February 2003

DRAFT

Dredged Material Management Plan – Appendix E

For the

Miami Harbor Navigation Study
General Reevaluation Report

Miami-Dade County, Florida - 010140

US Army Corps of Engineers

Jacksonville District
South Atlantic Division

PRELIMINARY ASSESSMENT

MIAMI HARBOR, FLORIDA

NATIONAL HARBORS PROGRAM:
DREDGED MATERIAL MANAGEMENT PLANS

FEBRUARY 2003

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PRELIMINARY ASSESSMENT
MIAMI HARBOR, FLORIDA

NATIONAL HARBORS PROGRAM:
DREDGED MATERIAL MANAGEMENT PLANS

1. Project Name and Description

1a. Name: Miami Harbor

1b. CWIS #: 010140

1c. Project Description:

The Federal navigation project is in Biscayne Bay, a shallow salt water sound on the Atlantic coast near the southern end of the Florida peninsula. Shallow natural passages between the keys and two artificial cuts, called Bakers Haulover Inlet and Government Cut, connect the bay to the ocean. Government Cut is the main deep-draft ship channel to the Port of Miami. The City of Miami is situated on the western shore of Biscayne Bay. The project is 23 miles south of Port Everglades, 71 miles south of Palm Beach Harbor, and about 130 miles northeast of Key West Harbor.

The authorized project for the Port of Miami is on figure 1. The harbor project provides for following features identified by section:

Section A - An approach channel 44 feet deep over a bottom width of 500 feet from the ocean to the beach line;

Section B - A channel with a 42-foot depth and bottom width of 500 feet from the beach line to the Fisher Island turning basin;

Section C - The Fisher Island turning basin with a depth of 42 feet depth over a triangular shaped bottom area;

Section D - A channel (Fisherman's Channel) 42 feet deep over a bottom width of 400 feet from the Fisher Island turning basin along the south side of Lummus Island to the Lummus Island turning basin;

NOTES:
1] DRAFT Environmental Baseline Resource Survey (underwater features) provided February 2001, by Dial Cordy & Associates, Jacksonville Beach, FL
2] USACE Survey Number 00-058, March 2000
3] Beacons, aids to navigation, and soundings are in approximate locations based on NOAA Nautical Charts (number 11468, 36th Ed., July 24 1999, and number 11466, 34th Ed., February 6 1999)
4] Elevations in feet and refer to mean lower low water
5] Projection Stateplane Coordinate System, NAD27, Flpazone 0901
6] Background aerial photos taken September 1 1999

LEGEND:

Existing Navigation Channel
- Existing Centerline
- Existing Channel Edge

Proposed Components
- Cmp1c
- Cmp2a
- Cmp3b
- Cmp4
- Cmp5
- Cmp5a
- Cmp6
- Cmp6a

2000 0 2000 4000 6000 Feet

MIAMI HARBOR GENERAL REEVALUATION REPORT
Proposed Navigation Channel Modifications

N

U.S.ARMY CORPS OF ENGINEERS
Jacksonville District

Figure 1

Section E - The Lummus Island turning basin with a depth of 42 feet and a turning diameter of 1600 feet;

Section F - A channel 34 feet deep over a bottom width of 400 feet extending west 1200 feet from the Lummus Island turning basin;

Section G - A (Municipal) channel 36 feet deep over a bottom width of 400 feet from the Fisher Island turning basin west along the north side of Lummus and Dodge Islands to a third turning basin;

Section H - A (Municipal) turning basin 36 feet deep with a turning diameter of 1650 feet at the west end of the 36-foot channel;

1d. Current Project as Being Maintained:

The Federal project exists as authorized except for a portion along the south side of Lummus and Dodge Islands. Construction is underway as indicated in table 1 to complete the remaining authorized portion. About half of the 42-foot Fisherman's channel south of Lummus Island was completed under a 204 (e) agreement with the Port of Miami in 1993. Completion of the remaining half of the Fisherman's channel construction and the Lummus Island (Middle) turning basin is pending completion of a new Project Cooperation Agreement (PCA) with the Port of Miami. Completion of the new PCA is scheduled for 2003. The 34-foot channel west of the Lummus Island turning basin has been completed. Figure 1 shows the authorized project and identifies the project features as well as land areas associated with the new work dredging.

New construction in the entrance channel and work underway on the 42-foot depth features of the project have an authorized 1 foot of allowable overdepth for dredging inaccuracies. No allowance is in the authorization for a required overdepth to enable maintenance in the rock bottom. Policy at the time precluded any required overdepth dredging in rock except as justified on the basis of advanced maintenance.

TABLE 1 - PROJECT STATUS:

CWIS Number	Reach or Segment (if more than one)	Nominal Depth (feet) [1] (as auth.)	(as maint.)	Nom. Chan. Width (feet) (as auth.)	(as maint)	Max. Sailing Draft [2] (feet)	Project Sponsor (Y/N)
010140	Entrance Channel	44	44	500	500	41	Y
	Inner Channel	42	42	400	400	39	Y
	Fisher Is. T. B.	42	42	39 acres	39 acres	39	Y
	Fisherman Channel	42	[3]	400	[3]	[3]	Y
	Lummus Island Turning Basin	42	[3]	1600 dia	[3]	[3]	Y
	Fisherman Channel	34	34	400	400	31	Y
	Municipal Channel & T. B.	36	36	400 & 1650 dia	400 & 1650 dia	33	Y

Source: Waterborne Commerce of the United States (CY 2000).

Name: Miami-Dade County Seaport Department, c/o Port of Miami		
Address: 1015 North American Way		
City: Miami	State: Florida	ZIP: 33132
Point of Contact: Carl Fielland	Phone #: (305) 347-4890	

NOTES: [1] Does not include 1-foot allowable overdepth.

[2] For vessels currently using the harbor with no use of tides. Mean tidal variation is 2.5 feet at the entrance and 2.0 in the bay.

[3] Project feature under construction and not yet complete pending new PCA in 2003.

1e. Sponsor: Miami-Dade County Seaport Department
c/o Port of Miami Harbor
1015 North American Way
Miami, FL 33132

Point of Contact: (307) 347-4890

1f. Name and Status of Cooperation Agreement:

There are several cooperation agreements in effect covering new construction and maintenance dredging contracts including a 203(e) agreement signed in November 1991, which has been amended three times. A new Project Cost Sharing agreement scheduled for execution in 2003 is currently under review by the Miami-Dade County Seaport Department to allow the Corps to takeover completion of the remaining western half of the 42-foot Lummus Island (Fisherman's) channel from the Port of Miami.

2. Authority

The authorizing documents are as follows:

a. River and Harbor Act of June 13, 1902 provided for a channel (Government Cut) 8 feet deep land cut across the peninsula and for jetty construction;

b. River and Harbor Act of March 2, 1907 set the width of the channel at 100 feet
and enabled construction of the south jetty;

c. River and Harbor Act of July 25, 1912 enlarged the channel depth to 20 feet and width to 300 feet and extended the jetties;

d. River and Harbor Act of March 3, 1925 provided for the deepening of the channels to 25 feet and increasing the width of the entrance channel to 500 feet and widening the inner channel to 200 feet across Biscayne Bay;

e. The River and Harbor Act of July 3, 1930 provided for a width of 300 feet in the channel across Biscayne Bay and for enlarging the turning basin;

f. River and Harbor Act of 1935 enabled dredging to provide a depth of 30 feet in the channel and turning basin;

g. River and Harbor Act of 1937 provided for the widening of the 30-foot deep turning basin by 200 feet southward;

h. River and Harbor Act of 1945 enabled the Virginia Key improvements;

i. River and Harbor Act of 1945 consolidated the Miami River and Miami Harbor projects;

j. River and Harbor Act of 1960 widened the channel to 400 feet and enlarged the turning basin 300 feet along both the south and northeasterly sides, and dredged a 39-acre turning basin with a depth of 30 feet along the north side Fisher Island; deleted the Virginia Key development and Dinner Key approach channel;

k. River and Harbor Act of 1968 enlarged the entrance channel to a 38-foot depth and 500-foot width from the ocean to the existing beach line; deepened the 400-foot wide channel to 36 feet; and deepened the turning basins at Biscayne Boulevard terminal and Fisher Island to 36 feet;

l. Water Resources Development Act of 1990 Public Law 101-640 authorized deepening the existing Outer Bar Cut, Bar Cut, and Government Cut to a depth of 44 feet, enlarging Fisherman's Channel, south of Lummus Island, to a depth of 42 feet and a width of 400 feet, and construction of a 1600-foot diameter Turning Basin near the end of Lummus Island to a depth of 42 feet;

m. Water Resources Development Act of 1986 deauthorized the widening at the mouth of Miami River to existing project widths; the channels from the mouth of Miami River to the turning basin, to Government Cut and to a harbor of refuge in Palmer Lake; and

n. Water Resources Development Act of 1996 authorized deepening a channel to a depth of 34 feet over a bottom width of 400 feet from the Lummus Island turning basin west a distance of 1200 feet.

3. Economic Assessment

The Port of Miami is an important stimulus to the economic growth and progress of the Miami and South Florida area. Job-related industries, transportation of finished products, and cruise-oriented activities have contributed significantly in the expansion of economic activity. The Port of Miami having an estimated impact of $8 billion on the surrounding community supports over 45,000 jobs.

Transportation networks, connecting Miami Harbor to Florida and the remainder of the region, are extensive. A 5-lane high span bridge across the Intracoastal Waterway provides a super highway connection from the port to downtown Miami Streets for access to Interstate 95, a major north-south artery. Two major railroads provide direct service to port facilities. The Miami International Airport is a few miles west of the port and handles a majority of cruise passengers using the port.

The most recent statistical information available on vessels and tonnage is from 2000. During the period of January 1, 2000, to December 31, 2000, the number of vessels calling at Miami Harbor averaged more than 871 per month. The facilities that handled those vessels were on Dodge and Lummus Islands, and Fisher Island Tanker Terminal. About 16 percent of these vessels had drafts of 25 to 40 feet requiring the deeper depths of Miami Harbor for access. Major commodities moving through Miami Harbor in 2000 included tile, marble and granite; textiles; paper and paper products; and refrigerated fruits and vegetables. These commodities account for only 15 percent of Miami's total imports and exports. The majority of traffic is categorized as General Cargo, and accounts for 45.17 percent of imports and 63.7 percent of exports. Waterborne Commerce of the United States shows a total of 8,610,000 tons of waterborne cargo in 2000. Dodge and Lummus Islands accommodate cargo and cruise ship operations, while Fisher Island handles petroleum product, that is, bunker fuel for the cruise ships.

Passenger Terminals and cruise ship operations are mainly on the northwest portion of Dodge Island. The 36-foot deep channel and turning basin provide vessel access to that area. Some of those terminals handle both cargo and passengers. Remaining facilities are for cargo and include some roll/on-roll/off platforms. The number of cruise ship passengers increased from 2,734,816 in 1990 to 3,364,643 in 2000 while general cargo increased from 4,720,000 tons in 1991 to 8,610,000 tons in 2000. The year 2000's tonnage is 212 percent of the projected amount set by a 1989 USACE feasibility study of Miami Harbor [1].

A port development plan in 1979 evaluated the need for further improvements to increase the port's facilities for handling anticipated growth at that point in time for cruise and cargo traffic. That study resulted in an expenditure of about $250 million for capital improvements to expand the port. The main development centered on increasing the acreage of Lummus Island and connecting it to Dodge Island using material dredged from the waterway (Fisherman's Channel) south of the island. That dredging provided deeper channel access to the south side of Lummus Island. Development on Lummus Island included four gantry cranes, container berths and terminals. Development on Dodge Island included construction of a passenger terminal on the south side.

[1] Source: Miami-Dade County Florida Seaport Department, Port of Miami GRR Economics Analysis, 2002

The Waterborne Commerce of the United States, 2000, reported 10,456 commercial inbound vessel movements for Miami Harbor in 2000. Those movements include tankers, cargo vessels, barges, and cruise ships. The cargo in 2000 totaled about 8,610,000 short tons in comparison to 4,720,000 short tons in 1991. The average annual increase is about 6.9 percent. The inbound and outbound movements amounted to about 10.4 and 10.4 million, respectively, in 2000. Total petroleum products to the port amounted to about 1,784,000 short tons in 2000. Primary manufactured products through the harbor were 2,249,000 short tons. Food and farm products totaled about 1,969,000 tons. The port's commercial activity is summarized in table 2.

A significant portion of the tonnage movement was in containers and involved transshipment to other ports. The Port of Miami is an important transshipment point for cargo coming from Asia and Europe. That cargo arrives in larger vessels and is then reloaded into smaller vessels for destinations in the Caribbean as well as Central and South America. The port also helps supply various commodities to the Greater Miami and Dade County area. That support includes petroleum products and general cargo.

About 10 percent of the commodities and containerized goods that enter Miami Harbor are transported through terminals and cargo handling facilities along Miami River. The river terminals supply goods to ports in the Caribbean Basin where larger vessels cannot enter due to restricted harbor depths. The terminal operations are structured to a scale that can efficiently utilize the vessel fleet calling on shallower Caribbean Basin ports.

TABLE 2 - ECONOMIC DATA:

Reach or Segment	Benefit Indicators[1]	Current Operations[2]	Trend (Up, Down, Steady)	Summary/ Remarks
Project	COMMODITY TYPES	Petroleum and petroleum prod. Primary manuf. gds. Food and Farm products	Upward Upward Upward	Tonnage Traded by Region (% of Total Tonnage) S. America 24.2 Caribbean 15.5 Far East 11.3 Europe 23.8 Central Am. 20.5 Other 4.7
	TONNAGE	8,610,000		
	GROWTH RATES	7.2% per year for 1990 to 2000 period		
	VESSEL TYPES	Breakbulk and container. Bulk carriers, product tankers, tug and barge, commercial fishing vessels and cruise ships		
	VESSEL SIZES	965 ft./144.4 design draft,/39 ft. constrained draw 60635 DWT. 4300 TEUs Cruise ships - 1035 ft./35 ft. draw	Increased length and draw Increased length and width	3.36 million cruise ship passengers
	RECREATIONAL VESSEL TYPES	Mega yachts; sail and power boats		
	RECREATIONAL VESSEL SIZES	15 feet to 80 feet		
	COMMERCIAL FISHING, CHARTER	None		
	COMMERCIAL FISHING, OTHER	None		

NOTE: [1] Pertinent indicators taken from sponsor's correspondence, annual report and directories.

[2] For calendar year 2000

4. Maintenance Dredging

Shoals form in three primary areas on the deeper depth portion of the project serving the Port of Miami. The entrance channel shoal occurs mainly from the outer end of the jetties and the shoreline. Surveys in 1996 showed depths of 37.5 and 18.9 feet along the right outside quarter of the channel in that area. Shoaling in Fisherman's channel occurs about midway between Fisher Island and Lummus Island turning basins. Surveys in that area indicated depths of 31.8 feet near the eastern end of Lummus Island. The Municipal Turning Basin has shoaling along the periphery of the bottom. Depths between 29.3 and 32.9 feet can be found along the outside of the Main Turning Basin.

Bar pilots report navigational difficulties in the entrance channel. Large ground swells, effects of the Gulfstream, and northeasterly winds have an impact on vessel movements in that channel. Those conditions vary at different times of the year and make entrance into the harbor very difficult for deep draft ships. The shoaled areas of the channel reduce the bottom width of the channel for the deeper draft vessels. To lessen the probability of groundings, the port monitors the need for maintenance frequently. Maintenance dredging is to the authorized project depths where constructed with an allowance of 1 foot for dredging inaccuracies.

The deep depth project for the port overall experiences very little shoaling with an annual rate of about 15,000 cubic yards. Maintenance volumes for that portion of the project through 2000 are as shown in table 3. Since 1973, the deeper depths have been maintained four times. There are no known reasons for the variance in quantities and intervals of past maintenance dredging events. The 15,000 cubic yards dredged in 1985 may have resulted from the effects of a beach nourishment north of the project. Some material may have passed through the north jetty into the channel. That jetty has since been sand tightened.

TABLE 3 - MAINTENANCE DREDGING OF DEEPER DEPTH FEATURES SERVING THE PORT

Year	Quantity (cubic yards)
1957	80,083
1960	79,689
1965	210,218
1985	15,000
1989	250,000
1993	247,000
1995	3,000

The project has undergone construction dredging 18 times since 1904. The larger construction contracts were in 1927, 1937 -1938, 1939, and 1964. During those years, the total amount of dredged material was about 10.6 million cubic yards. Over 90 percent of the material went to expand Lummus, Dodge, and Fisher Islands as well as Virginia Key. An additional 8.4 million cubic yards of material planned to come from new work construction that began in 1991 was planned for completion by 1999 under two separate contracts. The first contract required the dredging of 2,395,000 cubic yards (Phase I) and was completed in 1993. All of that dredged material was deposited on Virginia Key. The second contract (Phase II) planned to produce about 6,000,000 cubic yards of material. Negotiations with the Miami-Dade Seaport Department (Port of Miami) are currently in progress for the Corps to take over completion of that Phase II work. The material for Phase II that was completed by the Port of Miami went to the ODMDS, which amounted to about 2.3 million cubic yards.

Maintenance dredging for 1998 through 2002 is in table 4 for the deep draft ship channels. That table shows no maintenance dredging from the project over the past 5 years. The average annual shoaling rate of 15,000 cubic yards shown in table 4 was computed with data recorded from 1925 to 2002.

TABLE 4 - DREDGING HISTORY:

Reach or Segment	Primary Dredging Method[1]	Dredging History[2] (000 CY per year)						Disposal Site(s) Used (Identifier)
		1998	1999	2000	2001	2002	Ave.	
Project	1	0	0	0	0	0	15[3]	ODMDS

NOTE: [1] Hopper Dredge with Pump-Off. [2] Amount dredged by year for each of last 5 years. [3] Average for 1925 to 2002 period.

As of 2000, a total of $ 42,938,423, including contributions by the sponsor, has been expended on construction and maintenance on the project. Table 5 shows the expenditure of construction and maintenance dredging cost. Maintenance dredging costs since 1925 indicate an annual average of $298,000 a year.

TABLE 5 - CHANNEL COST HISTORY:

Reach or Segment	Construction/ Acquisition		Dredging Cost [3] (thousands of dollars per year)						
	Year	Cost		1991	1992	1993	1994	1995	Ave
Project	1927 to 1939	3,651,000	Dredging:			980			298
	1964	2,587,423	Transpor-tation:						
	1993	26,000,000	Placement:						
	1994-1999	10,700,000	Env. Studies:						
			Total:			980			298

The most recent hydrographic survey for Miami Harbor No. 02-086 dated February/March 2002 for maintenance dredging indicates 22,000 cubic yards of material in Cut-1 and Cut-2. The north edge of Cut-4 and all four sides of the main (cruise ship) turning basin contain 210,000 cubic yards of material. Removal of those maintenance quantities will occur along with completion of the phase II new construction dredging project currently scheduled to start in 2003 and finish in 2004 as shown in table 6.

TABLE 6 - ANTICIPATED DREDGING:

Reach or Segment	Programmed Dredging[1] (000 CY) (consistent with 10-year O&M maintenance plan)											Disposal Site(s) to be Used
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	5 year Ave.	
Project	22	1,412 [2]	1,800 [3]	1,200 [3]	400 [3]	1,300 [3]	1,300 [3]	0	0	0	100	ODMDS

NOTE: [1] Amount programmed for project dredging over the next 10 years. Computed average yardage covers a 5-year period. [2]1,200,000 cubic yards consist of phase II new work with 212,000 cubic yards of maintenance for the ODMDS. [3]Represents about 6,000,000 cy of phase III new work dredging, which will go to the ODMDS, Virginia Key CDF, North Biscayne Bay seagrass mitigation borrow sites, and offshore artificial reef mitigation sites identified in figure 2.

The programmed amount of dredged material averages 100,000 cubic yards every 5 years as identified in table 6. The next programmed maintenance dredging will not occur until after 2012 as shown in table 7. As indicated in table 7 the annual maintenance cost is projected to be $3,000,000 over a ten year period or an average of $300,000 over a five year period.

TABLE 7 - CHANNEL MAINTENANCE COST PROJECTIONS:

Reach or Segment	Programmed Dredging Cost (millions of dollars per year, consistent with 10-year project O&M maintenance schedule)											
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Ave[1]
Project	Dredging	BREAKDOWN IS NOT AVAILABLE										
	Transpor-tation:											
	Placem't:											
	Env. Studies:											
	Disp.Site O&M: ODMDS											
	Total:	0	0	3	0	0	0	0	0	0	0	.3

NOTE: [1] Average cost over 5 years.

5. Dredged Material Disposal Site Capacity and Usage

All project dredging in the deep harbor area has been in navigable waters of the United States. Since 1990, disposal of dredged maintenance material was offshore in a designated ocean dredged material disposal site (ODMDS). Table 8 shows the placement history of maintenance material from the deeper harbor area between 1992 and 1995. Past records indicate no problem in using that site which is centered 4.5 nautical miles southeast from the mouth of the harbor.

The ODMDS is square with each side being 5,000 feet and the center at 25 degrees 45 minutes north and 80 degrees 3 minutes and 22 seconds west. Depths at that site are from 390 to over 630 feet as shown on figure 2. Disposal in the past has had little impact on depths. Routine maintenance is sporadic and not likely to have a significant impact on depths in that area.

TABLE 8 - PLACEMENT HISTORY:

Disposal Site(s) (Identifier)	Primary Disposal Method[1]	Placement History[2] (000 CY)					
		1998	1999	2000	2001	2002	Ave.
ODMDS	Bottom Dump		2,300[3]				15

NOTE: [1] Bottom Dump
[2] Computed average per year shown since site not used in last 5 years for maintenance. [3] New work material from phase II placed at ODMDS.

Table 9 indicates little information is available about the ODMDS. That site is in use for disposal of dredged material from the deepening of the harbor serving the port. The first contract for the new work, completed in 1993, did not require disposal of material in the ODMDS.

If all the construction material stayed in the ODMDS, the depth of material in that site would be roughly less than 7 feet assuming a somewhat uniform spread over the entire area. Potential maintenance from the deep harbor area use at about 15,000 cubic yards a year results in about 300,000 cubic yards over 20 years. That is equivalent to less than a foot of depth in the ODMDS. The assessment of the ODMDS capability is that the site can easily handle another 20 to 30 years of disposal including new work dredging without a significant reduction in depths.

Virginia Key (figure 1) is an upland confined disposal facility (CDF) that could be used during the phase III (February 2003, Draft Miami Harbor GRR and EIS) dredging to potentially receive some of the material dredged from Cuts-1, 2, 3, and 5 by a cutter-suction dredge. Sand removed from the widening of the entrance channel and Fisherman's channel by the cutter-suction could be placed at Virginia Key for later reuse. About 25,000 cubic yards of that sand material from Virginia Key will serve as a beneficial use of dredged material by providing a 2-foot cap over approximately 375,000 cubic yards of rock material from the phase III deepening to fill of a borrow site within north Biscayne Bay for seagrass mitigation as shown in figure 2. As a beneficial use of dredged material the City of Miami has mined material from Virginia Key to use as construction fill. Currently the Virginia Key CDF requires rehabilitation of the dikes and weirs. Rehabilitation of the CDF would provide approximately 1.5 to 2.0 million cubic yards of capacity using existing material within the CDF to rebuild or raise the dikes.

Other potential beneficial uses of dredged material from the phase III (February 2003, Draft Miami Harbor GRR and EIS) deepening include about 55,000 cubic yards of rock material for development of low and high relief artificial reefs. The artificial reefs will provide mitigation for impacts to existing reef areas as a result of the entrance channel widener shown as component 1C in figure 1.

TABLE 9 - DISPOSAL SITE DATA:

Disposal Site(s) (Name or Identifier)	Site Type [1] (select)	Disposal Site Capacity		Beneficial Uses (CY/Year)		Other Users [2]	Disposal Site Sponsor (Y/N)
		Original (000)	Percent Filled	Existing	Anti-cipated	(select)	
ODMDS	2	N/A	N/A	N	N	B	Y
Virginia Key	6	850	N/A	N/A	25	B	Y
Proposed Artificial Reef POM	2	N/A	N/A	0	55,000	B	Y
Proposed Seagrass Mitigation POM	1	N/A	N/A	0	400,000	B	Y

Sponsor(s) for Disposal Site(s) (List all individual sponsors)		
Name: Miami-Dade County Seaport Department, c/o Port of Miami		
Address: 1015 North American Way		
City: Miami	State: Florida	ZIP: 33132
Point of Contact: Carl Fielland	Phone # (305) 347-4890	

NOTES:

[1] Disposal Sites:

1 - Open Water, unrestrained
2 - Designated Open Water
3 - Near Shore (surf zone)
4 - On Shore (beach nourishment)
5 - Near Shore Confined (in-water CDF)
6 - Upland Confined (on-shore CDF)
7 - Upland Unconfined

[2] Non-Corps Users:

A - None, [Corps has exclusive use]
B - Authorized [Other parties allowed to use, with or without Corps consent]
C - Allocated [Space available for project related non-Corps dredging at no cost]
D - Permitted [Space available for non-Corps dredging in the area at a cost]
E - Restricted [Non-Corps use controlled by another party, Corps has full use]
F - Royalty [Site controlled by another party, Corps uses at a cost]

6. Environmental Compliance

A final Environmental Impact Statement (EIS) dated August 09, 1995, resulted in designation of a new ODMDS. Investigations revealed three areas of controversy. The State of Florida believes that all ODMDSs should be restricted to prohibit the disposal of:

a. Beach quality sand,
b. Material with a grain size less than .025 mm, and
c. Material constituted by more than 10 percent fine-grained material.

No issues remain unresolved. The first two issues concerning beach quality sand disposal and prohibition of fine-grained material were resolved with the State. The August 09, 1995 EIS contains the resolution of those issues with associated responses to comments. The EIS states that only dredged material suitable for ocean disposal will be disposed in the Miami ODMDS. The suitability of dredged material for ocean disposal must be verified by the Corps of Engineers and agreed to by EPA prior to disposal. The disposition of beach compatible sand from the deep harbor project will be determined during State water quality considerations. The site management and monitoring plan requires a real-time current monitoring program during disposal until the effects of disposal during eddy currents are better understood. Disposal of fine-grained materials occurs only during certain current conditions.

A Draft Environmental Impact Statement (DEIS) submitted as part of the February 2003 Navigation Study for Miami Harbor Draft General Reevaluation Report and Environmental Impact Statement proposes disposal of new work dredging materials at up to four disposal sites. The four sites include seagrass mitigation sites in north Biscayne Bay, artificial reef areas south of the entrance channel, the Virginia Key upland confined disposal facility, or the offshore Miami ODMDS.

The February 2003 DEIS, Appendix E, contains an environmental baseline resource survey of the Miami Harbor area. The environmental resource survey includes the results of field investigations (video and diver surveys) which characterize marine habitats with the areas to be impacted.

Few environmental quality resources exist in the deep harbor portions of the project serving the port. Upland areas of the port on Dodge and Lummus Islands are fully developed. The deep-water areas serving the port have low and high relief harbottom reef habitat and seagrass areas outside the edges of the Federal channel. Benthic organisms can be found on the bottom and sides of the deep project. The rocks and crevices of the jetties provide habitat for a variety of fish.

Most terrestrial mammals and birds have been effectively extirpated from along the Port of Miami. Development is intense in those areas. Aquatic birds such as pelicans and gulls still range over the areas.

Species that are listed as threatened or endangered that can be found in the area are as follows:

Reptiles	Mammals	Fish
Green turtle	West Indian manatee	Smalltooth Sawfish
Hawksbill turtle	Finback whale	Proposed (E)
Kemp's Ridley turtle	Humpback whale	Designated Critical Habitat
Leatherback turtle	Right whale	Johnson's Seagrass:
Loggerhead turtle	Sei whale	Manatees
American Crocodile	Sperm whale	
	Blue Whale	

A notice of intent to prepare a draft EIS was published in the Federal Register on August 13, 2001. After completion of independent technical reviews and approval by higher authority initiation of the public review period as well as State and Federal agency reviews of the draft EIS will occur.

Archival and literature review along with consultation with the Florida State Historic Preservation Officer (SHPO) identified the potential for significant cultural resources within the channel expansion areas. A survey for underwater cultural resources was recommended and conducted. No significant cultural resources were identified as a result of the survey. Based on that survey SHPO concurred (April 18, 2002 DHR #2002-03669) with the Corps determination that the dredging project would have no effect on cultural resources.

The dredge material will be disposed in existing disposal areas or used to fill previously dredged borrow site areas near the Julia Tuttle Causeway. As such the disposal has no potential to affect cultural resources. The reef construction was developed as mitigation for this project and will require separate SHPO consultation.

Table 10 notes that the environmental documentation is in the process of being updated for completion of the phase II new work dredging and maintenance (WQC #138023199). Draft NEPA documentation for the proposed phase III deepening and widening project is scheduled for submission to higher authority in February 2003 as part of the Navigation Study for Miami Harbor Draft General Reevaluation Report and Environmental Impact Statement.

TABLE 10 - PROJECT COMPLIANCE:

Reach or Segment	Document[1]	Preparation Date	Expiration Date	Scheduled Update
Project	WQC#138023199	7 March 1986	7 March 2001	March 2003
	Draft General Reevaluation . Report & EIS	February 2003	Concurrent with Final Report	Concurrent with Final Report

NOTE: [1] NEPA Document or documentation showing compliance with environmental law or regulation, e.g. Water Quality Certification.

7. Conclusions

Preliminary assessment of the deep harbor serving the port indicates that the disposal of shoal material has no major problems for the foreseeable dredging cycle. Future dredging of that portion will utilize the designated ODMDS and Virginia Key. The ODMDS is in deep water and has an estimated potential capacity for over 20 years of disposal for maintenance and new work dredged material. Virginia Key has significant capacity remaining with rehabilitation of the dikes, and current fill will continue to be recycled as construction fill and also be a potential source of material for stabilization of the shoreline and preservation of the historic Virginia Key Beach Park or other nearby beach erosion control projects. Past disposal in the offshore site from the deep harbor area involved no problem with the Environmental Protection Agency approving the material.

The economic viability of Miami Harbor is not in question at the present time. Over the years, the amount of cargo tonnage in the deep harbor area has increased from 4,720,000 tons in 1991 to 8,610,000 tons in 2000. Port-related industries have significant investments in terminals and infrastructure to handle the tonnage volume.

The Miami Port Authority has plans to expand existing facilities and needs its funding sources for that development. Use of funds for maintenance dredging is a drain on those sources and can adversely impact their future operations. Available information indicates that Miami Harbor is an economically viable project and justified for future maintenance as indicated in table 11.

Environmental compliance does not appear to be in question on the deep harbor portion of the project. Water Quality Certification (WQC) on that portion will be obtained and environmental impact statements will be updated as noted in table 10.

TABLE 11 - MAINTENANCE SUMMARY STATUS FOR MIAMI HARBOR:

The ability to maintain this project for the next 20 years is limited by:	
Disposal Site Capacity	N
Economic Viability	N
Environmental Compliance	N

8. Recommendations

Miami Harbor - Continued maintenance of this project is warranted on the basis of project usage and indicators of economic productivity, sufficient disposal capacity available, and maintenance activities in compliance with applicable environmental laws and regulations for the next 20 years. Therefore, no additional dredged material management plan (DMMP) is necessary beyond this assessment. See table 12.

This assessment supports that this project's disposal requirements can be met for the next 20 years. A DMMP is not required.

TABLE 12 - ECONOMIC ASSESSMENT OF CONTINUED MAINTENANCE DREDGING

	ECONOMIC STATISTICS	AUTHORIZING STUDY [1]	RECENT STUDY [2]	CURRENT CONDITIONS [3]	ASSESS-MENT	SUMM-ARY
BENEFIT INDICATORS	COMMODITY TYPES	GENERAL CARGO [4]	GENERAL CARGO	GENERAL CARGO	+	+
	TONNAGE ESTIMATES	2.4 MILLION [5]	8.6 MILLION [6]	8.6 MILLION [6]	+	
	GROWTH RATES	5% [7]	8.07% [8]	8.07% [8]	+	
	TRADE ROUTES	[9]	[9]	[9]	+	
	VESSEL TYPES	CONTAINER RO/RO	CONTAINER RO/RO	CONTAINER RO/RO	+	
	VESSEL SIZES	PANAMAX [10]	POST-PANAMAX [11]	PANAMAX [12]	+	
	VESSEL OPERATIONS	MAX LOAD [12]	MAX LOAD [12]	CONSTRAINED [13]	+	
COST INDICATORS	DREDGING CYCLE	NA	10	10	0	0
	DREDGING QUANTITIES/CYCLE	NA	100,000	100,000	0	
	AVG. ANN.MAINT. COST	NA	$3,000,000	$3,000,000	0	
	PRICE LEVEL	NA	2003	2003		
CONCLUSION	JUSTIFICATION OF CONTINUED MAINENANCE DREDGING IS WARRANTED BASED ON THE FEB 2003 ECONOMIC ANALYSIS IN THE MIAMI HARBOR GRR					

Note:

[1]- JUNE 1989

[2]- FEB 2003

[3]- FEB 2003

[4]- 2002 (PORT CARGO DATA RECORDS)

[5]- 2.4 MILLION SHORT TONS (1986)

[6]- 8.6MILLION SHORT TONS

[7]- 5% Average Annual Growth Rate 1976 to 1986

[8]- 8.07% Average Annual Growth Rate 1990 to 2000

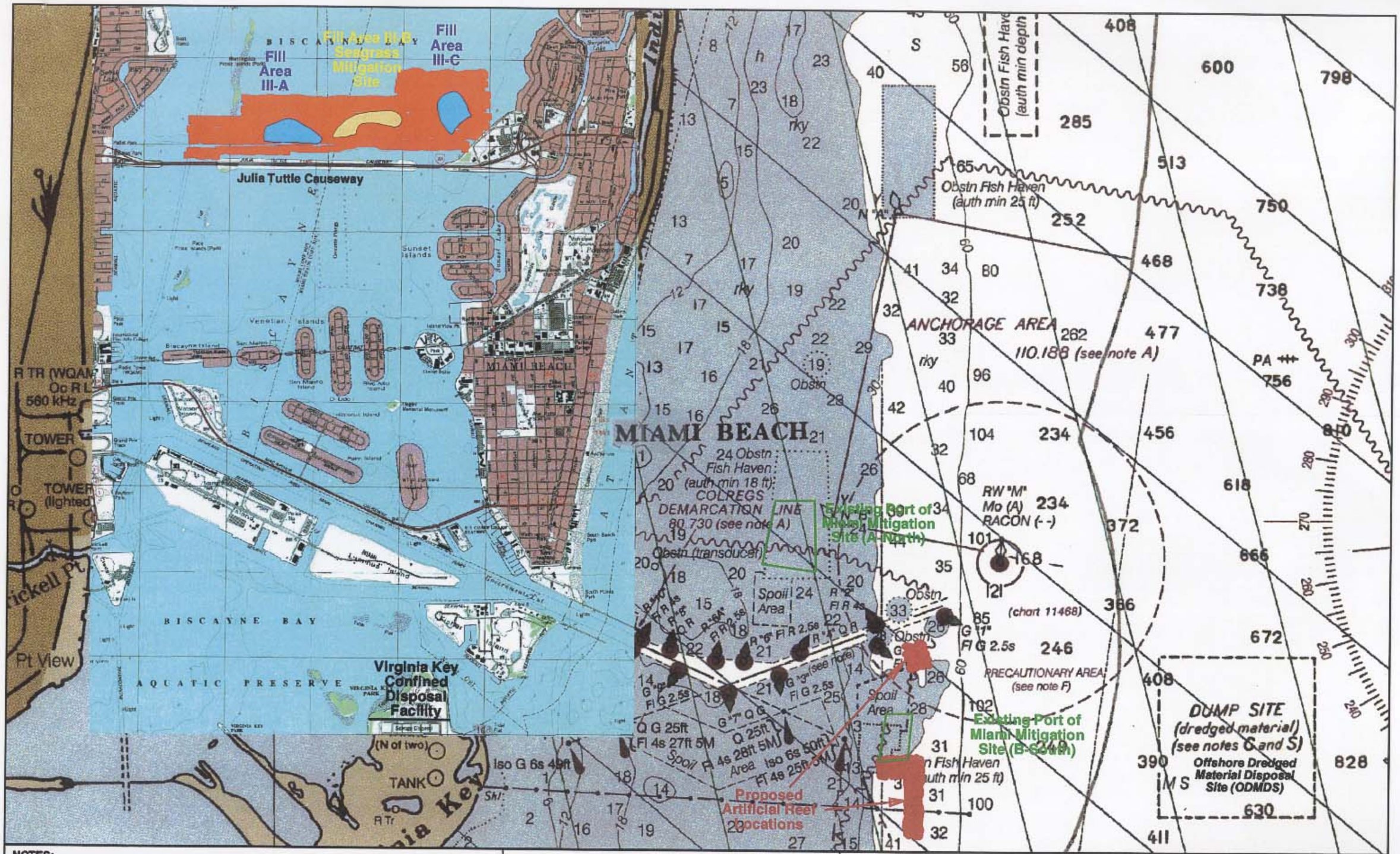
[9]- Latin America, Europe, Mediterranean, Far East

[10]- Panamax: 950 feet LOA, 106 feet beam, 43.0 feet draft

[11]- Post-Panamax: 1,138 Feet LOA, 141 feet beam, 47.6 feet draft

[12]- Panamax: 965 feet LOA, 106 feet beam, 44.4 feet draft

[13]- Lightloaded prior to deepening



NOTES:
1] Background images combined NOAA navigational charts 11466, 35th Ed. dated June 2000 and 11468, 38th Ed. dated March 2001.
2] Soundings in feet at mean lower low water.
3] Projection Universal Transverse Mercator (UTM), NAD27, units meters, zone 17.

2000 0 2000 4000 6000 Feet

N

PROPOSED DREDGED MATERIAL DISPOSAL SITES AND MITIGATION LOCATIONS

U.S.ARMY CORPS OF ENGINEERS
Jacksonville District

Figure 2