd^3/Hr, 6 days/week, 20 hours/day, and represents the requirements to reliably accept 15% solids by weight slurry at that rate. The design effort will require close coordination with the dredging and wastewater treatment design components, and will include reviewing and revising the mass balance calculations based on the most current information available.

how does this relate to # of dredges.

It is assumed that there is sufficient subsurface data available for the Sawyer Street facility to design the holding tank foundation.

Material Handling Equipment

A conveyor and hopper system will be included in the proposed system to allow for ease of material handling and in consideration of the throughput requirements. A schematic of the dewatered cake distribution system is presented in Figure 2-2. Each mechanical dewatering system would have its own screw conveyor to transport filter cake to one of three strategically placed bucket elevator and storage hoppers. Each storage hopper will feed into one of two redundant screw conveyors traveling the length of the building to a distribution hopper in proximity to and above the loading area. The distribution hopper will feed into a reversible screw conveyor allowing for loading of a feed hopper over one of the two parallel loading areas. Elephant truck discharge hose from the feed hopper allows for manually directing the flow of material to evenly load the gondolas/trucks.

A motorized roll-up door will separate the loading and decontamination areas. Rail scales in the loading area will be utilized for weighing operations.

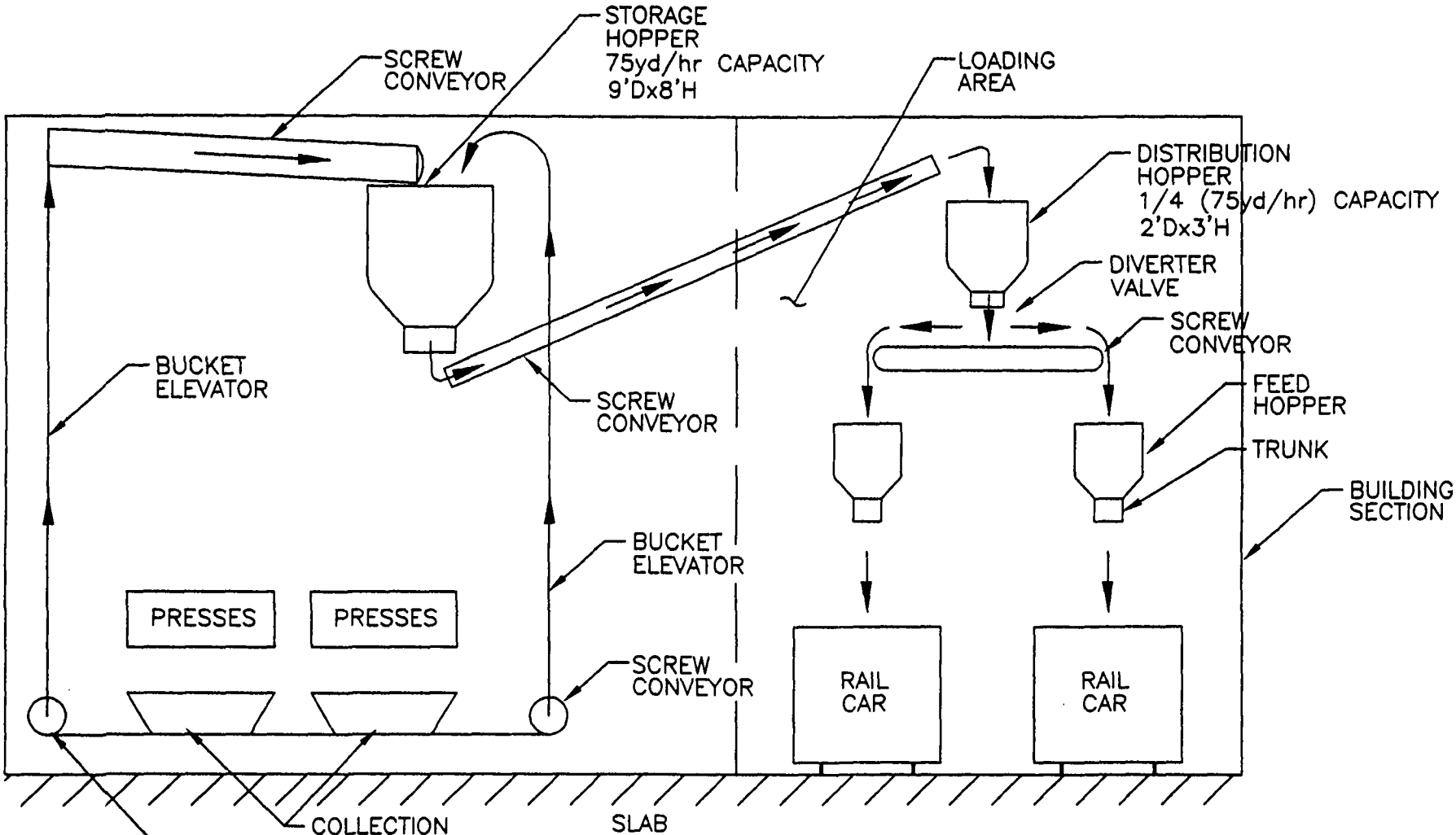


FIGURE 2-2

NEW BEDFORD HARBOR SUPERFUND SITE
RAILROAD OPTION
NEW BEDFORD, MA

DEWATERED CAKE DISTRIBUTION SCHEMATIC

NOT TO SCALE

CADDFILE: RRDET-04.DWG

The loading operations will be segregated from the process portion of the facility and will have it's own air emission control ductwork.

CSX Interfacing/On-Site Rail

The mechanical dewatering facility will include on-site rail capabilities for material delivery and/or off-site disposal separated and ~~dewatered materials.~~ The trackage required on-site to connect with ~~CSX, and~~ to permit loading, storage and switching of cars, is assumed to be constructed on top of steel T-shaped piles and concrete ties as shown in Figure 2-3. This design assumption will be verified in the site characterization tasks described above. Rail stops, as shown in Figure 2-4, will be placed on the ends of stub tracks.

To minimize the number of trips across Herman Melville Boulevard to the CSX rail yard, sufficient on-site storage is provided for six (6) gondolas. This arrangement will allow for one to two trips per day of material (fill, coarse material, sand, and filter cake) to and from the site.

The mechanical dewatering facility design will include a detailed design of the on-site rail system. This design will include horizontal alignment of rail centerlines and distances from structures in accordance with Army TM 5-850-2. Loading requirements, rail spurs, switches, crossings and degree of curvature, as shown in Figure 1-3, will also be designed as part of this Subtask.

It is assumed that all design associated with the upgrade of the off-site rail system will be the responsibilities of CSX. In addition, it is assumed that CSX will provide sufficient near-site storage to enable the assemblage of a standard 60-car unit train as shown on Figure 2-5.

Close coordination between the USEPA, CSX and the MBTA will be required to ensure that the provisions required for each project are integrated into an overall plan that will support technical, logistical and schedule requirements. Additionally, discussions will be held with CSX to confirm that any maintenance and/or upgrading that might be needed to support rail traffic into the rail yard is scheduled to support the needs of this project.

<u>Activity 20.93.01 – 30% Design - Sediment Dewatering System</u>

A 30% Design submittal generally provides the conceptual approach and consists of the following components:

- An outline of relevant specification sections, consisting of marked-up USACE guide specifications (Spec-Intact).
- Conceptual drawings necessary to convey the intent of the 30% design.
- A Basis of Design/Design Analysis (BD/DA) Report which provides the basis for the 30% Design, and includes preliminary design calculations and field notes appendices.
- An acquisition strategy for the most cost effective approach to construction. This will include types of specifications, drawings, and submittals depending on what will be self-performed by Foster Wheeler and what will be constructed by subcontractors. The design estimate in this Work Plan is based on completing a 100% design.
- Recommendations for early start construction tasks.
- Preliminary submittal register contents with the construction approach.

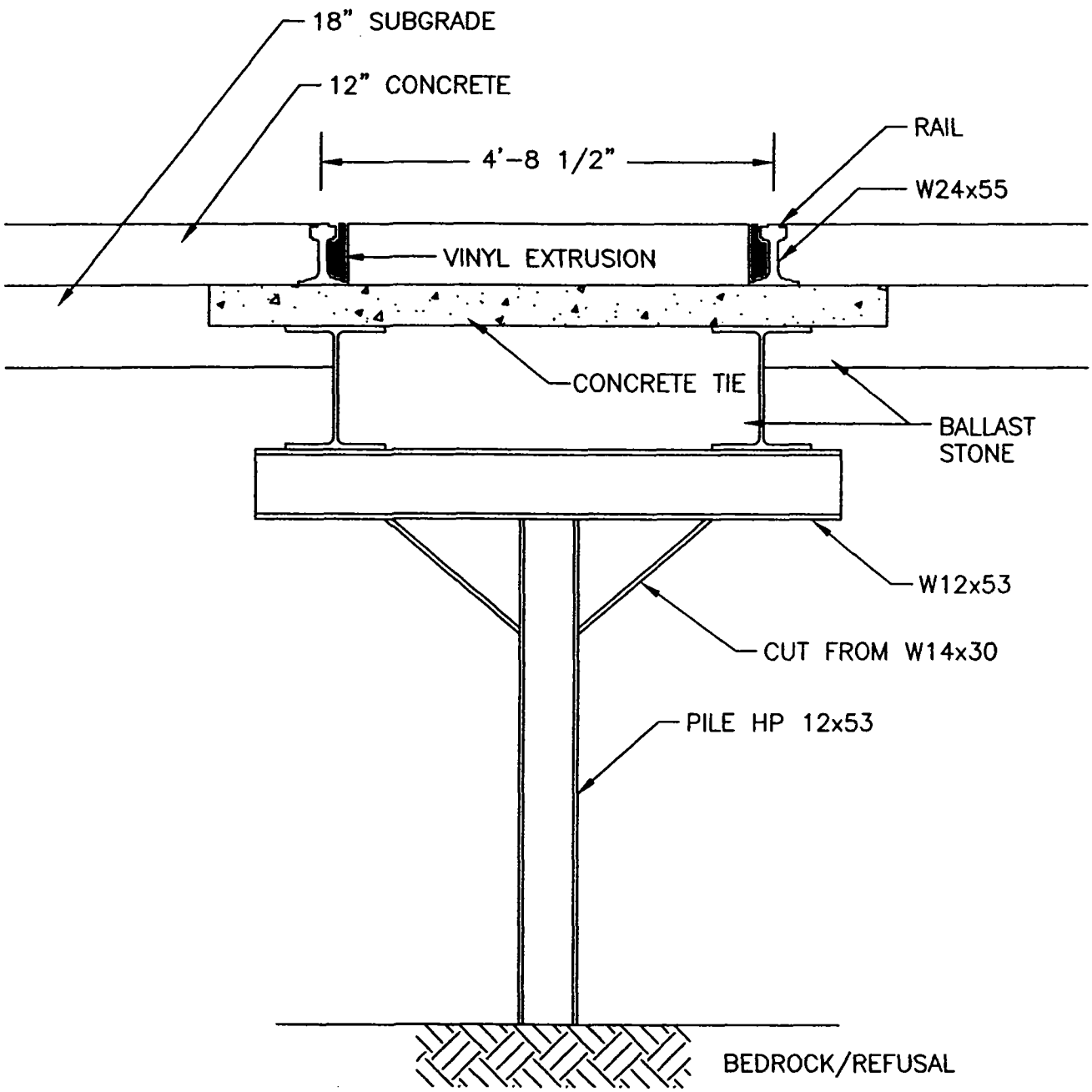


FIGURE 2-3

NEW BEDFORD HARBOR SUPERFUND SITE
RAILROAD OPTION
NEW BEDFORD, MA

RAIL SUPPORT SYSTEM

NOT TO SCALE

CADDFILE: RRDET-02.DWG

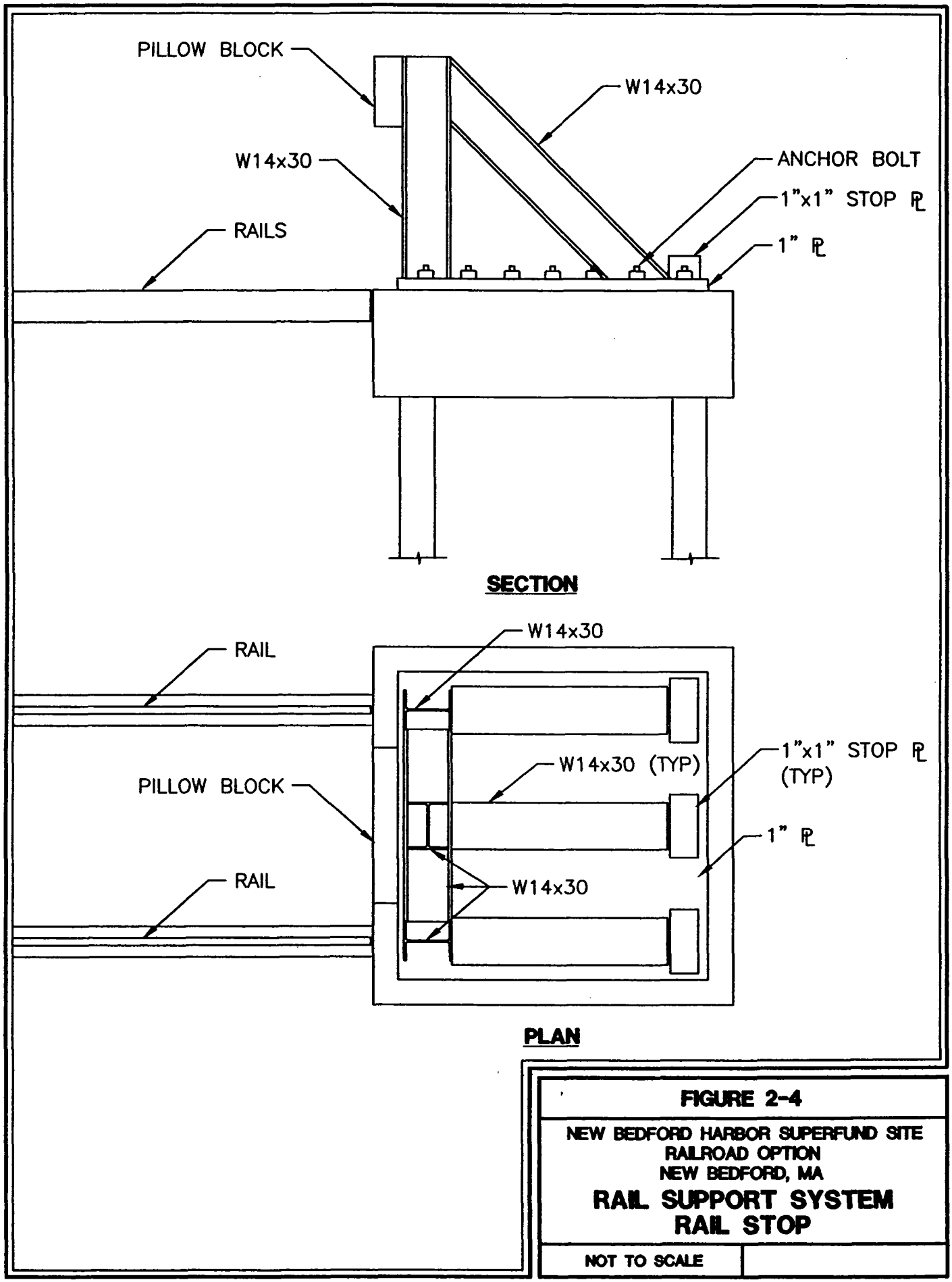


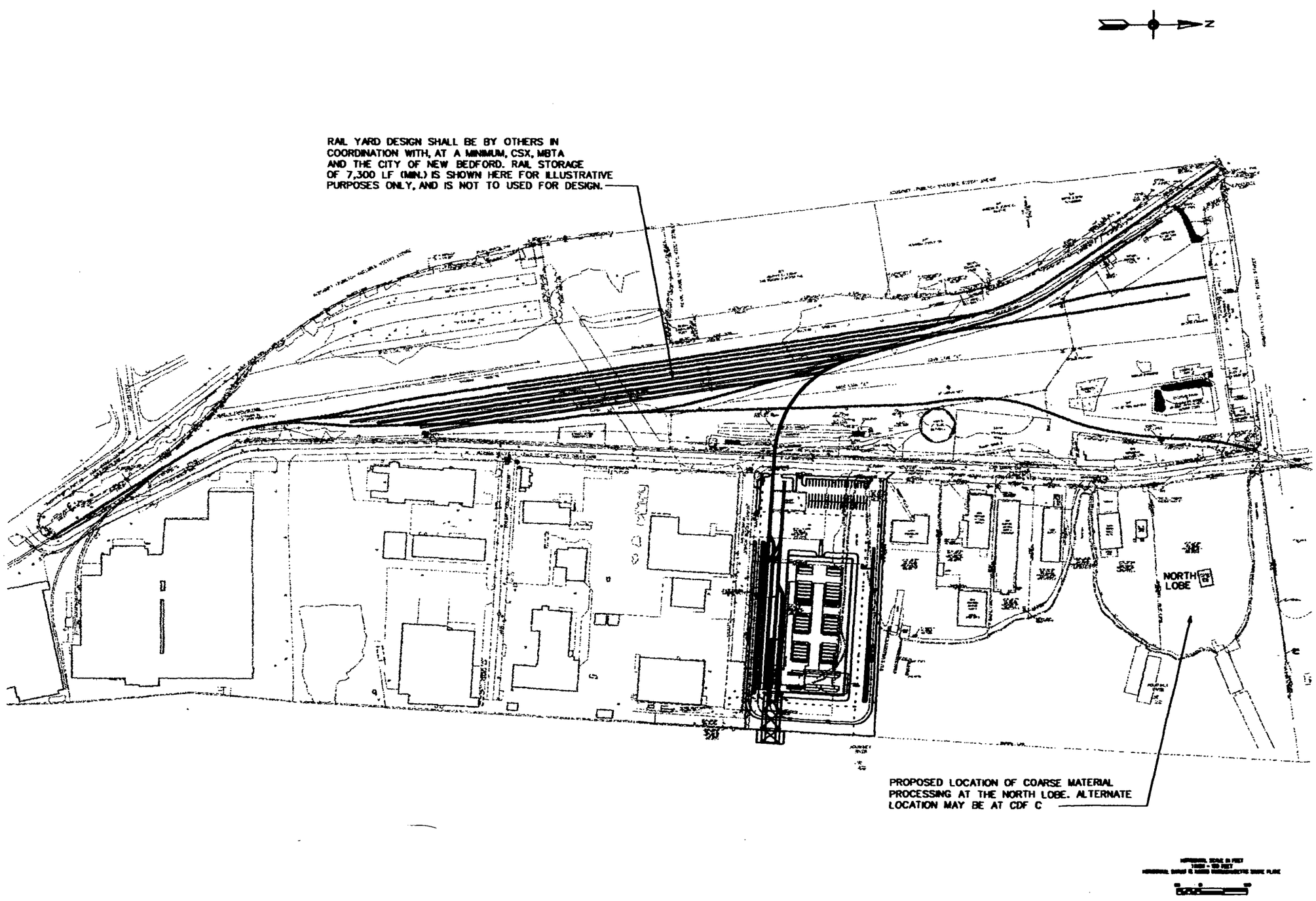
FIGURE 2-4

NEW BEDFORD HARBOR SUPERFUND SITE
RAILROAD OPTION
NEW BEDFORD, MA

RAIL SUPPORT SYSTEM
RAIL STOP

NOT TO SCALE

CADDFILE: RRDET-06.DWG



U.S. Army Corps of Engineers
New England District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

FOSTER WHEELER
ENVIRONMENTAL CORP.
133 FEDERAL STREET
BOSTON, MASSACHUSETTS

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

DEWATERING AREA
CONCEPTUAL SITE LAYOUT

Reference number:
FIGURE 2-5

Sheet 1 of 1

Based on discussion with USACE at the March 28, 2001 Work Plan Kick-off Meeting, the Draft Off-Site Transportation and Disposal Option E1 vs. E2 Report (March 2001) is to be considered the 30% Design submittal for the Mechanical Dewatering System. While the report does not contain all of these components list above, it does contain enough information such that it can be considered to be the 30% Design submittal. Therefore this Activity does not include any costs.

Activity 20.93.02 – 90% Design – Sediment Dewatering System

The 90% Design phase for the mechanical dewatering system will begin following submittal and acceptance of a Response to Comments package addressing the USACE and EPA comments on the Draft Off-Site Transportation and Disposal Options E1 vs. E2 Report (30% Design submittal). Subsequent design tasks will involve detailed design analyses and finalization of design for the various components of the mechanical dewatering system based on the design criteria developed in the Draft Off-Site Transportation and Disposal Options E1 vs E2 Report (March 2001). These Design Activities will include the following components:

- Draft Final specification package based upon on-board reviews of design, using USACE guide specifications where available. Foster Wheeler will develop specification sections if guide specifications do not exist.
- Draft Final contract drawing package based on on-board reviews of design. Appendix D contains the preliminary list of drawings expected to be prepared.
- Draft final BD/DA report will be prepared and submitted which provides the basis for the 90% Design and includes final design calculations.
- Draft final submittal register consistent with the construction approach.

A critical aspect of the design process will be coordination between Foster Wheeler and USACE prior to the 90% Design submittal/review. Advancing the 30% Design to the 90% Design will require discussion and resolution of the critical path issues without the time required for a formal submittal and review process. Therefore, two on-board reviews will be held between the USACE and Foster Wheeler such that consensus on critical issues can be developed and USACE input can be incorporated into the designs prior to the 90% Design submittal.

Activity 20.93.03 – 100% Design – Sediment Dewatering System

Final design will consist of the following tasks:

- Respond to USACE and EPA 90% Design review comments and prepare and submit a Response to Comments package to reviewers.
- Revise specifications, drawings, and design reports (BD/DA and site maintenance plan) as appropriate based on USACE and EPA review comments.
- Submit final design specifications, P.E. signed, and stamped drawings, BD/DA, and site maintenance.

Subtask 20.94 – Restoration Design

Foster Wheeler is in the process of finalizing a Mentor Protégé arrangement with The Bioengineering Group under the DOD Pilot Mentor Protégé Program. For purposes of this estimate Foster Wheeler has requested a budgetary quote from The Bioengineering Group for conducting the wetland restoration design. Ultimately, the balance of resources to complete the wetland restoration design will be based on appropriate skilled resources, cost, and the finalization of the Mentor Protégé relationship with The Bioengineering Group.

Activity 20.94.01 – 30% Design

The efforts to prepare the 30% Design Submittal for restoration of dredged and excavated areas will be included under this Activity. The 30% Design Submittal will include draft technical specifications, utilizing the USACE guide where applicable. The 30% Design Submittal will include the draft Restoration BD/DA (Design Report) which will provide the basis for the 30% Design. The report will summarize restoration-related information generated during the pre-design and design evaluations and will address restoration for each habitat type affected. Habitat types will include, but not necessarily be limited to:

- Non-vegetated intertidal area (i.e., mud flat)
- Low intertidal salt marsh
- High intertidal salt marsh
- Palustrine or esturine scrub/shrub wetland
- Palustrine forested wetland
- Forested, scrub, and open uplands

The design analysis will include the results of the evaluation of alternatives to reduce the aerial extent of habitat restoration via the increase of subtidal habitat (e.g., no backfill following dredge/excavation) or other appropriate methods (see Activity 21.99.02).

Restoration design drawings will be prepared for each intertidal area within the dredge/excavation limits. Based on experience at the Early Action area, it is assumed some adjacent uplands will also be excavated and restored. Drawings of existing conditions as prepared for Excavation Design (Activity 20.92.01) and Dredge Design (Activity 20.91.01) will be used as the base for Restoration Design drawings.

The following is the approach to work for this Activity:

- Approximately 65 acres of intertidal wetlands, as well as adjacent upland areas as necessary to cover approximate dredge/excavation limits, will be addressed in the restoration design.
- The area addressed by restoration design will not include currently undefined access roads or staging areas outside of the dredge/excavation limits. These areas are assumed to be outside the wetlands boundaries and will be addressed as part of the Excavation Design.
- Efforts on Restoration 30% Design will tier off of Excavation 30% Design (Activity 20.92.01) and Dredge 30% Design (Activity 20.91.01).
- Drawings of existing conditions (civil site plans) as prepared for Excavation 30% Design and Dredge 30% Design will be used as the base for Restoration 30% Design drawings.
- Efforts on Restoration 30% Design Drawings will not begin until Excavation and Dredge 30% Design Drawings are complete.

- Approximately 20 drawings will be required to cover the 65 acres of intertidal dredge/excavation area at a scale of 1 inch = 40 feet.
- A total of 67 drawings will be produced. Drawings will include existing conditions, final grade, and planting design for each area of coverage (3 x 20 drawings), map index (2 drawings), and details and specifications (5 drawings). A complete list of drawings is included in Appendix E.
- Existing elevations at one foot contours will be available for each dredge and excavation area to be restored (contours will be shown on civil site plans prepared under Excavation and Dredge 30% drawings).
- One on-board review meeting will be conducted during 30% Design.
- Specifications will be prepared to address the following components of work:
    - Quality Assurance
    - Reference Drawings
    - Site Preparation
    - Backfill
    - Access Road Removal
    - Erosion and Sediment Control
    - Mulch
    - Propagules ?
    - Delivery of Products
    - Plant Storage
    - Planting Schedule
    - Planting Methods
    - Hydroseeding
    - Watering
    - Post-restoration Monitoring

A preliminary list of CSI specifications sections is included in Appendix E.

Deliverables for this Activity include the following:

- One monthly on-board review design issues submittal
- Initial Draft Restoration BD/DA (Design Report)
- Draft Restoration Design Report
- Restoration 30% Drawings
- Restoration 30% Specifications
- Response to comments on 30% Design Submittals

<u>Activity 20.94.02 – 90% Design</u>

The efforts to prepare the 90% Design Submittal for restoration of dredged and excavated areas will be included under this Activity. The 90% Design Submittal will include Draft Final technical specifications and Draft Final Restoration Report. Efforts will include response to USACE and EPA review comments, including revisions to the Restoration Report and technical specifications as appropriate, and the review and preparation of a Response to Comment package to the reviewers.

The following is the approach to work for this Activity:

- Efforts on Restoration 90% Design will tier off of Excavation 90% Design (Activity 20.92.02) and Dredge 90% Design (Activity 20.91.02).
- Drawings of existing conditions as prepared for Excavation 90% Design and Dredge 90% Design will be used as the base for Restoration 90% Design drawings.
- Two on-board review meetings will be conducted during 90% Design.

Deliverables for this Activity include the following:

- Two monthly on-board review design issues submittals
- Draft Final Restoration Report
- Restoration 90% Drawings
- Restoration 90% Specifications
- Response to comments on 90% Design Submittals

Activity 20.94.03 – 100% Design

The efforts to prepare the 100% Design Submittal for restoration of dredged and excavated areas will be included under this Activity. The 100% Design Submittal will include Final technical specifications and the Final Restoration Report, which will provide the basis for the 100% Design. Efforts will include response to USACE and EPA review comments on the 90% Design, including revisions to the Restoration Report and technical specifications as appropriate, and the review and preparation of a Response to Comment package to the reviewers.

The following is the approach for this Activity:

- Efforts on Restoration 100% Design will tier off of Excavation 100% Design (Activity 20.92.03) and Dredge 100% Design (Activity 20.91.03).
- Drawings of existing conditions as prepared for Excavation 100% Design and Dredge 100% Design will be used as the base for Restoration 100% Design drawings.
- No on-board review meetings will be conducted during 100% Design.

Deliverables for this Activity include the following:

- Final Restoration Report
- Restoration 100% Drawings
- Restoration 100% Specifications

Task 21 - Special Studies/Value Engineering

Subtask 21.04 - Real Estate

Activity 21.04.01 - Real Estate Support

Included under this Activity are the efforts associated with issues relating to Real Property identification, assistance in acquiring access agreements, technical support, and project coordination in real estate issues during the investigation and design phase of the dredging program. It is assumed that this support will be provided for the duration of the field effort.

The implementation of field investigations for the remedial investigation and design tasks will require obtaining rights of entry (ROEs) for properties in the Upper Harbor. Foster Wheeler will be responsible for identifying property owners of record for use in obtaining ROEs prior to the initiation of fieldwork (EPA will take the lead on obtaining these agreements) and assisting in the development of a property acquisition strategy for future acquisition of easements to be utilized during the construction phase of the project.

No scope or cost for activities associated with easement acquisition (property survey, title searches, appraisals, closing documents) is included in this cost estimate. Should the alternatives evaluation (Activity 21.99.02) determine that there is a beneficial cost to the project by acquiring properties, an FCN will be prepared to provide scope and funding for additional real estate activities.

For the purposes of this Work Plan and Cost Estimate, real estate services are assumed to be confined to the activities required to:

- Define and characterize (from an ownership standpoint) the properties that would be affected by investigation and design activities;
- Assist USACE and USEPA in developing an initial strategy for dealing with those properties (from a real estate standpoint);
- Assist USACE and USEPA in obtaining property ROE and access agreements for investigation and design activities;
- Provide technical services assistance for real estate issues related to coordination and access with landowners and technical personnel; and
- Participate in weekly conference calls related to real estate activities.

For the purposes of this Work Plan and Cost Estimate, and based on a preliminary review of property maps, it is assumed that investigation and design work in the Upper Harbor will affect a total of 100 properties.

Property owners will be identified and a notification strategy developed with EPA. Foster Wheeler will develop a mailing list for notification and provide follow up coordination during the sampling effort.

Foster Wheeler will contact/meet property owners prior to and during the site investigation phase to discuss activities and identify issues associated with the presence of equipment on the property. Foster Wheeler will coordinate access for survey personnel to properties on previously unidentified properties for the purposes of topographic and property boundary survey verification. Foster Wheeler will identify properties in consultation with the design team and then identify and contact owners and tenants to obtain access. This Activity will be ongoing as requested by the investigation/design team.

Subtask 21.96 – Material Balance

The purpose of the Material Balance Activity is to develop a methodology for quantitatively establishing the relationship of sediment dredged and soil excavated, material handling and process requirements, and ultimate disposition offsite (anticipated material characterization, volume and weight) or onsite (CDF capacity required). Foster Wheeler plans to develop this methodology in concert with USACE utilizing an approach similar to that used in the CDF D Alternatives Analysis.

This effort has been segregated into two main phases. The first phase is aimed towards developing an Initial Material Balance to assist in the final decision making as to the ultimate components to be included in the remediation of New Bedford Harbor. Following this decision, the second phase is aimed towards developing the Final Material Balance that will be able to be utilized as a budgeting tool in developing the overall schedule for remediation as well as an earned-value tracking tool during remediation. Each of these efforts have been structured to utilized existing data and data as it is collected to support design efforts. It has been assumed that efforts to prepare each Material Balance will not be required to commence prior to firm design data being available. As presently envisioned, no data will need to be collected specifically to support the material balance. Efforts involved in developing each of these material balances have been assumed to be limited to the following:

It has been assumed that USACE will provide a single set of material quantity and volume data for CDF D Alternative F to support the Interim Material Balance and that the Interim Material Balance will evaluate the relative ranking of construction of a single alternative of CDF A, B, C and D and offsite disposal reduced to a cost per ISCY.

- Developing the outline and approach and identifying technical personnel responsible for providing inputs
- Reformatting design data collected for use as inputs
- Preparing and checking the Material Balance calculation
- Identifying and developing construction quantities and unit rates
- Integrating the Material Balance and Construction estimate
- Report Preparation

For each Material Balance, it has been assumed that a single review meeting will be required to review the draft and that Foster Wheeler will receive a single set of consolidated comments. Additionally, it has been assumed, for each Material Balance, that a single meeting will be conducted to present the final report to EPA and USACE and that Foster Wheeler will receive a single set of consolidated comments from the USACE.

The components and purpose of each phase is more fully described below:

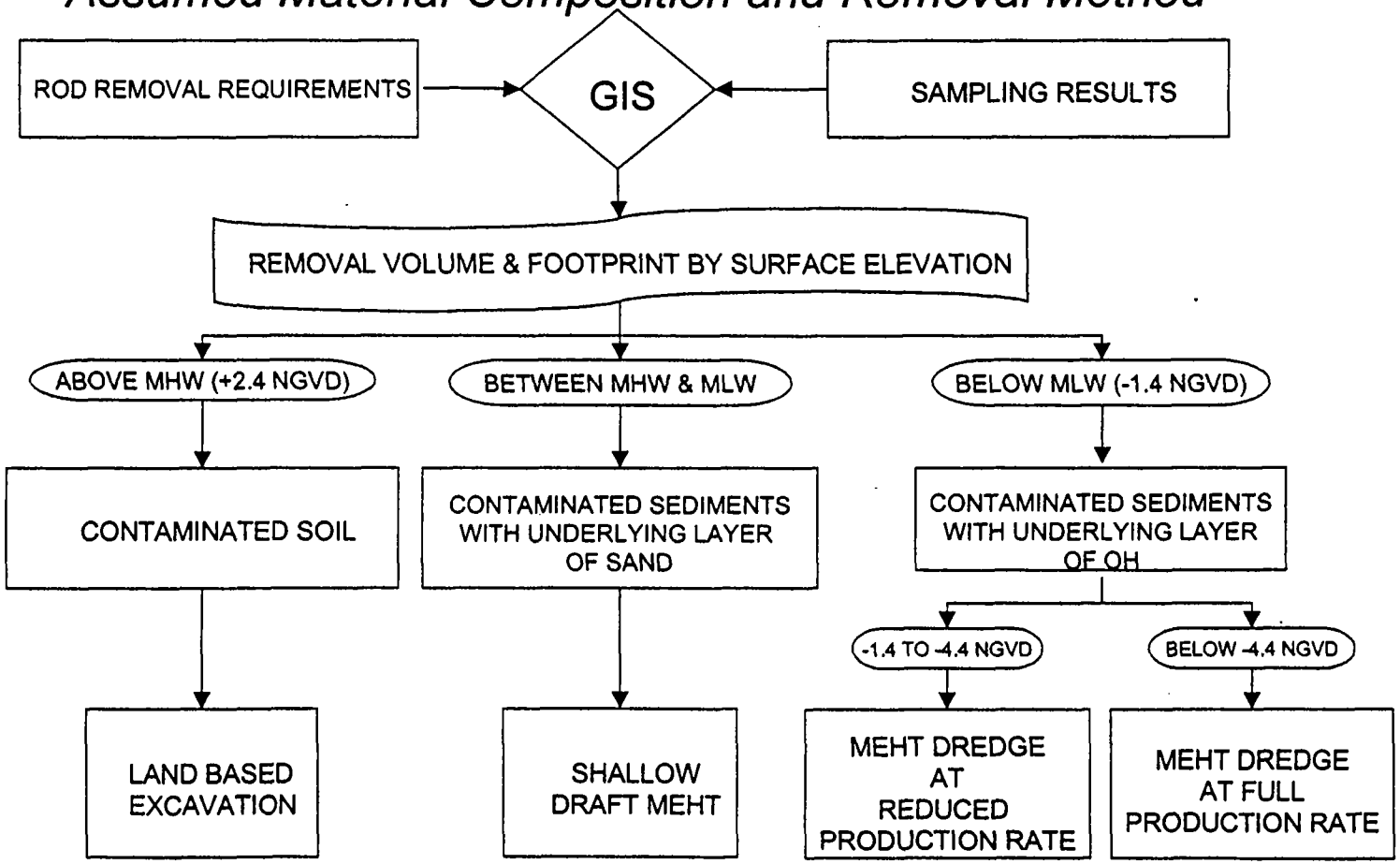
Initial Material Balance

As noted above, the purpose of this phase is to assist EPA in making final decisions as to the components and approach for the remediation of New Bedford Harbor. This phase will focus on filling the major data gaps identified in the CDF D Alternatives Analysis to the extent practical without impacting the design schedule. The Material Balance approach utilized in the CDF D Alternatives Analysis, as presented in Figures 2-6 and 2-7 will be utilized for the Initial Material Balance.

Figure 2-6

Material Balance Approach

Assumed Material Composition and Removal Method

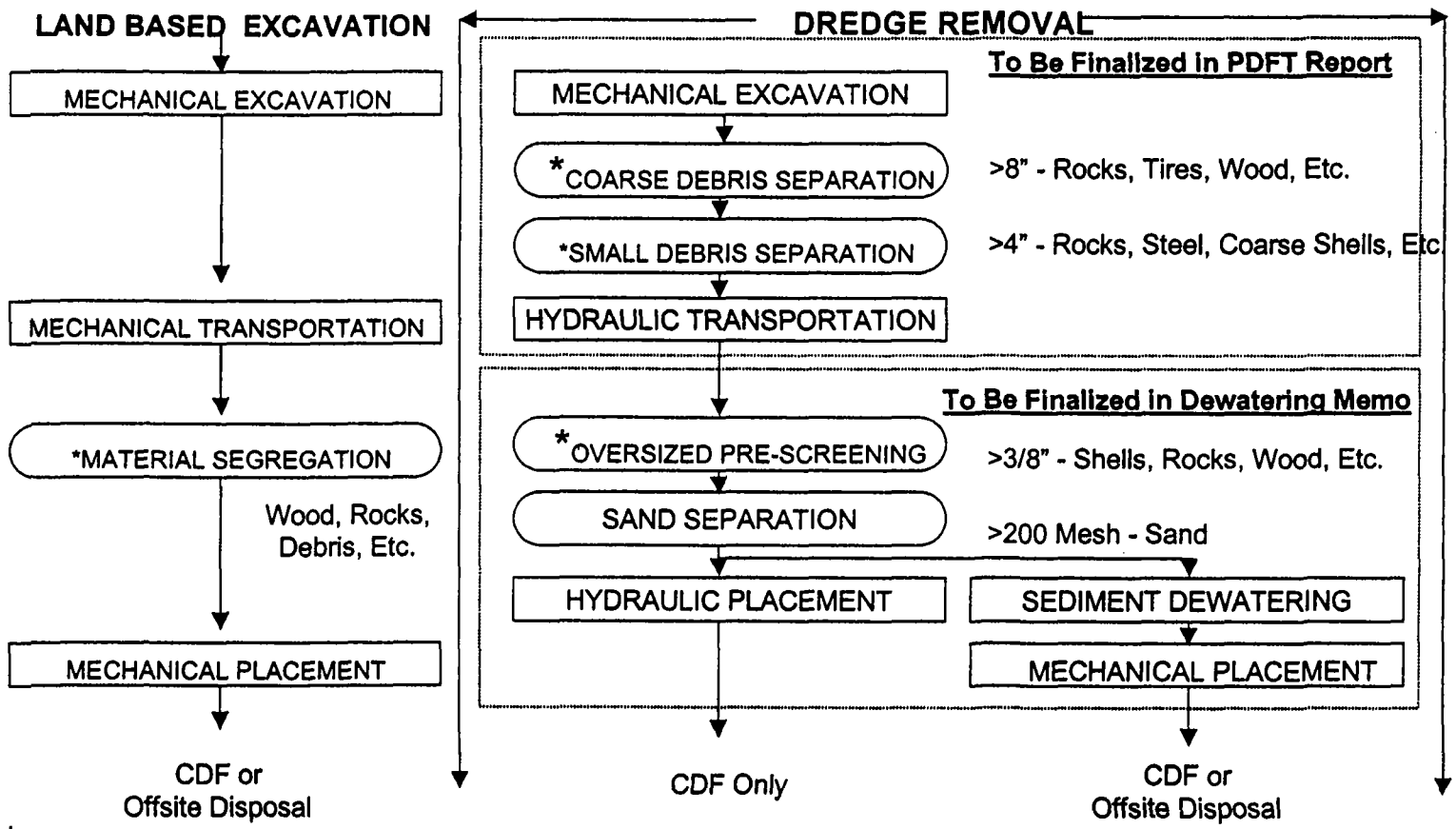


FOSTER WHEELER ENVIRONMENTAL CORPORATION **US ARMY CORPS OF ENGINEERS - NEW ENGLAND DISTRICT**

Figure 2-7

Material Balance Approach

Assumed Removal, Transportation & Disposal Options



*Not Presently Considered in Mass Balance or Cost Estimate

FOSTER WHEELER ENVIRONMENTAL CORPORATION

US ARMY CORPS OF ENGINEERS - NEW ENGLAND DISTRICT

Generally, this approach will be updating key inputs with improved data collected during sediment sampling Phase IIIA (see Subtask 06.03) and initial review of existing geophysical data (see Activity 06.08.01). Specifically, the following enhancements to the Material Balance will be included in the Initial Material Balance:

- Update GIS Extent of Contamination Within CDFs
  - Sampling in areas necessary to determine "bottom" of contamination within areas of potential CDFs (06.03)

- Update GIS Extent of Contamination in Harbor
  - Sampling in large areas driven by a single data point (06.03)

- Correlation of PCB contamination to sediment
  - Sampling of areas identified with deep sediments (06.08.01)

- Assess Extent of Use of Visual Approach
  - Review of existing Geophysical Data (06.08.01)

- Update Mass Balance for Dredging and Dewatering
  - As part of initial Dewatering Design activities (20.93.02)

- Compile and Provide Updated Quantities for CDF C
  - Final CDF C Design

- Compile and Provide Updated Quantities for CDF A & B
  - Pro-rated Final CDF C Design

- USACE Compile and Provide Updated Quantities for CDF D
  - CDF C 30% Design

This data will be utilized to prepare the Initial Material Balance and cost estimate. The Initial Material Balance will calculate the cost per In-situ Cubic Yard (ISCY) for each CDF and for offsite disposal. Based upon review of GIS data and sensitivity, Foster Wheeler will also prepare recommendations for additional area of characterization, if appropriate. Additionally, as part of the Initial Material Balance Report, Foster Wheeler will also prepare recommendations for segregable areas of NBH for developing the Final Material Balance. This recommendation will identify segregable areas:

- By Material Types (data compiled in GIS – 11.02.99)
- By Visual Approach (06.08.01 and 06.03)
- By Dredging Method (20.91.01)
- By Geophysics/Borings (06.08.01)
- By Restoration (Wetlands Delineation – 06.09.01)

It has been assumed that USACE will provide a single set of material quantity and volume data for CDF D Alternative F to support the Interim Material Balance and that the Interim Material Balance will evaluate the relative ranking of construction of a single alternative of CDF A, B, C and D and offsite disposal reduced to a cost per ISCY. It has been further assumed that, based upon the results of the Initial Material Balance, USACE will be able to obtain EPA Decision on Project Components to be included in the final remediation.

Final Material Balance

This phase will be based upon the Project Components identified by EPA and will phase will focus on filling remaining data gaps identified in the Initial Material Balance Report to the extent practical without impacting the design schedule. The same Material Balance approach will be utilized but will be specifically tailored to support the selected approach and project components. For estimating purposes, it has been assumed that the basis of the Final Material Balance will be equivalent to Alternative E2, offsite disposal and construction of a single CDF (CDF C).

Generally, this approach will be updating key inputs with improved data collected during sediment sampling Phase IIIC (see Subtask 06.03) and additional geophysical data (see Activity 06.08.01). Specifically, the following enhancements to the Material Balance will be included in the Final Material Balance:

- Update GIS Extent of Contamination Within Applicable CDFs
  - Additional sediment sampling (06.03)

- Update GIS Extent of Contamination in Harbor
  - Sampling in areas necessary to determine "bottom" of contamination within remaining areas of NBH (06.03)
  - Sampling in remaining large areas driven by a single data point (06.03)
  - Additional sediment sampling (06.03)

- Assess Extent of Use of Visual Approach Geophysical Area A
  - Results of review (06.08.01)

- Assess Extent of Use of Visual Approach Geophysical Area B
  - If required to be performed (06.08.01)

- Assess Extent of Use of Visual Approach Geophysical Area C
  - If required to be performed (06.03)

- Update Mass Balance for Dredging and Dewatering
  - As part of final Dewatering Design activities (20.93.03)

- Compile and Provide Updated Quantities for Applicable CDFs
  - As appropriate

This data will be utilized to prepare the Final Material Balance and cost estimate. The Final Material Balance will provide an overall project cost estimate structured to support cost loading of the project schedule to support funding requirements. This integrated Material Balance and Cost Estimate will also be provided in a format to allow tracking material related and process assumptions as dredging and excavation proceeds to provide a tool for identifying, quantifying and projecting variance. Additionally, as part of the Final Material Balance Report, Foster Wheeler will also prepare recommendations for potential value engineering enhancements, as appropriate.

Subtask 21.99 – Specific Value Engineering Efforts

Activity 21.99.01 – On-site Laboratory Cost Benefit Analysis

Under this Activity, potential on-site and off-site approaches for chemical analysis to support sediment PCB sampling will be evaluated. This evaluation will include a cost-benefit comparison between potential on-site and off-site analytical options. A total of four different options will be evaluated. These will include:

1. Utilization of an on-site chemical laboratory staffed directly by the Foster Wheeler Team or by a subcontractor on-site laboratory with appropriate capabilities in this area (such as Severn Trent Laboratories).

2. Utilization of on-site field PCB screening techniques (Immunoassay Methods) supported by confirmatory off-site laboratory analysis.

3. Utilization of a local USACE certified off-site, local laboratory (such as Mitkem) with equipment and staff dedicated to the New Bedford Harbor project, capable of providing next day turnaround.

From the technical perspective, each option will first be evaluated in terms of its ability to support project data quality objectives (DQOs). Any associated analytical method limitations that could impact primary or secondary project DQOs, will be noted. Overall method technical strengths and weaknesses will be identified and compared. The logistics associated with implementing each analytical option and the potential impacts to the overall sediment evaluation effort, will be considered.

The analytical options will also be examined in terms of their ability to support the project schedule, including the time frames required to set up the laboratory(s) and operational time frames to produce initial unvalidated analytical results. Finally, this evaluation will include a comparison of the respective costs for the four options under consideration. Evaluation of costs will include consideration of both staff equipment, and possible sample throughput rates.

The results of the comparative evaluations discussed above will be summarized in a technical memorandum. It is expected that recommendations regarding the best approach for future implementation will not be appropriate until the confirmatory sampling approach is fully developed and the project needs for data quality and turnaround are identified. Accordingly, the draft memorandum will be submitted without recommendations. Following consensus on a confirmatory sampling approach and review and discussions with the USACE and EPA, the technical memorandum will be finalized.

It should be noted that the budget developed to support this Activity is based on the assessment of only the options identified above. The budget assumes that it will not be necessary to evaluate any additional options under this Activity. The budget also assumes that it will not be necessary to solicit competitive bids from multiple laboratory organizations to determine probable on-site or off-site costs.

Activity 21.99.02 – Wetlands Restoration Alternatives Evaluation

As discussed with USACE and EPA, the design analysis for wetlands restoration will include an evaluation of alternatives to reduce the aerial extent of habitat restoration via the increase of subtidal and/or intertidal (non-vegetated habitat) or via other methods. Alternatives that require less backfill and less plantings and/or effort may offer large potential cost savings for remediation. These cost savings may be somewhat offset by the costs associated with property appraisals, negotiations with individual

property owners and the purchase of property and/or easements. To further assess the potential options for wetlands restoration, a coarse, planning level cost/benefit analysis of intertidal backfill and restoration vs. property loss and acquisition (no backfill and no restoration) will be included in this Activity. The analysis will be based on the dredge/excavation limits identified on the December 18, 2000 Dredge Quantity Map.

This analysis will include the following steps:

- Discussions with USACE to obtain and verify the assumptions for a per property cost to include a deed and title search, property survey, appraisal, and negotiations with landowners.
- USACE will provide zoning bylaws, including minimum lot size restrictions and maximum allowable lot coverages for the Towns of Acushnet and Fairhaven and the City of New Bedford. USACE will review these bylaws in the context of the December 18, 2000 Dredge Plan or most recent plans to determine how many properties affected by dredging and excavation may exceed zoning bylaw requirements.
- Develop a representative per square foot price for purchase of the type(s) of property (e.g., residential property, salt marsh) that could be potentially affected by the restoration alternative. This will involve discussions with an appraisal company and may involve a representative appraisal.
- The costs for wetlands restoration will be developed under Subtask 20.94. These will be converted to a square foot cost suitable for comparison with the purchase price.

A brief technical memorandum will be prepared summarizing the cost benefit analysis results with a recommendation for further consideration of various restoration alternatives. Potential concerns that may warrant exceptions to straightforward implementation of possible solutions, such as the effects of changing lot sizes will be discussed.

This Activity will not include an evaluation or discussion of deed and title transfers or other property ownership issues associated with the purchase and subsequent ownership of remediated property.

Activity 21.99.03 – Confirmatory Sampling Approach Development

Under this Activity, a confirmatory sampling approach will be developed to define and achieve ROD defined cleanup goals within the practical limitations of the size of the site, the variety of different geographical areas, and an implementable project schedule. The Confirmatory Sampling Plan will address the following topics and provide appropriate specifications for the collection and analysis of samples:

Timing and Frequency: Consideration will be given to the effects of sloughing; tidal resuspension/deposition; local disturbances by the tug boats that will reset the anchor wires (estimated to occur every 10 hours to a couple of days); collecting samples so as not to impede dredging production; getting results quickly enough to provide feedback to the dredge to minimize costly and inefficient relocations and additional environmental impacts associated with repositioning the dredge; accommodating maximum sample holding times; and having a contingency if the dredge should break or other conditions occur that prevent sampling immediately following dredging.

Area: The plan will consider the spatial extent of compliance consistent with the basis for the calculated remediation goal and coincident with the dredging acceptance areas. Confirmation areas may be linked to the shallow, intermediate, and deep dredging zones based on the type of dredge used; or otherwise

determined by practical work areas (e.g., reachable from one placement of the anchor wires (approximately 100'x300' [0.69 acres] to 200'x500' [2.3 acres]).

Sampler Access: The Confirmatory Sampling Plan will address the logistical and practical limitations of physically accessing the sampling points. The plan will consider whether to sample from the dredge or from a boat behind the dredge (dredges can move in both directions, and samplers must stay out of the way of operations). Health and safety precautions and the costs associated with their implementation will be considered. Access to tidal areas at low and high tide will also be considered in conjunction with the potential for recontamination with tidal influence.

Sample Depth: Sample depth requirements will consider evaluating the effectiveness of the dredge and the statistical achievement of cleanup goals. Sampling from different depths may be required to address surface re-contamination due to deposition. The premise for dredging to a visual approach will also be evaluated in this step.

Sample Type: The plan will consider representative composite samples from multiple locations vs. grab or composite samples from individual cores.

Sample Density: A statistical basis for demonstrating achievement of cleanup goals will be developed, including establishing acceptable confidence and error intervals for use in conjunction with a systematic grid; based on precedents established by other projects (e.g., 12 samples per acre or on roughly 60' centers).

Analyses: Specific analytical methods and levels of quality for analyses and reporting will be considered in conjunction with schedule needs and the evaluation of potential on-site analytical methods (See Activity 21.99.01).

QA/QC: Measures of quality control and quality assurance will be considered relative to project data quality objectives, schedule requirements, and overall costs. Consideration will be given to rapid measures of QC including field screening with periodic confirmation by one or more labs, split samples for analysis by different labs using different methods. The level and applicability of traditional data validation procedures will also be considered.

Compliance: A brief summary memorandum will be prepared summarizing how to demonstrate compliance once the confirmatory results are available. Considerations will include the availability of rapid turnaround or screening level results vs. final "validated" documentation; compliance metrics (averages, distribution comparison within an area, and other statistical measures for compliance). The results and recommendations will be discussed with USACE and EPA for consensus in approach and finalized in an implementation memorandum for incorporation into the final design specifications.

3.0 MANAGEMENT PLAN

A full discussion of the management plan that is being followed under TO 17 is provided in the original Work Plan submittal April 1999. The following are updates/revisions based on events that have occurred since the submittal of the April 1999 Work Plan and the requirements of RFP No. 63.

3.1 Project Organization and Key Personnel

The New Bedford Harbor remedial design organization is presented in Figure 3-1. It is essentially the same organization chart in the April 1999 Work Plan with one addition. A Deputy Project Manager has been added to assist the Chief Project Manager in managing the overall Task Order. Mr. John Holwell will act as the Deputy Project Manager. Mr. Holwell's responsibilities will include the preparation, and implementation of a critical path schedule for this Task Order, management of the material balance, which is critical to the overall design and remediation, and special projects as requested by the USACE Project Manager and Foster Wheeler Chief Project Manager.

Other changes in the organization are updates in the following lead personnel that have been previously approved by the USACE:

Program QC Supervisor – Thomas Kelly
Real Estate Acquisition – J H Rumpp
Remediation Manager – R. Francisco
Field Operations QC Lead – Joseph Kraycik

The responsibilities of these individuals remain as described in the April 1999 Work Plan.

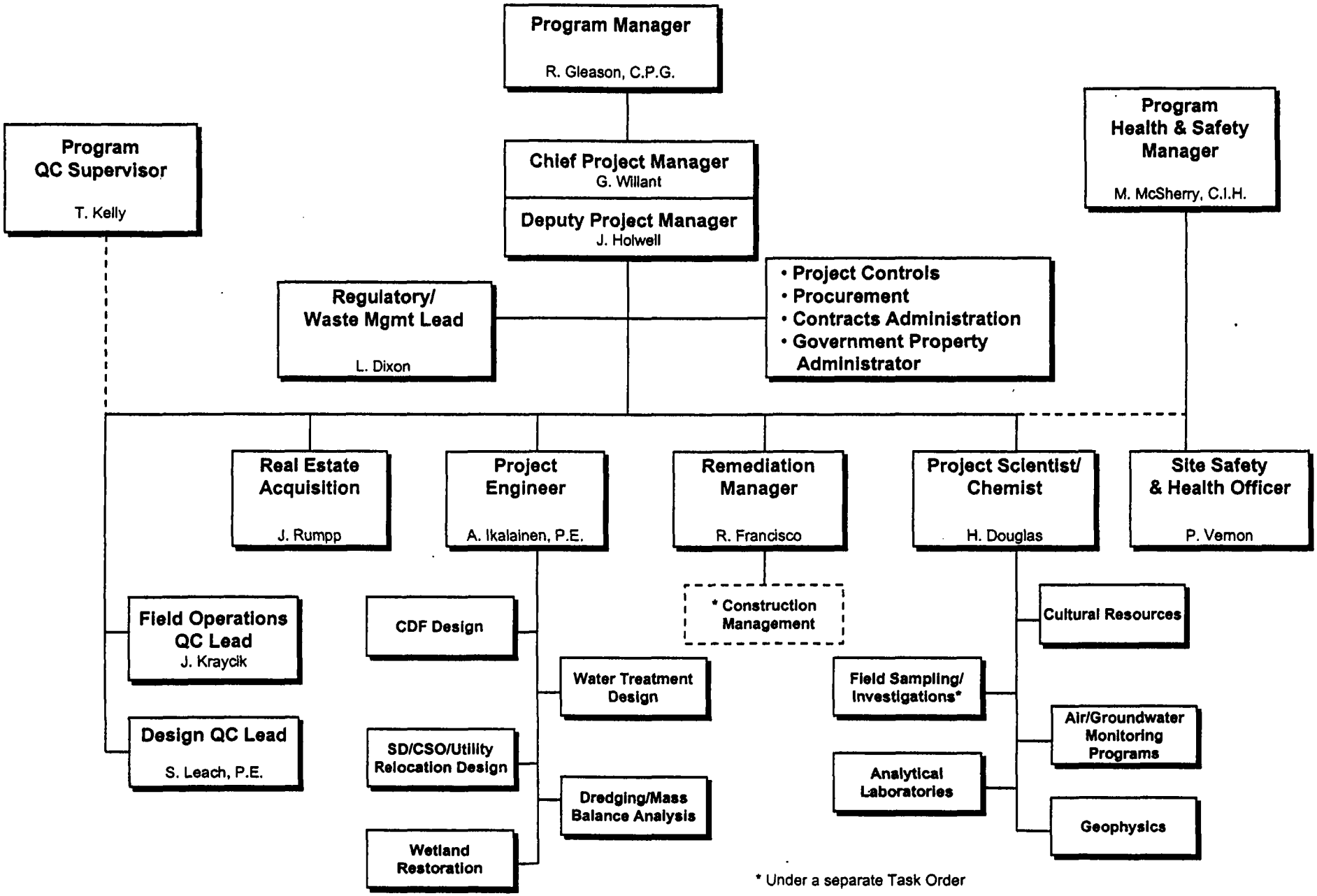
3.2 Organizational Roles of Foster Wheeler Team

Resources to implement this portion of the remedial design effort will be drawn, as required, from several corporate elements of Foster Wheeler NE TERC Team. As always Foster Wheeler will provide overall management and technical leadership. Foster Wheeler may seek assistance from team subcontractors and Mentor Protégé firms to identify available staff to augment, as necessary, the project resource pool throughout the remedial design process.

3.3 Management of Information Systems
3.4 Acquisition Strategy
3.5 Government Property

There is no change to these sections from the discussion in the April 1999 Work Plan.

Figure 3-1
Project Organizational Chart



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4.0 PROJECT SCHEDULE

A detailed Project Design Schedule has been prepared for Task Order No. 17 and accompanies this Work Plan Modification (see Appendix F). The attached schedule depicts the detailed activities for the design, investigative studies, and sampling efforts.

In preparing this Draft Work Plan and Project Schedule, efforts were made to allow implementation of work requested via RFP no. 63 with the overall schedule provided in the April 17, 2001 email from the USACE Project Manager. As mentioned in this email, it is assumed that refinements in the design schedule will be made after Work Plan and Cost Estimate negotiations.

Two main components of the critical path were identified to allow for the successful commencement of dredging operation in early 2003. These are the Dewatering Design (Subtask 20.93), which includes the development of the southern lobe of area D to provide the infrastructure to house the dewatering system equipment, and the Dredging Design (Subtask 20.91), which is required to allow procurement efforts to commence. Each of these efforts rely upon investigatory efforts and key decisions/input from EPA and/or USACE.

what about excavation (20.92)

Foster Wheeler has striven to develop a schedule for the investigations, analysis and data evaluation to support each of these critical path components to match the USACE overall schedule. This schedule can be met assuming that the procurement of the dredging/dewatering subcontractor can be started with the issuance of the 90% design for USACE review. It is also predicated on the following key planning and procurement activities beginning during the review and negotiations of this Work Plan and Cost Estimate;

- Development of the SSHP and RCP for the expanded sampling and design work; and
- Procurement efforts up to, but not including award, of the following subcontracts:
  - Vibracore Subcontractor
  - Geobrobe Subcontractor
  - Geophysics Subcontractor
  - Drilling Subcontractor
  - Cultural Resources Subcontractor
  - Chemistry Support Subcontractor

No awards will be made on any of the above-mentioned subcontracts before modification of the TO or prior approval from the USACE. Foster Wheeler will proceed with this approach unless notified by USACE to do otherwise.

?

The schedule also assumes that the dredge/excavation designs are based only on chemical and geotechnical analytical results from Phase III Sediment Sampling versus the observational approach. Waiting for the assessment of data and final resolution of the observational approach would potentially impact the design schedule. However, if the observational approach is proven to be a valid approach in large areas of the Harbor, there could be significant savings in dredging/dewatering/disposal costs. The status of this on-going review and any affect on the overall schedule will be discussed with the USACE in the monthly on-board review meetings.

Lastly, the schedule identifies key input/decisions required from EPA and/or the USACE as milestones to allow for monitoring of these activities throughout the project.

The multi-level schedules utilized by Foster Wheeler throughout the project include the following:

- Summary Level Schedule

  The Summary Level Schedule organized by HTRW Series 32 Codes Level 2 - Task and Level 3 - Subtask will be provided to USACE monthly with a progress report. Other typical groupings include summaries by engineering design, investigative/sampling studies, and procurement.

- Project Critical Path Method (CPM) Schedule

  The detail schedule will contain sufficient information to allow coordination efforts with USACE on design activities and investigative efforts. The schedule will be expanded to include procurement and construction efforts for Remedial Action as part of the Work Plan comment resolution following negotiations. At this level, the analysis provides the project's critical path and other crucial scheduling data.

- 3-Week Work Schedule

  The schedule will be generated on a weekly basis as a snapshot of the Project Schedule. This schedule will contain a 3-week look ahead for activities planned and 1-week history. This schedule provides a control tool for:

  - Prioritizing work and interfacing engineering, investigative, procurement, and construction activities.
  - Monitoring progress.
  - Demonstrating the need for recovery plans when applicable.
  - Identifying craft manpower, crew size, or shift requirements.
  - Planning staff manpower requirements.

  The 3-Week Schedules will be utilized during weekly review meetings. The meetings will focus on the communication of potential and real concerns and the assignment of action items which lead to timely resolution of concerns.

5.0 PROJECT ESTIMATE

A detailed project Cost Estimate for this Draft Work Plan Modification has been provided under separate cover.

APPENDIX A

HTRW SERIES 32 CODES WBS

NEW BEDFORD HARBOR
REMEDIAL DESIGN - TO #17
MODIFICATION 20
HTRW Series 32 Codes WBS

Notes:

1 **Level 2 WBS defines Task and Level 3 defines Subtask.**
2 **The actual cost will be collected at WBS Level 4 and Level 5.**
3 **Level 5 defines distribution of cost by Foster Wheeler, Team Subs, Other Subs, Craft Labor, Equipment Rental, Site Mat.(breakdown not shown here).**
4 ***The Tasks identified with "bold" print are included with in this Work Plan Modification***
5 **The Tasks that are crossed out were identified during the Original WBS development stage. These Tasks are not expected to be used by Foster Wheeler.**

WBS Levels
1 2 3 4
32

01 Preparation of Plans
- **01 Work Plan**
- **03 Sampling and Analysis Plan (SAP)**
  - **01 Quality Assurance Project Plan (QAPP)**
- **04 Site Safety & Health Plan (SSHP)**
- **08 Transportation & Temporary Storage Plan (TTSP)**
- **91 Regulatory Compliance Plan (RCP)**
- 92 Construction Quality Control Plan (CQCP)
- 93 Erosion Control and Sedimentation Plan (ECSP)
- 94 Site Logistics Layout Plan (SLLP)

02 Project Management /Support /Administrative
- **01 Project Management**
  - **01 Conduct Project Management**
  - **02 Cost Estimate**
  - **03 Cost /Schedule Control Systems**
  - 11 Project Closeout
- **02 Subcontracting Support**
  - **01 Procurement Activities**
- **91 Other Distributive Support**
  - **01 Health & Safety Support**
  - **02 Regulatory Compliance /Waste Management**

~~03 Administrative Record~~

~~04 Community Relations~~

~~05 Regulatory Interaction~~

06 Field Investigation
- **01 Site Reconnaissance**
  includes: Ecological Resources Reconnaissance, Well Inventory, Residential Well Sampling, Land Survey, Topographic Mapping, Field Screening
- ~~02 Perform Mobilization /Demobilization (field crew)~~ *Will be included in tasks below*
- **03 Conduct Geological Investigations (Soil /Sediments)**
- 04 Conduct Air Investigations
- 05 Conduct Hydrogeological Investigations (Groundwater)
  - 01 Groundwater Monitoring Well Installation
  - 02 ~~Temporary Well Point Installation and~~ Groundwater Sampling
- 07 Conduct Waste Investigation (Wastewater)
- **08 Conduct Geophysical Investigation**
  - **01 Marine Surveys**
  - 02 On-Land Surveys for Sub-Surface Obstructions /Hazard Identification
- **09 Conduct Ecological Investigation (includes wetland delineation)**
  - **01 Wetland and Habitat Delineation**
- **91 Conduct Geotechnical Investigation**
- **92 Cultural Resources**
  - 01 Stage 1
  - **01 Stage 1B (intensive)**
  - 03 ~~Stage 3~~ Com Elec Area
- 99 Distributive Materials /Supplies /Equipment
  - 01 Health & Safety Supplies /Equipment
  - 02 Other Specialty Equipment

07 Site Work /Temporary Facilities — *Expenses only*
- 01 Mobilization — *incl. fax and copier and costs to mob office trailers*
- 15 Sample /Waste Storage Facility — *incl. Waste Transp & Disp Sub & PPE Disposal Sub*
- 16 Construct Other Temporary Facilities — *incl. boat dock and office lease & monthly site facil exp*

08 Off-Site Lab Sample Analysis
- 01 Analyze Air Samples
- 02 Analyze Groundwater Samples
- **04 Soil /Sediment Testing**
  - **01 Geotechnical Testing**
  - **02 Soil /Sediment Testing (Chemical)**
- 06 Analyze ~~Treatment Plant Liquid~~ Wastewater Samples
- 07 Analyze IDW Samples
- 99 Health & Safety Samples

09 On-Site Lab Sample Analysis
- 04 Analyze Soil /Sediment Samples

10 Analytical Support /Sample Management /Data validation
- **05 Perform Data Validation**
  - **91 Validate Soils/Sediment Chemical Data**
  - 92 Validate Air Data
  - 93 Validate Groundwater Data
  - 94 Validate Treatment Plant Wastewater Data
  - 95 Validate IDW Data
  - **96 Validate Geotechnical Data**

11 Data Evaluation
- **02 Data Tabulation /Evaluation**
  - **01 Evaluate Soil /Sediment Chemical Data**
  - 02 Evaluate Air Data
  - 03 Evaluate Groundwater Data
  - 04 Evaluate ~~Treatment Plant~~ Wastewater Data
  - 05 Evaluate IDW Data
  - 90 Evaluate Com Elec Air Data
  - **91 Evaluate Geotechnical Data**
  - 98 Evaluate Pre-Design Field Test Data
  - **99 GIS Data Management**

12 Risk Assessment
- 01 Human Health Risk Assessment
  - 91 Risk Assessment-Air (Air Action Levels)
  - 92 Risk Assessment- Sediment

~~13 Document Assessment~~

14 Alternate Evaluation (RA /CM)
- 91 Alternative Technology Literature Review

~~15 Treatibility Studies~~

~~16 Document FS~~

~~17 Post Assessment Support~~

~~18 Enforcement Support~~

~~19 Identification of Long Lead Items~~ — *(will be included under procurement)*

NEW BEDFORD HARBOR
REMEDIAL DESIGN - TO #17
MODIFICATION 20
HTRW Series 32 Codes WBS

20 Remedial Design

11 Design for CDF A
- 01 30% Design - CDF A
- 02 90% Design - CDF A
- 03 100% Design - CDF A

12 CDF A Storm Drain / Utilities Relocations
- 01 30%
- 02 90%
- 03 100%

13 WTP CDF A
- 01 30%
- 02 90%
- 03 100%

14 CDF A Cap /Land Use Design
- 01 30%
- 02 90%
- 03 100%

The design preparation structure deviates from standard HTRW codes. An additional level designating area and type of design is inserted between standard HTRW level 2 and 3. This addition facilitates preparation of design packages by CDF Area A, B, C & D.
The cost report will include special codes that will

Area A Design

21 Design for CDF B
- 01 30% Design - CDF B
- 02 90% Design - CDF B
- 03 100% Design - CDF B

22 CDF B Utilities Relocations
- 01 30%
- 02 90%
- 03 100%

23 WTP CDF B (optional)
- 01 30%
- 02 90%
- 03 100%

24 CDF B Cap /Land Use Design
- 01 30%
- 02 90%
- 03 100%

Area B Design

31 Design for CDF C
- 01 30% Design - CDF C
- 02 90% Design - CDF C
- 03 100% Design - CDF C
- 90 CDF C - Alternative Design Evaluations
- 91 CDF C - Alternative T&D-TSCA Facil
- 92 CDF C Photo Simulation

32 CSO CDF C /Utilities Relocations
- 01 30%
- 02 90%
- 03 100%
- 90 CSO C - Surface Water Drainage Design

33 WTP CDF C
- 01 30%
- 02 90%
- 03 100%

34 CDF C Cap /Land Use Design
- 01 30%
- 02 90%
- 03 100%

Area C Design

41 CDF D Remedial Design Support *USACE Design Scope /FWENC Interface & Design Review*
- 01 30%
- 02 90%
- 03 100%

42 CDF Area D /Utilities Relocations
- ~~01 30%~~
- ~~02 90%~~
- ~~03 100%~~
- 90 City Contract for CSO D Design

43 WTP CDF D
- 01 30%

44 Final CDF D Cap /Land Use Design

Area D Design

91 Dredging Design Support
- **01 30%**
- **02 90%**
- **03 100%**

92 Excavation Design
- **01 30%**
- **02 90%**
- **03 100%**

93 Dewatering Design Support
- **01 30%**
- **02 90%**
- **03 100%**

94 Restoration Design
- **01 30%**
- **02 90%**
- **03 100%**

21 Special Studies (Includes Real Estate) /Value Engineering

04 Real Estate
- **01 Real Estate Support in Land Acquisition**
- 91 Land Acquisition Area A
- 92 Land Acquisition Area B
- 93 Land Acquisition Area C
- 94 Land Acquisition Area D

91 Special Studies Area A
- 02 Perform Value Engineering — *For CSO*
- 05 Participate in Biddability /Constructibility Reviews

92 Special Studies Area B
- 02 Perform Value Engineering
- 05 Participate in Biddability /Constructibility Reviews — *For CSO*

93 Special Studies Area C
- 02 Perform Value Engineering
- 05 Participate in Biddability /Constructibility Reviews — *For CSO & CDF*

94 Special Studies Area D
- 02 Perform Value Engineering
- 05 Participate in Biddability /Constructibility Reviews — *For CSO*
- 90 Rail Access Study at Area D
- 91 T&D SOWs/Estimates - Area D

95 Water Treatment Plant Study

96 Material Balance Of Dredged Material and CDF Storage Capacity

97 Water Treatment Studies
- 01 UV Oxidation Design Test
- 02 Influent Characterization Study

98 Pre-Design Field Test
- 01 Dredge Technology Testing
- 02 Materials Handling Testing
- 03 Mechanical Sediment Dewatering

99 Specific Value Engineering Efforts
- **01 On Site Laboratory Cost Benefit Analysis**
- **02 Wetlands Restoration Alternatives Evaluation**
- **03 Confirmation Sampling Approach Development**

22 Post Design Support (Procurement)
- 01 Perform Prebid (Pre-Solicitation Activities)
- 02 Perform Preaward Activities

~~23 Engineering Support During Remedial Action~~ — *(to be included with Remedial Action)*

97 PM Allocation — *actual costs collected under TO#10*
- 01 Year 7 PM
- 02 Year 8 PM

98 Estimated Indirect Rate Adjustment — *calculated monthly*

APPENDIX B

DREDGING DESIGN
PRELIMINARY LIST OF DRAWINGS AND SPECIFICATIONS

DREDGING DESIGN
PRELIMINARY LIST OF DRAWINGS

Drawing No.	Title
G-001	Cover Sheet and Index of Drawings
G-002	Standard Symbols and Abbreviations
C-101	Existing Conditions Plan
C-102	Site Preparation
C-103	Site Plan
C-104-C-140	Dredging Plan(s) (Sheets 1-36)
C-301-C-372	Dredge Cross Sections (Sheets 1-72)

DREDGING DESIGN
PRELIMINARY LIST OF SPECIFICATIONS

Division 01 – General Requirements

00020 Advertisement for Bids
01110 Summary of Work
01201 Pre-Construction Conference
01270 Measurement and Payment
01320 Project Schedule
01330 Submittal Procedures
01351 Safety, Health and Emergency Response
01355 Environmental Protection
01451 Subcontractor Quality Control
01500 Temporary Facilities and Controls
01572 Equipment Decontamination
01780 Closeout Submittals

Division 02 – Site Work

02111 Excavation and Handling of Contaminated Material
02120 Transportation and Disposal of Hazardous Materials
02121 Air Emissions Control
02220 Demolition
02230 Clearing and Grubbing
02325 Dredging
02380 Stone, Channel, Shoreline/Coastal Protection
02821 Fencing

APPENDIX C

EXCAVATION DESIGN
PRELIMINARY LIST OF DRAWINGS AND SPECIFICATIONS

EXCAVATION DESIGN
PRELIMINARY LIST OF DRAWINGS

Drawing No.	Title
G-001	Cover Sheet and Index of Drawings
G-002	Standard Symbols and Abbreviations
C-101	Existing Conditions Plan
C-102	Site Preparation
C-103	Site Plan
C-104	Excavation Plan (Sheet 1)
C-105	Excavation Plan (Sheet 2)
C-106	Excavation Plan (Sheet 3)
C-107	Excavation Plan (Sheet 4)
C-108	Excavation Plan (Sheet 5)
C-109	Excavation Plan (Sheet 6)
C-110	Excavation Plan (Sheet 7)
C-501	Excavation Details (Sheet 1)
C-502	Excavation Details (Sheet 2)
C-503	Excavation Details (Sheet 3)
C-504	Excavation Details (Sheet 4)
C-505	Excavation Details (Sheet 5)

EXCAVATION DESIGN
PRELIMINARY LIST OF SPECIFICATIONS

Division 01 – General Requirements

01110 Summary of Work
01270 Measurement and payment
01320 Project Schedule
01330 Submittal Procedures
01351 Safety, Health, and Emergency Response
01355 Environmental Protection
01356 Stormwater Pollution Prevention Measures
01451 Subcontractor Quality Control
01500 Temporary Facilities and Controls
01572 Equipment Decontamination
01780 Closeout Submittals

Division 02 – Site Work

02111 Excavation and Handling of Contaminated Material
02120 Transportation and Disposal of Hazardous Materials
02121 Air Emissions Control
02220 Demolition
02230 Clearing and Grubbing
02300 Earthwork
02325 Dredging
02370 Soil Surface Erosion Control
02372 Waste Containment Geomembrane
02380 Stone, Channel, Shoreline/Coastal Protection
02630 Storm-Drainage System
02763 Pavement Markings
02821 Fencing
02921 Seeding

Division 10 – Specialists

10430 Exterior Signage

APPENDIX D

DEWATERING DESIGN
PRELIMINARY LIST OF DRAWINGS AND SPECIFICATIONS

DEWATERING DESIGN
PRELIMINARY LIST OF DRAWINGS

Drawing No.	Title
G-001	Cover Sheet and Index of Drawings
G-002	Standard Symbols and Abbreviations
C-101	Existing Conditions Plan
C-102	Site Preparation
C-103	Site Plan
C-104	Grading Plan
C-105	Storm Sewer Plan/Profile
C-106	Sanitary Sewer Plan/Profile
C-107	Soil Erosion and Sedimentation Control Plan
C-501	Details (Sheet 1)
C-502	Details (Sheet 2)
C-503	Details (Sheet 3)
U-101	Utility Plan
U-501	Utility Details
E-001	Electrical Symbols and Abbreviations
E-601	One Line Diagram
E-101	Power and Lighting Plan
E-501	Electrical Details (Sheet 1)
E-502	Electrical Details (Sheet 2)
E-602	Plan Board Schedule
E-603	Cable/Conduit Schedule
S-101	Building Concrete Floor Plan
S-102	Building Foundation Plan
S-501	Building Foundation Sections and Details
M-101	HVAC Floor Plan
M-301	Sections – Mechanical Equipment
M-501	HVAC Schematic
M-502	HVAC Details and Schedule
H-001	Piping & Instrumentation Diagram (P&ID) Symbols and Abbreviations
H-601	P&ID (Sheet 1)
H-602	P&ID (Sheet 2)
H-603	Process Flow Diagram
H-101	Equipment Layout
H-201	Equipment Elevations
H-501	Equipment Details
H-502	Hanger and Support Details
A-101	Architectural Plans and Elevations – Building

DEWATERING DESIGN
PRELIMINARY LIST OF SPECIFICATIONS

Division 01 – General Requirements

01110 Summary of Work
01270 Measurement and Payment
01320 Project Schedule
01330 Submittal Procedures
01351 Safety, Health, and Emergency Response
01356 Stormwater Pollution Prevention Measures
01410 Environmental Protection
01451 Subcontractor Quality Control
01500 Temporary Facilities and Controls
01720 Field Engineering
01780 Closeout Submittals

Division 02 – Site Work

02111 Excavation and Handling of Contaminated Material
02120 Transportation and Disposal of Hazardous Materials
02217 Foundation Preparation
02230 Clearing and Grubbing
02300 Earthwork
02315 Excavation, Filling and Backfilling for Buildings
02316 Excavation, Trenching, and Backfilling for Utilities Systems
xxxxx Foundation Piles (Section To Be Determined)
02630 Storm-Drainage System
02130 Bituminous Base Course
02510 Water Distribution
02531 Sanitary Sewerage
02556 Gas Distribution System
02722 Aggregate and/or Graded-Crushed Aggregate Base Course
02755 Roller Compacted Concrete Pavement
02762 Joints, Reinforcements, and Mooring Eyes in Concrete Pavements
02763 Pavement Markings
02770 Concrete Sidewalks and Curbs and Gutters
02821 Fencing
02840 Vehicle Barriers

Division 03 - Concrete

03100 Structural Concrete Formwork
03101 Formwork for Concrete
03150 Expansion Joints, Contraction Joints, and Waterstops
03200 Concrete Reinforcement
03300 Cast-In-Place Structural Concrete

Division 05 - Metals

05090 Welding, Structural
05120 Structural Steel
05500 Miscellaneous Metal
05650 Railroads

Division 07 – Thermal & Moisture Protection

07900 Joint Sealing

Division 08 – Doors & Windows

08110 Steel Doors and Frames
08330 Overhead Rolling Doors
08150 Steel Windows

Division 09 - Finishes

09250 Gypsum Wallboard
09510 Acoustical Ceilings
09900 Painting, General

Division 10 - Specialties

10430 Exterior Signage
10440 Interior Signage
10522 Portable Fire Extinguishers

Division 11 - Equipment

11211 Pumps: Water, Centrifugal
11215 Air Blowers and Accessories
11226 Vapor Phase Activated Carbon Adsorption Units
11500 Air Pollution Control

Division 13 – Special Construction

13080 Seismic Protection for Miscellaneous Equipment
13100 Lightning Protection System
13120 Standard Metal Building Systems
13720 Electronic Security System
13850 Fire Detection and Alarm System

Division 14 – Conveying Systems

14601 Cranes, Bridge & Gantry, Top Running, 30-Ton Maximum Capacity
14700 Conveyor Systems

Division 15 - Mechanical

15070 Seismic Protection for Mechanical Equipment
15200 Pipelines, Liquid Process Piping
15565 Heating System; Gas-Fired Heaters
15560 Evaporative Cooling System
15950 Heating, Ventilating and Air Conditioning (HVAC) Control Systems
15990 Testing, Adjusting, and Balancing of HVAC Systems

Division 16 - Electrical

16070 Seismic Protection for Electrical Equipment
16375 Electrical Distribution System, Underground
16403 Motor Control Centers, Switchboards and Panelboards
16415 Electrical Work, Interior
16510 Exterior/Interior Lighting
16900 Controls and Instrumentation, General
16925 Programmable Logic Controllers (PLC)

APPENDIX E

RESTORATION DESIGN
PRELIMINARY LIST OF DRAWINGS AND SPECIFICATIONS

RESTORATION DESIGN
PRELIMINARY LIST OF DRAWINGS

Drawing No.	Title
G-001	Cover Sheet and Index of Drawings
G-002	Standard Symbols and Abbreviations
C-101 – C-120	Site Plan(s) (Sheets 1 - 20)
C-201 – C-220	Restoration Plan(s) (Sheet 1-20)
C-501	Restoration Details (Sheet 1)
L-101 – L-120	Restoration Planting Plan(s) (Sheets 1 - 20)
L-501	Planting Details (Sheet 1)
L-502	Planting Details (Sheet 2)
L-503	Planting Details (Sheet 3)
L-504	Planting Details (Sheet 4)

RESTORATION DESIGN
PRELIMINARY LIST OF SPECIFICATIONS

Division 01 – General Requirements

01110 Summary of Work
01270 Measurement and payment
01320 Project Schedule
01330 Submittal Procedures
01351 Health, Safety and Emergency Response
01355 Environmental Protection
01356 Stormwater Pollution Prevention Measures
01451 Subcontractor Quality Control
01500 Temporary Facilities and Controls
01780 Closeout Submittals

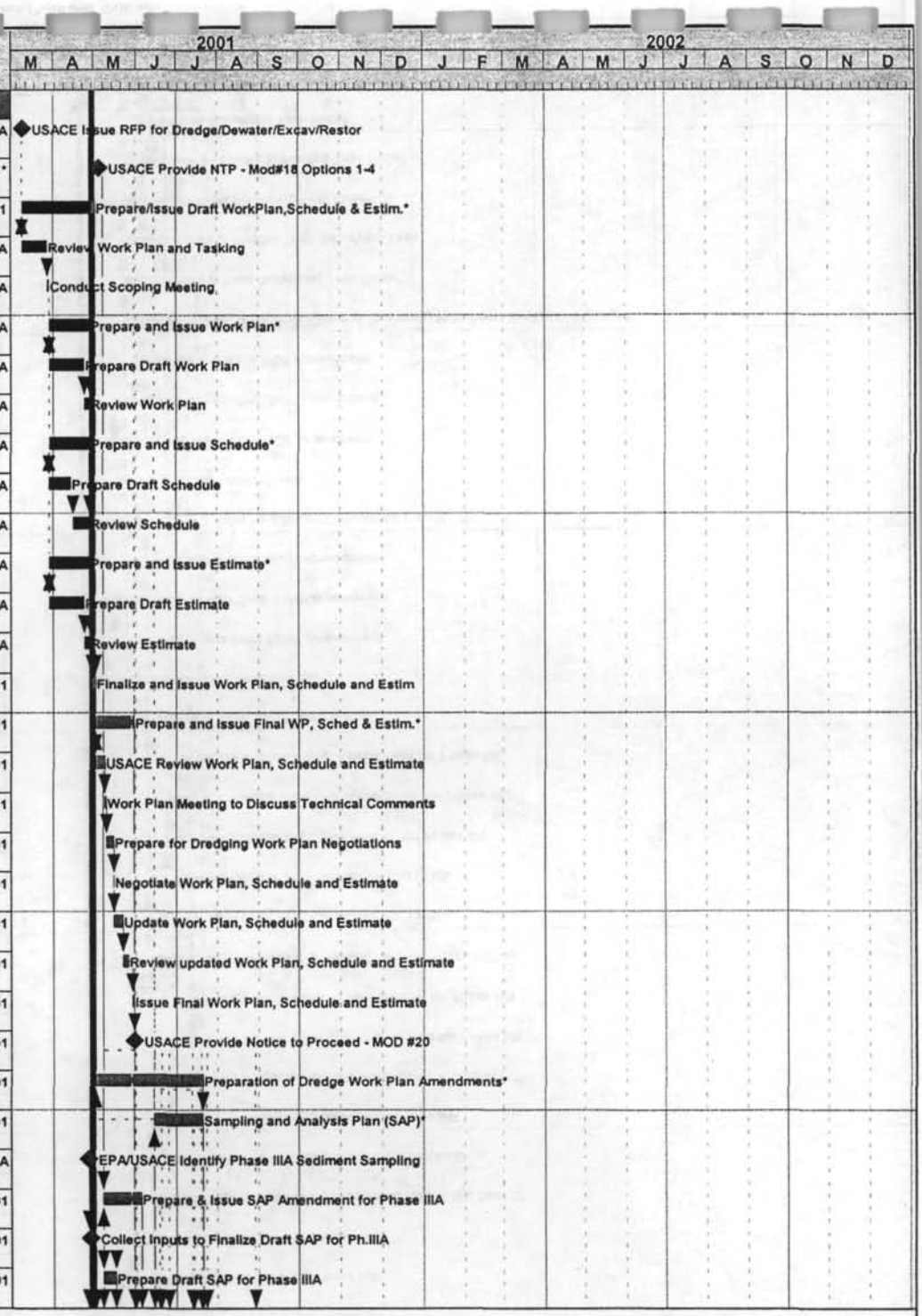
Division 02 – Site Work

02300 Earthwork
02370 Soil Surface Erosion Control
02380 Stone, Channel, Shoreline/Coastal Protection
02373 Separation/Filtration Geotextile
02821 Fencing
02921 Seeding
02923 Sprigging
02930 Exterior Planting
02935 Exterior Plant Material Maintenance

APPENDIX F

REMEDIAL DESIGN BASELINE PROJECT SCHEDULE

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
DRAFT DREDGE WORK PLAN						
B70101D000	01.01	USACE Issue RFP for Dredge/Dewater/Excav/Restor		0		08MAR01A
B70101D001	06.03	USACE Provide NTP - Mod#18 Options 1-4		0		04MAY01*
B70101D005	01.01	Prepare/Issue Draft WorkPlan,Schedule & Estim.*	B70101D010*	38*	09MAR01A	01MAY01
B70101D010	01.01	Review Work Plan and Tasking	B70101D000	14	09MAR01A	27MAR01A
B70101D015	01.01	Conduct Scoping Meeting	B70101D010	1	28MAR01A	28MAR01A
B70101D020	01.01	Prepare and Issue Work Plan*	B70101D025*	22*	29MAR01A	27APR01A
B70101D025	01.01	Prepare Draft Work Plan	B70101D015	18	29MAR01A	23APR01A
B70101D030	01.01	Review Work Plan	B70101D020*, B70101D025	2	24APR01A	27APR01A
B70101D035	01.01	Prepare and Issue Schedule*	B70101D040*	22*	29MAR01A	27APR01A
B70101D040	01.01	Prepare Draft Schedule	B70101D015	12	29MAR01A	13APR01A
B70101D045	01.01	Review Schedule	B70101D035*, B70101D040	6	16APR01A	27APR01A
B70101D050	02.01.02	Prepare and Issue Estimate*	B70101D055*	22*	29MAR01A	27APR01A
B70101D055	02.01.02	Prepare Draft Estimate	B70101D015	18	29MAR01A	23APR01A
B70101D060	02.01.02	Review Estimate	B70101D050*, B70101D055	2	24APR01A	27APR01A
B70101D065	02.01.02	Finalize and Issue Work Plan, Schedule and Estim	B70101D005*, B70101D030*, B70101D045*, B70101D060*	2	30APR01A	01MAY01
B70101D070	01.01	Prepare and Issue Final WP, Sched & Estim.*	B70101D075*	20*	02MAY01	30MAY01
B70101D075	01.01	USACE Review Work Plan, Schedule and Estimate	B70101D065*	5	02MAY01	08MAY01
B70101D080	01.01	Work Plan Meeting to Discuss Technical Comments	B70101D075*	1	09MAY01	09MAY01
B70101D085	01.01	Prepare for Dredging Work Plan Negotiations	B70101D080*	3	10MAY01	14MAY01
B70101D090	01.01	Negotiate Work Plan, Schedule and Estimate	B70101D085*	1	15MAY01	15MAY01
B70101D095	01.01	Update Work Plan, Schedule and Estimate	B70101D090*	5	16MAY01	22MAY01
B70101D100	01.01	Review updated Work Plan, Schedule and Estimate	B70101D095*	3	23MAY01	25MAY01
B70101D105	01.01	Issue Final Work Plan, Schedule and Estimate	B70101D100*	2	29MAY01	30MAY01
B70101D200	01.01	USACE Provide Notice to Proceed - MOD #20	B70101D070*, B70101D105*	0		30MAY01
B70103D000	01	Preparation of Dredge Work Plan Amendments*	B70103D005, B70104D000*, B70191D000*	56*	02MAY01	20JUL01
B70103D005	01.03	Sampling and Analysis Plan (SAP)*	B70103D000*, B70103D200*, B70103D300*	25*	15JUN01	20JUL01
B70103D100	06.03	EPA/USACE Identify Phase IIIA Sediment Sampling		0		26APR01A
B70103D105	01.03	Prepare & Issue SAP Amendment for Phase IIIA	B70103D100, B70103D115*	20*	07MAY01	04JUN01
B70103D110	01.03	Collect Inputs to Finalize Draft SAP for Ph.IIIA	B70103D100*	0		27APR01
B70103D115	01.03	Prepare Draft SAP for Phase IIIA	B70101D001*, B70103D110	8	07MAY01	16MAY01



Start Date	01MAR94
Finish Date	03NOV09
Data Date	30APR01
Run Date	01MAY01 10:03

Early Bar
Progress Bar
Critical Activity

TR1D

Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

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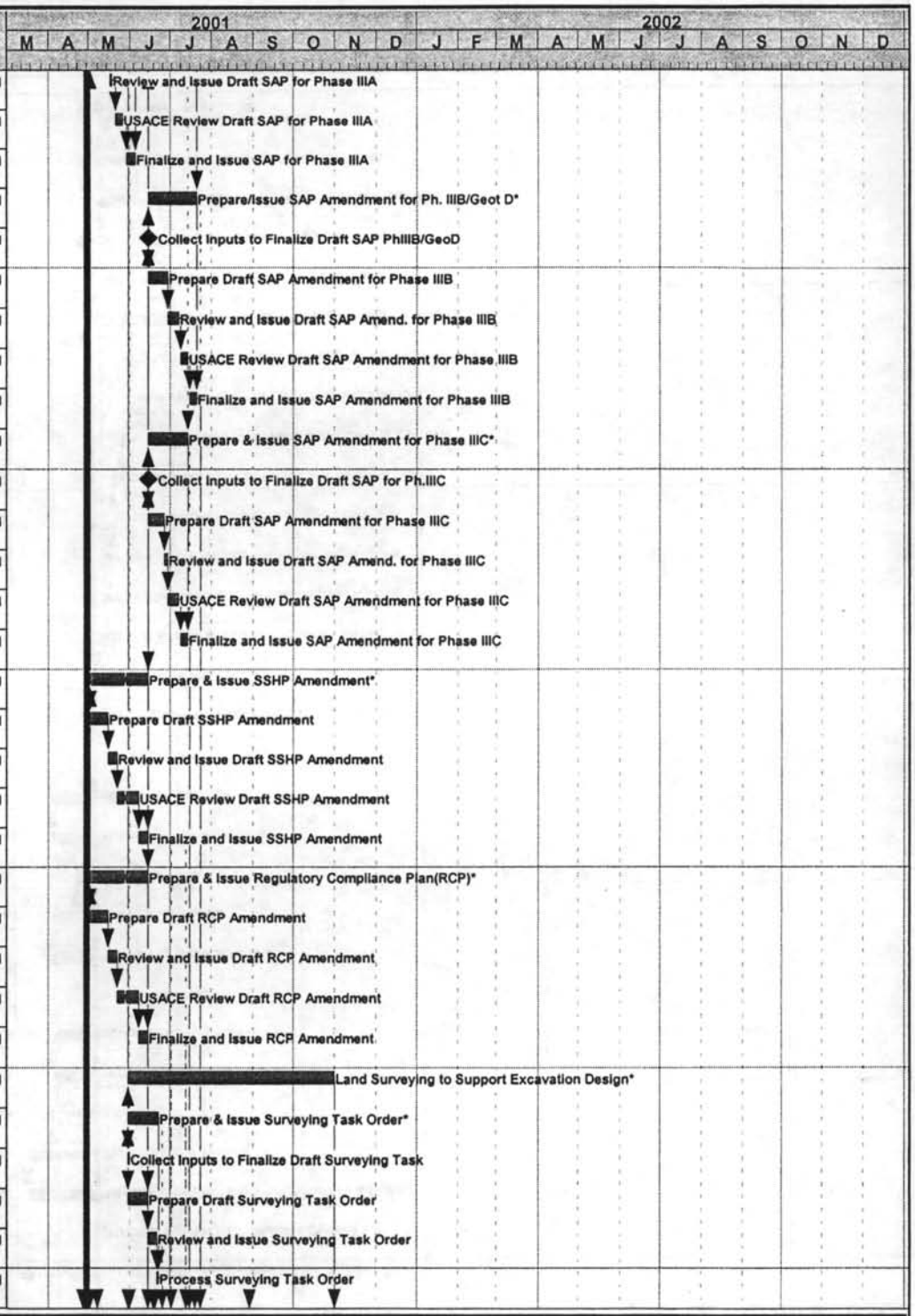
ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B70103D120	01.03	Review and Issue Draft SAP for Phase IIIA	B70103D115*	2	17MAY01	18MAY01
B70103D125	01.03	USACE Review Draft SAP for Phase IIIA	B70103D120*	5	21MAY01	25MAY01
B70103D130	01.03	Finalize and Issue SAP for Phase IIIA	B70103D105*, B70103D125*	5	29MAY01	04JUN01
B70103D200	01.03	Prepare/Issue SAP Amendment for Ph. IIIB/Geot D*	B70103D005*, B70103D210*	25*	15JUN01	20JUL01
B70103D205	01.03	Collect Inputs to Finalize Draft SAP PhIIIB/GeoD	B71102D205, B71102D210, B71102D215*, B71102D220, B71102D225	0		14JUN01
B70103D210	01.03	Prepare Draft SAP Amendment for Phase IIIB	B70101D200, B70103D205*	10	15JUN01	28JUN01
B70103D215	01.03	Review and Issue Draft SAP Amend. for Phase IIIB	B70103D210*	5	29JUN01	06JUL01
B70103D220	01.03	USACE Review Draft SAP Amendment for Phase IIIB	B70103D215*	5	09JUL01	13JUL01
B70103D225	01.03	Finalize and Issue SAP Amendment for Phase IIIB	B70103D200*, B70103D220*	5	16JUL01	20JUL01
B70103D300	01.03	Prepare & Issue SAP Amendment for Phase IIIC*	B70103D005, B70103D310*	20*	15JUN01	13JUL01
B70103D305	01.03	Collect Inputs to Finalize Draft SAP for Ph.IIIC	B71102D305*, B71102D310*, B71102D320	0		14JUN01
B70103D310	01.03	Prepare Draft SAP Amendment for Phase IIIC	B70101D200, B70103D305*	8	15JUN01	26JUN01
B70103D315	01.03	Review and Issue Draft SAP Amend. for Phase IIIC	B70103D310*	2	27JUN01	28JUN01
B70103D320	01.03	USACE Review Draft SAP Amendment for Phase IIIC	B70103D315*	5	29JUN01	06JUL01
B70103D325	01.03	Finalize and Issue SAP Amendment for Phase IIIC	B70103D300*, B70103D320*	5	09JUL01	13JUL01
B70104D000	01.04	Prepare & Issue SSHP Amendment*	B70103D000, B70104D005*	30*	02MAY01	13JUN01
B70104D005	01.04	Prepare Draft SSHP Amendment	B70101D065*	10	02MAY01	15MAY01
B70104D010	01.04	Review and Issue Draft SSHP Amendment	B70104D005*	5	16MAY01	22MAY01
B70104D015	01.04	USACE Review Draft SSHP Amendment	B70104D010*	10	23MAY01	06JUN01
B70104D020	01.04	Finalize and Issue SSHP Amendment	B70104D000*, B70104D015*	5	07JUN01	13JUN01
B70191D000	01.91	Prepare & Issue Regulatory Compliance Plan(RCP)*	B70103D000, B70191D005*	30*	02MAY01	13JUN01
B70191D005	01.91	Prepare Draft RCP Amendment	B70101D065*	10	02MAY01	15MAY01
B70191D010	01.91	Review and Issue Draft RCP Amendment	B70191D005*	5	16MAY01	22MAY01
B70191D015	01.91	USACE Review Draft RCP Amendment	B70191D010*	10	23MAY01	06JUN01
B70191D020	01.91	Finalize and Issue RCP Amendment	B70191D000*, B70191D015*	5	07JUN01	13JUN01
B70601D000	06.01	Land Surveying to Support Excavation Design*	B70601D010*	107*	31MAY01	30OCT01
B70601D005	06.01	Prepare & Issue Surveying Task Order*	B70601D015*	17*	31MAY01	22JUN01
B70601D010	06.01	Collect Inputs to Finalize Draft Surveying Task	B70101D065, B70101D200*	1	31MAY01	31MAY01
B70601D015	06.01	Prepare Draft Surveying Task Order	B70101D200*, B70601D010	10	31MAY01	13JUN01
B70601D020	06.01	Review and Issue Surveying Task Order	B70601D015*	5	14JUN01	20JUN01
B70601D025	02.02.01	Process Surveying Task Order	B70601D005*, B70601D020*	2	21JUN01	22JUN01



Start Date	01MAR94	Early Bar
Finish Date	03NOV09	Progress Bar
Data Date	30APR01	Critic[redacted]y
[redacted]	[redacted]	[redacted]

TR1D

Sheet 2 of 20

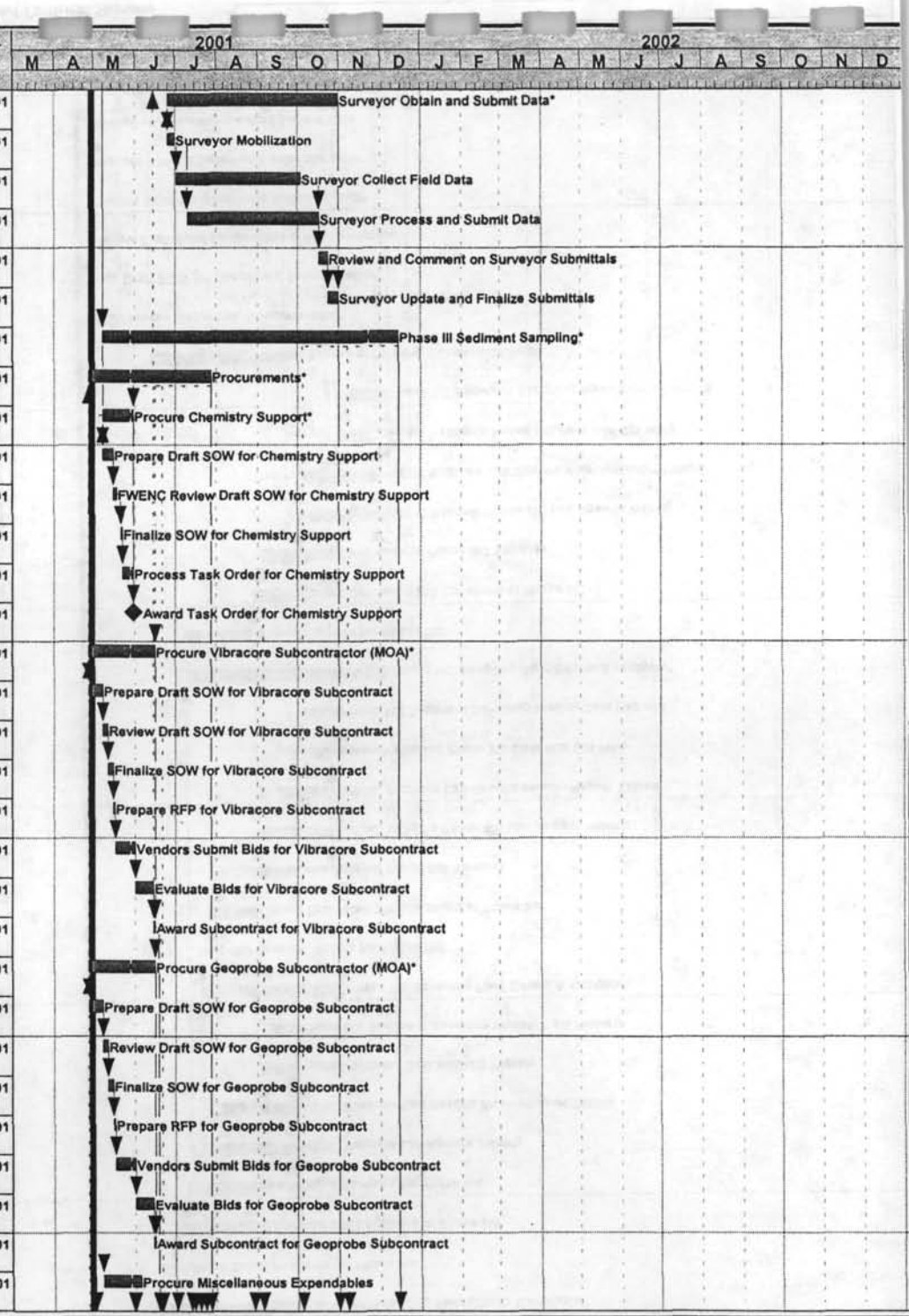
Draft Work Plan Schedule for Remedial Design Dredging

[redacted] Mass[redacted]nce S[redacted]t, Sec[redacted] Sam[redacted]

Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B70601D030	06.01	Surveyor Obtain and Submit Data*	B70601D000*, B70601D005, B70601D035*	90*	25JUN01	30OCT01
B70601D035	06.01	Surveyor Mobilization	B70101D200, B70601D025*	5	25JUN01	29JUN01
B70601D040	06.01	Surveyor Collect Field Data	B70601D035*	65	02JUL01	02OCT01
B70601D045	06.01	Surveyor Process and Submit Data	B70601D035*, B70601D040*	70	10JUL01	16OCT01
B70601D050	06.01	Review and Comment on Surveyor Submittals	B70601D045*	5	17OCT01	23OCT01
B70601D055	06.01	Surveyor Update and Finalize Submittals	B70601D030*, B70601D050*	5	24OCT01	30OCT01
B70603D000	06.03	Phase III Sediment Sampling*	B70103D105*	155*	07MAY01	14DEC01
B70603D001	06.03	Procurements*	B70603D002, B70603D010*, B70603D020*, B70691D000, B70804D001	63*	27APR01A	26JUL01
B70603D002	06.03	Procure Chemistry Support*	B70603D001, B70603D003*	17*	07MAY01	30MAY01
B70603D003	06.03	Prepare Draft SOW for Chemistry Support	B70101D001*	7	07MAY01	15MAY01
B70603D004	06.03	FWENC Review Draft SOW for Chemistry Support	B70603D003*	3	16MAY01	18MAY01
B70603D005	06.03	Finalize SOW for Chemistry Support	B70603D004*	2	21MAY01	22MAY01
B70603D006	06.03	Process Task Order for Chemistry Support	B70603D005*	5	23MAY01	30MAY01
B70603D007	06.03	Award Task Order for Chemistry Support	B70603D002*, B70603D006*	0		30MAY01
B70603D010	06.03	Procure Vibracore Subcontractor (MOA)*	B70603D001, B70603D011*	35*	27APR01A	15JUN01
B70603D011	06.03	Prepare Draft SOW for Vibracore Subcontract	B70103D100*	7	27APR01A	07MAY01
B70603D012	06.03	Review Draft SOW for Vibracore Subcontract	B70603D011*	3	08MAY01	10MAY01
B70603D013	06.03	Finalize SOW for Vibracore Subcontract	B70603D012*	2	11MAY01	14MAY01
B70603D014	06.03	Prepare RFP for Vibracore Subcontract	B70603D013*	2	15MAY01	16MAY01
B70603D015	06.03	Vendors Submit Bids for Vibracore Subcontract	B70603D014*	10	17MAY01	31MAY01
B70603D016	06.03	Evaluate Bids for Vibracore Subcontract	B70603D015*	10	01JUN01	14JUN01
B70603D017	06.03	Award Subcontract for Vibracore Subcontract	B70101D001, B70603D010*, B70603D016*	1	15JUN01	15JUN01
B70603D020	06.03	Procure Geoprobe Subcontractor (MOA)*	B70603D001, B70603D021*	35*	27APR01A	15JUN01
B70603D021	06.03	Prepare Draft SOW for Geoprobe Subcontract	B70103D100*	7	27APR01A	07MAY01
B70603D022	06.03	Review Draft SOW for Geoprobe Subcontract	B70603D021*	3	08MAY01	10MAY01
B70603D023	06.03	Finalize SOW for Geoprobe Subcontract	B70603D022*	2	11MAY01	14MAY01
B70603D024	06.03	Prepare RFP for Geoprobe Subcontract	B70603D023*	2	15MAY01	16MAY01
B70603D025	06.03	Vendors Submit Bids for Geoprobe Subcontract	B70603D024*	10	17MAY01	31MAY01
B70603D026	06.03	Evaluate Bids for Geoprobe Subcontract	B70603D025*	10	01JUN01	14JUN01
B70603D027	06.03	Award Subcontract for Geoprobe Subcontract	B70101D100, B70603D020*, B70603D026*	1	15JUN01	15JUN01
B70603D030	06.03	Procure Miscellaneous Expendables	B70101D001*	20	07MAY01	04JUN01



Start Date	01MAR94
Finish Date	03NOV09
Data Date	30APR01
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Early Bar
Progress Bar
Critical Activity

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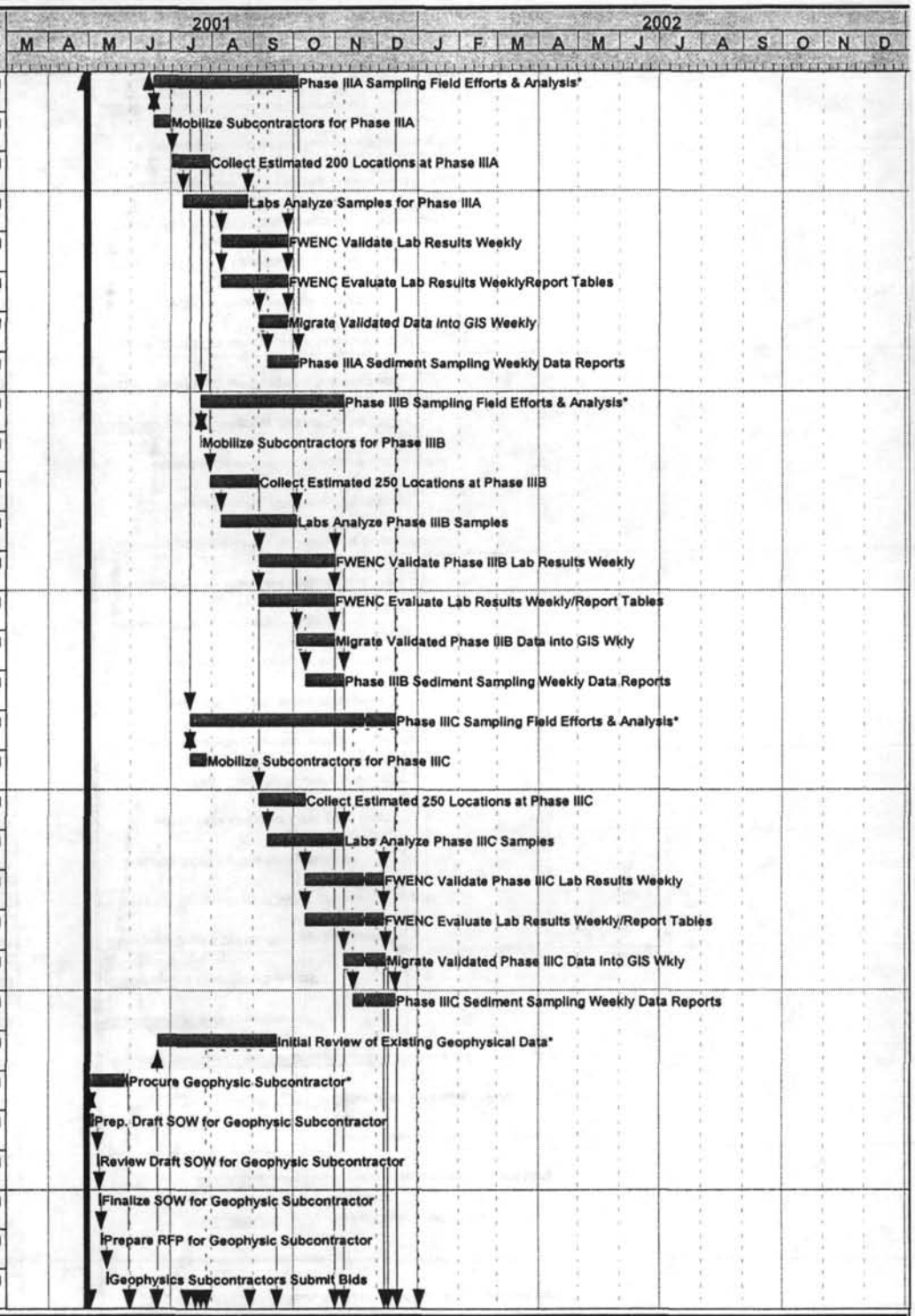
Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B70603D100	06.03	Phase IIIA Sampling Field Efforts & Analysis*	B70103D105, B70603D105*	76*	18JUN01	03OCT01
B70603D105	06.03	Mobilize Subcontractors for Phase IIIA	B70603D017*, B70603D027*	10	18JUN01	29JUN01
B70603D110	06.03	Collect Estimated 200 Locations at Phase IIIA	B70104D020, B70191D020, B70603D105*	20	02JUL01	30JUL01
B70603D115	08.04.02	Labs Analyze Samples for Phase IIIA	B70603D110*, B70603D110*	35	10JUL01	27AUG01
B70603D120	10.05.91	FWENC Validate Lab Results Weekly	B70603D115*, B70603D115*	35	07AUG01	25SEP01
B70603D125	11.02.01	FWENC Evaluate Lab Results WeeklyReport Tables	B70603D115*, B70603D115*	35	07AUG01	25SEP01
B70603D130	11.02.99	Migrate Validated Data into GIS Weekly	B70603D120*, B70603D125*, B70603D125*	16	05SEP01	26SEP01
B70603D135	11.02.01	Phase IIIA Sediment Sampling Weekly Data Reports	B70603D000, B70603D100, B70603D100*, B70603D130, B70603D130*	16	12SEP01	03OCT01
B70603D200	06.03	Phase IIIB Sampling Field Efforts & Analysis*	B70103D200, B70603D205*	77*	23JUL01	07NOV01
B70603D205	06.03	Mobilize Subcontractors for Phase IIIB	B70103D225*	1	23JUL01	23JUL01
B70603D210	06.03	Collect Estimated 250 Locations at Phase IIIB	B70603D110*, B70603D205	25	31JUL01	04SEP01
B70603D215	08.04.02	Labs Analyze Phase IIIB Samples	B70603D210*, B70603D210*	40	07AUG01	02OCT01
B70603D220	10.05.91	FWENC Validate Phase IIIB Lab Results Weekly	B70603D007, B70603D215*, B70603D215*	40	05SEP01	30OCT01
B70603D225	11.02.01	FWENC Evaluate Lab Results Weekly/Report Tables	B70603D215*, B70603D215*	40	05SEP01	30OCT01
B70603D230	11.02.99	Migrate Validated Phase IIIB Data into GIS Wkly	B70603D220*, B70603D225*, B70603D225*	21	03OCT01	31OCT01
B70603D235	11.02.01	Phase IIIB Sediment Sampling Weekly Data Reports	B70603D000, B70603D200, B70603D200*, B70603D230, B70603D230*	21	10OCT01	07NOV01
B70603D300	06.03	Phase IIIC Sampling Field Efforts & Analysis*	B70103D300, B70603D305*	107*	16JUL01	14DEC01
B70603D305	06.03	Mobilize Subcontractors for Phase IIIC	B70103D325*	10	16JUL01	27JUL01
B70603D310	06.03	Collect Estimated 250 Locations at Phase IIIC	B70603D210*, B70603D305	25	05SEP01	09OCT01
B70603D315	08.04.02	Labs Analyze Phase IIIC Samples	B70603D310*, B70603D310*	40	12SEP01	06NOV01
B70603D320	10.05.91	FWENC Validate Phase IIIC Lab Results Weekly	B70603D315*, B70603D315*	40	10OCT01	06DEC01
B70603D325	11.02.01	FWENC Evaluate Lab Results Weekly/Report Tables	B70603D315*, B70603D315*	40	10OCT01	06DEC01
B70603D330	11.02.99	Migrate Validated Phase IIIC Data into GIS Wkly	B70603D320*, B70603D325*, B70603D325*	21	07NOV01	07DEC01
B70603D335	11.02.01	Phase IIIC Sediment Sampling Weekly Data Reports	B70603D000*, B70603D300, B70603D300*, B70603D330, B70603D330*	21	14NOV01	14DEC01
B70608D000	06.08.01	Initial Review of Existing Geophysical Data*	B70608D110*	61*	21JUN01	17SEP01
B70608D005	06.08.01	Procure Geophysic Subcontractor*	B70608D010*	20*	02MAY01	30MAY01
B70608D010	06.08.01	Prep. Draft SOW for Geophysic Subcontractor	B70101D065*	3	02MAY01	04MAY01
B70608D015	06.08.01	Review Draft SOW for Geophysic Subcontractor	B70608D010*	2	07MAY01	08MAY01
B70608D020	06.08.01	Finalize SOW for Geophysic Subcontractor	B70608D015*	1	09MAY01	09MAY01
B70608D025	02.02.01	Prepare RFP for Geophysic Subcontractor	B70608D020*	2	10MAY01	11MAY01
B70608D030	06.08.01	Geophysics Subcontractors Submit Bids	B70608D025*	2	14MAY01	15MAY01



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critical Activity	
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Draft Work Plan Schedule for Remedial Design Dredging

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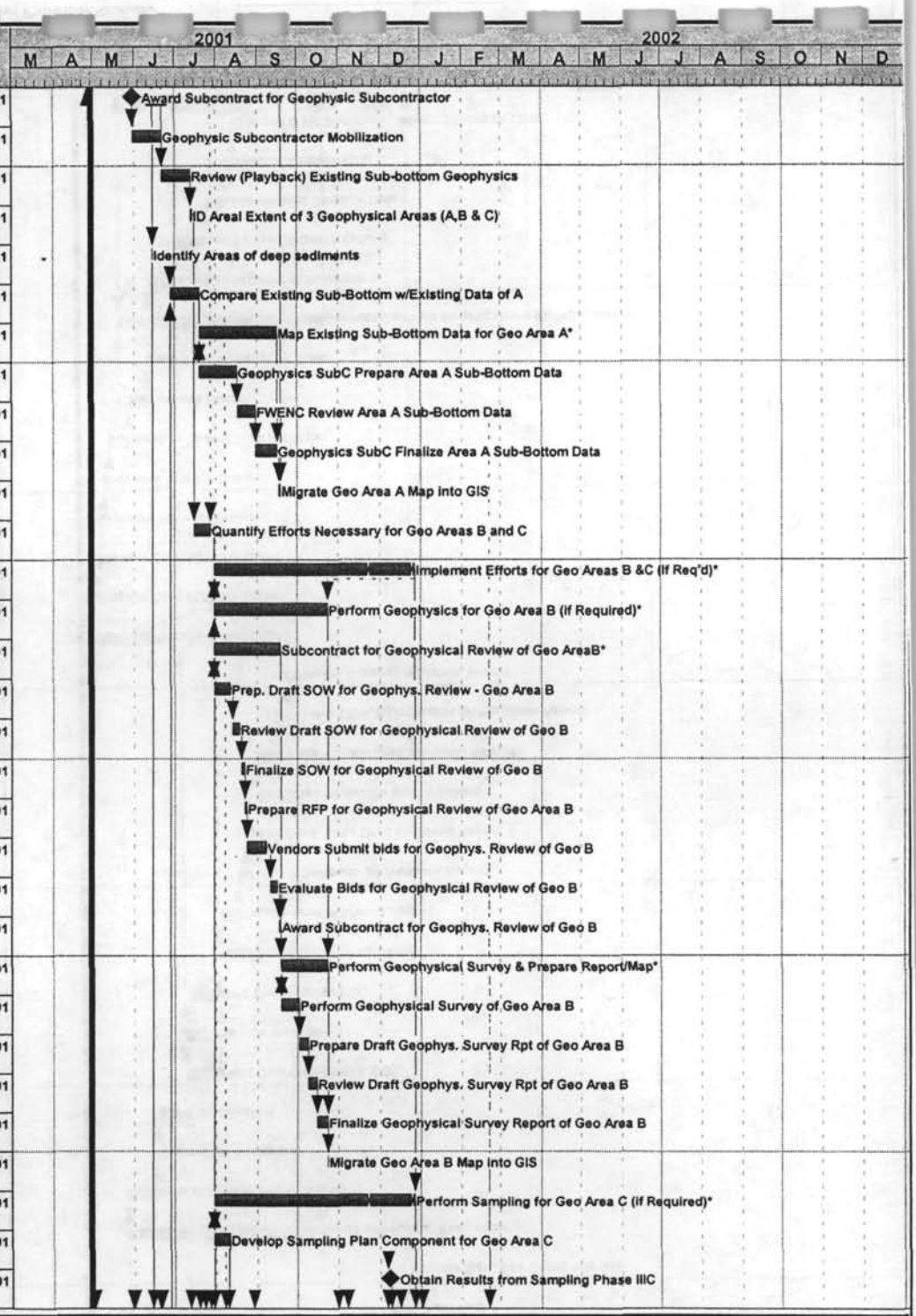
Wetland Delineation and Cultural Survey

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B70608D100	02.02.01	Award Subcontract for Geophysic Subcontractor	B70101D200*, B70608D005*, B70608D030	0		30MAY01
B70608D105	06.08.01	Geophysic Subcontractor Mobilization	B70608D100*	15	31MAY01	20JUN01
B70608D110	06.08.01	Review (Playback) Existing Sub-bottom Geophysics	B70608D105*	15	21JUN01	12JUL01
B70608D115	06.08.01	ID Areal Extent of 3 Geophysical Areas (A,B & C)	B70608D110*	1	13JUL01	13JUL01
B70608D120	06.08.01	Identify Areas of deep sediments	B70608D100*	1	14JUN01	14JUN01
B70608D125	06.08.01	Compare Existing Sub-Bottom w/Existing Data of A	B70608D120, B71102D070*	15	28JUN01	19JUL01
B70608D130	06.08.01	Map Existing Sub-Bottom Data for Geo Area A*	B70608D135*	40*	20JUL01	14SEP01
B70608D135	06.08.01	Geophysics SubC Prepare Area A Sub-Bottom Data	B70608D125*	20	20JUL01	16AUG01
B70608D140	06.08.01	FWENC Review Area A Sub-Bottom Data	B70608D135*	10	17AUG01	30AUG01
B70608D145	06.08.01	Geophysics SubC Finalize Area A Sub-Bottom Data	B70608D130*, B70608D140*	10	31AUG01	14SEP01
B70608D150	11.02.99	Migrate Geo Area A Map into GIS	B70608D000*, B70608D145*	1	17SEP01	17SEP01
B70608D155	06.08.01	Quantify Efforts Necessary for Geo Areas B and C	B70608D000, B70608D115*	10	16JUL01	27JUL01
B70608D200	06.08.01	Implement Efforts for Geo Areas B &C (If Req'd)*	B70608D205*, B70608D300*	103*	30JUL01	26DEC01
B70608D205	06.08.01	Perform Geophysics for Geo Area B (if Required)*	B70608D155, B70608D200, B70608D210*	60*	30JUL01	22OCT01
B70608D210	06.08.01	Subcontract for Geophysical Review of Geo AreaB*	B70608D215*	35*	30JUL01	17SEP01
B70608D215	06.08.01	Prep. Draft SOW for Geophys. Review - Geo Area B	B70608D155*	10	30JUL01	10AUG01
B70608D220	06.08.01	Review Draft SOW for Geophysical Review of Geo B	B70608D215*	5	13AUG01	17AUG01
B70608D225	06.08.01	Finalize SOW for Geophysical Review of Geo B	B70608D220*	2	20AUG01	21AUG01
B70608D230	02.02.01	Prepare RFP for Geophysical Review of Geo Area B	B70608D225*	2	22AUG01	23AUG01
B70608D235	06.08.01	Vendors Submit bids for Geophys. Review of Geo B	B70608D230*	10	24AUG01	07SEP01
B70608D240	06.08.01	Evaluate Bids for Geophysical Review of Geo B	B70608D235*	5	10SEP01	14SEP01
B70608D245	02.02.01	Award Subcontract for Geophys. Review of Geo B	B70608D210*, B70608D240*	1	17SEP01	17SEP01
B70608D250	06.08.01	Perform Geophysical Survey & Prepare Report/Map*	B70608D205*, B70608D210, B70608D255*	25*	18SEP01	22OCT01
B70608D255	06.08.01	Perform Geophysical Survey of Geo Area B	B70608D245*	10	18SEP01	01OCT01
B70608D260	06.08.01	Prepare Draft Geophys. Survey Rpt of Geo Area B	B70608D255*	5	02OCT01	08OCT01
B70608D265	06.08.01	Review Draft Geophys. Survey Rpt of Geo Area B	B70608D260*	5	09OCT01	15OCT01
B70608D270	06.08.01	Finalize Geophysical Survey Report of Geo Area B	B70608D250*, B70608D265*	5	16OCT01	22OCT01
B70608D275	11.02.99	Migrate Geo Area B Map into GIS	B70608D270*	1	23OCT01	23OCT01
B70608D300	06.03	Perform Sampling for Geo Area C (if Required)*	B70608D200*, B70608D305*	103*	30JUL01	26DEC01
B70608D305	06.03	Develop Sampling Plan Component for Geo Area C	B70608D155*	10	30JUL01	10AUG01
B70608D310	06.03	Obtain Results from Sampling Phase IIIC	B70603D330*	0		07DEC01



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Finish Date	03NOV09
Data Date	30APR01
Run Date	01MAY01 10:03

Early Bar
Progress Bar
Critical Activity

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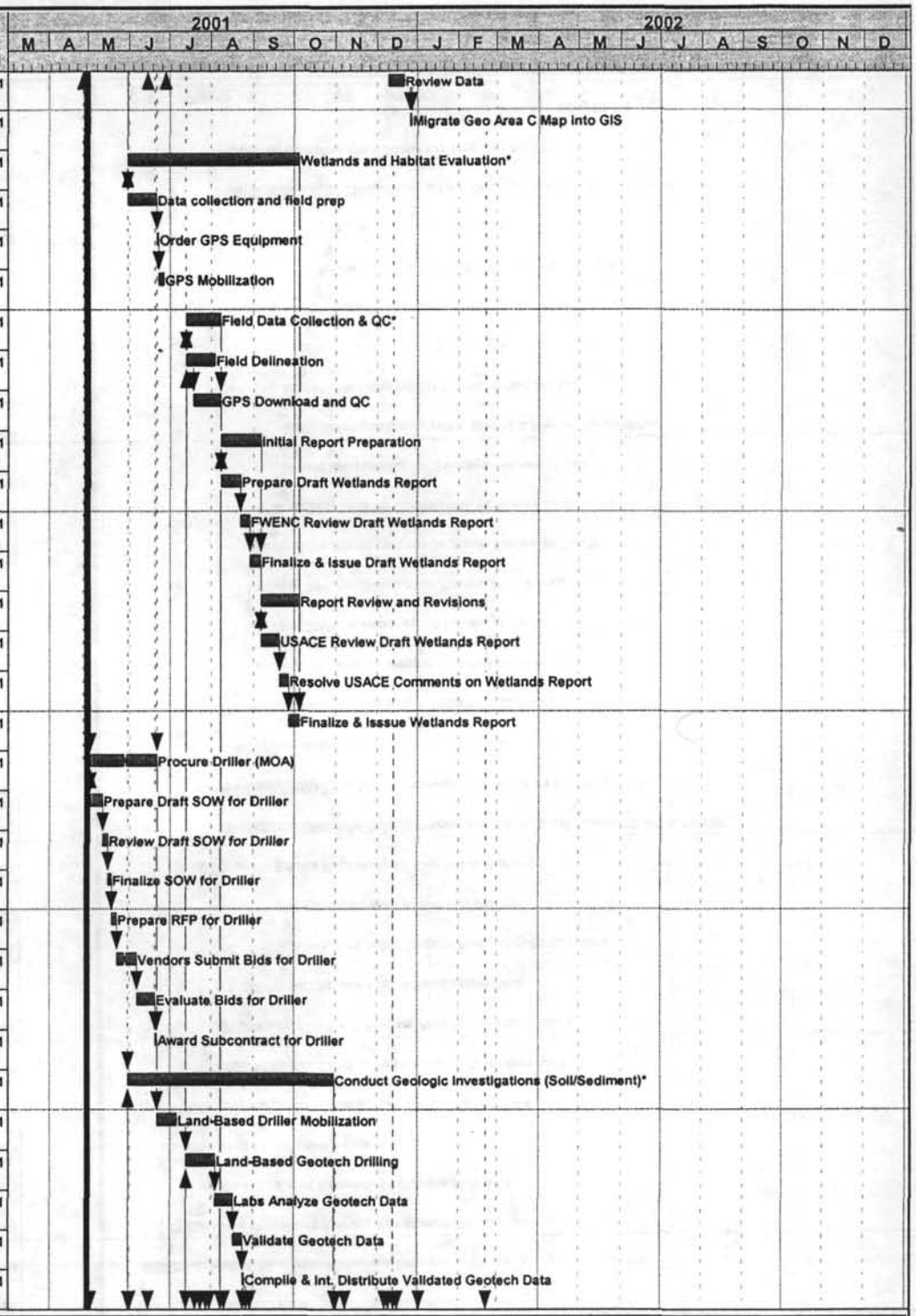
Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B70608D315	06.03	Review Data	B70608D310*	10	10DEC01	21DEC01
B70608D320	11.02.99	Migrate Geo Area C Map into GIS	B70608D300*, B70608D315*	1	26DEC01	26DEC01
B70609D000	06.09.01	Wetlands and Habitat Evaluation*	B70609D005*	88*	31MAY01	03OCT01
B70609D005	06.09.01	Data collection and field prep	B70101D200*	15	31MAY01	20JUN01
B70609D010	06.09.01	Order GPS Equipment	B70609D005*	1	21JUN01	21JUN01
B70609D015	06.09.01	GPS Mobilization	B70609D010*	2	22JUN01	25JUN01
B70609D020	06.09.01	Field Data Collection & QC*	B70609D021*	18*	13JUL01	07AUG01
B70609D021	06.09.01	Field Delineation	B70609D015, B72104D030*	15	13JUL01	02AUG01
B70609D025	06.09.01	GPS Download and QC	B70609D020*, B70609D021*	15	18JUL01	07AUG01
B70609D030	06.09.01	Initial Report Preparation	B70609D031*	20*	08AUG01	05SEP01
B70609D031	06.09.01	Prepare Draft Wetlands Report	B70609D025*	10	08AUG01	21AUG01
B70609D032	06.09.01	FWENC Review Draft Wetlands Report	B70609D031*	5	22AUG01	28AUG01
B70609D033	06.09.01	Finalize & Issue Draft Wetlands Report	B70609D030*, B70609D032*	5	29AUG01	05SEP01
B70609D035	06.09.01	Report Review and Revisions	B70609D036*	20*	06SEP01	03OCT01
B70609D036	06.09.01	USACE Review Draft Wetlands Report	B70609D033*	10	06SEP01	19SEP01
B70609D037	06.09.01	Resolve USACE Comments on Wetlands Report	B70609D036*	5	20SEP01	26SEP01
B70609D038	06.09.01	Finalize & Isssue Wetlands Report	B70609D000*, B70609D035*, B70609D037*	5	27SEP01	03OCT01
B70691D000	06.91	Procure Driller (MOA)	B70101D200, B70603D001, B70691D005*	35*	02MAY01	20JUN01
B70691D005	06.91	Prepare Draft SOW for Driller	B70101D065*	7	02MAY01	10MAY01
B70691D010	06.91	Review Draft SOW for Driller	B70691D005*	3	11MAY01	15MAY01
B70691D015	06.91	Finalize SOW for Driller	B70691D010*	2	16MAY01	17MAY01
B70691D020	06.91	Prepare RFP for Driller	B70691D015*	2	18MAY01	21MAY01
B70691D025	06.91	Vendors Submit Bids for Driller	B70691D020*	10	22MAY01	05JUN01
B70691D030	06.91	Evaluate Bids for Driller	B70691D025*	10	06JUN01	19JUN01
B70691D035	06.91	Award Subcontract for Driller	B70101D200, B70691D000*, B70691D030*	1	20JUN01	20JUN01
B70691D100	06.03	Conduct Geologic Investigations (Soil/Sediment)*	B70101D200, B71102D200*	106*	31MAY01	29OCT01
B70691D105	06.91	Land-Based Driller Mobilization	B70691D035*	10	21JUN01	05JUL01
B70691D110	06.91	Land-Based Geotech Drilling	B70104D020, B70191D020, B70691D105, B72104D025*	15	13JUL01	02AUG01
B70691D115	08.04.01	Labs Analyze Geotech Data	B70691D110*	10	03AUG01	16AUG01
B70691D120	10.05.96	Validate Geotech Data	B70691D115*	5	17AUG01	23AUG01
B70691D125	10.05.96	Compile & Int. Distribute Validated Geotech Data	B70691D120*	1	24AUG01	24AUG01



Start Date	01MAR94	Early Bar	
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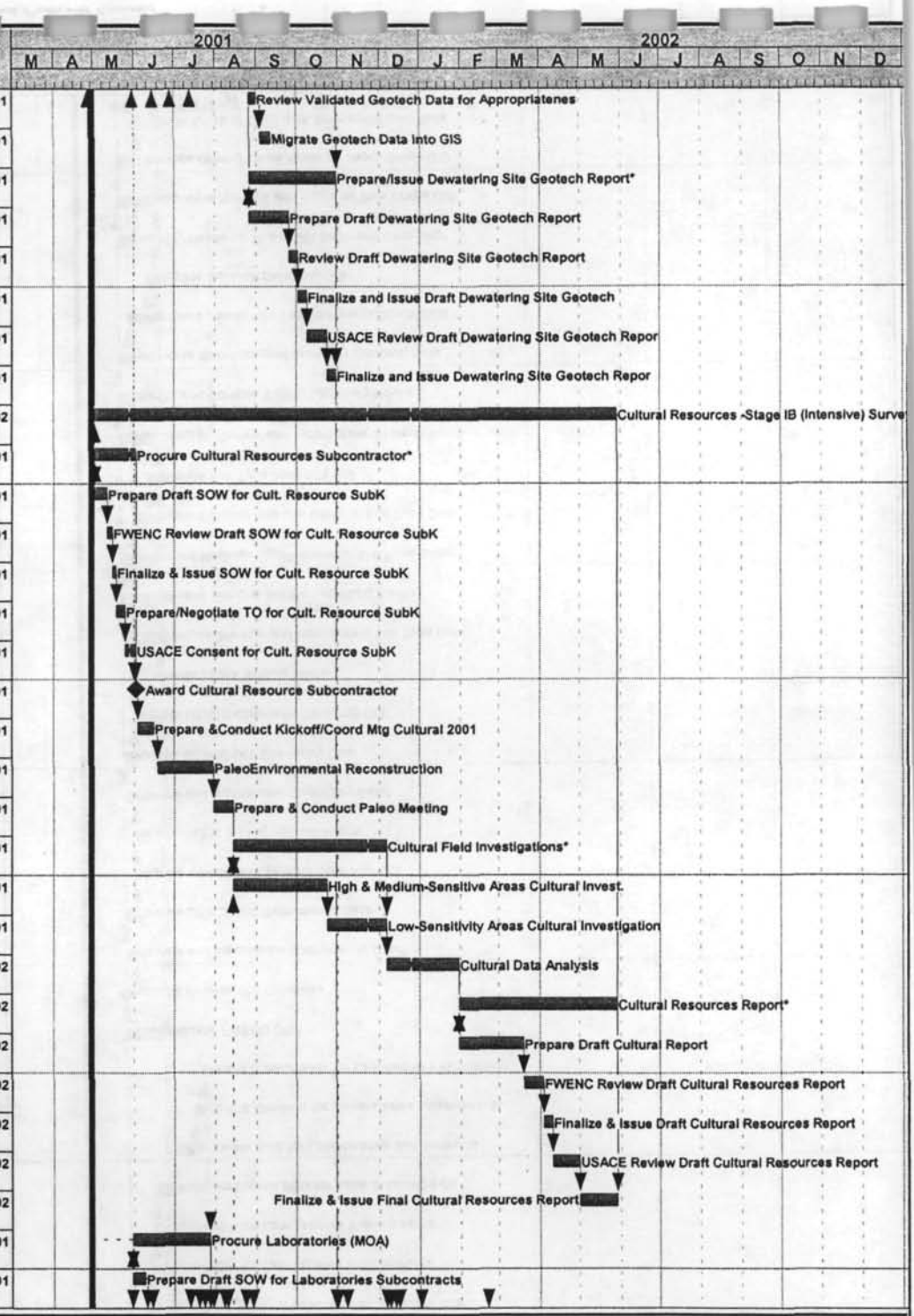
Draft Work Plan Schedule for Remedial Design Dredging [redacted] Mass [redacted]nce S[redacted]t, Sed[redacted] Sam[redacted] Wetland Delineation and Cultural Survey

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B70691D130	11.02.01	Review Validated Geotech Data for Appropriatenes	B70691D125*	5	27AUG01	31AUG01
B70691D135	11.02.99	Migrate Geotech Data into GIS	B70691D130*	5	04SEP01	10SEP01
B70691D140	10.05.96	Prepare/Issue Dewatering Site Geotech Report*	B70691D100*, B70691D145*	45*	27AUG01	29OCT01
B70691D145	10.05.96	Prepare Draft Dewatering Site Geotech Report	B70691D125*	20	27AUG01	24SEP01
B70691D150	10.05.96	Review Draft Dewatering Site Geotech Report	B70691D145*	5	25SEP01	01OCT01
B70691D155	10.05.96	Finalize and Issue Draft Dewatering Site Geotech	B70691D150*	5	02OCT01	08OCT01
B70691D160	10.05.96	USACE Review Draft Dewatering Site Geotech Repor	B70691D155*	10	09OCT01	22OCT01
B70691D165	10.05.96	Finalize and Issue Dewatering Site Geotech Repor	B70691D140*, B70691D160*	5	23OCT01	29OCT01
B70692D000	06.92.01	Cultural Resources -Stage IB (Intensive) Survey*	B70692D001*	272*	02MAY01	28MAY02
B70692D001	06.92.01	Procure Cultural Resources Subcontractor*	B70692D002*	22*	02MAY01	01JUN01
B70692D002	06.92.01	Prepare Draft SOW for Cult. Resource SubK	B70101D065*	7	02MAY01	10MAY01
B70692D003	06.92.01	FWENC Review Draft SOW for Cult. Resource SubK	B70692D002*	3	11MAY01	15MAY01
B70692D004	06.92.01	Finalize & Issue SOW for Cult. Resource SubK	B70692D003*	2	16MAY01	17MAY01
B70692D005	06.92.01	Prepare/Negotiate TO for Cult. Resource SubK	B70692D004*	5	18MAY01	24MAY01
B70692D006	06.92.01	USACE Consent for Cult. Resource SubK	B70692D005*	5	25MAY01	01JUN01
B70692D007	06.92.01	Award Cultural Resource Subcontractor	B70101D200, B70692D001*, B70692D006*	0		01JUN01
B70692D010	06.92.01	Prepare &Conduct Kickoff/Coord Mtg Cultural 2001	B70692D007*	10	04JUN01	15JUN01
B70692D015	06.92.01	PaleoEnvironmental Reconstruction	B70692D010*	30	18JUN01	30JUL01
B70692D020	06.92.01	Prepare & Conduct Paleo Meeting	B70692D015*	10	31JUL01	13AUG01
B70692D025	06.92.01	Cultural Field Investigations*	B70692D030*, B72104D035	80*	14AUG01	06DEC01
B70692D030	06.92.01	High & Medium-Sensitive Areas Cultural Invest.	B70692D020*, B72104D035	50	14AUG01	23OCT01
B70692D035	06.92.01	Low-Sensitivity Areas Cultural Investigation	B70692D025*, B70692D030*	30	24OCT01	06DEC01
B70692D040	06.92.01	Cultural Data Analysis	B70692D035*	35	07DEC01	29JAN02
B70692D045	06.92.01	Cultural Resources Report*	B70692D050*	85*	30JAN02	28MAY02
B70692D050	06.92.01	Prepare Draft Cultural Report	B70692D040*	35	30JAN02	19MAR02
B70692D055	06.92.01	FWENC Review Draft Cultural Resources Report	B70692D050*	10	20MAR02	02APR02
B70692D060	06.92.01	Finalize & Issue Draft Cultural Resources Report	B70692D055*	5	03APR02	09APR02
B70692D065	06.92.01	USACE Review Draft Cultural Resources Report	B70692D060*	15	10APR02	30APR02
B70692D070	06.92.01	Finalize & Issue Final Cultural Resources Report	B70692D000*, B70692D045*, B70692D065*	20	01MAY02	28MAY02
B70804D001	08.04	Procure Laboratories (MOA)	B70603D001*, B70804D002*	40*	31MAY01	26JUL01
B70804D002	08.04	Prepare Draft SOW for Laboratories Subcontracts	B70101D001, B70101D200*	7	31MAY01	08JUN01



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Finish Date	03NOV09
Data Date	30APR01
Run Date	01MAY01 10:03

Early Bar
Progress Bar
Critical Activity

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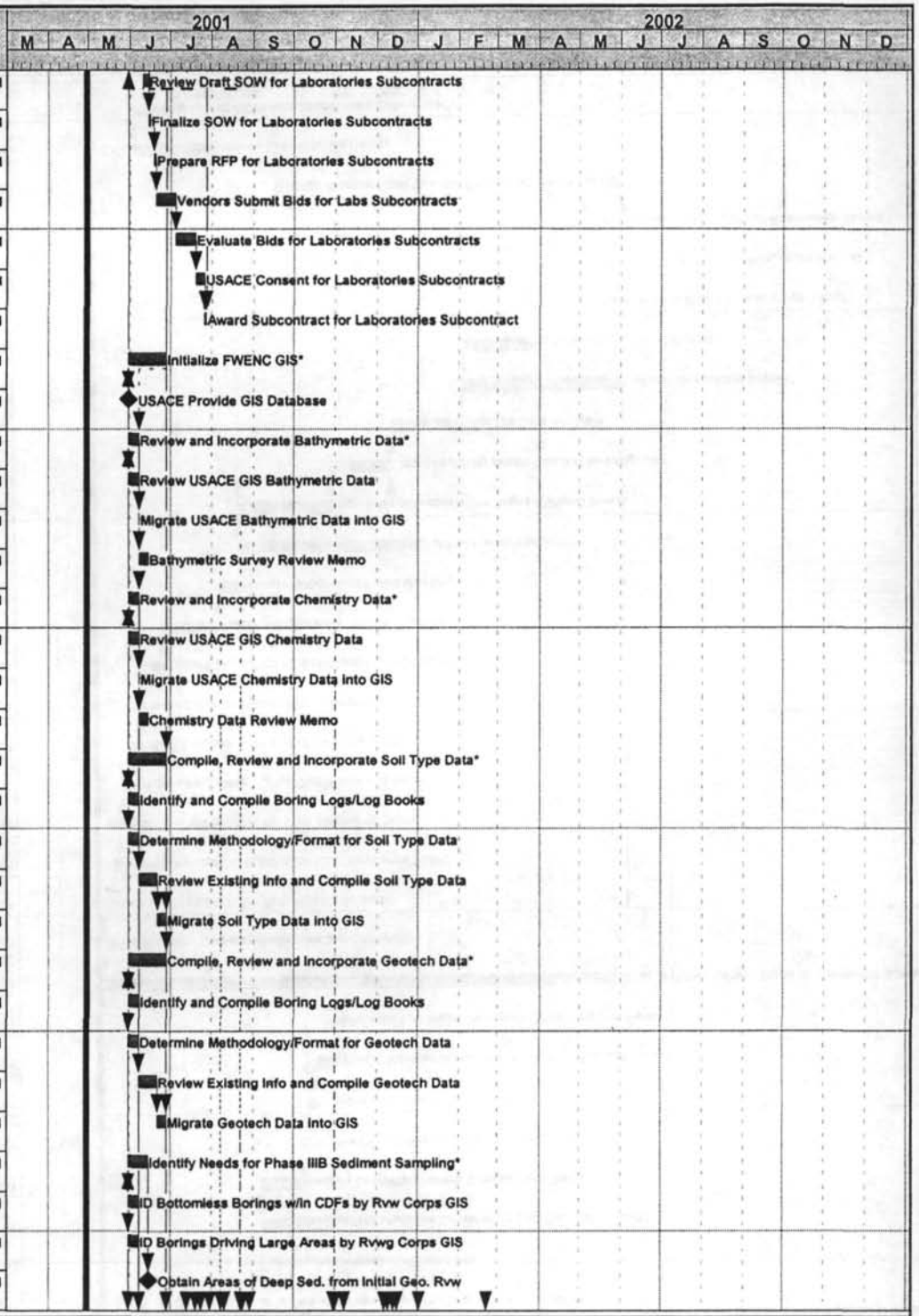
Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B70804D003	08.04	Review Draft SOW for Laboratories Subcontracts	B70804D002*	3	11JUN01	13JUN01
B70804D004	08.04	Finalize SOW for Laboratories Subcontracts	B70804D003*	2	14JUN01	15JUN01
B70804D005	08.04	Prepare RFP for Laboratories Subcontracts	B70804D004*	2	18JUN01	19JUN01
B70804D006	08.04	Vendors Submit Bids for Labs Subcontracts	B70804D005*	10	20JUN01	03JUL01
B70804D007	08.04	Evaluate Bids for Laboratories Subcontracts	B70804D006*	10	05JUL01	18JUL01
B70804D008	08.04	USACE Consent for Laboratories Subcontracts	B70804D007*	5	19JUL01	25JUL01
B70804D009	08.04	Award Subcontract for Laboratories Subcontract	B70804D001*, B70804D008*	1	26JUL01	26JUL01
B71102D000	11.02.99	Initialize FWENC GIS*	B71102D005, B71102D010*, B71102D030*, B71102D050*,	20*	31MAY01	27JUN01
B71102D005	11.02.99	USACE Provide GIS Database	B70101D200*	0		30MAY01
B71102D010	11.02.99	Review and Incorporate Bathymetric Data*	B71102D000, B71102D015*	6*	31MAY01	07JUN01
B71102D015	11.02.99	Review USACE GIS Bathymetric Data	B71102D005*	5	31MAY01	06JUN01
B71102D020	11.02.99	Migrate USACE Bathymetric Data into GIS	B71102D010*, B71102D015*	1	07JUN01	07JUN01
B71102D025	11.02.99	Bathymetric Survey Review Memo	B71102D020*	5	08JUN01	14JUN01
B71102D030	11.02.99	Review and Incorporate Chemistry Data*	B71102D000, B71102D035*	6*	31MAY01	07JUN01
B71102D035	11.02.99	Review USACE GIS Chemistry Data	B71102D005*	5	31MAY01	06JUN01
B71102D040	11.02.99	Migrate USACE Chemistry Data into GIS	B71102D030*, B71102D035*	1	07JUN01	07JUN01
B71102D045	11.02.99	Chemistry Data Review Memo	B71102D040*	5	08JUN01	14JUN01
B71102D050	11.02.91	Compile, Review and Incorporate Soil Type Data*	B71102D000*, B71102D055*	20*	31MAY01	27JUN01
B71102D055	11.02.01	Identify and Compile Boring Logs/Log Books	B70101D200*	5	31MAY01	06JUN01
B71102D060	11.02.01	Determine Methodology/Format for Soil Type Data	B71102D055*	5	31MAY01	06JUN01
B71102D065	11.02.01	Review Existing Info and Compile Soil Type Data	B71102D055*, B71102D060*	10	07JUN01	20JUN01
B71102D070	11.02.99	Migrate Soil Type Data into GIS	B71102D050*, B71102D065*	5	21JUN01	27JUN01
B71102D075	11.02.91	Compile, Review and Incorporate Geotech Data*	B71102D000*, B71102D080*	20*	31MAY01	27JUN01
B71102D080	11.02.91	Identify and Compile Boring Logs/Log Books	B70101D200*	5	31MAY01	06JUN01
B71102D085	11.02.91	Determine Methodology/Format for Geotech Data	B71102D080*	5	31MAY01	06JUN01
B71102D090	11.02.91	Review Existing Info and Compile Geotech Data	B71102D080*, B71102D085*	10	07JUN01	20JUN01
B71102D095	11.02.99	Migrate Geotech Data into GIS	B71102D075*, B71102D090*	5	21JUN01	27JUN01
B71102D200	06.03	Identify Needs for Phase IIIB Sediment Sampling*	B71102D225*	11*	31MAY01	14JUN01
B71102D205	11.02.01	ID Bottomless Borings w/in CDFs by Rvw Corps GIS	B71102D005*	5	31MAY01	06JUN01
B71102D210	11.02.01	ID Borings Driving Large Areas by Rvwg Corps GIS	B71102D005*	5	31MAY01	06JUN01
B71102D215	06.08.01	Obtain Areas of Deep Sed. from Initial Geo. Rvw	B70608D120*, B71102D200*	0		14JUN01



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critic[redacted]y	
[redacted]	[redacted]	[redacted]	

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Sheet 8 of 20

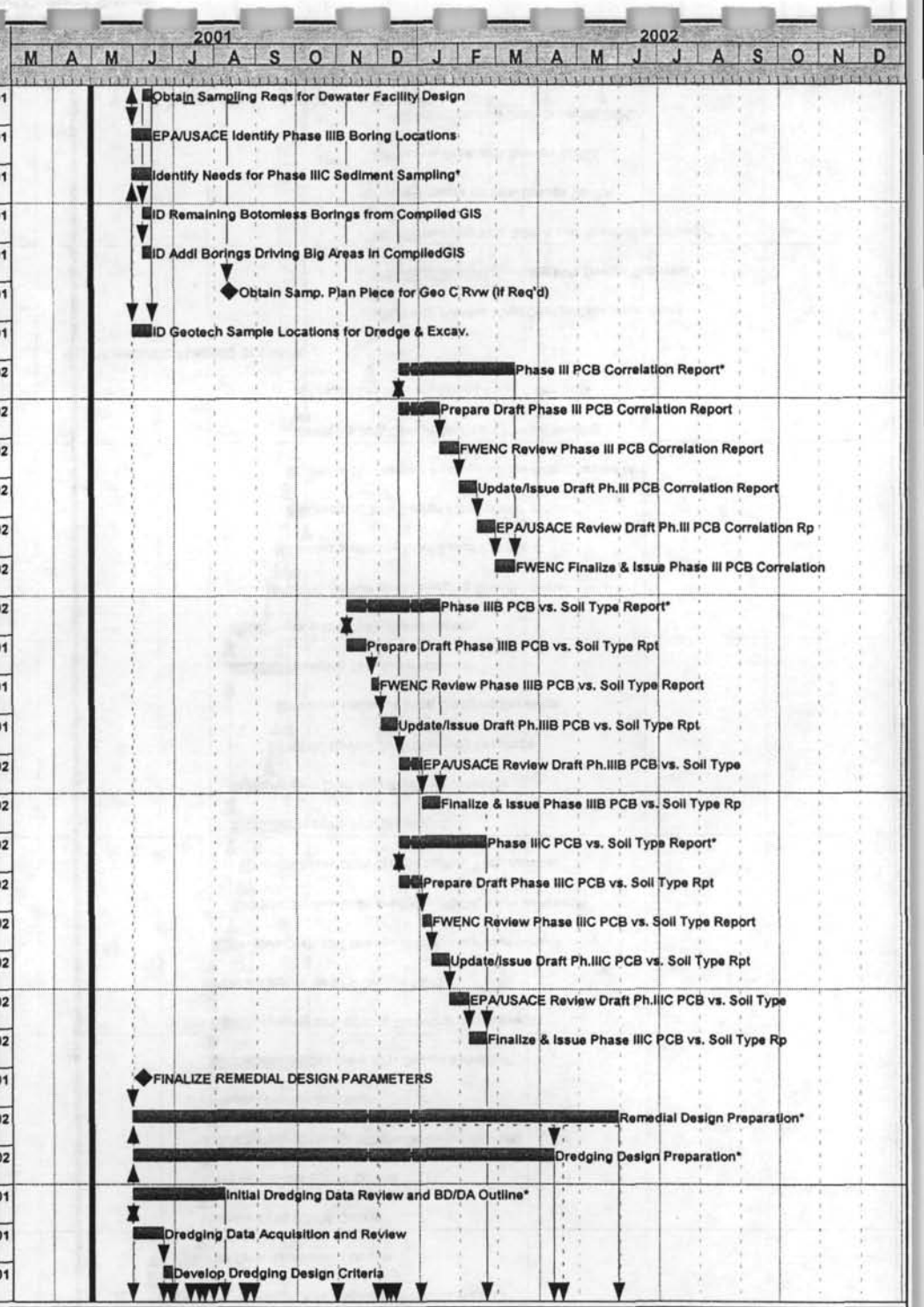
Draft Work Plan Schedule for Remedial Design Dredging

[redacted] Mass[redacted]nce S[redacted], Sec[redacted] Sam[redacted]

Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B71102D220	11.02.91	Obtain Sampling Reqs for Dewater Facility Design	B71102D080*	5	07JUN01	13JUN01
B71102D225	11.02.01	EPA/USACE Identify Phase IIIB Boring Locations	B70101D200*	10	31MAY01	13JUN01
B71102D300	11.02.01	Identify Needs for Phase IIIC Sediment Sampling*	B71102D320*	10*	31MAY01	13JUN01
B71102D305	11.02.01	ID Remaining Botomless Borings from Compiled GIS	B71102D040*	5	08JUN01	14JUN01
B71102D310	11.02.01	ID Addl Borings Driving Big Areas in CompiledGIS	B71102D040*	5	08JUN01	14JUN01
B71102D315	11.02.01	Obtain Samp. Plan Piece for Geo C Rvw (if Req'd)	B70608D305*	0		10AUG01
B71102D320	11.02.01	ID Geotech Sample Locations for Dredge & Excav.	B70101D200*, B71102D300*	10	31MAY01	13JUN01
B71102D400	11.02.01	Phase III PCB Correlation Report*	B71102D405*	60*	17DEC01	13MAR02
B71102D405	11.02.01	Prepare Draft Phase III PCB Correlation Report	B70603D135, B70603D235, B70603D335*	20	17DEC01	16JAN02
B71102D410	11.02.01	FWENC Review Phase III PCB Correlation Report	B71102D405*	10	17JAN02	30JAN02
B71102D415	11.02.01	Update/Issue Draft Ph.III PCB Correlation Report	B71102D410*	10	31JAN02	13FEB02
B71102D420	11.02.01	EPA/USACE Review Draft Ph.III PCB Correlation Rp	B71102D415*	10	14FEB02	27FEB02
B71102D425	11.02.01	FWENC Finalize & Issue Phase III PCB Correlation	B71102D400*, B71102D420*	10	28FEB02	13MAR02
B71102D600	11.02.01	Phase IIIB PCB vs. Soil Type Report*	B71102D605*	45*	08NOV01	16JAN02
B71102D605	11.02.01	Prepare Draft Phase IIIB PCB vs. Soil Type Rpt	B70603D235*	10	08NOV01	21NOV01
B71102D610	11.02.01	FWENC Review Phase IIIB PCB vs. Soil Type Report	B71102D605*	5	26NOV01	30NOV01
B71102D615	11.02.01	Update/Issue Draft Ph.IIIB PCB vs. Soil Type Rpt	B71102D610*	10	03DEC01	14DEC01
B71102D620	11.02.01	EPA/USACE Review Draft Ph.IIIB PCB vs. Soil Type	B71102D615*	10	17DEC01	02JAN02
B71102D625	11.02.01	Finalize & Issue Phase IIIB PCB vs. Soil Type Rp	B71102D600*, B71102D620*	10	03JAN02	16JAN02
B71102D700	11.02.01	Phase IIIC PCB vs. Soil Type Report*	B71102D705*	45*	17DEC01	20FEB02
B71102D705	11.02.01	Prepare Draft Phase IIIC PCB vs. Soil Type Rpt	B70603D335*	10	17DEC01	02JAN02
B71102D710	11.02.01	FWENC Review Phase IIIC PCB vs. Soil Type Report	B71102D705*	5	03JAN02	09JAN02
B71102D715	11.02.01	Update/Issue Draft Ph.IIIC PCB vs. Soil Type Rpt	B71102D710*	10	10JAN02	23JAN02
B71102D720	11.02.01	EPA/USACE Review Draft Ph.IIIC PCB vs. Soil Type	B71102D715*	10	24JAN02	06FEB02
B71102D725	11.02.01	Finalize & Issue Phase IIIC PCB vs. Soil Type Rp	B71102D700*, B71102D720*	10	07FEB02	20FEB02
B72091D000		FINALIZE REMEDIAL DESIGN PARAMETERS	B720330230, B720410116, B721980536*, B721980629	0		06JUN01
B72091D005	20	Remedial Design Preparation*	B70101D200, B72091D015*, B72092D000*, B72093D005*,	254*	31MAY01	30MAY02
B72091D010	20.91	Dredging Design Preparation*	B72091D005, B72091D015*	219*	31MAY01	11APR02
B72091D015	20.91.01	Initial Dredging Data Review and BD/DA Outline*	B72091D020*	48*	31MAY01	07AUG01
B72091D020	20.91.01	Dredging Data Acquisition and Review	B70101D200*	16	31MAY01	21JUN01
B72091D025	20.91.01	Develop Dredging Design Criteria	B72091D020*	5	22JUN01	28JUN01



Start Date	01MAR94
Finish Date	03NOV09
Data Date	30APR01
Run Date	01MAY01 10:03

Early Bar
Progress Bar
Critical Activity

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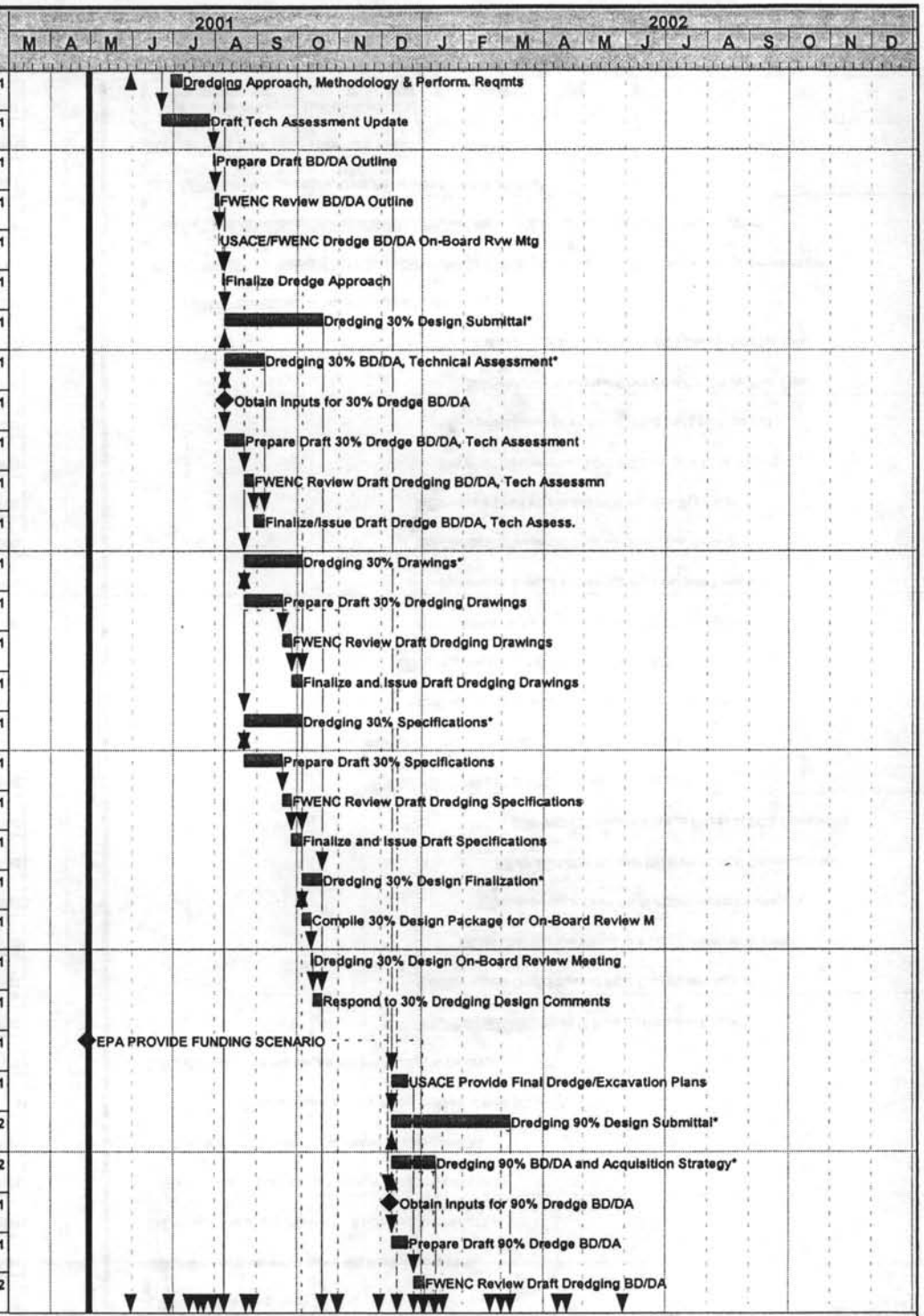
Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72091D030	20.91.01	Dredging Approach, Methodology & Perform. Reqmts	B72091D025*	5	29JUN01	06JUL01
B72091D035	20.91.01	Draft Tech Assessment Update	B72091D020*	25	22JUN01	27JUL01
B72091D037	20.91.01	Prepare Draft BD/DA Outline	B72091D035*	2	30JUL01	31JUL01
B72091D040	20.91.01	FWENC Review BD/DA Outline	B72091D030, B72091D037*	2	01AUG01	02AUG01
B72091D042	20.91.01	USACE/FWENC Dredge BD/DA On-Board Rvw Mtg	B72091D040*	1	03AUG01	03AUG01
B72091D045	20.91.01	Finalize Dredge Approach	B72091D015*, B72091D042*	2	06AUG01	07AUG01
B72091D100	20.91.01	Dredging 30% Design Submittal*	B72091D015, B72091D105*	51*	08AUG01	18OCT01
B72091D105	20.91.01	Dredging 30% BD/DA, Technical Assessment*	B72091D115*	20*	08AUG01	05SEP01
B72091D110	20.91.01	Obtain Inputs for 30% Dredge BD/DA	B70608D125, B71102D025, B71102D045, B72091D045*	0		07AUG01
B72091D115	20.91.01	Prepare Draft 30% Dredge BD/DA, Tech Assessment	B72091D110*	10	08AUG01	21AUG01
B72091D120	20.91.01	FWENC Review Draft Dredging BD/DA, Tech Assessmn	B72091D115*	5	22AUG01	28AUG01
B72091D125	20.91.01	Finalize/Issue Draft Dredge BD/DA, Tech Assess.	B72091D105*, B72091D120*	5	29AUG01	05SEP01
B72091D130	20.91.01	Dredging 30% Drawings*	B72091D105, B72091D135*	30*	22AUG01	03OCT01
B72091D135	20.91.01	Prepare Draft 30% Dredging Drawings	B71102D020, B71102D040, B71102D095, B72091D115*	20	22AUG01	19SEP01
B72091D140	20.91.01	FWENC Review Draft Dredging Drawings	B72091D135*	5	20SEP01	26SEP01
B72091D145	20.91.01	Finalize and Issue Draft Dredging Drawings	B72091D130*, B72091D140*	5	27SEP01	03OCT01
B72091D150	20.91.01	Dredging 30% Specifications*	B72091D105, B72091D155*	30*	22AUG01	03OCT01
B72091D155	20.91.01	Prepare Draft 30% Specifications	B72091D115*	20	22AUG01	19SEP01
B72091D160	20.91.01	FWENC Review Draft Dredging Specifications	B72091D155*	5	20SEP01	26SEP01
B72091D165	20.91.01	Finalize and Issue Draft Specifications	B72091D150*, B72091D160*	5	27SEP01	03OCT01
B72091D170	20.91.01	Dredging 30% Design Finalization*	B72091D100*, B72091D175*, B72196D055	11*	04OCT01	18OCT01
B72091D175	20.91.01	Compile 30% Design Package for On-Board Review M	B72091D045, B72091D125, B72091D145*, B72091D165*	5	04OCT01	10OCT01
B72091D180	20.91.01	Dredging 30% Design On-Board Review Meeting	B72091D175*	1	11OCT01	11OCT01
B72091D185	20.91.01	Respond to 30% Dredging Design Comments	B72091D170*, B72091D180*	5	12OCT01	18OCT01
B72091D200	20.91.02	EPA PROVIDE FUNDING SCENARIO		0		27APR01
B72091D202	20	USACE Provide Final Dredge/Excavation Plans	B70603D330*	10	10DEC01	21DEC01
B72091D205	20.91.02	Dredging 90% Design Submittal*	B72091D100, B72091D210*	61*	10DEC01	07MAR02
B72091D210	20.91.02	Dredging 90% BD/DA and Acquisition Strategy*	B72091D220*	21*	10DEC01	10JAN02
B72091D215	20.91.02	Obtain Inputs for 90% Dredge BD/DA	B70603D330*, B72091D170, B72091D180, B72091D185, B72091D200	0		07DEC01
B72091D220	20.91.02	Prepare Draft 90% Dredge BD/DA	B72091D215*	10	10DEC01	21DEC01
B72091D225	20.91.02	FWENC Review Draft Dredging BD/DA	B72091D220*	5	26DEC01	02JAN02



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critical	
Run Date	01NOV01 10:33		

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Draft Work Plan Schedule for Remedial Design Dredging

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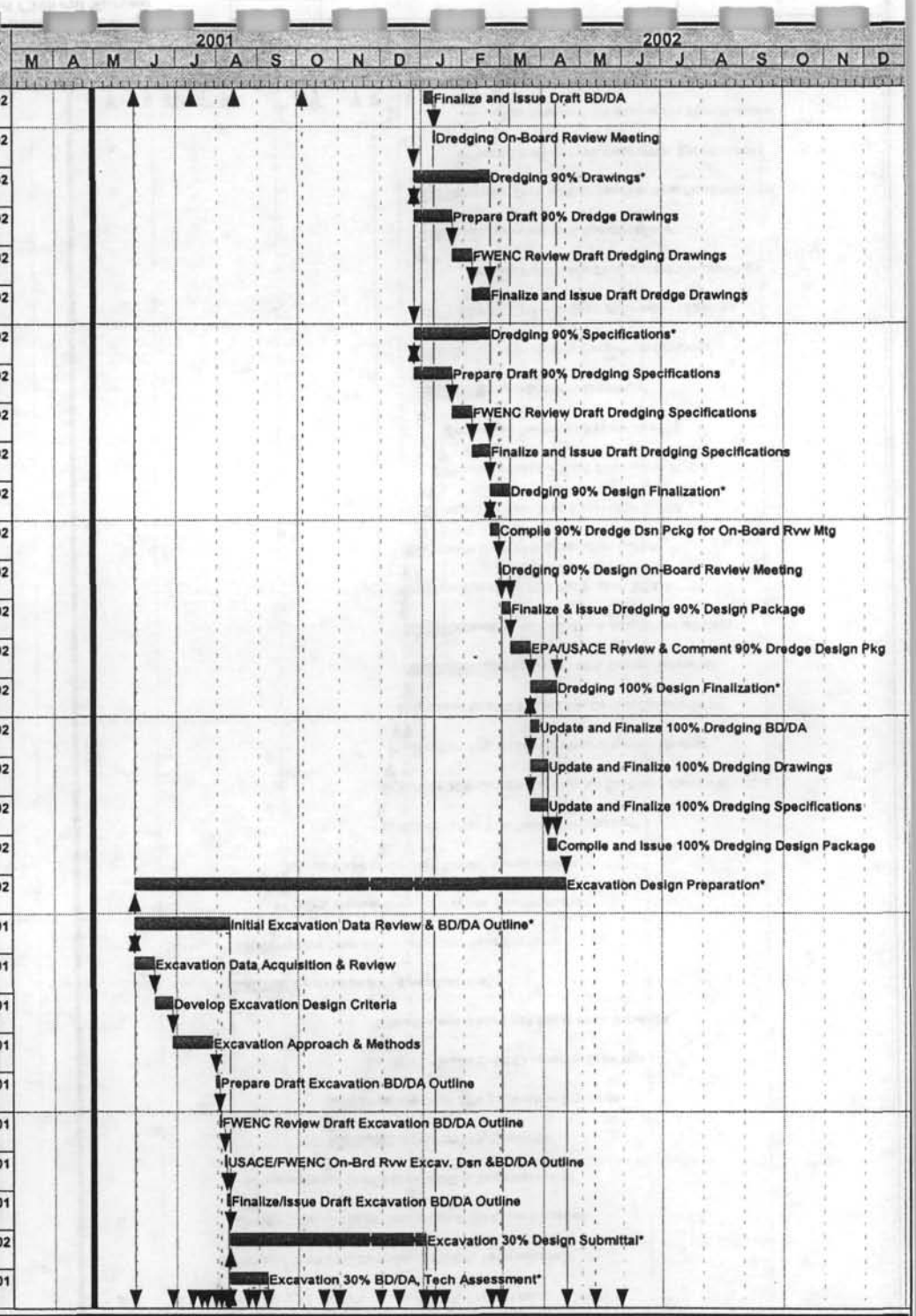
Wetland Delineation and Cultural Survey

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72091D230	20.91.02	Finalize and Issue Draft BD/DA	B72091D225*	5	03JAN02	09JAN02
B72091D235	20.91.02	Dredging On-Board Review Meeting	B72091D210, B72091D210*, B72091D230*	1	10JAN02	10JAN02
B72091D240	20.91.02	Dredging 90% Drawings*	B72091D210, B72091D245*	40*	26DEC01	20FEB02
B72091D245	20.91.02	Prepare Draft 90% Dredge Drawings	B72091D202*, B72091D220*	20	26DEC01	23JAN02
B72091D250	20.91.02	FWENC Review Draft Dredging Drawings	B72091D245*	10	24JAN02	06FEB02
B72091D255	20.91.02	Finalize and Issue Draft Dredge Drawings	B72091D240*, B72091D250*	10	07FEB02	20FEB02
B72091D260	20.91.02	Dredging 90% Specifications*	B72091D210, B72091D265*	40*	26DEC01	20FEB02
B72091D265	20.91.02	Prepare Draft 90% Dredging Specifications	B72091D220*	20	26DEC01	23JAN02
B72091D270	20.91.02	FWENC Review Draft Dredging Specifications	B72091D265*	10	24JAN02	06FEB02
B72091D275	20.91.02	Finalize and Issue Draft Dredging Specifications	B72091D260*, B72091D270*	10	07FEB02	20FEB02
B72091D280	20.91.02	Dredging 90% Design Finalization*	B72091D240, B72091D260, B72091D285*	11*	21FEB02	07MAR02
B72091D285	20.91.02	Compile 90% Dredge Dsn Pckg for On-Board Rvw Mtg	B72091D230, B72091D255*, B72091D275*	5	21FEB02	27FEB02
B72091D290	20.91.02	Dredging 90% Design On-Board Review Meeting	B72091D285*	1	28FEB02	28FEB02
B72091D300	20.91.02	Finalize & Issue Dredging 90% Design Package	B72091D205*, B72091D280*, B72091D290*	5	01MAR02	07MAR02
B72091D305	20.91.02	EPA/USACE Review & Comment 90% Dredge Design Pkg	B72091D300*	10	08MAR02	21MAR02
B72091D400	20.91.03	Dredging 100% Design Finalization*	B72091D010*, B72091D305, B72091D405*, B72091D410*,	15*	22MAR02	11APR02
B72091D405	20.91.03	Update and Finalize 100% Dredging BD/DA	B72091D305*	5	22MAR02	28MAR02
B72091D410	20.91.03	Update and Finalize 100% Dredging Drawings	B72091D305*	10	22MAR02	04APR02
B72091D415	20.91.03	Update and Finalize 100% Dredging Specifications	B72091D305*	10	22MAR02	04APR02
B72091D420	20.91.03	Compile and Issue 100% Dredging Design Package	B72091D400*, B72091D405, B72091D410*, B72091D415*	5	05APR02	11APR02
B72092D000	20.92	Excavation Design Preparation*	B72091D005, B72092D005*	224*	31MAY01	18APR02
B72092D005	20.92.01	Initial Excavation Data Review & BD/DA Outline*	B72092D010*, B72094D010*	50*	31MAY01	09AUG01
B72092D010	20.92.01	Excavation Data Acquisition & Review	B70101D200*	10	31MAY01	13JUN01
B72092D015	20.92.01	Develop Excavation Design Criteria	B72092D010*	10	14JUN01	27JUN01
B72092D020	20.92.01	Excavation Approach & Methods	B72092D015*	21	28JUN01	27JUL01
B72092D025	20.92.01	Prepare Draft Excavation BD/DA Outline	B72092D020*	3	30JUL01	01AUG01
B72092D030	20.92.01	FWENC Review Draft Excavation BD/DA Outline	B72092D025*	2	02AUG01	03AUG01
B72092D035	20.92.01	USACE/FWENC On-Brd Rvw Excav. Dsn &BD/DA Outline	B72092D030*	2	06AUG01	07AUG01
B72092D040	20.92.01	Finalize/Issue Draft Excavation BD/DA Outline	B72092D005*, B72092D035*	2	08AUG01	09AUG01
B72092D045	20.92.01	Excavation 30% Design Submittal*	B72092D005, B72092D050*	98*	10AUG01	02JAN02
B72092D050	20.92.01	Excavation 30% BD/DA, Tech Assessment*	B72092D060*	20*	10AUG01	07SEP01



Start Date	01MAR94
Finish Date	03NOV09
Data Date	30APR01
Run Date	01MAY01 10:03

Early Bar
Progress Bar
Critical Activity

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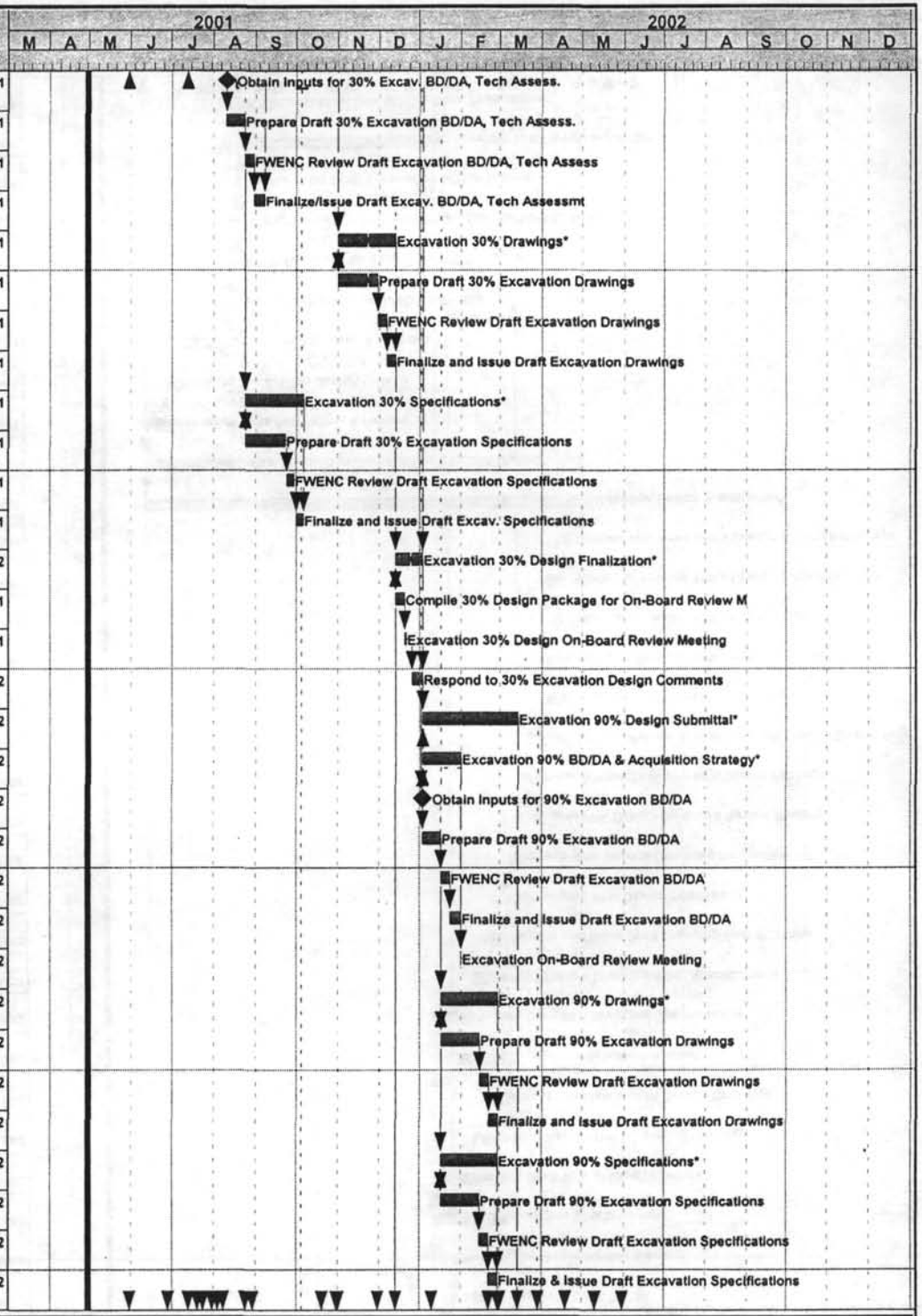
Sheet 11 of 20

Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72092D055	20.92.01	Obtain Inputs for 30% Excav. BD/DA, Tech Assess.	B72092D040*	0		09AUG01
B72092D060	20.92.01	Prepare Draft 30% Excavation BD/DA, Tech Assess.	B72092D040*, B72092D055*	10	10AUG01	23AUG01
B72092D065	20.92.01	FWENC Review Draft Excavation BD/DA, Tech Assess	B72092D060*	5	24AUG01	30AUG01
B72092D070	20.92.01	Finalize/Issue Draft Excav. BD/DA, Tech Assessmt	B72092D050*, B72092D065*	5	31AUG01	07SEP01
B72092D100	20.92.01	Excavation 30% Drawings*	B72092D050, B72092D105*	30*	31OCT01	13DEC01
B72092D105	20.92.01	Prepare Draft 30% Excavation Drawings	B70601D055*, B71102D015, B71102D040, B71102D095, B72091D135, B72092D060	20	31OCT01	29NOV01
B72092D110	20.92.01	FWENC Review Draft Excavation Drawings	B72092D105*	5	30NOV01	06DEC01
B72092D115	20.92.01	Finalize and Issue Draft Excavation Drawings	B72092D100*, B72092D110*	5	07DEC01	13DEC01
B72092D120	20.92.01	Excavation 30% Specifications*	B72092D050, B72092D125*	30*	24AUG01	05OCT01
B72092D125	20.92.01	Prepare Draft 30% Excavation Specifications	B72092D060*	20	24AUG01	21SEP01
B72092D130	20.92.01	FWENC Review Draft Excavation Specifications	B72092D125*	5	24SEP01	28SEP01
B72092D135	20.92.01	Finalize and Issue Draft Excav. Specifications	B72092D120*, B72092D130*	5	01OCT01	05OCT01
B72092D140	20.92.01	Excavation 30% Design Finalization*	B72092D045*, B72092D100, B72092D120, B72092D145*	11*	14DEC01	02JAN02
B72092D145	20.92.01	Compile 30% Design Package for On-Board Review M	B72092D070, B72092D115*, B72092D135	5	14DEC01	20DEC01
B72092D150	20.92.01	Excavation 30% Design On-Board Review Meeting	B72092D145*	1	21DEC01	21DEC01
B72092D155	20.92.01	Respond to 30% Excavation Design Comments	B72092D140*, B72092D150*	5	26DEC01	02JAN02
B72092D200	20.92.02	Excavation 90% Design Submittal*	B72092D045, B72092D205*	51*	03JAN02	14MAR02
B72092D205	20.92.02	Excavation 90% BD/DA & Acquisition Strategy*	B72092D215*	21*	03JAN02	31JAN02
B72092D210	20.92.02	Obtain Inputs for 90% Excavation BD/DA	B70603D330, B72091D200, B72092D155*	0		02JAN02
B72092D215	20.92.02	Prepare Draft 90% Excavation BD/DA	B72092D210*	10	03JAN02	16JAN02
B72092D220	20.92.02	FWENC Review Draft Excavation BD/DA	B72092D215*	5	17JAN02	23JAN02
B72092D225	20.92.02	Finalize and Issue Draft Excavation BD/DA	B72092D220*	5	24JAN02	30JAN02
B72092D230	20.92.02	Excavation On-Board Review Meeting	B72092D205*, B72092D225*	1	31JAN02	31JAN02
B72092D235	20.92.02	Excavation 90% Drawings*	B72092D205, B72092D240*	30*	17JAN02	27FEB02
B72092D240	20.92.02	Prepare Draft 90% Excavation Drawings	B72091D202, B72092D215*	20	17JAN02	13FEB02
B72092D245	20.92.02	FWENC Review Draft Excavation Drawings	B72092D240*	5	14FEB02	20FEB02
B72092D250	20.92.02	Finalize and Issue Draft Excavation Drawings	B72092D235*, B72092D245*	5	21FEB02	27FEB02
B72092D255	20.92.02	Excavation 90% Specifications*	B72092D205, B72092D260*	30*	17JAN02	27FEB02
B72092D260	20.92.02	Prepare Draft 90% Excavation Specifications	B72092D215*	20	17JAN02	13FEB02
B72092D265	20.92.02	FWENC Review Draft Excavation Specifications	B72092D260*	5	14FEB02	20FEB02
B72092D270	20.92.02	Finalize & Issue Draft Excavation Specifications	B72092D255*, B72092D265*	5	21FEB02	27FEB02



Start Date 01MAR94
Finish Date 03NOV09
Data Date 30APR01
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Early Bar
Progress Bar
Critica[redacted]

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Draft Work Plan Schedule for Remedial Design Dredging [redacted] Mass[redacted]ce Su[redacted] Sed[redacted] Samp[redacted] Wetland Delineation, and Cultural Survey

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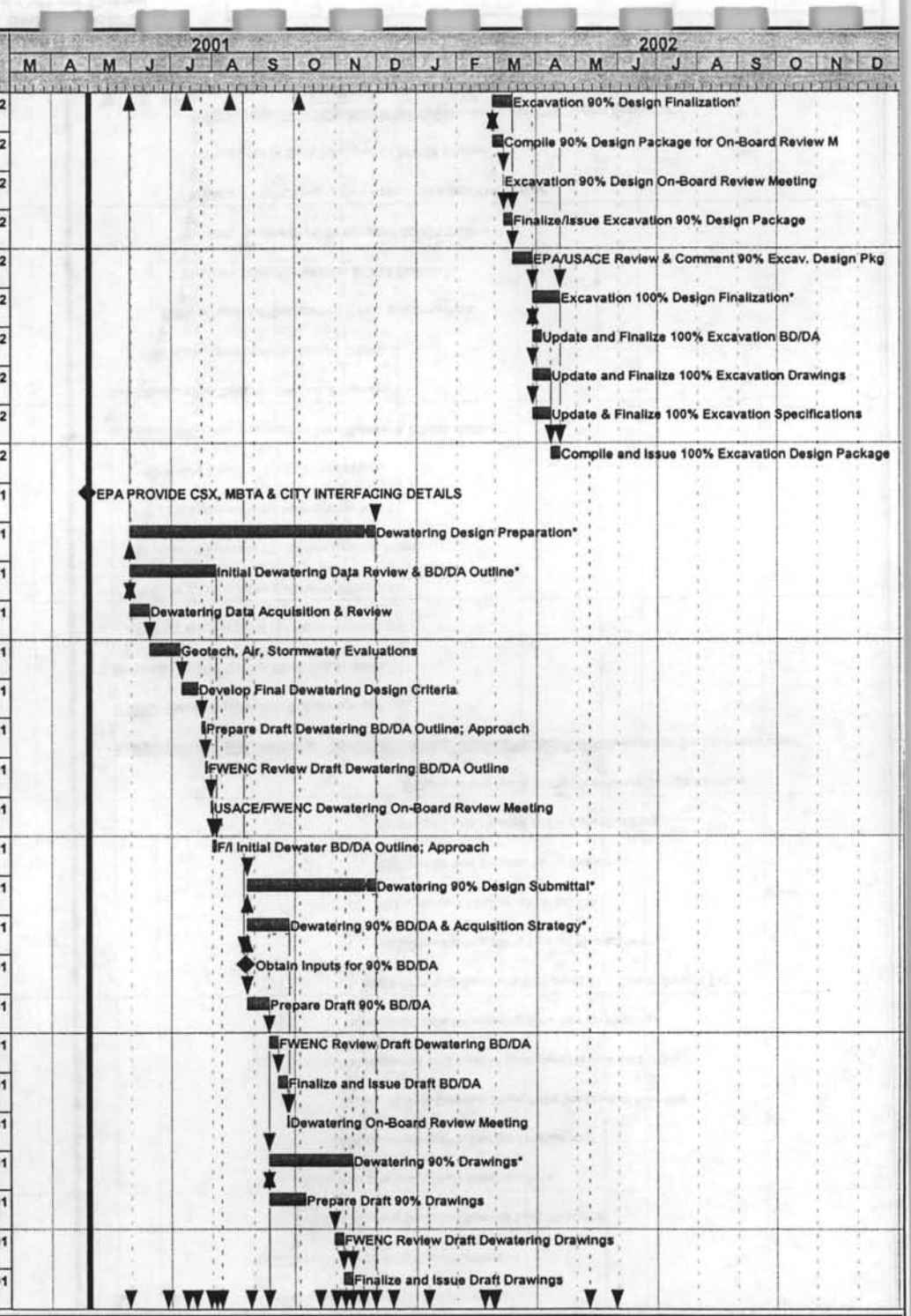
Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72092D275	20.92.02	Excavation 90% Design Finalization*	B72092D280*	11*	28FEB02	14MAR02
B72092D280	20.92.02	Compile 90% Design Package for On-Board Review M	B72092D230, B72092D250*, B72092D270*	5	28FEB02	06MAR02
B72092D285	20.92.02	Excavation 90% Design On-Board Review Meeting	B72092D280*	1	07MAR02	07MAR02
B72092D295	20.92.02	Finalize/Issue Excavation 90% Design Package	B72092D200*, B72092D275*, B72092D285*	5	08MAR02	14MAR02
B72092D300	20.92.02	EPA/USACE Review & Comment 90% Excav. Design Pkg	B72092D295*	10	15MAR02	28MAR02
B72092D400	20.92.03	Excavation 100% Design Finalization*	B72092D000*, B72092D200, B72092D300, B72092D405*	15*	29MAR02	18APR02
B72092D405	20.92.03	Update and Finalize 100% Excavation BD/DA	B72092D300*	5	29MAR02	04APR02
B72092D410	20.92.03	Update and Finalize 100% Excavation Drawings	B72092D300*	10	29MAR02	11APR02
B72092D415	20.92.03	Update & Finalize 100% Excavation Specifications	B72092D300*	10	29MAR02	11APR02
B72092D420	20.92.03	Compile and Issue 100% Excavation Design Package	B72092D400*, B72092D405, B72092D410*, B72092D415*	5	12APR02	18APR02
B72093D000		EPA PROVIDE CSX, MBTA & CITY INTERFACING DETAILS		0		27APR01
B72093D005	20.93	Dewatering Design Preparation*	B72091D005, B72093D010*	127*	31MAY01	29NOV01
B72093D010	20.93.02	Initial Dewatering Data Review & BD/DA Outline*	B72093D011*	45*	31MAY01	02AUG01
B72093D011	20.93.02	Dewatering Data Acquisition & Review	B70101D200*, B72093D000	10	31MAY01	13JUN01
B72093D012	20.93.02	Geotech, Air, Stormwater Evaluations	B72093D011*	16	14JUN01	06JUL01
B72093D013	20.93.02	Develop Final Dewatering Design Criteria	B72093D012*	10	09JUL01	20JUL01
B72093D015	20.93.02	Prepare Draft Dewatering BD/DA Outline; Approach	B70101D200, B72093D013*	3	23JUL01	25JUL01
B72093D020	20.93.02	FWENC Review Draft Dewatering BD/DA Outline	B72093D015*	2	26JUL01	27JUL01
B72093D030	20.93.02	USACE/FWENC Dewatering On-Board Review Meeting	B72093D020*	2	30JUL01	31JUL01
B72093D035	20.93.02	F/I Initial Dewater BD/DA Outline; Approach	B72093D010*, B72093D030*	2	01AUG01	02AUG01
B72093D200	20.93.02	Dewatering 90% Design Submittal*	B72093D010, B72093D205*	66*	27AUG01	29NOV01
B72093D205	20.93.02	Dewatering 90% BD/DA & Acquisition Strategy*	B72093D215*	21*	27AUG01	25SEP01
B72093D210	20.93.02	Obtain Inputs for 90% BD/DA	B70691D125*	0		24AUG01
B72093D215	20.93.02	Prepare Draft 90% BD/DA	B72093D210*	10	27AUG01	10SEP01
B72093D220	20.93.02	FWENC Review Draft Dewatering BD/DA	B72093D215*	5	11SEP01	17SEP01
B72093D225	20.93.02	Finalize and Issue Draft BD/DA	B72093D220*	5	18SEP01	24SEP01
B72093D230	20.93.02	Dewatering On-Board Review Meeting	B72093D205*, B72093D225*	1	25SEP01	25SEP01
B72093D235	20.93.02	Dewatering 90% Drawings*	B72093D205, B72093D240*	45*	11SEP01	12NOV01
B72093D240	20.93.02	Prepare Draft 90% Drawings	B72093D215*	20	11SEP01	08OCT01
B72093D245	20.93.02	FWENC Review Draft Dewatering Drawings	B70691D165*, B72093D240	5	30OCT01	05NOV01
B72093D250	20.93.02	Finalize and Issue Draft Drawings	B72093D235*, B72093D245*	5	06NOV01	12NOV01



Start Date	01MAR94
Finish Date	03NOV09
Data Date	30APR01
Run Date	01MAY01 10:03

Early Bar
Progress Bar
Critical Activity

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Sheet 13 of 20

Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

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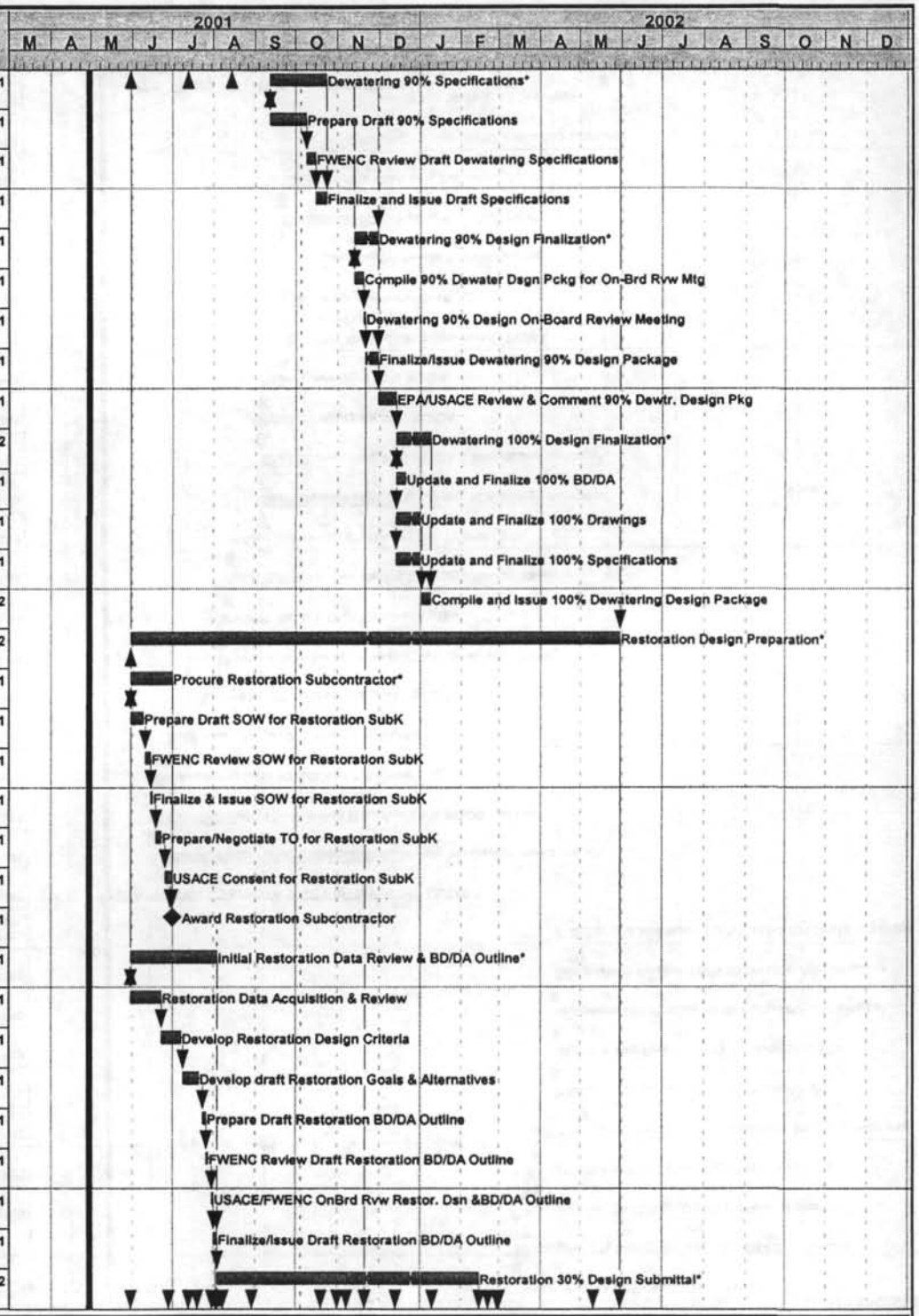
ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72093D255	20.93.02	Dewatering 90% Specifications*	B72093D205, B72093D260*	30*	11SEP01	22OCT01
B72093D260	20.93.02	Prepare Draft 90% Specifications	B72093D215*	20	11SEP01	08OCT01
B72093D265	20.93.02	FWENC Review Draft Dewatering Specifications	B72093D260*	5	09OCT01	15OCT01
B72093D270	20.93.02	Finalize and Issue Draft Specifications	B72093D255*, B72093D265*	5	16OCT01	22OCT01
B72093D275	20.93.02	Dewatering 90% Design Finalization*	B72093D200*, B72093D280*	11*	13NOV01	29NOV01
B72093D280	20.93.02	Compile 90% Dewater Dsgn Pckg for On-Brd Rvw Mtg	B72093D225, B72093D250*, B72093D270	5	13NOV01	19NOV01
B72093D285	20.93.02	Dewatering 90% Design On-Board Review Meeting	B72093D280*	1	20NOV01	20NOV01
B72093D295	20.93.02	Finalize/Issue Dewatering 90% Design Package	B72093D005*, B72093D275*, B72093D285*	5	21NOV01	29NOV01
B72093D300	20.93.02	EPA/USACE Review & Comment 90% Dewtr. Design Pkg	B72093D295*	10	30NOV01	13DEC01
B72093D400	20.93.03	Dewatering 100% Design Finalization*	B72093D300, B72093D405*	15*	14DEC01	08JAN02
B72093D405	20.93.03	Update and Finalize 100% BD/DA	B72093D300*	5	14DEC01	20DEC01
B72093D410	20.93.03	Update and Finalize 100% Drawings	B72093D300*	10	14DEC01	31DEC01
B72093D415	20.93.03	Update and Finalize 100% Specifications	B72093D300*	10	14DEC01	31DEC01
B72093D420	20.93.03	Compile and Issue 100% Dewatering Design Package	B72093D400*, B72093D405, B72093D410*, B72093D415*	5	02JAN02	08JAN02
B72094D000	20.94	Restoration Design Preparation*	B72091D005*, B72094D009*	254*	31MAY01	30MAY02
B72094D001	20.94.01	Procure Restoration Subcontractor*	B72094D002*	22*	31MAY01	29JUN01
B72094D002	20.94.01	Prepare Draft SOW for Restoration SubK	B70101D200*	7	31MAY01	08JUN01
B72094D003	20.94.01	FWENC Review SOW for Restoration SubK	B72094D002*	3	11JUN01	13JUN01
B72094D004	20.94.01	Finalize & Issue SOW for Restoration SubK	B72094D003*	2	14JUN01	15JUN01
B72094D005	20.94.01	Prepare/Negotiate TO for Restoration SubK	B72094D004*	5	18JUN01	22JUN01
B72094D006	20.94.01	USACE Consent for Restoration SubK	B72094D005*	5	25JUN01	29JUN01
B72094D007	20.94.01	Award Restoration Subcontractor	B72094D001*, B72094D006*	0		29JUN01
B72094D009	20.94.01	Initial Restoration Data Review & BD/DA Outline*	B72094D010*	45*	31MAY01	02AUG01
B72094D010	20.94.01	Restoration Data Acquisition & Review	B70101D200*	16	31MAY01	21JUN01
B72094D015	20.94.01	Develop Restoration Design Criteria	B72094D010*	10	22JUN01	06JUL01
B72094D020	20.94.01	Develop draft Restoration Goals & Alternatives	B72094D015*	10	09JUL01	20JUL01
B72094D025	20.94.01	Prepare Draft Restoration BD/DA Outline	B72094D020*	3	23JUL01	25JUL01
B72094D030	20.94.01	FWENC Review Draft Restoration BD/DA Outline	B72094D025*	2	26JUL01	27JUL01
B72094D035	20.94.01	USACE/FWENC OnBrd Rvw Restor. Dsn &BD/DA Outline	B72094D030*	2	30JUL01	31JUL01
B72094D040	20.94.01	Finalize/Issue Draft Restoration BD/DA Outline	B72092D005, B72094D009*, B72094D035*	2	01AUG01	02AUG01
B72094D100	20.94.01	Restoration 30% Design Submittal*	B72094D009, B72094D105*	133*	03AUG01	13FEB02



Start Date 01MAR94
Finish Date 03NOV09
Data Date 30APR01
Early Bar
Progress Bar
Critical

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Draft Work Plan Schedule for Remedial Design Dredging

[redacted] Mass[redacted]ce S[redacted], Sed[redacted] Sam[redacted]

Date	Revision	Checked	Approved
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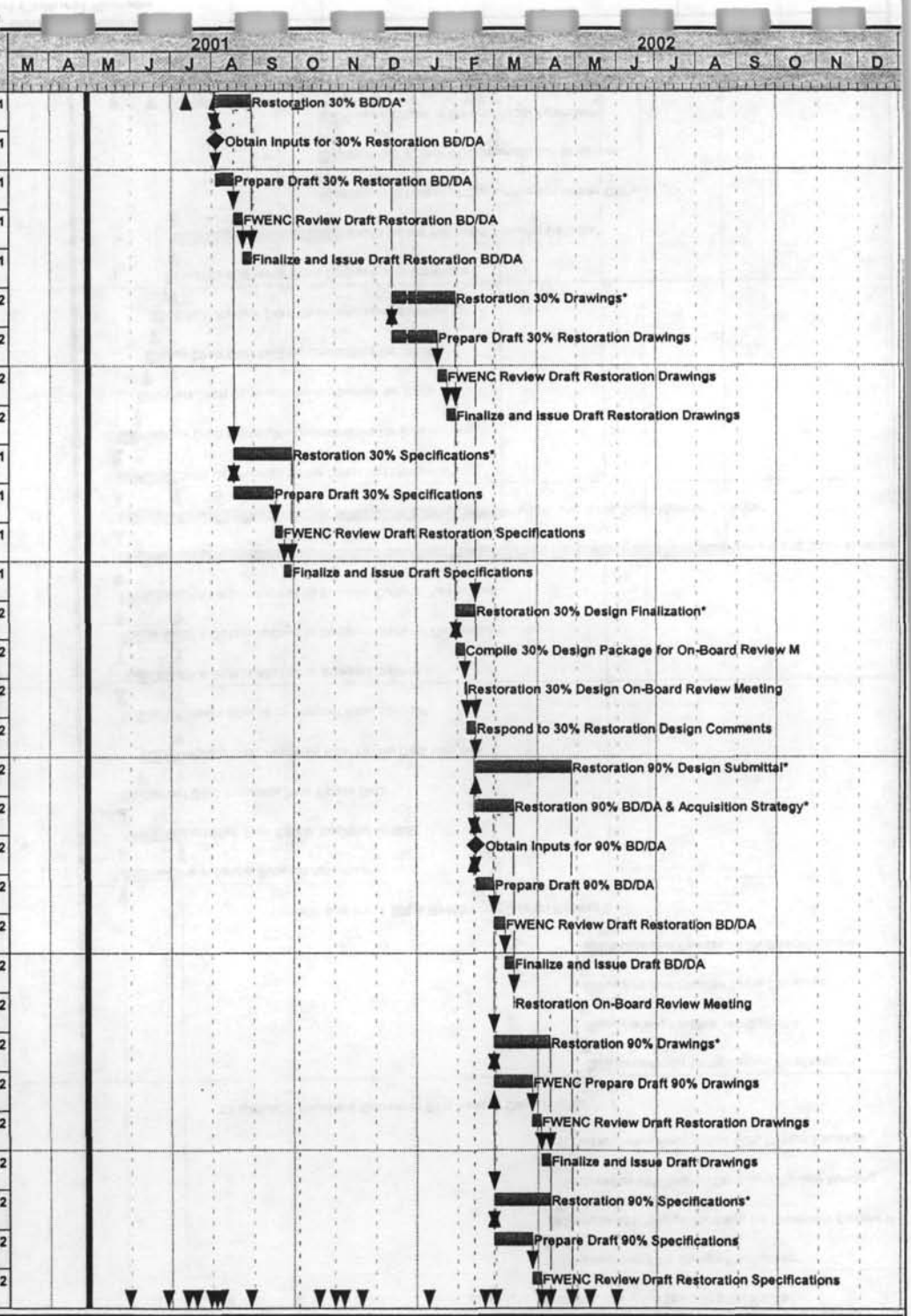
ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72094D105	20.94.01	Restoration 30% BD/DA*	B72094D115*	20*	03AUG01	30AUG01
B72094D110	20.94.01	Obtain Inputs for 30% Restoration BD/DA	B72094D040*	0		02AUG01
B72094D115	20.94.01	Prepare Draft 30% Restoration BD/DA	B72094D007, B72094D040*, B72094D110*	10	03AUG01	16AUG01
B72094D120	20.94.01	FWENC Review Draft Restoration BD/DA	B72094D115*	5	17AUG01	23AUG01
B72094D125	20.94.01	Finalize and Issue Draft Restoration BD/DA	B72094D105*, B72094D120*	5	24AUG01	30AUG01
B72094D130	20.94.01	Restoration 30% Drawings*	B72094D135*	30*	14DEC01	29JAN02
B72094D135	20.94.01	Prepare Draft 30% Restoration Drawings	B70609D000, B70609D038, B72091D130, B72091D145, B72092D100, B72092D115*,	20	14DEC01	15JAN02
B72094D140	20.94.01	FWENC Review Draft Restoration Drawings	B72094D135*	5	16JAN02	22JAN02
B72094D145	20.94.01	Finalize and Issue Draft Restoration Drawings	B72094D130*, B72094D140*	5	23JAN02	29JAN02
B72094D150	20.94.01	Restoration 30% Specifications*	B72094D105, B72094D155*	30*	17AUG01	28SEP01
B72094D155	20.94.01	Prepare Draft 30% Specifications	B72094D115*	20	17AUG01	14SEP01
B72094D160	20.94.01	FWENC Review Draft Restoration Specifications	B72094D155*	5	17SEP01	21SEP01
B72094D165	20.94.01	Finalize and Issue Draft Specifications	B72094D150*, B72094D160*	5	24SEP01	28SEP01
B72094D170	20.94.01	Restoration 30% Design Finalization*	B72094D100*, B72094D175*	11*	30JAN02	13FEB02
B72094D175	20.94.01	Compile 30% Design Package for On-Board Review M	B72094D125, B72094D145*, B72094D165	5	30JAN02	05FEB02
B72094D180	20.94.01	Restoration 30% Design On-Board Review Meeting	B72094D175*	1	06FEB02	06FEB02
B72094D185	20.94.01	Respond to 30% Restoration Design Comments	B72094D170*, B72094D180*	5	07FEB02	13FEB02
B72094D200	20.94.02	Restoration 90% Design Submittal*	B72094D100, B72094D205*	51*	14FEB02	25APR02
B72094D205	20.94.02	Restoration 90% BD/DA & Acquisition Strategy*	B72094D215*	21*	14FEB02	14MAR02
B72094D210	20.94.02	Obtain Inputs for 90% BD/DA	B72094D185*, B72199D160	0		13FEB02
B72094D215	20.94.02	Prepare Draft 90% BD/DA	B72094D210*	10	14FEB02	27FEB02
B72094D220	20.94.02	FWENC Review Draft Restoration BD/DA	B72094D215*	5	28FEB02	06MAR02
B72094D225	20.94.02	Finalize and Issue Draft BD/DA	B72094D220*	5	07MAR02	13MAR02
B72094D230	20.94.02	Restoration On-Board Review Meeting	B72094D205*, B72094D225*	1	14MAR02	14MAR02
B72094D235	20.94.02	Restoration 90% Drawings*	B72094D205, B72094D240*	30*	28FEB02	10APR02
B72094D240	20.94.02	FWENC Prepare Draft 90% Drawings	B72091D240, B72092D235, B72094D215*, B72199D160	20	28FEB02	27MAR02
B72094D245	20.94.02	FWENC Review Draft Restoration Drawings	B72094D240*	5	28MAR02	03APR02
B72094D250	20.94.02	Finalize and Issue Draft Drawings	B72094D235*, B72094D245*	5	04APR02	10APR02
B72094D255	20.94.02	Restoration 90% Specifications*	B72094D205, B72094D260*	30*	28FEB02	10APR02
B72094D260	20.94.02	Prepare Draft 90% Specifications	B72094D215*	20	28FEB02	27MAR02
B72094D265	20.94.02	FWENC Review Draft Restoration Specifications	B72094D260*	5	28MAR02	03APR02



Start Date	01MAR94
Finish Date	03NOV09
Data Date	30APR01
Run Date	01MAY01 10:03

Early Bar
Progress Bar
Critical Activity

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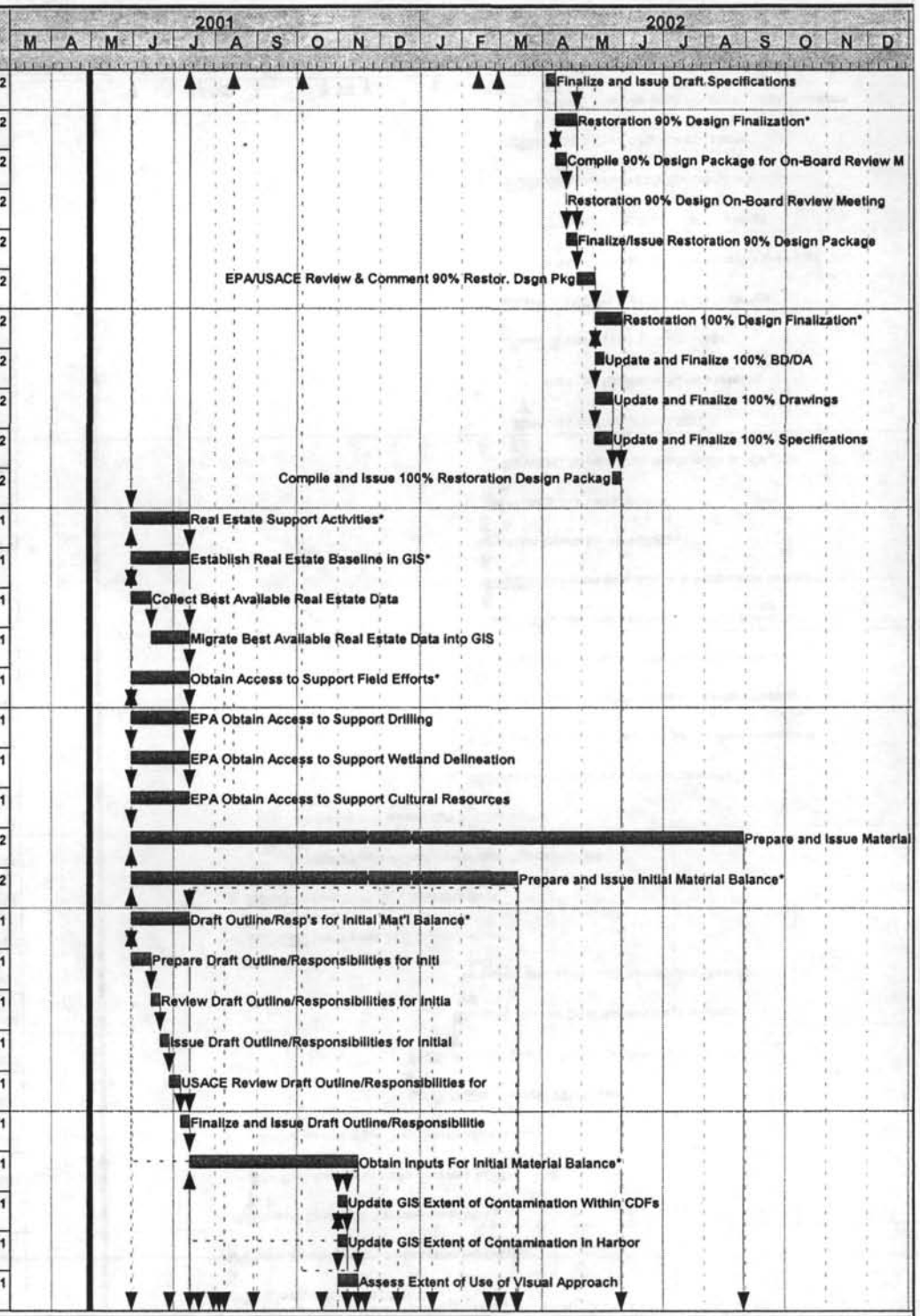
Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72094D270	20.94.02	Finalize and Issue Draft Specifications	B72094D255*, B72094D265*	5	04APR02	10APR02
B72094D275	20.94.02	Restoration 90% Design Finalization*	B72094D200*, B72094D280*	11*	11APR02	25APR02
B72094D280	20.94.02	Compile 90% Design Package for On-Board Review M	B72094D230, B72094D250*, B72094D270*	5	11APR02	17APR02
B72094D285	20.94.02	Restoration 90% Design On-Board Review Meeting	B72094D280*	1	18APR02	18APR02
B72094D295	20.94.02	Finalize/Issue Restoration 90% Design Package	B72094D275*, B72094D285*	5	19APR02	25APR02
B72094D300	20.94.02	EPA/USACE Review & Comment 90% Restor. Dsgn Pkg	B72094D295*	10	26APR02	09MAY02
B72094D400	20.94.03	Restoration 100% Design Finalization*	B72094D000*, B72094D300, B72094D405*	15*	10MAY02	30MAY02
B72094D405	20.94.03	Update and Finalize 100% BD/DA	B72094D300*	5	10MAY02	16MAY02
B72094D410	20.94.03	Update and Finalize 100% Drawings	B72091D410, B72092D410, B72094D300*	10	10MAY02	23MAY02
B72094D415	20.94.03	Update and Finalize 100% Specifications	B72094D300*	10	10MAY02	23MAY02
B72094D420	20.94.03	Compile and Issue 100% Restoration Design Packag	B72094D400*, B72094D405, B72094D410*, B72094D415*	5	24MAY02	30MAY02
B72104D000	21.04.01	Real Estate Support Activities*	B70101D200, B72104D005*, B72104D020*	30*	31MAY01	12JUL01
B72104D005	21.04.01	Establish Real Estate Baseline in GIS*	B72104D000*, B72104D010*	30*	31MAY01	12JUL01
B72104D010	21.04.01	Collect Best Available Real Estate Data	B70101D200*	10	31MAY01	13JUN01
B72104D015	11.02.99	Migrate Best Available Real Estate Data into GIS	B72104D005*, B72104D010*	20	14JUN01	12JUL01
B72104D020	21.04.01	Obtain Access to Support Field Efforts*	B72104D000*, B72104D025*, B72104D030*, B72104D035*	30*	31MAY01	12JUL01
B72104D025	21.04.01	EPA Obtain Access to Support Drilling	B70101D200*, B72104D020*	30	31MAY01	12JUL01
B72104D030	21.04.01	EPA Obtain Access to Support Wetland Delineation	B70101D200*, B72104D020*	30	31MAY01	12JUL01
B72104D035	21.04.01	EPA Obtain Access to Support Cultural Resources	B70101D200*, B72104D020*	30	31MAY01	12JUL01
B72196D000	21.96	Prepare and Issue Material Balances*	B70101D200, B72196D005*	319*	31MAY01	29AUG02
B72196D005	21.96	Prepare and Issue Initial Material Balance*	B72196D010*, B72196D040, B72196D100	198*	31MAY01	13MAR02
B72196D010	21.96	Draft Outline/Resp's for Initial Mat'l Balance*	B72196D005, B72196D015*	30*	31MAY01	12JUL01
B72196D015	21.96	Prepare Draft Outline/Responsibilities for Initi	B70101D200*	10	31MAY01	13JUN01
B72196D020	21.96	Review Draft Outline/Responsibilities for Initia	B72196D015*	5	14JUN01	20JUN01
B72196D025	21.96	Issue Draft Outline/Responsibilities for Initial	B72196D020*	5	21JUN01	27JUN01
B72196D030	21.96	USACE Review Draft Outline/Responsibilities for	B72196D025*	5	28JUN01	05JUL01
B72196D035	21.96	Finalize and Issue Draft Outline/Responsibilitie	B72196D010*, B72196D030*	5	06JUL01	12JUL01
B72196D040	21.96	Obtain Inputs For Initial Material Balance*	B72196D035, B72196D050, B72196D065, B72196D075*	88*	13JUL01	14NOV01
B72196D045	11.02.99	Update GIS Extent of Contamination Within CDFs	B70603D230*, B71102D040, B72196D040, B72196D070, B72196D075	5	01NOV01	07NOV01
B72196D050	11.02.99	Update GIS Extent of Contamination in Harbor	B70603D230*, B71102D040, B72196D035, B72196D040	5	01NOV01	07NOV01
B72196D055	21.96	Assess Extent of Use of Visual Approach	B70603D230*, B70691D125, B72196D040*	10	01NOV01	14NOV01



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critic[redacted]	

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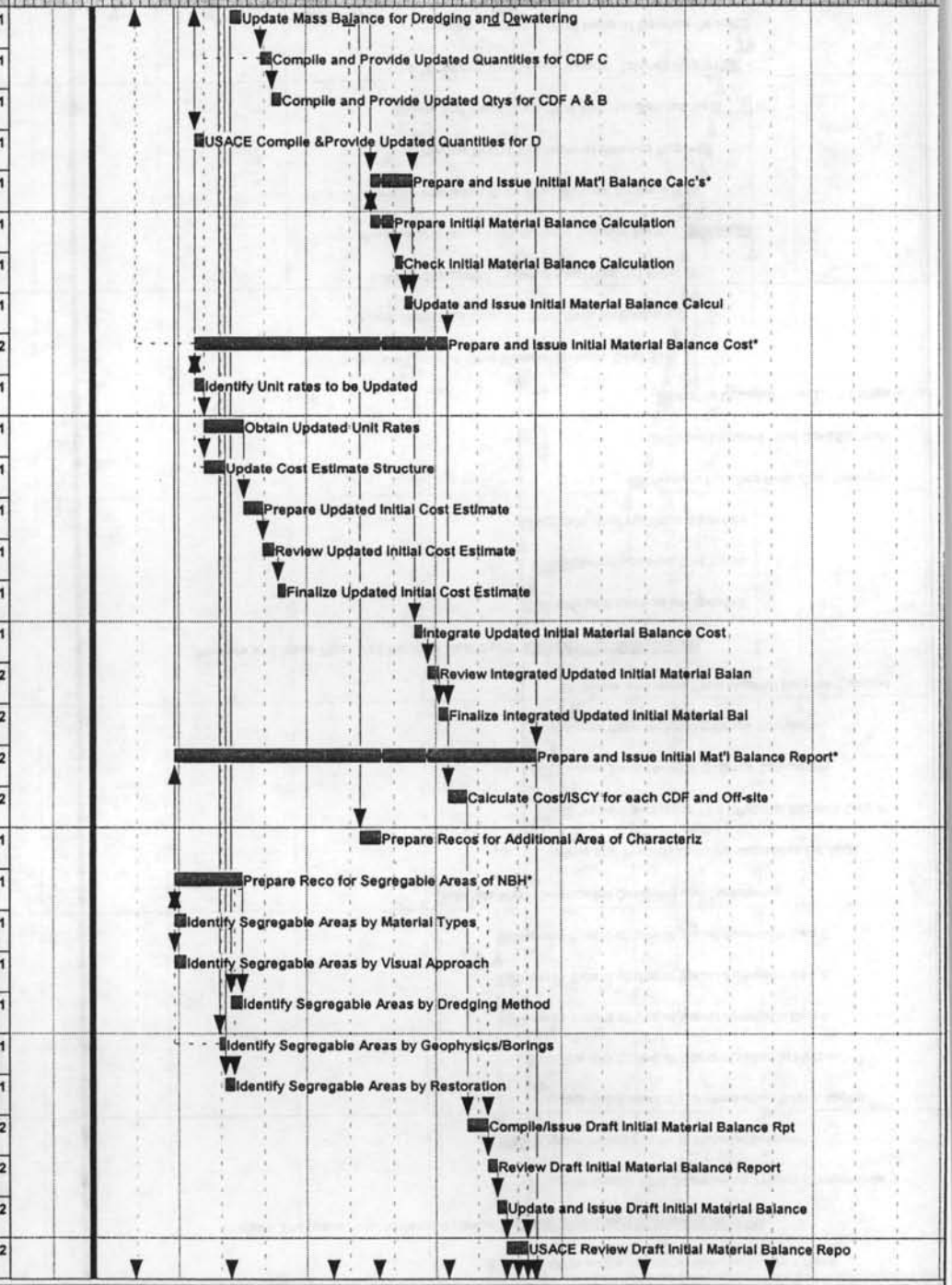
Draft Work Plan Schedule for Remedial Design Dredging

[redacted] Mass[redacted]ce S[redacted], Sed[redacted] Sam[redacted]

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72196D060	21.96	Update Mass Balance for Dredging and Dewatering	B72091D015, B72091D045*, B72093D010	5	08AUG01	14AUG01
B72196D065	21.96	Compile and Provide Updated Quantities for CDF C	B70101D200, B720312120, B720312225, B720312320, B720312335, B720312435,	5	29AUG01	05SEP01
B72196D070	21.96	Compile and Provide Updated Qtys for CDF A & B	B72196D065*	5	06SEP01	12SEP01
B72196D075	21.96	USACE Compile &Provide Updated Quantities for D	B70101D200, B720410120, B72196D035*	5	13JUL01	19JUL01
B72196D080	21.96	Prepare and Issue Initial Mat'l Balance Calc's*	B72196D005, B72196D040, B72196D085*	20*	15NOV01	14DEC01
B72196D085	21.96	Prepare Initial Material Balance Calculation	B72196D045, B72196D050, B72196D055*	10	15NOV01	30NOV01
B72196D090	21.96	Check Initial Material Balance Calculation	B72196D085*	5	03DEC01	07DEC01
B72196D095	21.96	Update and Issue Initial Material Balance Calcul	B72196D080*, B72196D090*	5	10DEC01	14DEC01
B72196D100	21.96	Prepare and Issue Initial Material Balance Cost*	B72196D005, B72196D105*, B72196D115	123*	13JUL01	09JAN02
B72196D105	21.96	Identify Unit rates to be Updated	B70101D200, B72196D035*	5	13JUL01	19JUL01
B72196D110	21.96	Obtain Updated Unit Rates	B72196D105*	20	20JUL01	16AUG01
B72196D115	21.96	Update Cost Estimate Structure	B70101D200, B72196D105*	10	20JUL01	02AUG01
B72196D120	21.96	Prepare Updated Initial Cost Estimate	B72196D110*, B72196D115	10	17AUG01	30AUG01
B72196D125	21.96	Review Updated Initial Cost Estimate	B72196D120*	5	31AUG01	07SEP01
B72196D130	21.96	Finalize Updated Initial Cost Estimate	B72196D125*	5	10SEP01	14SEP01
B72196D135	21.96	Integrate Updated Initial Material Balance Cost	B72196D080, B72196D095*, B72196D130	5	17DEC01	21DEC01
B72196D140	21.96	Review Integrated Updated Initial Material Balan	B72196D135*	5	26DEC01	02JAN02
B72196D145	21.96	Finalize Integrated Updated Initial Material Bal	B72196D100*, B72196D140*	5	03JAN02	09JAN02
B72196D200	21.96	Prepare and Issue Initial Mat'l Balance Report*	B72196D005*, B72196D215*, B72196D235	178*	28JUN01	13MAR02
B72196D205	21.96	Calculate Cost/ISCY for each CDF and Off-site	B72196D100, B72196D145*	10	10JAN02	23JAN02
B72196D210	21.96	Prepare Recos for Additional Area of Characteriz	B72093D035, B72196D040, B72196D045*, B72196D050*	10	08NOV01	21NOV01
B72196D215	21.96	Prepare Reco for Segregable Areas of NBH*	B72196D220*, B72196D225*, B72196D235	33*	28JUN01	14AUG01
B72196D220	21.96	Identify Segregable Areas by Material Types	B71102D070*	5	28JUN01	05JUL01
B72196D225	21.96	Identify Segregable Areas by Visual Approach	B71102D070*	5	28JUN01	05JUL01
B72196D230	21.96	Identify Segregable Areas by Dredging Method	B72091D015, B72091D045*, B72196D215*	5	08AUG01	14AUG01
B72196D235	21.96	Identify Segregable Areas by Geophysics/Borings	B70608D155*	5	30JUL01	03AUG01
B72196D240	21.96	Identify Segregable Areas by Restoration	B72094D009, B72094D040*, B72196D215	5	03AUG01	09AUG01
B72196D245	21.96	Compile/Issue Draft Initial Material Balance Rpt	B72196D205*, B72196D210	10	24JAN02	06FEB02
B72196D250	21.96	Review Draft Initial Material Balance Report	B72196D245*	5	07FEB02	13FEB02
B72196D255	21.96	Update and Issue Draft Initial Material Balance	B72196D250*	5	14FEB02	20FEB02
B72196D260	21.96	USACE Review Draft Initial Material Balance Repo	B72196D200, B72196D255*	10	21FEB02	06MAR02



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critical Activity	
Run Date	01MAY01 10:03		

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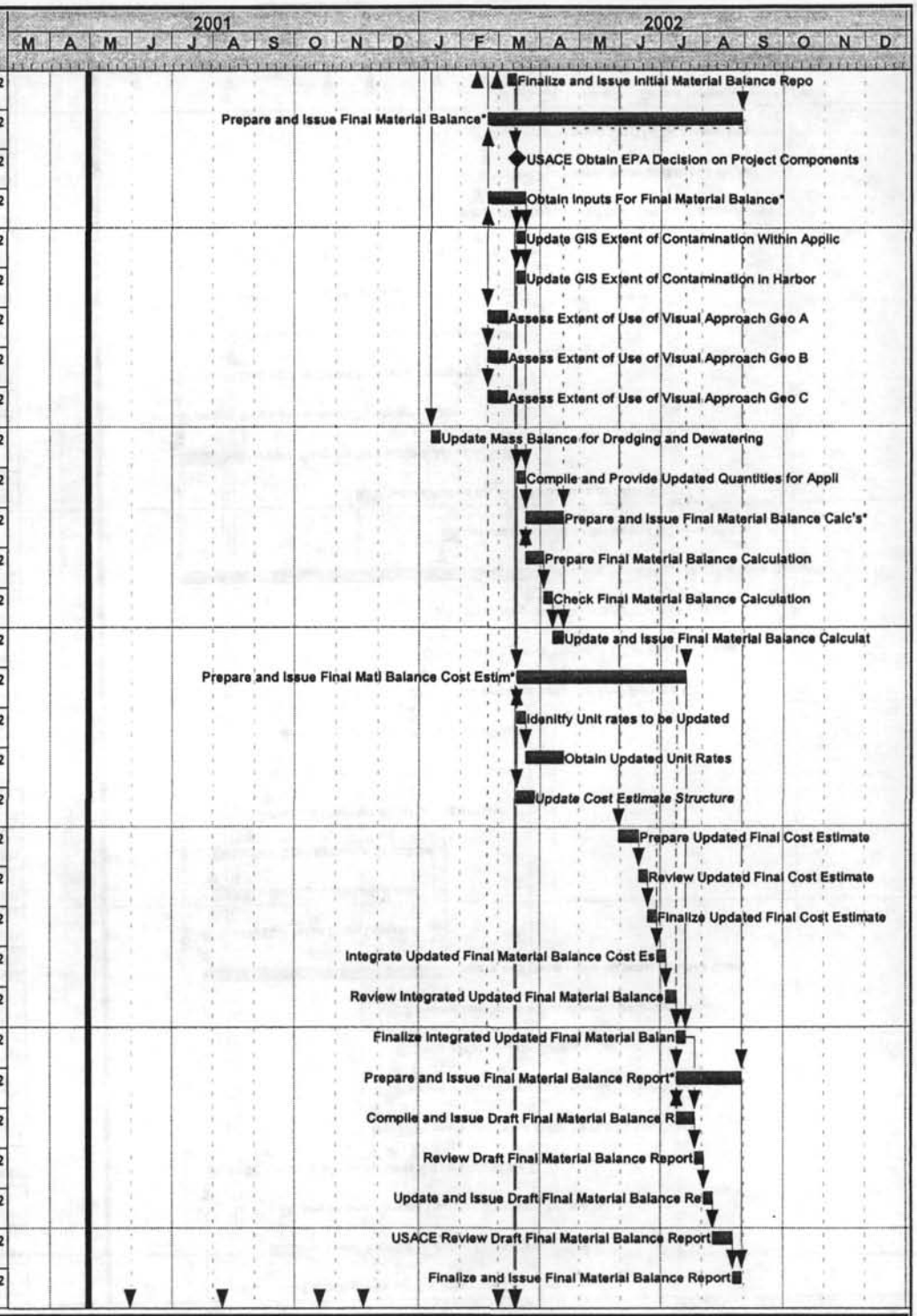
Sheet 17 of 20

Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72196D265	21.96	Finalize and Issue Initial Material Balance Repo	B72196D200*, B72196D260*	5	07MAR02	13MAR02
B72196D300	21.96	Prepare and Issue Final Material Balance*	B72196D000*, B72196D310*, B72196D400, B72196D450	136*	21FEB02	29AUG02
B72196D305	21.96	USACE Obtain EPA Decision on Project Components	B72196D005, B72196D265*	0		13MAR02
B72196D310	21.96	Obtain Inputs For Final Material Balance*	B72196D325*, B72196D330*, B72196D335*	20*	21FEB02	20MAR02
B72196D315	11.02.99	Update GIS Extent of Contamination Within Applic	B72196D305*, B72196D310*	5	14MAR02	20MAR02
B72196D320	11.02.99	Update GIS Extent of Contamination in Harbor	B72196D305*, B72196D310*	5	14MAR02	20MAR02
B72196D325	21.96	Assess Extent of Use of Visual Approach Geo A	B70608D140, B71102D625, B71102D725*	10	21FEB02	06MAR02
B72196D330	21.96	Assess Extent of Use of Visual Approach Geo B	B70608D205, B70608D275, B71102D625, B71102D725*	10	21FEB02	06MAR02
B72196D335	21.96	Assess Extent of Use of Visual Approach Geo C	B70608D320, B71102D625, B71102D725*	10	21FEB02	06MAR02
B72196D340	21.96	Update Mass Balance for Dredging and Dewatering	B72091D210, B72091D230*, B72093D205, B72093D225	5	10JAN02	16JAN02
B72196D345	21.96	Compile and Provide Updated Quantities for Appli	B720312960, B72196D305*, B72196D310*	5	14MAR02	20MAR02
B72196D350	21.96	Prepare and Issue Final Material Balance Calc's*	B72196D300, B72196D310, B72196D355*	20*	21MAR02	17APR02
B72196D355	21.96	Prepare Final Material Balance Calculation	B72196D345*	10	21MAR02	03APR02
B72196D360	21.96	Check Final Material Balance Calculation	B72196D355*	5	04APR02	10APR02
B72196D365	21.96	Update and Issue Final Material Balance Calculat	B72196D350*, B72196D360*	5	11APR02	17APR02
B72196D400	21.96	Prepare and Issue Final Matl Balance Cost Estim*	B72196D300, B72196D305, B72196D405*, B72196D415*	91*	14MAR02	18JUL02
B72196D405	21.96	Idenitfy Unit rates to be Updated	B72196D305*	5	14MAR02	20MAR02
B72196D410	21.96	Obtain Updated Unit Rates	B72196D405*	20	21MAR02	17APR02
B72196D415	*21.96*	*Update Cost Estimate Structure*	*B72196D305**	*10*	*14MAR02*	*27MAR02*
B72196D420	21.96	Prepare Updated Final Cost Estimate	B72091D005, B72094D420*, B72196D410, B72196D415	10	31MAY02	13JUN02
B72196D425	21.96	Review Updated Final Cost Estimate	B72196D420*	5	14JUN02	20JUN02
B72196D430	21.96	Finalize Updated Final Cost Estimate	B72196D425*	5	21JUN02	27JUN02
B72196D435	21.96	Integrate Updated Final Material Balance Cost Es	B72196D350, B72196D365, B72196D430*	5	28JUN02	04JUL02
B72196D440	21.96	Review Integrated Updated Final Material Balance	B72196D435*	5	05JUL02	11JUL02
B72196D445	21.96	Finalize Integrated Updated Final Material Balan	B72196D400*, B72196D440*	5	12JUL02	18JUL02
B72196D450	21.96	Prepare and Issue Final Material Balance Report*	B72196D300*, B72196D350, B72196D455*	35*	12JUL02	29AUG02
B72196D455	21.96	Compile and Issue Draft Final Material Balance R	B72196D365, B72196D445*	10	12JUL02	25JUL02
B72196D460	21.96	Review Draft Final Material Balance Report	B72196D455*	5	26JUL02	01AUG02
B72196D465	21.96	Update and Issue Draft Final Material Balance Re	B72196D460*	5	02AUG02	08AUG02
B72196D470	21.96	USACE Review Draft Final Material Balance Report	B72196D465*	10	09AUG02	22AUG02
B72196D475	21.96	Finalize and Issue Final Material Balance Report	B72196D450*, B72196D470*	5	23AUG02	29AUG02



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critical	

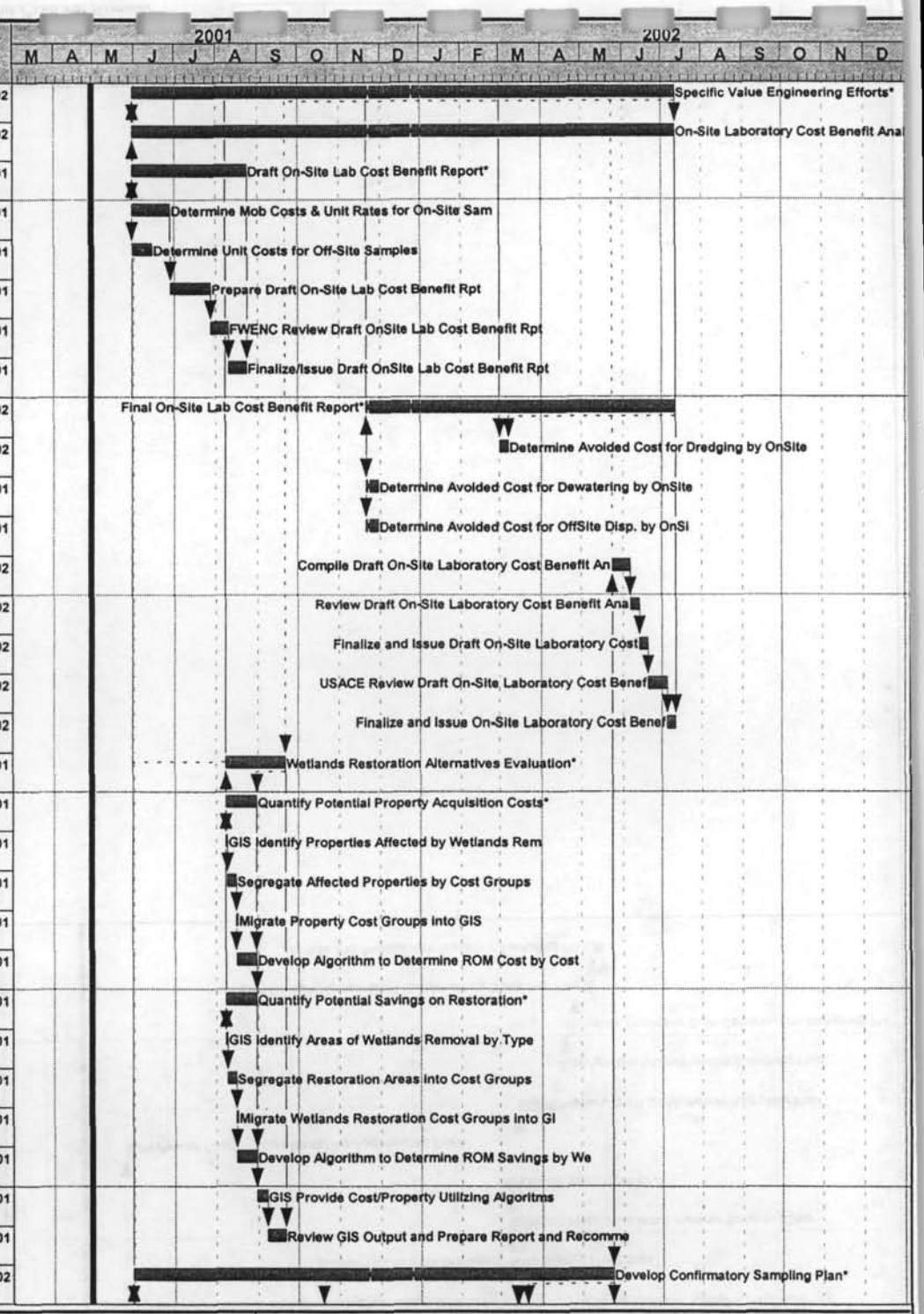
TR1D — Sheet 18 of 20

Draft Work Plan Schedule for Remedial Design Dredging

Mass[redacted]ce S[redacted], Sed[redacted] Sam[redacted]

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72199D000	21.99	Specific Value Engineering Efforts*	B72199D005*, B72199D100, B72199D200*	283*	31MAY01	10JUL02
B72199D005	21.99.01	On-Site Laboratory Cost Benefit Analysis*	B70101D200, B72199D000*, B72199D010*	283*	31MAY01	10JUL02
B72199D010	21.99.01	Draft On-Site Lab Cost Benefit Report*	B72199D015*, B72199D020*	60*	31MAY01	23AUG01
B72199D015	21.99.01	Determine Mob Costs & Unit Rates for On-Site Sam	B70101D200*	20	31MAY01	27JUN01
B72199D020	21.99.01	Determine Unit Costs for Off-Site Samples	B70101D200*	10	31MAY01	13JUN01
B72199D025	21.99.01	Prepare Draft On-Site Lab Cost Benefit Rpt	B72199D015*	20	28JUN01	26JUL01
B72199D030	21.99.01	FWENC Review Draft OnSite Lab Cost Benefit Rpt	B72199D025*	10	27JUL01	09AUG01
B72199D035	21.99.01	Finalize/Issue Draft OnSite Lab Cost Benefit Rpt	B72199D010*, B72199D030*	10	10AUG01	23AUG01
B72199D040	21.99.01	Final On-Site Lab Cost Benefit Report*	B72199D050*, B72199D055*	161*	21NOV01	10JUL02
B72199D045	21.99.01	Determine Avoided Cost for Dredging by OnSite	B72091D205, B72091D290*, B72199D040	5	01MAR02	07MAR02
B72199D050	21.99.01	Determine Avoided Cost for Dewatering by OnSite	B72093D200, B72093D285*	5	21NOV01	29NOV01
B72199D055	21.99.01	Determine Avoided Cost for OffSite Disp. by OnSi	B72093D200, B72093D285*	5	21NOV01	29NOV01
B72199D060	21.99.01	Compile Draft On-Site Laboratory Cost Benefit An	B72199D200, B72199D250*	10	23MAY02	05JUN02
B72199D065	21.99.01	Review Draft On-Site Laboratory Cost Benefit Ana	B72199D060*	5	06JUN02	12JUN02
B72199D070	21.99.01	Finalize and Issue Draft On-Site Laboratory Cost	B72199D065*	5	13JUN02	19JUN02
B72199D075	21.99.01	USACE Review Draft On-Site Laboratory Cost Benef	B72199D070*	10	20JUN02	03JUL02
B72199D080	21.99.01	Finalize and Issue On-Site Laboratory Cost Benef	B72199D005*, B72199D040*, B72199D075*	5	04JUL02	10JUL02
B72199D100	21.99.02	Wetlands Restoration Alternatives Evaluation*	B72199D000, B72199D105*, B72199D130*	31*	08AUG01	20SEP01
B72199D105	21.99.02	Quantify Potential Property Acquisition Costs*	B72199D100, B72199D110*	16*	08AUG01	29AUG01
B72199D110	11.02.99	GIS Identify Properties Affected by Wetlands Rem	B70609D025*, B72104D015	1	08AUG01	08AUG01
B72199D115	21.99.02	Segregate Affected Properties by Cost Groups	B72199D110*	5	09AUG01	15AUG01
B72199D120	11.02.99	Migrate Property Cost Groups into GIS	B72199D115*	1	16AUG01	16AUG01
B72199D125	21.99.02	Develop Algorithm to Determine ROM Cost by Cost	B72199D105*, B72199D115*	10	16AUG01	29AUG01
B72199D130	21.99.02	Quantify Potential Savings on Restoration*	B72199D100, B72199D135*	16*	08AUG01	29AUG01
B72199D135	11.02.99	GIS Identify Areas of Wetlands Removal by Type	B70609D025*	1	08AUG01	08AUG01
B72199D140	21.99.02	Segregate Restoration Areas into Cost Groups	B72199D135*	5	09AUG01	15AUG01
B72199D145	11.02.99	Migrate Wetlands Restoration Cost Groups into GI	B72199D140*	1	16AUG01	16AUG01
B72199D150	21.99.02	Develop Algorithm to Determine ROM Savings by We	B72199D130*, B72199D140*	10	16AUG01	29AUG01
B72199D155	11.02.99	GIS Provide Cost/Property Utilizing Algoritms	B72199D105, B72199D125*, B72199D130, B72199D150*	5	30AUG01	06SEP01
B72199D160	21.99.02	Review GIS Output and Prepare Report and Recomme	B72199D100*, B72199D155*	10	07SEP01	20SEP01
B72199D200	21.99.03	Develop Confirmatory Sampling Plan*	B72199D000, B72199D205*, B72199D230	248*	31MAY01	22MAY02



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critical Activity	
Run Date	01MAY01 10:03		

TR1D

Sheet 19 of 20

Draft Work Plan Schedule for Remedial Design Dredging and Mass Balance Support, Sediment Sampling, Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved

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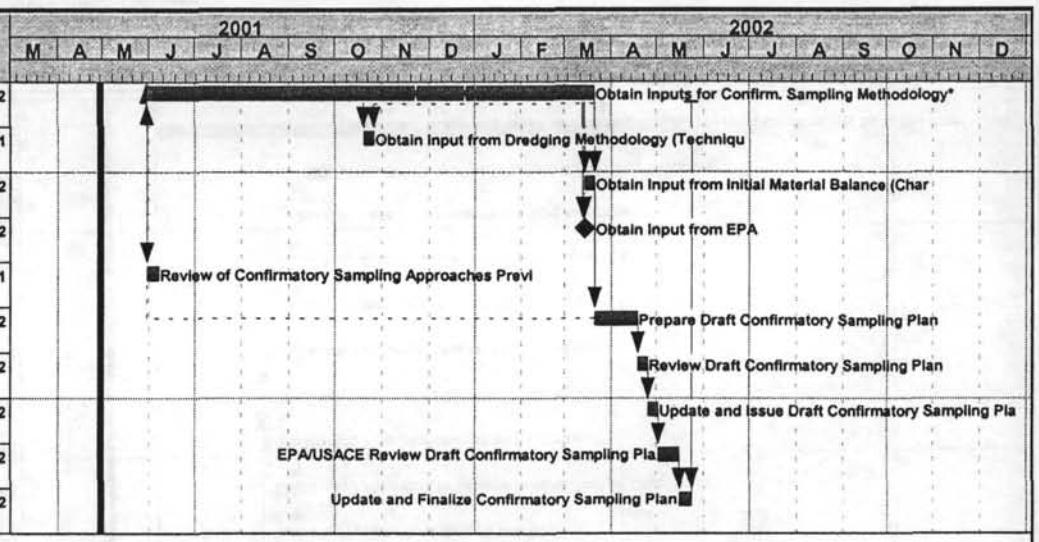
ACTIVITY ID	WBS	ACTIVITY DESCRIPTION	PREDECESSORS	ORIG DUR	EARLY START	EARLY FINISH
B72199D205	21.99.03	Obtain Inputs for Confirm. Sampling Methodology*	B72199D200, B72199D225*	203*	31MAY01	20MAR02
B72199D210	21.99.03	Obtain Input from Dredging Methodology (Techniqu	B72091D170, B72091D180, B72091D185*, B72199D205	5	19OCT01	25OCT01
B72199D215	21.99.03	Obtain Input from Initial Material Balance (Char	B72196D005, B72196D265*, B72199D205*	5	14MAR02	20MAR02
B72199D220	21.99.03	Obtain Input from EPA	B72196D305*, B72199D205	0		13MAR02
B72199D225	21.99.03	Review of Confirmatory Sampling Approaches Previ	B70101D200*	5	31MAY01	06JUN01
B72199D230	21.99.03	Prepare Draft Confirmatory Sampling Plan	B72199D205, B72199D215*	20	21MAR02	17APR02
B72199D235	21.99.03	Review Draft Confirmatory Sampling Plan	B72199D230*	5	18APR02	24APR02
B72199D240	21.99.03	Update and Issue Draft Confirmatory Sampling Pla	B72199D235*	5	25APR02	01MAY02
B72199D245	21.99.03	EPA/USACE Review Draft Confirmatory Sampling Pla	B72199D240*	10	02MAY02	15MAY02
B72199D250	21.99.03	Update and Finalize Confirmatory Sampling Plan	B72199D200*, B72199D245*	5	16MAY02	22MAY02



Start Date	01MAR94	Early Bar	
Finish Date	03NOV09	Progress Bar	
Data Date	30APR01	Critic[redacted]y	
F[redacted]	[redacted]Y01 1[redacted]		

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Draft Work Plan Schedule for Remedial Design Dredging [redacted] Mass [redacted]nce S[redacted]t, Sed[redacted] Sam[redacted] Wetland Delineation, and Cultural Survey

Date	Revision	Checked	Approved
[redacted]	[redacted]	[redacted]	[redacted]

APPENDIX G

SUBMITTAL REGISTER

New Bedford Harbor
TO #17 -Remedial Design
Modification 20
Submittal Register

Task Order: 17 Contract#: Project: New Bedford Harbor Location: New Bedford Date: 5/1/01 Contractor: Foster Wheeler

						Contractor Action	Approving Authority Action				Contractor Action	
WPS ITEM No.	SD No. and Type of Submittal Description	Approval Type	Reviewer(s): See Sheet 2 for Distribution Instructions	Trans. Control No.	Planned Submittal Date	Date Forwarded to Approving Authority/ Date Received From Contractor	Date Forwarded to Other Reviewer	Date Received from other Reviewer	Action Code	Date of Action	Mailed to Contractor/Received from Approving Authority	Remarks
(a)	(b)	(d)	(e)	(f)	(g)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
01 Preparation of Plans												
01.01	**Work Plan**											
	Draft Work Plan	GA	USACE, EPA, DEP									
	Final Work Plan	FIO	USACE, EPA, DEP									
	Response to WP Comments	FIO	USACE, EPA, DEP									
01.03	**Sampling and Analysis Plan (SAP)**											
	Draft SAP Amendment Phase IIIB	GA	USACE, EPA, DEP									
	Final SAP Amendment Phase IIIB	FIO	USACE, EPA, DEP									
	Response to SAP IIIB Comments	FIO	USACE, EPA, DEP									
	Draft SAP Amendment Phase IIIC	GA	USACE, EPA, DEP									
	Final SAP Amendment Phase IIIC	FIO	USACE, EPA, DEP									
	Response to SAP IIIC Comments	FIO	USACE, EPA, DEP									
01.04	**Site Safety and Health Plan (SSHP)**											
	Draft SSHP Amendment	GA	USACE									
	Final SSHP Amendment	FIO	USACE									
	Response to SSHP Amendment	FIO	USACE									
01.08	**Transportation and Storage Plan (TTSP)**											
01.91	**Regulatory Compliance Plan (RCP)**											
	Draft RCP Amendment	GA	USACE									
	Final RCP Amendment	FIO	USACE									
	Response to RCP Amendment	FIO	USACE									
02 Project Management/Support/Administration												
02.01.01	**Conduct Project Management**											
02.01.02	Cost Estimate											
	Submit Cost Estimate	GA										
	Submit Final Estimate	GA	USACE									
	Submit Schedule	FIO	USACE									
	Revise Schedule/Finalize	FIO	USACE									
02.01.03	**Cost/Schedule**											
02.02.01	**Procurement Activities**											
02.91.01	**Health and Safety Support**											
02.91.02	**Regulatory Compliance/Waste Management**											
06 Field Investigation												
06.01	**Site Reconnaissance (Land Surveying)**											
	Surveying Subcontractor Task Order SOW	FIO	USACE									
	Draft Topographic Drawings	FIO	USACE									
	Final Topographic Drawings	GA	USACE									
06.03	**Conduct Geological Investigations (Soil/Sediment)**											
	Vibracore Subcontractor Task Order SOW	FIO	USACE									
	Geoprobe Subcontractor Task Order SOW	FIO	USACE									
	Chemical Lab SOW - Congeners	FIO	USACE									

New Bedford Harbor
TO #17 -Remedial Design
Modification 20
Submittal Register

Task Order: 17	Contract#:	Project: New Bedford Harbor	Location: New Bedford			Date: 5/1/01	Contractor: Foster Wheeler					
						Contractor Action	Approving Authority Action				Contractor Action	
WPS ITEM No.	SD No. and Type of Submittal Description	Approval Type	Reviewer(s): See Sheet 2 for Distribution Instructions	Trans. Control No.	Planned Submittal Date	Date Forwarded to Approving Authority/ Date Received From Contractor	Date Forwarded to Other Reviewer	Date Received from other Reviewer	Action Code	Date of Action	Mailed to Contractor/Received from Approving Authority	Remarks
(a)	(b)	(d)	(e)	(f)	(g)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	Request for Consent: Chemical Lab - Congeners	GA	USACE									
	Chemical Lab SOW - Homologues	FIO	USACE									
	Chemical Lab SOW - Soil Full Suite Analysis	FIO	USACE									
06.08.01	**Conduct Geophysical Investigations - Marine**											
	Geophysics Subcontractor Task Order SOW	FIO	USACE									
	Draft Sub-bottom Report Geophysics Area A	GA	USACE									
	Final Sub-bottom Report Geophysics Area A	FIO	USACE									
	Resp to Comm Sub-bottom Report Geophysics Area A	FIO	USACE									
06.09.01	**Wetlands & Habitat Evaluation**											
	Draft Wetlands and Habitat Evaluation Report	GA	USACE									
	Final Wetlands and Habitat Evaluation Report	FIO	USACE									
	Resp to Comm Wetlands and Habitat Evaluation Report	FIO	USACE									
06.91	**Conduct Geotechnical Investigations**											
	Driller Subcontractor SOW	FIO	USACE									
06.92.02	**Cultural Resources - Stage II Survey**											
	Cultural Resources Subcontractor Task Order SOW	FIO	USACE									
	Draft Cultural Resources Report	GA	USACE									
	Final Cultural Resources Report	FIO	USACE									
	Resp to Comm Cultural Resources Report	FIO	USACE									
08. Off Site Laboratory Sample Analysis												
08.04.01	Analyze Soils and Sediment Samples - Geotech											
08.04.02	Analyze Soils and Sediment Samples - Chemical											
10. Analytical Support/Sample Management/Data Validation												
10.05.91	Validate Soil/Sediment Chemical Data											
10.05.96	Validate Geotech Data											
11. Data Evaluation												
11.02	**Data Reduction, Tabulation and Evaluation**											
11.02.01	**Evaluate Soil/Sediment Data**											
	Sediment Sampling Report - Phase IIIB Week 1	FIO	USACE, USEPA									
	Sediment Sampling Report - Phase IIIB Week 2	FIO	USACE, USEPA									
	Sediment Sampling Report - Phase IIIB Week 3	FIO	USACE, USEPA									
	Sediment Sampling Report - Phase IIIB Week 4	FIO	USACE, USEPA									
	Draft Sediment Sampling Report - Phase IIIB	GA	USACE, USEPA									
	Final Sediment Sampling Report - Phase IIIB	FIO	USACE, USEPA									
	Response to Comments Sediment Sampling Phase IIIB	FIO	USACE, USEPA									
	Draft Phase IIIB PCB vs Soil Type Report	GA	USACE, USEPA									
	Final Phase IIIB PCB vs Soil Type Report	FIO	USACE, USEPA									
	Resp to Comm Phase IIIB PCB vs Soil Type Report	FIO	USACE, USEPA									
	Sediment Sampling Report - Phase IIIC Week 1	FIO	USACE, USEPA									
	Sediment Sampling Report - Phase IIIC Week 2	FIO	USACE, USEPA									

New Bedford Harbor
TO #17 -Remedial Design
Modification 20
Submittal Register

Task Order: 17	Contract#:	Project: New Bedford Harbor	Location: New Bedford			Date: 5/1/01	Contractor: Foster Wheeler					
						Contractor Action	Approving Authority Action				Contractor Action	
WPS ITEM No.	SD No. and Type of Submittal Description	Approval Type	Reviewer(s): See Sheet 2 for Distribution Instructions	Trans. Control No.	Planned Submittal Date	Date Forwarded to Approving Authority/ Date Received From Contractor	Date Forwarded to Other Reviewer	Date Received from other Reviewer	Action Code	Date of Action	Mailed to Contractor/Received from Approving Authority	Remarks
(a)	(b)	(d)	(e)	(f)	(g)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	Sediment Sampling Report - Phase IIIC Week 3	FIO	USACE, USEPA									
	Sediment Sampling Report - Phase IIIC Week 4	FIO	USACE, USEPA									
	Draft Sediment Sampling Report - Phase IIIC	GA	USACE, USEPA									
	Final Sediment Sampling Report - Phase IIIC	FIO	USACE, USEPA									
	Response to Comments Sediment Sampling Phase IIIC	FIO	USACE, USEPA									
	Draft Phase IIIC PCB vs Soil Type Report	GA	USACE, USEPA									
	Final Phase IIIC PCB vs Soil Type Report	FIO	USACE, USEPA									
	Resp to Comm Phase IIIC PCB vs Soil Type Report	FIO	USACE, USEPA									
	Draft Phase III PCB Correlation Report	GA	USACE, USEPA									
	Final Phase III PCB Correlation Report	FIO	USACE, USEPA									
	Resp to Comm Phase III PCB Correlation Report	FIO	USACE, USEPA									
11.02.91	**Evaluate Geotech Data**											
	Draft Dewatering Area Geotechnical Report	GA	USACE									
	Final Dewatering Area Geotechnical Report	FIO	USACE									
	Resp to Comm Dewatering Area Geotechnical Report	FIO	USACE									
11.02.99	**GIS Data Management**											
20. Design Preparation												
20.91	**Dredging Design Support**											
20.91.01	**30% Design**											
	Draft Dredging BD/DA Outline & Technical Approach	GA	USACE									
	Final Dredging BD/DA Outline & Technical Approach	FIO	USACE									
	Resp to Comm Dredging BD/DA Outline & Technical Appro	FIO	USACE									
	Draft 30% Dredging BD/DA & Technical Assessment	GA	USACE									
	Final 30% Dredging BD/DA & Technical Assessment	FIO	USACE									
	Resp to Comm 30% Dredging BD/DA & Technical Assessm	FIO	USACE									
	Draft 30% Dredging Drawings	FIO	USACE									
	Draft 30% Dredging Specifications	FIO	USACE									
	30% Dredging Design Package On-Board Review	FIO	USACE									
	Response to Comments 30% Dredging Design Package	FIO	USACE									
20.91.02	**90% Design**											
	Draft 90% Dredging BD/DA and Acquisition Strategy	GA	USACE									
	Draft 90% Dredging Drawings	FIO	USACE									
	Draft 90% Dredging Specifications	FIO	USACE									
	90% Dredging Design Package On-Board Review	FIO	USACE									
	Response to Comments 90% Dredging Design Package	FIO	USACE									
20.91.03	**100% Design**											
	100% Dredging BD/DA	GA	USACE									
	100% Dredging Drawings	GA	USACE									
	100% Dredging Specifications	GA	USACE									
20.92	**Excavation Design**											

New Bedford Harbor
TO #17 -Remedial Design
Modification 20
Submittal Register

Task Order: 17	Contract#:	Project: New Bedford Harbor	Location: New Bedford			Date: 5/1/01	Contractor: Foster Wheeler					
						Contractor Action	Approving Authority Action				Contractor Action	
WPS ITEM No.	SD No. and Type of Submittal Description	Approval Type	Reviewer(s): See Sheet 2 for Distribution Instructions	Trans. Control No.	Planned Submittal Date	Date Forwarded to Approving Authority/ Date Received From Contractor	Date Forwarded to Other Reviewer	Date Received from other Reviewer	Action Code	Date of Action	Mailed to Contractor/Received from Approving Authority	Remarks
(a)	(b)	(d)	(e)	(f)	(g)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
20.92.01	**30% Design**											
	Draft Excavation BD/DA Outline & Technical Approach	GA	USACE									
	Final Excavation BD/DA Outline & Technical Approach	FIO	USACE									
	Resp to Comm Excavation BD/DA Outline & Technical App	FIO	USACE									
	Draft 30% Excavation BD/DA & Technical Assessment	GA	USACE									
	Final 30% Excavation BD/DA & Technical Assessment	FIO	USACE									
	Resp to Comm 30% Excavation BD/DA & Technical Asses	FIO	USACE									
	Draft 30% Excavation Drawings	FIO	USACE									
	Draft 30% Excavation Specifications	FIO	USACE									
	30% Excavation Design Package On-Board Review	FIO	USACE									
	Response to Comments 30% Excavation Design Package	FIO	USACE									
20.92.02	**90% Design**											
	Draft 90% Excavation BD/DA and Acquisition Strategy	GA	USACE									
	Draft 90% Excavation Drawings	FIO	USACE									
	Draft 90% Excavation Specifications	FIO	USACE									
	90% Excavation Design Package On-Board Review	FIO	USACE									
	Response to Comments 90% Excavation Design Package	FIO	USACE									
20.92.03	**100% Design**											
	100% Excavation BD/DA	GA	USACE									
	100% Excavation Drawings	GA	USACE									
	100% Excavation Specifications	GA	USACE									
20.93	**Dewatering Design Support**											
20.93.01	**30% Design**											
	Draft Dewatering BD/DA Outline & Technical Approach	GA	USACE									
	Final Dewatering BD/DA Outline & Technical Approach	FIO	USACE									
	Resp to Comm Dewatering BD/DA Outline & Technical Ap	FIO	USACE									
	Draft 30% Dewatering BD/DA & Technical Assessment	GA	USACE									
	Final 30% Dewatering BD/DA & Technical Assessment	FIO	USACE									
	Resp to Comm 30% Dewatering BD/DA & Technical Asses	FIO	USACE									
	Draft 30% Dewatering Drawings	FIO	USACE									
	Draft 30% Dewatering Specifications	FIO	USACE									
	30% Dewatering Design Package On-Board Review	FIO	USACE									
	Response to Comments 30% Dewatering Design Package	FIO	USACE									
20.93.02	**90% Design**											
	Draft 90% Dewatering BD/DA and Acquisition Strategy	GA	USACE									
	Draft 90% Dewatering Drawings	FIO	USACE									
	Draft 90% Dewatering Specifications	FIO	USACE									
	90% Dewatering Design Package On-Board Review	FIO	USACE									
	Response to Comments 90% Dewatering Design Package	FIO	USACE									
20.93.03	**100% Design**											
	100% Dewatering BD/DA	GA	USACE									

New Bedford Harbor
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Modification 20
Submittal Register

Task Order: 17	Contract#:	Project: New Bedford Harbor	Location: New Bedford			Date: 5/1/01	Contractor: Foster Wheeler					
						Contractor Action	Approving Authority Action				Contractor Action	
WPS ITEM No.	SD No. and Type of Submittal Description	Approval Type	Reviewer(s): See Sheet 2 for Distribution Instructions	Trans. Control No.	Planned Submittal Date	Date Forwarded to Approving Authority/ Date Received From Contractor	Date Forwarded to Other Reviewer	Date Received from other Reviewer	Action Code	Date of Action	Mailed to Contractor/Received from Approving Authority	Remarks
(a)	(b)	(d)	(e)	(f)	(g)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
	100% Dewatering Drawings	GA	USACE									
	100% Dewatering Specifications	GA	USACE									
20.94	**Restoration Design Support**											
20.94.01	**30% Design**											
	Draft Restoration BD/DA Outline & Technical Approach	GA	USACE									
	Final Restoration BD/DA Outline & Technical Approach	FIO	USACE									
	Resp to Comm Restoration BD/DA Outline & Technical Ap	FIO	USACE									
	Draft 30% Restoration BD/DA & Technical Assessment	GA	USACE									
	Final 30% Restoration BD/DA & Technical Assessment	FIO	USACE									
	Resp to Comm 30% Restoration BD/DA & Technical Asses	FIO	USACE									
	Draft 30% Restoration Drawings	FIO	USACE									
	Draft 30% Restoration Specifications	FIO	USACE									
	30% Restoration Design Package On-Board Review	FIO	USACE									
	Response to Comments 30% Restoration Design Package	FIO	USACE									
20.94.02	**90% Design**											
	Draft 90% Restoration BD/DA and Acquisition Strategy	GA	USACE									
	Draft 90% Restoration Drawings	FIO	USACE									
	Draft 90% Restoration Specifications	FIO	USACE									
	90% Restoration Design Package On-Board Review	FIO	USACE									
	Response to Comments 90% Restoration Design Package	FIO	USACE									
20.94.03	**100% Design**											
	100% Restoration BD/DA	GA	USACE									
	100% Restoration Drawings	GA	USACE									
	100% Restoration Specifications	GA	USACE									
21 Value Engineering/Special Studies												
21.04.01	**Real Estate**											
21.96	**Material Balance**											
	Draft Outline/Responsibilities Initial Material Balance	GA	USACE									
	Final Outline/Responsibilities Initial Material Balance	FIO	USACE									
	Draft Initial Material Balance Calculation	FIO	USACE									
	Draft Initial Cost Estimate	FIO	USACE									
	Draft Initial Material Balance Report	GA	USACE, EPA									
	Final Initial Material Balance Report	FIO	USACE, EPA									
	Response to Comments Initial Material Balance Report	FIO	USACE, EPA									
	Draft Outline/Responsibilities Final Material Balance	GA	USACE									
	Final Outline/Responsibilities Final Material Balance	FIO	USACE									
	Draft Final Material Balance Calculation	FIO	USACE									
	Draft Final Cost Estimate	FIO	USACE									
	Draft Final Material Balance Report	GA	USACE, EPA									
	Final Material Balance Report	FIO	USACE, EPA									
	Response to Comments Final Material Balance Report	FIO	USACE, EPA									

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Submittal Register

Task Order: 17	Contract#:	Project: New Bedford Harbor	Location: New Bedford			Date: 5/1/01	Contractor: Foster Wheeler					
						Contractor Action	Approving Authority Action				Contractor Action	
WPS ITEM No.	SD No. and Type of Submittal Description	Approval Type	Reviewer(s): See Sheet 2 for Distribution Instructions	Trans. Control No.	Planned Submittal Date	Date Forwarded to Approving Authority/ Date Received From Contractor	Date Forwarded to Other Reviewer	Date Received from other Reviewer	Action Code	Date of Action	Mailed to Contractor/Received from Approving Authority	Remarks
(a)	(b)	(d)	(e)	(f)	(g)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
21.99	**Specific Value Engineering Efforts**											
21.99.01	**On-Site Laboratory**											
	Draft On-Site Laboratory Cost Benefit Analysis	FIO	USACE									
	Draft Final On-Site Laboratory Cost Benefit Analysis	GA	USACE									
	Final On-Site Laboratory Cost Benefit Analysis	FIO	USACE									
	Response to Comments On-Site Laboratory Cost Benefit A	FIO	USACE									
21.99.02	**Wetlands Restoration Alternatives Evaluation**											
	Draft Wetlands Restoration Alternatives Evaluation	FIO	USACE									
	Final Wetlands Restoration Alternatives Evaluation	FIO	USACE									
	Response to Comments Wetlands Restoration Alternatives	FIO	USACE									
21.99.02	**Develop Confirmation Sampling Approach**											
	Draft Confirmation Sampling Approach	FIO	USACE, EPA									
	Final Confirmation Sampling Approach	FIO	USACE									
	Response to Comments Confirmation Sampling Approach	FIO	USACE, EPA									