

APPENDIX F

ALTERNATIVES ANALYSIS

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APPENDIX F – ALTERNATIVES ANALYSIS

F.1 SITE SCREENING FOR DREDGED MATERIAL PLACEMENT

This Appendix presents screening criteria that were initiated by the Maryland Port Administration (MPA) Master Plan in 1986 through the present. This Appendix briefly details the alternative analysis for the Masonville DMCF site and the history of site screening for the following groups, which represented studies with stages of options:

- Maryland Port Administration Master Plan, 1986 – 1989
- Governor’s Task Force, 1991 – 1992
- Dredging Needs and Placement Options Plan, 1992 - 2001
- Federal Dredged Material Management Plan
- State Dredged Material Management Plan Organizations:
 - Executive Committee
 - Management Committee
 - Citizens Committees
 - Harbor Team

The Dredged Material Containment Facility (DMCF) site identification process has been ongoing for over 35 years in the State of Maryland. The earliest work began in 1970 with the identification and screening for a DMCF in the upper Bay, which identified HMI as a preferred option (Green Associates and Trident Engineering Associates 1970). In 1970, over 70 sites in the Maryland portion of the Chesapeake Bay, including a variety of upland and in-water projects, were initially considered as dredged material placement sites (Green Associates and Trident Engineering Associates 1970, USACE 1973). Ultimately, fifteen sites were considered for Harbor materials and are presented in Figure F-1 and Table F-1. These sites included options such as open water placement, marsh restoration/creation, island creation, upland creation, and fastland creation. Of these fifteen sites, five were then recommended and included the following: HMI, Black Marsh, Six-Seven-Nine Foot Knolls, Belvidere Shoal, and Patapsco River Mouth. Of these potential placement sites, only HMI, the preferred placement site, was developed and used as a DMCF.

In 1982, sites along Baltimore Harbor were screened as placement options to provide environmental benefits to the area. Thirty-eight (38) total sites were evaluated for shoreline restoration in the 1982 Baltimore Harbor Environmental Enhancement Plan. These sites are included in Figure F-2 and Table F-2 (RPC 1982). In the late 1980s, the state of Maryland initiated a DMMP. The first action of this program was the preparation of the Dredged Material Management Master Plan, completed in 1986 through 1989 (MPA 1989). The 1989 Master Plan considered hundreds of options for potential placement sites. Most noteworthy and most viable for the Harbor was a proposed fastland creation at Hawkins Point-Thom’s Cove and the expansion of HMI (Figure F-3 and Table F-3. The Master Plan was followed by the Governor’s Task Force on Dredged Material Management, 1990 to 1991 and the Dredging Needs and Placement Options Program (DNPOP), 1992 to 2001. The Sparrows Point Shoreline Enhancement Study was completed in 1992 and is presented in Figure F-4 and Table F-3. The

Maryland Dredged Material Management Plan was completed in 1996 and the sites considered during this plan are presented in Figure F-5 and Table F-3. During the DNPOP program, Site 104 was the preferred option and was studied in-depth for the preparation of an EIS to support permitting of the site. A summary of the alternatives analysis for Site 104 details many of the sites screened in the DNPOP program is included as Table F-4 of this Appendix. However, the use of Site 104 was removed from consideration in 2000 because of perceived potential environmental impacts. As a result, MPA initiated studies in 2000 to modify the 1996 strategic plan. This work then led to the passing of the Dredged Material Management Act of 2001, and the subsequent creation of the State's DMMP. Subsequently, a 2002 Dredged Material Management Program Report was completed that included 28 potential placement sites. These sites are illustrated in Figure F-6 and detailed in Table F-3. Table F-3 presents the placement sites considered in the studies described above that were conducted between 1989 and 2002. Then, in 2003, the Harbor Options Work Group Study considered 15 potential placement sites as presented in Figure F-7 and Table F-5. A summary of all sites considered in the Harbor from 1970 through 2003 are presented in Figure F-8.

The present state of Maryland's DMMP relies on input from a variety of stakeholders including citizens and environmental groups and State and Federal agencies. Stakeholders are organized into three committees, the Executive Committee, the Management Committee, and the Citizens' Advisory Committee, and are supported by several technical working groups, including the BEWG and the Harbor Team, that are tasked with identifying, studying, reviewing, and prioritizing potential dredged material placement sites.

As stated above, a special committee of the State DMMP, the Harbor Team, was established in 2003 to develop recommendations for dredged material management options specific to Baltimore Harbor for the next 20 years. The Harbor Team was an integral part of the site selection process. Based on the recommendations of the Harbor Team and the BEWG, reconnaissance-level studies were completed for three sites within the Harbor: Masonville, Sparrows Point, and BP-Fairfield. The reconnaissance studies recommended carrying each of the sites forward to the State feasibility-level study. Interim findings of the State feasibility-level study revealed that Masonville was the most feasible option to satisfy the immediate dredged material placement needs. Thus, the DMMP Management Committee recommended that Masonville be the first site to be submitted for a permit application.

Harbor Team used the Baltimore Harbor Landuse Study, completed in 2001, to help identify and screen potential sites for dredged material management around the Harbor. The study looked at all properties adjacent to the Harbor and researched current landuse as well as future proposed landuse. The objective was to identify upland areas adjacent to the Harbor that would be suitable for Port utilization/development. Land use, including existing commercial, residential, and recreational land use (Figure F-9) was reviewed as well as existing industrial, power generation, and locations of utilities in the Harbor (Figure F-10). In addition, the locations of private and public marine terminals were reviewed (Figures E-11 and E-12). Finally, recent transactions and developments in the Harbor were reviewed (Figure F-13). Cumulative landuse is shown in Figure F-14. The study concluded that there was very little available land around Baltimore Harbor that would be available for any type of Port development. This demonstrated the low potential of identifying new sites for Harbor development, including DMCFs.

F.2 ALTERNATIVES COST ESTIMATES

This appendix section presents the detailed feasibility level cost estimates generated for each of the 18 Masonville study alternatives under each dredging scenario evaluated. The initial construction costs and total site costs by scenario are included in Attachment F-1 of this Appendix. For each alternative, a breakdown of the initial construction quantities, their unit costs, and the cost estimate for each aspect of site construction are provided (page one) and include the following construction elements:

- Mobilization/demobilization
- Sand fill
- Unsuitable
Excavation/placement
- Stone work
- Rock dike construction
- Road stone
- Spillways
- Geotextile
- Water main relocation
- Community enhancements
- Demolition
- Storm drains
- Contingency cost
- Total initial construction cost

General site characteristics and a total project cost estimate by alternative are also included (page two). This total project estimate includes initial construction costs, site development costs, future dike raising costs, dredging, transportation, and placement costs, and a 15 percent contingency cost. Included below are details for each item included in the total site costs:

- Initial construction costs:
 - Initial construction costs
 - Study costs
- Site development costs
 - Dredged material management
 - Site maintenance
 - Site monitoring and reporting
- Dike raising costs
 - Common borrow
 - Dried dredged material
- Dredging/transportation/placement costs
 - Mobilization/demobilization
 - Dredging
 - Transportation
 - Placement
- Contingency costs
- Total cost
- Total unit cost

At the onset of this State feasibility-level study, three specific alignments, three initial dike elevations, and two structures forming the berth area combined to make 18 study alternatives and four study scenarios. The three alignments combined with the potential site characteristics to form eighteen State feasibility-level study alternatives are presented in Figure F-15.

F.3 REFERENCES

Green Associates and Trident Engineering Associates. 1970. *Selection and Preliminary Design of Diked Disposal Areas for Dredged Spoil from Baltimore Harbor*. Prepared for the State of Maryland Department of General Services. December.

Regional Planning Council (RPC). 1982. *Baltimore Harbor Environmental Enhancement Plan*. Prepared by Regional Planning Council [Maryland], Ecological Analysts, Inc., [and] Land Design/Research, Inc. September.

State of Maryland. 1991. *Dredge Material Needs, Placement and Operations Plan (DNPOP)*. Baltimore, MD.

U.S. Army Corps of Engineers (USACE). 1973

U.S. Army Corps of Engineers (Baltimore District). 1999. *Draft Environmental Impact Statement for Proposed Open-Water Placement of Dredged Material at Site 104*. February.

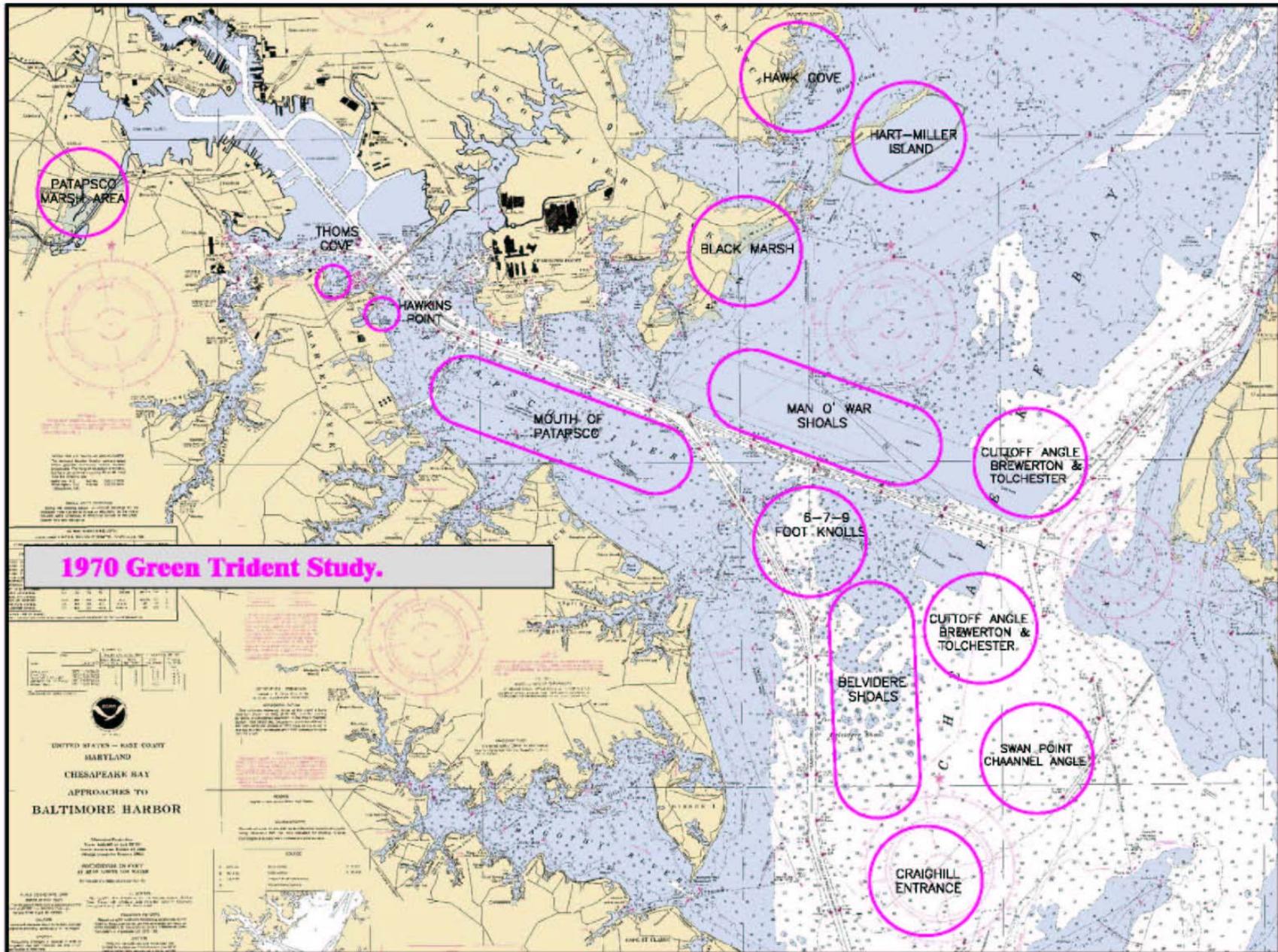


Figure F-1. Dredged Material Containment Facility Sites in Maryland Considered in 1970.

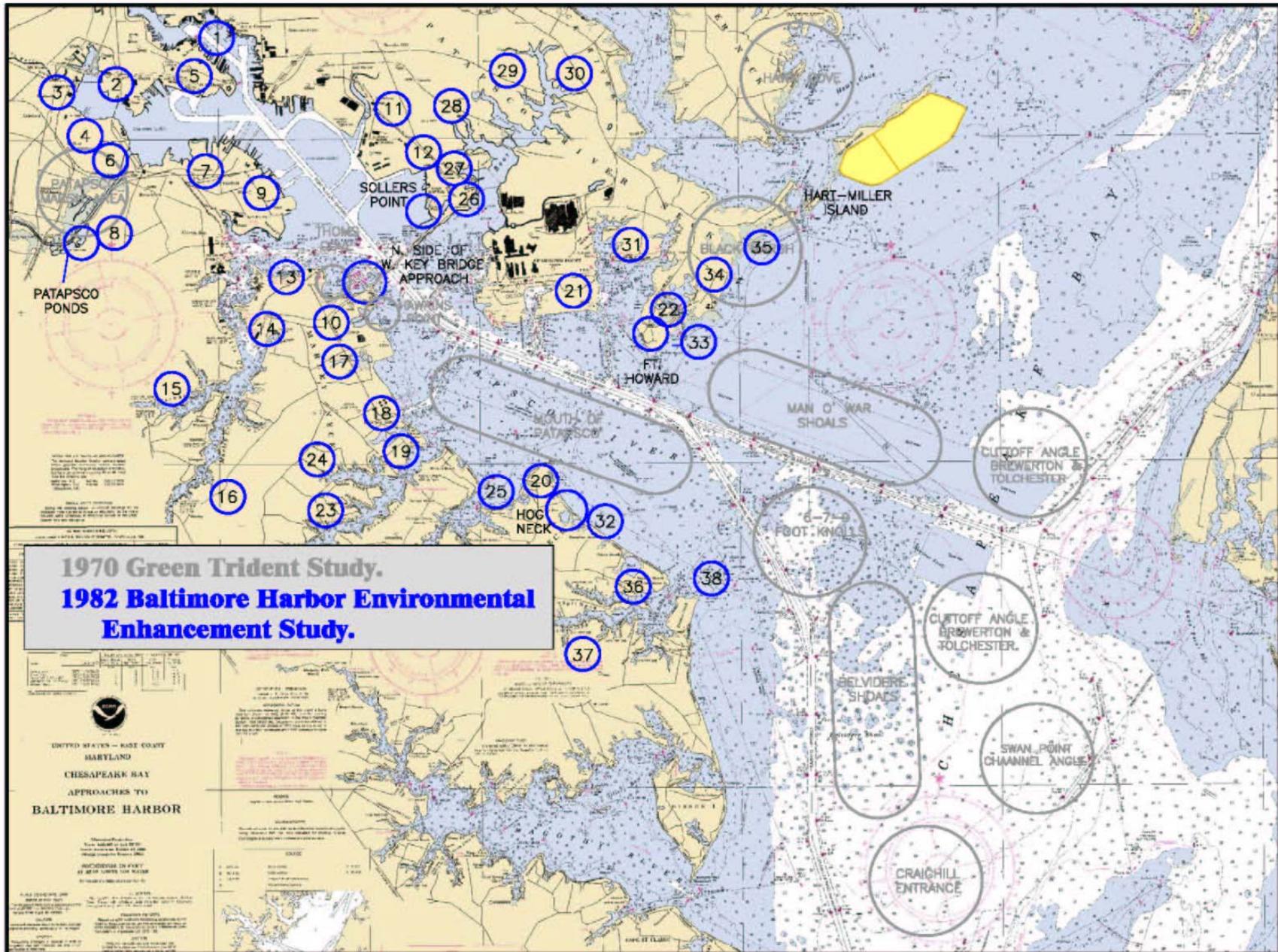


Figure F-2. Dredged Material Containment Facility Sites in Maryland Considered in 1970 and 1982.

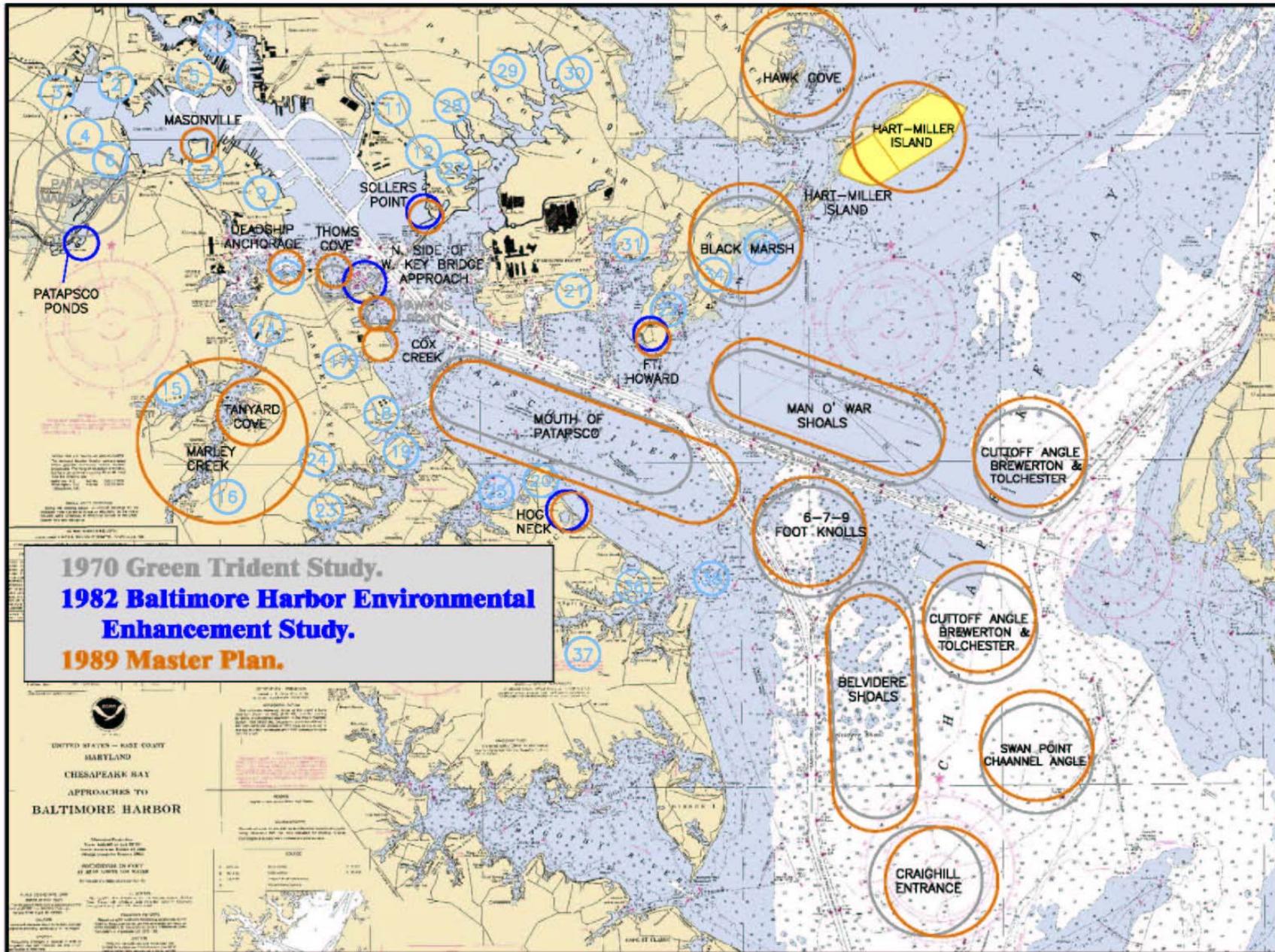
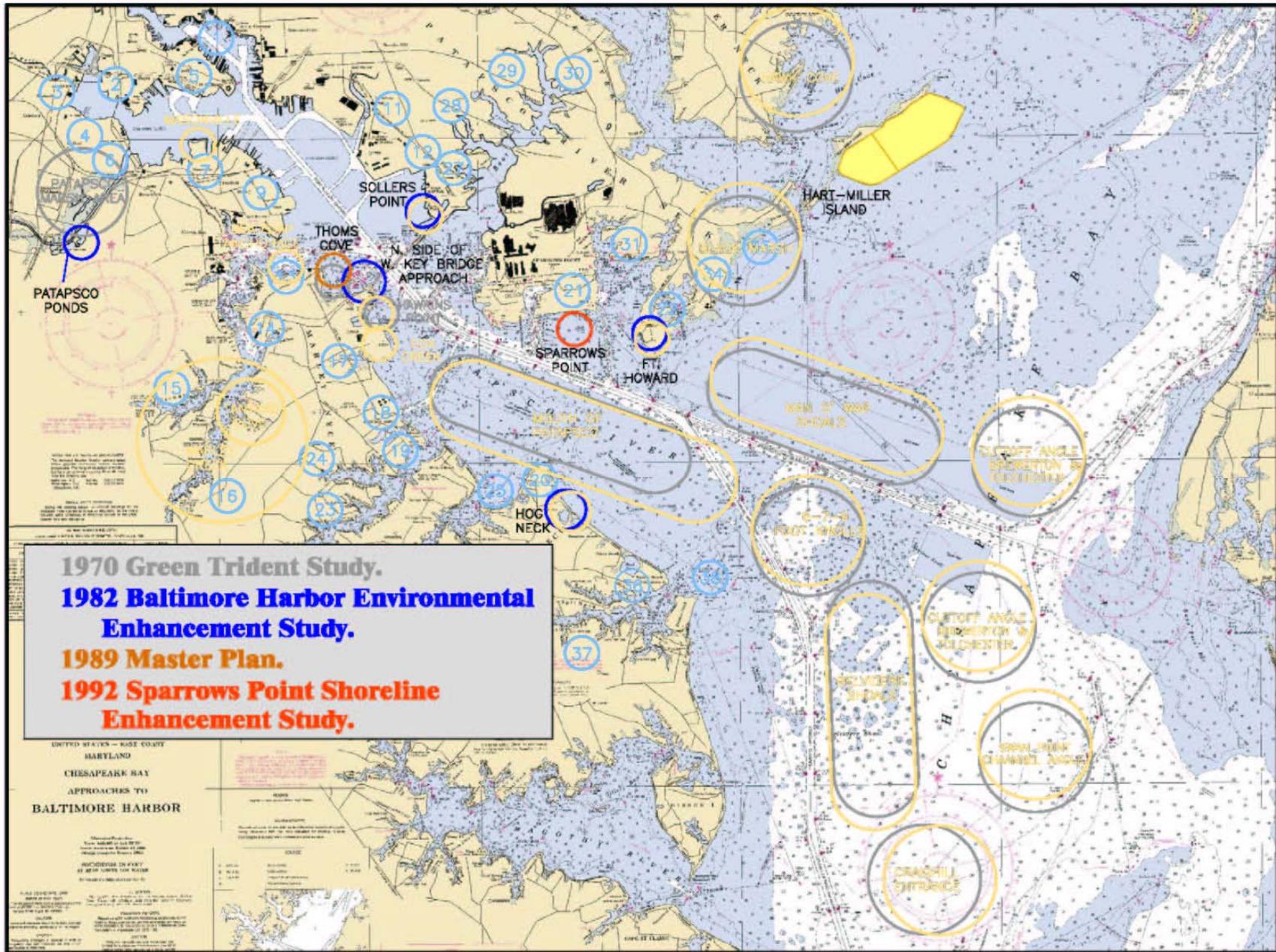


Figure F-3. Dredged Material Containment Facility Sites in Maryland Considered in 1970, 1982, and 1989.



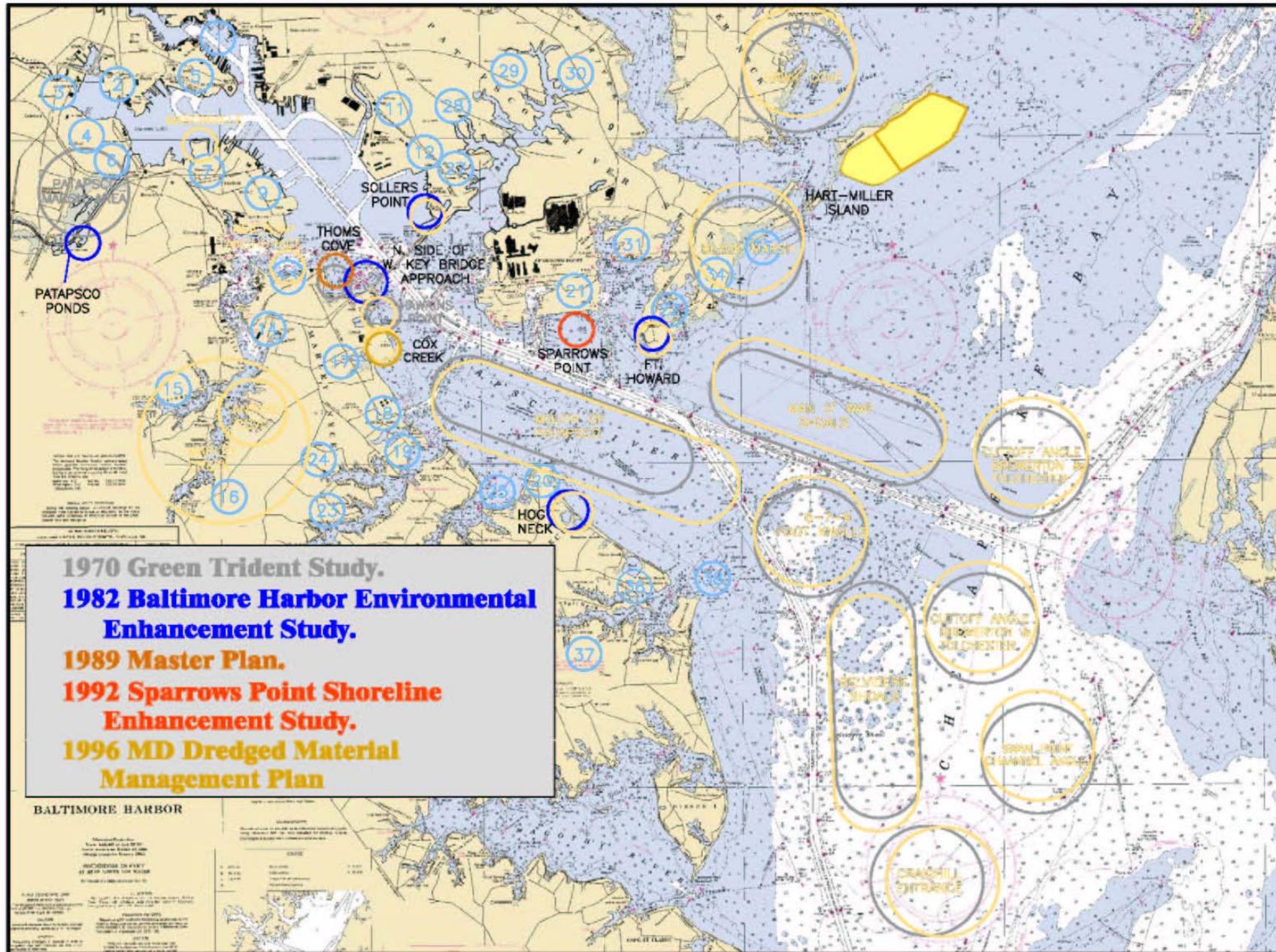


Figure F-5. Dredged Material Containment Facility Sites in Maryland Considered in 1970, 1982, 1989, 1992, and 1996.

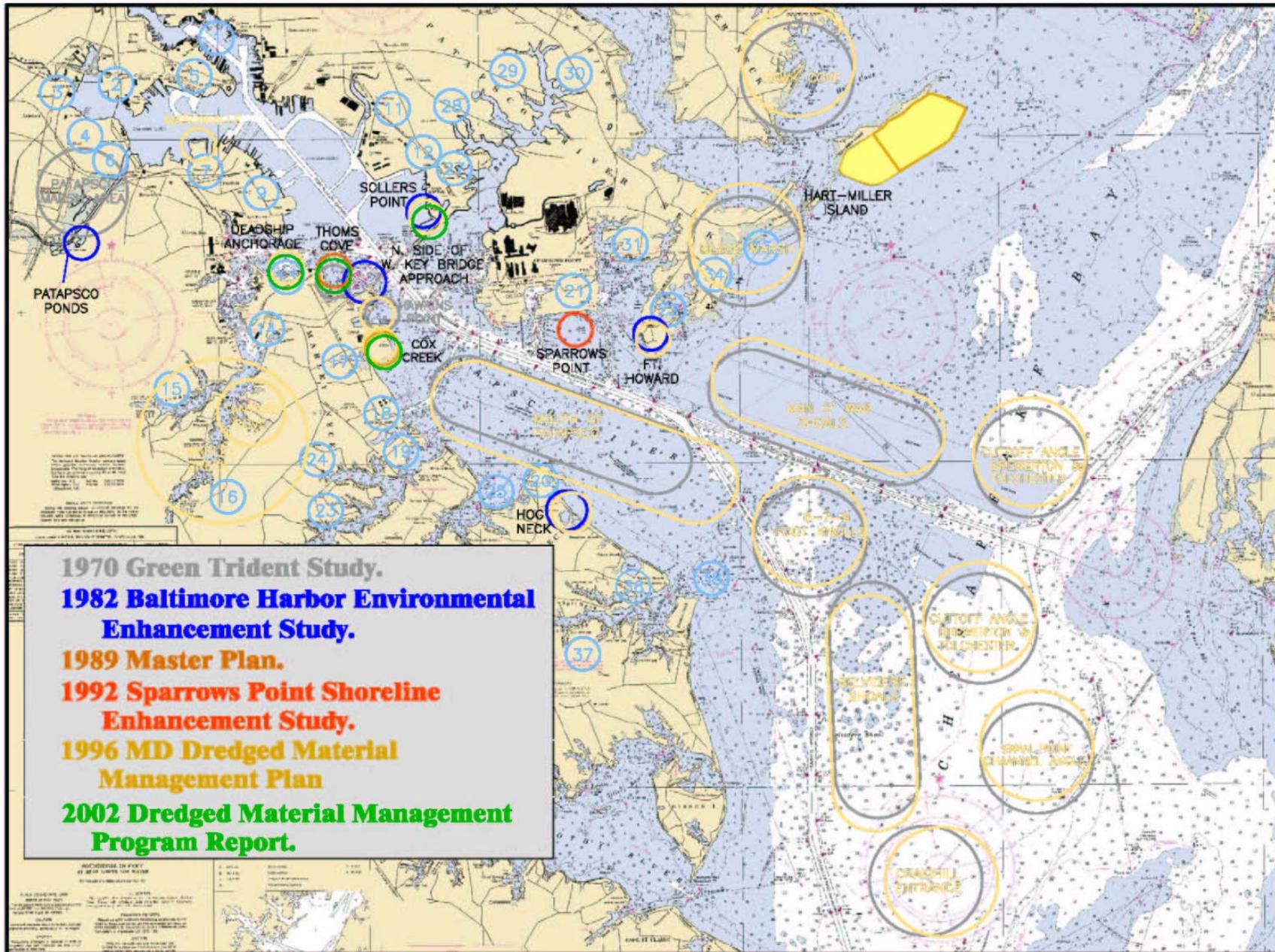


Figure F-6. Dredged Material Containment Facility Sites in Maryland Considered in 1970, 1982, 1989, 1992, 1996, and 2002.

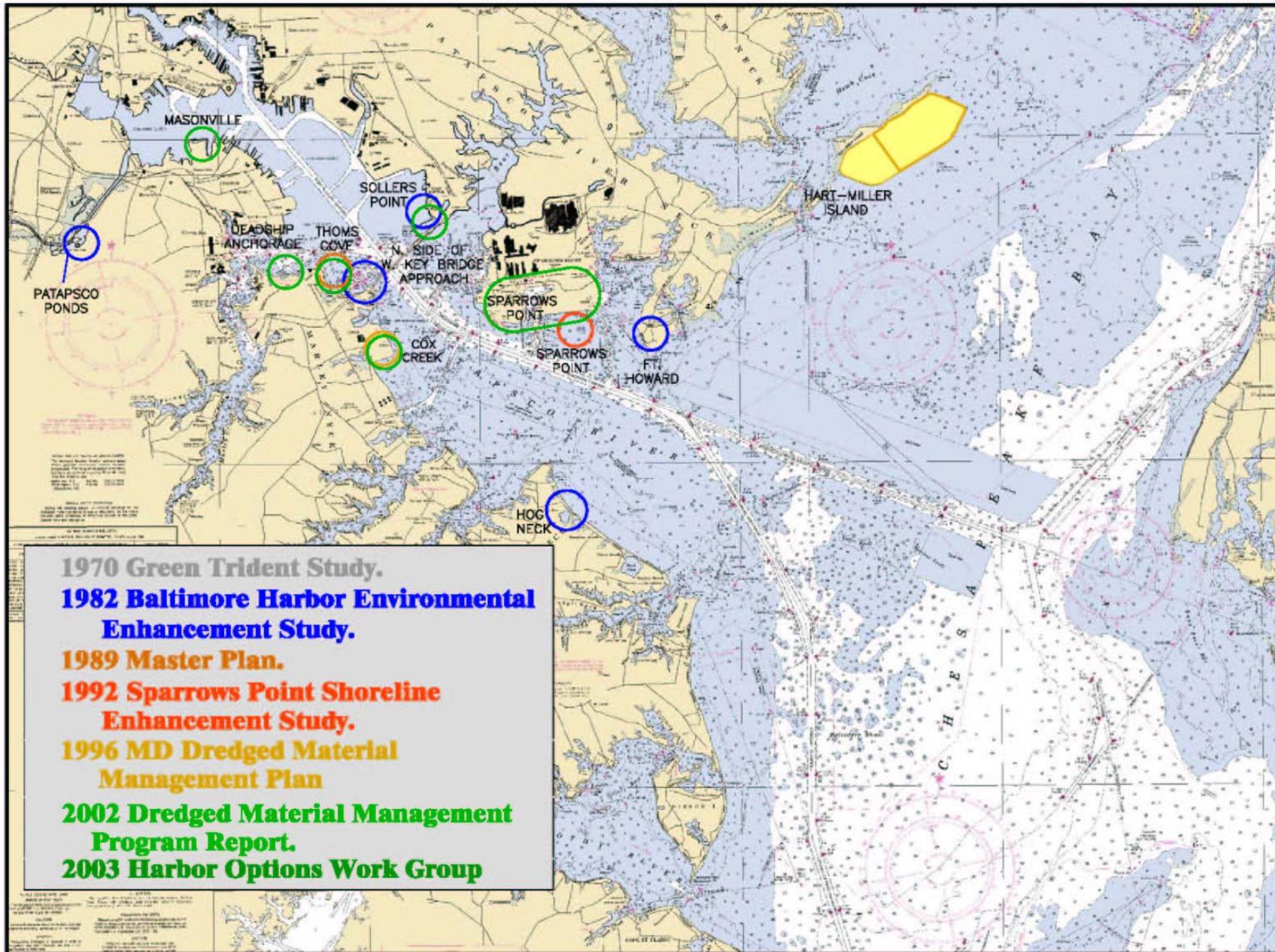


Figure F-7. Dredged Material Containment Facility Sites in Maryland Considered in 1970, 1982, 1989, 1992, 1996, 2002, and 2003.

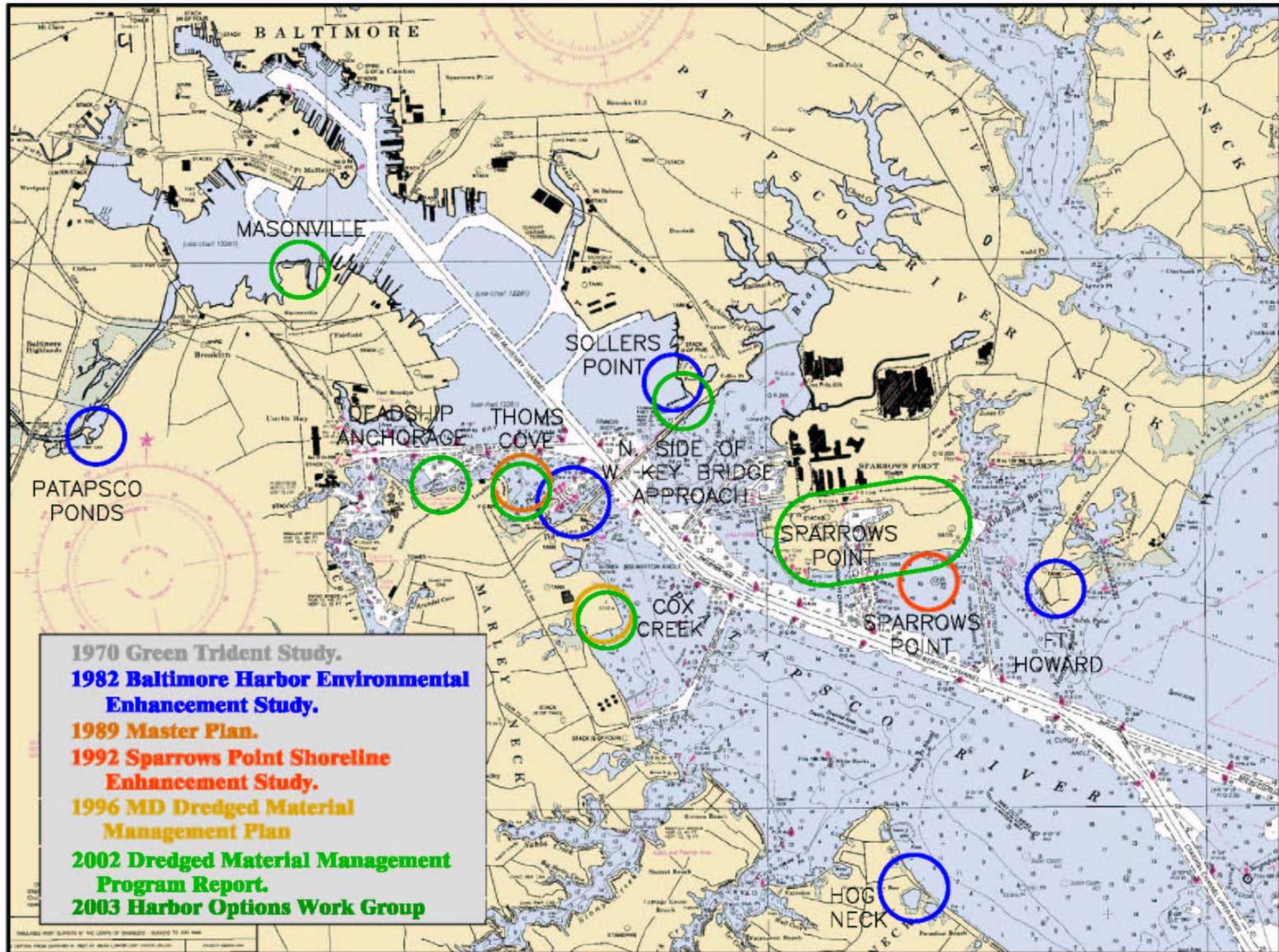


Figure F-8. Dredged Material Containment Facility Sites in Baltimore Harbor Considered in 1970, 1982, 1989, 1992, 1996, 2002, and 2003.

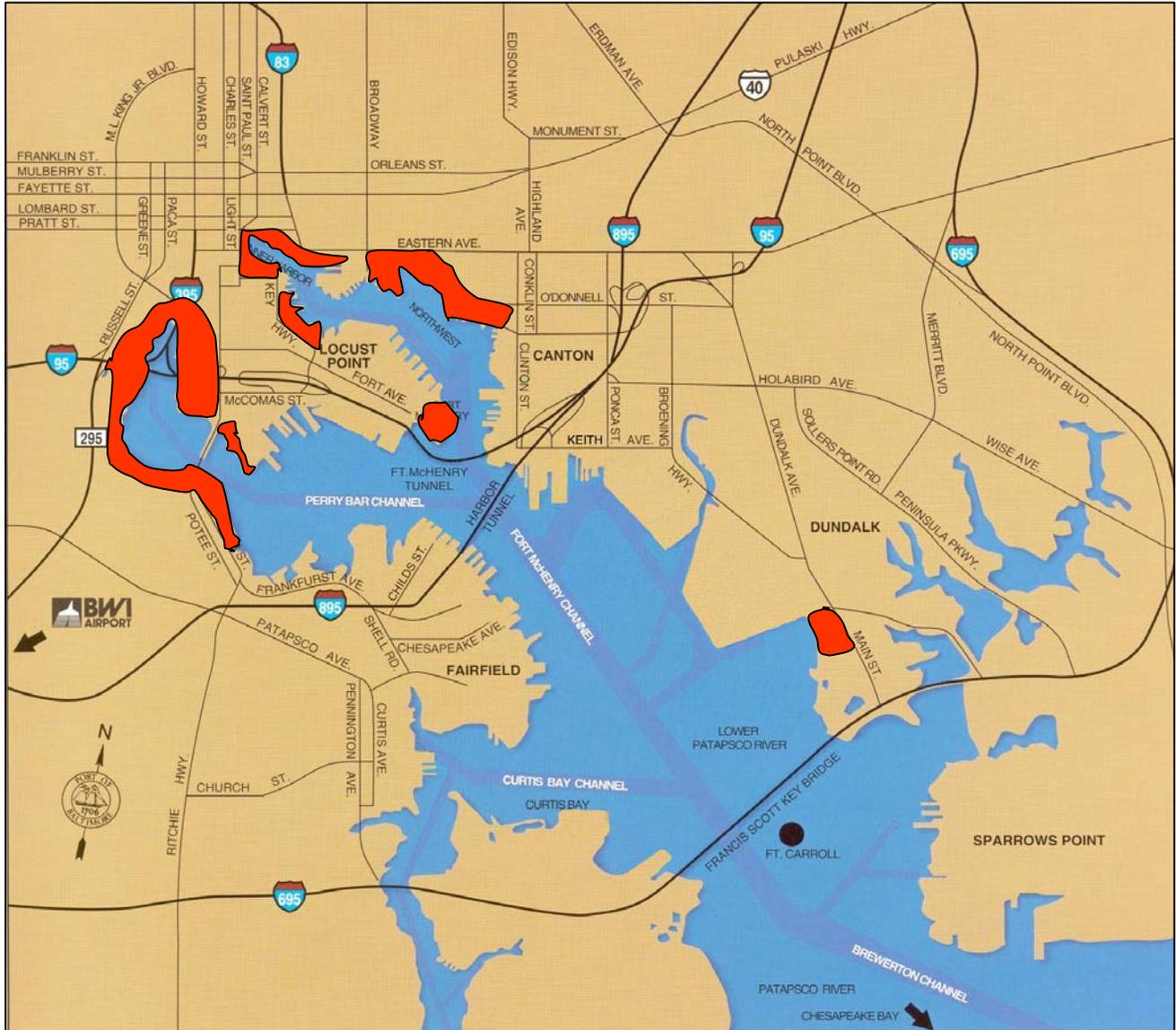


Figure F-9. Locations of Existing Commercial, Residential, and Recreational Development, Baltimore Harbor Land Use Study, 2001

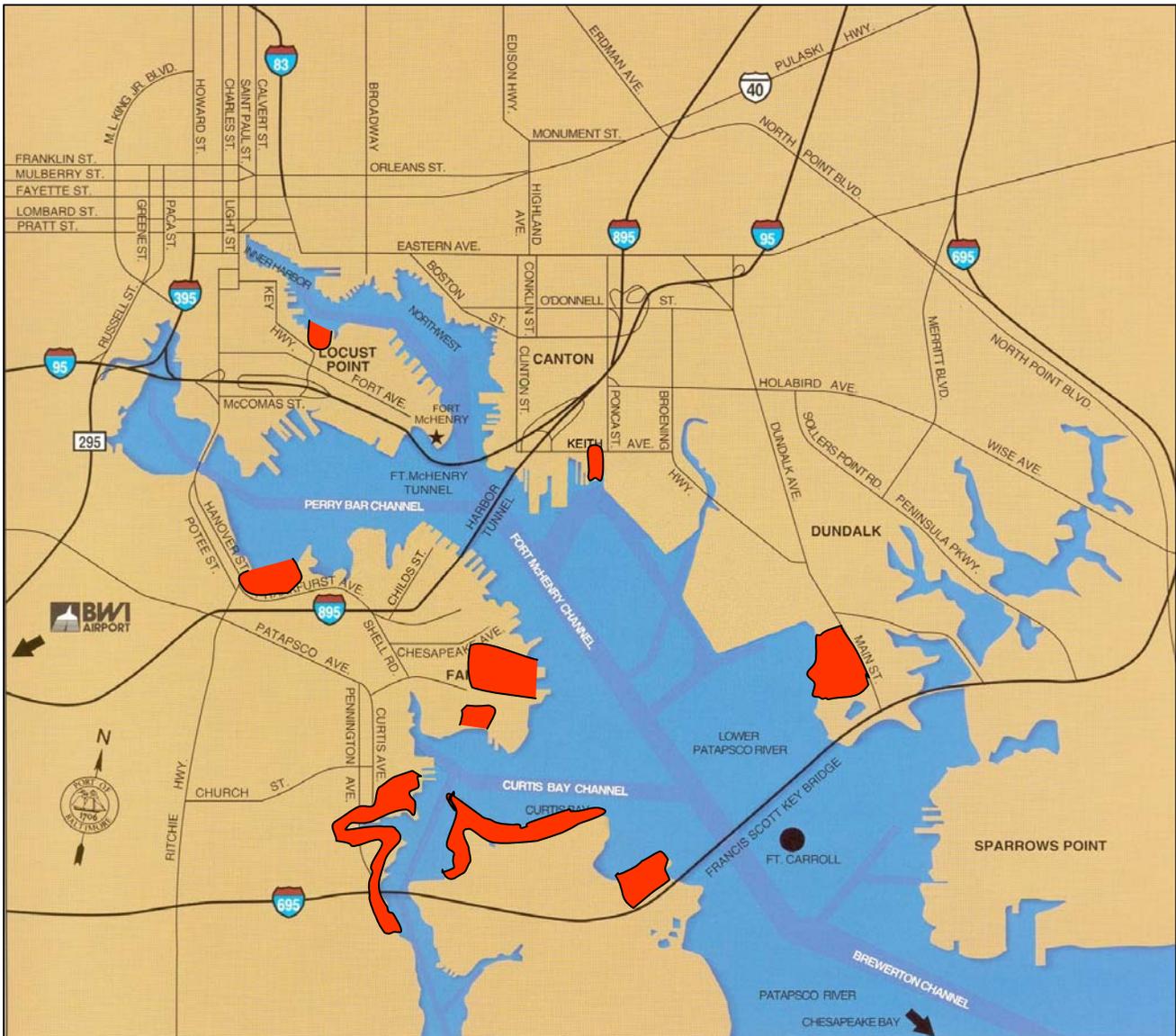


Figure F-10. Locations of Existing Industrial, Power Generation and Utilities, Baltimore Harbor Land Use Study, 2001

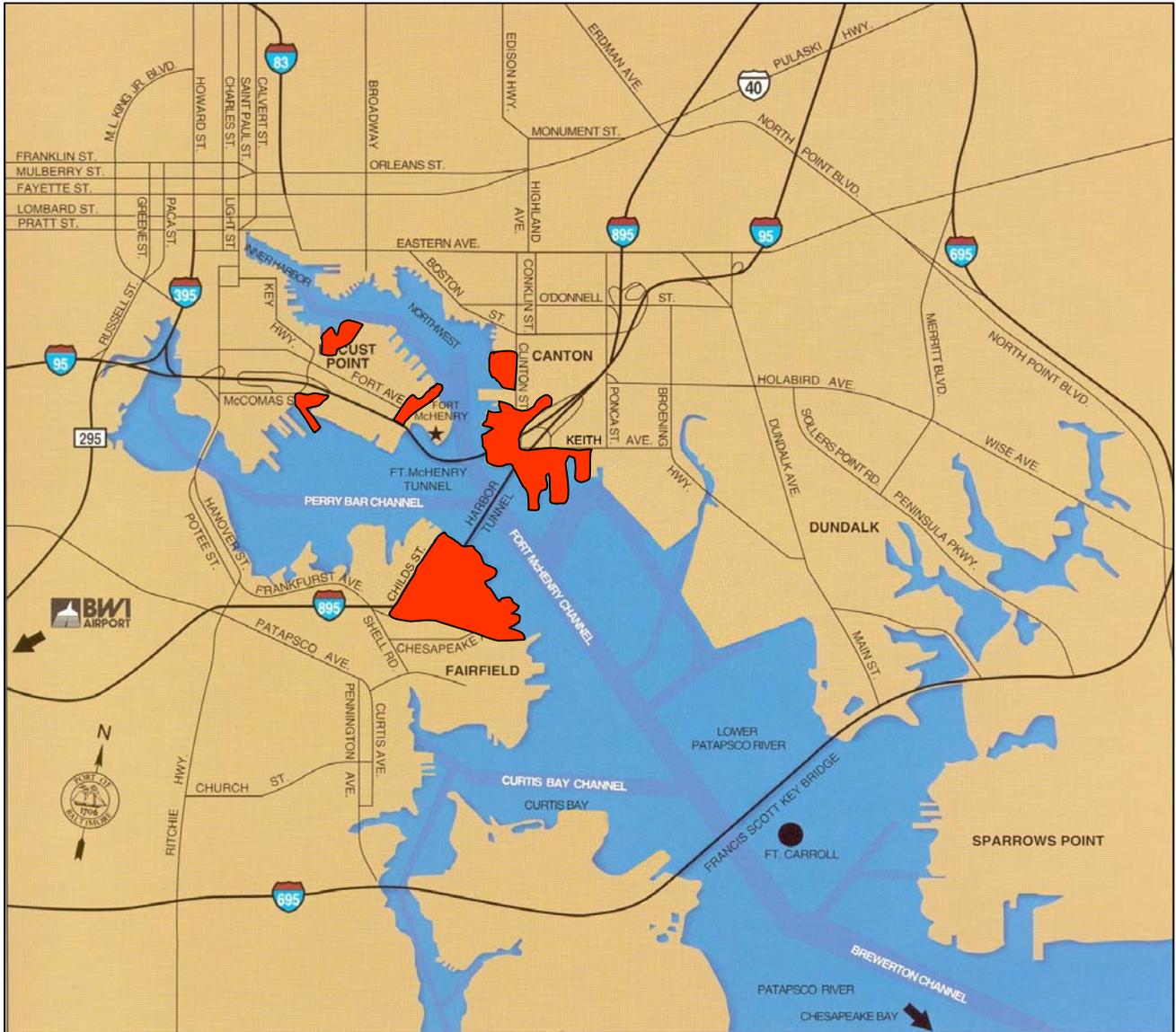


Figure F-11. Locations of Private Marine Terminals, Baltimore Harbor Land Use Study, 2001

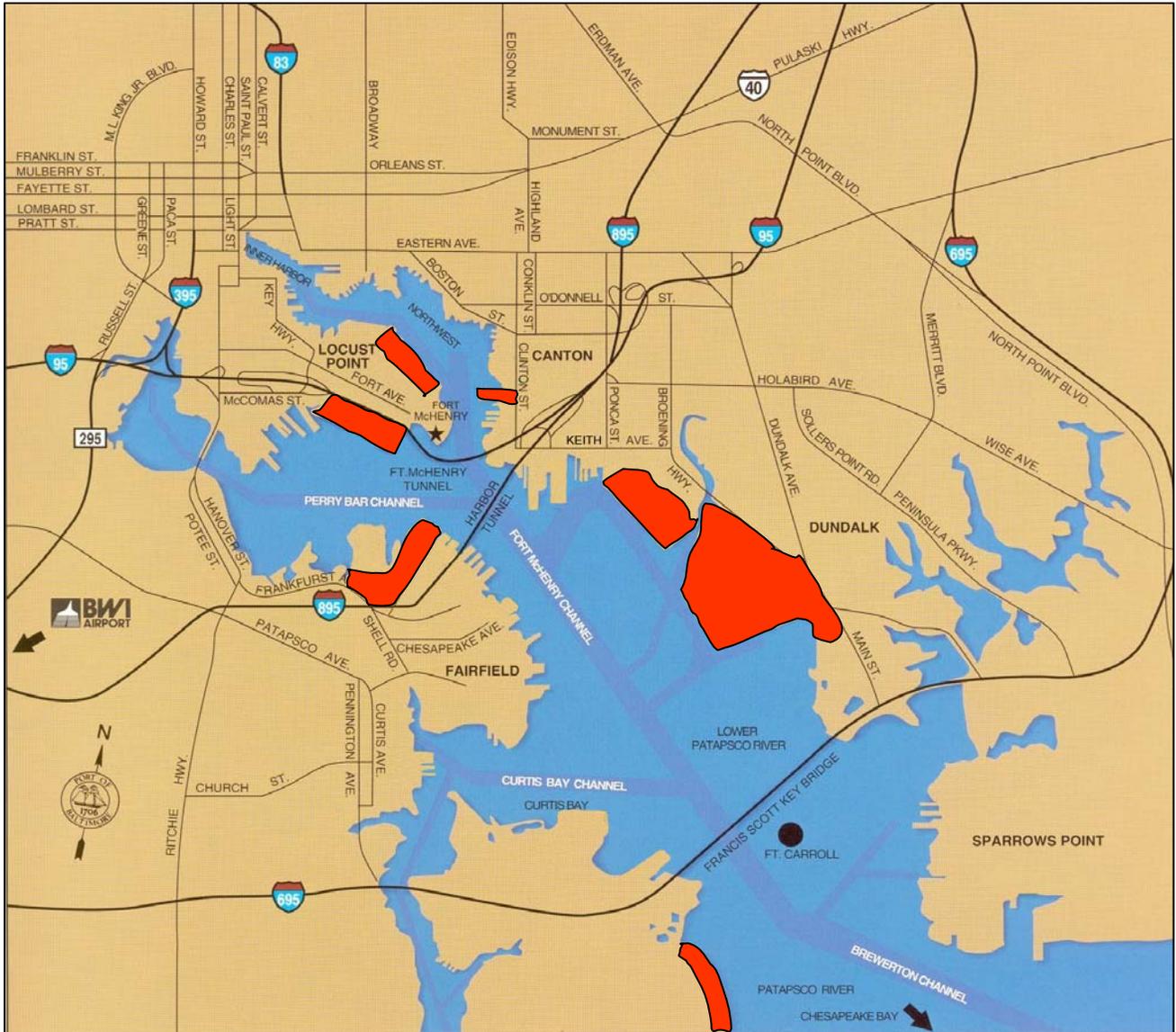


Figure F-12. Locations of Public Marine Terminals, Baltimore Harbor Land Use Study, 2001

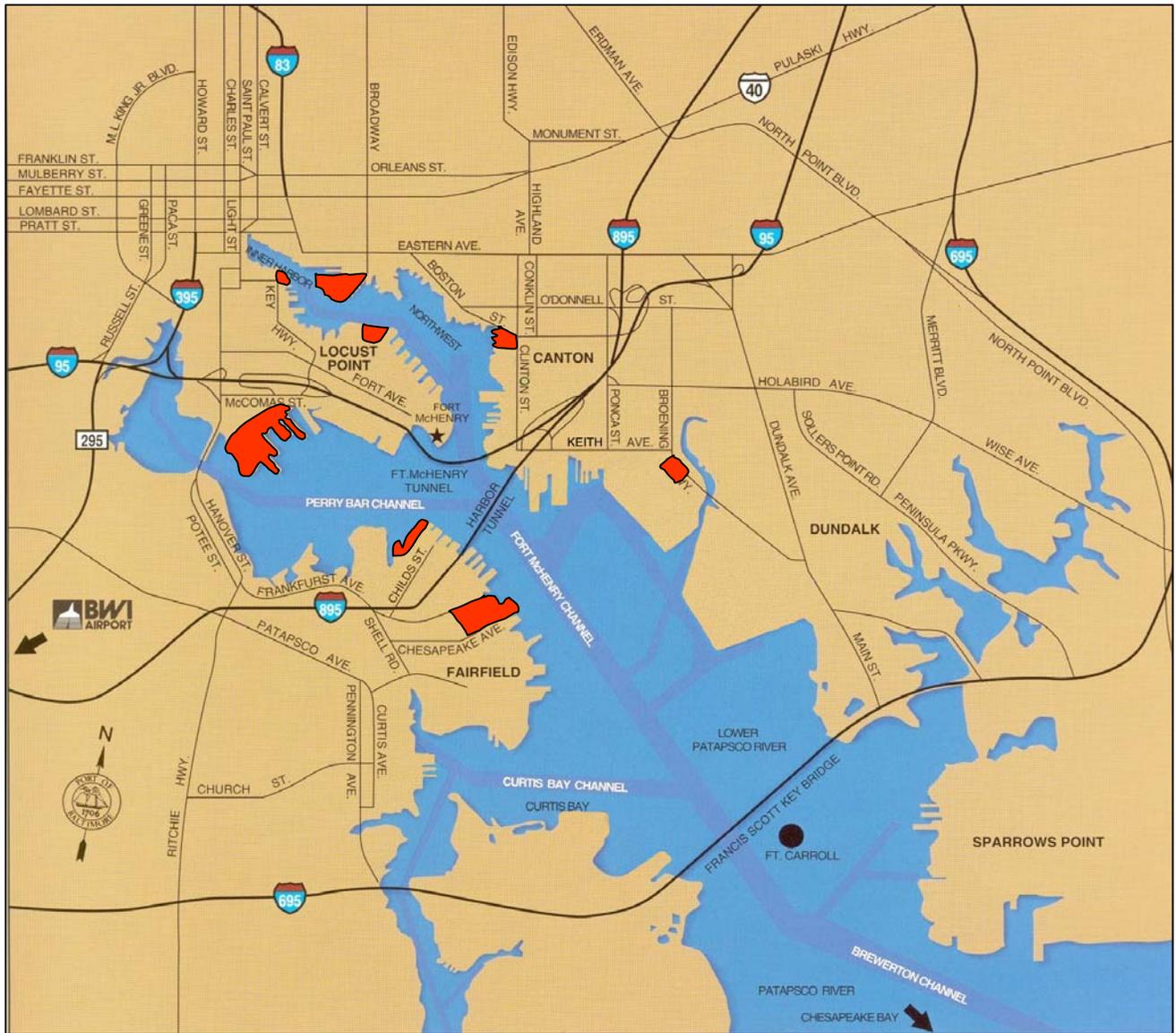


Figure F-13. Locations of Recent Transactions and Developments, Baltimore Harbor Land Use Study, 2001

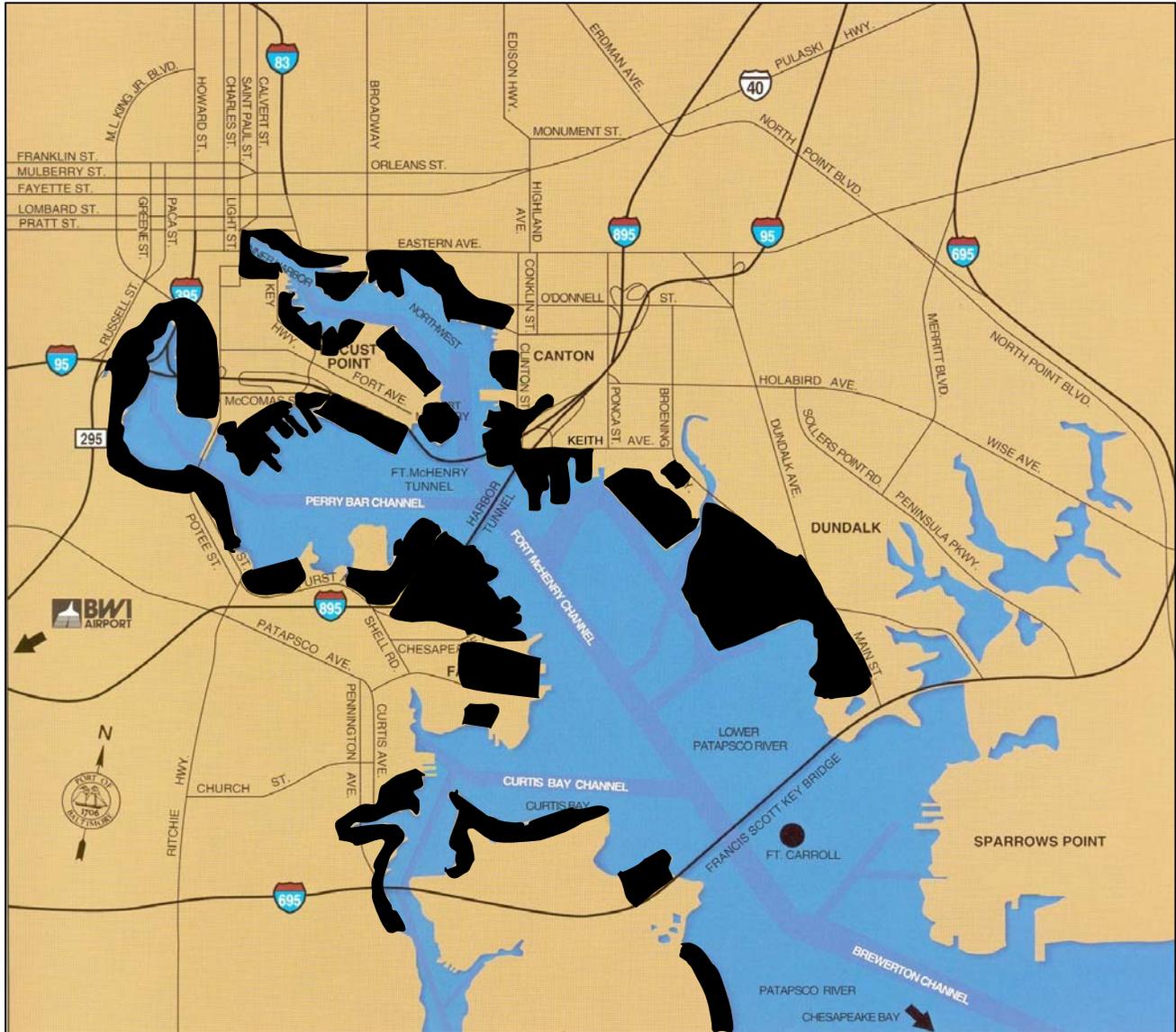


Figure F-14. Locations of Cumulative Space Consumed, Baltimore Harbor Land Use Study, 2001

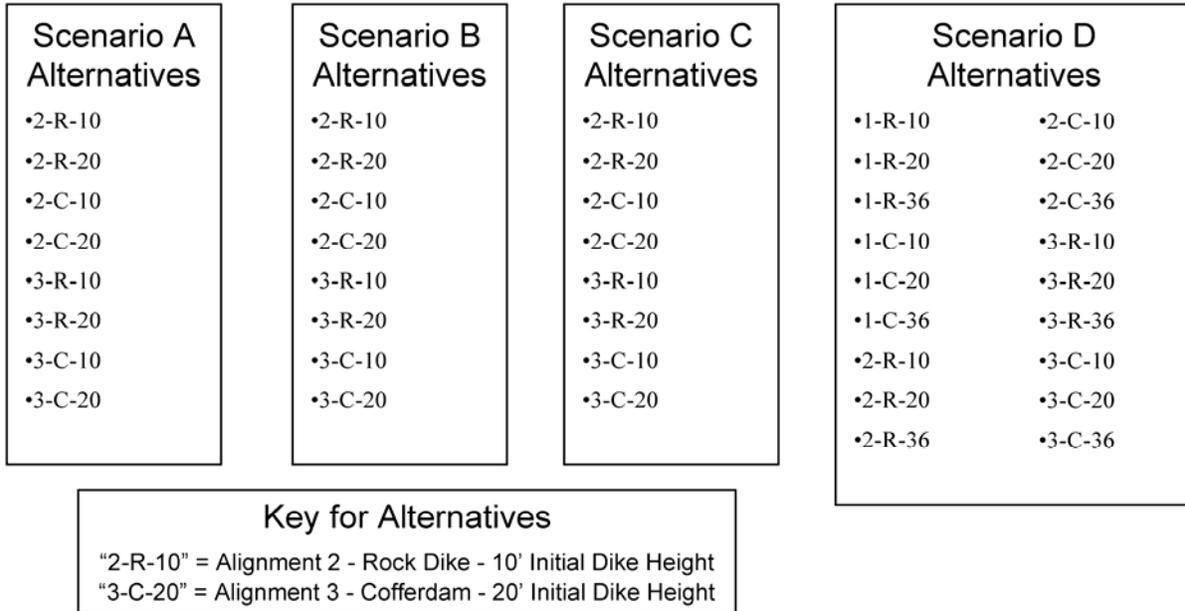


Figure F-15. Alternatives Evaluated Under Each Scenario

Notes: The alternatives presented are the 18 alternatives that were evaluated in the Masonville alternatives analysis. The names of the alternatives are indicative of the study aspects making up each alternative. For example, alternative "2"- "R"- "10" indicates that the following study aspects of which they consist: "Alignment 2" - "Rock Dike berth area" - "Initial dike elevation of +10 ft MLLW".

**TABLE F-1. DREDGED MATERIAL PLACEMENT SITES IN THE 1970 TRIDENT-GREEN STUDY
MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY, BALTIMORE HARBOR, MARYLAND**

SITE NAME	TYPE OF OPTION	COMMENTS AND ISSUES
Carroll's Island (Hawthorn Cove)	Marsh/Upland	Unexploded Ordinance, high ecological value
Patapsco River Mouth	Water	High construction cost, near oyster bed, water flow disturbance, danger to navigation
Hawk Cove	Water	Cannot use, insufficient size and conflicting present or intended land use
Hart-Miller Island (HMI)	Island Creation	Used, useful size, close to dredging areas, high use value as reclaimed lands
Black Marsh	Marsh Creation	Cond., useful size, good accessibility, high value as reclaimed lands, conflicting present or intended land use
Man O' War Shoals	Open Water	Marg., useful size, close to dredging areas, disturbance of water flow, obstruction or danger
Cutoff Angle Brewerton & Tolchester	Open Water	Marg., useful size, proximity to oyster areas, disturbance or water flow
6-7-9 Foot Knolls	Open Water	Cond., useful size, probably already polluted, obstruction or danger to navigation, conflicting present or intended land use
Belvidere Shoal	Open Water	Can use, useful size, close to dredging area
Swan Point Channel Angle	Open Water	Marg., useful size, close to dredging area, proximity to oyster areas and may cause damage
Craighill Entrance	Open Water	Marg., useful size, expensive development, proximity to oyster areas and may cause damage
Mouth of Patapsco	Open Water	Can use, useful size, close to dredging area
Hawkins Point	Upland, marsh, and water	Cannot use, useful size, close to dredging area, obstruction or danger to navigation, conflicting present or intended land use
Thomas Cove	Fastland creation (in water)	Cond., insufficient size
Patapsco Marsh Area	Marsh restoration/creation	Cond., low use area, not a navigational obstruction, probably already polluted, possible danger to bay ecology, conflicting present or intended land use
Cutoff Angle South	Open Water	Marg., useful size, close to dredging areas, expensive development

Source: Green Associates and Trident Engineering Associates, 1970

*Note: As part of this study, 70 sites were investigated and considered - site numbers were not assigned in this study. However, many sites had very low capacity and real estate or access issues; those most applicable for Harbor placement are included in this table.

TABLE F-2. DREDGED MATERIAL PLACEMENT SITES IN IN THE 1982 BHEEP

MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY, BALTIMORE HARBOR, MARYLAND

SITE NUMBER	SITE NAME	TYPE OF OPTION
1	Fells Point to Clinton Street	Shoreline Restoration
2	I-95 East to Hanover Bridge	Shoreline Restoration
3	I-95 West to (but not including) Waterview Prk	Shoreline Restoration
4	Waterview Avenue Park	Shoreline Restoration
5	Ferry Bar	Shoreline Restoration
6	Broening Park and South Baltimore General Hospital	Shoreline Restoration
7	South of Reed Bird Park to Harbor Tunnel	Shoreline Restoration
8	Patapsco State Park	Shoreline Restoration
9	Harbor Tunnel to Fishing Point	Shoreline Restoration
10	Leading Point to Hawkins Point	Shoreline Restoration
11	Colgate Creek	Shoreline Restoration
12	Dundalk Marine Terminal to Sollers Point	Shoreline Restoration
13	Curtis Bay and Stonehouse Cove	Shoreline Restoration
14	Curtis Creek	Shoreline Restoration
15	Furnace Creek	Shoreline Restoration
16	Marley Creek	Shoreline Restoration
17	Brandon Shores	Shoreline Restoration
18	Cox Creek	Shoreline Restoration
19	Stoney Beach and Riviera Beach	Shoreline Restoration
20	Fort Smallwood Park	Shoreline Restoration
21	Sparrow Point	Shoreline Restoration
22	Fort Howard Medical Center	Shoreline Restoration
23	Stoney Creek	Shoreline Restoration
24	Back Cove and Nabbs Creek (in Stoney Creek)	Shoreline Restoration
25	Rock Creek and Coves	Shoreline Restoration
26	Sollers Point	Shoreline Restoration
27	Clements Cove and Peachtree Cove	Shoreline Restoration
28	Bullneck Cove	Shoreline Restoration
29	Lynch Cove	Shoreline Restoration
30	Head of Bear Creek	Shoreline Restoration
31	Old Road Bay	Shoreline Restoration
32	Hog Neck	Shoreline Restoration
33	Fort Howard Park	Shoreline Restoration
34	Shallow Creek	Shoreline Restoration
35	Black Marsh	Shoreline Restoration
36	Back Creek (A.A. County)	Shoreline Restoration
37	Main Creek	Shoreline Restoration
38	Bodkin Creek	Shoreline Restoration

Source: RPC 1982

*Note: This was a major screening of sites around the Harbor. All were fairly small options that could not handle large amounts of material but would be useful as potential beneficial use options. None were ruled out entirely but were also not serious contenders for large dredged material placement projects.

**TABLE F-3. DREDGED MATERIAL PLACEMENT SITES IN THE 1989 MASTER PLAN AND 2002 DREDGED MATERIAL MANAGEMENT PROGRAM REPORT
MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY, BALTIMORE HARBOR, MARYLAND**

STUDY	SITE NAME	TYPE OF OPTION	COMMENTS
1989 Master Plan*	Hawkins Point-Thoms Cove	Fastland Creation	Used
1989 Master Plan*	Hart-Miller Island	Expansion	Moved ahead for more study
1992 Sparrows Point Shoreline Enhancement Study	Thoms Cove	Wetland Creation	Carried to 2003; dropped for ecological reasons
1992 Sparrows Point Shoreline Enhancement Study	Sparrows Point	Wetland creation	Legislative Issue
1996 MD Dredged Material Management Plan	Cox Creek	Rehabilitation	Used
Site 104 Alternatives Analysis	Various	Various	71 sites considered; Intensive screening of all sites conducted (Table
2002 Dredged Material Management Program Report	Aberdeen Proving Grounds	Wetlands Creation	Fastland that would be rehabilitated for wetlands creation; Some ecological issues. Institutional constraints with DOD lands.
2002 Dredged Material Management Program Report	Agricultural	Land application	Among the preferred options; carried to Harbor Team.
2002 Dredged Material Management Program Report	Barren Island	Island Restoration; Beneficial Use	Large; not appropriate for Harbor Materials but considered for mainstem Bay sediments
2002 Dredged Material Management Program Report	Innovative Use at Cox Creek	Expansion of facility to handle	Forwarded to Harbor team
2002 Dredged Material Management Program Report	Dead Ship Anchorage	Fastland creation	Significant site development issues
2002 Dredged Material Management Program Report	Furnace Bay	Upland	Ranked OKI ecologically but very small annual capacity and access problematic. Not forwarded.
2002 Dredged Material Management Program Report	Hawkins Point/Thoms Cove	Fastland creation	Ecological more sensitive than other options
2002 Dredged Material Management Program Report	Holland Island	Island Restoration; Beneficial Use	Small and ecologically sensitive; not appropriate for Harbor Materials
2002 Dredged Material Management Program Report	James Island	Island Restoration; Beneficial Use	Large; not appropriate for Harbor Materials but considered for mainstem Bay sediments
2002 Dredged Material Management Program Report	Lower Eastern Neck Island	Shoreline restoration ; Beneficial Use	Not appropriate for Harbor materials; but considered for mainstem Bay sediments; smaller than Island options
2002 Dredged Material Management Program Report	Mines and Quarries	Upland; mine reclamation	Among the preferred options; forwarded to Harbor Team
2002 Dredged Material Management Program Report	Ocean Placement	Open Water; offshore	Moderate environmental score; costly transport; not an option for Harbor sediments.
2002 Dredged Material Management Program Report	Parsons Island	Shoreline restoration ; Beneficial Use	Not appropriate for Harbor materials; but considered for mainstem Bay sediments; smaller than Island options and privately owned
2002 Dredged Material Management Program Report	Poplar Island Modification (lateral expansion)	Existing site modification	Not appropriate for Harbor sediments but among the most viable options for short-term Mainstem need.
2002 Dredged Material Management Program Report	Poplar Island Modification (dike raising)	Existing site modification	Not appropriate for Harbor sediments but among the most viable options for short-term Mainstem need.
2002 Dredged Material Management Program Report	Soller Point	Fastland creation	Selected as the most viable option of the Harbor options
2002 Dredged Material Management Program Report	Sharps Island	Island Restoration; Beneficial Use	Ecologically sensitive; not appropriate for Harbor Materials
2002 Dredged Material Management Program Report	Sparrows Point	Fastland /Upland	Some ecological issues, but potentially viable for Harbor materials; Has institutional constraints. Forwarded to Harbor Team.
2002 Dredged Material Management Program Report	Wetland Thin Layering Enhance. / Restor.	Wetland restoration	Some ecological issues; has been done on small scale, but is not an option for Harbor sediments

TABLE F-3. CONTINUED

MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY, BALTIMORE HARBOR, MARYLAND

STUDY	SITE NAME	TYPE OF OPTION	COMMENTS
2002 Dredged Material Management Program Report	1 - Tolchester West	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	2 - Tolchester/Brewerton Angle	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	3 - Swan Point West	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	3S - Swan Point West	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	4a - Pooles Island	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	4b - Pooles Island	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	4br - Pooles Island	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	Site 170 (Mouth of Patapsco)	Island Creation**	Island creation considered in depth for Site 104 (Table E-4), but ranked relatively low environmenttally - not suitable for Harbor materials.
2002 Dredged Material Management Program Report	MD - C&D Placement Sites (6)	Upland	Various ecological issues; screened in depth for Site 104 (Table E-4)

Source: USACE 1999

*Note: Hundreds of options considered throughout the Bay; most viable for Harbor included in this table; many sites detailed in Site 104 analysis (Table E-X).

TABLE F-4. SITE 104 PLACEMENT SITE SCREENING CRITERIA[†]

MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY, BALTIMORE HARBOR, MARYLAND

Alternative Type	Site Number	Site	Primary Screening Criteria				Secondary Screening Criteria						
			1	2	3	4	5	6	7	8			
			Placement Capacity	Preliminary Environmental Suitability	Infrastructure Considerations	Navigation	Economic Viability	Real Estate	Institutional Constraints	Environmental Trade-Offs			
Open Water	1	Deep Trough (North of Bloody Point)++	Y	Y	Y	Y	Y	Y	N	Local sponsor cannot designate as a placement site because use of the site is prohibited by State law.	Y	Y	
	2	Deep Trough (South of Bloody Point)++	Y	Y	Y	Y	Y	Y	Y		Y	Y	
	3	Man-O-War Shoals	Y	Y	Y	N	It is anticipated that cross-currents in the upper Bay would erode materials back into the shipping channel, increasing potential adverse effects on navigation.	Y	Y	Y	Y	Y	
	4	Ocean Placement++	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	5	Pooles Island Open Water++	N	42 % of need. Capacity already programmed.	Y	Y	Y	Y	Y	Y	Y	Y	
	6	Shad Battery Shoal	N	45% of need.	N	Striped bass spawning area.	Y	N	Adjacent to shipping channels. Potential hydrodynamic effects.	Y	Y	Y	Y
	7	Site 104++	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	8	Site 170B/Patapsco River Mouth (Open Water)	Y	N	High potential for erosion of materials into nearby shallow-water areas.	Y	Y	Y	Y	Y	Y	Y	
	9	Site 171 Open Water++	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	10	Tolchester S-Turn Channel	N	<28% of need.	N	Not extensively studied. Significant recreational fisheries nearby.	Y	S-turn project would have to pass environmental reviews.	Y	Y	Y	Y	Y
	11	Worton Point Open Water	N	32% of need.	N	Significant SAV, fisheries, and waterfowl resources within or adjacent to site.	Y	N	Berming would be necessary to keep materials out of adjacent shipping channels	Y	Y	Y	Y
Existing Placement Options (Not Including Open Water)	C&D Canal Upland Sites:												
	12	Bethel Dredged Material Containment Facility	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	
	13	Biddles Point Material Containment Facility	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	
	14	Chesapeake City Dredged Material Containment Facility++	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	
	15	Courthouse Point Dredged Material Containment Facility++	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	
	16	Delaware City Dredged Material Containment Facility++	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	
	17	Emily Point Dredged Material Containment Facility	N	24 % of need.	Y	Y	Y	?	Y	Y	Y	Y	
	18	Goose Point Dredged Material Containment Facility	N	25 % of need.	N	Currently a State wildlife area.	Y	Y	?	Y	N	Currently a wildlife area.	Y
	19	Long Creek Dredged Material Containment Facility	N	4 % of need.	Y	Y	Y	?	Y	Y	Y	Y	
	20	Lower Summit Dredged Material Containment Facility	N	27 % of need	Y	Y	Y	?	Y	Y	Y	Y	
	21	Pearce Creek Dredged Material Containment Facility++	Y	Y	Y	Y	Y	?	Y	N	Use of the site has been suspended pending resolution of ground-water issues.	Y	
	22	Penn Central Cutoff Dredged Material Containment Facility	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	
	23	Penn Central East Dredged Material Containment Facility	Y	Y	Y	Y	Y	?	Y	Y	Y	Y	
	24	Penn Central West Dredged Material Containment Facility	N	14% of need.	Y	Y	Y	?	Y	Y	Y	Y	
	25	Reedy Point North Dredged Material Containment Facility	N	42 % of need.	Y	Y	Y	?	Y	Y	Y	Y	
26	Reedy Point South Dredged Material Containment Facility	N	44 % of need.	Y	Y	Y	?	Y	Y	Y	Y		

Table F-4 (Continued)

Alternative Type	Site Number	Site	Primary Screening Criteria				Secondary Screening Criteria										
			1	2	3	4	5	6	7	8							
			Placement Capacity	Preliminary Environmental Suitability	Infrastructure Considerations	Navigation	Economic Viability	Real Estate	Institutional Constraints	Environmental Trade-Offs							
	27	Schoolhouse Road Dredged Material Containment Facility	N	31 % of need.	Y		Y		?	Y	Y	Y					
	28	St. Georges Dredged Material Containment Facility	N	33 % of need.	Y		Y		?	Y	Y	Y					
Existing Placement Options (Not Including Open Water) (continued)	29	Summit East Dredged Material Containment Facility	N	19 % of need.	N	High diversity forested area.	Y		?	Y	Y	Y					
	30	Upper Summit Dredged Material Containment Facility	N	6 % of need.	Y		Y		?	Y	Y	Y					
	31	Welch Point Dredged Material Containment Facility			Y		Y		?	Y	Y	Y					
	32	Cox Creek Dredged Material Containment Facility	N	33 % of need.	Y		Y		Y	Y	Y	Y					
		Hart-Miller Island Dredged Material Containment Facility															
	33	Hart-Miller Island South Cell Reconstruction/Reactivation	Y		Y		Y		Y		N	Restricted by State law from receiving additional material.	Y				
	34	Hart-Miller Island Use of Existing North Cell Capacity	Y	Capacity already programmed by MDOT.	Y		Y		Y		N	Dikes cannot be raised any further by State law	Y				
	35	Masonville	N	0 % . Closed.	Y		Y				N	Site reserved for re-development	Y				
		Poplar Island Restoration Project:															
	36	Poplar Island Dike Raising	Y		Y		Y		Y		N	Water quality certification and wetland license that specify acreage and percent for wetland cells would be needed.	Y				
	37	Poplar Island Wetland Cell Conversion to Upland	Y		Y		Y		Y		Y	Y					
New Containment Facilities	38	Bay Bridge Airport	N	<1 % of need.	N	Shallow-water habitat, SAV, and soft-shell clam beds onsite. Waterfowl use area.	Y		Y		Y	Y					
	39	Hart-Miller Island Footprint Expansion++	Y		N	Conversion of additional shallow-water habitat. Recreational fishing area.	N	Would take 10-11 years to bring online.	Y		N	By State law, no dikes can be raised adjacent to site.	Y				
	40	Poplar Island Footprint Expansion	Y		Y	Some trade-off, but of net benefit	Y		Y		Y	Y					
Beneficial Use Placement Options	41	APG Beneficial Use Options (General Application)	V	Most < 50 %	V	Most have significant living resource issues	V	All would need some infrastructure	Y		V	Highly variable but UXO removal would increase costs at all sites.	N	Federally (DOD) owned. APG has declined access to most sites.	N	UXO and CERCLA liabilities at all sites. Dike restrictions at some.	Y
	42	APG-Graces Quarters	N	2-5 % of need.	N	RTE habitat onsite. Finfish nursery area	N	Site would not be constructed by the time it is needed (due to need to clear UXO).	Y		N	Federally (DOD) owned. APG has declined access.	N	UXO and CERCLA liabilities. Dike restriction due to proximity to HMI.	Y		
	43	APG-J-Field	N	6-8 % of need.	N	RTE habitat onsite. Finfish nursery area. Floating marsh.	N	Site would not be constructed by the time it is needed (due to need to clear UXO).	Y		N	Federally (DOD) owned. APG has declined access.	N	UXO and CERCLA liabilities. Dike restriction due to proximity to HMI.	Y		
	44	Artificial Reefs-Thomas Point Strawman Design	N	28 % of need.	Y		Y		N	Deep draft vessels would not be able to use the area as an anchorage.	Y		Y		Y		
	45	Barren Island Restoration	Y	If island were completely reconstructed. Otherwise, < 3 % of need.	N	Satellite of USFWS Blackwater Refuge. Potentially significant resource issues.	Y		Y		Y		Y		Y		
	46	Bodkin Island Restoration	N	< 3 % of need.	Y		N	Construction likely would not be complete by the time it is needed.	Y		N	Costly: \$39/cy.	Y		Y		
	47	Bodkin Point	N	2-8 % of need.	Y		Y		Y		N	Very costly: \$75-\$100/cy.	Y		Y		
	48	Davis Tract	N	<1 % of need.	N	Forested: old growth. Excellent upland habitat & ravines. SAV along shore. Recreational activities (including fishing) along shore.	Y		Y		N	Very costly: \$75-\$100/cy.	Y		Y		
	49	Eastern Neck Island National Wildlife Refuge	N	< 1 % of need.	Y		Y		Y		N	Costly: \$20-\$85/cy.	Y		Y		

Table F-4 (Continued)

Alternative Type	Site Number	Site	Primary Screening Criteria						Secondary Screening Criteria							
			1	2	3	4	5	6	7	8						
			Placement Capacity	Preliminary Environmental Suitability	Infrastructure Considerations	Navigation	Economic Viability	Real Estate	Institutional Constraints	Environmental Trade-Offs						
Beneficial Use Placement Options (continued)	50	Grove Neck	N	11 % of need.	N	Currently a Wildlife Management Area.	Y	Y	Y	N	State owned and maintained as a WMA.	Y	Y			
	51	Hawkins Point/Thomas Cove	N	10-42 % of need.	N	Would need to convert shallow-water habitat and remove the last natural shoreline in the Harbor area for creation of an upland facility.	Y	Y		Y		Y	Y			
	52	Holland Island (Small-Scale)++	N	3-13 % of need.	Y		Y	Y	N	Very costly: \$52-125/cy.	Y	Y	Y			
	53	Holland Island (Large-Scale)	Y		Y		N	In preliminary stages of planning and would not be ready to meet need.	Y	N	Costly: \$25-45/cy.	Y	Y			
	54	Holly Neck Farm	N	1 % of need.	N	Wetlands and shallow-water habitat. Oyster bars and fisheries resources. Waterfowl use area. Significant terrestrial resources.	Y	Y	N	**Expected to be costly: must confirm**	Y	Y	Y			
	55	James Island	Y		Y		N	In preliminary stages of planning and would not be ready to meet need.	Y	Y		Y	Y			
	56	Parsons Island++	N	6-11 % of need.	Y		Y	Y	N	Costly: \$25-75/cy.	Y	Y	Y			
	57	Poplar Island (Existing)	Y		Y		Y	Y	Y	Basis for evaluation.	Y	Y	Y			
	58															
	59	Queenstown	Y		N	Tidal and non-tidal wetlands.	Y	Y	Y	N	Currently a golf course.	Y	Y			
	60	Rocky Point	N	33 % of need.	N	Tidal and non-tidal wetlands and forested areas on site.	Y	Y	Y	Y		Y	Y			
	61	Smith Island	N	2 % or 44 %	Y		Y	But larger site in very early stages of planning and may not be ready in time.	Y	Y		Y	Y			
	62	Sollers Point	N	22 % of need.	Y		Y	Y	Y	Y		N	Lies within the State dike restriction zone around HMI.			
	63	Sparrows Point Habitat Development	Y		Y		N	Planning stalled. Would not be constructed in time to meet need.	Y	Y		N	Lies within the State dike restriction zone around HMI.			
	64	Swan Point Beneficial Use	N	11-28 % of need.	N	Potential for significant (aquatic) resources. Needs further study.	Y	Y		Y		Y	Y			
	65	Worton Point Beneficial Use	N	47 % of need.	N	SAV and shallow-water habitat. Significant fisheries resources.	N	In preliminary stages of planning and would not be ready to meet need.	Y	Y		Y	Y			
	66	Innovative Use of Dredged Material	N	< 1 % of need.	V	Completely dependent upon end use.	V	In R&D phase. Uncertain.	N/A	V	Some could meet criteria while others are potentially very costly: \$25-200/cy.	V	Completely dependent upon end use.	V	Completely dependent upon end use.	N
Proposed Upper Bay Island Long-Term Placement Site	67	Pooles Island Upper Bay Island Placement Site	Y		N	SAV, shallow-water habitat, and forest for most configurations. Significant fisheries, avian, and terrestrial resources.	Y									
					Y		Y	Y	Y		N	Two configurations lie within APG-controlled area (UXO and CERCLA liability). All lie within HMI dike restriction area.	Y			

Table F-4 (Continued)

Alternative Type	Site Number	Site	Primary Screening Criteria				Secondary Screening Criteria					
			1	2	3	4	5	6	7	8		
			Placement Capacity	Preliminary Environmental Suitability	Infrastructure Considerations	Navigation	Economic Viability	Real Estate	Institutional Constraints	Environmental Trade-Offs		
	68	Site 168 (Two Configurations)++	Y	Y	Y	N/Y*	Potential for erosion of material into adjacent channels. Alternate configuration lessens the potential.	Y	Y	N	Within HMI dike restriction area.	Y
Proposed Upper Bay Island Long-Term Placement Site (continued)	69	Site 170A	Y	N	N	Y	In early stages of planning. Would not be constructed in time to meet need.	Y	Y	N	Within HMI dike restriction area.	Y
	70	Site 171 (Two Configurations)++	Y	Y	Y	Y	Permitting and construction could take up to 10 years. Could provide some capacity toward end of planning window.	Y	Y	Y		Y
	71	Tolchester West (Gales Lumps)++	Y	Y	Y	Y	Permitting and construction could take up to 10 years. Could provide some capacity toward end of planning window.	Y	Y	N	Within HMI dike restriction area.	Y

Source: USACE 1999, Annex E.

†Note: Y – Yes; N – No; V – Varies within option.; N/A – Not applicable.; * - Alternate configuration would lessen navigational effects; UXO – Unexploded Ordnance.; HMI – Hart-Miller Island; WMA – Wildlife Management Area.
Site names that are shaded have been screened out as potential stand-alone alternatives. ++ - Denotes that an option has been retained as part of a combination of smaller alternatives.

Summary of Environmental Factors, Weights and Scores

Harbor Sites

COL.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			
ROW			WATER QUALITY					AQUATIC INV.			WETLANDS		AQUATIC BIOLOGY - FINFISH/SHELLFISH						SPECIAL		WATERBIRDS		TERRESTRIAL					PHYSICAL PARAMETERS										
1	Weighting Factor		3	3	3	4	5	3	4	5	5	5	4	4	6	3	4	4	4	5	5	4	4	2	3	4	2	2	3	3	4	4	5	3	2			
2	OPTION NAME		Dissolved Oxygen	Nutrient Enrichment	Turbidity	Salinity	Ground Water	Benthic Community	Shallow Water Habitat (Tier II & Tier III)	SAV	Tidal Wetlands	Non-tidal Wetlands	Finfish Spawning Habitat	Finfish Rearing Habitat	Larval Transport	Essential Fish Habitat	Commercially Harvested Species and Habitat	Thermal Refuge	Recreational Fishery	Protected Species (RTE) (SSPRA)	Habitat of Particular Concern	Waterfowl Use	Wading and Shorebird Use	Wildlife Habitat	Forests	Streams	Lakes & Ponds	Other Natural Avian Habitat	Prime or Unique Agricultural Land	Substrate/Soil Characteristics	Hydro-dynamics effects	Toxic Contaminants	CERCLA/UXO Potential	Fossil Shell Mining	Floodplains			
3	Option No.																																					
4		Placement Options																																				
5	1	Dead Ship Anchorage	0	-1	0	0	0	-1	-1	0	-1	0	0	-1	0	0	0	0	0	0	0	-1	-1	0	0	0	0	0	0	0	0	0	1	-1	0	0		
6	2	Masonville	0	-1	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	
7	3	Sparrows Point 1	0	-1	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	-1	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	
8	4	Sparrows Point 2	0	-1	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	-1	0	0	-1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
9	5	Sparrows Point- Wetland Development	1	-1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	-1	0	0	-1	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	
10	6	Thoms Cove	0	-1	0	0	0	-1	-1	0	-1	0	0	-1	0	0	0	0	-1	0	0	-1	-1	0	0	0	0	0	0	0	-1	0	1	-1	0	0	0	
11	7	Fairfield-Amoco	0	-1	0	0	0	-1	-1	0	0	0	0	-1	0	0	0	0	-1	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	
12		Innovative Uses																																				
13	8	Innovative Use at Cox Creek	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
14	9	Landfill Usage	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
15	10	Use in Aggregates	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
16	11	Bricks for Construction & Walkways	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
17	12	Agricultural Use	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
18	13	Mines & Quarries Reclamation	0	1	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	1	1	0	1	0	1	0	1	0	1	0	0	0	
19		Community Enhancement/Beneficial Use (Concepts)																																				
20	14	Masonville- Shoreline Enhancement	0	-1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	-1	0	0	
21	15	Sollers Point East (Wetlands Creation)	1	-1	0	0	0	1	-1	0	0	0	0	1	0	0	0	0	-1	0	0	-1	1	0	0	0	0	0	0	0	-1	0	1	0	0	0	0	
22	16	Sollers Point West (Key Quay)	0	-1	1	0	0	-1	-1	0	-1	0	0	-1	0	0	0	0	-1	0	0	-1	-1	0	0	0	0	0	0	0	-1	0	1	0	0	0	0	
23	17	Sparrows Point- Jones Creek Shoreline Enhancement	1	-1	0	0	0	1	1	1	1	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	18	Sparrows Point- Bear Creek Enhancement	0	-1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	

Legend:
 +1 Potential protection or enhancement
 0 No potential impacts expected
 0 Not enough / inconclusive data
 0 (shaded) Not applicable / not calculated
 - 1 Potential negative impacts expected
 RTE is the only parameter with a score >1 since each species impacted is counted

***This matrix is compiled by the BEWG. This is the final version of the matrix for presentation to Harbor Team at the September 11, 2003 meeting. In the future, this document may be updated as new information becomes available.

(NOTE: Bold scores represent those that have been "flagged" to receive particular consideration because of significant interest or impact and is captured on the Supplemental Information sheet.)

Summary of Environmental Factors, Weights and Scores

Harbor Sites

COL.	1	2	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
ROW			HUMAN USE ATTRIBUTES											BENEFICIAL ATTRIBUTES										ROW				
		Weighting Factor	2	2	2	3	3	3	3	4	4	4	5	5	3	4	2	2	2	2	2							
	Option No.	OPTION NAME	Recreational Value	Aesthetics	Noise	Cultural Resources	Air Quality	Infrastructure	Existing Land Use	Commercial Socioeconomics	Community Socioeconomics	Environmental Justice	Public Health	Public Safety	Navigation	Beneficial Use Wetlands	Beneficial Use Uplands	Beneficial Use - Adjacent Habitat Enhancement	Beneficial Use - Faunal	Beneficial Use - Recreational Enhancement	Shoreline Protection	Total Environmental Score	Normalized		Overall Rank	Option No.		
		Placement Options																										
1	1	Dead Ship Anchorage	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	1	-14	-0.3500	0.2864	5	1		
2	2	Masonville	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0.0286	0.6650	4	2		
3	3	Sparrows Point 1	0	1	0	0	0	0	1	1	1	0	1	-1	0	0	0	0	0	0	0	3	0.0909	0.7273	2	3		
4	4	Sparrows Point 2	0	1	0	0	0	0	1	1	1	0	1	-1	0	0	0	0	0	0	0	3	0.0909	0.7273	2	4		
5	5	Sparrows Point- Wetland Development	0	1	0	0	0	0	1	0	1	0	1	0	0	1	1	1	1	1	1	33	0.8462	1.4826	1	5		
6	6	Thoms Cove	0	0	0	0	0	0	1	1	0	0	1	-1	0	0	0	0	0	0	0	-28	-0.6364	0.0000	7	6		
7	7	Fairfield-Amoco	0	-1	0	0	0	0	1	1	1	0	1	-1	0	0	0	0	0	0	0	-18	-0.4737	0.1627	6	7		
8	8	Innovative Uses																										
9	9	Innovative Use at Cox Creek	0	<u>0</u>	-1	0	<u>0</u>	<u>0</u>	0	<u>0</u>	0	0	1	<u>0</u>	0	0	0	0	0	0	0	10	0.7692	1.4056	5	8		
10	10	Landfill Usage	1	1	<u>0</u>	0	<u>0</u>	<u>0</u>	1	<u>0</u>	<u>0</u>	<u>0</u>	1	<u>0</u>	0	0	1	0	1	1	0	24	0.9600	1.5964	4	9		
11	11	Use in Aggregates	0	<u>0</u>	<u>0</u>	0	<u>0</u>	<u>0</u>	0	1	0	0	1	<u>0</u>	0	0	0	0	0	0	0	16	1.4545	2.0909	2	10		
12	12	Bricks for Construction & Walkways	0	<u>0</u>	<u>0</u>	0	<u>0</u>	<u>0</u>	0	1	0	0	1	<u>0</u>	0	0	0	0	0	0	0	16	1.4545	2.0909	2	11		
13	13	Agricultural Use	0	0	0	0	0	0	1	1	0	0	1	<u>0</u>	0	0	0	0	0	0	0	18	0.6923	1.3287	6	12		
14	14	Mines & Quarries Reclamation	1	1	0	0	0	0	1	1	0	0	1	<u>0</u>	0	0	1	1	1	0	63	1.7500	2.3864	1	13			
15	15	Community Enhancement/Beneficial Use (Concepts)																										
16	16	Masonville- Shoreline Enhancement	1	1	<u>0</u>	0	0	0	1	0	0	0	<u>0</u>	1	0	1	0	1	1	1	1	38	0.8636	1.5000	3	14		
17	17	Sollers Point East (Wetlands Creation)	0	1	<u>0</u>	0	0	0	1	0	1	1	1	0	0	1	1	1	1	1	0	30	0.6522	1.2886	4	15		
18	18	Sollers Point West (Key Quay)	1	0	<u>0</u>	0	0	0	1	1	1	1	1	1	0	0	0	0	0	1	1	4	0.0952	0.7316	5	16		
19	19	Sparrows Point- Jones Creek Shoreline Enhancement	1	1	1	0	0	0	1	0	1	0	1	1	0	1	1	1	1	1	1	69	1.5000	2.1364	1	17		
20	20	Sparrows Point- Bear Creek Enhancement	0	1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	1	0	34	0.8718	1.5082	2	18		

New Parameters in light green; parameters that might not be pertinent have columns shaded; peach means doesn't match the text anymore.

- Legend:**
- +1 Potential protection or enhancement
 - 0 No potential impacts expected
 - 0 Not enough / inconclusive data
 - 0 (shaded) Not applicable / not calculated
 - 1 Potential negative impacts expected
 - RTE is the only parameter with a score >1 since each species impacted is counted

Options list tentative; please note that the older sites (DS Anchorage, Thoms Cove) now have shoreline enhancements in design so score may need to change

(NOTE: Bold scores represent those that have been "flagged" to receive particular consideration because of significant interest or impact and is captured on the Supplemental Information sheet.)

**TABLE F-6. DREDGED MATERIAL PLACEMENT SITES IN MARYLAND CONSIDERED BY THE 2003 HARBOR
OPTIONS WORK GROUP STUDY
MASONVILLE DREDGED MATERIAL CONTAINMENT FACILITY, BALTIMORE HARBOR, MARYLAND**

SITE NUMBER	SITE NAME	TYPE OF OPTION	COMMENTS
1	Agricultural Use	Innovative Use	May not be suitable for some Harbor materials; due to quality; can only use small quantities
2	Bricks	Innovative Use	Very expensive option; potentially feasible but requires dewatering and rehandling; can only handle small quantities.
3	Innovative Reuse at Cox Creek	Innovative Use using Cox Creek as a handling facility	Very expensive option; all products (e.g. aggregates, soil amendments, etc.) potentially feasible but require dewatering and rehandling; can only handle small quantities. Considered during innovative Use Forum
4	Key Bridge Piling Protection	In-water placement in bermed site	Very small quantities needed. Statutorily questionable without building dikes out of water.
	Mines and Quarries	Upland Placement to regrade quarries	Has potential but requires dewatering and rehandling. Still under consideration but suitable sites must be identified and
5	Deadship Anchorage	Fastland creation	Screened out due to development issues
6	Masonville	Fastland creation	Chosen; best option
7	Sparrows Point	Beneficial Use	Wetland Creation; carried for further study
8	Sparrows Point	Fastland Creation	Chosen for more study
9	Sollers Point	Fastland Creation	Screened out due citizen opposition
10	Thoms Cove	Fastland Creation	Screened out due to ecological issues
11	BP-Fairfield	Fastland Creation	Chosen for more study
12	Fort Howard	Community Enhancement	All had small capacities but were outdated relative to the current landuse. Newer community enhancements were developed by the Harbor Team and recommendations forwarded to the Executive Committee.
13	Hog Neck	Community Enhancement	
14	Key Bridge SW	Community Enhancement	
15	Patapsco Ponds	Community Enhancement	

TABLE F-7. UPLAND SITES SCREENED FROM ALL STUDIES				
Study	No.	Option	Type	Why Rejected¹
1970 Green-Trident		Carroll's Island (Hawthorn Cove)	Marsh/Upland	Unexploded Ordinance, high ecological value
1970 Green-Trident		Hawkins Point	Upland, marsh, and water	Cannot use, obstruction or danger to navigation, conflicting land use
1989 MPA Master Plan	1	Chesapeake City	Upland	ERO, TW, NTW, FSH, RTE, FOR, POP
1989 MPA Master Plan	2	Sandy Point	Upland	ERO, TW, NTW, FSH, RTE, FOR, HST
1989 MPA Master Plan	3	Herring Creek	Upland	ERO, NTW, FSH, FOR, HST
1989 MPA Master Plan	4	Veazey Neck West	Upland	ERO, NTW, FSH, FOR, FWL, ARC
1989 MPA Master Plan	5	Veazey Neck East	Upland	ERO, TW, NTW, SAV, FSH, FOR, FWL
1989 MPA Master Plan	6	Pearce Neck	Upland	ERO, TW, NTW, SAV, FSH, FOR, POP
1989 MPA Master Plan	7	Grove Neck East	Upland	ERO, TW, NTW, SAV, FSH, RTE, FOR, FWL, POP
1989 MPA Master Plan	8	Grove Neck West	Upland	FSH, FOR, ARC, POP, high cost
1989 MPA Master Plan	9	Money Creek	Upland	ERO, TW, NTW, SAV, FSH, RTE, FOR, FWL, ARC
1989 MPA Master Plan	10	Foreman Creek	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, ARC, POP
1989 MPA Master Plan	11	McGill Creek	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, ARC, POP
1989 MPA Master Plan	12	Back Creek	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, ARC, HST, POP
1989 MPA Master Plan	13	Hall Creek	Upland	ERO, NTW, FSH, POP
1989 MPA Master Plan	14	Lloyd Creek	Upland	ERO, TW, NTW, FSH, FWL

TABLE F-7. UPLAND SITES SCREENED FROM ALL STUDIES

Study	No.	Option	Type	Why Rejected ¹
1989 MPA Master Plan	15	Sassafrass River	Upland	ERO, TW, NTW, FSH, RTE, FWL, ARC
1989 MPA Master Plan	16	Turner Creek West	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, ARC
1989 MPA Master Plan	17	Turner Creek South	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, HST
1989 MPA Master Plan	18	Turner Creek Southeast	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL
1989 MPA Master Plan	19	Turner Creek North	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, HST, POP
1989 MPA Master Plan	20	Shewsbury Neck	Upland	ERO, TW, NTW, FSH, RTE, POP
1989 MPA Master Plan	21	Shellcross Neck	Upland	ERO, TW, NTW, FSH, RTE, FWL, ARC, HST
1989 MPA Master Plan	22	Island Creek	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, HST
1989 MPA Master Plan	23	Woodland Creek	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, ARC
1989 MPA Master Plan	24	Dyer Creek North	Upland	ERO, TW, NTW, FSH, RTE, FWL
1989 MPA Master Plan	25	Dyer Creek South	Upland	ERO, TW, NTW, FSH, RTE, FOR, POP
1989 MPA Master Plan	26	Georgetown	Upland	ERO, TW, NTW, FSH, RTE, FOR, FWL, POP
1989 MPA Master Plan	27	Galena	Upland	ERO, TW, FSH, RTE, ARC, POP
1989 MPA Master Plan	28	Howell Point	Upland	ERO, NTW, FSH, FOR
1989 MPA Master Plan	29	Stillpond Neck	Upland	ERO, NTW, SAV, FSH, FOR
1989 MPA Master Plan	30	Stillpond Creek	Upland	ERO, NTW, FSH, FWL, ARC
1989 MPA Master Plan	31	Rocky Point	Upland	ERO, TW, NTW, FSH, FWL, ARC, high cost

TABLE F-7. UPLAND SITES SCREENED FROM ALL STUDIES				
Study	No.	Option	Type	Why Rejected¹
1989 MPA Master Plan	32	Plum Point West	Upland	ERO, TW, NTW, SAV, FSH, FWL, ARC,
1989 MPA Master Plan	33	Plum Point East	Upland	ERO, NTW, FSH, RTE
1989 MPA Master Plan	34	Churn Creek West	Upland	ERO, NTW, FSH
1989 MPA Master Plan	35	Churn Creek South	Upland	ERO, TW, NTW, FSH, FWL, ARC
1989 MPA Master Plan	36	Worton Point	Upland	ERO, NTW, RTE, ARC
1989 MPA Master Plan	37	Newtown	Upland	ERO, TW, NTW, RTE, ARC
1989 MPA Master Plan	38	Fairlee Creek	Upland	ERO, NTW, FOR, ARC, POP
1989 MPA Master Plan	39	Fairlee Creek	Upland	ERO, TW, NTW, RTE, FOR, ARC
1989 MPA Master Plan	40	Fairlee	Upland	ERO, TW, NTW, RTE, FOR, ARC
1989 MPA Master Plan	41	Mitchell Bluff	Upland	ERO, NTW, POP
1989 MPA Master Plan	42	Tolchester Beach	Upland	ERO, NTW, FOR, ARC, HST
1989 MPA Master Plan	43	Tolchester Beach	Upland	ERO, NTW, PFOR, ARC, HST
1989 MPA Master Plan	44	Tolchester Beach	Upland	ERO, NTW, RTE, FOR
1989 MPA Master Plan	45	Tolchester Beach	Upland	ERO, NTW, RTE, FOR
1989 MPA Master Plan	46	Tolchester Beach	Upland	ERO, NTW, FOR
1989 MPA Master Plan	47	Tolchester Beach	Upland	ERO, NTW, FOR
1989 MPA Master Plan	48	Swan Creek North	Upland	ERO, TW, NTW, FSH, FOR, FWL, HST
1989 MPA Master Plan	49	Swan Creek South	Upland	TW, NTW, FSH, FWL
1989 MPA Master Plan	50	Swan Point	Upland	TW, NTW, SLF, FOR, FWL, ARC, high cost
1989 MPA Master Plan	51	Grays Inn Creek	Upland	ERO, TW, NTW, SAV, SLF, FOR, FWL
1989 MPA Master Plan	52	Browns Creek	Upland	ERO, TW, NTW, SAV, SLF, FOR, FWL, ARC

TABLE F-7. UPLAND SITES SCREENED FROM ALL STUDIES				
Study	No.	Option	Type	Why Rejected¹
1989 MPA Master Plan	53	Church Creek	Upland	ERO, TW, NTW, SAV, FSH, SLF, RTE, FWL
1989 MPA Master Plan	54	Goose Cove	Upland	ERO, TW, NTW, SAV, SLF, FWL, ARC
1989 MPA Master Plan	55	Grays Inn Point	Upland	ERO, TW, NTW, SAV, SLF, FWL
1989 MPA Master Plan	56	Shippen Cove	Upland	ERO, TW, NTW, SAV, SLF, FOR, FWL, ARC, POP
1989 MPA Master Plan	57	B&O Kennebec	Upland	RCH, ERO, NTW
1989 MPA Master Plan	58	Tanyard Cove	Upland	RCH, ERO, NTW, FOR, POP
1989 MPA Master Plan	59	Long Cove	Upland	RCH, ERO, TW, NTW, FSH, FOR
1989 MPA Master Plan	60	Marley Creek	Upland	RCH, ERO, NTW, FSH, FOR
1989 MPA Master Plan	61	Hog Neck	Upland	RCH, ERO, TW, NTW, FSH, FOR, POP
1989 MPA Master Plan	62	Bodkin Neck	Upland	RCH, TW, NTW, FSH, SLF, RTE, FWL, ARC
1989 MPA Master Plan	63	Magothy Creek	Upland	RCH, ERO, NTW, FSH, RTE, FOR, POP
1989 MPA Master Plan	64	Broad Creek	Upland	RCH, ERO, TW, NTW, FSH, RTE, FOR, FWL, POP
1989 MPA Master Plan	65	Blackhole Creek	Upland	RCH, ERO, NTW, FSH, RTE, FOR, FWL
1989 MPA Master Plan	66	Stevensville	Upland	ERO, TW, NTW, SLF, FOR, FWL, HST, POP
1989 MPA Master Plan	67	Macum Creek	Upland	ERO, NTW, POP
1989 MPA Master Plan	68	Queenstown	Upland	ERO, TW, NTW, SAV, SLF, FOR, high cost, currently a golf course
1989 MPA Master Plan	69	Thompson Creek	Upland	ERO, TW, NTW, FWL, POP
1989 MPA Master Plan	70	Warehouse Creek North	Upland	ERO, TW, NTW, FOR, FWL, POP

TABLE F-7. UPLAND SITES SCREENED FROM ALL STUDIES

Study	No.	Option	Type	Why Rejected ¹
1989 MPA Master Plan	71	Cox Creek	Upland	ERO, TW, NTW, FOR, FWL, POP
1989 MPA Master Plan	72	Crab Alley South	Upland	ERO, TW, SAV, FOR, FWL, POP
1989 MPA Master Plan	73	Crab Alley North	Upland	ERO, TW, SAV, FWL, POP
1989 MPA Master Plan	74	Warehouse Creek South	Upland	ERO, TW, NTW, FOR, FWL, POP
1989 MPA Master Plan	75	Tolson Creek	Upland	ERO, TW, SAV, SLF, FWL, POP
1989 MPA Master Plan	76	Bloody Point	Upland	ERO, NTW, SLF, FOR, FWL, ,ARC, POP
1989 MPA Master Plan	77	Chews Creek	Upland	ERO, NTW, FOR, FWL, POP
1989 MPA Master Plan	78	Tranners Creek North	Upland	ERO, TW, NTW, FOR, FWL, POP
1989 MPA Master Plan	79	Tranners Creek South	Upland	
1989 MPA Master Plan	80	Goose Pond	Upland	RCH, TW, NTW, SLF, FWL, ARC
1989 MPA Master Plan	81	Hackett Point	Upland	RCH, TW, NTW, SLF, FWL
1989 MPA Master Plan	82	Londontowne	Upland	RCH, EERO, TW, NTW, FWL, ARC, POP
2002 Dredged Material Management Program Report, 2003 Harbor Options Working Group		Agricultural	Land application	Research into this use is ongoing; There is concern about use, particularly for contaminated sediments, such as those dredged from the Harbor; generally very small volume options
2002 Dredged Material Management Program Report		Innovative Use at Cox Creek	Expansion of facility to handle	Under Consideration, very small volume, cannot be operational by 2009

TABLE F-7. UPLAND SITES SCREENED FROM ALL STUDIES

Study	No.	Option	Type	Why Rejected ¹
2002 Dredged Material Management Program Report, 2003 Harbor Options Working Group		Furnace Bay	Upland; mine reclamation	Ranked ok ecologically but very small annual capacity and access problematic. Not forwarded.
2002 Dredged Material Management Program Report, 2003 Harbor Options Working Group		Mines and Quarries	Upland; mine reclamation	Among the preferred options; forwarded by Harbor Team. Has potential but requires dewatering and rehandling. Still under consideration but suitable sites must be identified and infrastructure issues must be solved.
2002 Dredged Material Management Program Report		MD - C&D Placement Sites (6)	Upland	Unable to receive contaminated material, capacity allotted for C&D Channel materials
2003 Harbor Options Working Group		BP Fairfield	Upland and open water	Site recommended by Harbor Team. Has some potential for upland placement. Viable alternative that is less practicable than Masonville due to land ownership issues and more potential for some impacts.
¹ RCH - recharge area, ERO - low erosion area, TW - tidal wetland, NTW - non-tidal wetland, SAV - submerged aquatic vegetation, FSH - fish spawning or nursery ground, SLF - shellfish areas, RTE - Rare, Threatened or Endangered species, FOR - Forested area, FWL - waterfowl concentration area, ARC - archaeological site, HST - historic site, POP - within a 1/2 mile of a population center				

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ATTACHMENT F-1

INITIAL CONSTRUCTION COSTS AND TOTAL COSTS FOR SCENARIOS A THROUGH D

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Scenario A**Alignment 2-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	614,878	\$2,742,356
<i>Section 3 - Shoreline Dike</i>	20.27	\$/cy	29,314	\$594,195
<i>Unsuitable Replacement</i>	4.46	\$/cy	851,000	\$3,795,460
<i>10% Loss During Construction</i>	4.46	\$/cy	149,519	\$666,856
Total			1,644,711	\$7,798,866
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	55,000	\$305,250
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	851,000	\$4,723,050
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,326,000	\$7,359,300
<i>Total Volume Excavated</i>			2,232,000	
<i>Volume Taken Offsite</i>	100	%	2,232,000	
Total				\$12,387,600
Stone Work				
<i>Section 2 - Armored Sand Dike</i>	39.00	\$/ton	53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00	\$/sy	23,166	\$254,826
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	28,080	\$112,320
Total				\$432,944
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,690,592
Initial Construction Cost				\$51,294,537

Site Characteristics		
Item	Value	Units
Site Capacity	18.5	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	24.0	years
Perimeter Dike	13,310	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$54,094,537	
Initial Construction Costs				\$51,294,537	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$18,988,800	
Dredged Material Management	year	\$275,000	24.0	\$6,600,000	\$2,500 / acre
Site Maintenance	year	\$266,200	24.0	\$6,388,800	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	24.0	\$6,000,000	Enviro Monitoring
C. Dike Raising				\$9,414,000	
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000	
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000	
E. Dredging, Transportation, & Placement Costs				\$117,900,000	
Mob and Demob	year	\$750,000	24.0	\$18,000,000	
Dredging	mcy	\$2.25	18.5	\$41,625,000	Clamshell Dredging
Transportation	mcy	\$0.90	18.5	\$16,650,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	18.5	\$41,625,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$200,397,337	
F. Contingency Cost		15%		\$22,365,420	
Total Cost A+B+C+D+E+F				\$222,762,757	
Total Unit Cost				\$12.04 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario A**Alignment 2-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	880,137	\$3,925,411
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46	\$/cy	884,000	\$3,942,640
<i>10% Loss During Construction</i>	4.46	\$/cy	189,609	\$845,656
Total			2,085,699	\$11,454,371
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	85,000	\$471,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	884,000	\$4,906,200
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,249,000	\$6,931,950
<i>Total Volume Excavated</i>			2,218,000	
<i>Volume Taken Offsite</i>	100	%	2,218,000	
Total				\$12,309,900
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00	\$/sy	21,021	\$231,231
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	25,480	\$101,920
Total				\$422,544
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,765,358
Initial Construction Cost				\$59,534,409

Site Characteristics		
Item	Value	Units
Site Capacity	17.7	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	23.0	years
Perimeter Dike	12,340	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$62,334,409	
Initial Construction Costs				\$59,534,409	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$17,348,900	
Dredged Material Management	year	\$257,500	23.0	\$5,922,500	\$2,500 / acre
Site Maintenance	year	\$246,800	23.0	\$5,676,400	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	23.0	\$5,750,000	Enviro Monitoring
C. Dike Raising				\$3,681,000	
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000	
E. Dredging, Transportation, & Placement Costs				\$112,830,000	
Mob and Demob	year	\$750,000	23.0	\$17,250,000	
Dredging	mcy	\$2.25	17.7	\$39,825,000	Clamshell Dredging
Transportation	mcy	\$0.90	17.7	\$15,930,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	17.7	\$39,825,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$196,194,309	
F. Contingency Cost		15%		\$20,498,985	
Total Cost A+B+C+D+E+F				\$216,693,294	
Total Unit Cost				\$12.24 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario A**Alignment 2-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46	\$/cy	172,985	\$771,513
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	614,878	\$2,742,356
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46	\$/cy	851,000	\$3,795,460
<i>10% Loss During Construction</i>	4.46	\$/cy	166,818	\$744,007
Total			1,834,995	\$8,662,188
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	851,000	\$4,723,050
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,326,000	\$7,359,300
<i>Total Volume Excavated</i>			2,269,000	
<i>Volume Taken Offsite</i>	100	%	2,269,000	
Total				\$12,592,950
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	23,166	\$254,826
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	28,080	\$112,320
Total				\$296,144
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,057,846
Initial Construction Cost				\$54,110,154

Site Characteristics		
Item	Value	Units
Site Capacity	18.3	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	23.0	years
Perimeter Dike	13,310	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$56,910,154	
Initial Construction Costs				\$54,110,154	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$18,197,600	
Dredged Material Management	year	\$275,000	23.0	\$6,325,000	\$2,500 / acre
Site Maintenance	year	\$266,200	23.0	\$6,122,600	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	23.0	\$5,750,000	Enviro Monitoring
C. Dike Raising				\$9,414,000	
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000	
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000	
E. Dredging, Transportation, & Placement Costs				\$116,070,000	
Mob and Demob	year	\$750,000	23.0	\$17,250,000	
Dredging	mcy	\$2.25	18.3	\$41,175,000	Clamshell Dredging
Transportation	mcy	\$0.90	18.3	\$16,470,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	18.3	\$41,175,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$200,591,754	
F. Contingency Cost		15%		\$21,972,240	
Total Cost A+B+C+D+E+F				\$222,563,994	
Total Unit Cost				\$12.16 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario A**Alignment 2-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46	\$/cy	461,897	\$2,060,061
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	880,137	\$3,925,411
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46	\$/cy	884,000	\$3,942,640
<i>10% Loss During Construction</i>	4.46	\$/cy	235,799	\$1,051,662
Total			2,593,786	\$13,720,438
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	125,000	\$693,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	884,000	\$4,906,200
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,249,000	\$6,931,950
<i>Total Volume Excavated</i>			2,258,000	
<i>Volume Taken Offsite</i>	100.0	%	2,258,000	
Total				\$12,531,900
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	21,021	\$231,231
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	25,480	\$101,920
Total				\$285,744
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,802,327
Initial Construction Cost				\$59,817,840

Site Characteristics		
Item	Value	Units
Site Capacity	17.4	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	22.0	years
Perimeter Dike	12,340	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$62,617,840	
Initial Construction Costs				\$59,817,840	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$16,594,600	
Dredged Material Management	year	\$257,500	22.0	\$5,665,000	\$2,500 / acre
Site Maintenance	year	\$246,800	22.0	\$5,429,600	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	22.0	\$5,500,000	Enviro Monitoring
C. Dike Raising				\$3,681,000	
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000	
E. Dredging, Transportation, & Placement Costs				\$110,460,000	
Mob and Demob	year	\$750,000	22.0	\$16,500,000	
Dredging	mcy	\$2.25	17.4	\$39,150,000	Clamshell Dredging
Transportation	mcy	\$0.90	17.4	\$15,660,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	17.4	\$39,150,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$193,353,440	
F. Contingency Cost		15%		\$20,030,340	
Total Cost A+B+C+D+E+F				\$213,383,780	
Total Unit Cost				\$12.26 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario A**Alignment 3-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	560,957	\$2,501,868
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46	\$/cy	705,000	\$3,144,300
<i>10% Loss During Construction</i>	4.46	\$/cy	129,527	\$577,691
Total			1,424,798	\$6,832,711
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	55,000	\$305,250
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	705,000	\$3,912,750
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,143,000	\$6,343,650
<i>Total Volume Excavated</i>			1,903,000	
<i>Volume Taken Offsite</i>	100	%	1,903,000	
Total				\$10,561,650
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00	\$/sy	21,934	\$241,274
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	26,587	\$106,348
Total				\$407,260
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,231,961
Initial Construction Cost				\$47,778,365

Site Characteristics		
Item	Value	Units
Site Capacity	16.1	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	21.0	years
Perimeter Dike	12,750	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$50,578,365	
Initial Construction Costs				\$47,778,365	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$15,907,500	
Dredged Material Management	year	\$252,500	21.0	\$5,302,500	\$2,500 / acre
Site Maintenance	year	\$255,000	21.0	\$5,355,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	21.0	\$5,250,000	Enviro Monitoring
C. Dike Raising				\$8,730,000	
Common Borrow	\$/cy	\$15.00	294,000	\$4,410,000	
Dried Dredged Material	\$/cy	\$9.00	480,000	\$4,320,000	
E. Dredging, Transportation, & Placement Costs				\$102,690,000	
Mob and Demob	year	\$750,000	21.0	\$15,750,000	
Dredging	mcy	\$2.25	16.1	\$36,225,000	Clamshell Dredging
Transportation	mcy	\$0.90	16.1	\$14,490,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	16.1	\$36,225,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$177,905,865	
F. Contingency Cost		15%		\$19,519,125	
Total Cost A+B+C+D+E+F				\$197,424,990	
Total Unit Cost				\$12.26 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario A**Alignment 3-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	802,175	\$3,577,701
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46	\$/cy	733,000	\$3,269,180
<i>10% Loss During Construction</i>	4.46	\$/cy	166,713	\$743,539
Total			1,833,841	\$10,331,083
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	85,000	\$471,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	733,000	\$4,068,150
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,075,000	\$5,966,250
<i>Total Volume Excavated</i>			1,893,000	
<i>Volume Taken Offsite</i>	100	%	1,893,000	
Total				\$10,506,150
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$397,020
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,286,565
Initial Construction Cost				\$55,863,665

Site Characteristics		
Item	Value	Units
Site Capacity	16.0	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	20.0	years
Perimeter Dike	11,795	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$58,663,665	
Initial Construction Costs				\$55,863,665	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$14,468,000	
Dredged Material Management	year	\$237,500	20.0	\$4,750,000	\$2,500 / acre
Site Maintenance	year	\$235,900	20.0	\$4,718,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	20.0	\$5,000,000	Enviro Monitoring
C. Dike Raising				\$3,501,000	
Dried Dredged Material	\$/cy	\$9.00	389,000	\$3,501,000	
E. Dredging, Transportation, & Placement Costs				\$101,400,000	
Mob and Demob	year	\$750,000	20.0	\$15,000,000	
Dredging	mcy	\$2.25	16.0	\$36,000,000	Clamshell Dredging
Transportation	mcy	\$0.90	16.0	\$14,400,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	16.0	\$36,000,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$178,032,665	
F. Contingency Cost		15%		\$18,325,350	
Total Cost A+B+C+D+E+F				\$196,358,015	
Total Unit Cost				\$12.27 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario A**Alignment 3-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46	\$/cy	172,985	\$771,513
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	560,957	\$2,501,868
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46	\$/cy	705,000	\$3,144,300
<i>10% Loss During Construction</i>	4.46	\$/cy	146,826	\$654,842
Total			1,615,082	\$7,681,375
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	705,000	\$3,912,750
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,143,000	\$6,343,650
<i>Total Volume Excavated</i>			1,940,000	
<i>Volume Taken Offsite</i>	100.0	%	1,940,000	
Total				\$10,767,000
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	21,934	\$241,274
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	26,587	\$106,348
Total				\$270,460
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,597,016
Initial Construction Cost				\$50,577,126

Site Characteristics		
Item	Value	Units
Site Capacity	16.0	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	20.0	years
Perimeter Dike	12,750	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$53,377,126	
Initial Construction Costs				\$50,577,126	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$15,150,000	
Dredged Material Management	year	\$252,500	20.0	\$5,050,000	\$2,500 / acre
Site Maintenance	year	\$255,000	20.0	\$5,100,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	20.0	\$5,000,000	Enviro Monitoring
C. Dike Raising				\$8,730,000	
Common Borrow	\$/cy	\$15.00	294,000	\$4,410,000	
Dried Dredged Material	\$/cy	\$9.00	480,000	\$4,320,000	
E. Dredging, Transportation, & Placement Costs				\$101,400,000	
Mob and Demob	year	\$750,000	20.0	\$15,000,000	
Dredging	mcy	\$2.25	16.0	\$36,000,000	Clamshell Dredging
Transportation	mcy	\$0.90	16.0	\$14,400,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	16.0	\$36,000,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$178,657,126	
F. Contingency Cost		15%		\$19,212,000	
Total Cost A+B+C+D+E+F				\$197,869,126	
Total Unit Cost				\$12.37 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario A**Alignment 3-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46	\$/cy	461,897	\$2,060,061
<i>Section 2 - Armored Sand Dike</i>	4.46	\$/cy	802,175	\$3,577,701
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46	\$/cy	733,000	\$3,269,180
<i>10% Loss During Construction</i>	4.46	\$/cy	212,903	\$949,545
Total			2,341,928	\$12,597,150
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	125,000	\$693,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	733,000	\$4,068,150
<i>Unsuitable Excavated from Overtop of Borrow</i>	5.55	\$/cy	1,075,000	\$5,966,250
<i>Total Volume Excavated</i>			1,933,000	
<i>Volume Taken Offsite</i>	100.0	%	1,933,000	
Total				\$10,728,150
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$260,220
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,323,534
Initial Construction Cost				\$56,147,096

Site Characteristics		
Item	Value	Units
Site Capacity	15.7	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	20.0	years
Perimeter Dike	11,795	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$58,947,096	
Initial Construction Costs				\$56,147,096	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$14,468,000	
Dredged Material Management	year	\$237,500	20.0	\$4,750,000	\$2,500 / acre
Site Maintenance	year	\$235,900	20.0	\$4,718,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	20.0	\$5,000,000	Enviro Monitoring
C. Dike Raising				\$3,501,000	
Dried Dredged Material	\$/cy	\$9.00	389,000	\$3,501,000	
E. Dredging, Transportation, & Placement Costs				\$99,780,000	
Mob and Demob	year	\$750,000	20.0	\$15,000,000	
Dredging	mcy	\$2.25	15.7	\$35,325,000	Clamshell Dredging
Transportation	mcy	\$0.90	15.7	\$14,130,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	15.7	\$35,325,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$176,696,096	
F. Contingency Cost		15%		\$18,082,350	
Total Cost A+B+C+D+E+F				\$194,778,446	
Total Unit Cost				\$12.41 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario B**Alignment 2-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		614,878	\$2,742,356
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		851,000	\$3,795,460
<i>10% Loss During Construction</i>	4.46 \$/cy		149,519	\$666,856
Total			1,644,711	\$7,813,523
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		1,232,000	\$6,837,600
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			2,232,000	
<i>Volume Taken Offsite</i>	55 %		1,232,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$11,277,600
Stone Work				
<i>Section 2 - Armored Sand Dike</i>	39.00 \$/ton		53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00 \$/sy		23,166	\$254,826
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		28,080	\$112,320
Total				\$432,944
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$6,526,290
Initial Construction Cost				\$50,034,893

Site Characteristics		
Item	Value	Units
Site Capacity	17.8	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	23.0	years
Perimeter Dike	13,310	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$52,834,893	
Initial Construction Costs				\$50,034,893	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$18,197,600	
Dredged Material Management	year	\$275,000	23.0	\$6,325,000	\$2,500 / acre
Site Maintenance	year	\$266,200	23.0	\$6,122,600	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	23.0	\$5,750,000	Enviro Monitoring
C. Dike Raising				\$9,414,000	
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000	
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000	
E. Dredging, Transportation, & Placement Costs				\$113,370,000	
Mob and Demob	year	\$750,000	23.0	\$17,250,000	
Dredging	\$/cy	\$2.25	17.8	\$40,050,000	Clamshell Dredging
Transportation	\$/cy	\$0.90	17.8	\$16,020,000	\$0.10 / NM Haul Distance
Placement	\$/cy	\$2.25	17.8	\$40,050,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$193,816,493	
F. Contingency Cost		15%		\$21,567,240	
Total Cost A+B+C+D+E+F				\$215,383,733	
Total Unit Cost				\$12.10 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario B**Alignment 2-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		880,137	\$3,925,411
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		884,000	\$3,942,640
<i>10% Loss During Construction</i>	4.46 \$/cy		189,609	\$845,656
Total			2,085,699	\$11,454,371
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		1,218,000	\$6,759,900
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			2,218,000	
<i>Volume Taken Offsite</i>	55 %		1,218,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$11,199,900
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00 \$/sy		21,021	\$231,231
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		25,480	\$101,920
Total				\$422,544
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$7,598,858
Initial Construction Cost				\$58,257,909

Site Characteristics		
Item	Value	Units
Site Capacity	17.0	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	22.0	years
Perimeter Dike	12,340	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$61,057,909	
Initial Construction Costs				\$58,257,909	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$16,594,600	
Dredged Material Management	year	\$257,500	22.0	\$5,665,000	\$2,500 / acre
Site Maintenance	year	\$246,800	22.0	\$5,429,600	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	22.0	\$5,500,000	Enviro Monitoring
C. Dike Raising				\$3,681,000	
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000	
E. Dredging, Transportation, & Placement Costs				\$108,300,000	
Mob and Demob	year	\$750,000	22.0	\$16,500,000	
Dredging	mcy	\$2.25	17.0	\$38,250,000	Clamshell Dredging
Transportation	mcy	\$0.90	17.0	\$15,300,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	17.0	\$38,250,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$189,633,509	
F. Contingency Cost		15%		\$19,706,340	
Total Cost A+B+C+D+E+F				\$209,339,849	
Total Unit Cost				\$12.31 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario B**Alignment 2-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		172,985	\$771,513
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		614,878	\$2,742,356
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		851,000	\$3,795,460
<i>10% Loss During Construction</i>	4.46 \$/cy		166,818	\$744,007
Total			1,834,995	\$8,662,188
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		1,269,000	\$7,042,950
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			2,269,000	
<i>Volume Taken Offsite</i>	56 %		1,269,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$11,482,950
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		23,166	\$254,826
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		28,080	\$112,320
Total				\$296,144
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$6,891,346
Initial Construction Cost				\$52,833,654

Site Characteristics		
Item	Value	Units
Site Capacity	17.6	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	22.0	years
Perimeter Dike	13,310	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$55,633,654	
Initial Construction Costs				\$52,833,654	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$17,406,400	
Dredged Material Management	year	\$275,000	22.0	\$6,050,000	\$2,500 / acre
Site Maintenance	year	\$266,200	22.0	\$5,856,400	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	22.0	\$5,500,000	Enviro Monitoring
C. Dike Raising				\$9,414,000	
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000	
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000	
E. Dredging, Transportation, & Placement Costs				\$111,540,000	
Mob and Demob	year	\$750,000	22.0	\$16,500,000	
Dredging	mcy	\$2.25	17.6	\$39,600,000	Clamshell Dredging
Transportation	mcy	\$0.90	17.6	\$15,840,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	17.6	\$39,600,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$193,994,054	
F. Contingency Cost		15%		\$21,174,060	
Total Cost A+B+C+D+E+F				\$215,168,114	
Total Unit Cost				\$12.23 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario B**Alignment 2-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		461,897	\$2,060,061
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		880,137	\$3,925,411
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		884,000	\$3,942,640
<i>10% Loss During Construction</i>	4.46 \$/cy		235,799	\$1,051,662
Total			2,593,786	\$13,720,438
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		1,258,000	\$6,981,900
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			2,258,000	
<i>Volume Taken Offsite</i>	56 %		1,258,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$11,421,900
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		21,021	\$231,231
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		25,480	\$101,920
Total				\$285,744
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$7,635,827
Initial Construction Cost				\$58,541,340

Site Characteristics		
Item	Value	Units
Site Capacity	16.7	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	21.0	years
Perimeter Dike	12,340	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$61,341,340	
Initial Construction Costs				\$58,541,340	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$15,840,300	
Dredged Material Management	year	\$257,500	21.0	\$5,407,500	\$2,500 / acre
Site Maintenance	year	\$246,800	21.0	\$5,182,800	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	21.0	\$5,250,000	Enviro Monitoring
C. Dike Raising				\$3,681,000	
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000	
E. Dredging, Transportation, & Placement Costs				\$105,930,000	
Mob and Demob	year	\$750,000	21.0	\$15,750,000	
Dredging	mcy	\$2.25	16.7	\$37,575,000	Clamshell Dredging
Transportation	mcy	\$0.90	16.7	\$15,030,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	16.7	\$37,575,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$186,792,640	
F. Contingency Cost		15%		\$19,237,695	
Total Cost A+B+C+D+E+F				\$206,030,335	
Total Unit Cost				\$12.34 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario B**Alignment 3-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		560,957	\$2,501,868
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		705,000	\$3,144,300
<i>10% Loss During Construction</i>	4.46 \$/cy		129,527	\$577,691
Total			1,424,798	\$6,832,711
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		903,000	\$5,011,650
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			1,903,000	
<i>Volume Taken Offsite</i>	47 %		903,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$9,451,650
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00 \$/sy		21,934	\$241,274
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		26,587	\$106,348
Total				\$407,260
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$6,065,461
Initial Construction Cost				\$46,501,865

Site Characteristics		
Item	Value	Units
Site Capacity	15.6	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	20.0	years
Perimeter Dike	12,750	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$49,301,865	
Initial Construction Costs				\$46,501,865	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$15,150,000	
Dredged Material Management	year	\$252,500	20.0	\$5,050,000	\$2,500 / acre
Site Maintenance	year	\$255,000	20.0	\$5,100,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	20.0	\$5,000,000	Enviro Monitoring
C. Dike Raising				\$8,730,000	
Common Borrow	\$/cy	\$15.00	294,000.00	\$4,410,000	
Dried Dredged Material	\$/cy	\$9.00	480,000.00	\$4,320,000	
E. Dredging, Transportation, & Placement Costs				\$99,240,000	
Mob and Demob	year	\$750,000	20.0	\$15,000,000	
Dredging	mcy	\$2.25	15.6	\$35,100,000	Clamshell Dredging
Transportation	mcy	\$0.90	15.6	\$14,040,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	15.6	\$35,100,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$172,421,865	
F. Contingency Cost		15%		\$18,888,000	
Total Cost A+B+C+D+E+F				\$191,309,865	
Total Unit Cost				\$12.26 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario B**Alignment 3-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		802,175	\$3,577,701
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		733,000	\$3,269,180
<i>10% Loss During Construction</i>	4.46 \$/cy		166,713	\$743,539
Total			1,833,841	\$10,331,083
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		893,000	\$4,956,150
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			1,893,000	
<i>Volume Taken Offsite</i>	47 %		893,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$9,396,150
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00 \$/sy		19,822	\$218,042
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		24,027	\$96,108
Total				\$397,020
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$7,120,065
Initial Construction Cost				\$54,587,165

Site Characteristics		
Item	Value	Units
Site Capacity	15.4	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	20.0	years
Perimeter Dike	11,795	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$57,387,165	
Initial Construction Costs				\$54,587,165	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$14,468,000	
Dredged Material Management	year	\$237,500	20.0	\$4,750,000	\$2,500 / acre
Site Maintenance	year	\$235,900	20.0	\$4,718,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	20.0	\$5,000,000	Enviro Monitoring
C. Dike Raising				\$3,501,000	
Dried Dredged Material	\$/cy	\$9.00	389,000	\$3,501,000	
E. Dredging, Transportation, & Placement Costs				\$98,160,000	
Mob and Demob	year	\$750,000	20.0	\$15,000,000	
Dredging	mcy	\$2.25	15.4	\$34,650,000	Clamshell Dredging
Transportation	mcy	\$0.90	15.4	\$13,860,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	15.4	\$34,650,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$173,516,165	
F. Contingency Cost		15%		\$17,839,350	
Total Cost A+B+C+D+E+F				\$191,355,515	
Total Unit Cost				\$12.43 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario B**Alignment 3-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		172,985	\$771,513
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		560,957	\$2,501,868
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		705,000	\$3,144,300
<i>10% Loss During Construction</i>	4.46 \$/cy		146,826	\$654,842
Total				\$7,681,375
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		940,000	\$5,217,000
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			1,940,000	
<i>Volume Taken Offsite</i>	48 %		940,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$9,657,000
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		21,934	\$241,274
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		26,587	\$106,348
Total				\$270,460
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$6,430,516
Initial Construction Cost				\$49,300,626

Site Characteristics		
Item	Value	Units
Site Capacity	15.4	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	20.0	years
Perimeter Dike	12,750	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$52,100,626	
Initial Construction Costs				\$49,300,626	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$15,150,000	
Dredged Material Management	year	\$252,500	20.0	\$5,050,000	\$2,500 / acre
Site Maintenance	year	\$255,000	20.0	\$5,100,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	20.0	\$5,000,000	Enviro Monitoring
C. Dike Raising				\$8,730,000	
Common Borrow	\$/cy	\$15.00	294,000	\$4,410,000	
Dried Dredged Material	\$/cy	\$9.00	480,000	\$4,320,000	
E. Dredging, Transportation, & Placement Costs				\$98,160,000	
Mob and Demob	year	\$750,000	20.0	\$15,000,000	
Dredging	mcy	\$2.25	15.4	\$34,650,000	Clamshell Dredging
Transportation	mcy	\$0.90	15.4	\$13,860,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	15.4	\$34,650,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$174,140,626	
F. Contingency Cost				15%	\$18,726,000
Total Cost A+B+C+D+E+F				\$192,866,626	
Total Unit Cost				\$12.52 per cy	
Total Unit Cost Rounded				\$13.00 per cy	

Scenario B**Alignment 3-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		461,897	\$2,060,061
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		802,175	\$3,577,701
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		733,000	\$3,269,180
<i>10% Loss During Construction</i>	4.46 \$/cy		212,903	\$949,545
Total				\$12,597,150
Unsuitable Excavation/Placement				
<i>Unsuitable Offsite</i>	5.55 \$/cy		933,000	\$5,178,150
<i>Unsuitable Onsite</i>	2.28 \$/cy		1,000,000	\$2,280,000
<i>Total Volume Excavated</i>			1,933,000	
<i>Volume Taken Offsite</i>	48 %		933,000	
<i>Idle Days (Waiting for Consolidation)</i>	36,000 \$/day		60	\$2,160,000
Total				\$9,618,150
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		19,822	\$218,042
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		24,027	\$96,108
Total				\$260,220
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$7,157,034
Initial Construction Cost				\$54,870,596

Site Characteristics		
Item	Value	Units
Site Capacity	15.1	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	19.0	years
Perimeter Dike	11,795	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$57,670,596	
Initial Construction Costs				\$54,870,596	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$13,744,600	
Dredged Material Management	year	\$237,500	19.0	\$4,512,500	\$2,500 / acre
Site Maintenance	year	\$235,900	19.0	\$4,482,100	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	19.0	\$4,750,000	Enviro Monitoring
C. Dike Raising				\$3,501,000	
Dried Dredged Material	\$/cy	\$9.00	389,000	\$3,501,000	
E. Dredging, Transportation, & Placement Costs				\$95,790,000	
Mob and Demob	year	\$750,000	19.0	\$14,250,000	
Dredging	mcy	\$2.25	15.1	\$33,975,000	Clamshell Dredging
Transportation	mcy	\$0.90	15.1	\$13,590,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	15.1	\$33,975,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$170,706,196	
F. Contingency Cost		15%		\$17,375,340	
Total Cost A+B+C+D+E+F				\$188,081,536	
Total Unit Cost				\$12.46 per cy	
Total Unit Cost Rounded				\$12.00 per cy	

Scenario C**Alignment 2-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		614,878	\$2,742,356
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		851,000	\$3,795,460
<i>10% Loss During Construction</i>	4.46 \$/cy		149,519	\$666,856
Total				\$7,813,523
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,782,000	\$7,520,040
<i>Total Volume Excavated</i>			2,232,000	
<i>Volume Taken Offsite</i>	80 %			
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$27,226,040
Stone Work				
<i>Section 2 - Armored Sand Dike</i>	39.00 \$/ton		53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00 \$/sy		23,166	\$254,826
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		28,080	\$112,320
Total				\$432,944
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$8,918,556
Initial Construction Cost				\$68,375,599

Site Characteristics		
Item	Value	Units
Site Capacity	15.0	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	19.0	years
Perimeter Dike	13,310	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$71,175,599	
Initial Construction Costs				\$68,375,599	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$15,032,800	
Dredged Material Management	year	\$275,000	19.0	\$5,225,000	\$2,500 / acre
Site Maintenance	year	\$266,200	19.0	\$5,057,800	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	19.0	\$4,750,000	Enviro Monitoring
C. Dike Raising				\$9,414,000	
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000	
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000	
E. Dredging, Transportation, & Placement Costs				\$95,250,000	
Mob and Demob	year	\$750,000	19.0	\$14,250,000	
Dredging	mcy	\$2.25	15.0	\$33,750,000	Clamshell Dredging
Transportation	mcy	\$0.90	15.0	\$13,500,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	15.0	\$33,750,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$190,872,399	
F. Contingency Cost		15%		\$18,374,520	
Total Cost A+B+C+D+E+F				\$209,246,919	
Total Unit Cost				\$13.95 per cy	
Total Unit Cost Rounded				\$14.00 per cy	

Scenario C**Alignment 2-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		880,137	\$3,925,411
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		884,000	\$3,942,640
<i>10% Loss During Construction</i>	4.46 \$/cy		189,609	\$845,656
Total				\$11,454,371
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,768,000	\$7,460,960
<i>Total Volume Excavated</i>			2,218,000	
<i>Volume Taken Offsite</i>	80 %		0	
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$27,166,960
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00 \$/sy		21,021	\$231,231
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		25,480	\$101,920
Total				\$422,544
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$9,993,917
Initial Construction Cost				\$76,620,028

Site Characteristics		
Item	Value	Units
Site Capacity	14.4	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	18.0	years
Perimeter Dike	12,340	lf

Total Site Costs						
Item	Unit	Unit Rate	Quantity	Item Cost	Comments	
A. Initial Construction Costs				\$79,420,028		
Initial Construction Costs				\$76,620,028	Includes 15% Contingency	
Study Costs				\$2,800,000	Feasibility and PED	
B. Site Development Costs				\$13,577,400		
Dredged Material Management	year	\$257,500	18.0	\$4,635,000	\$2,500 / acre	
Site Maintenance	year	\$246,800	18.0	\$4,442,400	\$20 / lf perimeter dike	
Site Monitoring and Reporting	year	\$250,000	18.0	\$4,500,000	Enviro Monitoring	
C. Dike Raising				\$3,681,000		
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000		
E. Dredging, Transportation, & Placement Costs				\$91,260,000		
Mob and Demob	year	\$750,000	18.0	\$13,500,000		
Dredging	mcy	\$2.25	14.4	\$32,400,000	Clamshell Dredging	
Transportation	mcy	\$0.90	14.4	\$12,960,000	\$0.10 / NM Haul Distance	
Placement	mcy	\$2.25	14.4	\$32,400,000	Hydraulic Unloader	
Subtotal Cost A+B+C+D				\$187,938,428		
F. Contingency Cost				15%	\$16,697,760	
Total Cost A+B+C+D+E+F				\$204,636,188		
Total Unit Cost				\$14.21 per cy		
Total Unit Cost Rounded				\$14.00 per cy		

Scenario C**Alignment 2-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		172,985	\$771,513
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		614,878	\$2,742,356
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		851,000	\$3,795,460
<i>10% Loss During Construction</i>	4.46 \$/cy		166,818	\$744,007
Total				\$8,662,188
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,819,000	\$7,676,180
<i>Total Volume Excavated</i>			2,269,000	
<i>Volume Taken Offsite</i>	80 %			
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$27,382,180
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		23,166	\$254,826
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		28,080	\$112,320
Total				\$296,144
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$9,276,231
Initial Construction Cost				\$71,117,768

Site Characteristics		
Item	Value	Units
Site Capacity	14.8	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	19.0	years
Perimeter Dike	13,310	lf

Total Site Costs						
Item	Unit	Unit Rate	Quantity	Item Cost	Comments	
A. Initial Construction Costs				\$73,917,768		
Initial Construction Costs				\$71,117,768	Includes 15% Contingency	
Study Costs				\$2,800,000	Feasibility and PED	
B. Site Development Costs				\$15,032,800		
Dredged Material Management	year	\$275,000	19.0	\$5,225,000	\$2,500 / acre	
Site Maintenance	year	\$266,200	19.0	\$5,057,800	\$20 / lf perimeter dike	
Site Monitoring and Reporting	year	\$250,000	19.0	\$4,750,000	Enviro Monitoring	
C. Dike Raising				\$9,414,000		
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000		
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000		
E. Dredging, Transportation, & Placement Costs				\$94,170,000		
Mob and Demob	year	\$750,000	19.0	\$14,250,000		
Dredging	mcy	\$2.25	14.8	\$33,300,000	Clamshell Dredging	
Transportation	mcy	\$0.90	14.8	\$13,320,000	\$0.10 / NM Haul Distance	
Placement	mcy	\$2.25	14.8	\$33,300,000	Hydraulic Unloader	
Subtotal Cost A+B+C+D				\$192,534,568		
F. Contingency Cost		15%		\$18,212,520		
Total Cost A+B+C+D+E+F				\$210,747,088		
Total Unit Cost				\$14.24 per cy		
Total Unit Cost Rounded				\$14.00 per cy		

Scenario C**Alignment 2-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		461,897	\$2,060,061
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		880,137	\$3,925,411
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		884,000	\$3,942,640
<i>10% Loss During Construction</i>	4.46 \$/cy		235,799	\$1,051,662
Total				\$13,720,438
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,808,000	\$7,629,760
<i>Total Volume Excavated</i>			2,258,000	
<i>Volume Taken Offsite</i>	80 %			
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$27,335,760
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		21,021	\$231,231
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		45,956	\$183,824
<i>Roadway</i>	4.00 \$/sy		25,480	\$101,920
Total				\$285,744
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$10,022,906
Initial Construction Cost				\$76,842,279

Site Characteristics		
Item	Value	Units
Site Capacity	14.1	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	18.0	years
Perimeter Dike	12,340	lf

Total Site Costs						
Item	Unit	Unit Rate	Quantity	Item Cost	Comments	
A. Initial Construction Costs				\$79,642,279		
Initial Construction Costs				\$76,842,279	Includes 15% Contingency	
Study Costs				\$2,800,000	Feasibility and PED	
B. Site Development Costs				\$13,577,400		
Dredged Material Management	year	\$257,500	18.0	\$4,635,000	\$2,500 / acre	
Site Maintenance	year	\$246,800	18.0	\$4,442,400	\$20 / lf perimeter dike	
Site Monitoring and Reporting	year	\$250,000	18.0	\$4,500,000	Enviro Monitoring	
C. Dike Raising				\$3,681,000		
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000		
E. Dredging, Transportation, & Placement Costs				\$89,640,000		
Mob and Demob	year	\$750,000	18.0	\$13,500,000		
Dredging	mcy	\$2.25	14.1	\$31,725,000	Clamshell Dredging	
Transportation	mcy	\$0.90	14.1	\$12,690,000	\$0.10 / NM Haul Distance	
Placement	mcy	\$2.25	14.1	\$31,725,000	Hydraulic Unloader	
Subtotal Cost A+B+C+D				\$186,540,679		
F. Contingency Cost				15%	\$16,454,760	
Total Cost A+B+C+D+E+F				\$202,995,439		
Total Unit Cost				\$14.40 per cy		
Total Unit Cost Rounded				\$14.00 per cy		

Scenario C

Alignment 3-R-10 Initial Construction Costs

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		560,957	\$2,501,868
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		705,000	\$3,144,300
<i>10% Loss During Construction</i>	4.46 \$/cy		129,527	\$577,691
Total				\$6,832,711
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,453,000	\$6,131,660
<i>Total Volume Excavated</i>			1,903,000	
<i>Volume Taken Offsite</i>	76 %			
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$25,837,660
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00 \$/sy		21,934	\$241,274
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		26,587	\$106,348
Total				\$407,260
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$8,523,362
Initial Construction Cost				\$65,345,776

Site Characteristics		
Item	Value	Units
Site Capacity	13.2	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	17.0	years
Perimeter Dike	12,750	lf

Total Site Costs						
Item	Unit	Unit Rate	Quantity	Item Cost	Comments	
A. Initial Construction Costs				\$68,145,776		
Initial Construction Costs				\$65,345,776	Includes 15% Contingency	
Study Costs				\$2,800,000	Feasibility and PED	
B. Site Development Costs				\$12,877,500		
Dredged Material Management	year	\$252,500	17.0	\$4,292,500	\$2,500 / acre	
Site Maintenance	year	\$255,000	17.0	\$4,335,000	\$20 / lf perimeter dike	
Site Monitoring and Reporting	year	\$250,000	17.0	\$4,250,000	Enviro Monitoring	
C. Dike Raising				\$8,730,000		
Common Borrow	\$/cy	\$15.00	294,000	\$4,410,000		
Dried Dredged Material	\$/cy	\$9.00	480,000	\$4,320,000		
E. Dredging, Transportation, & Placement Costs				\$84,030,000		
Mob and Demob	year	\$750,000	17.0	\$12,750,000		
Dredging	mcy	\$2.25	13.2	\$29,700,000	Clamshell Dredging	
Transportation	mcy	\$0.90	13.2	\$11,880,000	\$0.10 / NM Haul Distance	
Placement	mcy	\$2.25	13.2	\$29,700,000	Hydraulic Unloader	
Subtotal Cost A+B+C+D				\$173,783,276		
F. Contingency Cost			15%	\$16,265,625		
Total Cost A+B+C+D+E+F				\$190,048,901		
Total Unit Cost				\$14.40 per cy		
Total Unit Cost Rounded				\$14.00 per cy		

Scenario C**Alignment 3-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		802,175	\$3,577,701
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		733,000	\$3,269,180
<i>10% Loss During Construction</i>	4.46 \$/cy		166,713	\$743,539
Total				\$10,331,083
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,443,000	\$6,089,460
<i>Total Volume Excavated</i>			1,893,000	
<i>Volume Taken Offsite</i>	76 %			
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$25,795,460
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27 \$/cy		502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67 \$/cy		150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00 \$/sy		19,822	\$218,042
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00 \$/sy		34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		24,027	\$96,108
Total				\$397,020
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$9,579,962
Initial Construction Cost				\$73,446,372

Site Characteristics		
Item	Value	Units
Site Capacity	13.1	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	17.0	years
Perimeter Dike	11,795	lf

Total Site Costs						
Item	Unit	Unit Rate	Quantity	Item Cost	Comments	
A. Initial Construction Costs				\$76,246,372		
Initial Construction Costs				\$73,446,372	Includes 15% Contingency	
Study Costs				\$2,800,000	Feasibility and PED	
B. Site Development Costs				\$12,297,800		
Dredged Material Management	year	\$237,500	17.0	\$4,037,500	\$2,500 / acre	
Site Maintenance	year	\$235,900	17.0	\$4,010,300	\$20 / lf perimeter dike	
Site Monitoring and Reporting	year	\$250,000	17.0	\$4,250,000	Enviro Monitoring	
C. Dike Raising				\$3,501,000		
Dried Dredged Material	\$/cy	\$9.00	389,000	\$3,501,000		
E. Dredging, Transportation, & Placement Costs				\$83,490,000		
Mob and Demob	year	\$750,000	17.0	\$12,750,000		
Dredging	mcy	\$2.25	13.1	\$29,475,000	Clamshell Dredging	
Transportation	mcy	\$0.90	13.1	\$11,790,000	\$0.10 / NM Haul Distance	
Placement	mcy	\$2.25	13.1	\$29,475,000	Hydraulic Unloader	
Subtotal Cost A+B+C+D				\$175,535,172		
F. Contingency Cost				15%	\$15,313,320	
Total Cost A+B+C+D+E+F				\$190,848,492		
Total Unit Cost				\$14.57 per cy		
Total Unit Cost Rounded				\$15.00 per cy		

Scenario C**Alignment 3-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		172,985	\$771,513
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		560,957	\$2,501,868
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		29,314	\$608,852
<i>Unsuitable Replacement</i>	4.46 \$/cy		705,000	\$3,144,300
<i>10% Loss During Construction</i>	4.46 \$/cy		146,826	\$654,842
Total				\$7,681,375
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,490,000	\$6,287,800
<i>Total Volume Excavated</i>			1,940,000	
<i>Volume Taken Offsite</i>	77 %			
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$25,993,800
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		21,934	\$241,274
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		26,587	\$106,348
Total				\$270,460
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$8,881,036
Initial Construction Cost				\$68,087,946

Site Characteristics		
Item	Value	Units
Site Capacity	13.0	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	17.0	years
Perimeter Dike	12,750	lf

Total Site Costs						
Item	Unit	Unit Rate	Quantity	Item Cost	Comments	
A. Initial Construction Costs				\$70,887,946		
Initial Construction Costs				\$68,087,946	Includes 15% Contingency	
Study Costs				\$2,800,000	Feasibility and PED	
B. Site Development Costs				\$12,877,500		
Dredged Material Management	year	\$252,500	17.0	\$4,292,500	\$2,500 / acre	
Site Maintenance	year	\$255,000	17.0	\$4,335,000	\$20 / lf perimeter dike	
Site Monitoring and Reporting	year	\$250,000	17.0	\$4,250,000	Enviro Monitoring	
C. Dike Raising				\$8,730,000		
Common Borrow	\$/cy	\$15.00	294,000.00	\$4,410,000		
Dried Dredged Material	\$/cy	\$9.00	480,000.00	\$4,320,000		
E. Dredging, Transportation, & Placement Costs				\$82,950,000		
Mob and Demob	year	\$750,000	17.0	\$12,750,000		
Dredging	mcy	\$2.25	13.0	\$29,250,000	Clamshell Dredging	
Transportation	mcy	\$0.90	13.0	\$11,700,000	\$0.10 / NM Haul Distance	
Placement	mcy	\$2.25	13.0	\$29,250,000	Hydraulic Unloader	
Subtotal Cost A+B+C+D				\$175,445,446		
F. Contingency Cost				15%	\$16,103,625	
Total Cost A+B+C+D+E+F				\$191,549,071		
Total Unit Cost					\$14.73 per cy	
Total Unit Cost Rounded					\$15.00 per cy	

Scenario C**Alignment 3-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000 \$/Job		1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	4.46 \$/cy		461,897	\$2,060,061
<i>Section 2 - Armored Sand Dike</i>	4.46 \$/cy		802,175	\$3,577,701
<i>Section 3 - Shoreline Dike</i>	20.77 \$/cy		131,953	\$2,740,664
<i>Unsuitable Replacement</i>	4.46 \$/cy		733,000	\$3,269,180
<i>10% Loss During Construction</i>	4.46 \$/cy		212,903	\$949,545
Total				\$12,597,150
Unsuitable Excavation/Placement				
<i>27" Hydraulic Dredge</i>	2.28 \$/cy		450,000	\$1,026,000
<i>Clamshell w/ Dump Scows</i>	4.22 \$/cy		1,483,000	\$6,258,260
<i>Total Volume Excavated</i>			1,933,000	
<i>Volume Taken Offsite</i>	77 %			
<i>Interim Standby</i>	18,680,000 \$/event		1	\$18,680,000
Total				\$25,964,260
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00 \$/ton		48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600 \$/lf		950	\$9,120,000
Road Stone	11.00 \$/sy		19,822	\$218,042
Spillways	200,000 \$/per		2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00 \$/sy		41,028	\$164,112
<i>Roadway</i>	4.00 \$/sy		24,027	\$96,108
Total				\$260,220
Water Main Relocation	3,500,000 \$/job		1	\$3,500,000
Community Enhancements	2,000,000 \$/job		1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	- \$/job		1	\$0
Storm Drains	5,128,000 \$/job		1	\$5,128,000
Contingency Cost	15%			\$9,608,951
Initial Construction Cost				\$73,668,623

Site Characteristics		
Item	Value	Units
Site Capacity	12.8	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	16.0	years
Perimeter Dike	11,795	lf

Total Site Costs						
Item	Unit	Unit Rate	Quantity	Item Cost	Comments	
A. Initial Construction Costs				\$76,468,623		
Initial Construction Costs				\$73,668,623	Includes 15% Contingency	
Study Costs				\$2,800,000	Feasibility and PED	
B. Site Development Costs				\$11,574,400		
Dredged Material Management	year	\$237,500	16.0	\$3,800,000	\$2,500 / acre	
Site Maintenance	year	\$235,900	16.0	\$3,774,400	\$20 / lf perimeter dike	
Site Monitoring and Reporting	year	\$250,000	16.0	\$4,000,000	Enviro Monitoring	
C. Dike Raising				\$3,501,000		
Dried Dredged Material	\$/cy	\$9.00	389,000.00	\$3,501,000		
E. Dredging, Transportation, & Placement Costs				\$81,120,000		
Mob and Demob	year	\$750,000	16.0	\$12,000,000		
Dredging	mcy	\$2.25	12.8	\$28,800,000	Clamshell Dredging	
Transportation	mcy	\$0.90	12.8	\$11,520,000	\$0.10 / NM Haul Distance	
Placement	mcy	\$2.25	12.8	\$28,800,000	Hydraulic Unloader	
Subtotal Cost A+B+C+D				\$172,664,023		
F. Contingency Cost				15%	\$14,849,310	
Total Cost A+B+C+D+E+F				\$187,513,333		
Total Unit Cost				\$14.65 per cy		
Total Unit Cost Rounded				\$15.00 per cy		

Scenario D**Alignment 1-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	433,622	\$3,304,200
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	7.62	\$/cy	446,000	\$3,398,520
<i>10% Loss During Construction</i>	7.62	\$/cy	90,894	\$692,609
Total			999,830	\$8,004,181
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	55,000	\$305,250
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	446,000	\$2,475,300
<i>Total Volume Excavated</i>			501,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$2,780,550
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00	\$/sy	21,934	\$241,274
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	26,587	\$106,348
Total				\$407,260
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$5,240,516
Initial Construction Cost				\$40,177,290

Site Characteristics		
Item	Value	Units
Site Capacity	8.0	mcy
Site Effective Acreage	71	acres
Annual Placement	0.8	mcy
Site Life	10.0	years
Perimeter Dike	12,155	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$42,977,290	
Initial Construction Costs				\$40,177,290	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$6,698,500	
Dredged Material Management	year	\$176,750	10.0	\$1,767,500	\$2,500 / acre
Site Maintenance	year	\$243,100	10.0	\$2,431,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	10.0	\$2,500,000	Enviro Monitoring
C. Dike Raising				\$7,956,000	
Common Borrow	\$/cy	\$15.00	258,000	\$3,870,000	
Dried Dredged Material	\$/cy	\$9.00	454,000	\$4,086,000	
E. Dredging, Transportation, & Placement Costs				\$50,700,000	
Mob and Demob	year	\$750,000	10.0	\$7,500,000	
Dredging	mcy	\$2.25	8.0	\$18,000,000	Clamshell Dredging
Transportation	mcy	\$0.90	8.0	\$7,200,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	8.0	\$18,000,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$108,331,790	
F. Contingency Cost		15%		\$10,223,175	
Total Cost A+B+C+D+E+F				\$118,554,965	
Total Unit Cost				\$14.82 per cy	
Total Unit Cost Rounded				\$15.00 per cy	

Scenario D**Alignment 1-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	632,213	\$4,817,463
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	7.62	\$/cy	466,000	\$3,550,920
<i>10% Loss During Construction</i>	7.62	\$/cy	123,017	\$937,386
Total			1,353,183	\$12,046,433
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	85,000	\$471,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	466,000	\$2,586,300
<i>Total Volume Excavated</i>			551,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$3,058,050
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$397,020
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,426,653
Initial Construction Cost				\$49,271,003

Site Characteristics		
Item	Value	Units
Site Capacity	8.2	mcy
Site Effective Acreage	65	acres
Annual Placement	0.8	mcy
Site Life	11.0	years
Perimeter Dike	11,200	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$52,071,003	
Initial Construction Costs				\$49,271,003	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$6,998,750	
Dredged Material Management	year	\$162,250	11.0	\$1,784,750	\$2,500 / acre
Site Maintenance	year	\$224,000	11.0	\$2,464,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	11.0	\$2,750,000	Enviro Monitoring
C. Dike Raising				\$3,330,000	
Dried Dredged Material	\$/cy	\$9.00	370,000	\$3,330,000	
E. Dredging, Transportation, & Placement Costs				\$52,530,000	
Mob and Demob	year	\$750,000	11.0	\$8,250,000	
Dredging	mcy	\$2.25	8.2	\$18,450,000	Clamshell Dredging
Transportation	mcy	\$0.90	8.2	\$7,380,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	8.2	\$18,450,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$114,929,753	
F. Contingency Cost		15%		\$9,848,813	
Total Cost A+B+C+D+E+F				\$124,778,565	
Total Unit Cost				\$15.22 per cy	
Total Unit Cost Rounded				\$15.00 per cy	

Scenario D**Alignment 1-R-36 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	1,053,997	\$8,031,457
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	424,472	\$8,816,283
<i>Unsuitable Replacement</i>	7.62	\$/cy	535,000	\$4,076,700
<i>10% Loss During Construction</i>	7.62	\$/cy	201,347	\$1,534,263
Total			2,214,816	\$22,458,704
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	535,000	\$2,969,250
<i>Total Volume Excavated</i>			627,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$3,479,850
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	670,793	\$10,243,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$13,793,509
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$397,020
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$8,437,069
Initial Construction Cost				\$64,684,194

Site Characteristics		
Item	Value	Units
Site Capacity	7.3	mcy
Site Effective Acreage	57	acres
Annual Placement	0.8	mcy
Site Life	10.0	years
Perimeter Dike	10,935	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$67,484,194	
Initial Construction Costs				\$64,684,194	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$6,114,500	
Dredged Material Management	year	\$142,750	10.0	\$1,427,500	\$2,500 / acre
Site Maintenance	year	\$218,700	10.0	\$2,187,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	10.0	\$2,500,000	Enviro Monitoring
C. Dike Raising				\$1,359,000	
Dried Dredged Material	\$/cy	\$9.00	151,000	\$1,359,000	
E. Dredging, Transportation, & Placement Costs				\$46,920,000	
Mob and Demob	year	\$750,000	10.0	\$7,500,000	
Dredging	mcy	\$2.25	7.3	\$16,425,000	Clamshell Dredging
Transportation	mcy	\$0.90	7.3	\$6,570,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	7.3	\$16,425,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$121,877,694	
F. Contingency Cost				15%	\$8,579,025
Total Cost A+B+C+D+E+F				\$130,456,719	
Total Unit Cost				\$17.87 per cy	
Total Unit Cost Rounded				\$18.00 per cy	

Scenario D**Alignment 1-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	172,985	\$1,318,146
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	433,622	\$3,304,200
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	7.62	\$/cy	446,000	\$3,398,520
<i>10% Loss During Construction</i>	7.62	\$/cy	108,192	\$824,424
Total			1,190,113	\$9,454,141
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	446,000	\$2,475,300
<i>Total Volume Excavated</i>			538,000	
<i>Volume Taken Offsite</i>	0	%	0	
Total				\$2,985,900
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	21,934	\$241,274
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	26,587	\$106,348
Total				\$270,460
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$5,695,766
Initial Construction Cost				\$43,667,541

Site Characteristics		
Item	Value	Units
Site Capacity	7.9	mcy
Site Effective Acreage	71	acres
Annual Placement	0.8	mcy
Site Life	10.0	years
Perimeter Dike	12,155	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$46,467,541	
Initial Construction Costs				\$43,667,541	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$6,698,500	
Dredged Material Management	year	\$176,750	10.0	\$1,767,500	\$2,500 / acre
Site Maintenance	year	\$243,100	10.0	\$2,431,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	10.0	\$2,500,000	Enviro Monitoring
C. Dike Raising				\$7,956,000	
Common Borrow	\$/cy	\$15.00	258,000	\$3,870,000	
Dried Dredged Material	\$/cy	\$9.00	454,000	\$4,086,000	
E. Dredging, Transportation, & Placement Costs				\$50,160,000	
Mob and Demob	year	\$750,000	10.0	\$7,500,000	
Dredging	mcy	\$2.25	7.9	\$17,775,000	Clamshell Dredging
Transportation	mcy	\$0.90	7.9	\$7,110,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	7.9	\$17,775,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$111,282,041	
F. Contingency Cost				15%	\$10,142,175
Total Cost A+B+C+D+E+F				\$121,424,216	
Total Unit Cost				\$15.37 per cy	
Total Unit Cost Rounded				\$15.00 per cy	

Scenario D**Alignment 1-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	461,897	\$3,519,655
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	632,213	\$4,817,463
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	7.62	\$/cy	466,000	\$3,550,920
<i>10% Loss During Construction</i>	7.62	\$/cy	169,206	\$1,289,352
Total			1,861,269	\$15,918,054
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	125,000	\$693,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	466,000	\$2,586,300
<i>Total Volume Excavated</i>			591,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$3,280,050
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$260,220
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,704,455
Initial Construction Cost				\$51,400,821

Site Characteristics		
Item	Value	Units
Site Capacity	7.9	mcy
Site Effective Acreage	65	acres
Annual Placement	0.8	mcy
Site Life	10.0	years
Perimeter Dike	11,200	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$54,200,821	
Initial Construction Costs				\$51,400,821	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$6,362,500	
Dredged Material Management	year	\$162,250	10.0	\$1,622,500	\$2,500 / acre
Site Maintenance	year	\$224,000	10.0	\$2,240,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	10.0	\$2,500,000	Enviro Monitoring
C. Dike Raising				\$3,330,000	
Dried Dredged Material	\$/cy	\$9.00	370,000	\$3,330,000	
E. Dredging, Transportation, & Placement Costs				\$50,160,000	
Mob and Demob	year	\$750,000	10.0	\$7,500,000	
Dredging	mcy	\$2.25	7.9	\$17,775,000	Clamshell Dredging
Transportation	mcy	\$0.90	7.9	\$7,110,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	7.9	\$17,775,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$114,053,321	
F. Contingency Cost		15%		\$9,397,875	
Total Cost A+B+C+D+E+F				\$123,451,196	
Total Unit Cost				\$15.63 per cy	
Total Unit Cost Rounded				\$16.00 per cy	

Scenario D**Alignment 1-C-36 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	610,390	\$4,651,172
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	1,053,997	\$8,031,457
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	424,472	\$8,816,283
<i>Unsuitable Replacement</i>	7.62	\$/cy	535,000	\$4,076,700
<i>10% Loss During Construction</i>	7.62	\$/cy	262,386	\$1,999,381
Total			2,886,245	\$27,574,993
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	131,000	\$727,050
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	535,000	\$2,969,250
<i>Total Volume Excavated</i>			666,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$3,696,300
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$260,220
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$8,515,433
Initial Construction Cost				\$65,284,988

Site Characteristics		
Item	Value	Units
Site Capacity	7.0	mcy
Site Effective Acreage	57	acres
Annual Placement	0.8	mcy
Site Life	9.0	years
Perimeter Dike	10,935	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$68,084,988	
Initial Construction Costs				\$65,284,988	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$5,503,050	
Dredged Material Management	year	\$142,750	9.0	\$1,284,750	\$2,500 / acre
Site Maintenance	year	\$218,700	9.0	\$1,968,300	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	9.0	\$2,250,000	Enviro Monitoring
C. Dike Raising				\$1,359,000	
Dried Dredged Material	\$/cy	\$9.00	151,000	\$1,359,000	
E. Dredging, Transportation, & Placement Costs				\$44,550,000	
Mob and Demob	year	\$750,000	9.0	\$6,750,000	
Dredging	mcy	\$2.25	7.0	\$15,750,000	Clamshell Dredging
Transportation	mcy	\$0.90	7.0	\$6,300,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	7.0	\$15,750,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$119,497,038	
F. Contingency Cost				15%	\$8,131,808
Total Cost A+B+C+D+E+F				\$127,628,846	
Total Unit Cost				\$18.23 per cy	
Total Unit Cost Rounded				\$18.00 per cy	

Scenario D**Alignment 2-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	614,878	\$4,685,370
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	7.62	\$/cy	851,000	\$6,484,620
<i>10% Loss During Construction</i>	7.62	\$/cy	149,519	\$1,139,336
Total			1,644,711	\$12,918,178
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	55,000	\$305,250
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	851,000	\$4,723,050
<i>Total Volume Excavated</i>			906,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$5,028,300
Stone Work				
<i>Section 2 - Armored Sand Dike</i>	39.00	\$/ton	53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00	\$/sy	23,166	\$254,826
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	28,080	\$112,320
Total				\$432,944
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,354,594
Initial Construction Cost				\$48,718,551

Site Characteristics		
Item	Value	Units
Site Capacity	13.5	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	17.0	years
Perimeter Dike	13,310	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$51,518,551	
Initial Construction Costs				\$48,718,551	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$13,450,400	
Dredged Material Management	year	\$275,000	17.0	\$4,675,000	\$2,500 / acre
Site Maintenance	year	\$266,200	17.0	\$4,525,400	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	17.0	\$4,250,000	Enviro Monitoring
C. Dike Raising				\$9,414,000	
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000	
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000	
E. Dredging, Transportation, & Placement Costs				\$85,650,000	
Mob and Demob	year	\$750,000	17.0	\$12,750,000	
Dredging	mcy	\$2.25	13.5	\$30,375,000	Clamshell Dredging
Transportation	mcy	\$0.90	13.5	\$12,150,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	13.5	\$30,375,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$160,032,951	
F. Contingency Cost		15%		\$16,697,160	
Total Cost A+B+C+D+E+F				\$176,730,111	
Total Unit Cost				\$13.09 per cy	
Total Unit Cost Rounded				\$13.00 per cy	

Scenario D**Alignment 2-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	880,137	\$6,706,644
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	7.62	\$/cy	884,000	\$6,736,080
<i>10% Loss During Construction</i>	7.62	\$/cy	189,609	\$1,444,821
Total			2,085,699	\$17,628,208
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	85,000	\$471,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	884,000	\$4,906,200
<i>Total Volume Excavated</i>			969,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$5,377,950
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00	\$/sy	21,021	\$231,231
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	25,480	\$101,920
Total				\$422,544
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,651,641
Initial Construction Cost				\$58,662,579

Site Characteristics		
Item	Value	Units
Site Capacity	13.1	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	17.0	years
Perimeter Dike	12,340	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$61,462,579	
Initial Construction Costs				\$58,662,579	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$12,823,100	
Dredged Material Management	year	\$257,500	17.0	\$4,377,500	\$2,500 / acre
Site Maintenance	year	\$246,800	17.0	\$4,195,600	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	17.0	\$4,250,000	Enviro Monitoring
C. Dike Raising				\$3,681,000	
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000	
E. Dredging, Transportation, & Placement Costs				\$83,490,000	
Mob and Demob	year	\$750,000	17.0	\$12,750,000	
Dredging	mcy	\$2.25	13.1	\$29,475,000	Clamshell Dredging
Transportation	mcy	\$0.90	13.1	\$11,790,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	13.1	\$29,475,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$161,456,679	
F. Contingency Cost				15%	\$15,419,115
Total Cost A+B+C+D+E+F				\$176,875,794	
Total Unit Cost				\$13.50 per cy	
Total Unit Cost Rounded				\$14.00 per cy	

Scenario D**Alignment 2-R-36 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	1,442,294	\$10,990,280
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	424,472	\$8,816,283
<i>Unsuitable Replacement</i>	7.62	\$/cy	998,000	\$7,604,760
<i>10% Loss During Construction</i>	7.62	\$/cy	286,477	\$2,182,952
Total			3,151,243	\$29,594,275
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	998,000	\$5,538,900
<i>Total Volume Excavated</i>			1,090,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$6,049,500
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	670,793	\$10,243,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$13,793,509
Road Stone	11.00	\$/sy	21,021	\$231,231
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	25,480	\$101,920
Total				\$422,544
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$9,932,589
Initial Construction Cost				\$76,149,848

Site Characteristics		
Item	Value	Units
Site Capacity	12.0	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	15.0	years
Perimeter Dike	12,055	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$78,949,848	
Initial Construction Costs				\$76,149,848	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$10,910,250	
Dredged Material Management	year	\$236,250	15.0	\$3,543,750	\$2,500 / acre
Site Maintenance	year	\$241,100	15.0	\$3,616,500	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	15.0	\$3,750,000	Enviro Monitoring
C. Dike Raising				\$1,458,000	
Dried Dredged Material	\$/cy	\$9.00	162,000	\$1,458,000	
E. Dredging, Transportation, & Placement Costs				\$76,050,000	
Mob and Demob	year	\$750,000	15.0	\$11,250,000	
Dredging	mcy	\$2.25	12.0	\$27,000,000	Clamshell Dredging
Transportation	mcy	\$0.90	12.0	\$10,800,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	12.0	\$27,000,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$167,368,098	
F. Contingency Cost		15%		\$13,682,738	
Total Cost A+B+C+D+E+F				\$181,050,836	
Total Unit Cost				\$15.09 per cy	
Total Unit Cost Rounded				\$15.00 per cy	

Scenario D**Alignment 2-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	172,985	\$1,318,146
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	614,878	\$4,685,370
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	7.62	\$/cy	851,000	\$6,484,620
<i>10% Loss During Construction</i>	7.62	\$/cy	166,818	\$1,271,151
Total			1,834,995	\$14,368,139
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	851,000	\$4,723,050
<i>Total Volume Excavated</i>			943,000	
<i>Volume Taken Offsite</i>	0	%	0	
Total				\$5,233,650
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	23,166	\$254,826
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	28,080	\$112,320
Total				\$296,144
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,809,844
Initial Construction Cost				\$52,208,803

Site Characteristics		
Item	Value	Units
Site Capacity	13.3	mcy
Site Effective Acreage	110	acres
Annual Placement	0.8	mcy
Site Life	17.0	years
Perimeter Dike	13,310	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$55,008,803	
Initial Construction Costs				\$52,208,803	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$13,450,400	
Dredged Material Management	year	\$275,000	17.0	\$4,675,000	\$2,500 / acre
Site Maintenance	year	\$266,200	17.0	\$4,525,400	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	17.0	\$4,250,000	Enviro Monitoring
C. Dike Raising				\$9,414,000	
Common Borrow	\$/cy	\$15.00	327,000	\$4,905,000	
Dried Dredged Material	\$/cy	\$9.00	501,000	\$4,509,000	
E. Dredging, Transportation, & Placement Costs				\$84,570,000	
Mob and Demob	year	\$750,000	17.0	\$12,750,000	
Dredging	mcy	\$2.25	13.3	\$29,925,000	Clamshell Dredging
Transportation	mcy	\$0.90	13.3	\$11,970,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	13.3	\$29,925,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$162,443,203	
F. Contingency Cost				15%	\$16,535,160
Total Cost A+B+C+D+E+F				\$178,978,363	
Total Unit Cost				\$13.46 per cy	
Total Unit Cost Rounded				\$13.00 per cy	

Scenario D**Alignment 2-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	461,897	\$3,519,655
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	880,137	\$6,706,644
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	7.62	\$/cy	884,000	\$6,736,080
<i>10% Loss During Construction</i>	7.62	\$/cy	235,799	\$1,796,786
Total			2,593,786	\$21,499,829
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	125,000	\$693,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	884,000	\$4,906,200
<i>Total Volume Excavated</i>			1,009,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$5,599,950
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	21,021	\$231,231
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	25,480	\$101,920
Total				\$285,744
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,929,443
Initial Construction Cost				\$60,792,397

Site Characteristics		
Item	Value	Units
Site Capacity	12.8	mcy
Site Effective Acreage	103	acres
Annual Placement	0.8	mcy
Site Life	16.0	years
Perimeter Dike	12,340	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$63,592,397	
Initial Construction Costs				\$60,792,397	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$12,068,800	
Dredged Material Management	year	\$257,500	16.0	\$4,120,000	\$2,500 / acre
Site Maintenance	year	\$246,800	16.0	\$3,948,800	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	16.0	\$4,000,000	Enviro Monitoring
C. Dike Raising				\$3,681,000	
Dried Dredged Material	\$/cy	\$9.00	409,000	\$3,681,000	
E. Dredging, Transportation, & Placement Costs				\$81,120,000	
Mob and Demob	year	\$750,000	16.0	\$12,000,000	
Dredging	mcy	\$2.25	12.8	\$28,800,000	Clamshell Dredging
Transportation	mcy	\$0.90	12.8	\$11,520,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	12.8	\$28,800,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$160,462,197	
F. Contingency Cost		15%		\$14,950,470	
Total Cost A+B+C+D+E+F				\$175,412,667	
Total Unit Cost				\$13.70 per cy	
Total Unit Cost Rounded				\$14.00 per cy	

Scenario D**Alignment 2-C-36 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	610,390	\$4,651,172
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	1,442,294	\$10,990,280
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	424,472	\$8,816,283
<i>Unsuitable Replacement</i>	7.62	\$/cy	998,000	\$7,604,760
<i>10% Loss During Construction</i>	7.62	\$/cy	347,516	\$2,648,069
Total			3,822,672	\$34,710,564
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	131,000	\$727,050
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	998,000	\$5,538,900
<i>Total Volume Excavated</i>			1,129,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$6,265,950
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	53,800	\$2,098,200
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	21,021	\$231,231
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	45,956	\$183,824
<i>Roadway</i>	4.00	\$/sy	25,480	\$101,920
Total				\$285,744
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$10,010,953
Initial Construction Cost				\$76,750,643

Site Characteristics		
Item	Value	Units
Site Capacity	11.7	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	15.0	years
Perimeter Dike	12,055	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$79,550,643	
Initial Construction Costs				\$76,750,643	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$10,910,250	
Dredged Material Management	year	\$236,250	15.0	\$3,543,750	\$2,500 / acre
Site Maintenance	year	\$241,100	15.0	\$3,616,500	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	15.0	\$3,750,000	Enviro Monitoring
C. Dike Raising				\$1,458,000	
Dried Dredged Material	\$/cy	\$9.00	162,000	\$1,458,000	
E. Dredging, Transportation, & Placement Costs				\$74,430,000	
Mob and Demob	year	\$750,000	15.0	\$11,250,000	
Dredging	mcy	\$2.25	11.7	\$26,325,000	Clamshell Dredging
Transportation	mcy	\$0.90	11.7	\$10,530,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	11.7	\$26,325,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$166,348,893	
F. Contingency Cost		15%		\$13,439,738	
Total Cost A+B+C+D+E+F				\$179,788,630	
Total Unit Cost				\$15.37 per cy	
Total Unit Cost Rounded				\$15.00 per cy	

Scenario D**Alignment 3-R-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	560,957	\$4,274,492
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	7.62	\$/cy	705,000	\$5,372,100
<i>10% Loss During Construction</i>	7.62	\$/cy	129,527	\$986,997
Total			1,424,798	\$11,242,441
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	55,000	\$305,250
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	705,000	\$3,912,750
<i>Total Volume Excavated</i>			760,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$4,218,000
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	265,423	\$4,053,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$7,603,509
Road Stone	11.00	\$/sy	21,934	\$241,274
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	26,587	\$106,348
Total				\$407,260
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$5,941,873
Initial Construction Cost				\$45,554,356

Site Characteristics		
Item	Value	Units
Site Capacity	12.0	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	15.0	years
Perimeter Dike	12,750	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$48,354,356	
Initial Construction Costs				\$45,554,356	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$11,362,500	
Dredged Material Management	year	\$252,500	15.0	\$3,787,500	\$2,500 / acre
Site Maintenance	year	\$255,000	15.0	\$3,825,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	15.0	\$3,750,000	Enviro Monitoring
C. Dike Raising				\$8,730,000	
Common Borrow	\$/cy	\$15.00	294,000	\$4,410,000	
Dried Dredged Material	\$/cy	\$9.00	480,000	\$4,320,000	
E. Dredging, Transportation, & Placement Costs				\$76,050,000	
Mob and Demob	year	\$750,000	15.0	\$11,250,000	
Dredging	mcy	\$2.25	12.0	\$27,000,000	Clamshell Dredging
Transportation	mcy	\$0.90	12.0	\$10,800,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	12.0	\$27,000,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$144,496,856	
F. Contingency Cost		15%		\$14,841,375	
Total Cost A+B+C+D+E+F				\$159,338,231	
Total Unit Cost				\$13.28 per cy	
Total Unit Cost Rounded				\$13.00 per cy	

Scenario D**Alignment 3-R-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	802,175	\$6,112,574
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	7.62	\$/cy	733,000	\$5,585,460
<i>10% Loss During Construction</i>	7.62	\$/cy	166,713	\$1,270,352
Total			1,833,841	\$15,709,049
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	85,000	\$471,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	733,000	\$4,068,150
<i>Total Volume Excavated</i>			818,000	
<i>Volume Taken Offsite</i>	0	%	0	
Total				\$4,539,900
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	502,574	\$7,674,305
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$11,224,805
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$397,020
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,198,322
Initial Construction Cost				\$55,187,138

Site Characteristics		
Item	Value	Units
Site Capacity	12.1	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	16.0	years
Perimeter Dike	11,795	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$57,987,138	
Initial Construction Costs				\$55,187,138	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$11,574,400	
Dredged Material Management	year	\$237,500	16.0	\$3,800,000	\$2,500 / acre
Site Maintenance	year	\$235,900	16.0	\$3,774,400	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	16.0	\$4,000,000	Enviro Monitoring
C. Dike Raising				\$3,501,000	
Dried Dredged Material	\$/cy	\$9.00	389,000	\$3,501,000	
E. Dredging, Transportation, & Placement Costs				\$77,340,000	
Mob and Demob	year	\$750,000	16.0	\$12,000,000	
Dredging	mcy	\$2.25	12.1	\$27,225,000	Clamshell Dredging
Transportation	mcy	\$0.90	12.1	\$10,890,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	12.1	\$27,225,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$150,402,538	
F. Contingency Cost				15%	\$14,282,310
Total Cost A+B+C+D+E+F				\$164,684,848	
Total Unit Cost				\$13.61 per cy	
Total Unit Cost Rounded				\$14.00 per cy	

Scenario D**Alignment 3-R-36 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	1,315,912	\$10,027,249
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	424,472	\$8,816,283
<i>Unsuitable Replacement</i>	7.62	\$/cy	828,000	\$6,309,360
<i>10% Loss During Construction</i>	7.62	\$/cy	256,838	\$1,957,109
Total			2,825,222	\$27,110,001
Unsuitable Excavation/Placement				
<i>Section 1 - Rock Dike Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	828,000	\$4,595,400
<i>Total Volume Excavated</i>			920,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$5,106,000
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Rock Dike Construction				
<i>Section 1 - Rock Dike Section (Sand & Placement)</i>	15.27	\$/cy	670,793	\$10,243,009
<i>Section 1 - Rock Dike Section (Stone & Placement)</i>	23.67	\$/cy	150,000	\$3,550,500
Total				\$13,793,509
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 1 - Rock Dike</i>	4.00	\$/sy	34,200	\$136,800
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$397,020
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$9,378,686
Initial Construction Cost				\$71,903,258

Site Characteristics		
Item	Value	Units
Site Capacity	10.9	mcy
Site Effective Acreage	87	acres
Annual Placement	0.8	mcy
Site Life	14.0	years
Perimeter Dike	11,535	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$74,703,258	
Initial Construction Costs				\$71,903,258	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$9,767,800	
Dredged Material Management	year	\$217,000	14.0	\$3,038,000	\$2,500 / acre
Site Maintenance	year	\$230,700	14.0	\$3,229,800	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	14.0	\$3,500,000	Enviro Monitoring
C. Dike Raising				\$1,413,000	
Dried Dredged Material	\$/cy	\$9.00	157,000	\$1,413,000	
E. Dredging, Transportation, & Placement Costs				\$69,360,000	
Mob and Demob	year	\$750,000	14.0	\$10,500,000	
Dredging	mcy	\$2.25	10.9	\$24,525,000	Clamshell Dredging
Transportation	mcy	\$0.90	10.9	\$9,810,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	10.9	\$24,525,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$155,244,058	
F. Contingency Cost		15%		\$12,501,120	
Total Cost A+B+C+D+E+F				\$167,745,178	
Total Unit Cost				\$15.39 per cy	
Total Unit Cost Rounded				\$15.00 per cy	

Scenario D**Alignment 3-C-10 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	172,985	\$1,318,146
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	560,957	\$4,274,492
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	29,314	\$608,852
<i>Unsuitable Replacement</i>	7.62	\$/cy	705,000	\$5,372,100
<i>10% Loss During Construction</i>	7.62	\$/cy	146,826	\$1,118,811
Total			1,615,082	\$12,692,401
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	92,000	\$510,600
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	705,000	\$3,912,750
<i>Total Volume Excavated</i>			797,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$4,423,350
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	21,934	\$241,274
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	26,587	\$106,348
Total				\$270,460
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$6,397,123
Initial Construction Cost				\$49,044,608

Site Characteristics		
Item	Value	Units
Site Capacity	11.8	mcy
Site Effective Acreage	101	acres
Annual Placement	0.8	mcy
Site Life	15.0	years
Perimeter Dike	12,750	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$51,844,608	
Initial Construction Costs				\$49,044,608	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$11,362,500	
Dredged Material Management	year	\$252,500	15.0	\$3,787,500	\$2,500 / acre
Site Maintenance	year	\$255,000	15.0	\$3,825,000	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	15.0	\$3,750,000	Enviro Monitoring
C. Dike Raising				\$8,730,000	
Common Borrow	\$/cy	\$15.00	294,000	\$4,410,000	
Dried Dredged Material	\$/cy	\$9.00	480,000	\$4,320,000	
E. Dredging, Transportation, & Placement Costs				\$74,970,000	
Mob and Demob	year	\$750,000	15.0	\$11,250,000	
Dredging	mcy	\$2.25	11.8	\$26,550,000	Clamshell Dredging
Transportation	mcy	\$0.90	11.8	\$10,620,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	11.8	\$26,550,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$146,907,108	
F. Contingency Cost				15%	\$14,679,375
Total Cost A+B+C+D+E+F				\$161,586,483	
Total Unit Cost				\$13.69 per cy	
Total Unit Cost Rounded				\$14.00 per cy	

Scenario D**Alignment 3-C-20 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	461,897	\$3,519,655
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	802,175	\$6,112,574
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	131,953	\$2,740,664
<i>Unsuitable Replacement</i>	7.62	\$/cy	733,000	\$5,585,460
<i>10% Loss During Construction</i>	7.62	\$/cy	212,903	\$1,622,317
Total			2,341,928	\$19,580,670
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	125,000	\$693,750
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	733,000	\$4,068,150
<i>Total Volume Excavated</i>			858,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$4,761,900
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$260,220
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$5,128,000
Contingency Cost	15%			\$7,476,125
Initial Construction Cost				\$57,316,956

Site Characteristics		
Item	Value	Units
Site Capacity	11.8	mcy
Site Effective Acreage	95	acres
Annual Placement	0.8	mcy
Site Life	15.0	years
Perimeter Dike	11,795	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$60,116,956	
Initial Construction Costs				\$57,316,956	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$10,851,000	
Dredged Material Management	year	\$237,500	15.0	\$3,562,500	\$2,500 / acre
Site Maintenance	year	\$235,900	15.0	\$3,538,500	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	15.0	\$3,750,000	Enviro Monitoring
C. Dike Raising				\$3,501,000	
Dried Dredged Material	\$/cy	\$9.00	389,000	\$3,501,000	
E. Dredging, Transportation, & Placement Costs				\$74,970,000	
Mob and Demob	year	\$750,000	15.0	\$11,250,000	
Dredging	mcy	\$2.25	11.8	\$26,550,000	Clamshell Dredging
Transportation	mcy	\$0.90	11.8	\$10,620,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	11.8	\$26,550,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$149,438,956	
F. Contingency Cost		15%		\$13,818,300	
Total Cost A+B+C+D+E+F				\$163,257,256	
Total Unit Cost				\$13.84 per cy	
Total Unit Cost Rounded				\$14.00 per cy	

Scenario D**Alignment 3-C-36 Initial Construction Costs**

Construction Element	Unit Cost	Units	Quantity	Cost
Mobilization/Demobilization	3,000,000	\$/Job	1	\$3,000,000
Sand Fill				
<i>Section 1 - Cofferdam Section (Behind)</i>	7.62	\$/cy	610,390	\$4,651,172
<i>Section 2 - Armored Sand Dike</i>	7.62	\$/cy	1,315,912	\$10,027,249
<i>Section 3 - Shoreline Dike</i>	20.77	\$/cy	424,472	\$8,816,283
<i>Unsuitable Replacement</i>	7.62	\$/cy	828,000	\$6,309,360
<i>10% Loss During Construction</i>	7.62	\$/cy	317,877	\$2,422,226
Total			3,496,651	\$32,226,290
Unsuitable Excavation/Placement				
<i>Section 1 - Cofferdam Section</i>	5.55	\$/cy	131,000	\$727,050
<i>Section 2 - Armored Sand Dike</i>	5.55	\$/cy	828,000	\$4,595,400
<i>Total Volume Excavated</i>			959,000	
<i>Volume Taken Offsite</i>	0 %		0	
Total				\$5,322,450
Stone Work				
<i>Section 2 - Armored Sand Dike (Slope Armor)</i>	39.00	\$/ton	48,000	\$1,872,000
Cofferdam Construction				
<i>Section 1 - Cofferdam Section</i>	9,600	\$/lf	950	\$9,120,000
Road Stone	11.00	\$/sy	19,822	\$218,042
Spillways	200,000	\$/per	2	\$400,000
Geotextile				
<i>Section 2 - Armored Sand Dike</i>	4.00	\$/sy	41,028	\$164,112
<i>Roadway</i>	4.00	\$/sy	24,027	\$96,108
Total				\$260,220
Water Main Relocation	3,500,000	\$/job	1	\$3,500,000
Community Enhancements	2,000,000	\$/job	1	\$2,000,000
Demolition				
<i>Pier 1 Deck</i>	-	\$/job	1	\$0
Storm Drains	5,128,000	\$/job	1	\$3,260,000
Contingency Cost	15%			\$9,176,850
Initial Construction Cost				\$70,355,853

Site Characteristics		
Item	Value	Units
Site Capacity	10.6	mcy
Site Effective Acreage	87	acres
Annual Placement	0.8	mcy
Site Life	14.0	years
Perimeter Dike	11,535	lf

Total Site Costs

Item	Unit	Unit Rate	Quantity	Item Cost	Comments
A. Initial Construction Costs				\$73,155,853	
Initial Construction Costs				\$70,355,853	Includes 15% Contingency
Study Costs				\$2,800,000	Feasibility and PED
B. Site Development Costs				\$9,767,800	
Dredged Material Management	year	\$217,000	14.0	\$3,038,000	\$2,500 / acre
Site Maintenance	year	\$230,700	14.0	\$3,229,800	\$20 / lf perimeter dike
Site Monitoring and Reporting	year	\$250,000	14.0	\$3,500,000	Enviro Monitoring
C. Dike Raising				\$1,413,000	
Dried Dredged Material	\$/cy	\$9.00	157,000	\$1,413,000	
E. Dredging, Transportation, & Placement Costs				\$67,740,000	
Mob and Demob	year	\$750,000	14.0	\$10,500,000	
Dredging	mcy	\$2.25	10.6	\$23,850,000	Clamshell Dredging
Transportation	mcy	\$0.90	10.6	\$9,540,000	\$0.10 / NM Haul Distance
Placement	mcy	\$2.25	10.6	\$23,850,000	Hydraulic Unloader
Subtotal Cost A+B+C+D				\$152,076,653	
F. Contingency Cost		15%		\$12,258,120	
Total Cost A+B+C+D+E+F				\$164,334,773	
Total Unit Cost				\$15.50 per cy	
Total Unit Cost Rounded				\$16.00 per cy	