
MAIN REPORT

NAVIGATION MANAGEMENT PLAN FOR THE PORT OF HAMPTON ROADS, VIRGINIA



**U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510-1096**

February 2000

**NAVIGATION
MANAGEMENT
PLAN**

FOR THE

**PORT OF HAMPTON
ROADS, VIRGINIA**

EXECUTIVE SUMMARY

The Navigation Management Plan covers all navigation-related activities lying within the port and was developed in cooperation with the Virginia Port Authority with substantial input from numerous maritime interests located throughout the Hampton Roads area. The primary objectives of the Plan are to provide: (1) a comprehensive, integrated plan for the port; (2) a vehicle for spanning jurisdictions and disciplines to identify and resolve existing and potential issues; and (3) documentation of existing corporate knowledge.

Port users and interests identified over 50 problems, needs, concerns, and opportunities associated with the use and development of the port. Circle "A" stakeholders, the principal advisers and reviewers for the development of the Plan, reviewed the total list of concerns and prioritized the top 15 concerns as follows:

TOP PRIORITIZED CONCERNS

Concern	Priority ranking
Maintenance dredging: Continued and timely maintenance of port channels	1
Norfolk Harbor Channel: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet to Lamberts Point	2
Need to extend life of Craney Island Dredged Material Area and/or locate alternative future placement sites	3
Use of Craney Island Dredged Material Area for port development	4

TOP PRIORITIZED CONCERNS
(Cont'd)

Concern	Priority ranking
Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to 50 feet to Lamberts Point	5
Elizabeth River Channel: Need to deepen from 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern and Southern Branch Channels	6
Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to the authorized depth of 55 feet to Lamberts Point	7 (tie)
Funding	7 (tie)
Channel to Newport News: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet	9
Southern Branch Channel: Need to deepen from 40 feet to the authorized depth of 45 feet to the Norfolk Southern Railroad bridge	10 (tie)
Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 50 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated	10 (tie)
Southern Branch Channel: Need to deepen from 35 feet to the authorized depth of 40 feet to the Gilmerton Bridge	12
Water quality	13
Channel to Newport News: Need to deepen the inbound lane from 50 feet to the authorized depth of 55 feet	14
Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 55 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated	15

From these top 15 prioritized concerns, a long-range strategic plan was developed. The plan is divided into two general categories: (1) new construction elements and (2) ongoing strategic elements. The new construction element section is further separated into channel elements and other elements. Channel elements include the various channel deepening considerations for the Norfolk Harbor Channel, the Channel to Newport News, the approach channels, the Elizabeth River Channel, the Southern Branch Channel, and the widening of the turning area at the Sewells Point Anchorage. Other new construction elements include the extension of the life and potential port development of the Craney Island Dredged Material Area. Ongoing strategic elements include maintenance dredging, funding, and improving water quality. The new construction elements associated with extending the useful life and port development of the Craney Island Dredged Material Area, as well as the ongoing strategic elements, would be accomplished concurrently with the implementation of the channel elements of the Plan. The proposed order of implementation is as follows:

1. Inbound channels to 50-foot depth
2. Widening turn at Sewells Point (K-1) anchorage to 50-foot depth
3. Outbound channels to 55-foot depth
4. Widening turn at Sewells Point (K-1) anchorage to 55-foot depth
5. Elizabeth River and Southern Branch Channels to 45-foot depth
6. Southern Branch channel (Upper Reach) to 40-foot depth
7. Inbound channels to 55-foot depth

Extending the useful life and port development of the Craney Island Dredged Material area would be considered concurrently with the above listed channel elements. The ongoing elements of the Plan, i.e. maintenance dredging, funding, and improving water quality, would be a continuing part of the Plan.

The Plan was reviewed and approved by the Circle "A" stakeholders. It has been developed for planning purposes and to give appropriate decision makers information from which implementation and funding decisions may be made. The Plan is flexible,

sensitive to the passing of time and events, and will require periodic updates to keep it current and viable. It is likely that the future of the port will reflect the past and there will never be enough resources to accomplish all that is desired. The Navigation Management Plan will assist Federal, state, local, and private investors to better allocate scarce port resources based on the prioritized concerns as established by port users and interests.

PREFACE

This document presents the results of a comprehensive 3-year coordinated effort to develop a Navigation Management Plan for the Port of Hampton Roads, Virginia, hereinafter referred to as the "Plan." The authority for preparation of the Plan is provided by Section 201(a) of Public Law 99-662, the Water Resources Development Act of 1986 (WRDA 86), enacted on November 17, 1986 as a part of the Norfolk Harbor and Channels, Virginia project. The Plan's development was directed by the Norfolk District, Army Corps of Engineers in conjunction with the Virginia Port Authority (VPA), the local sponsor. It involved the participation of over 400 stakeholders to provide for the most efficient management of the port's navigation features and to ensure that these features effectively accommodate future development and growth.

Presentation of the Plan is included in a main report supplemented by appropriate appendixes. The main report is divided into six sections. Section I provides the introductory information including the purpose and goals of the Plan, a description of the port complex, the identification of stakeholders, a description of the coordination process, and a general outline of the content of the Plan. Section II presents a discussion of the Corps of Engineers navigation projects that are located in the Hampton Roads harbor area. Section III describes pertinent current and previously studied projects and potential future studies/projects by the Corps of Engineers within the port and vicinity. Section IV presents general and specific navigation-related constraints, problems, needs, and opportunities identified within the port. Section V presents alternative solutions for addressing the primary concerns identified in Section IV. Finally, Section VI concludes with a description of a long-range plan to best accommodate the future management and development of the port's navigation features. The appendixes include eight sections providing pertinent, detailed information to support the main report.

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SECTION I

INTRODUCTION

SECTION I

INTRODUCTION

GENERAL

The Port of Hampton Roads is one of the busiest ports in the United States, serving as the center of substantial industrial, commercial, and military activity for the region. Indeed, it is a large and complex development with a multitude of supporting interests and activities. The port is also the largest exporter of coal in the world and contains one of the largest concentrations of naval installations in the world. In 1995, over 75 million tons of commerce, including over 50 million tons of coal, moved through its facilities. It has been estimated that over 100,000 jobs within the Commonwealth are directly related to port activity. The Commonwealth of Virginia, acting through the VPA, owns and manages three marine terminals located within the port that trade with over 100 nations worldwide. Vessels of every size and type transit the port waters ranging from the largest coal colliers and aircraft carriers to small commercial fishing boats and pleasure craft. **(Update the data in this paragraph when text is finalized)**

There are a number of Federally-maintained deep-draft navigation channels serving the port with maximum depths up to 50 feet (all depths in the Plan refer to mean lower low water [m.l.l.w.], except where otherwise indicated). In addition, several channel deepening and anchorage projects with depths up to 55 feet have been authorized but have not yet been constructed. To provide effective coordination and accomplish efficient operation and maintenance including further development, port growth, viability, and competitiveness, long-term planning for future navigation and related needs of the port is essential and can best be pursued through a comprehensive Navigation Management Plan.

The first section of the Plan discusses the purposes and goals that the Plan is designed to achieve and describes the port complex including its location, economic and military importance, and key future non-Corps of Engineers activities. It also contains a discussion regarding existing requirements and procedures for navigation-related projects. Pertinent background information concerning prior studies and reports, existing data and information records, and histories of navigation projects and other port-related activities is also included in Section I. In addition, this section identifies the key stakeholders involved in the use, operation, maintenance, and development of the port navigation features and explains their roles and responsibilities. The coordination process to involve all concerned stakeholders is discussed including a description of the process necessary to prioritize the constraints, problems, needs, concerns, and opportunities for improvements identified in Section IV. Finally, a procedure for periodic updating is included to insure that the Plan will remain current and viable for future use.

PURPOSE

The general purpose of the Plan is to provide the most efficient operation and maintenance of the port's navigation features and to insure that these navigation features effectively accommodate future development and growth. To accomplish this, the Plan stresses three specific purposes: (a) to provide a comprehensive, integrated, fully coordinated, flexible plan for the port; (b) to provide a vehicle for spanning jurisdictions and disciplines to identify and resolve existing and potential issues; and (c) to provide documentation of existing corporate knowledge.

Obviously plans currently exist in this District, the VPA, and other key organizations in the port area which chart a future course for some functional elements; however, there exists no comprehensive plan which addresses the integration of these separate plans and interests with the betterment of the port as the common goal. This plan will help facilitate the efficient use of future resources so that optimum results will be more easily obtainable.

In addition, the Plan provides a mechanism to coordinate comprehensive short- and long-range planning for early recognition of potential issues and problems. Early identification will greatly assist in obtaining quick resolution, thereby preventing more serious problems from developing later.

There is also a need to insure the maintenance of existing corporate knowledge to prevent the loss of valuable information over time as key personnel change. The Plan will be a repository for relevant information, serving as a centralized single source of data readily available to port interests. The periodic updating of information will insure the continuous availability of past and current data regardless of personnel changes in key port agencies and interests.

AREA DESCRIPTION

GENERAL SETTING

The Port of Hampton Roads is located in the southeastern part of the Commonwealth of Virginia at the southern end of Chesapeake Bay, midway on the Atlantic Seaboard (approximately 170 miles south of Baltimore, Maryland and 220 miles north of Wilmington, North Carolina). The harbor is a natural roadstead of 25 square miles formed by the confluence of the James, Nansemond, and Elizabeth Rivers. It is recognized as one of the largest and finest natural harbors in the world and is a primary stimulus to the economic well-being of the region, the Commonwealth, and the Nation. The land area surrounding the harbor encompasses about 1,500 square miles and includes the Cities of Chesapeake, Norfolk, Portsmouth, Suffolk, and Virginia Beach and Isle of Wight County on the southside and Hampton and Newport News on the northside, as shown on Plate 1. The population of this area is over 1.3 million people (**Update this figure when text is finalized**).

Vessels entering the harbor from the ocean follow a course through the Virginia Capes near Cape Henry, pass through Thimble Shoal Channel which crosses the lower end of the Chesapeake Bay, and enter Hampton Roads between Old Point Comfort on the north and Willoughby Spit on the south. Two deep-water channels extend through

Hampton Roads; one channel extends southward along the eastern side through the Elizabeth River and its Southern Branch, and the other channel extends westward to Hampton and Newport News, as shown on Plate 2. Principal waterways on the southside include the Lynnhaven River; Little Creek; the Elizabeth River and its Eastern, Southern, and Western Branches; the Lafayette River; Scotts Creek; the Nansemond River; and Chuckatuck Creek. Also, the route of the Atlantic Intracoastal Waterway traverses the Southern Branch of the Elizabeth River en route from Maine to Florida. On the northside, principal waterways include the James River, Newport News Creek, and Hampton Creek. These waterways are shown on Plate 3.

IMPORTANCE OF THE HARBOR (Update the data in this segment when text is finalized)

The Port of Hampton Roads is one of the largest and most active ports in the United States. Foreign, national, regional, and local markets are conveniently accessible to the port through the numerous steamship services to worldwide ports and the strategic position that the port occupies with respect to the national and regional transportation patterns. The geographic location of the port and an excellent rail and highway network make it economically and efficiently available to a significant portion of the nation's population and manufacturing centers. The following paragraphs of this section discuss the principal activities associated with the port including waterborne commerce, vessel traffic, shipbuilding and repair, military activities, port service industries, government agencies, and other port-related businesses. The port is most strategically located with respect to the vast coal fields of Virginia, West Virginia, and Kentucky and extensive amounts of steam and metallurgical coal resources are transported by rail from these areas to Norfolk and Newport News for both overseas shipment and domestic use. Other bulk commodities and breakbulk commodities also comprise a significant and important part of the waterborne shipments through the port. Container shipments have grown significantly in recent years and are projected to show substantial increases in the future. The port generates significant local, regional, and national economic impacts providing employment, payroll, and tax revenues in Hampton Roads, the Commonwealth, and the nation.

Commerce

Terminal facilities located within the port accommodate movements of coal and petroleum products; grain; forest, lumber, and wood products; farm and food products; non-metallic minerals; stone, clay, glass, and concrete products; chemicals and allied products; metallic and primary metal products; manufactured goods and products; machinery and transportation equipment; beverages; and tobacco. The following table shows the principal exports, imports, and coastwise shipments moving through the port during 1995, the latest year for which complete records are available.

Table I-1. EXPORTS, IMPORTS, AND COASTWISE RECEIPTS AND SHIPMENTS
MOVING THROUGH THE PORT OF HAMPTON ROADS IN 1995
(Thousands of short tons)

Coastwise

Commodity	Exports	Imports	(1)	Total
Minerals, fuels, lubricants, etc.	43,993	3,867	11,109	58,969
Crude materials	1,599	1,250	2,819	5,668
Manufactured goods	1,002	2,088	180	3,270
Food	1,550	721	351	2,622
Machinery and transportation equipment	612	827	926	2,365
Chemicals	312	611	379	1,302
Tobacco and beverages	438	377	-	815
Oils and fats	181	16	-	197
Miscellaneous	<u>13</u>	<u>193</u>	<u>28</u>	<u>234</u>
Total	49,700	9,950	15,792	75,442

(1) Includes internal and local shipments and receipts.

Sources: Waterborne Commerce of the United States (U.S. Army Corps of Engineers), Virginia Port Authority, and Hampton Roads Maritime Association.

By far, the export of coal comprises the largest part of commerce moving through the port, accounting for almost 44 million tons or 58 percent of total commerce and 89 percent of export tonnage in 1995. Petroleum and related products comprise the largest part of import tonnage, accounting for almost 4 million tons or 38 percent in 1995. Coal also accounts for the largest part of coastwise shipments, accounting for over 2 million tons or 50 percent of the total in 1995. As the previous table indicates, exports, imports, and coastwise shipments accounted for 66, 13, and 21 percent, respectively, of total tonnage moving through the port in 1995.

Over the past 30 years, commerce through the port has fluctuated somewhat due to domestic and world-wide economic factors such as mine and rail strikes. In terms of

tonnage, obviously, any change in coal exports has a great impact on overall port commerce movements since, historically, coal shipments dominate cargo tonnage. During the 30-year period, however, there has been a general and consistent increasing trend in foreign commerce tonnage moving through the port. The following table shows the total commerce tonnage moving through Hampton Roads at 10-year intervals over the past 30 years of record.

Table I-2. COMMERCE THROUGH THE PORT OF HAMPTON ROADS,
1965 TO 1995
(Millions of short tons)

<u>Category</u>	<u>1965</u>	<u>1975</u>	<u>1985</u>	<u>1995</u>
Exports	35.1	43.3	48.8	49.7
Imports	4.3	7.6	5.4	9.9
Coastwise	7.4	2.7	3.3	4.7
Internal and local	<u>7.3</u>	<u>13.3</u>	<u>9.1</u>	<u>11.1</u>
Total	54.1	66.9	66.6	75.4

Sources: Waterborne Commerce of the United States (U.S. Army Corps of Engineers) and the Hampton Roads Maritime Association.

In recent years the port has experienced substantial growth in containerized and breakbulk cargo. A report entitled "Virginia Port Authority 2010 Plan" dated August 1995 prepared by Vickerman, Zachary, and Miller for the VPA indicates a potential for the year 2010 of a 250 percent increase in containerized cargo and a 200 percent increase in breakbulk cargo over 1994 levels.

Vessel Traffic

Vessels of all types and sizes from ports all over the world call at Hampton Roads. They range from large coal colliers in the 170,000 Dead Weight Ton class with loaded drafts up to 59 feet and U.S. Navy ships including aircraft carriers with drafts up to 40 feet to small seafood work boats and pleasure craft. Traffic consists of vessels involved in foreign trade, coastwise movements, and local activities. Included are vessels from the many U.S. Government installations located adjacent to the harbor, particularly the Norfolk Naval Shipyard and the Norfolk Naval Base; the shipbuilding and repair activities at Newport News Shipbuilding and Drydock Company and other companies in the harbor engaged in ship maintenance work; the coal loading facilities at Norfolk and Newport News; and the VPA marine terminals located in Newport News, Norfolk, and Portsmouth. Nearly all the world's major shipping lines call at Hampton Roads. The following table shows total vessel trips, by, draft moving to and from the Port of Hampton Roads over the past 30 years by decade. The decrease in total vessel trips as shown in the table is due in part to the increase in use of larger vessels which permits more cargo to be transported with fewer vessel trips.

Table I-3. TRIPS AND DRAFTS OF VESSELS CALLING AT THE PORT OF HAMPTON ROADS, 1965 TO 1995

Draft (feet)	Years			
	1965	1975	1985	1995
50 to 46	0	25	192	300

45 to 41	13	182	248	216
40 to 36	210	798	379	294
35 to 31	952	918	986	1,652
30 to 26	1,447	2,296	1,765	1,764
25 to 21	2,504	2,389	1,590	1,292
20 and less	<u>86,943</u>	<u>75,250</u>	<u>40,951</u>	<u>30,502</u>
Total	92,069	81,858	46,111	36,020

Sources: Waterborne Commerce of the United States (U.S. Army Corps of Engineers).

As the previous table indicates, the draft of vessels calling at the port has continually increased since 1965 due to the economics of transporting commodities, particularly coal, in large vessels and the availability of deeper channels. More recent trends indicate larger ships becoming more prevalent in the containerized and general cargo trade in response to significant growth in world trade. Already on the containerized shipping scene are the so-called "Mega Ships", a term used generally for container ships with a capacity greater than 4,500 TEU's. (TEU is an abbreviation for twenty-foot equivalent unit which is based on how many 20-foot-long containers a ship can carry.) In 1990, less than 6 percent of U.S. containerized cargo was shipped on vessels with greater than 4,000-TEU or more capacity, but recent industry estimates project that by the year 2010, almost 40 percent of containerized cargo will move in vessels of this size or greater. These vessels will require adequate dockside facilities including special cranes sufficient to reach across the width of the vessels's decks. Also, the Port of Hampton Roads has been able to attract larger shares of the East Coast markets due to its deep protected natural harbor, its excellent rail connections to the Midwest, good labor and management relations, and its ability to effectively accommodate growth. In 1996, Hampton Roads became the second largest general cargo port on the East Coast, trailing only New York. As an indication of the port's increased growth, it was only the fifth largest among East Coast ports in the mid-1980s.

Port Industry

The tremendous amount of bulk and general cargo moving through the harbor as shown in Table I-1 is the basis for a wide range of port-related activity required to accommodate the movement and transfer of commerce and to provide services for the vessels engaged in foreign and domestic trade. Industrial activities which are directly port-dependent include railroads, trucking firms, ship chandlers, marine and industrial suppliers, stevedoring and charter firms, marine terminals, ship repair firms, towing and tug services, and broker and warehousing services. A number of manufacturing firms in the Hampton Roads area either import a substantial portion of their raw materials through the port and/or export commodities to foreign and domestic markets. Agricultural and mining activities are also dependent on the port for shipment and receipt of such commodities as grain, ores, and coal. A November 1997 report entitled "The Economic Impact and Rate of Return of Virginia's Ports on the Commonwealth, 1995", by Gilbert R. Yochum, Ph.D. and Vinod B. Agarwal, Ph.D. of Old Dominion University indicates that employment in industry directly and indirectly associated with the port was over 128,000.

In addition to the outstanding harbor, the area provides a number of industrial advantages including excellent rail, air, and highway transportation systems; enterprise and foreign trade zones; a mild climate; an efficient labor force; ample electric power and other utility services; educational and research institutions; and recreation and cultural opportunities. The cities and counties comprising the Hampton Roads area have aggressive and informed planning and industrial development organizations which provide material assistance to new and expanding companies.

Military Activities

The Hampton Roads area is the home of the nation's largest concentration of military installations, and their activities provide a major economic impact. Overall, the area is home base for about 106,000 active duty military personnel and over 37,000 civilian employees. The largest facilities are the naval installations on the southside where over 20 percent of the Navy's active duty personnel worldwide are assigned.

Other facilities include the Army and Air Force bases on the northside in Newport News and Hampton. However, the Army, Navy, Air Force, Marines, and Coast Guard all have a significant presence in the region extending from northside and southside Hampton Roads to the North Carolina border. Many of the headquarters of major military commands are located within the area. The headquarters of the Atlantic Fleet is situated in Norfolk. The Coast Guard's Atlantic Area Command and Maritime Defense Zone Atlantic is located in Portsmouth, making it the largest concentration of Coast Guard manpower in the country with about 2,500 personnel. The Air Force has its home for the Air Combat Command located at Langley Air Force Base in Hampton. The Army has its Transportation Center located at Fort Eustis in Newport News and its Training and Doctrine Command located at Fort Monroe in Hampton. The Marine Corps is planning to move its Marine Forces Atlantic Command back to Norfolk from Camp Lejeune, North Carolina. A vital link to all of the above-mentioned commands is the U.S. Atlantic Command located in Norfolk, a joint service headquarters that has the responsibility for training most of the military's fighting units.

The military continues to be a strong presence in the area, although economic and other factors frequently impact its level of activity. However, not even the large budget cuts of recent years have substantially reduced the military's importance in the region. In fact in many cases, base closings and consolidations of commands elsewhere have actually benefited the Hampton Roads area. The military will continue to be a major economic force within the area in the future, and the harbor will continue to play a major role in accommodating and enhancing many aspects of military activities.

Economic Impacts

The port generates substantial economic activity within the Hampton Roads area, the Commonwealth, and the nation. Vessels entering the harbor to load or discharge cargo require a wide range of services that provide employment, revenue, and payroll. Studies conducted at Old Dominion University, referenced previously, indicate that each ton of bulk cargo, container cargo, and breakbulk cargo passing through the port generates \$18.85, \$66.82, and \$110.64, respectively, within the Commonwealth's economy. Employment, wages, and tax revenues are generated by mining,

manufacturing, and agricultural interests which depend on the harbor for delivery or shipment of commodities. These include interests such as coal mines in West Virginia, textile and furniture firms in North Carolina, and tobacco and grain producers in the hinterlands.

Several categories of industry are supported by the port. First, there are those companies required by the port to provide essential services such as terminal operations, ship repair, stevedoring, and vessel supply. The second type of industry includes those companies that are attracted to the port because they need to either export commodities and/or import products for assembly in this country. Lastly, there are the interests which have expanded their markets due to reduced transportation costs, as represented by mining, manufacturing, and agricultural activities.

Several Commonwealth and Federal Government agencies also provide necessary port services including the Virginia Department of Agriculture and Consumer Services, VPA, National Oceanic and Atmospheric Administration, U.S. Department of Agriculture, U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Customs Service, U.S. Immigration and Naturalization Service, U.S. Maritime Administration, and the U.S. Public Health Service. About 40 percent of the more than 128,000 people having port-related jobs were employed in basic or primary activities such as transportation, cargo handling, ship repair, mining, manufacturing, and agriculture. Companies engaged in basic activities either directly participate in the movement of waterborne commerce or extract or grow the materials which move through the port, as in the case of mining, manufacturing, and agriculture. The remainder of the jobs are involved in secondary or supporting activities which provide services to people engaged in the basic activities.

In addition to providing jobs and wages, port activity also generates substantial tax revenues. In 1995, taxes paid to the Commonwealth and local governments by port industries and their employees were estimated at over \$122 million. A significant amount of Federal taxes are also generated by port activity.

A detailed and comprehensive explanation of the economic impact of port activities can be found in several reports prepared for the VPA by Gilbert R. Yochum and Vinod B. Agarwal of Old Dominion University. As discussed previously, their latest studies are presented in their report dated November 1997 which is available from the VPA.

Other Port-Related Activities

The importance of the harbor is also illustrated by several additional activities which have not been previously discussed. These activities include seafood harvesting and processing, pleasure boating and sport fishing, and visitation at the several noted port-related recreational and historical points of interest located adjacent to the harbor.

Historically, commercial seafood operations have been an important economic activity within the Hampton Roads area. The fishery resources of the Chesapeake Bay were noted in the earliest historical accounts dating from the Colonial period. Today this industry continues to be highly productive and supports a very significant commercial and sport-fishing harvest. Both the harvesting of finfish and shellfish in the adjacent waters of the Chesapeake Bay and the Atlantic Ocean and the processing of seafood products in adjacent cities surrounding the harbor have been and continue to be substantial operations within the area. The following table shows the amount and value of shellfish and finfish landings within the localities comprising the port for the most recent 5 years of record.

Insert Table I-4. SHELLFISH AND FINFISH LANDINGS, 1992 TO 1996

The area is extremely rich in outdoor recreational resources due to the numerous estuaries, rivers, and bays in the vicinity. Boating, water sports, and sport fishing are frequent recreational activities in which both residents and visitors engage. Numerous marinas provide access, harborage, and storage for thousands of recreational craft. The Southern Branch of the Elizabeth River is a portion of the Atlantic Intracoastal Waterway which connects Chesapeake Bay to the north with the sounds of North Carolina. Numerous pleasure craft use this waterway enroute between Maine and Florida. Several sightseeing tour boats are operated daily out of adjacent cities. The importance of recreational boating within the Hampton Roads area is clearly demonstrated by the increasing number of registrations over the past 17 years as shown in the following table.

Table I-5. PLEASURE BOAT REGISTRATIONS

<u>Locality</u>	<u>Years</u>				
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>1996</u>
Chesapeake	3,680	3,803	4,646	5,600	5,698
Hampton	3,090	3,203	3,985	4,188	4,198
Isle of Wight	1,014	1,230	1,580	1,929	1,905
Newport News	2,574	2,825	3,644	3,935	3,835
Norfolk	4,726	4,753	5,243	4,881	5,085
Portsmouth	1,965	2,325	2,893	3,267	3,193
Suffolk	2,118	2,347	3,083	3,215	3,872
Virginia Beach	<u>8,830</u>	<u>9,450</u>	<u>11,533</u>	<u>12,328</u>	<u>13,011</u>
Total	27,997	29,936	36,607	40,343	40,797

Source: Virginia Department of Game and Inland Fisheries.

In the vicinity of the harbor, there are numerous points of historical and recreational interest. The more notable of these include the site of the Civil War battle between the "Monitor" and "Merrimac," Fort Monroe, Fort Norfolk, Norfolk Naval Base, Norfolk Naval Shipyard, Waterside Festival Market Place, Mariners Museum, and Nauticus--The National Maritime Center. Nearby are the Virginia Beach Resort, Colonial Williamsburg, Jamestown, and Yorktown.

KEY FUTURE NON-CORPS OF ENGINEERS ACTIVITIES

Discussed in this section are several of the key activities scheduled for the foreseeable future which, when completed, will have significant favorable effects on port use and operations. These include a new bridge-tunnel between southside and northside Hampton Roads, a second tunnel adjacent to the existing Midtown Tunnel connecting the Cities of Norfolk and Portsmouth, and the "Virginia Port Authority 2010 Plan" which provides for the expansion and increased operational efficiencies for the Commonwealth-owned marine terminals.

Hampton Roads Crossing Study

Congestion at the Hampton Roads Bridge-Tunnel along Interstate 64 has been a concern for several years. In 1992, the Virginia General Assembly passed Joint Resolution 132, which directed the Virginia Department of Transportation (VDOT) to conduct a study on the Hampton Roads Bridge-Tunnel. The VDOT study stated that short-term measures would not solve congestion at the Hampton Roads Bridge-Tunnel, and that a long-term, large-scale solution would be required.

As a result of the VDOT study, the Hampton Roads Crossing study was initiated in late 1993 as a demonstration project based on authority contained in the Intermodal Surface Transportation Efficiency Act of 1991. A Coordinating Committee for the project was formed by the VDOT, and includes: the Federal Highway Administration, Federal Transit Authority, Virginia Department of Rail and Public Transportation, VDOT, Hampton Roads Metropolitan Planning Organization, local public officials, and regulatory and environmental agency representatives, including the Norfolk District, U.S.

Army Corps of Engineers. It also includes representatives from transit commissions, rail providers, port operators, and military bases.

The study has considered various solutions including options to construct new transportation facilities, upgrade existing roadways, and implement congestion management strategies. Initially, 45 potential solutions were considered; this was further narrowed down to 11 Transportation Corridors as shown on Plate 4. The Commonwealth Transportation Board, giving consideration to all aspects of the study, selected Corridor 9 as the “Locally Preferred Corridor.” It is important to note that Corridor 9 provides direct access from I-664 to the Norfolk International Terminals. The actual alignment within the Preferred Corridor will be determined based on additional detailed environmental and engineering analyses. In this connection, the Environmental Impact Statement (EIS) process for this project began in March 1998. The EIS will address the environmental impacts associated with the Locally Preferred Corridor, Corridor 9. In addition, Corridor 1 will also be investigated in the EIS. Corridor 1 was the only corridor developed in the VDOT study that provides a new crossing parallel to the existing Hampton Roads Bridge-Tunnel. A draft EIS is scheduled to be completed by the summer of 1999 with the Final EIS signed in fall of 1999 and a Record of Decision issued in the winter of 1999-2000, including a final decision on the project and detailed alignment.

Midtown Tunnel and Pinners Point Interchange

The VDOT is planning a second tube to be located in the Elizabeth River immediately adjacent to the existing Midtown Tunnel, which connects the Cities of Portsmouth and Norfolk. The tunnel is being considered for possible public-private partnership. A Final EIS for the project was completed by the Federal Highway Administration in 1996. The tunnel project would include improvements to the Hampton Boulevard/Brambleton Avenue Interchange in Norfolk. Currently, the Midtown Tunnel project is not on the VDOT's schedule. However, private investors are developing the project, and construction may be planned to begin prior to the year 2000.

An associated construction project is the Pinners Point Interchange, which

connects the east end of the West Norfolk Bridge (Route 164) in Portsmouth to the existing tunnel. The connector to the West Norfolk Bridge is proposed as a six-lane elevated roadway, built along the waterfront adjacent to the Port Norfolk Historic District as shown on Plate 5. It will be constructed as a high level structure (bridge) located offshore from Bayview Boulevard and will tie into an interchange located landward of the Portsmouth Marine Terminal. The Pinnars Point Interchange and Connector are scheduled for advertisement for construction bids in 1999.

Marine Terminal Expansions

The "Virginia Port Authority 2010 Plan", discussed previously, developed the marketing, operations, and development plans for an integrated port-wide plan for the three VPA marine terminals located in Newport News, Norfolk, and Portsmouth. The consultants, working closely with the VPA and Virginia International Terminals, assessed market opportunities and port-wide cargo handling capabilities. Each of the three marine terminals was studied, including the Virginia Inland Port in Northern Virginia. The following general findings were included in the report:

- The port has experienced substantial growth in cargo, which has been accommodated to the mid-1990s by continually increasing efficiency of operations;
- The market assessment indicates significant potential for continued growth. By 2010, should the high-end market forecast be realized, containerized cargo will increase by 250 percent (of which the intermodal volume will increase by 300 percent), and breakbulk cargo will increase by 200 percent;
- Significant improvements to existing facilities and construction of new facilities will be necessary to accommodate the potential growth in cargo. Expansion of on-terminal intermodal rail will be essential; and
- The study includes recommendations at all three terminals. However, the substantial focus of the 2010 Plan is on Norfolk International Terminals (the

primary opportunity site for expansion) and the need for good intermodal rail access.

To insure that the port is ready for the projected growth, the VPA is moving forward with its Plan 2010, which will effectively double the container-handling capacity of the Commonwealth-owned general cargo terminals at an estimated capital investment of over \$400 million. Current plans provide for the expansion of Norfolk International Terminals on an undeveloped 300-acre site north of the existing facility. However, projected growth in general cargo is expected to quickly use up this increased capacity requiring the provision of a fourth marine cargo terminal within the port. A study is currently underway by the Corps of Engineers and the VPA assessing the potential for locating such a facility on an expanded Craney Island Dredged Material Area. This study is discussed in detail in Section III. These and other future improvements will permit the port to accommodate the 16-million-ton volume of general cargo anticipated by the year 2010 and will also place the port in position to take advantage of new marketing opportunities in an increasingly competitive international shipping environment.

EXISTING REQUIREMENTS AND PROCEDURES

REGULATORY

All work in waters of the United States and wetlands require a permit from the U.S. Army Corps of Engineers. The proponent is required to submit a joint permit application form to the Virginia Marine Resources Commission. This application is assigned a number and forwarded to the Corps of Engineers and the Virginia Department of Environmental Quality (DEQ) for review. Review by each agency proceeds concurrently but independent of one another. The Virginia Marine Resources Commission issues authorization for work channelward of mean low water (m.l.w.) in tidal systems and ordinary high water in non-tidal systems. As part of the Corps review process, the Virginia DEQ issues Virginia Water Protection Permits for the water quality impacts associated with dredging projects in Section 404 waterways. This permit serves as the Section 401 Water Quality Certificate required under the Federal Water Pollution

Control Act Amendments of 1972, as amended (commonly referred to as the Clean Water Act) and is incorporated into the Corps permit when issued.

The Corps of Engineers has authority to review proposals for work in waters of the United States and wetlands. Section 10 of the Rivers and Harbors Act of 1899 requires approval for work in, over, and under navigable waters of the United States. Activities for which a permit is needed include dredging, piers, wharves, bulkheads, dolphins, marinas, ramps, intakes, and pipeline and utility line crossings. Section 404 of the Clean Water Act requires authorization for the placement of dredged and fill material into waters of the United States and wetlands. Activities for which authorization is needed include deposition of fill material for residential, commercial, and recreational activities; construction of revetments, groins, breakwaters, levees, dikes, and weirs; and backfill for bulkhead construction.

The Virginia Marine Resources Commission is responsible for authorization of work in subaqueous areas, tidal wetlands, and coastal primary sand dunes under Subtitle III of Title 28.2 of the Code of Virginia. The joint permit application form, developed in 1978, is submitted to the Virginia Marine Resources Commission for recording and distribution to the appropriate Federal, state, and local agencies for review and authorization.

The Tidewater Regional Office of the Virginia DEQ is responsible for implementation of the Virginia Water Protection Permit (VWPP) Program under Section 62.1-44.15:5. A VWPP is required for any project where water quality certification is necessary under Section 401 of the Clean Water Act. The VWPP insures that the proposed activity is consistent with the protection of in-stream beneficial uses including the protection of navigation; maintenance of waste assimilation capacity; protection of fish and wildlife resources and habitat; and protection of recreational, cultural, and aesthetic values. Any conditions which are made a part of the VWPP are also required conditions of any Corps permit authorization.

All Tidewater Virginia localities have established a local wetlands board which is responsible for the authorization of any work proposed for non vegetated shorelines between mean low and mean high water as well as areas to one and one-half times the tidal range along shorelines with wetland vegetation present. Each locality also has specific regulations for the implementation of the Chesapeake Bay Preservation Act.

The provisions of the Rivers and Harbors Act of 1888, as amended, authorizes the Secretary of the Army to designate the Norfolk District Engineer as Supervisor of the Harbor of Hampton Roads. The Supervisor, in coordination with the U.S. Coast Guard, Department of Justice, and other Federal and state agencies, conducts a program for the prevention, detection, and prosecution of the deposits of waste, refuse, and other injurious materials into navigable waters. The jurisdiction of the Supervisor of the Harbor includes Hampton Roads and the reaches of the Chesapeake Bay and the Atlantic Ocean located in Virginia and the tidal portion of numerous tributaries. An ancillary authority was established by the Rivers and Harbors Act of 1899, as amended, which prohibits obstructions to navigable water such as unauthorized structures, unauthorized fill, deposit of refuse, and sinking of vessels. The direct supervision of the waters under the jurisdiction of the Norfolk District is accomplished by means of two patrol vessels, a derrickboat, and a crane barge. They perform inspections and investigate and remove sunken or abandoned vessels and navigational hazards.

ENVIRONMENTAL

Among the various environmental laws and regulations that are applicable to proposed Federal actions in the harbor, the National Environmental Policy Act (NEPA) (42 USC 4321 et seq.) and its regulations (40 CFR 1500-1508) are among the most important. The intent of this law is to involve and inform public officials and citizens of the environmental consequences of an action and to help public officials take actions that protect, restore, enhance the environment. Implementation of the NEPA begins with “scoping,” a process of soliciting public and agency concerns regarding the proposed action. The next steps entail development of alternatives, an assessment of the resources in the study area, and a determination of the effects with project implementation. This analysis usually culminates with the preparation of either an EIS or an environmental

assessment (EA). An EIS is prepared when there are significant environmental effects expected, while an EA is normally written when the impacts are not anticipated to be significant. These documents are coordinated with various agencies and individuals, and any necessary revisions made. The EIS culminates with the signing of a Record of Decision (ROD) and the EA with the Finding of No Significant Impact (FONSI) or a decision to prepare an EIS. The Finding of no significant impact means a document by a Federal agency briefly presenting the reasons why an action, not otherwise excluded (40 CFR 1508.4), will not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared.

In addition to the NEPA, there are numerous other environmental laws and regulations that require consideration. Compliance with these is often combined with the NEPA process, and the results presented in the NEPA documents. Some of these laws include the Clean Air Act; Clean Water Act; Coastal Zone Management Act; Endangered Species Act; and Comprehensive Environmental Response, Compensation and Liability Act.

Compliance with environmental laws and regulations also involves compliance with various laws concerning historical resources, most notably the National Historic Preservation Act of 1966, as amended. Section 106 of this act authorizes the Advisory Council on Historic Preservation to review Federal actions to ensure that historic properties are considered during the planning and execution of such actions. This review process consists of the following steps: the identification of any historic resources in the area of potential effect, determining what effect the proposed action could have on the historic properties, consultation with the state historic preservation officer and others to try to find ways to make the action less harmful if an adverse effect is anticipated, preparation of a Memorandum of Agreement outlining the measures to be taken to mitigate the adverse effects, and obtaining the comments of the Advisory Council on the agreement and the project as a whole.

PROJECT COOPERATION AGREEMENTS

A Project Cooperation Agreement (PCA), formerly called a Local Cooperation Agreement, is a legally binding agreement between the Federal government and a non-Federal entity that lists the items of local cooperation and the cost sharing requirements necessary for the Federal Government to undertake water resources projects. PCAs are generally derived from Section 221 of the Flood Control Act of 1970 and are therefore sometimes referred to as "221 Agreements". Several other related agreements are also utilized before or in conjunction with a PCA, such as a Feasibility Cost-Sharing Agreement or an Escrow Agreement. PCAs are also utilized in the Continuing Authorities Program, under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and construct certain types of small water resources improvements without specific Congressional authorization of individual projects.

Over the years, several approved model PCAs and related agreements have been developed for specific types of Corps projects. These models are approved by the Headquarters, Army Corps of Engineers and the Assistant Secretary of the Army (Civil Works). Local cooperation requirements for authorized Corps projects within the Hampton Roads area are generally described in Section II. PCA-related requirements for potential projects currently under study and for proposed studies are shown in Section III.

OTHER

In addition to requirements and procedures discussed previously, other general procedures within the harbor are required by the U.S. Department of Agriculture, U.S. Coast Guard, U.S. Customs Service, U.S. Immigration and Naturalization Service, and Virginia Department of Agriculture and Consumer Affairs.

The U.S. Department of Agriculture insures that the quality of produce and meat entering the port meets appropriate standards. Ships are boarded at dockside on arrival, and all produce and meats in sea stores are inspected. The Department must make sure that all meats entering the United States are only from countries and establishments approved to send such meat products into this country. In cooperation with the Virginia Department of Agriculture's Grain Inspection Service, the U.S. Department of

Agriculture must insure that vessels transporting grain meet certain cleanliness standards and must supervise the loading of grain for both weight and quality.

The U.S. Coast Guard generally ensures the safety, security, and environmental protection of the Port of Hampton Roads through enforcement of marine safety standards and response to environmental and military threats. The commanding officer of the Marine Safety Office serves as Captain of the Port. Specific major responsibilities include the following:

- Control anchorages in the harbor, except those assigned to the U.S. Navy;
- Coordinate use of naval anchorages by commercial vessels;
- Control the movement of vessel traffic in emergency situations;
- Enforce dangerous cargo, tank vessel, and load line regulations;
- Enforce regulated navigation areas throughout the port;
- Inspect and certify vessels under U.S. law;
- Conduct foreign vessel examinations for navigation safety, pollution prevention, marine sanitation devices, and compliance with U.S. and international law; and
- Examine commercial fishing vessels for compliance with Federal regulations.

The U.S. Customs Service insures that vessels arriving from a foreign port have followed appropriate procedures for entry into the country, prior to transacting business. The U.S. Immigration Service makes sure that proper procedures are followed on all vessels arriving in the port from foreign countries.

HISTORICAL RECORDS AND DATA SOURCES

PURPOSE

This section provides the identification and location of relevant port-related resource material which is currently on file at a number of agencies involved in port operations. This resource material includes reports, studies, project histories, data records, regulations, photographs, etc. which may be useful to port interests. Since most of this material is much too voluminous to be included in the Plan, just a short description of the material has been provided. Should the reader desire more detailed information, a point of contact has also been provided. This inventory is presented as a centralized, one-stop reference to find various data sources to assist in research, analysis, and decision making.

METHODOLOGY

All port interests associated with the use and development of Hampton Roads harbor were contacted to determine if they maintained any port-related resource material which may be of potential interest to port users. A comprehensive survey was conducted through correspondence, telephone interviews, and personal contact. For each data source identified, respondents provided a brief description of the information, where and how it is currently maintained, and a point of contact for obtaining further details. As part of the comprehensive Plan, the data listings will be periodically updated to include pertinent future information and to insure that it does not become obsolete.

SUMMARY

The following table summarizes the data sources identified from the survey and includes the name of the responding agency, a descriptive title of the data/information, and a point of contact for further details. A more comprehensive description of the data is contained in Appendix _____.

Insert Table I-6. HISTORICAL RECORDS AND DATA SOURCES--page 1

Insert Table I-6. HISTORICAL RECORDS AND DATA SOURCES--page 2

Insert Table I-6. HISTORICAL RECORDS AND DATA SOURCES--page 3

Insert Table I-6. HISTORICAL RECORDS AND DATA SOURCES--page 4

COORDINATION PROCESS

This section discusses the manner in which coordination is conducted with the many and varied stakeholders involved in the development of the Plan. In order to develop an integrated and comprehensive plan, it is important to obtain the input and perspective of a wide variety of port interests. Over 400 stakeholders were involved in the Plan including Federal, state, regional, and local government agencies; large and small port-related businesses; professional groups; environmental organizations; and local universities. A topical, alphabetical listing of all stakeholders is included in Appendix _____ and contains a point of contact and address.

CIRCLES OF INFLUENCE

The importance of the stakeholder's participation in developing and maintaining this Plan cannot be overemphasized; it is essential to a successful effort. Because there are so many port users, the coordination process is based on "circles of influence"; a tiered approach which divides stakeholders into specific groups based on their degree of responsibility with respect to their participation in the development and review of the Plan. Picture the rings formed when a rock is thrown into a pond. The innermost circle is Circle "A", the next ring is Circle "B", and so on. Each successive circle contains all the interior circles. The Circle "A" stakeholders listed in the following table were the principal advisors and reviewers during the 3-year period the Plan was being formulated. These stakeholders also have the responsibility of updating the Plan periodically--every 3 to 5 years--to insure that the information contained therein remains viable and useful. Circle "B" stakeholders are substantially involved but to a lesser degree than Circle "A". They provide crucial information concerning the navigation needs of the port. These stakeholders, who were consulted through correspondence, personal interviews, and meetings are listed in a subsequent section of this segment. Circle "C" stakeholders include all of the others who have some connection and interest in the Plan. These stakeholders were consulted primarily via correspondence during the 3-year period of development, and a complete listing of them is contained in Appendix ____.

Insert Table I-7. CIRCLE "A" STAKEHOLDERS--page 1

Insert Table I-7. CIRCLE "A" STAKEHOLDERS--page 2

Insert Table I-7. CIRCLE "A" STAKEHOLDERS--page 3

Insert Table I-7. CIRCLE "A" STAKEHOLDERS--page 4

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Insert Table I-7. CIRCLE "A" STAKEHOLDERS--page 6

WORKSHOPS AND MEETINGS

Four formal workshops were held at key points during the development of the Plan to facilitate effective input and reviews. The first workshop was conducted in October 1997. Its primary purpose was to obtain input from attendees regarding problems, needs, concerns, and opportunities related to the use and development of the port. The second workshop was conducted in June 1998 to obtain comments on the preliminary work completed to this point--primarily the review by attendees of the identified problems, needs, concerns, and opportunities and the prioritization criteria. The workshop also provided a forum for completing the selection of Circle "A" members. In **(early)** 1999, a third workshop was conducted to give attendees an opportunity to review and comment on the prioritized problems, needs, concerns, and opportunities; the tentative solutions considered to address these problems; and the initial development of a long-range plan for the port. In **(late)** 1999 a fourth and final workshop meeting was conducted to present and obtain approval from the attendees of the final Plan. An extensive period between the last two workshops was devoted to review of the draft Plan. In addition to the workshop meetings, numerous informal discussions were conducted throughout the study with Circle "A" stakeholders to insure that the development of the Plan was accurately reflecting the desires and objectives of key port interests within the Hampton Roads area.

RECOGNITION

While all 400 plus stakeholders were periodically advised of the status of the Plan over the 3-year period of development, not all were active participants. However, over ___ stakeholders were directly involved in identifying and prioritizing the problems, needs, concerns, and opportunities associated with the use and development of the port through personal interviews, meetings, and/or correspondence. The following is a listing of stakeholders who provided pertinent information during the development of the Plan **(update this list when text is finalized to make sure it includes all contacts made through workshop, correspondence, phone calls, interviews, etc.; then put list in two columns):**

- Atlantic Wood/Metrocast

- Atlantic Yacht Basin
- Bay Diesel Corporation
- Capes Shipping Agencies, Incorporated
- Cargill, Incorporated
- CASRM
- City of Chesapeake
- City of Hampton
- City of Newport News
- City of Norfolk
- City of Portsmouth
- City of Suffolk
- City of Virginia Beach
- Colonna's Shipyard, Incorporated
- Craney Island Study Commission
- CSX Transportation
- Davis Grain Corporation
- Dominion Terminal Associates
- Dreadnought Marine, Incorporated
- Elizabeth River Terminals, Incorporated
- Federal Marine Terminals (Richmond), Incorporated
- Hampton Roads Maritime Association
- Hampton Roads Planning District Commission
- Hampton Roads Recreational Safe Boating Coalition
- Hapag-Lloyd (America), Incorporated
- Harbor Tours, Incorporated
- T. Parker Host, Incorporated
- Huntsman Corporation
- Isle of Wight County
- Frank L. Jordan Corporation
- Kanak, Limited

- Lyon Shipyard, Incorporated
- Marine Engineers Benefits Association
- Marine Freight Company, Incorporated
- McAllister Towing Company of Virginia, Incorporated
- Moran Towing of Virginia, Incorporated
- National Oceanic and Atmospheric Administration
- Norfolk Boat, Incorporated
- Norfolk Dredging Company
- Norfolk Southern Corporation
- Norfolk State University
- Norfolk Warehouse Distribution Centers, Incorporated
- Old Dominion University
- Southgate Corporation
- W. M. Stone and Company, Incorporated
- Tarmac America, Incorporated
- Tidewater Construction Corporation
- Tidewater Yacht Marina
- United Services Automobile Association
- United States Gypsum Company
- U.S. Coast Guard
- U.S. Fish and Wildlife Service
- U.S. Maritime Administration
- U.S. Military Sealift Command
- U.S. Navy
- Virginia B.A.S.S. Chapter Federation
- Virginia Chamber of Commerce
- Virginia Department of Business Assistance
- Virginia Department of Environmental Quality
- Virginia Department of Game and Inland Fisheries
- Virginia Department of Historical Resources

- Virginia Institute of Marine Science
- Virginia Marine Resources Commission
- Virginia Pilot Association
- Virginia Port Authority
- Virginia Power Company
- Wilhelmsen Lines (USA), Incorporated
- Wright Dredging Company

PERIODIC UPDATING PROCEDURE

The purpose of this section is to discuss the procedure for accomplishing the periodic updating of the Plan, including the methodology for adding current pertinent data to insure information in the Plan remains viable and useful in the future. It is important for the viability of the Plan that none of its elements or concepts are overcome by time and events and, therefore, rendered obsolete. Obviously, some aspects of the Plan are more conducive to changes and will require more frequent and extensive revisions and additions. The historical records and data sources section, for example, will need regular updating as new sources of information become available and points of contact continually change over time. Also, new and/or modified projects and other developments, as they occur in the port, will require the consistent and timely review and update of the Plan to reflect the most recent conditions.

Subject to the availability of funds, it is proposed that the Plan be completely reviewed and updated as appropriate every 5 to 6 years and that an abbreviated review be conducted every 2 to 3 years, primarily to insure that the listed points of contact and other rapidly changing information are as accurate as possible. This will maintain the integrity of the Plan by providing relatively current data and information with an acceptable investment of time and resources. Through this procedure, the Plan will retain its applicability to the port and will remain a valuable and useful tool for both port users and agencies with port-related duties and responsibilities.

Last revised: 4/29/99

EXTRA TEXT

The port is surrounded by the Norfolk-Virginia Beach-Newport News Metropolitan Statistical Area which had an estimated population in 1995 of over 1.3 million people.

From Joel:

- 1) Dredging Report of Operations, these reports are completed for each dredging project. These reports show the production of the dredge on the dredging projects throughout Virginia. Reports are available back to the 1960's, computerize reports are available since 1983.
- 2) Craney Island Deposit Information, this is a computerized data base recording all the deposits into Craney Island since the 1950's.

Table I-4. SHELLFISH AND FINFISH LANDINGS, 1992 TO 1996

Locality (000)	1992		1993		1994		1995		1996	
	Landed pounds (000)	Value (\$000) (000)	Landed pounds (\$000) (000)	Value (\$000) (000)	Landed pounds (000)	Value (\$000) (000)	Landed pounds	Value	Landed pounds	Value
Chesapeake	3.6	5.6	249.9	880.0	46.9	30.7	12.5	8.9	93.4	53.5
Hampton	12,220.8	15,640.0	9,794.2	12,804.2	9,571.4	17,087.7	9,053.8	12,809.9	8,114.5	9,191.3
Isle of Wight	122.8	323.6	465.5	383.2	455.0	437.8	483.3	546.8	563.4	594.2
Newport News	6,742.1	5,684.0	5,576.1	10,112.0	6,123.4	13,914.6	17,101.7	17,123.2	6,161.1	15,886.0
Norfolk	1,545.5	1,337.4	2,820.9	2,156.0	1,947.2	1,483.2	1,202.4	1,077.3	10,790.0	8,333.6
Portsmouth	869.8	295.8	318.4	224.2	210.4	140.3	218.7	149.2	206.5	162.9
Suffolk	13.6	19.9	497.2	370.7	387.9	403.9	453.7	407.7	321.7	292.7
Virginia Beach	<u>754.9</u>	<u>583.5</u>	<u>3,484.4</u>	<u>1,686.1</u>	<u>3,053.3</u>	<u>1,337.5</u>	<u>2,593.6</u>	<u>1,287.7</u>	<u>4,164.1</u>	<u>2,014.1</u>
Total	22,272.7	33,889.8	23,206.6	28,616.4	21,795.5	34,875.7	21,119.7	33,410.7	30,415.6	36,528.3

Source: Virginia Marine Resources Commission.

Table I-6. HISTORICAL RECORDS AND DATA SOURCES

Agency	Descriptive title	Point of contact	
		Name	Telephone
<ul style="list-style-type: none"> National Oceanic and Atmospheric Administration 	<ul style="list-style-type: none"> Geographic Data in the Marine Environment 	CDR Nick Perugini	(757) 441-6746
	<ul style="list-style-type: none"> Oceanographic Observing Systems 	Jim Dixon	(757) 436-0200
	<ul style="list-style-type: none"> National Spatial Reference System 	Joe Lindsay	(757) 441-3603
	<ul style="list-style-type: none"> Scientific Support During Spills 	Gary Ott	(757) 898-2234
<ul style="list-style-type: none"> U.S. Army Corps of Engineers 	<ul style="list-style-type: none"> Rivers and Harbors Congressional Documents 	Lane Killam	(757) 441-7652
	<ul style="list-style-type: none"> Annual Reports of the Corps of Engineers 	Lane Killam	(757) 441-7652
	<ul style="list-style-type: none"> Waterborne Commerce of the United States 	Lane Killam	(757) 441-7652
	<ul style="list-style-type: none"> Tide Tables and Tidal Current Tables 	Lane Killam	(757) 441-7652
	<ul style="list-style-type: none"> Various Studies, Reports, and Authorization 	Lane Killam	(757) 441-7652
	<ul style="list-style-type: none"> Project Map Files 	Richard Klein	(757) 441-7243
	<ul style="list-style-type: none"> Dredging Schedules 	Richard Klein	(757) 441-7243
	<ul style="list-style-type: none"> National Environmental Policy Act Documents 	Thomas McCarthy	(757) 441-7028
	<ul style="list-style-type: none"> Cultural Resources Reports 	Helene Haluska	(757) 441-7008
	<ul style="list-style-type: none"> Regulatory Branch Permit Database 	Craig Jones	(757) 441-7070
	<ul style="list-style-type: none"> Regulatory Branch Permit Records 	Susan Schrader	(757) 441-7652
	<ul style="list-style-type: none"> Aerial Photographs 	Willie Ricks/ John Evans	(757) 441-7580 (757) 441-7794

Table I-6. HISTORICAL RECORDS AND DATA SOURCES
(Cont'd)

Agency	Descriptive title	Point of contact	
		Name	Telephone
• U.S. Army Corps of Engineers (cont'd)	• Dredging Report of Operations	Tom Friberg	(757) 441-7645
	• Craney Island Dredged Material Data Base	Tom Friberg	(757) 441-7645
	• Real Estate Management Information System	Robert P. Turner/ Dillard H. Horton, Jr.	(757) 441-7733 (757) 441-7736
	• Real Estate Project Maps	Robert P. Turner/ Dillard H. Horton, Jr.	(757) 441-7733 (757) 441-7736
	• Real Estate Historical Files	Robert P. Turner/ Dillard H. Horton, Jr.	(757) 441-7733 (757) 441-7736
	• Real Estate Project Cooperation Agreement Files	Robert P. Turner/ Dillard H. Horton, Jr.	(757) 441-7733 (757) 441-7736
	• Real Estate Defense Environmental Restoration Files	Robert P. Turner/ Dillard H. Horton, Jr.	(757) 441-7733 (757) 441-7736
	• U.S. Maritime Administration	• Various Reports	L. Frank Mach
• U.S. Navy	• October 1992 Condition Survey	Al Siegler	(757) 363-4733
	• April 1995 Condition Survey	Al Siegler	(757) 363-4733
	• June 1996 Condition Survey	Al Siegler	(757) 363-4733
	• Spring 1998 Condition Survey	Al Siegler	(757) 363-4733
	• Military Construction Project P-100	Al Siegler	(757) 363-4733

Table I-6. HISTORICAL RECORDS AND DATA SOURCES
(Cont'd)

<u>Agency</u>	<u>Descriptive title</u>	<u>Point of contact</u>	
		<u>Name</u>	<u>Telephone</u>
• U.S. Navy (cont'd)	• Environmental Assessment for Military Construction Project P-100	M. Connor	(757) 464-7063
	• Initial Assessment Study of NAB LCREEK (NEESA 13-066)	K. Greaser	(757) 363-4571
	• History of Harbor Dredging Events	Al Siegler	(757) 363-4733
	• NAVPHIBASE LCREEK Dredging History of 1995	Al Siegler	(757) 363-4733
	• Hydrographic Surveys	Frank Cole	(757) 444-3765
	• Hydrographic Surveys	Chris Ceniccola	(757) 396-8240
• Virginia Department of Environmental Quality	• Water Quality Monitoring and	Roger Everton	(757) 518-2150
	• Water Quality Assessments	Kevin A. Curling	(757) 518-2155
	• Virginia Water Protection Permits	Robert F. Jackson	(757) 518-2113
	• Point Source Control Programs	Bob Goode	(757) 518-2110
	• Groundwater Protection Programs	Dave Borton	(757) 518-2118
	• Solid and Hazardous Waste Program	Harold Winer	(757) 518-2153
	• Air Pollution Control Program	Jane Workman	(757) 518-2112
	• Pollution Response Program	Kerita Kegler	(757) 518-2180
• Virginia Department of Historical Resources	• Archaeological and Historical Site Files	Suzanne Durham	(804) 367-2323 extension 124

Table I-6. HISTORICAL RECORDS AND DATA SOURCES
(Cont'd)

Agency	Descriptive title	Point of contact	
		Name	Telephone
• Virginia Institute of Marine Science	• Various Publications	John D. Boon	(804) 684-7272
• Virginia Port Authority	• Craney Island Study Committee Report	Neal T. Wright	(757) 683-2150
	• 2010 Plan	Neal T. Wright	(757) 683-2150
• Hampton Roads Planning District Commission	• Hampton Roads Data Book	John W. Whaley	(757) 420-8300
	• Regional Shoreline Study	John M. Carlock	(757) 420-8300
	• Regional Waterway/Vessel Management Study	Jeryl R. Phillips	(757) 420-8300
	• Third Crossing Study	Dwight L. Farmer/ John Crosby	(757) 420-8300 (757) 420-8300
	• Aerial Photography	Robert C. Jacobs	(757) 420-8300
• City of Norfolk	• Geographical Information System Bureau	Charles M. Ragland	(757) 664-4500
• City of Virginia Beach	• City Data Sheet	Janet Simons	(757) 437-6464

Table I-7. CIRCLE "A" STAKEHOLDERS

Name	Point of Contact	Title	Address	Telephone Number
• National Oceanic and Atmospheric Administration	LCDR Andrew Beaver	Chief, Atlantic Hydrographic Section	439 West York Street Norfolk, VA 23510-1114	757-441-6746
	Thomas J. Lochen	NMP Technical Team Leader	Planning Division 803 Front Street Norfolk, VA 23510	757-441-7539
	AND			
	Richard L. Klein	Operations Manager, Norfolk Harbor Maintenance	Engineering Division 803 Front Street Norfolk, VA 23510	757-441-7243
• U.S. Coast Guard	CAPT John Schrinner	Captain of the Port	Marine Safety Office Suite 700 200 Granby Street Norfolk, VA 23510	757-441-3302
	POCs:			
	LTJG Connie Rooke	Planning & Preparedness Staff	Marine Safety Office Suite 700 200 Granby Street Norfolk, VA 23510	757-441-3453
	AND			
	John R. Walters	Chief, Waterways Management Section	Commander (AOWW) U.S. Coast Guard Atlantic Area 431 Crawford Street Portsmouth, VA 23704	757-398-6230

Table I-7. CIRCLE "A" STAKEHOLDERS
(Cont'd)

Name	Point of Contact	Title	Address	Telephone Number
• U.S. Fish and Wildlife Service	William M. Hester	Fish and Wildlife Biologist	6669 Short Lane Gloucester, VA 23061	804-693-6694
• U.S. Maritime Administration	L. Frank Mach	Region Maritime Programs	Room 211, Building 4D 7737 Hampton Boulevard Norfolk, VA 23505	757-441-6393
	ALTERNATE:			
	Willie Barnes	Region Environmental Programs	Room 211, Building 4D 7737 Hampton Boulevard Norfolk, VA 23505	757-441-6393
• U.S. Military Sealift Command	Rick Caldwell	Marine Transportation Specialist, Fleet Operations	Military Sealift Command Atlantic 1966 Morris Street Norfolk, VA 23511-3496	757-443-5641
• U.S. Navy	RADM R.T. Ziemer	Commander	Navy Region, Mid Atlantic Building A 6506 Hampton Boulevard Norfolk, VA 23508-1273	757-322-2800
	POC:			
	Ray K. Kirby	Deputy	Regional Engineer Command Code 50 9742 Maryland Avenue Norfolk, VA 23511-3095	757-322-2871

Table I-7. CIRCLE "A" STAKEHOLDERS
(Cont'd)

Name	Point of Contact	Title	Address	Telephone Number
• Virginia Department of Environmental Quality	Robert F. Jackson, Jr.	Environmental Manager, Planning and Permit Support	Tidewater Regional Office 5636 Southern Boulevard Virginia Beach, VA 23462	757-518-2113
	ALTERNATE:			
	Kevin A Curling	Environmental Engineer, Planning and Permit Support	Tidewater Regional Office 5636 Southern Boulevard Virginia Beach, VA 23462	757-518-2155
• Virginia Marine Resources Commission	Robert Grabb	Chief, Habitat Management Division	2600 Washington Avenue Newport News, VA 23607	757-247-2250
• Virginia Port Authority	Robert R. Merhige, III	General Counsel and Deputy Executive Director	600 World Trade Center Norfolk, VA 23510	757-683-2107
• Hampton Roads Planning District Commission	John M. Carlock	Deputy Executive Director for Physical Planning	723 Woodlake Drive Chesapeake, VA 23320	757-420-8300
• Municipal Government, Northside	Robert G. Bates	Port Development Administrator and Harbor Master	Department of Planning and Development City of Newport News 2400 Washington Avenue Newport News, VA 23607	757-247-8437
• Municipal Government, Southside	G. Timothy Oksman	City Attorney	Portsmouth City Hall 801 Crawford Street Portsmouth, VA 23704	757-393-8731

Table I-7. CIRCLE "A" STAKEHOLDERS
(Cont'd)

Name	Point of Contact	Title	Address	Telephone Number
• Academic Institution of Higher Learning	Dr. John D. Boon	Professor of Marine Science	Department of Physical Sciences Virginia Institute of Marine Science Greene Road, Route 1208 Gloucester Pt., VA 23062	804-684-7272
• Craney Island Study Commission	George E. Watkins	Member	4301 Hatton Point Road Portsmouth, VA 23703	757-484-4040
• Dredging/Construction Company	T.J. Wright	President	Wright Dredging Company 9584 Bear Trap Circle Windsor, VA 23487	757-242-4800
• Hampton Roads Maritime Association	J.J. Keever	Executive Vice President	236 East Plume Street Norfolk, VA 23510	757-622-2639
• Railroad Company	Robert E. Martinez	Assistant Vice President, Marketing	Norfolk Southern Corp. Three Commercial Place Norfolk, VA 23510-9206	757-629-2748
• Recreation Interest	Steve Phillips	Member, Hampton Roads Recreational Safe Boating Coalition	Boating Safety Specialist U.S. Coast Guard 431 Crawford Street Portsmouth, VA 23704	757-398-6204

Table I-7. CIRCLE "A" STAKEHOLDERS
(Cont'd)

Name	Point of Contact	Title	Address	Telephone Number
Recreation Interest (cont'd)	ALTERNATE: Margaret Ware	Member, Hampton Roads Recreational Safe Boating Coalition	Drive Smart Consultant USAA Mid-Atlantic Region 5800 Northhampton Blvd. Norfolk, VA 23502-5514	757-893-4604
• Ship Agent and Broker	David Host	Executive Vice President	T. Parker Host, Incorporated Suite 820 World Trade Center Norfolk, VA 23510	757-627-6286
• Ship Repair Interest, Major	J. Douglas Forrest	Vice President	Colonna's Shipyard, Inc. 400 East Indian River Road Norfolk, VA 23523	757-545-2414
• Ship Repair Interest, Minor	Patrick A. Yaccarino	Operations Manager	Bay Diesel Corporation 3736 Cook Boulevard Chesapeake, VA 23323-1604	757-485-0075
• Terminal, Coal	Charles E. Brinley	President and Chief Operating Officer	Dominion Terminal Associates Harbor Road, Pier 11 Newport News, VA 23607	757-245-2275
	ALTERNATE: Stephen A. Wylie	Manager, Production and Quality Control	Dominion Terminal Associates Harbor Road, Pier 11 Newport News, VA 23607	757-245-2275 (extension 314)

Table I-7. CIRCLE "A" STAKEHOLDERS
(Cont'd)

Name	Point of Contact	Title	Address	Telephone Number
• Terminal, Other Than Container and Coal	Phil Stedfast	Manager, Customer Relations	Elizabeth River Terminals, Incorporated 4100 Buell Street Chesapeake, VA 23324	757-543-0335 (extension 16)
• Trucking Company	Shirley Roebuck	Terminal Manager	Marine Freight Company, Incorporated 400 Lee Avenue Portsmouth, VA 23707	757-398-0679
• Tug Company	Paul Horsboll	Vice President and General Manager	Moran Towing of Virginia, Incorporated 1901 Brown Avenue Norfolk, VA 23504	757-625-6000
• Virginia Pilot Association	J. William Cofer	President	3329 Shore Drive Virginia Beach, VA 23451	757-496-0995
• Warehouse Company	Fred Schultz	General Manager	Norfolk Warehouse Distribution Centers, Incorporated 6969 Tidewater Drive Norfolk, VA 23509	757-857-6081

SECTION II

POST-AUTHORIZATION CORPS OF ENGINEERS PROJECTS

SECTION II

POST-AUTHORIZATION CORPS OF ENGINEERS PROJECTS

GENERAL

This section of the Plan discusses the Federally-authorized Corps of Engineers navigation projects located in the Port of Hampton Roads and vicinity. There are many projects of various sizes in this area; however, the primary one is known collectively as the Norfolk Harbor and Channels project, which is a series of deep-draft channels, shallow-draft side channels, anchorages, and a dredged material placement area. For the purposes of this Plan, the Norfolk Harbor and Channels project is divided into two sections: (1) The Inner Harbor which refers to that portion west of the Hampton Roads Bridge-Tunnel and (2) the Outer Harbor which refers to that portion east of the Hampton Roads Bridge-Tunnel. The Inner Harbor includes the Channel to Newport News project and the Norfolk Harbor project (the Norfolk Harbor Channel; the Elizabeth River Channel; the Southern, Eastern, and Western Branches of the Elizabeth River; Scotts Creek; various anchorages; and the Craney Island Dredged Material Area). The Outer Harbor includes the Thimble Shoal Channel in the Chesapeake Bay and the Atlantic Ocean Channel east of Virginia Beach. The remaining projects include several shallow-draft channels and two offshore dredged material placement areas. Please reference Plates 1 to 6 and Appendix E, Tables E-1, E-2, and E-3.

Discussions of the Corps of Engineers navigation projects in the port area are divided into two subsections: (1) Those projects or elements thereof which are authorized and constructed and (2) those project elements which are authorized but not yet constructed. These discussions provide a summary of pertinent information associated with each project. The following table gives an overview of these post-authorization Corps of Engineers' projects.

Insert Table II-1.--page 1

Insert Table II-1.--page 2

Insert Table II-1.--page 3

Insert Table II-1.--page 4

Insert Table II-1.--page 5

Insert Table II-1.--page 6

Insert Table II-1.--page 7

Insert Table II-1.--page 8

Insert Table II-1.--page 9

Insert Table II-1.--page 10

Insert Table II-1.--page 11

Insert Table II-1.--page 12

Insert Table II-1.--page 13

Insert Table II-1.--page 14

CONSTRUCTED PROJECTS/ELEMENTS OF PROJECTS

In many cases, authorized project dimensions and constructed project dimensions are the same. However, in the case of the Norfolk Harbor and Channels project, only a portion--an element--of the most recently authorized project has been constructed and is currently being maintained. The following table provides a summary of Corps of Engineers' maintenance dredging activities for the constructed projects/elements of projects in the Port of Hampton Roads area. The subsequent paragraphs describe the authorized dimensions (see also the previous table), constructed dimensions, maintenance activities, local cooperation requirements, purpose, and current use for each project. The data in the table and the subsequent narrative are meant to provide a general picture of the maintenance and usage of the various navigation projects in Hampton Roads. The actual maintenance dredging requirements and schedules are subject to frequent changes due to many factors, including navigation conditions; shoaling; Congressional actions; budget constraints within the Norfolk District or imposed by higher authority; and delays as a result of local sponsors, regulatory agencies, placement sites, and engineering, legal, and contracting issues. It is noted that the current year schedules are frequently updated, and the latest data may be obtained as indicated in Table I-6 and Appendix E. The elements of existing authorized projects which have not yet been constructed will be discussed in the next part of Section II.

Insert Table II-2.--page 1

Insert Table II-2.--page 2

Insert Table II-2.--page 3

Insert Table II-2.--page 4

Insert Table II-2.--page 5

Insert Table II-2.--page 6

THIMBLE SHOAL CHANNEL

The Thimble Shoal Channel has an authorized depth of 55 feet over a 1,000-foot width for a distance of about 13.4 miles from deep water in the entrance of Chesapeake Bay at Cape Henry to a point about 4 miles east of Old Point Comfort. However, it has not been constructed to its full authorized dimensions. The outbound element has been dredged to a depth of 50 feet over a 650-foot width, and the remaining 350-foot-wide inbound portion is maintained to a depth of 45 feet. Approximately 400,000 cubic yards of material is dredged from the channel every 3 years and placed in the Dam Neck Dredged Material Area, an open ocean site located off Virginia Beach. The last time the channel was dredged was in 1996. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions in the Thimble Shoal Channel. In accordance with the WRDA 86, as amended, the Commonwealth of Virginia, acting through the VPA, is responsible for 50 percent of the increase in maintenance costs associated with channel depths in excess of 45 feet. However, no incremental increase in maintenance dredging has been attributed to the 50-foot depth since 1989. Also, since placement of the dredged material is in the open ocean site at Dam Neck, there are no placement fees. Therefore, the Federal Government currently funds 100 percent of the maintenance costs.

The channel provides the only means of entrance and departure for deep-draft ships utilizing the Port of Hampton Roads and ports along the James River. This includes commercial vessels engaged in foreign and coastwise trade carrying items such as coal, petroleum, grain, general cargo, and containerized cargo. In fact, Hampton Roads is the largest coal exporting port in the world, and coal is the primary beneficiary of the 50-foot outbound element. In 1996, deep-draft-vessel trips through the Thimble Shoal Channel totaled over 37,000. The channel is also used by ships calling at the Norfolk Naval Base, the largest naval complex in the world. Some of these vessels require up to 45 feet of depth.

NORFOLK HARBOR PROJECT

As discussed previously, the Norfolk Harbor project is comprised of several elements and is the largest part of the Inner Harbor portion of the Norfolk Harbor and Channels project. (The Channel to Newport News and its anchorages are the remaining part of the Norfolk Harbor and Channels Inner Harbor section.) The following discussion addresses each of the Norfolk Harbor project elements in detail and includes the Norfolk Harbor Channel; the Elizabeth River Channel; the Southern, Eastern, and Western Branches of the Elizabeth River; Scotts Creek; various anchorages; and the Craney Island Dredged Material Area.

Norfolk Harbor Channel

The Norfolk Harbor Channel is authorized to a depth of 55 feet and width of 1,500 feet over a 6.3-mile length from deep water near Fort Wool, a point just west of the Hampton Roads Bridge-Tunnel, to a point just south of the Norfolk International Terminal piers where the channel narrows to a width of 800 feet. The first part of this segment, extending 2.0 miles west of the Hampton Roads Bridge-Tunnel to the junction with the Channel to Newport News, is known as the Entrance Reach. The remaining portion, continuing to Norfolk International Terminal, is known as the Norfolk Harbor Reach and is 4.3 miles long. From Norfolk International Terminal, the channel is authorized at the same depth and the 800-foot width for 2.6 miles to the Norfolk Southern Railway coal loading piers at Lamberts Point. This segment of the channel is also known as the Craney Island Reach. The three reaches--Entrance Reach, Norfolk Harbor Reach, and Craney Island Reach--which form the Norfolk Harbor Channel are a total of 8.9 miles long.

As with the Thimble Shoal Channel, this channel has not been constructed to its full authorized dimensions. As a result of General Design Memorandum 1, Norfolk Harbor and Channels, Virginia dated June 1986, the width of the Norfolk Harbor Channel through the Entrance Reach and the Norfolk Harbor Reach has been reduced to 1,000 feet for the 55-foot depth. To date, the Entrance Reach has been constructed to a depth of

50 feet over a 1,000-foot width. Within the Norfolk Harbor Reach and the Craney Island Reach, a 650-foot-wide outbound element has been constructed to a depth of 50 feet. In addition, the first 4,000 feet of the Craney Island Reach downstream from Lamberts Point has been constructed to a 50-foot depth over the full 800-foot authorized width to allow the large bulk coal carriers departing from the coal terminal to attain safe maneuvering speed. The remaining portion of the Norfolk Harbor Channel from the bridge-tunnel to Lamberts Point is maintained at the previously authorized depth of 45 feet on the inbound side of the channel, over a width varying from 150 feet in the Craney Island Reach to 600 feet in the Norfolk Harbor Reach.

The Entrance Reach has not required maintenance since it was deepened in 1988. On the other hand, approximately 1 million cubic yards of material is dredged annually from the Norfolk Harbor Reach and the Craney Island Reach with deposition in the Craney Island Dredged Material Area. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions in the Norfolk Harbor Channel. As with the Thimble Shoal Channel, the Commonwealth of Virginia, acting through the VPA, is responsible for 50 percent of the increase in maintenance costs associated with channel depths in excess of 45 feet. However, no incremental increase in maintenance dredging has yet been attributed to the 50-foot depth. Also, local access channels and berthing areas are a local responsibility.

As with the Thimble Shoal Channel, the Entrance Reach of the Norfolk Harbor Channel provides the only means of entrance and departure for deep-draft ships utilizing the Port of Hampton Roads and ports along the James River. The remaining two reaches, the Norfolk Harbor Reach and the Craney Island Reach, serve the terminals located on the southside of Hampton Roads, including the Norfolk International Terminals and the coal terminals at Lamberts Point. Two-thirds of coal shipments from Hampton Roads move over this portion of the channel. A 45-foot depth has been deemed adequate, in the past, for all other commodities moving through the port. However, with the advent of supercontainer ships, this is changing (see the next part of Section II). Naval vessels use

this channel extensively since it provides deep-water access to the naval base. In 1996, deep-draft vessel trips totaled over 32,000 through the Norfolk Harbor Channel.

Elizabeth River Channel

The Elizabeth River Channel is authorized to a depth of 45 feet and width of 750 feet, and it extends for 3.0 miles from Lamberts Point upstream to the junction of the Eastern Branch and the Southern Branch of the river. The channel is further broken down into the Port Norfolk Reach and the Town Point Reach, and is maintained to a depth of 40 feet over the full authorized 750-foot width. The Elizabeth River Channel and the Lower and Middle Reaches of the Southern Branch are dredged as a unit about every 5 years and average about 400,000 cubic yards of dredged material which is placed in Craney Island. The channel was last maintained in 1998. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions in the channel. Also, local access channels and berthing areas are a local responsibility. The Elizabeth River Channel provides the only means of entrance and departure for deep-draft ships of foreign and coastwise trade utilizing terminal facilities and ship building and repair facilities in Chesapeake, Norfolk, and Portsmouth. This includes all kinds of commercial vessels carrying containers, petroleum, grain, general cargo, and miscellaneous dry bulk material such as fertilizer and scrap metal. Naval vessels, requiring up to 40 feet of depth also use the channel enroute to the Norfolk Naval Shipyard, located in Portsmouth.

Southern Branch of the Elizabeth River

The Southern Branch navigation channel is authorized to a depth of 45 feet over its existing width of 450 feet from its junction with the Eastern Branch 2.0 miles upstream to the Norfolk and Portsmouth Belt Line Railroad bridge. This segment of the channel is known as the Lower Reach of the Southern Branch. From the Norfolk and Portsmouth Belt Line Railroad bridge, the channel narrows to 375 feet and extends 1.0 mile upstream to the Norfolk Southern Railway Bridge. This segment of the channel is known as the Middle Reach of the Southern Branch. From that point, the channel is authorized to a depth of 40 feet over its existing widths of 250 to 500 feet, 2.4 miles

upstream to the Gilmerton Bridge. This is part of the Upper Reach. The channel then extends 0.6 mile upstream of the Gilmerton Bridge at the authorized depth of 35 feet over a 300-foot width. Beyond that, the channel is authorized to a depth of 35 feet over a 250-foot width for 1.5 miles upstream to a point 0.8 mile upstream of the I-64 highway bridge. These two segments are also part of the Upper Reach. The total length of the Southern Branch channel is about 7.5 miles.

Several turning basins have also been authorized as part of the channel system. Just downstream of the Norfolk and Portsmouth Belt Line Railroad bridge, an approach and turning basin is authorized to a depth of 45 feet, a length of approximately 2,900 feet, and a width of 450 to 830 feet. Other authorized turning basins included one at the mouth of St. Julians Creek, 40 feet deep, 800 feet wide, and 400 to 600 feet long; one at the mouth of Milldam Creek, just downstream of the Gilmerton Bridge, 40 feet deep and 800 feet square; one at the mouth of Newton Creek, 35 feet deep and 600 feet square; and one at the mouth of Mains Creek near the upstream end of the project, 35 feet deep and 800 feet square.

There are several segments of the Southern Branch which have not been constructed to their full authorized dimensions. The Lower Reach and Middle Reach have been constructed to a depth of 40 feet, and the Upper Reach to the Gilmerton Bridge has been constructed to a depth of 35 feet. The remaining portion of the Upper Reach has been constructed to its authorized dimensions; however, the portion of channel that is 250 feet wide has not been maintained since it was improved in 1980 to 1981. Several turning basins have also been constructed. They include the approach and turning basin just downstream of the Norfolk and Portsmouth Belt Line Railroad bridge to 40 feet deep, the turning basin at the mouth of St. Julians Creek to 35 feet deep, and the turning basins at the mouth of Newton Creek and Mains Creek to their authorized dimensions. All these basins were constructed to their full lengths and widths. The turning basin at Milldam Creek has not been constructed.

As discussed previously in the Elizabeth River Channel portion of this section, the Lower and Middle Reaches, the 40-foot channels, are maintained about every 5 years and were last dredged in 1998. With regard to the 35-foot reaches, about 100,000 cubic yards are dredged every 3 years and placed in Craney Island; the last maintenance dredging occurring in 1998. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions of the Southern Branch of the Elizabeth River. Also, access channels and berthing areas are a local responsibility for the entire Southern Branch.

This channel provides the only means of entrance and departure for deep-draft ships of foreign and coastwise trade utilizing terminal facilities and ship building and repair facilities in Portsmouth and Chesapeake. This includes all kinds of commercial vessels carrying petroleum, grain, general cargo, and miscellaneous dry bulk material such as fertilizer and scrap metal. Naval vessels, requiring up to 40 feet of depth also use the channel enroute to the Norfolk Naval Shipyard, located in Portsmouth.

Eastern Branch of the Elizabeth River

This channel has been constructed to its authorized dimensions. It extends from the junction with the Southern Branch, 1.1 miles upstream to the Norfolk Southern Railway Bridge at a depth of 25 feet and a width of 500 feet. The channel continues at a depth of 25 feet over a 300-foot width for a distance of 0.5 mile upstream to the Campostella Bridge. From this point, the 25-foot-deep channel extends over a width of 200 feet upstream to the second Norfolk Southern Railway Bridge, a distance of approximately 0.9 mile. At the upper end of this reach, a 25-foot-deep turning basin, approximately 5.5 acres in area, has also been constructed. The total length of the project is about 2.5 miles. Maintenance dredging in the Eastern Branch is required infrequently, with the dredged material being placed in Craney Island. The project was last maintained in 1989 after a long interval and has not needed dredging since then. The channel is not maintained upstream of the Campostella Bridge. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions of the Eastern Branch of the Elizabeth River. The Federal Government, through the Corps of

Engineers, funds 100 percent of the cost to maintain this channel. However, local access channels and berthing areas are a local responsibility.

The Eastern Branch is primarily associated with ship building and repair facilities which line both sides of the waterway. The project provides deep-draft access for all types of vessels including commercial, recreational, and naval vessels to a variety of ship building and repair facilities located along the Eastern Branch in Norfolk.

Western Branch of the Elizabeth River

This project has also been constructed to its authorized dimensions. A 24-foot-deep, 300-foot-wide channel has been constructed which connects to the main stem of the Elizabeth River Channel, and it extends 0.8 mile toward the mouth of the Western Branch. From that point, the channel continues at the 24-foot depth and a 200-foot width for a distance of 0.4 mile to a point downstream of the West Norfolk Bridge. The project then becomes an 18-foot-deep and 150-foot-wide channel, extending 0.6 mile to a point 0.3 mile upstream from the bridge for a total project length of about 1.8 miles. However, the 24-foot-deep portion of the project is now maintained to an 18-foot depth. Maintenance dredging in the Western Branch is required infrequently, with the dredged material being placed in Craney Island. It was last maintained in 1986 after a long interval and has not needed dredging since then. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions of the Western Branch of the Elizabeth River. The Federal Government, through the Corps of Engineers, funds 100 percent of the cost to maintain this channel. However, local access channels and berthing areas are a local responsibility. This project provides deep-draft access for primarily commercial and recreational vessels to terminal and docking facilities along the Western Branch. It is important to note that two major container terminals are located near the mouth of the Western Branch.

Scotts Creek

This project has been constructed to its authorized dimensions. The 12-foot-deep, 100-foot-wide channel connects to the main stem of the Elizabeth River Channel and

extends into the creek. The total length of the channel is 0.7 mile. It has not been maintained since its initial dredging in 1932, because the available depths are adequate for existing traffic. In the event that maintenance dredging became necessary, there would be no items of local cooperation in connection with maintaining the existing dimensions of Scotts Creek. The Federal Government, through the Corps of Engineers, would fund 100 percent of the cost to maintain this channel. However, local access channels and berthing areas are a local responsibility. This project provides access primarily for recreational vessels to public and private docking facilities along the Scotts Creek in Portsmouth, Virginia. There are also limited commercial seafood movements and usage by a diving company located near the mouth.

Anchorage

Three fixed-mooring anchorage facilities, each capable of handling two vessels simultaneously and having a project depth of 55 feet, have been authorized. These facilities were planned for the existing Quarantine Anchorage Area and a portion of a Naval anchorage area (anchorage areas designated as part of the "F" and "G" series) just west of the Hampton Roads Bridge-Tunnel. However, during advanced engineering and design studies, the recommended anchorage improvements were modified. Specifically, the current recommendation provides for one circular 55-foot anchorage with a swinging radius of 1,500 feet in the vicinity of the anchorage area where the fixed mooring facilities were planned. Two anchorages opposite Sewells Point have also been authorized, each 45 feet deep with a swinging radius of 1,200 feet. However, it was recommended during advanced engineering and design studies that the easternmost (designated "K-1") of the two circular anchorages be enlarged to a swinging radius of 1,500 feet. A rectangular anchorage area on the west side of the Norfolk Harbor Channel opposite Lamberts Point (designated "P") has also been authorized, which aggregates 173 acres and consists of one space 38 feet deep and 1,500 feet square; a second space 35 feet deep and 1,500 feet square; and a third space 20 feet deep, 1,000 wide, and 3,000 feet long. Another 45-acre anchorage has been authorized to a depth of 12 feet near Pinnars Point (designated "R"). The approaches from the navigation channels to the anchorage areas have also been included as part of the authorized projects.

The circular anchorage just west of the Hampton Roads Bridge-Tunnel was constructed to a depth of 50 feet over the 1,500 swinging radius in 1999. The two circular anchorages opposite Sewells Point have been constructed, each with a swinging radius of 1,200 feet. The westernmost (designated "K-2") of the two circular anchorages has been constructed to a 40-foot depth, and the other ("K-1") has been constructed to a 45-foot depth. However, deepening of the westernmost anchorage to 45 feet has since been deferred until a need for that depth develops. The Lamberts Point and Pinners Point anchorage areas have been constructed to their authorized dimensions. It is estimated that the anchorage just west of the Hampton Roads Bridge-Tunnel will be maintained every 6 years and yield an average of 80,000 cubic yards of dredged material per cycle. The Sewells Point anchorages were last dredged in 1995. They average about 600,000 cubic yards of dredged material every 4 years. All the material is placed in the Craney Island Dredged Material Area. The anchorages at Lamberts Point and Pinners Point are no longer maintained. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions in the Federally maintained anchorages within Hampton Roads, with the exception of the new 50-foot anchorage near the bridge-tunnel. The maintenance of the new 50-foot anchorage will be cost shared with the Commonwealth of Virginia, acting through the VPA, in accordance with the PCA.

These areas provide protected anchorage space for all types of commercial vessels calling at the Port of Hampton Roads. These anchorages are used primarily for vessels waiting for scheduled loading of commerce. However, the anchorages are also available for emergency situations such as breakdowns or severe weather conditions.

Craney Island Dredged Material Area

Craney Island Dredged Material Area is a Federally-owned, Corps-operated, trapezoidal-shaped, 2,500-acre, man-made dredged material placement area located in Portsmouth, Virginia. It was authorized by the Rivers and Harbors Act of 1946 and constructed from 1956 to 1958. In accordance with the original design dimensions, the main exterior levees were constructed to 8 feet above Corps of Engineers low water with

step levees ultimately constructed to 18 feet above Corps of Engineers low water. Users of the facility may pump material directly into the diked area. There is also a rehandling basin to the southeast of the containment area which may be used by bottom-dump scows. Craney Island was originally designed to hold about 100 million cubic yards of material. Based on authority contained in Section 148 of the Water Resources Development Act of 1976, the Craney Island Management Plan was developed in December 1981 to intensively manage the site with a view to extending its life. The plan involved: (1) subdividing the area into three cells; (2) constructing new retaining dikes 1,000 feet inside the main exterior levee to allow eventual dredged material placement up to an average elevation of 30 feet above Corps of Engineers low water; and (3) rotating future placement annually among the three subcontainments, allowing a 1-year active placement cycle followed by a 2-year inactive cycle for each subcontainment.

Craney Island is an income-producing facility which receives funds from toll charges levied on non-Corps of Engineers users. The tolls, which are adjusted periodically, cover both the original construction cost and the subsequent operation and maintenance requirements, including implementation of the management plan. Currently, there are no items of local cooperation associated with the Craney Island Dredged Material Area. The original river bottom was deeded to the Corps by the Commonwealth of Virginia. This facility is designated for use by all private interests, municipalities, and government agencies accomplishing dredging in Hampton Roads harbor and adjacent waters. Located near the center of dredging activity, Craney Island is a very economical placement facility and is critical to the viability of the Hampton Roads maritime community.

CHANNEL TO NEWPORT NEWS

The Channel to Newport News is authorized to a depth of 55 feet over its existing 800-foot width and extends 6.0 miles from its junction with the Norfolk Harbor Channel to the coal loading facilities at Newport News. In addition, there are two circular anchorages opposite Newport News Point that are each authorized to a depth of 45 feet over a 1,200-foot swinging radius. The channel has been dredged to a depth of 50 feet

over its full 800-foot width, and the anchorages have each been constructed to a depth of 40 feet over the full 1,200-foot swinging radius. However, deepening these anchorages to 45 feet has since been deferred until a need for that depth develops. Approximately 150,000 cubic yards of material are dredged from the channel every 4 years with deposition in the Craney Island Dredged Material Area. The last time the channel was dredged was in 1999. The two anchorages yield an average of about 400,000 cubic yards every 4 years. They were last maintained in 1996. Currently, there are no items of local cooperation in connection with maintaining the existing dimensions in the Channel to Newport News. Also, local access channels and berthing areas are a local responsibility. In accordance with the WRDA 86, as amended, the Commonwealth of Virginia, acting through the VPA, is responsible for 50 percent of the increase in maintenance costs associated with channel depths in excess of 45 feet. However, no incremental increase in maintenance dredging has yet been attributed to the 50-foot depth.

This project provides the only means of entrance and departure for deep-draft commercial vessels of foreign and coastwise trade carrying coal, petroleum, general, and container cargo utilizing the port of Newport News and other ports along the James River. The channel is also used by naval vessels which are built and repaired at the Newport News Shipbuilding and Drydock Company. Newport News handles about one-third of the coal exports from Hampton Roads, and coal is the primary beneficiary of the 50-foot channel. In 1996, deep-draft vessel trips totaled almost 24,000 through the Channel to Newport News.

ATLANTIC INTRACOASTAL WATERWAY

The Atlantic Intracoastal Waterway is a naturally protected navigation route which generally parallels the Atlantic coast between Massachusetts and Florida. In Virginia, it passes down the Chesapeake Bay, through Hampton Roads harbor, and down the Southern Branch of the Elizabeth River. Here it splits into two inland water routes approximately paralleling each other south of Norfolk, Virginia.

Albemarle and Chesapeake Canal Route

Route A of the Atlantic Intracoastal Waterway is locally known as the Albemarle and Chesapeake Canal Route, and it extends between a point on the Southern Branch, 2,500 feet south of the Norfolk Southern Railway Bridge, and the Virginia-North Carolina State line on the North Landing River, a distance of 27.2 miles. The authorized project has been constructed and provides for a channel that is 12 feet deep and from 90 feet wide in land cuts to 125 to 250 feet wide in rivers. The channel traverses the Southern Branch for 5.2 miles, the Virginia Land Cut (Albemarle and Chesapeake Canal) for 8.3 miles, and North Landing River for 13.7 miles. It also provides for a tidal guard lock at Great Bridge, Virginia, which forms a barrier that prevents the salt waters of the Southern Branch from entering the fresh waters of the Albemarle and Chesapeake Canal Route and, subsequently, the North Landing River. The channel downstream (north) of the locks in the Southern Branch is maintained infrequently, with the dredged material being placed in Craney Island. The Southern Branch portion of the project was last dredged in 1992.

Route A serves as the primary transportation link for the Atlantic Intracoastal Waterway system in this area. Navigation traffic is characterized by significant amounts of commercial and recreational activity. The majority of commercial traffic is internal and has responded to the needs of the regional growth in the Hampton Roads area. Principal commodities are sand, gravel, crushed rock, and petroleum products. Recreational activity has grown significantly over recent years as a direct result of the growth in population and the increase in leisure time devoted to water-based activities. The Albemarle and Chesapeake Canal route services both locally-based recreation traffic and coastal traffic in route to destinations along the Atlantic and Gulf coastlines.

Dismal Swamp Canal Route

Route B, locally known as the Dismal Swamp Canal Route, is located between its juncture with the Southern Branch of the Elizabeth River in Chesapeake, Virginia, and the mouth of the Pasquotank River in North Carolina. The route covers a distance of 64.6 miles. The authorized project has been constructed and provides for a channel that is 10 feet deep and 100 feet wide in an upstream tributary of the Southern Branch known as

Deep Creek, and in the Pasquotank River. Also included is a channel that is 9 feet deep and 50 feet wide in the Dismal Swamp and a channel that is 10 feet deep and 80 feet wide in Turners Cut, North Carolina. In addition, there are navigation locks located at Deep Creek and South Mills, North Carolina. Current traffic does not justify maintenance of the 9- and 10-foot-deep channels; therefore, until the traffic indicates the need for a change, a 6-foot-deep channel will be maintained. The Deep Creek portion of the project requires infrequent maintenance, with the dredged material being placed in Craney Island. The Deep Creek segment was last dredged in 1979.

Route B serves as the alternate transportation link for the Atlantic Intracoastal Waterway system in this area. Navigation traffic is characterized by various amounts of commercial and recreational activity, although pleasure boats are by far the predominant user. Auxiliary sailboats in the 30- to 40-foot range are the majority users of the canal. Some motor yachts over 50 feet long and bass boats use the canal also. Vessel activity is slow during the period from December to March.

LYNNHAVEN INLET

The authorized project has been constructed and provides for an entrance channel that is 10 feet deep and 150 feet wide extending 1 mile from that depth in the Chesapeake Bay to a mooring area and turning basin that is 10 feet deep, 1,250 feet long, and 700 feet wide in Lynnhaven Bay, just upstream from the Lesner Bridge at the mouth of the inlet. A channel that is 9 feet deep and 90 feet wide extends eastward 2.0 miles from the mooring area and turning basin to Broad Bay, via the Long Creek-Broad Bay canal. There is also a channel that is 6 feet deep and 90 feet wide extending 0.5 mile through The Narrows connecting Broad and Linkhorn Bays. The project has a total length of approximately 5.2 miles. The project also includes a 0.3-mile side channel that is 8 feet deep and 100 feet wide, connecting into Long Creek. Approximately 180,000 cubic yards of material are dredged from the channel every 3 years with a majority of material being deposited into a confined area just inside and on the west shore of the inlet. The last time the project was dredged was 1997. Suitable sand from the channel has been used to nourish adjacent shoreline fronting the Chesapeake Bay and has also been

transported by trucks to nourish the resort strip along the Virginia Beach oceanfront. The Federal Government, through the Corps of Engineers, funds 100 percent of the cost to maintenance dredge this project. However, as local sponsor, the City of Virginia Beach is responsible for the provision of adequate placement areas and the cost of containment dikes and other site preparation. In addition, local access channels and berthing areas are a local responsibility.

Lynnhaven Inlet is a very busy inlet which provides access for heavy commercial and recreational vessel traffic to public and private docking facilities within Lynnhaven Inlet and connecting waters. There are several seafood processing establishments and boat storage and repair facilities. In addition, numerous recreational vessels are located along the connecting waters, and use that the inlet on a regular basis, particular during the summer months. Two of the more important users are the Virginia Pilot Association and the Association of Maryland Pilots, both of whom have large pilot boats based inside the inlet.

LITTLE RIVER (CREEK)

The authorized project has been constructed, and it provides for a channel that is 20 feet deep and 400 feet wide from that depth in the Chesapeake Bay to the railroad terminals, a distance of about 1.4 miles. The project also includes a turning basin at the upstream end of the channel adjacent to the terminals. The basin is 20 feet deep, 400 to 1,240 feet wide, and 1,160 feet long. Little Creek is maintained by the Navy. Local access channels and berthing areas are a local responsibility.

Little River, better known as Little Creek Inlet, is a very busy waterway with significant naval and commercial vessel traffic. Several seafood processing establishments and boat storage and repair facilities are located here. Petroleum products also move on this waterway. In addition, numerous recreational vessels use the inlet on a regular basis, particularly during the summer months. The Coast Guard has a station within the inlet, and it also uses the Federal channel. As previously indicated, numerous

naval vessels calling at the amphibious base use the channel. In 1996, vessel trips totaled almost 2,000 through Little Creek.

WILLOUGHBY CHANNEL

The authorized project has been constructed, and it provides for a 10-foot-deep, 300-foot-wide channel from deep water in Hampton Roads to a point opposite the extreme tip of Willoughby Spit in Willoughby Bay, a distance of 1.5 miles. However, based on current vessel traffic, the project is currently being maintained to 6 feet deep and 200 feet wide. Maintenance dredging in Willoughby Channel is required infrequently. It was last maintained in 1994, when the material was placed on a nearby beach fronting Chesapeake Bay. The Federal Government, through the Corps of Engineers, funds 100 percent of the cost to maintain this project. However, local access channels and berthing areas are a local responsibility.

The Willoughby Channel is very busy with commercial and recreational vessel traffic. The area is known for sailboats and an associated yacht basin with storage and repair facilities. Willoughby Bay is one of the best sailing areas in the region. Vessels from various locations along the East Coast call on this harbor. In addition, commercial fish are transported through docks in Willoughby Bay.

LAFAYETTE RIVER

The authorized project has been constructed and provides for a channel that is 8 feet deep and 100 feet wide from deep water in Hampton Roads to the Hampton Boulevard Bridge, a distance of about 1.7 miles. From there, the channel continues at a 6-foot depth and 100-foot width to a point opposite Knitting Mill Creek, a distance of about 1.7 miles. The main channel then continues for 0.6 mile upstream to a point opposite East Haven Creek and immediately downstream of the Granby Street Bridge. The total length of the main channel from the head of East Haven Creek to deep water in Hampton Roads is 4.0 miles. A side channel extends from the main channel into East Haven Creek about 0.3 mile to a settling basin. The channel is 50 feet wide and 6 feet deep from that depth in the Lafayette River to the upstream end of the creek, and the

settling basin is 8 feet deep, 50 feet wide, and 100 feet long. Another side channel, 6 feet deep and 40 to 80 feet wide, extends 0.6 mile from the main channel into Knitting Mill Creek to a settling basin at the head of the creek. This basin is also 8 feet deep, 50 feet wide, and 100 feet long. Maintenance dredging in the Lafayette River is required infrequently, with the dredged material being placed in Craney Island. It was last maintained in 1993. The Federal Government, through the Corps of Engineers, funds 100 percent of the cost to maintain the navigation channel, while the City of Norfolk is responsible for maintaining basins on the upstream ends of East Haven and Knitting Mill Creeks. Local access channels and berthing areas are also a local responsibility.

The Lafayette River is used primarily by recreational vessel traffic. Located along its many coves are high value residential homes and a yacht club with storage and repair facilities.

CHANNEL TO NANSEMOND ORDNANCE DEPOT

A 12-foot-deep channel was constructed as authorized over a width of 100 feet from deep water in Hampton Roads, a distance of approximately 0.5 mile shoreward to a 12-foot-deep turning basin varying in width from 100 to 300 feet and approximately 300 feet long. In addition, a 650-foot timber wharf was constructed. However, the project is no longer required and maintenance has been discontinued. There are no items of local cooperation associated with this discontinued project. The project was originally constructed to serve the Nansemond Ordnance Depot at the mouth of the Nansemond River, however, the property has been sold to private interest.

BENNETTS CREEK

The authorized project was constructed in 1992, and it provides a channel that is 6 feet deep and 60 feet wide from that depth in the Nansemond River into the creek and upstream to the city boat ramp at Bennetts Creek Park, a total distance of approximately 2.4 miles. Limited initial maintenance took place in 1998 and removed 14,000 cubic yards of dredged material which were deposited in Craney Island. The maintenance cycle is estimated to be 3 years and the average volume about 20,000 cubic yards. The

City of Suffolk, as local sponsor, is responsible for 100 percent of the operation and maintenance costs apportioned to recreation. The Federal government pays for 100 percent of the maintenance costs apportioned to commercial navigation. In addition, local access channels and berthing areas are a local responsibility. This project provides access for commercial and recreational vessels to public and private docking facilities along Bennetts Creek.

NANSEMOND RIVER

The authorized project was constructed, and it provides a 12-foot-deep, 100-foot-wide channel which extends about 18.2 miles from that depth in Hampton Roads through the mouth of the river and upstream to the Business Route 460 highway bridge in Suffolk. There is also a turning basin that is 12 feet deep and 200 feet square near the bridge. A side channel, 10 feet deep and 80 feet wide, extends from the main channel 2.0 miles into the Western Branch of the Nansemond River to Reids Ferry. However, based on current vessel traffic in this reach, the channel is only being maintained to a depth of 6 feet. The Western Branch Channel is maintained about every 5 years and an average of about 20,000 cubic yards of dredged material is deposited in an upland site adjacent to the mouth of the Western Branch. It was last maintained in 1994. No maintenance dredging is performed on the main channel at this time since depths are adequate for the recreational craft and small commercial seafood boats which use the waterway. Although the Federal Government, through the Corps of Engineers, funds 100 percent of the dredging cost to maintain the Western Branch Channel, local interests are responsible for providing the upland placement site. Also, local access channels and berthing areas are a local responsibility. This project provides access primarily for recreational vessels to public and private docking facilities along the Nansemond River. There are also limited commercial seafood movements over the waterway.

NEWPORT NEWS CREEK

The originally authorized project and more recently authorized project have both been constructed. There is now a dual entrance channel wherein a 16-foot-deep and

125-foot-wide channel overlays a 12-foot-deep and 150-foot-wide channel for a distance of 0.2 mile from Hampton Roads into an area shielded by a wave screen. The wave screen was constructed by VDOT and is now owned and maintained by the City of Newport News. Two channels branch off the 16-foot portion of the entrance channel, providing access into the wave screen berthing areas. The north access channel is 16 feet deep, 150 feet wide, and 0.2 mile long. It runs parallel to the north edge of two of the piers inside the wave screen and adjacent to their berthing areas. The south access channel is 16 feet deep, 200 feet wide, and 0.2 mile long. It runs parallel to the south edge of one of the piers inside the wave screen and adjacent to its berthing area. A barge fleeting area that is 16 feet deep, 100 to 500 feet wide, and 1,100 to 1,140 feet long is also located within wave screen and is south of the access channels and piers. The 12-foot-deep and 150-foot-wide portion of the entrance channel extends a distance of 0.3 mile from Hampton Roads and then narrows to a width of 90 feet for a distance of approximately 0.1 mile at the mouth. The channel then widens again to 150 feet and continues at a depth of 12 feet for approximately 0.5 mile into the inner harbor of Newport News Creek itself. At the upstream terminus of the project is a turning basin/anchorage area/municipal boat harbor of the same depth, 188 to 214 feet wide, and 500 feet long. Approximately 50,000 cubic yards of material are dredged from the channel every 8 years with deposition in Craney Island. In the past, some suitable material has been placed on nearby eroding shorelines. The project was last maintained in 1992. The more recently authorized portion of the project, the 16-foot-deep channel sections, was constructed in 1998. The Federal Government, through the Corps of Engineers, funds 100 percent of the cost to maintain this project. However, local access channels and berthing areas are a local responsibility.

Newport News Creek is a very busy commercial harbor with some occasional recreational vessel traffic. A considerable number of barges use the harbor including the barge fleeting area within the wave screen. Commercial seafood, fabricated metal, petroleum products, and aggregate materials also move on this channel. The harbor has a full-time Harbor Master, hired by the City of Newport News, to manage utilization of this area.

HAMPTON CREEK

The authorized project was constructed and provides a channel that is 12 feet deep and 200 feet wide across Hampton Flats and then 150 feet wide upstream to the Queen Street highway bridge, a total distance of about 2.5 miles. The project includes a side channel into Herberts (formerly Sunset) Creek, 12 feet deep and 80 to 100 feet wide, for a length of approximately 0.6 mile from the main channel in Hampton Creek to Kecoughtan Road (formerly Jackson Street). Approximately 100,000 cubic yards of material are dredged from the channel every 8 years with deposition in Craney Island. It was last maintained in 1997. The Federal Government, through the Corps of Engineers, funds 100 percent of the cost of maintenance dredging, while the City of Hampton pays the tolls for the use of Craney Island. Local access channels and berthing areas are also a local responsibility. Hampton Creek has both commercial and recreational vessel traffic. The area is known for sail boats and associated yacht basins with storage and repair facilities. In addition, petroleum products are transported on the creek.

CHANNEL FROM PHOEBUS

The authorized project was constructed and provides a channel that is 12 feet deep and 150 feet wide from that depth in Hampton Roads to the Phoebus waterfront, a distance of about 0.8 mile. The project has not been maintained since 1944. The Federal Government, through the Corps of Engineers, would fund 100 percent of the cost to maintain this project, while local access channels and berthing areas would be a local responsibility. This project provides access for commercial and recreational vessels to public and private docking facilities along the Phoebus waterfront.

COLLECTION AND REMOVAL OF DRIFT

This authorization provides for the collection and removal of floating drift in Hampton Roads and its tributary waters for the protection of navigation. It also provides for a debris dock and incinerator located on Craney Island. The project involves operation and maintenance activities only; it did not entail construction of any kind. There are no items of local cooperation associated with this project. The Federal Government funds 100 percent of the collection and removal of floating debris.

PREVENTION OF OBSTRUCTIVE AND INJURIOUS DEPOSITS

This authorization also involves operation and maintenance only and does not entail construction of any kind. It provides for the preservation of the tidal waters of Hampton Roads. The laws are administered by an officer of the Corps of Engineers (usually the Norfolk District Commander) designated as Supervisor of the Harbor. The Supervisor, in coordination with the Coast Guard, Department of Justice, and other Federal and state agencies, conducts a program for the prevention, detection, and prosecution of the deposit of waste, refuse, and other injurious materials into navigable waters. The jurisdiction of the Supervisor of the Harbor of Hampton Roads includes Hampton Roads; the reaches of the Chesapeake Bay and Atlantic Ocean located in Virginia; and the tidal portion of their numerous tributaries, including the James River, York River, Rappahannock River, and the south shore of the Potomac River. There are no items of local cooperation associated with this project. The Federal Government funds 100 percent of this program.

RELATED PROJECTS

Dam Neck Dredged Material Area

This site, located about 3 miles east of Virginia Beach, has been in use since 1967 when the Corps dredged the Thimble Shoal Channel to a depth of 45 feet. Since that time, material dredged from the Thimble Shoal and Cape Henry Channels (with limited exceptions) has been deposited at Dam Neck. In 1977, the Environmental Protection Agency (EPA) designated Dam Neck as an interim ocean site for dredged material. The EPA approval of this site was for an interim period pending final designation for continuing use. At that time, the site contained an area of about 4 square miles with rectangular dimensions of 5,000 by 22,000 feet. An expanded site was designated as an approved ocean placement site under the Corps of Engineers authority contained in Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972. The expanded site contains an area of about 10 square miles, more than double the original site. The Corps approved the expanded site on September 23, 1985. Subsequently, EPA gave Dam Neck final designation under authority in Section 102(c) of the Marine

Protection Research and Sanctuaries Act of 1972. This final designation by EPA appeared in the Federal Register on March 31, 1988. As designated, Dam Neck is the primary placement site for three Federal channels: (1) Thimble Shoal, (2) Cape Henry, and (3) Atlantic Ocean Channels.

Norfolk Dredged Material Area

This area is a large ocean site located about 17 miles east of the mouth of the Chesapeake Bay and is delineated by a circle with a radius of 4 nautical miles (50 square miles in area). The site was permanently designated by EPA pursuant to Section 102(c) of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended. The final rule was promulgated by EPA on July 2, 1993, and it was made effective that same day. The Norfolk Dredged Material Area has an unlimited useful life and serves as an alternate site for the Dam Neck Dredged Material Area for lower bay channels, as well as a site that can accommodate dredged material suitable for ocean placement from the inner harbor channels within the Port of Hampton Roads. This site has been used by the Navy for placement of material from Yorktown Naval Weapons Station.

PROJECT ELEMENTS NOT YET CONSTRUCTED

In several cases, particularly the Norfolk Harbor and Channels project, not all of the authorized features have been constructed and maintained. The following table and subsequent paragraphs address these authorized, but not yet constructed, project elements with respect to dredging to provide and maintain authorized dimensions. They do not address considerations such as improving tunnel covers, providing navigation aids, relocating utility crossings, and removing wrecks and obstructions. The table provides a summary of the estimated volume of dredged material associated with the initial construction of these elements. It also includes the estimated maintenance cycle, the estimated increase in the volume of maintenance dredged material on an annual basis, the probable placement area for the dredged material, and the document from which these estimates are drawn. Further, these elements have been grouped under categories such as "55-Foot Outbound Element." These combinations are driven by the necessity to create a

viable channel system, and a certain progression of events must be assumed. It is assumed that the order of construction would be the 50-foot inbound element to complete the 50-foot channel system, then the 55-foot outbound element, and finally the 55-foot inbound element to complete the full-width 55-foot channel system. In addition, since the Channel to Newport News was dredged to a width of 800 feet during the construction of the 50-foot outbound element, it is assumed, at this point, that no additional width is needed here for implementation of a 50-foot full-width channel. This assumption will be confirmed during the preconstruction engineering and design (PED) phase for the next element of channel construction. In addition, the same assumption of an 800-foot channel width applies to the 55-foot outbound element for the Channel to Newport News. The Elizabeth River Southern Branch Channels and the Deferred Anchorages are independent of this sequence and may occur at any time before, during, or after the sequence. The paragraphs subsequent to the table describe the elements in detail--their current and future use, their current and authorized sizes, a description of their construction dimensions, details on their initial construction dredged material volumes, specifics on their increased maintenance volumes on an annual basis, their maintenance cycles, their environmental impacts, and their local cooperation requirements.

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50-FOOT INBOUND ELEMENT (50-FOOT FULL-WIDTH CHANNELS)

This is the grouping of elements necessary to provide the viable 50-foot navigation system for deep-draft vessels, both inbound and outbound. In the past, the 45-foot depth has been deemed adequate for those commodities entering the port. However, as discussed earlier in Section II, with the advent of supercontainer ships, this is changing. Construction of the inbound elements would combine with the existing 50-foot outbound element to provide a uniform depth for both inbound and outbound traffic.

The outbound element of the Thimble Shoal Channel has already been dredged to 50 feet over a 650-foot width. Therefore, it would be necessary to dredge the inbound element to 50 feet over a width of 350 feet to attain the full authorized 1,000-foot width. The Norfolk Harbor Reach of the Norfolk Harbor Channel would be deepened from 45 feet to 50 feet over the remaining 350-foot width to provide the full width of 1,000 feet, as recommended in the 1986 General Design Memorandum. However, the actual width needed for inbound-outbound traffic at the 50-foot depth for the Norfolk Harbor Reach will be evaluated during the PED phase for this element. The portion of the Craney Island Reach not already at 50 feet, a section of channel 150 feet wide, would also be considered during the PED phase for this element. The Channel to Newport News has been constructed to a depth of 50 feet over its full authorized width of 800 feet. Both the Channel to Newport News and the Atlantic Ocean Channel will be reevaluated during the PED phase for this element.

Based on the most recently approved report for the Norfolk Harbor and Channels project, the September 1989 Supplemental Engineering Report to the 1986 General Design Memorandum, all dredged material from deepening and widening work downstream (north) of Lamberts Point would be placed in the Dam Neck Dredged Material Area. (The purpose of the 1989 Supplemental Engineering Report was to address changes in the construction plan since completion of the 1986 General Design Memorandum.) The material from upstream (south) of Lamberts Point would be placed in the Craney Island Dredged Material Area. It is estimated that only limited amounts of

material from Thimble Shoal Channel would be suitable for placement on area beaches. Should there be an increase in Craney Island capacity for any reason, consideration would be given to placing some of the dredged material in Craney Island, which would result in a significant reduction in project cost. Maintenance material from areas west of the Hampton Roads Bridge-Tunnel would continue to be placed in Craney Island and material east of the Bridge-Tunnel would continue to be placed in Dam Neck.

Based on the dimensions recommended by the 1986 General Design Memorandum, approximately 3,841,000 cubic yards of material would be dredged during the construction of the 50-foot inbound element. Maintenance would continue to be conducted annually on the Norfolk Harbor Channel and about every 3 years on the Thimble Shoal Channel, with the dredged material going to Craney Island and Dam Neck, respectively.

There are no significant adverse environmental impacts which would result from construction of this deepening. All NEPA and related documentation have been fully satisfied but will need to be updated prior to construction.

In accordance with the WRDA 86, as amended, the Commonwealth of Virginia, acting through the VPA, would be responsible for 60 percent of the General Navigation Features (including Craney Island toll charges, but excluding aids to navigation), 10 percent of which can be paid over 30 years. In addition, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would also be the responsibility of the Commonwealth of Virginia. Based on experience to date in maintaining the 50-foot outbound element, a significant increase in maintenance is not anticipated for the 50-foot inbound element following its completion.

55-FOOT OUTBOUND ELEMENT

This is a very large grouping of navigation features, and it would represent a significant effort in terms of time and cost. To date, the 50-foot outbound element has been adequate to serve the needs of the port. However, there is increasing interest in

deepening the system beyond 50 feet to accommodate large bulk coal carriers leaving the Port of Hampton Roads with maximum drafts exceeding 50 feet. The anchorage improvements would be needed to accommodate these large vessels.

In order to handle vessels of this size, it would be necessary to construct the Atlantic Ocean Channel, which would connect deep water in the Atlantic Ocean with deep water at the entrance of the Chesapeake Bay. This channel is naturally deep enough to accommodate existing vessel traffic; however, with the deepening of the other outbound elements in the project to 55 feet, this channel would need to be improved. It would be dredged to a depth of 60 feet over a width of 650 feet for a distance of about 11.1 miles. The 60-foot depth is needed to allow increased under-keel safety clearance due to sea conditions in the open ocean. The Thimble Shoal Channel would be deepened to 55 feet over the 650-foot width of the existing 50-foot outbound element. The Entrance Reach of the Norfolk Harbor Channel would be dredged to 55 feet over the 1,000-foot width of the existing channel. The Norfolk Harbor Reach of the Norfolk Harbor Channel would be dredged to a depth of 55 feet over a width of 650 feet to match the width of the existing 50-foot outbound element. In addition, the first 4,000 feet downstream from Lamberts Point would be deepened to 55 feet over the full authorized width of 800 feet. The remaining portion of the Craney Island Reach would be deepened to the same depth over a 650-foot width to mirror the footprint of the existing outbound element. The Channel to Newport News would be deepened to 55 feet over its full authorized width of 800 feet. In addition, the anchorage (F) just west of the Hampton Roads Bridge-Tunnel would be dredged to its authorized depth of 55 feet over its recommended 1,500-foot swinging radius, and the easternmost anchorage at Sewells Point (K-1) would be expanded from a 1,200-foot to its recommended 1,500-foot swinging radius. All of these discussions are based on the 1986 General Design Memorandum.

Approximately 30,500,000 cubic yards of material would be dredged and placed in the Dam Neck Dredged Material Area. Suitable material from the Atlantic Ocean Channel and the Thimble Shoal Channel would be considered for placement on area

beaches. Maintenance would continue to be conducted annually on the Norfolk Harbor Channel and about every 5 years on the Atlantic Ocean Channel, every 3 years on the Thimble Shoal Channel, and every 4 years on the Channel to Newport News. The two anchorage areas would be maintained about every 4 years. The total estimated volume of dredged material for the increased maintenance dredging on these elements, on an annual basis, is expected to be an estimated 372,000 cubic yards.

There are no significant adverse environmental impacts which would result from construction of this deepening. All NEPA and related documentation have been fully satisfied but will need to be updated prior to construction.

In accordance with the WRDA 86, as amended, the Commonwealth of Virginia, acting through the VPA, would be responsible for 60 percent of the general navigation features (including Craney Island toll charges, but excluding aids to navigation) concerning depths greater than 45 feet, 10 percent of which can be paid over 30 years. In addition, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would also be the responsibility of the Commonwealth of Virginia. With regard to the improvements of the 45-foot anchorage near Sewells Point, the Commonwealth would be responsible for 35 percent of the general navigation features (including Craney Island Toll Charges, but excluding aids to navigation), 10 percent of which can be paid over 30 years. The Federal government would be responsible for 100 percent of the operation and maintenance cost of the 45-foot anchorage.

55-FOOT INBOUND ELEMENT (55-FOOT FULL-WIDTH CHANNELS)

This grouping of elements provides for a complement to the 55-foot outbound element and would be required for large deep-draft vessels, such as fully-loaded supercontainer ships, inbound to the port. Construction of these elements would combine with the 55-foot outbound element to provide a uniform depth for both inbound and outbound traffic.

As stated in the introduction to this portion of Section II, a certain order of events is being assumed. In this case, it is assumed that the outbound element of the Atlantic Ocean Channel has already been constructed to a 60-foot depth over a 650-foot width. Therefore, it would be necessary to dredge the inbound element to 60 feet over the remaining 650 feet to attain the full recommended 1,300-foot width. In addition, the inbound element of the Thimble Shoal Channel would be deepened from 50 to 55 feet over the remaining 350-foot width to attain the full authorized 1,000-foot width. The Norfolk Harbor Reach of the Norfolk Harbor Channel would be deepened from 50 feet to 55 feet over the remaining 350-foot width to provide the full width of 1,000 feet, as recommended in the 1986 General Design Memorandum. The portion of the Craney Island Reach not already at 55 feet, a section of channel 150 feet wide, would also be deepened. The Channel to Newport News would have already been constructed to a depth of 55 feet over its full authorized width of 800 feet during the construction of the 55-foot outbound element. As with the 50-foot inbound element, the actual dimensions needed to accommodate future inbound-outbound traffic within each of these channels would be evaluated during the PED phase for the 55-foot inbound element.

Approximately 16,060,000 cubic yards of material would be dredged and placed in the Dam Neck Dredged Material Area. Suitable material from the Atlantic Ocean Channel and the Thimble Shoal Channel would be considered for placement on area beaches. Maintenance would be conducted annually on the Norfolk Harbor Channel and about every 5 years on the Atlantic Ocean Channel and every 3 years on the Thimble Shoal Channel. The estimated volumes of dredged material for the increased maintenance dredging on these elements, on an annual basis, are 100,000, 12,000, and 97,000 cubic yards for the Atlantic Ocean Channel, the Thimble Shoal Channel, and the Norfolk Harbor Channel, respectively.

There are no significant adverse environmental impacts which would result from construction of this deepening. All NEPA and related documentation have been fully satisfied but will need to be updated prior to construction.

In accordance with the WRDA 86, as amended, the Commonwealth of Virginia, acting through the VPA, would be responsible for 60 percent of the general navigation features (including Craney Island toll charges, but excluding aids to navigation), 10 percent of which can be paid over 30 years. In addition, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would also be the responsibility of the Commonwealth of Virginia.

ELIZABETH RIVER CHANNEL AND SOUTHERN BRANCH CHANNEL

There are actually two groupings covered under this umbrella. The first considers deepening the existing channel from 40 feet to the authorized depth of 45 feet, and it combines portions of the Elizabeth River Channel (the Port Norfolk and Town Point Reaches) and the Southern Branch Channel (the Lower and Middle Reaches). The second considers deepening the existing channel from 35 feet to the authorized depth of 40 feet in the Upper Reach of the Southern Branch. Indeed, there is a potential need for a 45-foot channel along the Elizabeth River to accommodate container ship traffic to Portsmouth Marine Terminal and to Sea-Land Services, Incorporated and along the Southern Branch Channel up to the Norfolk Southern Railway Bridge for commodities such as grain and petroleum products moving up the Southern Branch. There also is a potential need for the 40-foot channel improvement up to the Gilmerton Bridge for miscellaneous dry and liquid bulk commodities. The 40- and 45-foot-deep channel improvements would extend over the existing widths and include deepening the respective approach and turning basins to their full authorized dimensions. In addition, a new turning basin, 40 feet deep and 800 feet square, would be constructed in the Upper Reach.

Approximately 4,210,000 cubic yards and 2,350,000 cubic yards of material would be dredged from the 45-foot channel and 40-foot channel, respectively, and placed in the Craney Island Dredged Material Area. Maintenance would continue to be conducted about every 3 to 5 years on each. The estimated volumes of dredged material for the increased maintenance dredging on each, on an annual basis, are 33,000 and 34,000 cubic yards, for the 45-foot and the 40-foot channels, respectively.

There are no significant adverse environmental impacts which would result from construction of these projects. All NEPA and related documentation have been fully satisfied but will need to be updated prior to construction.

In accordance with the WRDA 86, as amended,, the Commonwealth of Virginia, acting through VPA, would be responsible for 35 percent of the general navigation features (including Craney Island toll charges, but excluding aids to navigation), 10 percent of which can be paid over 30 years. The Federal government would be responsible for 100 percent of the operation and maintenance cost of the 45- and 40-foot channels.

DEFERRED ANCHORAGES

Three anchorages were constructed in Hampton Roads to a depth of 40 feet. Construction to their authorized depth of 45 feet was deferred until a need was determined. Two of the anchorages (I-1 and I-2) are located near the upstream terminus of the Channel to Newport News opposite the Newport News Point. The third is the westernmost (K-2) of the two anchorages located opposite Sewells Point. All three have been constructed to a depth of 40 feet over a 1,200-foot swinging radius and are authorized to a depth of 45 feet. These anchorage improvements, although deferred, have not be deauthorized and might be needed at some future time.

Approximately 3,300,000 cubic yards and 2,000,000 cubic yards of material would be dredged from the Newport News and Sewells Point anchorage areas, respectively, and placed in the Craney Island Dredged Material Area. Maintenance would be conducted about every 6 years on both areas. The estimated volume of dredged material for the increased maintenance dredging on each area, on an annual basis, is 3,000 cubic yards.

There are no significant adverse environmental impacts which would result from construction of these projects. All NEPA and related documentation have been fully satisfied but will need to be updated prior to construction.

In accordance with the WRDA 86, as amended, the Commonwealth of Virginia, acting through VPA, would be responsible for 35 percent of the general navigation features (including Craney Island toll charges, but excluding aids to navigation), 10 percent of which can be paid over 30 years. The Federal government would be responsible for 100 percent of the operation and maintenance cost of the three anchorages.

NOTES:

- **Update the maintenance dredging data--date last dredged, amount, placement area, etc.--when text is finalized. Comments from Richard Klein dated 9/30/99 did not include any updates.**

- Table II-1: For project dimensions and other details, refer to Waterways and Ports Branch; Norfolk District Project Map Book; Shallow-Draft Navigation in the Commonwealth of Virginia; Norfolk Harbor and Channels Long-Term Disposal (Inner Harbor) Draft Information Report, Main Report, dated June 1990 (especially Plates 3 and 4); and Norfolk Harbor and Channels GDM #1, Main Report, dated June 1986.

- Table II-1: For questions on the Atlantic Ocean Channel, refer to Norfolk Harbor and Channels GDM #1, Main Report, dated June 1986, page 2.4: Table indicates length of 60' channel at 9.6 miles; but the Norfolk District Project Map Book, Map #70, indicates 57' channel at 11.1 miles. The 60' channel should be longer! Engineering Division needs to address this.

- Table II-1: Lengths are rounded to the nearest tenth of a mile.

- Table II-2: For project maintenance and other details, refer to Waterways and Ports Branch; Norfolk District Project Map Book; Shallow-Draft Navigation in the Commonwealth of Virginia; 55-Foot Outbound Element, 1989 Supplemental Engineering Report to 1986 GDM 1, revised September 1989; Elizabeth River and Southern Branch 45-Foot and 40-Foot Improvements, Plan of Action for Engineering and Design, February 1988, revised May 1988; and Norfolk Harbor and Channels GDM #1, Main Report, dated June 1986.

- Table II-3: For project maintenance and other details, refer to Waterways and Ports Branch; Norfolk District Project Map Book; Shallow-Draft Navigation in the Commonwealth of Virginia; 55-Foot Outbound Element, 1989 Supplemental Engineering Report to 1986 GDM 1, revised September 1989; Elizabeth River and Southern Branch 45-Foot and 40-Foot Improvements, Plan of Action for Engineering and Design, February 1988, revised May 1988; and Norfolk Harbor and Channels GDM #1, Main Report, dated June 1986.

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS (1)

Project	Authorized	Constructed	Not yet constructed
Atlantic Ocean Channel	<ul style="list-style-type: none"> • 57' depth; 1,000' width; 11.1-mile length in Atlantic Ocean off Virginia Beach. Subsequently, advanced engineering and design recommended 60' depth; 1,300' width; 11.1-mile length. 	<ul style="list-style-type: none"> • Naturally over 50' depth over its 11.1-mile length; channel marked with 1,300' width) 	<ul style="list-style-type: none"> • 60' depth; 1,300' width; 11.1-mile length
Thimble Shoal Channel	<ul style="list-style-type: none"> • 55' depth; 1,000' width; 13.4-mile length from entrance to Chesapeake Bay at Cape Henry westward to a point near Old Point Comfort 	<ul style="list-style-type: none"> • Outbound element: 50' depth; 650' width • Remaining 350' width maintained at 45' depth 	<ul style="list-style-type: none"> • Inbound element: 50' depth; 350' width (2) • 55' depth; 1,000' width
<u>Norfolk Harbor Project:</u> <ul style="list-style-type: none"> • Norfolk Harbor Channel 	<ul style="list-style-type: none"> • Entrance Reach: 55' depth; 1,500' width; 2.0-mile length from I-64 Bridge-Tunnel westward to junction with Channel to Newport News. Subsequently, advanced engineering and design recommended 1,000' width. 	<ul style="list-style-type: none"> • 50' depth; 1,000' width 	<ul style="list-style-type: none"> • 55' depth; 1,000' width

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> Norfolk Harbor Channel (cont'd) 	<ul style="list-style-type: none"> Norfolk Harbor Reach: 55' depth; 1,500' width; 4.3-mile length from junction with Channel to Newport News southward to Norfolk International Terminal. Subsequently, advanced engineering and design recommended 1,000' width. Craney Island Reach: 55' depth; 800' width; 2.6-mile length from Norfolk International Terminal southward to Lamberts Point 	<ul style="list-style-type: none"> Outbound element: 50' depth; 650' width Remaining 350' width maintained at 45' depth; additional 250' width maintained at 45' depth under previous authorization. Total 600' width. First 4,000' downstream from Lamberts Point 50' depth; full 800' width to provide maneuvering area Remaining portion of outbound element: 50' depth; 650' width; remaining 150' width maintained at 45' depth 	<ul style="list-style-type: none"> Inbound element: 50' depth; 350' width (2) 55' depth; 1,000' width Remaining portion of full-width channel: 50' depth; 150' width 55' depth; 800' width
<ul style="list-style-type: none"> Elizabeth River Channel 	<ul style="list-style-type: none"> Port Norfolk Reach and Town Point Reach: 45' depth; 750' width; 3.0-mile length from Lamberts Point to junction of Eastern Branch Channel and Southern Branch Channel 	<ul style="list-style-type: none"> 40' depth; 750' width 	<ul style="list-style-type: none"> 45' depth; 750' width

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> • Southern Branch of Elizabeth River 	<ul style="list-style-type: none"> • Lower Reach: 45' depth; 450' width; 2.0-mile length from junction with Eastern Branch Channel to Norfolk and Portsmouth Belt Line Railroad bridge • Middle Reach: 45' depth; 375' width; 1.0-mile length from Norfolk and Portsmouth Belt Line Railroad bridge upstream to Norfolk Southern Railroad bridge • <u>Upper Reach:</u> <ul style="list-style-type: none"> • 40' depth; 250' to 500' width; 2.4-mile length from Norfolk Southern Railroad bridge upstream to Gilmerton Bridge • 35' depth; 300' width; 0.6-mile length from Gilmerton Bridge upstream. Thence 250' width; 1.5-mile length upstream to end of project at a point 0.8 mile above I-64 highway bridge. Total 2.1-mile length. 	<ul style="list-style-type: none"> • 40' depth; 450' width • 40' depth; 375' width • 35' depth; 250' to 500' width • Authorized project constructed; however, upsteammost portion of channel with 250' width will be maintained at 25' depth 	<ul style="list-style-type: none"> • 45' depth; 450' width • 45' depth; 375' width • 40' depth; 250' to 500' width

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> • Southern Branch of Elizabeth River (cont'd) 	<ul style="list-style-type: none"> • Approach and turning basin opposite Norfolk Naval Shipyard, just downstream of Norfolk and Portsmouth Belt Line Railroad bridge; 45' depth; 450' to 830' width; 2,900' length • Turning basin at mouth of St. Julians Creek; 40' depth; 800' width; 400' to 600' length • Turning basin at mouth of Milldam Creek, just downstream of Gilmerton Bridge; 40' depth; 800' square • Turning basin at mouth of Newton Creek; 35' depth; 600' square • Turning basin at mouth of Mains Creek near upstream end of project; 35' depth; 800' square 	<ul style="list-style-type: none"> • 40' depth; 450' to 830' width; 2,900' length • 35' depth; 800' width; 400' to 600' length • Authorized project constructed • Authorized project constructed; will be maintained at 25' depth 	<ul style="list-style-type: none"> • 45' depth; 450' to 830' width; 2,900' length • 40' depth; 800' width; 400' to 600' length • 40' depth; 800' square
<ul style="list-style-type: none"> • Eastern Branch of Elizabeth River 	<ul style="list-style-type: none"> • 25' depth; 500' width; 1.1-mile length from junction with Southern Branch Channel to Norfolk Southern Railroad bridge 	<ul style="list-style-type: none"> • Authorized project constructed 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> Eastern Branch of Elizabeth River (cont'd) 	<ul style="list-style-type: none"> 25' depth; 300' width; 0.5-mile length from Norfolk Southern Railroad bridge upstream to Campostella Bridge 25' depth; 200' width; 0.9-mile length from Campostella Bridge upstream to end of project at second Norfolk Southern Railroad bridge Turning basin near upstream end of project; 25' depth; 5.5 acres in area 	<ul style="list-style-type: none"> Authorized project constructed Authorized project constructed; however, it is no longer maintained Authorized project constructed 	
<ul style="list-style-type: none"> Western Branch of Elizabeth River 	<ul style="list-style-type: none"> 24' depth; 300' width; 0.8-mile length connecting from main Elizabeth River Channel. Thence 200' width; 0.4-mile length to a point downstream of West Norfolk Bridge. Total 1.2-mile length. 18' depth; 150' width; 0.6 mile length from a point downstream of West Norfolk Bridge upstream to end of project at a point 0.3 mile upstream of West Norfolk Bridge 	<ul style="list-style-type: none"> Authorized project constructed; however, an 18' depth is now maintained Authorized project constructed 	
<ul style="list-style-type: none"> Scotts Creek 	<ul style="list-style-type: none"> 12' depth; 100' width; 0.7-mile length connecting from main Elizabeth River Channel into creek 	<ul style="list-style-type: none"> Authorized project constructed; however, it is no longer maintained 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> • Anchorages 	<ul style="list-style-type: none"> • 3 fixed mooring anchorages just west of I-64 Bridge-Tunnel; 55' depth. Subsequently, advanced engineering and design recommended one anchorage (F); 55' depth; 1,500' swinging radius. • 2 anchorages opposite Sewells Point; 45' depth; easternmost (K-1) 1,200' swinging radius and westernmost (K-2) 1,200' swinging radius. Subsequently, advanced engineering and design recommended enlarging the K-1 anchorage to 45' depth; 1,500' swinging radius. • 3 anchorages opposite Lamberts Point in 173-acre area (P) on west side of 55' depth channel; 38' depth and 1,500' square; 35' depth and 1,500' square; 20' depth, 1,000' width, 3,000' length • 45-acre anchorage near Pinners Point (R); 12' depth 	<ul style="list-style-type: none"> • Anchorage F: 50' depth; 1,500' swinging radius • Easternmost anchorage: 45' depth; 1,200' swinging radius • Westernmost anchorage: 40' depth; 1,200' swinging radius • Authorized project constructed; however, it is no longer maintained • Authorized project constructed; however, it is no longer maintained 	<ul style="list-style-type: none"> • 55' depth; 1,500' swinging radius • Easternmost anchorage: 45' depth; 1,500' swinging radius • Westernmost anchorage: 45' depth; 1,200' swinging radius; however, construction has been deferred

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> • Craney Island Dredged Material Area 	<ul style="list-style-type: none"> • 2,500-acre diked dredged material placement area located in Portsmouth; rehandling basin with approach and exit channels connecting rehandling basin to Craney Island Reach of Norfolk Harbor Channel 	<ul style="list-style-type: none"> • Authorized project constructed; currently being intensively managed under authority of Section 148 of Water Resources Development Act of 1976 (Public Law 94-587) 	
Channel to Newport News	<ul style="list-style-type: none"> • 55' depth; 800' width; 6.0-mile length connecting from Norfolk Harbor Channel to coal terminals in Newport News • 2 anchorages (I-1 and I-2); 45' depth; 1,200' swinging radius each 	<ul style="list-style-type: none"> • 50' depth; 800' width • 40' depth; 1,200' swinging radius each 	<ul style="list-style-type: none"> • 55' depth; 800' width • 45' depth; 1,200' swinging radius each; however, construction has been deferred
<u>Atlantic Intracoastal Waterway:</u> <ul style="list-style-type: none"> • General 	<ul style="list-style-type: none"> • Extends from Massachusetts to Florida; coming south, it passes through Hampton Roads and down Southern Branch of Elizabeth River and splits into two routes 		

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> Albemarle and Chesapeake Canal Route 	<ul style="list-style-type: none"> 12' depth; 90' width in land cuts and 125' to 250' width in rivers; tidal guard lock at Great Bridge 	<ul style="list-style-type: none"> Authorized project constructed 	
<ul style="list-style-type: none"> Dismal Swamp Canal Route 	<ul style="list-style-type: none"> 10' depth; 100' width in Deep Creek; tidal guard lock at Deep Creek 	<ul style="list-style-type: none"> Authorized project constructed; however, a 6' depth project is now maintained 	
<p>Lynnhaven Inlet</p>	<ul style="list-style-type: none"> 10' depth; 150' width; 1.0-mile length from Chesapeake Bay into inlet to Lesner Bridge Mooring area and turning basin just upstream from Lesner Bridge; 10' depth; 700' width; 1,250' length 9' depth; 90' width; 2.0-mile length from turning basin to Broad Bay via Long Creek-Broad Bay canal 6' depth; 90' width; 0.5-mile length through The Narrows connecting Broad and Linkhorn Bays 	<ul style="list-style-type: none"> Authorized project constructed Authorized project constructed Authorized project constructed Authorized project constructed 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
Lynnhaven Inlet (cont'd)	<ul style="list-style-type: none"> 8' depth; 100' width; 0.3-mile length side channel connecting into Long Creek 	<ul style="list-style-type: none"> Authorized project constructed 	
Little River (Creek)	<ul style="list-style-type: none"> 20' depth; 400' width; 1.4-mile length from Chesapeake Bay into inlet to basin Turning basin adjacent to railroad terminals; 20' depth; 400' to 1,240' width; 1,160' length 	<ul style="list-style-type: none"> Authorized project constructed; however, it is maintained by the Navy Authorized project constructed; however, it is maintained by the Navy 	
Willoughby Channel	<ul style="list-style-type: none"> 10' depth; 300' width; 1.5-mile length from Hampton Roads to a point near tip of Willoughby Spit in Willoughby Bay 	<ul style="list-style-type: none"> Authorized project constructed; however, a 6' depth; 200' width project is now maintained 	
<u>Lafayette River:</u> <ul style="list-style-type: none"> Main channel 	<ul style="list-style-type: none"> 8' depth; 100' width; 1.7-mile length from Hampton Roads to Hampton Boulevard Bridge 	<ul style="list-style-type: none"> Authorized project constructed 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<ul style="list-style-type: none"> Main channel (cont'd) 	<ul style="list-style-type: none"> 6' depth; 100' width; 2.3-mile length from Hampton Boulevard Bridge upstream to a point opposite East Haven Creek 	<ul style="list-style-type: none"> Authorized project constructed 	
<ul style="list-style-type: none"> Knitting Mill Creek 	<ul style="list-style-type: none"> 6' depth; 40' to 80' width; 0.6-mile length connecting from Lafayette River Channel into creek to settling basin (8' depth; 50' width; 100' length) at upstream end of creek 	<ul style="list-style-type: none"> Authorized project constructed 	
<ul style="list-style-type: none"> East Haven Creek 	<ul style="list-style-type: none"> 6' depth; 50' width; 0.3-mile length connecting from Lafayette River Channel into creek to settling basin (8' depth; 50' width; 100' length) at upstream end of creek 	<ul style="list-style-type: none"> Authorized project constructed 	
Channel to Nansemond Ordnance Depot	<ul style="list-style-type: none"> 12' depth; 100' width; 0.5-mile length from Hampton Roads shoreward 	<ul style="list-style-type: none"> Authorized project constructed; however, project no longer required and maintenance has been discontinued 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
Channel to Nansemond Ordnance Depot (cont'd)	<ul style="list-style-type: none"> • Turning basin at shoreward end of channel; 12' depth; 100' to 300' width; 300' length • Construction of timber wharf; 650' length 	<ul style="list-style-type: none"> • Authorized project constructed; however, project no longer required and maintenance has been discontinued • Authorized project constructed; however, project no longer required and maintenance has been discontinued 	
Bennetts Creek	<ul style="list-style-type: none"> • 6' depth; 60' width; 2.4-mile length from Nansemond River into creek to city boat ramp at Bennetts Creek Park 	<ul style="list-style-type: none"> • Authorized project constructed 	
Nansemond River	<ul style="list-style-type: none"> • 12' depth; 100' width; 18.2-mile length from Hampton Roads into river to Business Route 460 highway bridge in Suffolk • 10' depth; 80' width; 2.0-mile length side channel connecting from main channel into Western Branch to Reids Ferry 	<ul style="list-style-type: none"> • Authorized project constructed; however, maintenance is no longer required • Authorized project constructed; however, a 6' depth is now maintained 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
Nansemond River (cont'd)	<ul style="list-style-type: none"> • Turning basin at upstream end of project in Suffolk; 12' depth; 200' square 	<ul style="list-style-type: none"> • Authorized project constructed; however, maintenance is no longer required 	
Newport News Creek	<ul style="list-style-type: none"> • <u>Dual, overlapping, entrance channel:</u> <ul style="list-style-type: none"> • 16' depth; 125' width; 0.2-mile length from Hampton Roads into wave screen area • 12' depth; 90' to 150' width; 0.9-mile length from Hampton Roads upstream to turning basin • North access channel: 16' depth; 150' width; 0.2-mile length; located within wave screen • South access channel: 16' depth; 200' width; 0.2-mile length; located within wave screen • Barge fleeting area: 16' depth; 100' to 500' width; 1,100' to 1,140' long; located within wave screen 	<ul style="list-style-type: none"> • Authorized project constructed • Authorized project constructed • Authorized project constructed • Authorized project constructed • Authorized project constructed 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
Newport News Creek (cont'd)	<ul style="list-style-type: none"> • Turning basin/anchorage area/municipal boat harbor at upstream terminus of creek; 12' depth; 188' to 214' width; 500' length 	<ul style="list-style-type: none"> • Authorized project constructed 	
Hampton Creek	<ul style="list-style-type: none"> • 12' depth; 150' to 200' width; 2.5-mile length from Hampton Roads into creek to Queen Street bridge • 12' depth; 80' to 100' width; 0.6-mile length side channel connecting from main channel into Herberts (Sunset) Creek to Kecoughtan Road 	<ul style="list-style-type: none"> • Authorized project constructed • Authorized project constructed 	
Channel from Phoebus	<ul style="list-style-type: none"> • 12' depth; 150' width; 0.8-mile length from Hampton Roads to Phoebus waterfront 	<ul style="list-style-type: none"> • Authorized project constructed 	
Collection and Removal of Drift	<ul style="list-style-type: none"> • Collection and removal of floating debris in harbor 	<ul style="list-style-type: none"> • No construction facilities involved; maintenance activities only 	
Prevention of Obstructive and Injurious Deposits	<ul style="list-style-type: none"> • Prevention, detection, and prosecution of the deposit of waste, refuse, and other injurious materials into navigable waters 	<ul style="list-style-type: none"> • No construction facilities involved; maintenance activities only 	

Table II-1. CORPS OF ENGINEERS POST-AUTHORIZATION PROJECTS
(Cont'd)

Project	Authorized	Constructed	Not yet constructed
<u>Related Projects:</u> <ul style="list-style-type: none"> • General 	<ul style="list-style-type: none"> • In addition to Craney Island Dredged Material Area, the Corps of Engineers may place suitable dredged material in the following two open ocean sites; these sites have been approved by the Environmental Protection Agency 		
<ul style="list-style-type: none"> • Dam Neck Dredged Material Area 	<ul style="list-style-type: none"> • 10-square-mile area located about 3 miles east of Virginia Beach 		
<ul style="list-style-type: none"> • Norfolk Dredged Material Area 	<ul style="list-style-type: none"> • 50-square-mile area located about 17 miles east of mouth of Chesapeake Bay; unlimited useful life 		

(1) All depths refer to mean lower low water.

(2) The 350-foot width is based on the design for the 55-foot channel in General Design Memorandum 1, Norfolk Harbor and Channels, Virginia dated June 1986. The width needed for the inbound element will be determined during the Preconstruction Engineering and Design phase of the 50-foot inbound element, based on current requirements for inbound traffic.

Table II-2. CORPS OF ENGINEERS PROJECT MAINTENANCE (1)

Project	Date last dredged (Federal fiscal year)	Estimated cycle (years) (2)	Average volume per cycle (cubic yards) (2)	Placement area
Thimble Shoal Channel	1996	3	400,000	Dam Neck Dredged Material Area
<u>Norfolk Harbor Project:</u>				
• Norfolk Harbor Channel				
• Entrance Reach	1988	20+	Has not required maintenance since improved in 1988	Craney Island Dredged Material Area
• Norfolk Harbor Reach and Craney Island Reach	1999	1	1,000,000	Craney Island Dredged Material Area
• Elizabeth River Channel	1998	5	400,000	Craney Island Dredged Material Area
• Southern Branch of Elizabeth River				
• Lower Reach and Middle Reach	1998	5	(3)	Craney Island Dredged Material Area
• Upper Reach (4)	1998	3	100,000	Craney Island Dredged Material Area
• Eastern Branch of Elizabeth River	1989	20+	(5)	Craney Island Dredged Material Area

Table II-2. CORPS OF ENGINEERS PROJECT MAINTENANCE
(Cont'd)

Project	Date last dredged (Federal fiscal year)	Estimated cycle (years) (2)	Average volume per cycle (cubic yards) (2)	Placement area
• Western Branch of Elizabeth River	1986	20+	(5)	Craney Island Dredged Material Area
• Scotts Creek	1932	Has not required maintenance since initial construction in 1932	(6)	--
• Anchorages				
• I-64 Bridge-Tunnel	1999	6	80,000	Craney Island Dredged Material Area
• Sewells Point	1995	4	600,000	Craney Island Dredged Material Area
• Lamberts Point	1960	(6)	(6)	--
• Pinners Point	1929	(6)	(6)	--
• Craney Island Dredged Material Area	--	--	--	--
<u>Channel to Newport News:</u>				
• Channel	1999	4	150,000	Craney Island Dredged Material Area

Table II-2. CORPS OF ENGINEERS PROJECT MAINTENANCE
(Cont'd)

Project	Date last dredged (Federal fiscal year)	Estimated cycle (years) (2)	Average volume per cycle (cubic yards) (2)	Placement area
• Anchorages	1996	4	400,000	Craney Island Dredged Material Area
<u>Atlantic Intracoastal Waterway:</u> • Albemarle and Chesapeake Canal Route (7)	1992	20+	(5)	Craney Island Dredged Material Area
• Dismal Swamp Canal Route (7)	1979	20+	(5)	Craney Island Dredged Material Area
Lynnhaven Inlet	1997	3	180,000	Suitable material used to nourish nearby beaches; remaining material placed in upland confined area just inside inlet
Little River (Creek) (8)	--	--	--	--
Willoughby Channel	1994	20+	(5)	Material used to nourish nearby beaches
Lafayette River	1993	20+	(5)	Craney Island Dredged Material Area

Table II-2. CORPS OF ENGINEERS PROJECT MAINTENANCE
(Cont'd)

Project	Date last dredged (Federal fiscal year)	Estimated cycle (years) (2)	Average volume per cycle (cubic yards) (2)	Placement area
Channel to Nansemond Ordnance Depot (9)	--	(6)	(6)	--
Bennetts Creek	1998	3	20,000	Craney Island Dredged Material Area
Nansemond River (10)	1994	5	20,000	Upland confined area adjacent to mouth of Western Branch
Newport News Creek	1998	8	50,000	Suitable material used to nourish nearby beaches; remaining material placed in Craney Island Dredged Material Area
Hampton Creek	1997	8	100,000	Craney Island Dredged Material Area

Table II-2. CORPS OF ENGINEERS PROJECT MAINTENANCE
(Cont'd)

Project	Date last dredged (Federal fiscal year)	Estimated cycle (years) (2)	Average volume per cycle (cubic yards) (2)	Placement area
Channel from Phoebus	1944	Has not required maintenance since last maintenance dredging in 1944	(6)	--
Collection and Removal of Drift	--	--	--	--
Prevention of Obstructive and Injurious Deposits	--	--	--	--
<u>Related Projects:</u>				
• Dam Neck Dredged Material Area	--	--	--	--
• Norfolk Dredged Material Area	--	--	--	--

- (1) Maintenance of turning basins is included as part of respective channel segment work.
- (2) Subject to change due to many factors as discussed in the introductory text preceding this table.
- (3) The Elizabeth River Channel and the Lower and the Middle Reaches of the Southern Branch are maintained as one segment.
- (4) The 250-foot-wide portion of channel farthest upstream was improved during Fiscal Years 1980 and 1981 and has since not been maintained.
- (5) There is a long interval between maintenance cycles; an average volume has not been established.
- (6) This feature is no longer maintained.
- (7) This refers only to the portion of the route downstream from the locks, either in the Southern Branch or Deep Creek.
- (8) This project is maintained by the Navy.
- (9) The authorized project was constructed; however, the project is no longer required, and maintenance has been discontinued.

(10) No maintenance dredging is performed on the main channel at this time since depths are adequate for the recreational craft and small commercial seafood boats that use the waterway. However, the Western Branch channel is maintained about every 5 years.

Table II-3. CORPS OF ENGINEERS PROJECT DREDGING ELEMENTS NOT YET CONSTRUCTED (1)

Project	Estimated volume of dredged material for initial construction (1,000 cubic yards)	Estimated cycle for maintenance (years)	Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards)	Placement area (2)	Reference document
<u>50' Inbound Element (Full-Width Channels):</u> <ul style="list-style-type: none"> • Thimble Shoal Channel: Construct to 50' depth; 350' width (3) • Norfolk Harbor Channel: Construct to 50' depth; 150' to 350' width (3) • Channel to Newport News (4) • Total 	<p style="text-align: center;">2,613</p> <p style="text-align: center;">1,228</p> <p style="text-align: center;">--</p> <p style="text-align: center;">3,841</p>	<p style="text-align: center;">3</p> <p style="text-align: center;">1</p> <p style="text-align: center;">--</p>	<p style="text-align: center;">(5)</p> <p style="text-align: center;">(5)</p> <p style="text-align: center;">--</p> <p style="text-align: center;">(5)</p>	<p style="text-align: center;">Dam Neck</p> <p style="text-align: center;">Dam Neck</p> <p style="text-align: center;">--</p>	<p style="text-align: center;">General Design Memorandum 1, Norfolk Harbor and Channels, Virginia dated June 1986 (3)</p>
<u>55' Outbound Element:</u> <ul style="list-style-type: none"> • Atlantic Ocean Channel: Construct to recommended 60' depth; 650' width • Thimble Shoal Channel: Construct to authorized 55' depth; 650' width 	<p style="text-align: center;">9,600</p> <p style="text-align: center;">7,400</p>	<p style="text-align: center;">5</p> <p style="text-align: center;">3</p>	<p style="text-align: center;">100</p> <p style="text-align: center;">21</p>	<p style="text-align: center;">Dam Neck</p> <p style="text-align: center;">Dam Neck</p>	<p style="text-align: center;">Supplemental Engineering Report to General Design Memorandum 1, (cont'd)</p>

Table II-3. CORPS OF ENGINEERS PROJECT DREDGING ELEMENTS NOT YET CONSTRUCTED (1)
(Cont'd)

Project	Estimated volume of dredged material for initial construction (1,000 cubic yards)	Estimated cycle for maintenance (years)	Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards)	Placement area (2)	Reference document
<u>55' Outbound Element (cont'd):</u>					(cont'd)
<ul style="list-style-type: none"> • Norfolk Harbor Channel: Construct to authorized 55' depth; 650' to authorized 800' width 	4,300	1	179	Dam Neck	Norfolk Harbor and Channels, Virginia dated September 1989 (6)
<ul style="list-style-type: none"> • Channel to Newport News: Construct to authorized 55' depth; authorized 800' width 	4,500	4	24	Dam Neck	
<ul style="list-style-type: none"> • I-64 Bridge-Tunnel anchorage (F): Construct to authorized 55' depth; recommended 1,500' swinging radius 	1,500	4	20	Dam Neck	
<ul style="list-style-type: none"> • Sewells Point easternmost anchorage (K-1): Construct to recommended 1,500' swinging radius 	<u>3,200</u>	4	<u>28</u>	Dam Neck	
<ul style="list-style-type: none"> • Total 	30,500		372		

Table II-3. CORPS OF ENGINEERS PROJECT DREDGING ELEMENTS NOT YET CONSTRUCTED (1)
(Cont'd)

Project	Estimated volume of dredged material for initial construction (1,000 cubic yards)	Estimated cycle for maintenance (years)	Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards)	Placement area (2)	Reference document
<u>55' Inbound Element (Full-Width Channels):</u> <ul style="list-style-type: none"> • Atlantic Ocean Channel: Construct to authorized 60' depth; 650' width (7) • Thimble Shoal Channel: Construct from 50' to authorized 55' depth; 350' width (7) • Norfolk Harbor Channel: Construct from 50' to authorized 55' depth; 150' to 350' width (7) • Channel to Newport News (8) • Total 	<p align="center">9,093</p> <p align="center">2,993</p> <p align="center">3,974</p> <p align="center">==</p> <p align="center">16,060</p>	<p align="center">5</p> <p align="center">3</p> <p align="center">1</p> <p align="center">--</p>	<p align="center">100</p> <p align="center">12</p> <p align="center">97</p> <p align="center">==</p> <p align="center">209</p>	<p align="center">Dam Neck</p> <p align="center">Dam Neck</p> <p align="center">Dam Neck</p> <p align="center">--</p>	<p align="center">General Design Memorandum 1, Norfolk Harbor and Channels, Virginia dated June 1986 (7)</p>

Table II-3. CORPS OF ENGINEERS PROJECT DREDGING ELEMENTS NOT YET CONSTRUCTED (1)
(Cont'd)

Project	Estimated volume of dredged material for initial construction (1,000 cubic yards)	Estimated cycle for maintenance (years)	Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards)	Placement area (2)	Reference document
<u>Elizabeth River Channel and Southern Branch Channel:</u> <ul style="list-style-type: none"> • Port Norfolk, Town Point, Lower, and Middle Reaches: Construct to authorized 45' depth; authorized 375' to 750' widths • Upper Reach: Construct to authorized 40' depth; authorized 250' to 500' widths 	4,210	5	33	Craney Island	Plan of Action for Engineering and Design for Elizabeth River and Southern Branch 45-Foot and 40-Foot Improvements dated May 1988 (9)
<u>Deferred Anchorages:</u> <ul style="list-style-type: none"> • Sewells Point westernmost anchorage (K-2): Construct to authorized 45' depth; authorized 1,200' swinging radius 	2,000	6	3	Dam Neck	Review Report on Channel to Newport News, Norfolk Harbor,

Table II-3. CORPS OF ENGINEERS PROJECT DREDGING ELEMENTS NOT YET CONSTRUCTED (1)
(Cont'd)

Project	Estimated volume of dredged material for initial construction (1,000 cubic yards)	Estimated cycle for maintenance (years)	Estimated volume of dredged material for increased annual maintenance (1,000 cubic yards)	Placement area (2)	Reference document
<u>Deferred Anchorages (cont'd):</u> • Newport News anchorages (I-1 and I-2): Construct to authorized 45' depth; authorized 1,200' swinging radius each	3,300	6	3	Dam Neck	(cont'd) and Thimble Shoal Channel, VA dated March 1965

- (1) All depths refer to mean lower low water. Construction of turning basins, if authorized, is included as part of respective channel segment work.
- (2) This is based on the most recently approved plan for the Norfolk Harbor project deepening, as contained in the 1989 Supplemental Engineering Report. All dredged material from deepening and widening work downstream (north) of Lamberts Point would be placed in the Dam Neck Dredged Material Area. Maintenance material from inside (west of) the Hampton Roads Bridge-Tunnel would continue to be placed at Craney Island, as would all material from improvements and maintenance upstream (south) of Lamberts Point. Consideration would be given to placing beach quality sand on area beaches under authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86. Should there be an increase in Craney Island capacity for any reason, consideration would be given to placing some of the dredged material in Craney Island, which would result in a significant reduction in project cost.
- (3) This is based on widths associated with the 50-foot inbound element, which brings the channel to full width. Design widths for 50-foot full-width channels will be evaluated during the Preconstruction Engineering and Design phase of the 50-foot inbound element.

- (4) This channel was already dredged to the full authorized width of 800 feet during the 50-foot outbound element construction. Additional channel width has not been determined to be necessary at this time.
- (5) Based on experience with maintenance of the 50-foot outbound element, a significant increase in annual maintenance following the construction of these elements is not anticipated.
- (6) This document recommended that all material from subsequent improvements to the 55-foot channel system should be placed in the Dam Neck Dredged Material Area.
- (7) As with the 50-foot inbound element, the 55-foot inbound element would bring the 55-foot channel system to full width. Actual widths would need to be reevaluated during the Preconstruction Engineering and Design phase for this element.
- (8) This channel would have already been dredged to the full authorized width of 800 feet during the 55-foot outbound element construction. Additional channel width has not been determined necessary at this time.
- (9) There has been no approved document for the Elizabeth River Channel or the Southern Branch Channel elements, subsequent to the feasibility report; however, estimates for new work and maintenance were refined during the Preconstruction Engineering and Design investigations performed through 1994.

SECTION III

PRE-AUTHORIZATION CORPS OF ENGINEERS PROJECTS/STUDIES

SECTION III

PRE-AUTHORIZATION CORPS OF ENGINEERS PROJECTS/STUDIES

GENERAL

This section of the Plan discusses navigation investigations which fall into three stages: (1) those which have recently been studied, (2) those currently under study, and (3) those which may potentially be studied in the foreseeable future. Pertinent information relating to those studies is provided although the availability of data varies significantly, depending on the stage of the investigation. The following paragraphs discuss Section 933 studies, the Dredging Master Plan for the City of Norfolk, the Elizabeth River Environmental Restoration Study, the Eastward Expansion of Craney Island Study, and the Lynnhaven River Environmental Restoration Study. Please reference Appendix E, Tables E-1 and E-2.

SECTION 933 STUDIES

Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86 and Section 207 of the WRDA 92, provides the opportunity for beneficial uses of beach-quality dredged material through a cost-shared placement operation in conjunction with dredging operations at Federally-authorized navigation projects. Specifically, the additional cost of placing suitable dredged material on a public beach (over the least cost placement alternative that meets the Federal standard) can be cost shared on a 50/50 basis with the non-Federal sponsor including the state or locality (city, town, or county). Such a cost-sharing arrangement is subject to the added cost of placement being economically justified, based on hurricane and storm damage reduction benefits, and the environmental acceptability of the placement.

The Norfolk District has conducted Section 933 studies as part of the Norfolk Harbor and Channels Long-Term Disposal Study for the Outer Harbor area of Hampton Roads (the area west of the Hampton Roads Bridge-Tunnel) for the beaches shown on Plate 8. This effort produced individual reports to determine the Federal interest in the one-time placement of suitable dredged material from the proposed 55-foot outbound deepening project onto area beaches. Section 933 studies were also accomplished in 1987 to determine the Federal interest in cost sharing in the placement of sand dredged as part of the Baltimore Harbor and Channels project (Cape Henry Channel) onto beaches at East Ocean View and the Virginia Beach resort strip. The findings of these studies are summarized as follows:

<u>Study</u>	<u>Findings</u>
Sandbridge Beach, Virginia Beach	Economically justified
Virginia Beach Resort Strip, Virginia Beach	Economically justified
Ocean Park Beach, Virginia Beach	Economically justified
East Ocean View, Norfolk	<u>Not</u> economically justified
Central Ocean View Beach, Norfolk	Economically justified
Willoughby Spit Area, Norfolk	Economically justified
Buckroe Beach, Hampton	<u>Not</u> economically justified
Salt Ponds Beach, Hampton	<u>Not</u> economically justified
White Marsh Beach, Hampton	<u>Not</u> economically justified
Grandview Beach, Hampton	<u>Not</u> economically justified
Yorktown Beach, Yorktown	<u>Not</u> economically justified

The favorable studies listed above are awaiting construction of the 55-foot outbound element of the authorized Norfolk Harbor and Channels project. The following discussion summarizes the findings of these studies. Prior to construction of the 55-foot outbound element, the beaches resulting in favorable 933 studies would need to be reevaluated, if placement of sand were still supported by non-Federal interests.

SANDBRIDGE BEACH, VIRGINIA BEACH

This report, dated August 1990, concluded that the added cost of dredging, approximately 1,097,000 cubic yards of sand from the Thimble Shoal Channel or approximately 1,226,000 cubic yards of sand from the Atlantic Ocean Channel, for placement on the beach at Sandbridge between the Naval Fleet Anti-Air Warfare Training Center at Dam Neck and Back Bay National Wildlife Refuge to construct a berm approximately 5 miles long and 100 feet wide at elevation 6 feet NGVD is justified by the benefits associated with the placement of sand. The costs were estimated in 1990 to be \$5,378,000 for the Thimble Shoal Channel and \$5,144,000 for the Atlantic Ocean Channel, which would be cost shared on a 50/50 basis with the Commonwealth of Virginia acting as local cost-sharing sponsor.

VIRGINIA BEACH RESORT STRIP, VIRGINIA BEACH

The Section 933 report, dated August 1989, concluded that the added cost of the placement of 1.1 million cubic yards of sand from the Atlantic Ocean Channel, or 1.0 million cubic yards of sand from the Thimble Shoal Channel, on the resort beach between Rudee Inlet and 49th Street is economically justified. The added costs for these placements were estimated in 1989 to be \$7.4 million from the Atlantic Ocean Channel and \$5.4 million from the Thimble Shoal Channel. Again, these added costs would be cost shared on a 50/50 basis with the Commonwealth of Virginia as local cost-sharing sponsor. It should also be noted that 1,174,000 cubic yards of sand from the dredging of the Cape Henry Channel were actually placed on the resort strip in the summer of 1989 as a result of the “Reevaluation Report, Virginia Beach Nourishment, Virginia Beach, Virginia, Sections 933 and 934 (PL 99-662) Study,” dated December 1987. Section 933 allowed cost sharing for the added cost, and Section 934 allowed extension of the existing beach nourishment project from 25 years to 50 years.

OCEAN PARK BEACH, VIRGINIA BEACH

This report, dated July 1990, concluded that the added cost of placing 408,000 cubic yards of sand dredged from the Thimble Shoal Channel on the beach at Ocean Park between the Chesapeake Bay Bridge-Tunnel and Lynnhaven Inlet to

construct a berm approximately 11,000 feet long and 125 feet wide at elevation 5 feet National Geodetic Vertical Datum (NGVD) is justified by the benefits associated with the placement. The estimated cost of this placement in 1990 was \$1,253,000, which would be cost shared on a 50/50 basis with the Commonwealth of Virginia acting as local cost-sharing sponsor.

CENTRAL OCEAN VIEW BEACH, NORFOLK

This report, dated March 1991, concluded that the added cost of placing 60,000 cubic yards of sand dredged from the Thimble Shoal Channel on the beach at Central Ocean View between Warwick Street and the eastern boundary of Community Beach to construct a berm approximately 2,340 feet long and 125 feet wide at elevation 5 feet m.l.w. is economically justified. The estimated cost of this placement was estimated in 1991 to be \$249,000, which would be cost shared on a 50/50 basis with the Commonwealth of Virginia acting as local cost-sharing sponsor.

WILLOUGHBY SPIT AREA, NORFOLK

The report, dated August 1990, concluded that the added cost of placing 386,000 cubic yards of sand dredged from the Thimble Shoal Channel on the beach at Willoughby Spit between Mason Creek Road and the terminal groin at the end of Lea View Avenue to construct a berm approximately 13,500 feet long and 125 feet wide at elevation 5 feet m.l.w. is justified by the benefits. The added cost of this placement was estimated in 1990 to be \$1,675,000, which would be cost shared on a 50/50 basis with the Commonwealth of Virginia acting as local cost-sharing sponsor.

DREDGING MASTER PLAN FOR THE CITY OF NORFOLK

The Norfolk District developed a Dredging Master Plan for the City of Norfolk in Fiscal Year 1998 under authority of Section 22 of the WRDA 74 (Public Law 93-251, Planning Assistance to States), as amended. The effort was cost shared with the City of Norfolk on a 50/50 basis and is being accomplished in two phases. The Dredging Master

Plan addresses three areas of dredging, including navigation, storm drainage, and in-town reservoir maintenance.

Phase 1 investigations included four principal tasks: (1) identification and description of the existing and potential dredging areas within the City of Norfolk; (2) identification and description of the criteria, methods, and locations used for disposal of dredged material; (3) definition and examination of partnering opportunities such as combining dredging jobs (piggybacking) in the interest of reducing mobilization and demobilization costs and, thus, reducing the total costs to the City; and (4) identification and description of the major factors used in determining dredging costs.

Phase 2 investigations included the following tasks: (1) identification of criteria for the prioritization of dredging projects by the City; (2) development of a 5-year prioritized dredging schedule of the City; (3) identification and discussion of potential Federal and state programs/funding sources for “new work” and/or periodic maintenance; and (4) preparation of a report formally documenting the Dredging Master Plan.

ELIZABETH RIVER ENVIRONMENTAL RESTORATION STUDY

The Norfolk District conducted a Federally-funded reconnaissance study during Fiscal Years 1997 and 1998 which determined the need for environmental and other interrelated activities required to restore the Elizabeth River. The reconnaissance study identified a Federal interest in proceeding to a more detailed feasibility study which would be cost shared on a 50/50 basis with the non-Federal sponsors. In this connection, the Commonwealth of Virginia and the Cities of Chesapeake, Norfolk, Portsmouth, and Virginia Beach signed a Feasibility Cost-Sharing Agreement in July 1998 with the Norfolk District to proceed to the feasibility study phase. The feasibility phase is estimated to cost \$2.4 million and extend over a 3-year period.

The study area encompasses the entire Elizabeth River Basin which is located in the Cities of Chesapeake, Portsmouth, Norfolk, and Virginia Beach, within the southside Hampton Roads area of southeastern Virginia. The Elizabeth River is approximately 20 miles in length and has a drainage area of about 165 square miles. Urban, rural, industrial, and residential areas blend together along the Elizabeth River and its branches. More than 13,000 vessels, with a mix ranging from freighters and cargo ships to fishing boats and cabin cruisers, use the Elizabeth River annually. Three hundred years of industry and commerce have made the river one of the nation's most contaminated waterways. Only limited wetlands remain to support wildlife and filter stormwater runoff, the river's leading source of pollution. In 1993, the Chesapeake Bay Program identified the Elizabeth River as a "Region of Concern," targeting it as one of three sites in the Bay watershed where contaminants pose the greatest threat to natural resources. This sub-estuary of the Chesapeake Bay provides spawning grounds for fish; habitat for rare terns, peregrine falcons, and great egrets; and mud flats for shellfish.

The feasibility study, which was initiated in July 1998, will evaluate several environmental restoration projects in the Elizabeth River with primary focus on wetland restoration and sediment clean up. Specifically, 14 candidate wetland restoration sites throughout the watershed have been identified and will be evaluated. In the feasibility phase, field studies will be accomplished to evaluate the environmental, economic, and engineering suitability of these sites for restoration. These candidate sites primarily afford the opportunity for tidal saltmarsh wetland restoration. Various size and configuration alternatives will be developed at the various sites. With regard to sediment clean up, five sites have been identified for evaluation during the feasibility study. The first step in evaluating sediments at any given site is to specifically characterize the type and spatial extent of the sediment contamination. The second step is the identification of treatment technologies and methods. One of the five sites will be evaluated intensively during the feasibility study. The study is scheduled to be completed in 2001, and it will be the basis for construction authorization for the recommended environmental restoration projects.

EASTWARD EXPANSION OF CRANEY ISLAND STUDY

Pursuant to the Congressional authority contained in a September 24, 1997 resolution of the U.S. House Committee on Transportation and Infrastructure, the Norfolk District completed a reconnaissance study in March 1999 which determined a Federal interest in an eastward expansion of the Craney Island Dredged Material Area.

The Commonwealth of Virginia, acting through the VPA, strongly supports the next phase of study, the feasibility phase, and is an equal cost-sharing partner for this effort. The 3-year feasibility phase began in May 1999 and will be completed in 2002. The feasibility report, including NEPA documentation, will be the basis for Congress to authorize construction of an expansion of the Craney Island facility.

An eastward expansion of Craney Island would serve three purposes. First, it would provide a fourth cell which would extend the useful life of Craney Island as a dredged material containment area. Second, once filled, it could provide additional acreage for the development of projected long-term berthing and landside port facilities adjacent to the Norfolk Harbor Channel expressed by the VPA. Third, it could serve as a logistical and tactical area supporting deployment of national defense forces.

The port facilities currently owned by the Commonwealth of Virginia include three separate marine terminals: (1) the Newport News Marine Terminal, (2) Norfolk International Terminal, and (3) Portsmouth Marine Terminal. These terminals are managed by the VPA and are operated by Virginia International Terminals. Newport News Marine Terminal contains 150 acres, Norfolk International Terminal includes approximately 811 acres, and Portsmouth Marine Terminal totals 320 acres (including Sea-Land and CSX sites and 41 acres of undeveloped area). These terminals handle containers, breakbulk, and roll on-roll off (ro-ro) cargoes. All facilities have excellent highway access and are served by either the CSX or Norfolk Southern rail systems.

In order to meet projected future demands, major capital improvements have been recommended for all three of these marine terminals. However, even capital improvements to existing terminals will not fully accommodate the expected growth in and needs of the container shipping industry. Therefore, the VPA projects the need for a fourth marine terminal. They need an additional marine terminal to accommodate the projected rapid increase in container traffic. Also, according to a study conducted by the U.S. Department of Transportation, Office of Intermodalism, entitled "The Impacts of Changes in Ship Design on Transportation Infrastructure and Operations," dated February 1998, mega ships or supercontainer ships are being constructed requiring channel depths of 50 feet or greater to more efficiently transport containers.

The above developments have prompted the Commonwealth of Virginia to explore ways to place the Port of Hampton Roads in a position to effectively capture and be responsive to the projected increases in container movements and the vessels that will move these containers. Hampton Roads has an advantage in terms of channel depths, because it already has a 50-foot outbound channel and has authorized depths to 55 feet. The need for the development of a mega ship port has already prompted support from the VPA to pursue the 50-foot inbound element of the Norfolk Harbor and Channels project.

With regard to the need for an additional container port terminal, the Virginia General Assembly has also authorized a study to evaluate the potential expansion of Craney Island as a site for a fourth marine terminal. The Virginia Secretary of Transportation is responsible for the study and has formed the Craney Island Study Committee to carryout the study.

The study by the Commonwealth is being carefully coordinated with this concurrent Federally-authorized study. The Corps study will address the Federal interest in expanding Craney Island to provide additional capacity for dredged material placement. The study will address a number of issues, including the projected dredged material placement needs in Hampton Roads; engineering and design techniques for the construction of an expansion to Craney Island; environmental, cultural, and social

concerns; cost-sharing issues; and the future disposition of the expanded area of Craney Island to the Commonwealth of Virginia.

LYNNHAVEN RIVER ENVIRONMENTAL RESTORATION STUDY

The Lynnhaven River Basin is located in Virginia Beach on the south shore of the Chesapeake Bay, just west of Cape Henry and 10 miles east of Norfolk. The river, which is a tributary of the Chesapeake Bay, is a rather shallow body of water from which extends two main branches--the Western Branch and the Eastern Branch. In addition, immediately inside Lynnhaven Inlet, there is a narrow channel running easterly known as Long Creek. This ends in a large body of water known as Broad Bay. Broad Bay, in turn, joins a second body of water named Linkhorn Bay. Also, Little Neck Creek, Great Neck Creek, and Crystal Lake all join Linkhorn Bay. All waters within the basin are brackish and are subject to the action of tides. The entire drainage area is 50 square miles. The total water surface area is approximately 10 square miles, and there are 100 miles of shoreline within the basin. There is a Federal navigation project which is maintained within the basin. It consists of channel depths varying from 10 feet deep at the entrance to Chesapeake Bay at Lynnhaven Inlet to 6 feet deep at the Narrows between Broad Bay and Linkhorn Bay.

The basin was once a highly productive ecosystem known worldwide for the famous Lynnhaven oyster. However, widespread residential and commercial development has gradually degraded the environmental resources within the basin. Loss of wetlands and forested buffers have resulted in increased sedimentation and degraded water quality. This, in turn, has caused loss of habitat for submerged aquatic vegetation, shellfisheries (oysters), and finfish/crab spawning and juvenile rearing areas.

The City of Virginia Beach has expressed the need for an environmental restoration study of the Lynnhaven River Basin. In this connection, a study has been authorized by a resolution adopted on May 6, 1998 by the Committee on Transportation and Infrastructure, U.S. House of Representatives. As indicated by a letter dated

November 25, 1998, the City strongly supports the reconnaissance study and has expressed its willingness to cost share in a feasibility study.

The reconnaissance study, which is proposed for initiation in Fiscal Year 2000, will evaluate alternatives to improve the environmental quality of the Lynnhaven River Basin by restoring wetlands, submerged aquatic vegetation, and fisheries. Stabilizing eroding shorelines with wetland fringes, using wetlands for stormwater treatment, and improving submerged bottom by dredging or other methods of decontamination will be evaluated. It is important to note that the Chesapeake Bay, including the Lynnhaven River as a tributary, is one of the most important ecosystems in the nation, and environmental restoration is a high priority within the Administration.

NOTES:

- **From Craney Island study--see list of committee members: Update the information on this list when the text is finalized--Mark will write a letter advising committee of name changes for DE and DDE and ask if there have been other changes--allow 2 to 3 months. See 10/18/99 e-mail--decided to delete list--approved by Mansfield.**

With regard to the need for an additional container port terminal, the Virginia General Assembly has also authorized a study to evaluate the potential expansion of Craney Island as a site for a fourth marine terminal. The Virginia Secretary of Transportation is responsible for the study and has formed a committee to carryout the study. Appointments to the Craney Island Study Committee include:

- Honorable _____, Chairman
Deputy Secretary of Transportation
Commonwealth of Virginia
- J. Robert Bray
Executive Director
Virginia Port Authority
- Colonel Allan B. Carroll
District Engineer
Norfolk District, Corps of Engineers
- J. J. Keever
Executive Vice-President
Hampton Roads Maritime Association

- Elder L. Lash
Chairman, Craney Island Study Commission
City of Portsmouth
- Robert R. Merhige, III
Virginia Port Authority
General Counsel & Deputy Executive Director
- G. Timothy Oksman
City Attorney
City of Portsmouth
- James N. Thomasson
Deputy District Engineer for Project Management
Norfolk District, Corps of Engineers
- Captain George E. Watkins
Virginia Pilot Association

SECTION IV

PROBLEMS, NEEDS, CONCERNS, AND OPPORTUNITIES

SECTION IV

PROBLEMS, NEEDS, CONCERNS, AND OPPORTUNITIES

GENERAL

The following paragraphs present general and specific discussions of navigation problems, needs, concerns, and opportunities identified within the Port of Hampton Roads. The first part of this section discusses general concerns associated with most ports such as anchorages, channels, dredged material placement areas, environmental requirements, funding constraints, rules and regulations, and other common issues. The second part of this section discusses specific navigation concerns which have been identified by port users and other interests (including businesses; private organizations; academia; and Federal, state, regional, and local agencies) within the Hampton Roads area. These specific concerns were identified primarily through interviews, meetings, and correspondence with port users and are categorized under one of the general concerns. The last part of the section presents the relevant prioritization criteria and methodology used by Circle "A" stakeholders to numerically rank the identified problems, needs, concerns, and opportunities.

GENERAL CONCERNS

There are a number of general navigation problems, needs, concerns, and opportunities which have been identified within the Port of Hampton Roads that are common to most large port complexes. These concerns are listed below and discussed in the following paragraphs:

- Anchorages
- Channels
- Dredged Material Placement Areas
- Environmental Concerns
- Funding
- Landside Concerns
- Navigation Information
- Rules and Regulations
- Supplemental Facilities

ANCHORAGES

Natural water depths in most harbors are insufficient to accommodate large ships, which are required to anchor in port. Although large, deep-draft vessels must have a minimum in-port time due to the economics involved in operating costs, on many occasions, vessels are required to anchor while waiting for berths, crews, proper tidal conditions, better weather, or repairs. For these reasons, all ports must have some area where delayed vessels may be anchored safely without obstructing the channels or other water areas provided for the movement of vessels. The existing anchorage areas within Hampton Roads harbor are described in Section II.

CHANNELS

Channels are waterway routes used by ships. Their primary function is to facilitate the safe movement of vessels between two points. They normally connect bodies of deep water and shallow water and permit vessels to call at waterfront facilities. Increases in the number and/or size of vessels calling at ports create a demand for improvement of a harbor's major navigable channels. Also, the improvement of ingress and egress channels to waterfront military and commercial facilities must keep pace with the main channels. Normal concerns, with respect to channels, include their depth, width, length, and location. The existing channels, which comprise the Port of Hampton Roads, are described in Section II.

DREDGED MATERIAL PLACEMENT AREAS

The construction and maintenance of channels, anchorages, and other navigation features within the harbor result in the relocation of significant volumes of dredged material. The location of a convenient and environmentally acceptable dredged material placement area within economical distance of dredging operations is a crucial aspect of the operation and maintenance of all ports. The Craney Island Dredged Material Area serves this purpose. It is a 2,500-acre Federally-owned confined placement area located within the Hampton Roads harbor complex. Dredged material may also be placed in one of the two designated and approved off-shore sites, the Dam Neck Dredged Material Area and the Norfolk Dredged Material Area. These placement areas are described in Section II.

ENVIRONMENTAL CONCERNS

Environmental concerns are related to the identification and description of beneficial and adverse effects of actions within the port on significant natural resources and historical properties. Relevant evaluations are necessary to comply with the requirements of Federal, state, and local legislation. Representative Federal laws include the Rivers and Harbors Appropriation Act of 1899, as amended; the Fish and Wildlife Coordination Act of 1958; the National Historic Preservation Act of 1966; the NEPA of 1969; the Clean Water Act; the Coastal Zone Management Act of 1972; the Marine Protection, Research, and Sanctuaries Act of 1972; and the Endangered Species Act of 1973. These evaluations include the effects on the ecological, cultural, and aesthetic attributes of the natural, historical, and cultural resources of the port area. Ecological attributes are components of the environment that directly or indirectly sustain dynamic, diverse, and viable ecosystems such as wetlands; plant and animal species; habitat; and the chemical and physical properties of air, water, and soil and other natural resources. Cultural attributes are evidence of past and present habitation that can be used to reconstruct or preserve human life ways. These include structures, sites, artifacts, and environmental and other relevant information. Aesthetic attributes are perceptual stimuli that provide diverse and pleasant surroundings for human enjoyment and appreciation such as sight, sound, scents, and tastes. Concerns are reviewed and addressed through the

environmental permitting requirements of the Corps of Engineers and the appropriate state and local authorities."

FUNDING

The operation and development of all aspects of the port are dictated by budget constraints to various degrees. Rarely, if ever, are there sufficient funds to accomplish all that port users and interests desire. Thus, it is necessary to establish priorities so that available funds are used most efficiently and effectively. A primary purpose of the Plan is to prioritize the identified problems, needs, concerns, and opportunities associated with the operation, maintenance, and development of the port to better facilitate the allocation of limited funds.

LANDSIDE CONCERNS

Landside concerns are numerous and varied, and they include the facilities and resources necessary for port operations. These concerns include receiving, storage, and transfer facilities; intermodal systems and land access; land for future development; police and fire protection; a productive workforce; and impacts on host cities--all of which are important within the port complex. In order to maintain a competitive port and to provide for future growth, it is imperative that the most effective landside facilities, resources, and operations are in place to compliment the waterways and related improvements to insure efficient, safe, and equitable operations within the Hampton Roads port complex.

NAVIGATION INFORMATION

Safe and efficient navigation requires accurate and timely information regarding water depths and levels, tides, currents, and other pertinent oceanographic and meteorological data. Much of this information is provided by the National Oceanic and Atmospheric Administration and is contained on nautical charts. Hydrographic surveys to determine the configuration of the bottom of water bodies, including the location and identification of derelict vessels and obstructions, are crucial to safe navigation, as is the precise location of landmarks and navigation aids. Harbor pilots and ship masters also

require accurate and real-time information in order to avoid groundings and collisions and permit the full utilization of tidal cycles. Real-time data regarding water levels, currents, and tidal conditions permit port authorities and maritime shippers to make sound decisions regarding loading of tonnage based on available bottom clearance of the vessel which will maximize loads and limit passage time without impacting safety.

RULES AND REGULATIONS

As discussed in Section I, there are numerous rules and regulations administered by a number of Federal, state, and local agencies within any major harbor. These rules and regulations are necessary to efficiently and safely operate the port while protecting the environment. Some concern was expressed by stakeholders regarding the continued availability of appropriate permits for commercial development within the port and the opportunity to reduce and/or streamline some of the existing requirements.

SUPPLEMENTAL FACILITIES

These facilities include turning basins, piers and wharves, and berthing and mooring areas required to accommodate vessels using the navigation channels and adjacent businesses. These necessary adjuncts to the harbor complex are critical to the operation of an efficient and competitive port. Vessels must have adequate turning areas for proper and safe maneuvering within the navigation channels. Adequate piers and wharves and berthing and mooring areas are necessary to permit ships to be loaded and unloaded in a timely manner without having to wait in anchorage areas at considerable costs to owners and operators. There is a need to insure that these facilities are sufficient to accommodate the number and size of vessels calling at the port both now and in the foreseeable future. This need will be exacerbated by the expected increase in the number and size of ships calling at the port, particularly container vessels.

SPECIFIC CONCERNS

A survey of port users and interests was accomplished in the early stages of the development of the Plan to identify specific problems, needs, concerns, and opportunities

associated with the use and development of the navigation features of the port and the opportunities available for improvements. As part of the survey, respondents provided their short-range (less than 5 years) and long-range navigation plans so that future impacts on port use and development could be estimated. They also provided a rationale for determining the importance of their concerns which guided Circle "A" stakeholders in establishing the prioritization criteria subsequently listed and ultimately assisted Circle "A" in the ranking of identified concerns. Information obtained through personal contacts was supplemented and confirmed at the first two workshop meetings conducted in October 1997 and June 1998. The complete list of concerns was also coordinated with more than 400 stakeholders on the Plan mailing list to obtain their input. The views of individual port users and interests obtained through personal surveys and workshop meetings were crucial to providing a comprehensive assessment of current and future navigation concerns facing the port. The following table lists the specific problems, needs, concerns, and opportunities which have been identified. Specific items of concern are listed under the appropriate general concern categories previously discussed.

Table IV-1. IDENTIFIED PROBLEMS, NEEDS, CONCERNS, AND OPPORTUNITIES

- I. Anchorages
 - A. Sewells Point: Need to deepen the westernmost anchorage opposite Sewells Point (K-2) from 40 feet to the authorized depth of 45 feet
 - B. Sewells Point: Need to increase the swinging radius in the easternmost, 45-foot-deep anchorage opposite Sewells Point (K-1) from the authorized radius of 1,200 feet to the recommended radius of 1,500 feet
 - C. Sewells Point: Need to make broader use of the anchorages opposite Sewells Point (K-1 and K-2)
 - D. Lamberts Point: Need to make broader use of the anchorages opposite Lamberts Point (H-1)
 - E. Newport News: Need to deepen both anchorages opposite Newport News (I-1 and I-2) from 40 feet to the authorized depth of 45 feet
 - F. Hampton Roads Bridge-Tunnel: Need to deepen the 1,500-foot swinging radius anchorage (F) just west of the Hampton Roads Bridge-Tunnel from 50 feet to the authorized depth of 55 feet
 - G. Need additional anchorages

Table IV-1. IDENTIFIED PROBLEMS, NEEDS, CONCERNS, AND
OPPORTUNITIES
(Cont'd)

II. Channels

A. Depths

1. Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to 50 feet to Lamberts Point (1)
2. Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to the authorized depth of 55 feet to Lamberts Point (2)
3. Norfolk Harbor Channel: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet to Lamberts Point (3)
4. Elizabeth River Channel: Need to deepen from 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern and Southern Branch Channels
5. Southern Branch Channel: Need to deepen from 40 feet to the authorized depth of 45 feet to the Norfolk Southern Railroad bridge
6. Southern Branch Channel: Need to deepen from 35 feet to the authorized depth of 40 feet to the Gilmerton Bridge
7. Channel to Newport News: Need to deepen the inbound lane from 50 feet to the authorized depth of 55 feet (4)
8. Channel to Newport News: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet (5)

B. Widths

1. Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 50 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated
2. Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 55 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated

C. Maintenance dredging: Continued and timely maintenance of port channels

D. Crossings

1. Bridges
2. Tunnels
3. Utility crossings

E. Multiple-use conflicts: Potential conflicts between recreational, commercial, and military uses

F. Navigation aids

1. Better channel markings
2. More lighted buoys

Table IV-1. IDENTIFIED PROBLEMS, NEEDS, CONCERNS, AND
OPPORTUNITIES
(Cont'd)

- G. Obstructions
 - 1. Derelict vessels, sunken barges, etc.
 - 2. Debris and drift material
 - 3. Docked boats which obstruct view of navigation channel

- III. Dredged Material Placement Areas
 - A. Need to extend life of Craney Island Dredged Material Area and/or locate alternative future placement sites
 - B. Use of Craney Island Dredged Material Area for port development

- IV. Environmental Concerns
 - A. Contaminated areas along rivers and on river bottoms
 - B. Deep channel effects on currents and depths in the vicinity of the Norfolk Naval Base
 - C. Water quality
 - D. Wetlands

- V. Funding

- VI. Landside Concerns
 - A. Receiving, storage, and transfer facilities
 - B. Intermodal facilities which may impact navigation
 - C. Land for future development
 - D. Police and fire protection
 - E. Productive workforce
 - F. Impact of port growth on the host cities

- VII. Navigation Information
 - A. Depths
 - B. Tides
 - C. Currents
 - D. Waves
 - E. Weather
 - F. Planning and management tools
 - G. Twenty-four hour side scan sonar capability

- VIII. Rules and Regulations
 - A. Dredging permits
 - B. Unnecessary and burdensome

Table IV-1. IDENTIFIED PROBLEMS, NEEDS, CONCERNS, AND
OPPORTUNITIES
(Cont'd)

- IX. Supplemental Facilities
 - A. Turning basins
 - B. Piers and wharves
 - C. Berthing and mooring areas
 - D. Additional dolphins for commercial vessels at Great Bridge Lock
 - E. Recreational boating facilities

-
- (1) This segment of channel also requires the deepening of the inbound lane of the Thimble Shoal Channel from 45 feet to 50 feet.
 - (2) This segment of channel also requires the deepening of the inbound lane of the Thimble Shoal Channel from 45 feet to the authorized depth of 55 feet and the Atlantic Ocean Channel to the recommended depth of 60 feet.
 - (3) This segment of channel also requires the deepening of the outbound lane of the Thimble Shoal Channel from 50 feet to the authorized depth of 55 feet and the Atlantic Ocean Channel to the recommended depth of 60 feet.
 - (4) This segment of channel also requires the deepening of a portion of the inbound lane of the Norfolk Harbor Channel from 45 feet to the authorized depth of 55 feet, the inbound lane of the Thimble Shoal Channel from 45 feet to the authorized depth of 55 feet, and the Atlantic Ocean Channel to the recommended depth of 60 feet.
 - (5) This segment of channel also requires the deepening of a portion of the outbound lane of the Norfolk Harbor Channel from 50 feet to the authorized depth of 55 feet, the outbound lane of the Thimble Shoal Channel from 50 feet to the authorized depth of 55 feet, and the Atlantic Ocean Channel to the recommended depth of 60 feet.

The following paragraphs discuss the specific concerns in the order in which they are listed in the previous table. Each concern is described as defined by the stakeholder(s) who identified it. When possible, the concerns are incorporated into the plan verbatim from the port user surveys. All specific problems, needs, concerns, and opportunities related to navigation within the port which have been identified are included, regardless of their relative importance. In some cases, related concerns are discussed together.

ANCHORAGES

The specific concerns related to anchorages are generally divided into four areas of the harbor: Sewells Point, Lamberts Point, Hampton Roads Bridge-Tunnel, and Newport News. For the most part, brief descriptions given in Table IV-1 adequately define the need as expressed by port users and interests. The basic concern, with respect to anchorage areas, is that they be sufficient in size, number, and location to safely and efficiently accommodate existing and prospective vessel traffic. Port interests expressed a need to construct the existing authorized anchorages to their fully authorized dimensions to be commensurate with increased channel dimensions. They also indicated opportunities for more commercial usage of the Navy anchorage areas opposite Sewells Point and a potential for the provision of additional deep-draft anchorages in the future to accommodate port growth and maintain its competitiveness.

CHANNELS

More channel-related problems, needs, concerns, and opportunities were indicated by port users and interests than any other aspect of the harbor. These concerns are divided into seven individual categories: depths, widths, maintenance dredging, crossings, multiple-use conflicts, navigation aids, and obstructions. Each of these categories is discussed as follows:

Depths

Norfolk Harbor Channel: Need to Deepen the Inbound Lane from 45 Feet to 50 Feet to Lamberts Point. This concern also requires the deepening of the inbound lane of the Thimble Shoal Channel from 45 feet to 50 feet since provision for both are required to achieve the desired results. Addressing this need would provide an inbound channel depth equal to the existing outbound channel depth, eliminating the current two-level channel situation. It would primarily accommodate the existing and prospective increase in the size of container ships calling at the southside of the port.

Norfolk Harbor Channel: Need to Deepen the Inbound Lane from 45 Feet to the Authorized Depth of 55 Feet to Lamberts Point. This concern also requires the deepening of the inbound lane of the Thimble Shoal Channel from 45 feet to the authorized depth of 55 feet and the Atlantic Ocean Channel to the recommended depth of 60 feet to achieve prospective benefits. The need for the Atlantic Ocean Channel is a part of the Federally-authorized project to deepen the Hampton Roads harbor channels to a depth of 55 feet. The additional 5 feet in channel depth for the Atlantic Ocean Channel is required due to its open-ocean environment and the need for increased clearances beneath vessels keels and the channel bottom. This project is described in detail in Section II. The entire deepening project, including the Atlantic Ocean Channel deepening, is required to safely and efficiently accommodate large bulk coal carriers departing the port with loaded drafts 50 feet and greater and to facilitate the inbound transit of the largest current and future container ships. An inbound channel that is 55 feet deep could be an independent increment of the overall Hampton Roads harbor authorized project providing safe and efficient access to the southside of the port for the largest container ships expected in the foreseeable future.

Norfolk Harbor Channel: Need to Deepen the Outbound Lane from 50 Feet to the Authorized Depth of 55 Feet to Lamberts Point. This concern also requires the deepening of the outbound lane of the Thimble Shoal Channel from 50 feet to the authorized depth of 55 feet and the Atlantic Ocean Channel to the recommended depth of 60 feet to provide a viable increment of the overall authorized Federal project. This would primarily serve the large bulk coal carriers departing the southside of the port with loaded drafts of 50 feet or greater. It would enable owners and operators of their ships to utilize the additional cargo carrying capacity of their vessels, thereby achieving savings in transportation costs and permitting larger vessels into the trade.

Elizabeth River Channel: Need to Deepen from 40 Feet to the Authorized Depth of 45 Feet from Lamberts Point to the Junction of the Eastern and Southern Branch Channels. This would benefit the terminals and ship repair yards located along

this reach of the river and would provide safe and efficient access for larger ships to these areas.

Southern Branch Channel: Need to Deepen from 40 Feet to the Authorized Depth of 45 Feet to the Norfolk Southern Railroad Bridge. This would benefit the various industries, ship repair yards, and storage facilities located along this reach of the river and would provide safe and efficient access for larger ships to these locations.

Southern Branch Channel: Need to Deepen from 35 Feet to the Authorized Depth of 40 Feet to the Gilmerton Bridge. This concern expresses a need to deepen the existing 35-foot-deep channel to accommodate both existing and future vessel traffic engaged in the transport of grain, petroleum products, and miscellaneous dry and liquid bulk commodities. It would also provide an opportunity for further industrial development along the Southern Branch.

Channel to Newport News: Need to Deepen the Inbound Lane from 50 Feet to the Authorized Depth of 55 Feet. Addressing this need would also require the deepening of a portion of the inbound lane of the Norfolk Harbor Channel from 45 feet to the authorized depth of 55 feet, the inbound lane of the Thimble Shoal Channel from 45 feet to the authorized depth of 55 feet, and the Atlantic Ocean Channel to the recommended depth of 60 feet. An inbound channel that is 55 feet deep would provide safe and efficient access to the northside of the port for the largest container ships expected in the foreseeable future.

Channel to Newport News: Need to Deepen the Outbound Lane from 50 Feet to the Authorized Depth of 55 Feet. Addressing this need would also require the deepening of a portion of the outbound lane of the Norfolk Harbor Channel from 50 feet to the authorized depth of 55 feet, the outbound lane of the Thimble Shoal Channel from 50 feet to the authorized depth of 55 feet, and the Atlantic Ocean Channel to the recommended depth of 60 feet. This would primarily serve the large bulk coal carriers departing the northside of the port with loaded drafts of 50 feet or greater. It

would enable owners and operators of these ships to utilize additional cargo carrying capacity of their vessels, thereby achieving savings in transportation costs and permitting larger vessels into the trade.

Widths

Need to Deepen the Entire Easternmost Anchorage Area Opposite Sewells Point (K-1) and a Small Section of Channel to 50 Feet to Provide Easier Transit between the Norfolk Harbor Channel and the Channel to Newport News; in Addition, the K-1 Anchorage Would Need to Be Relocated. The need is to provide a safer and more efficient turn to facilitate the maneuvering of large vessels from one channel to the other. On some occasions, it is necessary to use tugs for making the turn.

Need to Deepen the Entire Easternmost Anchorage Area Opposite Sewells Point (K-1) and a Small Section of Channel to 55 Feet to Provide Easier Transit between the Norfolk Harbor Channel and the Channel to Newport News; in Addition, the K-1 Anchorage Would Need to Be Relocated. A depth of 55 feet would provide safe and efficient maneuvering between channels for the largest bulk coal carriers and container ships, and it would be commensurate with the deepening of the Hampton Roads harbor channels to the authorized depth of 55 feet.

Maintenance Dredging

Another need is to insure that the Corps of Engineers continue its program to provide maintenance dredging of the main Federal channels of the port at appropriate intervals to make sure that proper dimensions are available for efficient, effective, and safe navigation.

Crossings

Bridges. A general concern for the port is the increasing waterway traffic that requires frequent bridge openings which delay cars and trucks and/or added bridge

opening restrictions which severely hamper boat traffic. Increasing highway traffic significantly adds to congestion and delays. This particularly becomes a problem during the recreation boating season which adds substantially to bridge opening requirements. More effective coordination, especially during peak traffic times, is needed to help alleviate the current situation. Additional vertical clearance may be required under new highway bridges and additional tunnels may be required in the future to adequately address this problem. Specific concerns were expressed regarding the dual highway and railroad bridges at Gilmerton which restrict the size of vessels that may transit upstream from this point on the Southern Branch and, consequently, hamper future industrial development in this reach of the river. Also, specific concerns were expressed with the efficiency of openings for the Jordan Bridge on the Southern Branch and the Norfolk Southern railway bridge on the Eastern Branch.

Tunnels. The need for utilizing tunnels in lieu of bridges for channel crossings was expressed as a concern since some believe that tunnel crossings are less restrictive for both water and highway traffic. Tunnels can, however, reduce the depth to which navigation channels can be constructed.

Utility Crossings. Overhead utilities can restrict the height of vessels transiting channel, and underground utilities can limit the depth of navigation channels--both impacting the size of vessels.

Multiple-Use Conflicts

The various uses of the waterways in the Hampton Roads area can, at times, be incompatible with each other. Since waterways are limited in space and, as more users and uses are introduced in the water, demand and competition for space increases and conflicts may occur. Use conflicts may result in boating accidents, user complaints, disturbances of wildlife and wildlife habitat, water quality degradation, or boat wake erosion of wetlands and/or private waterfront property. The need exists for improved waterway use management in the Hampton Roads area and for increased awareness of existing concerns by localities, resource management agencies, and the state legislature.

Navigation Aids

Better Channel Markings. There is a need for a directional sign at the confluence of the Eastern and Southern Branches to prevent transient boats from going up the Eastern Branch looking for the Intracoastal Waterway. Also, more prominent no-wake zone signs are needed between Norfolk and Portsmouth; the existing signs are helpful but are difficult to see. Tugs, commercial boats, and pleasure craft create too much wake in this area of the river. Southbound vessels in the Elizabeth River pass too close to Portside in Portsmouth. This problem is exacerbated by the location of Harbor Towers and trees which block the line-of-sight for boat operators coming out of Portside. A red buoy on the curve of the channel near Harbor Towers would cause boat operators going southbound to make a wider turn when passing Portside.

More Lighted Buoys. There is a need for more lighted buoys in the Port Norfolk Reach of the channel to assist transient pleasure boat operators who are unfamiliar with the harbor.

Obstructions

Derelict Vessels, Sunken Barges, Etc. Abandoned and/or derelict vessels, barges, and similar objects sunken in the harbor area are a concern. In addition to being aesthetically undesirable, they can adversely impact navigation safety and the aquatic environment. As an abandoned vessel ages, it breaks apart providing sources of floating debris which can cause damages to boats. Also, derelict vessels can destroy submerged aquatic vegetation and may leach toxic chemicals to the water from paint, fuel, and oil.

Debris and Drift Material. There is a continuous need for the collection and removal of floating debris and drift material from the waters of the harbor that may damage vessels or threaten public health, recreation, and/or the environment. Derelict objects, such as waterfront structures and sunken vessels, are a concern since they provide substantial sources for floating debris.

Docked Boats Which Obstruct View of Navigation Channel. One concern was expressed regarding the large dolphin in the river near the confluence of the Eastern and Southern Branches of the Elizabeth River. When a large ship is docked there for repairs, it blocks the view of east-bound traffic, causing a potential hazard.

DREDGED MATERIAL PLACEMENT AREAS

Need to Extend the Life of Craney Island Dredged Material Area and/or Locate Alternative Future Placement Sites

It is imperative that the Hampton Roads maritime interests implement a practical and feasible long-range solution for placement of dredged material. It is important to plan for and implement suitable, well-placed, environmentally acceptable, and economically viable dredged material placement areas to insure the effective and efficient maintenance of the port. The channels and other navigation features in Hampton Roads must be appropriately maintained if the area's nationally vital commercial and military functions are to continue. To meet the future dredged material placement needs, consideration would have to be given to the expansion of the Craney Island Dredged Material Area and/or finding, acquiring, and developing alternative sites. The provision of adequate future areas will require addressing concerns such as environmental issues, wetlands, and competing land uses.

Use of Craney Island Dredged Material Area for Port Development

Port interests have long recognized the outstanding potential available to make use of part of the Craney Island Dredged Material Area for future development. Its location, adjacent to deepwater channels, presents exceptional advantages for port use. The Virginia General Assembly has authorized the Craney Island Study Commission, which is comprised of representatives from the VPA, the City of Portsmouth, the Hampton Roads Maritime Association, and the Army Corps of Engineers, to examine current use and future expansion of Craney Island and recommend appropriate future use of the area. The potential expansion of the facility could provide areas for development

of an additional container facility to accommodate future growth while providing for the future efficient and cost-effective placement of dredged material from adjacent channels.

ENVIRONMENTAL CONCERNS

Contaminated Areas along Rivers and on River Bottoms

Many years of industrial and commercial use have resulted in contaminants located along the shores of the harbor and in bottom sediments. The worst of these areas are located within the Elizabeth River Basin, specifically its Southern Branch. As discussed in Section III, the Elizabeth River Basin feasibility study initiated in June 1998 will address five contaminant sites within the Elizabeth River. However, there may be other problem areas within the port, that are outside the scope of the Elizabeth River Basin study.

Deep Channel Effects on Currents and Depths in the Vicinity of the Norfolk Naval Base

Concern was expressed with the impacts, if any, of adjacent deep-draft channels on the currents and depths in the vicinity of the Naval Base.

Water Quality

Several concerns were expressed regarding the improvement of water quality within the port. These concerns are as follows:

- Facilities should be provided for proper disposal of on-board waste, especially with respect to recreational boats and marinas;
- The direct pumping of bilge water into the harbor should be eliminated;
- Container facilities should be designed to include elements that reduce or eliminate untreated stormwater runoff, provide adequate containment areas

for liquid and gas containers, and provide elements to eliminate possible contamination during transfer;

- Bulk cargo storage facilities should be designed to reduce emissions of dust and debris into air, water, and soil;
- Eliminate and/or control what is commonly referred to as “prop” dredging; and
- Provide for the proper handling of contaminated dredged material.

Wetlands

Concerns have been expressed regarding the filling and draining of wetlands of the waterways of Hampton Roads over many years. This type of wetland alteration and destruction has likely reduced the diversity of fish and wildlife in the area and served to reduce water quality. Restoration of these wetlands would benefit fish and wildlife resources, improve water quality, and generally make the area more aesthetically pleasing.

FUNDING

Funding is a general concern that applies to all aspects of port operation and development. As previously stated in the section describing general concerns, a primary purpose of the Plan is to prioritize the identified problems, needs, concerns, and opportunities to better facilitate the allocation of limited funds.

LANDSIDE CONCERNS

Receiving, Storage, and Transfer Facilities

In order to maintain a competitive port and to provide for future growth, it is imperative that the most efficient and effective facilities are in place to accommodate the transfer of cargo with the least amount of port time for ships. There is a need to insure

that sufficient storage areas are available and that transfer facilities, such as container cranes, are upgraded to accommodate larger vessels.

Intermodal Facilities Which May Impact Navigation

Potential issues which have been identified as significant concerns include access to port facilities, safety, costs, bridge clearances and weight limits, travel time, and transfer and connection between modes. There is a need for the port area to significantly improve the land-based transportation network that is projected to carry even greater volumes of marine freight in the future. Accelerated development throughout the region is resulting in congestion on the area's transportation infrastructure. Roads, tunnels, bridges, and rail systems that serve the port terminals have reached and, in some cases, surpassed capacity. Also, channel dredging projects have been identified as one of the specific infrastructure needs that substantially impacts intermodal transportation in the Hampton Roads area. Concerns specific to bridges and tunnels and to navigation channel needs were discussed previously in this section.

Land for Future Development

Land suitable for maritime facilities is at a premium within the port area. It is necessary that every effort be made to maximize existing land use. Although some undeveloped land remains adjacent to deep-water channels within the port, the major opportunity for the future may be the redevelopment of existing properties and more efficient use of existing land areas. A survey of the harbor area indicates a significant amount of under-developed properties located adjacent to deep water channels. The potential use of the Craney Island Dredged Material Area for port development, as discussed previously, would provide a substantial amount of prime waterfront property located adjacent to deep navigation channels for future commercial maritime use.

Police and Fire Protection

With respect to this specific category, only one concern was expressed during the survey of port users. A potential problem may exist with the capability to deal with spills of hazardous material and petroleum products during emergency situations, such as

hurricanes. Although a coordinated emergency response system is currently in place, the severity of the problem and the extent of the risk during emergencies may be beyond the capability of the system and is a concern that warrants consideration.

Productive Workforce

Economic activity directly and indirectly associated with the port creates a need for a substantial number of workers. As indicated previously in Section I, over 128,000 people in Virginia are employed in port-related jobs. It is important that skilled workers are available within the area surrounding the port to satisfy future employment needs. Also of comparable importance is the continued cooperative attitude between labor and management, which is essential to maintaining an efficient and competitive port.

Impact of Port Growth on Host Cities

A concern was expressed with the impact of port development in Newport News, Norfolk, and Portsmouth. Although the positive economic impacts of the VPA marine terminals are dispersed throughout the Hampton Roads area and the Commonwealth, the significant operational impacts of their presence such as land acquisition, rail and truck traffic congestion, and tax exempt status are localized in the three host cities. Some have indicated a need for a partnership with the host cities to accommodate and foster continued port growth while allowing the port to achieve its potential and the Commonwealth and host cities to enjoy the associated benefits.

NAVIGATION INFORMATION

The first five items listed in Table IV-1 under "Navigation Information" are depths, tides, currents, waves, and weather. These are required basic navigation data which are inter-related and, therefore, their discussion is combined. The need as expressed by port users is the ability to get vessels in and out of the port as fast as possible, with maximum loads and under safe conditions. To accomplish this requires accurate and timely information, permitting vessel operators to make greater and more efficient use of existing navigation conditions. Currently, operators rely essentially on

charts which are based on average conditions and not on actual data for the specific time of sailing. The National Oceanic and Atmosphere Administration has developed a Physical Oceanographic Real Time System (PORTS) to support maritime commerce and navigation safety which is presently in use at several areas, including the lower Chesapeake Bay, Houston/Galveston, New York/New Jersey Harbor, San Francisco Bay, and Tampa Bay. The system provides accurate real-time oceanographic and meteorological information tailored to the specific needs of individual ports. State-of-the-art instruments measure water level, water temperature, conductivity, wind speed, wind direction, wind gusts, air temperature, and barometric pressure at various locations in a harbor. These data are collected and processed by remote data collection platforms, then transmitted to a centralized data acquisition system. The information is then formatted into text, voice, or graphic outputs. The data are updated every six minutes and can be accessed immediately via the internet, modem dial-in, or telephone. You can access PORTS on the internet at its website address (*www.opsd.nos.noaa.gov*).

Planning and Management Tools

Concern was expressed regarding the need for certain planning and management tools for effective port development. These may include:

- Environmental database development, including information on previous port development efforts, studies done in connection with them, and monitoring results and other pertinent data made readily available through today's new media and data dissemination formats;
- Hydrodynamic model development, which is a new capability using computer simulation in place of the physical models that were once used to evaluate the response of an estuary to physical changes; numerical models, once calibrated and verified at appropriate scales for Hampton Roads waterways, can be used to answer many "what if" questions very early in the planning process; and

- Observational systems development, which is another new capability to monitor more easily the "vital statistics" of estuarine behavior through state-of-the-art oceanographic instrumentation; new instruments such as acoustic Doppler current profiling (ADCP) systems offer innovative means of observing waves, currents, water temperature, and suspended sediment concentration.

Twenty-Four Hour Side Scan Sonar Capability

Concern was indicated for access to 24-hour side scan sonar capability within the port. This would permit a more rapid determination of the extent of a channel blockage due to sunken objects such as ships, barges, buoys, etc., and it would assist in keeping the harbor channels open to vessel traffic.

RULES AND REGULATIONS

Dredging Permits

A concern was expressed regarding the continued availability of appropriate permits for commercial facilities located within the port.

Unnecessary and Burdensome

Concern was indicated for the increasing number of rules and regulations required to do business within the port. Some believe that many of the rules and regulations are unnecessary, and they make it difficult for small companies to do business within the port.

SUPPLEMENTAL FACILITIES

Turning Basins

A general concern, with respect to turning basins, is that they be sufficient in size, number, and location to safely and efficiently accommodate existing and prospective

vessel traffic; in addition, that they be commensurate with any future increased channel dimensions.

Piers and Wharves

The maintenance of a competitive port which provides for future growth requires that adequate piers and wharves are available to accommodate the size and type of vessels calling at the port now and in the foreseeable future. Piers and wharves must be sufficient to permit ships to load and unload as efficiently as possible, reducing in-port time to a minimum.

Berthing and Mooring Areas

Adequate berthing and mooring areas are necessary to permit ships to be loaded and unloaded in a timely manner without having to wait in anchorage areas at considerable costs. There is a need to insure that there are sufficient berths for the number and size of vessels calling this port now and in the foreseeable future. This need will be exacerbated by the expected increase in the number and size of ships calling at the port, particularly container vessels.

Additional Dolphins for Commercial Vessels at the Great Bridge Lock

A concern was indicated for more dolphins at the Great Bridge Lock for larger vessels. Currently, there is space for only two commercial vessels, and the area can become very congested. This situation is exacerbated during the spring and fall seasons when many pleasure boats are passing through the area on the Atlantic Intracoastal Waterway.

Recreational Boating Facilities

Concerns were indicated for specific additional recreational boating facilities within the Hampton Roads harbor area. Some additional facilities which were suggested include launching ramps, pump-out stations, reasonably accessible and affordable pier spaces especially for large sailing vessels, and harbor of refuge spaces for transient pleasure craft.

PRIORITIZATION CRITERIA AND RANKING

Time and resources must be efficiently allocated to properly address the most important identified problems, needs, concerns, and opportunities facing the port. In order to effectively evaluate the many and various concerns within the port, it is necessary to develop a prioritized list. This portion of the section presents the relevant criteria used in developing the priority ranking of previously identified concerns. These criteria provide a checklist when weighing the individual concerns to insure that all pertinent aspects are considered in the decision process. The following is an alphabetical list of items which are considered important in establishing a priority of action:

- Benefits
- Business: Attraction and location of new domestic and foreign business
- Commerce
- Competitiveness of the port
- Congestion, delays, and losses
- Costs
- Dredging cost efficiency
- Economic impacts
- Efficiency/productivity
- Environmental quality
- Fiscal impact on host cities
- Growth of port
- Landside development
- Mega ship operation
- Military importance
- Safety
- Seasonal pleasure boat operation
- Vessel traffic

The relative importance of each criterion varied with respect to the problem, need, concern, or opportunity to which it was being applied and to the individual making the judgement. A committee of port users and interests, referred to as Circle "A" stakeholders and identified in Section I, was responsible for assigning priority rankings to each of the identified concerns. The Circle "A" stakeholders considered the importance of each prioritization criterion as it applied to each concern in making their evaluations. The individual numeric rankings were then combined to develop a composite list based on the total assigned values. The following table lists the problems, needs, concerns, and opportunities as just described.

Table IV-2. PRIORITIZATION OF IDENTIFIED PROBLEMS, NEEDS, CONCERNS, AND OPPORTUNITIES

Concern	Assigned numeric ranking
I. Anchorages	
A. Sewells Point: Need to deepen the westernmost anchorage opposite Sewells Point (K-2) from 40 feet to the authorized depth of 45 feet	18
B. Sewells Point: Need to increase the swinging radius in the easternmost, 45-foot-deep anchorage opposite Sewells Point (K-1) from the authorized radius of 1,200 feet to the recommended radius of 1,500 feet	22
C. Sewells Point: Need to make broader use of the anchorages opposite Sewells Point	19
D. Lamberts Point: Need to make broader use of the anchorages opposite Lamberts Point	40
E. Newport News: Need to deepen both anchorages opposite Newport News from 40 feet to the authorized depth of 45 feet	29
F. Hampton Roads Bridge-Tunnel: Need to deepen the 1,500-foot swinging radius anchorage (F) just west of the Hampton Roads Bridge-Tunnel from 50 feet to the authorized depth of 55 feet	16
G. Need additional anchorages	49

Table IV-2. PRIORITIZATION OF IDENTIFIED PROBLEMS, NEEDS, CONCERNS,
AND OPPORTUNITIES
(Cont'd)

Concern		Assigned numeric ranking
II.	Channels	
A.	Depths	
1.	Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to 50 feet to Lamberts Point	5
2.	Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to the authorized depth of 55 feet to Lamberts Point	7 (tie)
3.	Norfolk Harbor Channel: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet to Lamberts Point	2
4.	Elizabeth River Channel: Need to deepen from 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern and Southern Branch Channels.....	6
5.	Southern Branch Channel: Need to deepen from 40 feet to the authorized depth of 45 feet to the Norfolk Southern Railroad Bridge.....	10 (tie)
6.	Southern Branch Channel: Need to deepen from 35 feet to the authorized depth of 40 feet to the Gilmerton Bridge	12
7.	Channel to Newport News: Need to deepen the inbound lane from 50 feet to the authorized depth of 55 feet	14
8.	Channel to Newport News: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet	9

Table IV-2. PRIORITIZATION OF IDENTIFIED PROBLEMS, NEEDS, CONCERNS,
AND OPPORTUNITIES
(Cont'd)

Concern		Assigned numeric ranking
B.	Widths	
1.	Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 50 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated	10 (tie)
2.	Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 55 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated	15
C.	Maintenance dredging: Continued and timely maintenance of port channels.....	1
D.	Crossings	
1.	Bridges	23
2.	Tunnels.....	17
3.	Utility crossings	42
E.	Multiple-use conflicts: Potential conflicts between recreational, commercial, and military uses	33
F.	Navigation aids	
1.	Better channel markings	26 (tie)
2.	More lighted buoys	37
G.	Obstructions	
1.	Derelict vessels, sunken barges, etc.....	30 (tie)
2.	Debris and drift material	48
3.	Docked boats which obstruct view of navigation channel	51
III.	Dredged Material Placement Areas	
A.	Need to extend life of Craney Island Dredged Material Area and/or locate alternative future placement sites	3
B.	Use of Craney Island Dredged Material Area for port development	4

Table IV-2. PRIORITIZATION OF IDENTIFIED PROBLEMS, NEEDS, CONCERNS,
AND OPPORTUNITIES
(Cont'd)

Concern		Assigned numeric ranking
IV.	Environmental Concerns	
A.	Contaminated areas along rivers and on river bottoms.....	20
B.	Deep channel effects on currents and depths in the vicinity of the Norfolk Naval Base	43
C.	Water quality.....	13
D.	Wetlands	28
V.	Funding	7 (tie)
VI.	Landside Concerns	
A.	Receiving, storage, and transfer facilities	38
B.	Intermodal facilities which may impact navigation.....	21
C.	Land for future development	45
D.	Police and fire protection	47
E.	Productive workforce.....	50
F.	Impact of port growth on the host cities	46
VII.	Navigation Information	
A.	Depths	32
B.	Tides.....	25
C.	Currents.....	24
D.	Waves.....	41
E.	Weather	34 (tie)
F.	Planning and management tools	39
G.	Twenty-four hour side scan sonar capability	34 (tie)
VIII.	Rules and Regulations	
A.	Dredging permits	44
B.	Unnecessary and burdensome.....	52
IX.	Supplemental Facilities	
A.	Turning basins.....	31 (tie)
B.	Piers and wharves	26 (tie)
C.	Berthing and mooring areas	36

Table IV-2. PRIORITIZATION OF IDENTIFIED PROBLEMS, NEEDS, CONCERNS,
AND OPPORTUNITIES
(Cont'd)

Concern	Assigned numeric ranking
D. Additional dolphins for commercial vessels at Great Bridge Lock	54
E. Recreational boating facilities.....	53

It is not practical to evaluate all of the identified problems, needs, concerns, and opportunities which were identified by port users and interests, due to constraints of time and resources. Therefore, only those concerns ranked number 1 to 15 are evaluated in the Resolution Section which follows.

SECTION V

RESOLUTION

SECTION V

RESOLUTION

GENERAL

This section evaluates the most important problems, needs, concerns, and opportunities based on the prioritized rankings presented in Section IV. The evaluations are accomplished in the order of the composite numeric rankings assigned by Circle "A" stakeholders and include preliminary estimates of costs, benefits, and potential impacts on port operation and development. Monetary values for costs and benefits are based primarily on available information supplemented by sufficient new data where required to support conclusions and recommendations for the specific concern being evaluated. The section also includes a discussion of the responsibility for implementing the necessary action to facilitate resolution of the concern, as well as cost-sharing implications. Following the evaluations, Section VI will incorporate the individual concerns into a long-range comprehensive planning strategy that provides for the most efficient development of the port's navigation features and insures that these features effectively accommodate future use and growth.

LISTING OF CONCERNS TO BE EVALUATED

All of the concerns identified by stakeholders were described and prioritized in Section IV; however, only the most important concerns as prioritized by Circle "A" stakeholders are evaluated in this section. The following table lists the concerns which are discussed and evaluated in subsequent paragraphs.

Table V-1. PRIORITIZED CONCERNS SELECTED FOR EVALUATION

Concern	Priority ranking
Maintenance dredging: Continued and timely maintenance of port channels	1
Norfolk Harbor Channel: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet to Lamberts Point	2
Need to extend life of Craney Island Dredged Material Area and/or locate alternative future placement sites	3
Use of Craney Island Dredged Material Area for port development	4
Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to 50 feet to Lamberts Point	5
Elizabeth River Channel: Need to deepen from 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern and Southern Branch Channels	6
Norfolk Harbor Channel: Need to deepen the inbound lane from 45 feet to the authorized depth of 55 feet to Lamberts Point	7 (tie)
Funding	7 (tie)
Channel to Newport News: Need to deepen the outbound lane from 50 feet to the authorized depth of 55 feet	9
Southern Branch Channel: Need to deepen from 40 feet to the authorized depth of 45 feet to the Norfolk Southern Railroad bridge	10 (tie)
Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 50 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated	10 (tie)
Southern Branch Channel: Need to deepen from 35 feet to the authorized depth of 40 feet to the Gilmerton Bridge	12
Water quality	13

Table V-1. PRIORITIZED CONCERNS SELECTED FOR EVALUATION
(Cont'd)

Concern	Priority ranking
Channel to Newport News: Need to deepen the inbound lane from 50 feet to the authorized depth of 55 feet	14
Need to deepen the entire easternmost anchorage area opposite Sewells Point (K-1) and a small section of channel to 55 feet to provide easier transit between the Norfolk Harbor Channel and the Channel to Newport News; in addition, the K-1 anchorage would need to be relocated	15

CONCERN NUMBER 1

MAINTENANCE DREDGING: CONTINUED AND TIMELY MAINTENANCE OF PORT CHANNELS

DESCRIPTION

This concern relates to the need to insure that the Corps of Engineers continue its program to provide maintenance dredging of the main Federal channels of the port at appropriate intervals to make sure that proper dimensions are available for efficient, effective, and safe navigation.

PROPOSED ACTION

Full authorized project dimensions are maintained within the harbor where feasible and justified. The maintenance of full project dimensions often requires advance maintenance dredging, which is the additional depth and/or width specified to be dredged beyond the project channel dimensions for the purpose of reducing overall maintenance costs by decreasing the frequency of dredging. In some of the Federally authorized channels and anchorages, the current navigation needs are met by dredging the project channel or anchorage area to less than the authorized depth and/or width. Channel

conditions are surveyed frequently to determine existing conditions, and necessary actions, including the scheduling of appropriate funding, are routinely accomplished by the Norfolk District Corps of Engineers.

PLAN ACCOMPLISHMENTS

Provision of appropriate maintenance dredging of channels, anchorages, and turning basins within the harbor permit the safe and efficient movement of vessels of all types into and out of the port. Vessels ranging from large bulk coal carriers, Navy ships, containerships, commercial work boats, recreational craft, and others make daily use of the maintained channels. The maintained channels support substantial port industry and military activities, and they provide significant economic impacts to the Hampton Roads area, the region, and the nation as discussed in Section I.

ANALYSES

Valid economic analyses are accomplished periodically to determine the needs of using traffic and to insure the continued justification of maintenance expenditures.

Costs

An average of \$7.0 million is spent annually on maintenance dredging activities within the Hampton Roads harbor area.

Benefits

Maintenance dredging of the waterways that comprise the Port of Hampton Roads benefits a wide range of port activity. All vessels utilizing the port received benefits from the channels, turning basins, and anchorage areas which are periodically maintained. In the absence of maintenance dredging, channels would shoal, resulting in vessel delays, increased transportation costs, vessel damage, and other hardships on the port's military, industrial, commercial, and recreational interests. Appropriate maintenance dredging keeps the port running efficiently, effectively, and safely.

Environmental Impacts

Maintenance dredging efforts of the Corps of Engineers are governed by the environmental compliance requirements and procedures set forth in the Clean Water Act and other applicable Federal, state, and local environmental laws and regulations. Environmental analyses and documentation have been accomplished and will continue to be updated and kept current for all maintenance dredging activities within the Hampton Roads harbor area.

DIVISION OF PLAN RESPONSIBILITY

For the Federal projects that comprise the Port of Hampton Roads, the Corps of Engineers is responsible for appropriate and timely maintenance dredging. Local owners and operators are responsible for maintaining their access channels and berthing areas. In planning new navigation projects, the present policy is to require local interests to provide, without cost to the United States, all suitable areas required for initial and subsequent placement of dredged material. The WRDA 96 modified the WRDA 86 to include dredge material facilities (such as retaining dikes, bulkheads, and embankments) as part of the general navigation features of a project and cost shared between the Federal Government and the non-Federal sponsor on the same basis as other project features. Owing to great foresight, the port is very fortunate to have the Craney Island Dredged Material Area available where most of the material from maintenance dredging activities within the port is placed. Craney Island is an income-producing facility which receives funds from toll charges levied on non-Corps of Engineers users.

CONCLUSIONS

The Norfolk District Corps of Engineers does an excellent job in maintaining the many waterways that comprise the Port of Hampton Roads. Proper and timely maintenance dredging will continue into the future depending upon appropriate and timely funding and the continued availability of the Craney Island Dredged Material Area or a similar alternative placement area.

CONCERN NUMBER 2

NORFOLK HARBOR CHANNEL: NEED TO DEEPEN THE OUTBOUND LANE FROM 50 FEET TO THE AUTHORIZED DEPTH OF 55 FEET TO LAMBERTS POINT

DESCRIPTION

This concern expresses a need to deepen the elements of the outbound lane of the Norfolk Harbor Channel from their currently maintained depth of 50 feet to the authorized depth of 55 feet to Lamberts Point. The 55-foot outbound element is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. The concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to outbound navigation on the southside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the outbound channel element of the Norfolk Harbor Channel to 55 feet. As discussed in Section II, it would also require the dredging of the approach channels (the Atlantic Ocean Channel and the Thimble Shoal Channel), anchorages (Anchorage F and Sewells Point), and appropriate access channels and berthing areas. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 55-foot main channel depth. In addition, some wrecks would have to be cleared, a water main would have to be relocated or replaced, a tunnel cover would have to be constructed to protect the Chesapeake Bay Bridge-Tunnel which runs under the Thimble Shoal Channel, and aids to navigation would have to be moved and/or installed.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. Suitable material from the Thimble Shoal and Atlantic Ocean Channels would be

considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area, which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Provision of the 55-foot-deep outbound channel elements would primarily serve the large bulk coal carriers departing the southside of the port with loaded drafts of 50 feet and greater. It would enable owners and operators of these ships to utilize the additional cargo-carrying capacity of their vessels, thereby achieving savings in transportation costs. It would allow modern deep-draft vessels to operate in a more efficient, safe, and economical manner and enable the port to maintain a competitive position in the world coal market. It is estimated that the deepening of the Thimble Shoal and Atlantic Ocean Channels would provide over 6 million cubic yards of suitable quality dredged material for nourishing area beaches under authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86.

ANALYSES

The most recent detailed analyses of costs, benefits, environmental, and other impacts of the 55-foot-deep outbound channel elements were accomplished in the September 1989 Supplemental Engineering Report. Analyses accomplished subsequent to the 1989 Supplemental Engineering Report have been limited primarily to updating costs in support of periodic budget submittals and keeping the local sponsor advised of the project status. The most recent estimate, based on October 1998 price levels, was accomplished to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 26 million cubic yards of material would be dredged during the initial construction as shown in Table II-3. The costs for this specific concern are based on estimates prepared for the entire 55-foot outbound channel element. It is likely that some of these values would be

modified if this concern was accomplished separately from the total 55-foot outbound channel project; however, the estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the water main and tunnel cover items include engineering and design and supervision and administration costs since these are totally non-Federal responsibilities. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-2. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 2

Item	Amount (\$1,000)
Dredge Atlantic Ocean Channel	16,255
Dredge Thimble Shoal Channel	28,121
Dredge Norfolk Harbor Channel	24,814
Dredge Hampton Roads Anchorage F	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	97,709
Engineering and design (2%)	1,954
Supervision and administration (4%)	<u>3,908</u>
Total	103,571
Relocate/replace 36-inch water main	5,006
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Total	9,190
Grand total	112,761

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs, based on the maintenance cycles and cubic yardage as shown in Table II-3, is estimated to be \$1.1 million at October 1998 price levels.

Benefits

The benefits attributable to the 55-foot outbound channel are based primarily on transportation savings accruing to the export of coal via deeper channels as described under Plan Accomplishments. This was the premise in the Norfolk Harbor and Channels, Virginia Deepening and Disposal Feasibility Report dated July 1980, and it continues to be the primary force driving the need for deeper outbound channels. The most recent detailed analysis of the benefits--primarily transportation savings, which would accrue to the outbound 55-foot-deep channel element--was accomplished in the 1989 Supplemental Engineering Report. In this analysis, based on October 1989 price levels, the total average annual transportation savings were estimated at \$22.2 million. These savings, however, accrued to both the northside and southside of the port. Although no separation of benefits was accomplished between the northside and southside of the harbor since both sides were considered essential for a viable project, it is estimated that about 60 percent of the savings would accrue to the southside, based on the most recent data available regarding coal exports.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of Public Law 99-88. Detailed information regarding the methods, materials, and results of these studies may be found in the complete documents, which are available on microfiche from National Technical Information Services, Washington, D.C. (see Appendix E, Table E-4 for the internet site). The main emphasis of the effort was to determine and reasonably assess the impacts associated with the deepening of the channels and related placement of the dredged material. Some of the more important studies included effects on benthic resources, commercial benthos, non-commercial benthos, finfish, plankton, phytoplankton, zooplankton, sediment quality, seabed stability, and cultural and archaeological resources. All NEPA and related documentation have been fully satisfied but will need to be updated prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 55-foot outbound element is part of the Norfolk Harbor and Channels project which is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the City of Norfolk, the Chesapeake Bay Tunnel District Commission, and the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels, including the Atlantic Ocean Channel, would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 55-foot outbound element are based on the provisions of the WRDA's 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated

with this project is estimated at \$1.1 million, of which \$550,000 would be a Federal responsibility and \$550,000 a non-Federal responsibility.

Table V-3. INITIAL CONSTRUCTION COST SHARING FOR CONCERN NUMBER 2

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,255	6,502.0	9,753.0
Dredge Thimble Shoal Channel	28,121	11,248.4	16,872.6
Dredge Norfolk Harbor Channel	24,814	9,925.6	14,888.4
Dredge Hampton Roads Anchorage F	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	97,709	39,083.6	58,625.4
Engineering and design (2%)	1,954	781.6	1,172.4
Supervision and administration (4%)	<u>3,908</u>	<u>1,563.2</u>	<u>2,344.8</u>
Total	103,571	41,428.4	62,142.6
Relocate/replace 36-inch water main	5,006	0.0	5,006.0
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Total	9,190	0.0	9,190.0
Grand total	112,761	41,428.4	71,332.6

CONCLUSIONS

This specific concern relates only to the southside of the Hampton Roads harbor and does not include all of the elements of the 55-foot outbound channel projects, specifically, the Channel to Newport News. This concern could be more logically addressed with the construction of the entire 55-foot outbound element of the Norfolk Harbor and Channels project. Accordingly, this specific concern will be considered for combination with appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the Port of Hampton Roads.

CONCERN NUMBER 3

NEED TO EXTEND THE LIFE OF THE CRANEY ISLAND DREDGED MATERIAL AREA AND/OR LOCATE ALTERNATIVE PLACEMENT SITES

DESCRIPTION

This concern expresses a need to insure a practical and feasible long-range solution for the future placement of dredged material from construction and maintenance activities within the Port of Hampton Roads. Periodic dredging requires the placement of material dredged from numerous channels, anchorages, berthing areas, turning basins, and other areas making up the port complex. Continuing vital dredging, maintaining appropriate depths, and preserving the port's economic health are all considerations which account for the identification of this concern by stakeholders and its high priority.

PROPOSED ACTION

The proposed actions necessary to address the above-described concern would include the consideration of the expansion of the Craney Island Dredged Material Area (such as construction of a fourth cell on its east side), placement of dredged material at alternative confined sites, ocean placement of suitable material, beneficial uses of dredged material, and a combination of dredged material management plans. Each of these alternative considerations would have to be evaluated in terms of providing the most economical and environmentally acceptable plan for the long-term placement of

dredged material from navigation projects in the Port of Hampton Roads and adjacent waters.

PLAN ACCOMPLISHMENTS

The Port of Hampton Roads consists of commercial maritime facilities in cities with access to the lower James River, lower Chesapeake Bay and its tributaries, and the Elizabeth River. Waterborne commerce is vital to the adjacent cities, as well as to the Commonwealth of Virginia, to the East Coast, and to the nation. While Hampton Roads is a natural harbor, the depths of many of its channels cannot accommodate deep-draft vessels without periodic dredging. In order to provide for current and future shipping interests, channels must be maintained and even deepened. The provision of long-term placement capability for future dredging operations will ensure that the commercial and military navigation requirements will be satisfied, and the port will continue to thrive and grow.

ANALYSES

A number of studies have been conducted which are related to the long-term dredged material placement needs. These include the 1980 Feasibility Report; 1986 General Design Memorandum; Technical Report EL-81-11, "Development of a Management Place for Craney Island Disposal," published by the Army Corps of Engineers Waterways Experiment Station in December 1981; "Effects of Norfolk Harbor Deepening on Management of Craney Island Disposal Area" dated April 1983; "Site Operations and Monitoring Report 1980 to 1987" dated February 1989 and prepared by the Waterways Experiment Station; Dam Neck Ocean Disposal Site studies which led to final designation from the EPA in March 1988; Norfolk Harbor and Channels, Virginia, Long-Term Disposal (Inner Harbor) dated June 1990; Norfolk Disposal Site studies which led to final designation by the EPA in 1993; Norfolk Harbor and Channels, Virginia, Long-Term Dredged Material Management dated July 1994; and various Section 933 reports referenced in Section III. A reconnaissance study completed in March 1999 determined a Federal interest in proceeding to a feasibility study to evaluate the potential eastward expansion of the Craney Island Dredged Material Area and to

evaluate other potential alternative long-term placement areas. Appropriate analyses regarding construction costs, operation and maintenance costs, benefits, and environmental and other impacts will be included as part of the feasibility report initiated in April 1999 and scheduled for completion in March 2002.

Costs

The evaluation of alternative long-term dredged material placement sites requires the comparison of unit placement costs, i.e. cost per cubic yard. All costs involved in placing the dredged material are included in order to arrive at a valid comparison. The most recent cost analyses were accomplished as part of the Long-Term Dredged Material Management Report dated June 1990. With all of the plans considered, it was clear that the costs of managing dredged material in the port will increase substantially over what they have been in the past. The current toll charges for the Craney Island Dredged Material Area are \$0.86 per cubic yard for direct placement and \$2.30 per cubic yard for deposition into the Craney Island Rehandling Basin. The feasibility study discussed previously will determine the least costly viable plan, which is environmentally and socially acceptable to accommodate long-term dredged material placement in the future.

Benefits

The benefits attributable to the provision of a long-term placement area for dredged material for the port are widespread and substantial and accrue to numerous private and government interests. The assurance of an economical placement area provides for continued maintenance dredging and navigation improvements for the port and helps maintain the port's competitive position in world markets. Provision of a long-term placement area through an eastward expansion, serving as a least-costly alternative, will provide monetary benefits that are specifically quantified for dredged material placement, in addition to the millions of dollars of transportation savings attributable to maintenance dredging of the port channels. The continued maintenance and improvements permit safe and effective commercial and military operations into the foreseeable future.

Environmental Impacts

The environmental impacts associated with all potential long-term dredged material placement areas will require careful evaluation. All requirements of the NEPA, the Clean Water Act, and other applicable statutes will have to be satisfied. The necessary environmental studies will be accomplished as part of the previously discussed feasibility report scheduled for completion in March 2002.

DIVISION OF PLAN RESPONSIBILITY

Federal legislation requires the Commonwealth of Virginia, as the local cost-sharing sponsor, to provide the necessary placement areas for dredged material from Congressionally-authorized channels. Accordingly, the VPA, acting as the statutory agent for the Commonwealth, would be responsible for all construction and operation and maintenance costs associated with a new and/or expanded placement facility to serve the port; however, the WRDA 96 modified the WRDA 86 to include dredged material facilities as part of the general navigation features of a project. In this regard, the dredged material facilities could be cost shared between the Federal Government and the non-Federal sponsor on the same basis as the remainder of project features. This may permit up-front financing of construction costs by the Federal Government with reimbursement over time through the collection of toll charges. The previously discussed feasibility study will carefully evaluate all costs, benefits, and environmental impacts to determine the optimum Federal involvement and cost-sharing requirements in the provision of long-term dredged material placement.

CONCLUSIONS

This concern is extremely important to the maintenance and growth of the port and is directly related to the other identified concerns. A current feasibility study addressing this problem is scheduled for completion in March 2002, and it should provide a satisfactory solution. The concern, however, will be included in Section VI due to the importance and critical relationship to the other prioritized concerns of insuring a practical and feasible long-range solution for the future placement of dredged material within the port.

CONCERN NUMBER 4

USE OF CRANEY ISLAND DREDGED MATERIAL AREA FOR PORT DEVELOPMENT

DESCRIPTION

This concern expresses a need to make use of part of the Craney Island Dredged Material Area for future port development. The potential expansion of the facility could provide an ideal area for necessary future port development while also addressing Concern Number 3, the provision of a future efficient and cost-effective placement area for dredged material from adjacent waterway.

PROPOSED ACTION

Specific actions have already been put in place to help achieve the resolution of this concern. The Virginia General Assembly has authorized the Craney Island Study Committee, which is comprised of representatives from the VPA, the City of Portsmouth, the Hampton Roads Maritime Administration, the Virginia Pilot Association, and the Army Corps of Engineers, to examine the current use and future expansion of the Craney Island Dredged Material Area and to recommend appropriate future uses of the area. A progress report dated December 1997 was sent to the Senate Finance and House Appropriations Committee of the General Assembly of Virginia. The report concluded that the expansion of the Craney Island Dredged Material Area is critically important to the future of the port in maintaining the capability to dredge at an economical rate and to be able to expand the port in order to meet the expected needs resulting from its projected growth. A second related action resulted from the reconnaissance report, previously discussed under Concern Number 3, which determined that a Federal interest exists in accomplishing a feasibility study to evaluate the future long-term need for dredged material placement areas, including the eastward expansion of the Craney Island Dredged Material Area.

PLAN ACCOMPLISHMENTS

The location of Craney Island Dredged Material Area adjacent to deep-water channels provides outstanding advantages for port use. As previously discussed in Section I, the VPA is moving forward with its 2010 Plan which will effectively double the container-handling capacity of the Commonwealth-owned general cargo terminals; however, projected growth is expected to quickly use up this increased capacity requiring the provision of a fourth marine terminal. Section I also describes the increase expected in both the amount of containerized shipments and in the size of vessels involved in this trade. The VPA projects the need for a fourth terminal to accommodate the expected rapid increase in container traffic. Also, according to a study conducted by the U.S. Department of Transportation, Office of Intermodalism entitled, "The Impacts of Changes in Ship Design on Transportation Infrastructure and Operations" dated February 1998, mega ships are being constructed which require channel depths up to 50 feet in order to more efficiently transport containers. The use of Craney Island Dredged Material Area for future port development, such as a fourth container terminal, would help provide for continued port growth and would keep the Port of Hampton Roads, as well as the nation, competitive in the world container market.

ANALYSES

The discussion contained under Concern Number 3 is equally applicable to this concern. The VPA's 2010 Plan discussed in Section I provides pertinent analyses regarding future needs for port development. Additional pertinent analyses will be contained in the previously mentioned feasibility study expected to be completed in March 2002.

Costs

No specific costs have been developed for the use of Craney Island Dredged Material Area for future port development.

Benefits

Although no monetary quantification of potential benefits attributable to the use of Craney Island Dredged Material Area for Port Development has been accomplished, it is obvious that such values would be widespread and substantial. Direct benefits would accrue as a result of increased commodity movements and corresponding waterborne transportation savings resulting from the additional terminal facilities adjacent to deep-water channels. Expansion of terminal facilities would also increase employment, payroll, and tax revenues within the region, thus providing additional positive economic impacts.

Environmental Impacts

The environmental impacts associated with the development of port facilities at Craney Island Dredged Material Area would require careful evaluation in a river system already stressed due to existing intensive development by government, commercial, and industrial facilities. The requirements of the NEPA and all other Federal, state, and local environmental laws and regulations would be addressed as part of the feasibility report scheduled for completion in March 2002.

DIVISION OF PLAN RESPONSIBILITY

In accordance with the WRDA 86, as amended, the provision of dredged material placement areas is the responsibility of the non-Federal sponsor; however, the WRDA 96 modified the WRDA 86 to include dredged material facilities as part of the general navigation features of a project. Accordingly, the dredged material facilities could be cost shared between Federal and non-Federal interests on the same basis as the remainder of the project features. It may be possible for the Federal government to finance the costs of constructing an expansion of Craney Island Dredged Material Area with reimbursement over time through the collection of toll charges. Special non-Federal cost sharing may also apply for project purposes other than for the expansion of placement capacity. The previously mentioned feasibility study will examine, in detail, the cost sharing requirements for this specific concern.

CONCLUSIONS

This concern is directly related to and is an integral part of the previously discussed Concern Number 3. The potential expansion of the Craney Island Dredged Material Area and the subsequent construction of a fourth general cargo terminal on Craney Island will be evaluated in the ongoing feasibility study. Both concerns will be included in Section VI.

CONCERN NUMBER 5

NORFOLK HARBOR CHANNEL: NEED TO DEEPEN THE INBOUND LANE FROM 45 FEET TO 50 FEET TO LAMBERTS POINT

DESCRIPTION

This concern expresses a need to deepen the elements of the inbound lane of the Norfolk Harbor Channel from their currently maintained depth of 45 feet to a depth of 50 feet to Lamberts Point. The 45-foot inbound element is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. The concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to inbound navigation on the southside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the inbound channel element of the Norfolk Harbor Channel to 50 feet. As discussed in Section II, it would also require the dredging of the Thimble Shoal Channel and appropriate access channels and berthing areas. This construction would provide a full-width 50-foot channel for the port. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 50-foot main channel depth.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process.

Suitable material from the Thimble Shoal Channel would be considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area, which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Provision of the 50-foot-deep inbound channel elements would permit the port to safely and efficiently accommodate larger container ships which are transporting increasing amounts of containerized cargo. The Plan would also provide a one-level channel at 50 feet deep over authorized/recommended widths.

ANALYSES

Analyses accomplished on this specific concern have been in connection with the entire Norfolk Harbor and Channels project. There have been no separate economic evaluations made of the 50-foot inbound channel elements. The most recent detail cost data for this element are contained in the 1986 General Design Memorandum. Since completion of this document, cost estimates based on price level increase only have been developed to support budget requests and to keep the local sponsor informed. The most recent estimate, based on October 1998 price levels, was accomplished to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 3,841,000 cubic yards of material would be dredged during the initial construction as shown in Table II-3. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are the responsibility of each respective user, are not included in these estimates. In addition, the estimates do not

include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-4. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 5

<u>Item</u>	<u>Amount (\$1,000)</u>
Dredge Thimble Shoal Channel	12,150
Dredge Norfolk Harbor Channel	<u>7,601</u>
Subtotal	19,751
Engineering and design (2%)	395
Supervision and administration (4%)	<u>790</u>
Total	20,936

Operation and Maintenance Costs

Based on experience with the maintenance of the 50-foot outbound element, it is anticipated that there will be no significant increase in the average annual quantity of maintenance material and, consequently, no incremental average annual maintenance costs associated with this concern.

Benefits

No quantification of monetary benefits has been accomplished for the 50-foot-deep inbound lane of the Norfolk Harbor Channel; however, it is expected that substantial beneficial impacts would accrue to the owners and operators of large container ships which call at the existing terminals in Norfolk and Portsmouth. Potential benefits would grow as the amount of general cargo increases within the port and container ships calling at the port become increasingly larger. Container shipments have grown significantly in recent years, and industry experts project even more substantial increases in the future. VPA studies, previously discussed in Section I, indicate a potential by the year 2010 for a 250 percent increase in containerized cargo and a 200 percent increase in break bulk cargo over 1994 levels. Industry estimates project that by the year 2010, almost 40 percent of containerized cargo will move in vessels with a capacity of 4,000 TEU's or greater. Container ships have already called at the port with the capacity of 6,000 TEU's and loaded drafts of 47.5 feet. In addition to container ships, the 50-foot-deep inbound channel would benefit all vessel traffic on the southside of the Hampton Roads harbor by replacing the existing two-level channel with a one-level channel at the 50-foot depth over existing authorized/recommended widths.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of PL 99-88, as described previously for the 55-foot-deep outbound lane of the Norfolk Harbor and Channels project (Concern Number 2). All NEPA and related documentation have been fully satisfied but will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 50-foot inbound element is part of the Norfolk Harbor and Channels project, which is authorized but not

yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

Since no significant increase is expected in the average annual quantity of maintenance material and, consequently, no incremental average annual maintenance cost, no additional cost sharing is anticipated.

Table V-5. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 5

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Thimble Shoal Channel	12,150	4,860.0	7,290.0
Dredge Norfolk Harbor Channel	<u>7,601</u>	<u>3,040.4</u>	<u>4,560.6</u>
Subtotal	19,751	7,900.4	11,850.6
Engineering and design (2%)	395	158.0	237.0
Supervision and administration (4%)	<u>790</u>	<u>316.0</u>	<u>474.0</u>
Total	20,936	8,374.4	12,561.6

CONCLUSIONS

This specific concern only relates to the southside of the Hampton Roads harbor. It would complete the 50-foot channel system in the port and appears to have sufficient merit to be investigated in further detail. This concern will be considered for combination with appropriate prioritized concerns in Section VI.

CONCERN NUMBER 6

**ELIZABETH RIVER CHANNEL: NEED TO DEEPEN FROM 40 FEET TO THE
AUTHORIZED DEPTH OF 45 FEET FROM LAMBERTS POINT TO THE
JUNCTION OF THE EASTERN AND SOUTHERN BRANCH CHANNELS**

DESCRIPTION

This concern expresses a need to deepen the Elizabeth River Channel from its currently maintained depth of 40 feet to the authorized depth of 45 feet from Lamberts Point to the junction of the Eastern Branch and Southern Branch Channels. The concern,

identified by stakeholders and prioritized by Circle "A" members, is a separable element of what is generally referred to as the Elizabeth River and Southern Branch Channels.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Port Norfolk and Town Point Reaches of the Elizabeth River Channel to 45 feet, as discussed in Section II. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 45-foot main channel depth. Dredged material from the Corps of Engineers project would be placed in the Craney Island Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process.

PLAN ACCOMPLISHMENTS

Provision of the 45-foot-deep channel would benefit the terminals and ship repair yards located along these reaches of the Elizabeth River Channel, such as the Portsmouth Marine Terminal and the general cargo facilities of Sea Land Service, Incorporated, located in the City of Portsmouth on the north side of Pinners Point.

ANALYSES

Analyses accomplished on this specific concern have been in connection with the entire Elizabeth River Channel and Southern Branch Channel 45-foot element. There have been no separate economic evaluations made of this separable element. Since completion of the 1980 Feasibility Report, cost estimates based on price level increases only have been developed to support budget requests and to keep the local sponsor informed. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on

October 1998 price levels, the most recent financial data available. A total of 2,430,000 cubic yards of material would be dredged during the initial construction. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-6. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 6

Item	Amount (\$1,000)
Dredge Elizabeth River Channel (Port Norfolk and Town Point Reaches)	9,842
Craney Island tolls	<u>2,790</u>
Subtotal	12,632
Engineering and design (2%)	253
Supervision and administration (4%)	<u>505</u>
Total	13,390
Operation and Maintenance Costs	

It is estimated that there would be an average annual increase of 21,000 cubic yards in dredged material removed to support the maintenance of a 45-foot-deep channel over that currently dredged for the existing 40-foot-deep channel in the Port Norfolk and Town Point Reaches of the Elizabeth River Channel. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$100,000 at October 1998 price levels.

Benefits

No quantification of monetary benefits has been accomplished for this specific element. Benefit estimates were prepared for the entire Elizabeth River Channel and Southern Branch Channel 45-foot element in the 1980 Feasibility Report and updated periodically thereafter; however, the price level indexes used to make the updates may not reflect actual conditions that have occurred in the shipping industry. The latest benefit update was to October 1986 price levels and indicated average annual benefits of over \$15 million for the entire 45-foot project. The estimate did not reflect changes in the quantity and type of commodities being currently transported on the channel and no benefits were estimated to accrue to the reach of the Elizabeth River Channel described in this concern.

Environmental Impacts

During the 1980 Feasibility Report study, a Final EIS was prepared. A Final Supplement 1 to this statement was prepared in 1985 to address additional work and changes to the project up to that time. Extensive environmental investigations have already been performed during PED. Physical and numerical model studies of the entire Norfolk Harbor and Channels project were conducted to predict possible effects on tides, currents, salinity, and sedimentation. Extensive sediment quality testing was also performed on the entire harbor system and supplemental sediment studies were conducted for the Norfolk Harbor and Southern Branch Channels in August 1995 and August and September 1996 (see Appendix E, Tables E-1 and E-2 for references to reports on these studies). However, it is expected that additional work will be required to

support the preparation of necessary NEPA documentation prior to construction of this element.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 45-foot element is part of the Norfolk Harbor and Channels project which is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 35 percent of the general navigation features (10 percent of which can be paid over 30 years), including Craney Island toll charges but excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels would be accomplished by the Corps of Engineers. The Federal Government would be responsible for 100 percent of the operation and maintenance cost of the 45-foot-deep channel. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 45-foot element are based on the provisions of the WRDA's 86 and 88 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs.

Table V-7. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 6

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Elizabeth River Channel (Port Norfolk and Town Point Reaches)	9,842	6,397.3	3,444.7
Craney Island tolls	<u>2,790</u>	<u>1,813.5</u>	<u>976.5</u>
Subtotal	12,632	8,210.8	4,421.2
Engineering and design (2%)	253	164.5	88.5
Supervision and administration (4%)	<u>505</u>	<u>328.2</u>	<u>176.8</u>
Total	13,390	8,703.5	4,686.5

CONCLUSIONS

This specific concern is a separate element of the Elizabeth River Channel and Southern Branch Channel 45-foot improvements, which provides for deepening the existing 40-foot channel to the authorized depth of 45 feet from Lamberts Point to the Norfolk Southern Railroad bridge on the Southern Branch of the Elizabeth River. This concern could be more logically addressed with the construction of the entire 45-foot reach. Accordingly, this specific concern will be considered for combination with appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the port.

CONCERN NUMBER 7 (TIE)

NORFOLK HARBOR CHANNEL: NEED TO DEEPEN THE INBOUND LANE FROM 45 FEET TO THE AUTHORIZED DEPTH OF 55 FEET TO LAMBERTS POINT

DESCRIPTION

This concern expresses a need to deepen the elements of the inbound lane of the Norfolk Harbor Channel from their currently maintained depth of 45 feet to the authorized depth of 55 feet to Lamberts Point. The 55-foot inbound channel is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. The concern identified by stakeholders and prioritized by Circle "A" members is related to improvements to inbound navigation on the southside of the Hampton Roads harbor, and it is an extension of Concern Number 5.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the inbound channel element of the Norfolk Harbor Channel to 55 feet. As discussed in Concern Number 2, it would also require the dredging of the approach channels (the Atlantic Ocean Channel and the Thimble Shoal Channel), anchorages (Anchorage F and Sewells Point), and appropriate access channels and berthing areas. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 55-foot main channel depth. In addition, some wrecks would have to be cleared, a water main would have to be relocated or replaced, a tunnel cover would have to be constructed to protect the Chesapeake Bay Bridge-Tunnel which runs under the Thimble Shoal Channel, and aids to navigation would have to be moved and/or installed.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. Suitable material from the Thimble Shoal and Atlantic Ocean Channels would be

considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Plan accomplishments would be the same as those described previously for Concern Number 5, except the additional depth would obviously accommodate larger container ships. It would also enable owners and operators of other ships to utilize the additional cargo-carrying capacity of their vessels, thereby, achieving savings in transportation costs. It would allow modern deep-draft vessels to operate in a more efficient, safe, and economical manner and enable the port to maintain a competitive position in the world containerized-cargo market. It is estimated that the deepening of the Thimble Shoal and Atlantic Ocean Channels would provide over 6 million cubic yards of suitable quality dredged material for nourishing area beaches under the authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86.

ANALYSES

As in the case of Concern Number 5, there have been no separate economic evaluations made of the 55-foot inbound channel element. Discussions contained relative to Concern Number 5 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 24,601,000 cubic yards of material would be dredged during the initial construction as shown in Table II-3. It is not very likely that this concern would be implemented prior to the implementation of Concern Number 2. Detailed cost estimates have been made, based on this premise and are included in Section VI. Accordingly, it is not considered warranted to expend time and resources to prepare a separate detailed cost estimate for

this concern, assuming Concern Number 2 is not in place. However, using readily available information, it is possible to develop a reasonable, preliminary estimate for the cost of constructing Concern Number 7 as a "stand alone" increment, which is presented for informational purposes and to provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the water main and tunnel cover items also include engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-8. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 7 (TIE)

Item	Amount (\$1,000)
Dredge Atlantic Ocean Channel	16,276
Dredge Thimble Shoal Channel	26,068
Dredge Norfolk Harbor Channel	32,200
Dredge Hampton Roads Anchorage F	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	103,063
Engineering and design (2%)	2,061
Supervision and administration (4%)	<u>4,123</u>
Total	109,247
Relocate/replace 36-inch water main	5,006
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Total	9,190
Grand total	118,437

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs is estimated to be \$820,000 at October 1998 price levels.

Benefits

Discussion of benefits for this concern is identical to that presented for Concern Number 5. As previously stated, container ships with a potential loaded draft of 47.5 feet have already called at the port, and even larger ships are expected. Industry experts expect an increasing amount of containerized cargo to move in these mega ships in the future. A 55-foot-deep inbound channel would permit appropriate under-keel clearance for these larger ships and would provide for efficient and safe navigation.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of PL 99-88, as described previously for the 55-foot-deep outbound lane of the Norfolk Harbor and Channels project (Concern Number 2). All NEPA and related documentation have been fully satisfied but will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II and Concern Number 5, the 55-foot inbound element is part of the Norfolk Harbor and Channels project that is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the City of Norfolk, the

Chesapeake Bay Tunnel District Commission, and the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels, including the Atlantic Ocean Channel, would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 55-foot inbound element are based on the provisions of the WRDA's 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with this element is estimated at \$820,000, of which \$410,000 would be a Federal responsibility and \$410,000 a non-Federal responsibility.

Table V-9. INITIAL CONSTRUCTION COST SHARING FOR CONCERN NUMBER
7 (TIE)

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,276	6,510.4	9,765.6
Dredge Thimble Shoal Channel	26,068	10,427.2	15,640.8
Dredge Norfolk Harbor Channel	32,200	12,880.0	19,320.0
Dredge Hampton Roads Anchorage F	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	103,063	41,225.2	61,837.8
Engineering and design (2%)	2,061	824.4	1,236.6
Supervision and administration (4%)	<u>4,123</u>	<u>1,649.2</u>	<u>2,473.8</u>
Total	109,247	43,698.8	65,548.2
Relocate/replace 36-inch water main	5,006	0.0	5,006.0
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Total	9,190	0.0	9,190.0
Grand total	118,437	43,698.8	74,738.2

CONCLUSIONS

This specific concern only relates to the southside of the Hampton Roads harbor. It appears to have merit and should be investigated in further detail. This concern will be considered for combination with appropriate prioritized concerns in Section VI.

CONCERN NUMBER 7 (TIE)

FUNDING

DESCRIPTION

Funding is a universal concern involved in all port operations and development, since there is rarely sufficient money to accomplish all that is desired. The expressed need is to establish appropriate priorities so that available funds are used most efficiently and effectively.

PROPOSED ACTION

The objective is to help decision makers to arrive at more informed judgments regarding the port's future navigation problems, needs, concerns, and opportunities. Better and more comprehensive information will assist in reducing funding constraints, which limit the extent to which prioritized concerns may be successfully addressed. As discussed in Section I, a primary purpose of this Plan is to establish priorities based on the input of stakeholders, which will be beneficial in preparing and justifying budget requests. Other planning actions discussed in Section I, such as the VPA's 2010 Plan, will also facilitate future funding decisions.

PLAN ACCOMPLISHMENTS

The availability of more comprehensive information regarding the navigation concerns identified by port users and prioritized by Circle "A" stakeholders will permit decision makers to better determine the best use of the funds which are available. Since there will never be enough money to do everything that stakeholders desire, the Plan will help Federal, state, local, and private investors to arrive at informed decisions based on a prioritized list established by port users and interests.

CONCLUSIONS

A key objective of the Navigation Management Plan is the identification and prioritization of the navigation problems, needs, concerns, and opportunities associated with the operation, maintenance, and development of the port. Obviously, appropriate funding from Federal, state, local, and private interests is essential to the development of a long-range, comprehensive planning strategy for the port. Since adequate funding is a necessity for the implementation of actions required to address all of the identified concerns, it will be discussed further in Section VI, particularly as it relates to cost sharing.

CONCERN NUMBER 9

CHANNEL TO NEWPORT NEWS: NEED TO DEEPEN THE OUTBOUND LANE FROM 50 FEET TO THE AUTHORIZED DEPTH OF 55 FEET

DESCRIPTION

This concern expresses a need to deepen the elements of the outbound lane of the Channel to Newport News from their currently maintained depth of 50 feet to the authorized depth of 55 feet. The 55-foot outbound channel is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. This concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to outbound navigation on the northside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Channel to Newport News to 55 feet. It would be deepened, however, over its fully authorized width of 800 feet, as was done when it was deepened from 45 feet to 50 feet; therefore, there would be no need for the inbound lane. As discussed in Section II, it would also require the dredging of the outbound lanes of the approach channels (the Atlantic Ocean Channel, the Thimble Shoal Channel, and the Entrance Reach of the Norfolk Harbor Channel), anchorages (Anchorage F and Sewells Point), and appropriate access channels and berthing areas. The access channels and

berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 55-foot main channel depth. In addition, some wrecks would have to be cleared, a tunnel cover would have to be constructed to protect the Chesapeake Bay Bridge-Tunnel which runs under the Thimble Shoal Channel, and aids to navigation would have to be moved and/or installed.

Dredged material from the Corps of Engineers project would be placed in the Dam Neck Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. Suitable material from the Thimble Shoal and Atlantic Ocean Channels would be considered for nourishing area beaches. During the PED phase, consideration would be given to placing dredged material in the Craney Island Dredged Material Area, which could result in a significant reduction in project cost.

PLAN ACCOMPLISHMENTS

Provision of the 55-foot-deep Channel to Newport News and its outbound elements would primarily serve the large bulk coal carriers departing the northside of the port with loaded drafts of 50 feet and greater. It would enable owners and operators of these ships to utilize the additional cargo-carrying capacity of their vessels, thereby, achieving savings in transportation costs. It would allow modern deep-draft vessels to operate in a more efficient, safe, and economical manner and enable the port to maintain a competitive position in the world coal market. It is also estimated that the deepening of the Thimble Shoal and Atlantic Ocean Channels would provide over 6 million cubic yards of suitable quality dredged material for nourishing area beaches under authority of Section 145 of the WRDA 76, as modified by Section 933 of the WRDA 86.

ANALYSES

The most recent detailed analyses of costs, benefits, environmental, and other impacts of the 55-foot-deep Channel to Newport News and its outbound elements were accomplished in the 1989 Supplemental Engineering Report, as discussed in Concern Number 2. Analyses accomplished subsequent to this report have been limited primarily

to updating costs in support of periodic budget submittals and keeping the local sponsor advised of project status. The most recent estimate, based on October 1998 price levels, was accomplished to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 26.2 million cubic yards of material would be dredged during the initial construction as shown in Table II-3. The costs for this specific concern are based on estimates prepared for the entire 55-foot outbound channel element. It is likely that some of these values would be modified if this concern was accomplished separately from the total 55-foot outbound channel project; however, the estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the tunnel cover item also includes engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-10. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 9

Item	Amount (\$1,000)
Dredge Atlantic Ocean Channel	16,255
Dredge Thimble Shoal Channel	28,121
Dredge Channel to Newport News	26,144
Dredge Hampton Roads Anchorage F	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	99,039
Engineering and design (2%)	1,981
Supervision and administration (4%)	<u>3,962</u>
Total	104,982
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Grand total	109,166

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs, based on the maintenance cycles and cubic yardage as shown in Table II-3, is estimated to be \$700,000 at October 1998 price levels.

Benefits

The benefits attributable to the 55-foot outbound channel are based primarily on transportation savings accruing to the export of coal via deeper channels as described

under Plan Accomplishments and in Concern Number 2. As indicated in Concern Number 2, a total savings of \$22.2 million would accrue to the total 55-foot-deep outbound channel, both the northside and southside of the harbor. Although no separation of benefits was accomplished between the northside and southside of the harbor, it is estimated that about 40 percent of the savings would accrue to the northside, based on the most recent data available regarding coal exports.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of Public Law 99-88, as described previously for the 55-foot-deep outbound lane for the Norfolk Harbor and Channels project. While all NEPA and related documentation have been fully satisfied, they will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 55-foot outbound element is part of the Norfolk Harbor and Channels project that is authorized, but not yet constructed. The construction of this element of the project would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA. There are also funding requirements for project implementation from the Chesapeake Bay Tunnel District Commission and the private pier facility owners and operators.

Operation and Maintenance. Once constructed, maintenance dredging of the additional channel depths in the Federal channels, including the Atlantic Ocean Channel, would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth. Maintenance dredging of access channels and berthing areas would be the responsibility of the owners and operators of adjacent facilities and would require authorization from the Norfolk District Regulatory Branch.

Cost Sharing

The cost-sharing requirements for the 55-foot outbound element are based on the provisions of the WRDA's 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with the project is estimated at \$700,000, of which \$350,000 would be a Federal responsibility and \$350,000 a non-Federal responsibility.

Table V-11. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 9

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,255	6,502.0	9,753.0
Dredge Thimble Shoal Channel	28,121	11,248.4	16,872.6
Dredge Channel to Newport News	26,144	10,457.6	15,686.4
Dredge Hampton Roads Anchorage F	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	99,039	39,615.6	59,423.4
Engineering and design (2%)	1,981	792.4	1,188.6
Supervision and administration (4%)	<u>3,962</u>	<u>1,584.8</u>	<u>2,377.2</u>
Total	104,982	41,992.8	62,989.2
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Grand total	109,166	41,992.8	67,173.2

CONCLUSIONS

This concern relates only to the northside of the Hampton Roads harbor and does not include all of the elements of the 55-foot outbound channel project; specifically, most of the Norfolk Harbor Channel. It could be more logically addressed with the construction of the entire 55-foot outbound element of the Norfolk Harbor and Channels project. Accordingly, this specific concern will be considered for combination with

appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the Port of Hampton Roads.

CONCERN NUMBER 10 (TIE)

SOUTHERN BRANCH CHANNEL: NEED TO DEEPEN FROM 40 FEET TO THE AUTHORIZED DEPTH OF 45 FEET TO THE NORFOLK SOUTHERN RAILROAD BRIDGE

DESCRIPTION

This concern expresses a need to deepen a portion of the Southern Branch Channel from its currently maintained depth of 40 feet to the authorized depth of 45 feet from the junction with the main channel of the Elizabeth River upstream to the Norfolk Southern Railroad bridge. The concern, identified by stakeholders and prioritized by Circle "A" members, is a separable element of what is generally referred to as the Elizabeth River and Southern Branch Channels.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Lower and Middle Reaches of the Southern Branch Channel to 45 feet, as discussed in Section II. It would also include deepening the approach and turning basin from 40 feet to 45 feet opposite the Norfolk Naval Shipyard between Miles 13 and 14. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 45-foot main channel depth. Dredged material from the Corps of Engineers project would be placed in the Craney Island Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process.

In addition, some cables would have to be removed.

PLAN ACCOMPLISHMENTS

Provision of the 45-foot-deep channel would benefit the various industries, ship repair yards, and storage facilities located along these reaches of the Southern Branch

Channel, such as the Navy operations at the Norfolk Naval Shipyard. It would permit safe and efficient navigation for large commercial and Navy ships calling at terminals in this area of the river.

ANALYSES

As in the case of Concern Number 6, there have been no separate economic evaluations made of this portion of the Elizabeth River Channel and Southern Branch Channel 45-foot element. Discussions relative to Concern Number 6 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 4,770,000 cubic yards of material would be dredged during the initial construction. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the cable item also includes engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-12. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 10 (TIE)

Item	Amount (\$1,000)
Dredge Southern Branch Channel (Lower and Middle Reaches)	7,209
Craney Island tolls	<u>2,050</u>
Subtotal	9,259
Engineering and design (2%)	185
Supervision and administration (4%)	<u>370</u>
Total	9,814
Remove cables	<u>305</u>
Grand total	10,119

Operation and Maintenance Costs

It is estimated that there would be an average annual increase of 12,000 cubic yards in dredged material removed to support the maintenance of a 45-foot-deep channel over that currently dredged for the existing 40-foot-deep channel in the Middle and Lower Reaches of the Southern Branch Channel. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$50,000 at October 1998 price levels.

Benefits

Discussion of monetary benefits included for Concern Number 6 is also appropriate for this concern. As previously stated, the latest benefit quantification was based on October 1986 price levels and indicated average annual benefits of over

\$15 million for the entire Elizabeth River Channel and Southern Branch Channel 45-foot element.

Environmental Impacts

The discussion of environmental impacts relative to Concern Number 6 are equally applicable to this concern. Although all NEPA and related requirements have been fully satisfied, they will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II and Concern Number 6, the 45-foot element is part of the Norfolk Harbor and Channels project. Discussions included for Concern Number 6 are also applicable to this concern. There are also funding requirements for project implementation from the owner of the cables to be removed and private pier facility owners and operators.

Operation and Maintenance. Discussions included for Concern Number 6 are also applicable to Concern Number 10 (tie).

Cost Sharing

Discussions included for Concern Number 6 are also applicable to this concern. The following table shows the apportionment of Federal and non-Federal construction costs.

Table V-13. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 10 (TIE)

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Southern Branch Channel (Lower and Middle Reaches)	7,209	4,685.9	2,523.1
Craney Island tolls	<u>2,050</u>	<u>1,332.5</u>	<u>717.5</u>
Subtotal	9,259	6,018.4	3,240.6
Engineering and design (2%)	185	120.2	64.8
Supervision and administration (4%)	<u>370</u>	<u>240.5</u>	<u>129.5</u>
Total	9,814	6,379.1	3,434.9
Remove cables	<u>305</u>	<u>0.0</u>	<u>305.0</u>
Grand total	10,119	6,379.1	3,739.9

CONCLUSIONS

This specific concern is a separate portion of the Elizabeth River Channel and Southern Branch Channel 45-foot improvements, which provide for deepening the existing 40-foot channel to the authorized depth of 45 feet from Lamberts Point to the Norfolk Southern Railroad bridge on the Southern Branch of the Elizabeth River. This concern could not be addressed without first addressing Concern Number 6.

Accordingly, this specific concern will be considered for combination with appropriate prioritized concerns in Section VI to develop a long-range, comprehensive planning strategy for the port.

CONCERN NUMBER 10 (TIE)

NEED TO DEEPEN THE ENTIRE EASTERNMOST ANCHORAGE AREA OPPOSITE SEWELLS POINT (K-1) AND A SMALL SECTION OF CHANNEL TO 50 FEET TO PROVIDE EASIER TRANSIT BETWEEN THE NORFOLK HARBOR CHANNEL AND THE CHANNEL TO NEWPORT NEWS; IN ADDITION, THE K-1 ANCHORAGE WOULD NEED TO BE RELOCATED

DESCRIPTION

This concern expresses a need to deepen the K-1 Anchorage to 50 feet, including a small section of the Norfolk Harbor Channel adjacent to the anchorage area. Also included is a small area, adjacent to the K-1 Anchorage, known as the Naval Maneuvering Area.

PROPOSED ACTION

Aside from deepening the areas described from 45 feet to 50 feet, the existing K-1 Anchorage would have to be relocated to an alternate site. This relocation would necessitate the deauthorization of the existing anchorage site and the consideration of a newly authorized anchorage area to be evaluated in a comprehensive anchorage analysis for the entire port. This analysis could be conducted as part of the PED phase of a major channel deepening or as a separate investigation. Dredged material would be placed in the Dam Neck Dredged Material Area.

PLAN ACCOMPLISHMENTS

Deepening these areas from 45 feet to 50 feet would provide a safer and more efficient turn to facilitate the maneuvering of large vessels from one channel to the other. It would be most beneficial for larger bulk coal carriers taking on partial loads at terminals on both the northside and southside of the port.

ANALYSES

There have been no economic evaluations made for this specific concern, although initial costs have been estimated to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 4.5 cubic yards of material would be dredged during the initial construction. Unlike the deepening elements discussed earlier, no studies or preliminary design have been conducted on this improvement, previous to it being included as part of the Navigation Management Plan; therefore, for the purposes of this analysis only, the cost estimate for the relocation of the K-1 Anchorage is based on the deepening of the K-2 Anchorage area by 5 feet from 40 feet to 45 feet, thus retaining the 45-foot-deep anchorage with a 1,200-foot swinging radius. The estimates presented in the following table are for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-14. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 10 (TIE)

Item	Amount (\$1,000)
Dredge K-1 Anchorage	15,876
Dredge K-2 Anchorage	9,639
Engineering and design (2%)	510
Supervision and administration (4%)	<u>1,021</u>
Total	27,046

Operation and Maintenance Costs

It is estimated that there would be an average annual increase of 50,000 cubic yards in dredged material removed to support the maintenance in this area over the existing depths. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$200,000 at October 1998 price levels.

Benefits

Although no monetary values have been quantified for addressing this concern, it would provide substantial beneficial impacts resulting from the provision of an adequate area to permit large vessels to make the turn from one channel to the other with reduced tug assistance. It would enhance navigation in the port by providing additional safety, effectiveness, and efficiency in operations.

Environmental Impacts

All NEPA and related requirements will be fully satisfied prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. The deepening of the K-1 Anchorage, a small part of the Norfolk Harbor Channel, and the Naval Maneuvering Area to 50 feet and the relocation of the existing anchorage area would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate authorization and funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation, for the dredging in excess of 45 feet. For the area where the dredging is 45 feet or less, the VPA would be responsible for 35 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA.

Operation and Maintenance. Once constructed, maintenance dredging of the additional depths would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth; however, the Federal Government would be responsible for 100 percent of the operation and maintenance cost of the 45-foot deep K-2 Anchorage.

Cost Sharing

The cost-sharing requirements for this work are based on the provisions of the WRDA's 86, 88, and 96 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with this project is estimated at \$200,000, of which \$150,000 would be a Federal responsibility and \$50,000 a non-Federal responsibility.

Table V-15. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 10 (TIE)

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge K-1 Anchorage	15,876	6,350.4	9,525.6
Dredge K-2 Anchorage	9,639	6,265.3	3,373.7
Engineering and design (2%)	510	252.3	257.7
Supervision and administration (4%)	<u>1,021</u>	<u>504.6</u>	<u>516.4</u>
Total	27,046	13,372.6	13,673.4

CONCLUSIONS

The implementation of this concern would require the deauthorization of the existing Federally authorized K-1 Anchorage area and the consideration of an alternative replacement location. The concern, however, has substantial merit and will be considered in Section VI.

CONCERN NUMBER 12

**SOUTHERN BRANCH CHANNEL: NEED TO DEEPEN FROM 35 FEET TO
THE AUTHORIZED DEPTH OF 40 FEET TO GILMERTON BRIDGE**

DESCRIPTION

This concern expresses a need to deepen a portion of the Southern Branch Channel from its currently maintained depth of 35 feet to the authorized depth of 40 feet from the Norfolk Southern Railroad bridge to the Gilmerton Bridge (U.S. Routes 460 and 13 highway bridge). The concern, identified by stakeholders and prioritized by Circle

"A" members, is a separable element of what is generally referred to as the Elizabeth River Channel and Southern Branch Channels.

PROPOSED ACTION

The proposed action necessary to address the above-described concern would require the deepening of the Upper Reach of the Southern Branch Channel to 40 feet, as discussed in Section II. It would also include the construction of a 800 feet turning basin to a depth of 40 feet at the channel's terminus. The access channels and berthing areas adjacent to the main channel would be deepened by the respective users to be commensurate with the 40-foot main channel depth. Dredged material from the Corps of Engineers project would be placed in the Craney Island Dredged Material Area. The placement area for dredged material from the access channels and berthing areas would be determined during the permit process. In addition, a water main would have to be relocated or replaced.

PLAN ACCOMPLISHMENTS

Provision of the 40-foot-deep channel would benefit deep-draft vessels in the coastwise and foreign trade which transport petroleum, grain, general cargo, and miscellaneous dry and liquid bulk commodities to and from terminals on the Southern Branch. It would also provide an opportunity for further industrial development along this reach of the river.

ANALYSES

The most recent detailed analyses of costs, benefits, and environmental and other impacts of this concern were made in the 1980 Feasibility Report. Discussions relative to Concern Number 6 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 2,350,000 cubic yards of material would be dredged during the initial construction as shown in Table II-3. These cost estimates are presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the water main and turning basin items also include engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-16. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 12

Item	Amount (\$1,000)
Dredge Southern Branch Channel (Upper Reach)	12,220
Craney Island tolls	<u>2,700</u>
Subtotal	14,920
Engineering and design (2%)	298
Supervision and administration (4%)	<u>597</u>
Total	15,815
Relocate/replace 42-inch water main	3,615
Acquire land for turning basin	<u>1,000</u>
Total	4,615
Grand total	20,430

Operation and Maintenance Costs

The incremental increase in average annual operation and maintenance costs, based on the maintenance cycles and cubic yardage as shown in Table II-3, is estimated to be \$200,000 at October 1998 price levels.

Benefits

Discussion of monetary benefits included for Concern Number 6 is also appropriate for this concern. The values from the 1980 Feasibility Report were updated by indexing to October 1988 price levels for the Plan of Action for Engineering and Design Report dated May 1988, which indicated an average annual benefit of

\$31 million. The update, however, did not reflect the potential effects of changes in commodities or quantities of commodities, which are currently transported on the channel. Due to possible changes in commodities, vessel sizes, and operating practices, it will be necessary to reevaluate the transportation savings, which would accrue to a 40-foot-deep channel prior to construction to affirm economic justification.

Environmental Impacts

The discussion of environmental impacts relative to Concern Number 6 are equally applicable to this concern. Although all NEPA and related requirements have been fully satisfied, they will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 40-foot element is part of the Norfolk Harbor and Channels project. Discussions included for Concerns Number 6 are also applicable to this concern. There are also funding requirements for project implementation from the City of Norfolk and private pier facility owners and operators. Non-Federal activities in the waters of the United States or wetlands to implement this concern would require authorizations from the Norfolk District Regulatory Branch.

Operation and Maintenance. Discussions included for Concerns Number 6 are also applicable to Concern Number 12.

Cost Sharing

Discussions included for Concerns Number 6 and 10 (tie) (the Southern Branch concern) are also applicable to this concern. The following table shows the apportionment of Federal and non-Federal construction costs.

Table V-17. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 12

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Southern Branch Channel (Upper Reach)	12,220	7,943.0	4,277.0
Craney Island tolls	<u>2,700</u>	<u>1,755.0</u>	<u>945.0</u>
Subtotal	14,920	9,698.0	5,222.0
Engineering and design (2%)	298	193.7	104.3
Supervision and administration (4%)	<u>597</u>	<u>388.1</u>	<u>208.9</u>
Total	15,815	10,279.8	5,535.2
Relocate/replace 42-inch water Main	3,615	0.0	3,615.0
Acquire land for turning basin	<u>1,000</u>	<u>0.0</u>	<u>1,000.0</u>
Total	4,615	0.0	4,615.0
Grand total	20,430	10,279.8	10,150.2

CONCLUSIONS

This concern appears to have merit and should be investigated in further detail. It will be considered for combination with appropriate prioritized concerns in Section VI.

CONCERN NUMBER 13
WATER QUALITY

DESCRIPTION

The quality of water in the Hampton Roads harbor area has been identified as a concern by stakeholders. The area surrounding the harbor includes a variety of uses including residential, agricultural, commercial, industrial, and military. Thousands of vessels ranging from cargo ships and navy craft to small commercial fishing boats and pleasure boats make annual use of the harbor. Many years of intensive industrial and military use have added to the deteriorated water quality. As discussed in Section IV, stakeholders identified several specific actions, which could potentially assist in the improvement of water quality in the port. These concerns include actions related to disposal of on-board waste, especially with respect to recreational boats and marinas; the elimination of direct pumping of bilge water into the harbor; better design of container and breakbulk cargo facilities to reduce water quality problems; elimination of "prop" dredging; and proper handling of contaminated dredged material.

PROPOSED ACTION

Water quality concerns within the port are currently being addressed by existing Federal, state, and local programs. Section I discusses a number of the regulatory, environmental, and other related requirements, which are now in place within the harbor. These programs for correcting deteriorating water quality include managing surface runoff; monitoring water quality, so that trends can be established; water quality regulation enforcement; and endorsement of existing Federal and state programs to preserve, maintain, and improve water quality on a regional scale. Existing regulations need to be clearly defined and widely disseminated with timely follow-up and enforcement. The specific actions listed previously would require the cooperation and strict compliance with existing regulations by those individuals, companies, and agencies involved in the specific activities the concern is directed towards. Section III discusses two studies by the Army Corps of Engineers, the Elizabeth River Environmental

Restoration Study and the proposed Lynnhaven River Restoration Study, which will assist in addressing water quality problems in the area.

PLAN ACCOMPLISHMENTS

Improving the water quality within the Hampton Roads harbor would be an important aspect of restoring the environmental conditions of the port. The harbor and its surrounding waters are an important sub-estuary of the Chesapeake Bay, and their improvement would assist in reversing the decline in the vitality of living resources in the Chesapeake Bay through water quality protection.

DIVISION OF PLAN RESPONSIBILITY

The Virginia DEQ is responsible for developing and implementing policies, programs, and procedures to assure the proper use and management of the Commonwealth's water resources. The Water Division of the Virginia DEQ has permitting programs associated with toxic reductions to Virginia water including the Water Quality Standards (VR 680-21-00), the Virginia Pollution Discharge Elimination System (VPDES), the Toxics Management Regulation (VR 680-14-03), the Virginia Pollution Abatement Permits, and the VWPP. Nonpoint source programs include the Stormwater Management Regulations, the Underground Storage Tank Regulations, the Pesticide Management Program, and the Solid and Hazardous Waste Management Programs. The Air Quality Program, which is administered by the Air Division of the Virginia DEQ, monitors and regulates toxics released to the air that are also deposited in the watershed. These and other Virginia programs are described in the following table. Please also reference Appendixes D and H.

Table V-18. WATER QUALITY PROTECTION PROGRAMS IN VIRGINIA

Management program	Oversight agency	Program intent
Water Quality Standards (VR 680-21-00)	DEQ - Water Division	Provides both qualitative descriptions and numeric limits for specific physical, chemical, biological, and radiological characteristics of both surface waters and groundwater. Regulates mixing zones associated with point source discharges. Includes protection of wetlands along with Virginia's waters.
Virginia Pollutant Discharge Elimination System (VPDES) (VR 680-14-01)	DEQ - Water Division	Controls industrial and municipal waste discharges to surface waters. Include numeric effluent limitations, as well as self-monitoring and reporting requirements. Best management practice measures required as part of VPDES program.
Toxics Management Regulation (VR 680-14-03)	DEQ - Water Division	Provides guidelines for the administration and implementation of the Toxics Management Program. Controls the input of toxic pollutants to surface waters from point source discharges.
Virginia Pollution Abatement Permits (VR 680-14-01)	DEQ - Water Division	Applies to waste management facilities and operations that do not directly discharge to surface waters. Issued for land application of sewage sludge, animal waste, and industrial waste.
VWPP	DEQ - Water Division	Clean Water Act Section 401 Certification. Ensures that projects with Federal approval will have no adverse effect on water quality or existing beneficial uses of Virginia's waters.
Pretreatment Program	Hampton Roads Sanitation District (HRSD)	Regulates the "non-domestic" users that discharge toxic or unusually strong conventional waste to publicly owned treatment works (POTWs). HRSD is responsible for controlling the industrial users under the program.

Table V-18. WATER QUALITY PROTECTION PROGRAMS IN VIRGINIA
(Cont'd)

<u>Management program</u>	<u>Oversight agency</u>	<u>Program intent</u>
Erosion and Sediment Control Regulations (VR 625-02-00)	Department of Conservation and Recreation	Establishes soil conservation requirements for land-disturbing activities associated with new construction.
Pesticide Management Program (VR 115-04-03)	Virginia Pesticide Control Board	Regulates pesticide use and the protection of human health and environment from unreasonable effects.
Hazardous Waste Management Program (VR 672-10-1)	DEQ - Waste Division	Regulates disposal of hazardous waste and encourages development of waste management programs. Provides for control of all hazardous wastes that are generated in or transported to Virginia. Limits uncontrolled release of hazardous substances to the environment.
Solid Waste Management Program (VR 672-20-10)	DEQ - Waste Division	Regulates management of open dumps and unpermitted facilities, solid waste disposal facility standards, permitting of solid waste management facilities, and special wastes.
Chesapeake Bay Preservation Act	Chesapeake Bay Local Assistance Department and Chesapeake Bay Local Assistance Board	Develops regulations that reverse the decline in the vitality of living resources in the Chesapeake Bay through water quality protection. Local government administered land use controls and stormwater management.

CONCLUSIONS

The improvement of water quality and other environmental preservation actions is an important aspect of port operations, use, and maintenance. It is imperative that all water quality and other environmental requirements are complied with by private and governmental interests in the implementation of actions considered in this Navigation Management Plan. These requirements have been discussed as they relate to each concern and will be carried forward to the next section for incorporation into the long-range, comprehensive planning strategy for the port.

CONCERN NUMBER 14

CHANNEL TO NEWPORT NEWS: NEED TO DEEPEN THE INBOUND LANE FROM 50 FEET TO THE AUTHORIZED DEPTH OF 55 FEET

DESCRIPTION

This concern expresses a need to deepen the elements of the inbound lane of the Channel to Newport News from their currently maintained depth of 50 feet to the authorized depth of 55 feet. The 55-foot inbound channel is a separable element of the Norfolk Harbor and Channels project authorized by the WRDA 86. This concern, identified by stakeholders and prioritized by Circle "A" members, is related to improvements to inbound navigation on the northside of the Hampton Roads harbor.

PROPOSED ACTION

The proposed action necessary to address this concern is similar to that required for Concern Number 9, deepening the outbound lane of the Channel to Newport News to 55 feet. The inbound lane would be deepened over its fully authorized width of 800 feet; therefore, there would be no need to consider the outbound lane separately. Of course, the inbound lanes of the approach channels would be dredged, rather than the outbound lanes, as in Concern Number 9.

PLAN ACCOMPLISHMENTS

Plan accomplishments would be the same as those described previously for the inbound lanes of the Norfolk Harbor Channel, Concerns Number 5 and 7 (tie) (the Norfolk Harbor Channel concern), except they would accrue to the northside of the port.

ANALYSES

As in the case of Concerns Number 5 and 7 (tie) (the Norfolk Harbor Channel concern), there have been no separate economic evaluations made of the 55-foot inbound channel element. Discussions contained relative to Concern Number 5 are equally appropriate for this concern. The most recent estimate, based on October 1998 price levels, was prepared to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 26.2 million cubic yards of material would be dredged during the initial construction as shown in Table II-3. The costs for this specific concern are based on estimates prepared for the entire 55-foot outbound channel element. Some of these values would be modified if this concern was accomplished separately from the total 55-foot outbound channel project. It is not very likely that this concern would be implemented prior to the implementation of Concern Number 9, as described in Section VI. Accordingly, it is not considered warranted to expend time and resources to prepare a separate detailed cost estimate for this concern, assuming Concern Number 9 is not in place. However, using readily available information, it is possible to develop a reasonable, preliminary estimate for the cost of constructing Concern Number 14 as a "stand alone" increment which is presented for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. In addition, the tunnel cover item also includes engineering and design and supervision and administration costs since these are totally a non-Federal responsibility. The costs for aids to navigation (the responsibility of the Coast Guard) and access channel and berthing area dredging (the responsibility of each respective user)

are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-19. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 14

<u>Item</u>	<u>Amount (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,276
Dredge Thimble Shoal Channel	26,068
Dredge Channel to Newport News	26,144
Dredge Hampton Roads Anchorage F	9,510
Dredge Sewells Point Anchorage	18,141
Remove wrecks	<u>868</u>
Subtotal	97,007
Engineering and design (2%)	1,940
Supervision and administration (4%)	<u>3,880</u>
Total	102,827
Construct Thimble Shoal tunnel cover	<u>4,184</u>
Grand total	107,011

Operation and Maintenance Costs

As indicated in Concern Number 9, the incremental increase in average annual operation and maintenance costs, is estimated to be \$700,000 at October 1998 price levels.

Benefits

The discussion of benefits for this concern is similar to that previously presented for Concerns Number 5 and 7 (tie) (the Norfolk Harbor Channel concern) except that these beneficial impacts would accrue to the northside of the port. As stated in Concern Number 7 (tie), container ships with a potential loaded draft of 47.5 feet have already called at the port, and even larger ships are expected. Industry experts expect an increasing amount of containerized cargo to move in these mega ships in the future. A 55-foot-deep inbound channel would permit appropriate under-keel clearance for these larger ships and would provide for more efficient and safe navigation.

Environmental Impacts

Substantial environmental studies were accomplished during the period from 1982 to 1985 by Federal agencies, state and university research laboratories, and private contractors under provisions of PL 99-88, as described previously for the 55-foot-deep outbound lane of the Norfolk Harbor and Channels project (Concern Number 2). All NEPA and related documentation have been fully satisfied but will require updating prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. As previously discussed in Section II, the 55-foot inbound element is part of the Norfolk Harbor and Channels project. Discussions included for Concern Number 9 are also applicable to this concern.

Operation and Maintenance. Discussions included for Concern Number 9 are also applicable to Concern Number 14.

Cost Sharing

Discussions included for Concern Number 9 are also applicable to this concern. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with this element is estimated at \$700,000, of which \$350,000 would be a Federal responsibility and \$350,000 a non-Federal responsibility.

Table V-20. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 14

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,276	6,510.4	9,765.6
Dredge Thimble Shoal Channel	26,068	10,427.2	15,640.8
Dredge Channel to Newport News	26,144	10,457.6	15,686.4
Dredge Hampton Roads Anchorage F	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	97,007	38,802.8	58,204.2
Engineering and design (2%)	1,940	776.0	1,164.0
Supervision and administration (4%)	<u>3,880</u>	<u>1,552.0</u>	<u>2,328.0</u>
Total	102,827	41,130.8	61,696.2
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Grand total	107,011	41,130.8	65,880.2

CONCLUSIONS

This concern relates only to the northside of the Hampton Roads harbor and does not include all of the elements of the 55-foot inbound channel project; specifically, most of the Norfolk Harbor Channel. Also, it is related to Concerns Number 7 (tie) (the Norfolk Harbor Channel concern) and 9, since the resolution of these two concerns would fully address Concern Number 14. Concern Number 7 (tie) would provide for the

deepening of all of the inbound channel elements needed for this concern, except for the Channel to Newport News element. Concern Number 9 requires the deepening of the outbound channel element of the Channel to Newport News and, since the outbound channel would be dredged over its fully authorized width of 800 feet, there would be no additional dredging required for the inbound channel element.

CONCERN NUMBER 15

NEED TO DEEPEN THE ENTIRE EASTERNMOST ANCHORAGE AREA OPPOSITE SEWELLS POINT (K-1) AND A SMALL SECTION OF CHANNEL TO 55 FEET TO PROVIDE EASIER TRANSIT BETWEEN THE NORFOLK HARBOR CHANNEL AND THE CHANNEL TO NEWPORT NEWS; IN ADDITION, THE K-1 ANCHORAGE WOULD NEED TO BE RELOCATED

DESCRIPTION

This concern expresses a need to deepen the K-1 Anchorage to 55 feet, including a small section of the Norfolk Harbor Channel adjacent to the anchorage area. Also included is a small area, adjacent to the K-1 Anchorage, known as the Naval Maneuvering Area.

PROPOSED ACTION

In the case of this concern, it must be assumed that Concern Number 10 (tie) (the K-1 concern) has already been constructed. Indeed, this concern is identical to Concern Number 10 (tie), except that the depth would be increased from 50 feet to 55 feet rather than 45 feet to 50 feet. The discussions included under Concern Number 10 (tie) are equally applicable for this concern; however, the provision of a 55-foot depth would not be appropriate unless and until the authorized depth of 55 feet is provided for the Hampton Roads harbor.

PLAN ACCOMPLISHMENTS

A depth of 55 feet would provide safe and efficient maneuvering between channels for the largest bulk coal carriers and container ships and would be commensurate with deepening of the Hampton Roads harbor channels to the authorized depth of 55 feet.

ANALYSES

There have been no economic evaluations made for this specific concern, although initial costs have been estimated to support this Navigation Management Plan.

Initial Construction Costs

The following table shows the estimated construction costs based on October 1998 price levels, the most recent financial data available. A total of 3.1 million cubic yards of material would be dredged during the initial construction. Unlike the deepening elements discussed earlier, no studies or preliminary design have been conducted on this improvement, previous to it being included as part of the Navigation Management Plan. The estimates presented in the following table are for informational purposes and provide reasonable values that are valid for comparative purposes. Contingencies are included in each item, rather than in a single lump sum as a separate item. The costs for aids to navigation (the responsibility of the Coast Guard) are not included in these estimates. In addition, the estimates do not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan, and one that has not been completed, the Southern Branch PED. The total cost for the completed efforts is \$5,538,000 and, as of the end of Federal Fiscal Year 1999, the estimated total cost of the third effort is \$3,360,000. Once a special effort is completed, its cost will be applied to the next major element of channel improvement to be constructed and will be cost shared with the non-Federal sponsor.

Table V-21. INITIAL CONSTRUCTION COSTS FOR CONCERN NUMBER 15

<u>Item</u>	<u>Amount (\$1,000)</u>
Dredge K-1 Anchorage	17,577
Engineering and design (2%)	352
Supervision and administration (4%)	<u>703</u>
Total	18,632

Operation and Maintenance Costs

It is estimated that there would be an average annual increase of 60,000 cubic yards in dredged material removed to support the maintenance in this area over the existing depths. The incremental increase in average annual operation and maintenance costs, based on this additional quantity of dredged material, is estimated to be \$240,000 at October 1998 price levels.

Benefits

The discussion of benefits contained under Concern Number 10 (tie) (the K-1 concern) are equally applicable here. The additional 5 feet of depth over that proposed for Concern Number 10 (tie) would permit the largest bulk coal carriers and container ships to safely and efficiently maneuver the turn area.

Environmental Impacts

All NEPA and related requirements will be fully satisfied prior to construction.

DIVISION OF PLAN RESPONSIBILITY

Action

Implementation. The deepening of the K-1 Anchorage, a small part of the Norfolk Harbor Channel, and the Naval Maneuvering Area to 55 feet would require the joint efforts of the Commonwealth of Virginia, acting through its statutory agent, the VPA, and the Federal Government, acting through the Army Corps of Engineers, to obtain appropriate funding. In accordance with the WRDA 86, the VPA would be responsible for 60 percent of the general navigation features (10 percent of which can be paid over 30 years), excluding aids to navigation. The execution of the necessary Project Cooperation Agreement specific to this identified concern, the financing plan, and the escrow agreement would be required from the VPA.

Operation and Maintenance. Once constructed, maintenance dredging of the additional depth would be accomplished by the Corps of Engineers. In accordance with the provisions of Section 101(b) of the WRDA 86, 50 percent of the incremental operation and maintenance costs for depths in excess of 45 feet would be the responsibility of the Commonwealth.

Cost Sharing

The cost-sharing requirements for this work are based on the provisions of the WRDA's 86 and 88 and current guidance and policies. The following table shows the apportionment of Federal and non-Federal construction costs. The incremental increase in average annual operation and maintenance costs associated with this project is estimated at \$240,000, of which \$120,000 would be a Federal responsibility and \$120,000 a non-Federal responsibility.

Table V-22. INITIAL CONSTRUCTION COST SHARING FOR CONCERN
NUMBER 15

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge K-1 Anchorage	17,577	7,030.8	10,546.2
Engineering and design (2%)	352	140.8	211.2
Supervision and administration (4%)	<u>703</u>	<u>281.2</u>	<u>421.8</u>
Total	18,632	7,452.8	11,179.2

CONCLUSIONS

The implementation of this concern is contingent upon the assumption that, at a minimum, Concerns Number 10 (tie) (the K-1 concern), 2 or 7 (tie) (the Norfolk Harbor Channel concern), and 9 or 14 have been provided. It is directly related to these five concerns. The concern, however, has substantial merit and will be so considered in Section VI.

NOTES:

(4/19/99) CONCERN 7 (TIE): THE ESTIMATE IS BASED ON BRINGING THE CHANNELS TO FULL WIDTH--IT ASSUMES THAT THE 55' OUTBOUND WILL HAVE ALREADY BEEN CONSTRUCTED. THEREFORE, THE THIMBLE SHOAL PORTION IS BASED ON AN INBOUND CHANNEL ONLY 350' WIDE INSTEAD OF 650' WIDE. IT IS JUST AN EXTENSION OF THE ESTIMATE FOR THE 45' TO 50' INBOUND CHANNEL, WHICH IS MERELY THE FILLING OUT THE REST OF THE 1,000' CHANNEL FROM THE 650' WIDTH NOW THERE. TO BE PROPERLY DONE, IT SHOULD CONSIDER THE COSTS AS SHOWN IN CONCERN 5 AND THEN, ASSUMING THERE HAS BEEN NO DEEPENING OF THE 55' OUTBOUND ELEMENT, ADD THE COSTS FOR A CHANNEL WHICH IS 650' WIDE ON THE INBOUND SIDE. THIS WOULD APPLY TO THE THIMBLE SHOAL CHANNEL AND THE NORFOLK HARBOR CHANNEL. WE ALREADY HAVE THE CORRECT INBOUND COSTS FOR THE ATLANTIC OCEAN CHANNEL. HOWEVER, SINCE SECTION V IS MERELY FOR COMPARISON, AND THIS CONCERN WILL NEVER BE EXECUTED IN THIS FASHION (45' TO 55'), LET IT GO. ASSUMING ALSO THAT THE WATER MAIN AND TUNNEL COVER COSTS WOULD BE APPLICABLE TO ANY NORFOLK HARBOR CHANNEL 55' DEEPENING.

(4/19/99) CONCERNS 9 AND 14: MADE NEWPORT NEWS INBOUND AND OUTBOUND THE SAME IN ORDER TO OBTAIN A BETTER COMPARISON. ALTHOUGH WE SHOULD ADD COSTS FOR ENTRANCE REACH OF NORFOLK HARBOR CHANNEL (NOT IN RICHARD'S ESTIMATE), LET IT GO, SINCE THIS SECTION IS MERELY FOR COMPARISON AND WILL NEVER BE EXECUTED SEPARATELY FROM THE NORFOLK HARBOR CHANNEL 55' OUTBOUND. USED RICHARD'S ESTIMATE FOR THIMBLE SHOAL, ALTHOUGH THEY ARE BASED ON A 350' WIDE INBOUND CHANNEL--SEE NOTES FOR CONCERN 7. THE COST FOR THE ATLANTIC

**OCEAN CHANNEL IS OKAY SINCE IT IS ACTUALLY BASED ON THE 650'-
WIDE INBOUND CHANNEL.**

**(4/19/99) CONCERNS 10 (TIE) AND 15: THE SMALL SECTION OF THE
INBOUND NORFOLK HARBOR CHANNEL IS NOT INCLUDED IN
ESTIMATE. HOWEVER, SINCE SECTION V IS FOR COMPARISON ONLY
AND THE QUANTITY IS PROBABLY SO SMALL, WE WILL LET IT GO.
REGARDING CONCERN 10, IN THE REAL WORLD THIS SECTION OF
CHANNEL WILL HAVE ALREADY BEEN DREDGED AS PART OF THE 50'
INBOUND SYSTEM. HOWEVER, REGARDING CONCERN 15, UNLIKE
CONCERN 10, IN THE REAL WORLD THIS SECTION OF CHANNEL MAY
NOT HAVE ALREADY BEEN DREDGED AS PART OF THE 55' INBOUND
SYSTEM. THE 55' OUTBOUND PROBABLY WILL HAVE BEEN DONE. AT
ANY RATE, BOTH OF THE 55' CHANNELS WOULD HAVE HAD TO BE
DONE SINCE WITHOUT THEM, THE BEND EASING WOULD NOT BE
NEEDED.**

SECTION VI

LONG-RANGE PLANNING STRATEGY

SECTION VI

LONG-RANGE PLANNING STRATEGY

GENERAL

The previous section of the Plan contains the individual evaluations of the most important problems, needs, concerns, and opportunities identified by stakeholders and prioritized by Circle "A" members. This section will incorporate these individual concerns into a long-range, comprehensive planning strategy that provides for the most efficient development of the port's navigation features and insures that these features logically and effectively accommodate future use and growth. The following criteria were considered in the development of the planning strategy.

- Priority/Preference/Acceptability
- Costs
- Benefits
- Efficiency
- Environmental Impacts
- Completeness/Compatibility
- Effectiveness
- Funding/Cost-Sharing Capabilities

The priority/preference/acceptability criteria relate to the importance of each of the elements of the Plan to the stakeholders. They consider the workability and viability of the element with respect to the comprehensive long-range plan; its likely acceptance by Federal, state, regional, local, and private interests; and its compatibility with existing laws, regulations, and public policies.

Cost is always an important consideration in the formulation of long-range plans, especially in view of continuing funding constraints. In some cases, it may be practical to implement one or more of the lower costs elements of the Plan in the initial stages and defer the more costly elements until later.

Like costs, beneficial impacts are almost always important considerations in the formulation of long-range plans. Benefits attributable to the Navigation Management Plan could result from transportation savings from the use of larger vessels, more efficient use of existing vessels, reduction in transit time, lower cargo and tug assistance costs, and improved safety of operations. Both the magnitude and the wide-spread nature of the beneficial effects are important considerations in combining the elements into a long-range, comprehensive plan.

Efficiency is the extent to which the elements of the Plan are the most cost-effective means of addressing the specified concern and realizing the specified opportunities, consistent with protecting the region's environment. A measure of efficiency can be determined by comparing the prospective benefits of the planning element with its estimated costs.

Both favorable and unfavorable environmental effects must be considered in combining the elements of the Plan into a long-range, comprehensive planning strategy. Beneficial effects are favorable changes in the ecological, aesthetic, and cultural attributes of natural and cultural resources, while adverse environmental effects are unfavorable changes. Significant beneficial and adverse impacts, as they relate to the specific elements of the Plan, have been incorporated into the decision making process in developing the overall Plan for the port.

Completeness and compatibility are the extent to which the elements of the Plan provide and account for all necessary investments and other actions to ensure the realization of the planned effects. They also require relating the planning elements to other types of public and private actions to obtain optimum results.

Effectiveness is the extent to which the elements of the Plan alleviate the specified problems and achieves the specified opportunities.

The final criteria deal with funding and cost-sharing capability. The combining of the elements into a long-range, comprehensive Plan for the Port requires active participation by all relevant Federal, state, local, and private interests. The costs of implementing the Plan are shared between Federal and non-Federal interests in accordance with the provisions of water resources development laws, specific requirements of acts authorizing projects and, in some cases, administrative instructions. The implementation of the elements of the Plan requires the availability of adequate and timely funding from Federal and non-Federal sources and the willingness and ability of non-Federal interests to participate in appropriate cost sharing.

LONG-RANGE STRATEGIC PLAN ELEMENTS

The long-range, strategic plan is divided into two general categories: new construction elements and ongoing strategic elements. The new construction element section is further separated into channel elements and other elements. Channel elements include the various channel deepening considerations for the Norfolk Harbor Channel, the Channel to Newport News, the approach channels, the Elizabeth River Channel, the Southern Branch Channel, and the widening of the turning area at the Sewells Point Anchorage. Other new construction elements include the extension of the life of Craney Island Dredged Material Area and potential port development of the Craney Island Dredged Material Area. Ongoing strategic elements include maintenance dredging, funding, and water quality. Channel elements are discussed in the following paragraphs in order of their priority of implementation. The new construction elements associated with extending the useful life and port development of Craney Island Dredged Material Area and the ongoing strategic elements would be accomplished concurrently with the implementation of the channel elements of the Plan.

NEW CONSTRUCTION ELEMENTS

Channels

Inbound Channels to 50 Feet Deep.

- **Norfolk Harbor Channel** - The first element of the Plan considered for implementation is the deepening of the inbound lane of the Norfolk Harbor Channel from 45 feet to 50 feet to Lamberts Point. Although this is ranked as Concern Number 5 in the previous section, its selection as the top priority element for implementation is valid for the following reasons. Concern Number 1, maintenance dredging, is an ongoing strategic element that is accomplished concurrently with new channel construction. Concerns Number 3 and 4, which are associated with the use and development of the Craney Island Dredged Material Area, will also be accomplished concurrently with new channel construction elements. Concern Number 2, the 55-foot-deep outbound element of the Norfolk Harbor Channel, is a new channel construction element; however, its ranking has been overcome by events and superseded by Concern Number 5. Subsequent to the identification and ranking of the concerns, discussions were initiated in November 1998 between representatives of the Corps of Engineers and the VPA regarding the accomplishment of the PED phase for the 50-foot-deep inbound channel. This effort should be completed by September 2002, with the initiation of construction planned in May 2003. As shown in Section V, the cost of Concern Number 5 is \$20,936,000; however, this figure does not include costs for two PED-related specialized efforts that have been completed, the Long-Term Disposal Study and the Navigation Management Plan. The combined cost of these specialized efforts is \$5,538,000, and it will be cost shared with the non-Federal sponsor. This brings the total cost of Concern Number 5 to \$26,474,000. One other specialized effort that has not been completed, Southern Branch PED, will be applied to the next major element of channel improvement to be constructed after that special effort is completed. The cost of the Southern Branch effort, estimated to be \$3,360,000 as of the end of Federal Fiscal Year 1999, will also be shared with the non-Federal sponsor. Based on experience with the maintenance of the 50-foot outbound element, it is anticipated that there will be no significant incremental

increase in average annual operation and maintenance costs for Concern Number 5. While the benefits expected from provision of this element have not been quantified, based on the increasing size of container ships as described in Section V, beneficial impacts are likely to be substantial. Detailed studies, which will be accomplished in the PED phase, will clearly show the relationship of average annual benefits and average annual costs, demonstrating the economic efficiency of this element. Also, all NEPA and related requirements will be updated prior to construction. This element of the Plan will provide the navigation features, i.e. a 50-foot-deep inbound channel, which will permit the port to accommodate large container ships safely and efficiently. It will require investments by non-Federal interests to provide commensurate depths for access channels and berthing areas to provide the capability to take full advantage of the 50-foot main channel depths. Investments will also be required at terminals to insure that transfer facilities are adequately upgraded to accommodate larger vessels. The accomplishment of all the features of this element will provide the most effective means of alleviating the problems involved with this concern. The cost-sharing requirements for this element are discussed in the previous section. Its implementation will require adequate and timely funding from both Federal and non-Federal sources. The Commonwealth of Virginia, acting through its statutory agent, the VPA, is the local sponsor for this element, and it is believed that the Commonwealth possesses both the ability and willingness to provide the appropriate items of local cooperation, including cost sharing.

- **Widening Turn at Sewells Point (K-1) Anchorage** - This element of the Plan is considered for implementation following the previously discussed element. It consists of deepening the K-1 Anchorage Area and relocating the existing anchorage area to an alternative site. (The small section of the adjacent channel would have already been deepened to 50 feet during the construction of the 50-foot inbound portion of the Norfolk Harbor Channel.) This relocation would necessitate the deauthorization of the existing anchorage site and the consideration of a newly authorized area to be evaluated in a comprehensive anchorage analysis for the entire port. This analysis could be conducted as part of the PED phase of a major channel deepening or as a separate investigation. Although this is ranked as Concern Number 10 (tie) in Section V, its selection as the next

element to be constructed is believed to be valid because it would provide a complete, one-level channel at the 50-foot depth, thus permitting a safer and more efficient turn to facilitate the maneuvering of large vessels from one channel to the other. As shown in the previous section, the total construction cost of this element of the Plan is \$27,046,000. While no monetary benefits have been quantified for implementing this element of the Plan, it would permit large vessels to make the turn from one channel to the other with reduced tug assistance and would enhance navigation in the port by providing additional safety, effectiveness, and efficiency of operations. It is expected that the element would be economically efficient with average annual benefits exceeding average annual costs. With respect to environmental impacts, all NEPA and related requirements will be fully satisfied prior to construction. The provision of this element of the Plan would complete the 50-foot channel system within the port. It would provide the most effective means of alleviating the problems associated with the difficult channel turn in the vicinity of the K-1 Anchorage. The cost-sharing requirements for this element are discussed in the previous section. It is believed that the Commonwealth of Virginia has the ability and willingness to provide the appropriate cost sharing required for implementation of this element of the Plan.

Outbound Channels to 55 Feet Deep.

- **Norfolk Harbor Channel and Channel to Newport News** - The deepening from 50 feet to 55 feet of two channels--the Norfolk Harbor Channel and the Channel to Newport News--ranks as Concerns Number 2 and 9, respectively, in the previous section. These elements of the Plan are considered concurrently. The combined total cost of implementing the 55-foot-deep outbound channels is estimated at \$140,474,000. The cost-sharing requirements for each of these two elements are shown separately in Section V; however, the following table shows the combined requirements. The incremental increase in average annual operation and maintenance costs is estimated at \$1,220,000 for the combined elements. The Commonwealth of Virginia would also share in the incremental increase in average annual operation and maintenance costs associated with this element estimated at \$550,000; the Federal share would be \$670,000. The most recent estimate of benefits, as discussed in Section V, was based on 1989 price

levels. Average annual benefits were estimated at \$22.2 million, clearly exceeding average annual costs and demonstrating the economic efficiency of this element. As with all the elements associated with deepening the port's main channels, all NEPA and related requirements have been fully satisfied but will be updated prior to construction. The combining of these two elements for both the southside and northside of the Hampton Roads harbor includes all of the elements of the 55-foot outbound channel project and provides a complete and compatible plan. The completeness of the Plan requires investments by non-Federal interests to provide commensurate depths for access channels and berthing areas to take full advantage of the 55-foot-deep main channels. When combined with the other elements of this grouping, they provide the most effective means of alleviating the problems involved with these concerns.

Table VI-1. COMBINED IMPLEMENTATION COSTS FOR CONCERNS NUMBER
2 AND 9

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,255	6,502.0	9,753.0
Dredge Thimble Shoal Channel	28,121	11,248.4	16,872.6
Dredge Norfolk Harbor Channel	24,814	9,925.6	14,888.4
Dredge Channel to Newport News	26,144	10,457.6	15,686.4
Dredge Hampton Roads Anchorage F	9,510	3,804.0	5,706.0
Dredge Sewells Point Anchorage	18,141	7,256.4	10,884.6
Remove wrecks	<u>868</u>	<u>347.2</u>	<u>520.8</u>
Subtotal	123,853	49,541.2	74,311.8
Engineering and design (2%)	2,477	990.8	1,486.2
Supervision and administration (4%)	<u>4,954</u>	<u>1,981.6</u>	<u>2,972.4</u>
Total	131,284	52,513.6	78,770.4
Relocate/replace 36-inch water main	5,006	0.0	5,006.0
Construct Thimble Shoal tunnel cover	<u>4,184</u>	<u>0.0</u>	<u>4,184.0</u>
Total	9,190	0.0	9,190.0
Grand total	140,474	52,513.6	87,960.4

- **Widening Turn at Sewells Point (K-1) Anchorage** - This element of the Plan is considered for implementation following the previously discussed element. Although it is ranked as Concern Number 15 in order of priority, including it as part of the 55-foot-deep outbound system is believed to be valid, since it is the provision of the 55-foot-deep channels that creates the need to address this specific concern. Implementation of an earlier element of the Plan, the widening of the turn at Sewells Point K-1 Anchorage to a depth of 50 feet, would have been previously accomplished, so that the requirement to address this specific concern would consist of deepening the turning area an additional 5 feet. As shown in Section V, the total construction cost of this element of the Plan is \$18,632,000, with an incremental increase in average annual operation and maintenance costs of \$240,000. While no benefits have been quantified for implementing this element of the Plan, the additional 5 feet of depth would permit the largest bulk coal carriers and container ships to safely and efficiently maneuver the turn area. It is estimated that the increased efficiency and safety of operations would provide sufficient economic benefits to justify the implementation of this element. With respect to the environmental effects, all NEPA and related requirements will be fully satisfied prior to construction. The provision of this element of the Plan following the construction of the 55-foot-deep outbound channels would be an important and needed adjunct to the deepened channels, thus, permitting the deep-draft vessels to maneuver in the turning area between the Norfolk Harbor Channel and the Channel to Newport News. The cost-sharing requirements of this element are discussed in Section V. It is believed that the Commonwealth of Virginia has the ability and willingness to provide the appropriate cost sharing required for implementation of this element of the Plan.

Elizabeth River Channel (Port Norfolk and Town Point Reaches) and Southern Branch Channel (Lower and Middle Reaches) to 45 Feet Deep. The deepening from 40 feet to 45 feet of two channels in these reaches--the Elizabeth River Channel and Southern Branch Channel--ranks as Concerns Number 6 and 10 (tie), respectively, in the previous section. These elements of the Plan are considered concurrently to include the entire existing 40-foot project reach from Lamberts Point to the Norfolk Southern Railroad bridge. It would not be possible to address the Southern

Branch element without first addressing the Elizabeth River element. The combined total cost of implementing these combined elements is estimated at \$23,510,000. The cost-sharing requirements for each of these two elements are shown separately in Section V; however, the following table shows the combined requirements. The incremental increase in average annual operation and maintenance costs is estimated at \$150,000 for the combined elements, all of which would be paid by the Federal Government. The most recent estimate of benefits, as discussed in Section V, was based on October 1986 price levels and indicated an average annual value of over \$15 million. The project was economically justified at the time, but an updated economic analysis will be required prior to initiating construction to reflect changes in the quantity and type of commodities being currently transported on the channel. Although extensive environmental investigations have already been accomplished, it is expected that additional studies will be required to support the preparation of appropriate NEPA documents prior to construction. The combining of these two elements provides a complete and compatible plan for this portion of the harbor. The completeness of the Plan requires investments by non-Federal interests to provide commensurate depths for access channels and berthing areas in order to take full advantage of the 45-foot-deep main channel. The deepening of these two elements to 45 feet provides the most effective means of alleviating the problems involved with this concern.

Table VI-2. COMBINED IMPLEMENTATION COSTS FOR CONCERNS
NUMBER 6 AND 10 (TIE)

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Elizabeth River Channel (Port Norfolk and Town Point Reaches)	9,842	6,397.3	3,444.7
Dredge Southern Branch Channel (Lower and Middle Reaches)	7,209	4,685.9	2,523.1
Craney Island tolls	<u>4,840</u>	<u>3,146.0</u>	<u>1,694.0</u>
Subtotal	21,891	14,229.2	7,661.8
Engineering and design (2%)	438	284.7	153.3
Supervision and administration (4%)	<u>876</u>	<u>569.4</u>	<u>306.6</u>
Total	23,205	15,083.3	8,121.7
Remove cables	<u>305</u>	<u>0.0</u>	<u>305.0</u>
Grand total	23,510	15,083.3	8,426.7

Southern Branch Channel to 40 Feet Deep (Upper Reach). This element of the Plan is ranked as Concern Number 12 priority and consists of deepening a portion of the Upper Reach of the Southern Branch Channel from 35 feet to 40 feet from the Norfolk Southern Railroad bridge to the Gilmerton Bridge. Although this is ranked Concern Number 12 in Section V, its selection as the next element to be constructed is believed valid, since it will complete the Southern Branch project. As shown in Section V, the total construction cost of this element of the Plan is \$20,430,000, with an incremental increase in average annual operation and maintenance costs of \$200,000. The most recent estimate of benefits, as discussed in Section V, was based on October

1988 price levels and indicated an average annual value of \$31 million. The project was economically justified at that time, but an updated economic analysis will be required prior to initiating construction to reflect potential changes in the quantity and type of commodities being currently transported on the channel. Although all NEPA and related requirements have been fully satisfied, they will require updating prior to construction. This element of the Plan will provide the navigation features, i.e. a 40-foot-deep channel that will benefit deep-draft vessels in the coastwise and foreign trade, which transport petroleum, grain, general cargo, and miscellaneous dry and liquid bulk commodities to and from terminals on the Southern Branch. It will require investments by non-Federal interests to provide commensurate depths for access channels and berthing areas to provide the capability to take full advantage of the 40-foot-deep main channels. Investments will also be required at adjacent terminals to insure that transfer facilities are adequate to accommodate larger vessels. The accomplishment of all of the features of this element will provide the most effective means of alleviating the problems and obtaining the opportunities associated with this concern. The cost-sharing requirements for this element are discussed in Section V. Its implementation will require adequate and timely funding from both Federal and non-Federal sources. Final cost sharing and financing will be coordinated with the VPA in accordance with the WRDA 86, as amended, and other relevant policies.

Inbound Channels to 55 Feet Deep. The deepening from 45 feet to 55 feet in the Norfolk Harbor Channel and from 50 feet to 55 feet in the Channel to Newport News ranks as Concerns Number 7 (tie) and 14, respectively, in Section V. Although these elements of the Plan are considered concurrently, it is likely that no action would be required to provide the Channel to Newport News element, since the outbound channel would have been deepened earlier over its full authorized width of 800 feet in accomplishing the higher-prioritized 55-foot-deep outbound element of the Plan. With regard to Concern Number 7 (tie), the Norfolk Harbor Channel would have already been deepened from 45 feet to 50 feet in accomplishing the higher-prioritized Concern Number 5; therefore, Concern Number 7 (tie) considers here the deepening from 50 feet to 55 feet only. The cost of implementing these elements, separately, is shown in

Section V for comparative purposes; however, there would be no additional dredging requirements for the inbound Channel to Newport News due to the implementation of related elements previously. The following table, therefore, shows the total cost of implementing this element of the Plan, assuming that earlier, higher priority elements are in place. The incremental increase in average annual operation and maintenance costs is estimated at \$600,000. The Commonwealth of Virginia would also share in the incremental increase in average annual operation and maintenance costs associated with this element estimated at \$300,000; the Federal share would be \$300,000. While benefits attributable to the provision of this element have not been quantified, a 55-foot-deep inbound channel would permit appropriate under-keel clearances for the largest container ships providing for efficiency and safety of operations. Detailed studies would be accomplished to demonstrate the economic efficiency of this element prior to initiating construction. Also, all NEPA and related requirements will be updated at the time. Implementation of this element will require investments by non-Federal interest to provide commensurate depths for access channels and berthing areas to provide the capability to take full advantage of the 55-foot main channel depths. Investments may also be required at terminals to insure that transfer facilities are adequate to accommodate larger vessels. The accomplishment of all the features of this element will provide the most effective means of alleviating problems and providing opportunities, and it will complete the 55-foot channel deepening for the port.

Table VI-3. COMBINED IMPLEMENTATION COSTS FOR CONCERNS
NUMBER 7 (TIE) AND 14

<u>Item</u>	<u>Total (\$1,000)</u>	<u>Federal (\$1,000)</u>	<u>Non-Federal (\$1,000)</u>
Dredge Atlantic Ocean Channel	16,276	6,510.4	9,765.6
Dredge Thimble Shoal Channel	13,917	5,566.8	8,350.2
Dredge Norfolk Harbor Channel	24,599	9,839.6	14,759.4
Dredge Channel to Newport News	<u>(1)</u>	<u>(1)</u>	<u>(1)</u>
Subtotal	54,792	21,916.8	32,875.2
Engineering and design (2%)	1,096	438.4	657.6
Supervision and administration (4%)	<u>2,192</u>	<u>876.8</u>	<u>1,315.2</u>
Total	58,080	23,232.0	34,848.0

(1) This channel was dredged to its full width during the construction of the 55-foot outbound element.

Other

Extend Life of Craney Island Dredged Material Area. Extending the life of Craney Island Dredged Material Area is ranked as Concern Number 3 in Section V. Stakeholders recognize the importance to the port of providing long-term economical placement capability for future dredging operations. This element of the Plan is directly related to the new construction channel elements and to maintenance dredging; its implementation will be considered concurrently with the highest prioritized elements of the comprehensive Plan. As discussed in Section V, a reconnaissance study completed in March 1999 determined there is a Federal interest in proceeding to a feasibility study to evaluate the potential eastward expansion of Craney Island Dredged Material Area and other potential alternative long-term placement areas. This study is scheduled for

completion in March 2002 and will provide detailed analyses regarding construction costs, operation and maintenance costs, benefits, environmental impacts, and appropriate cost sharing between Federal and non-Federal interests for recommendations to increase the dredged material placement capacity in the Hampton Roads area.

Port Development of Craney Island Dredged Material Area. Immediately after extending the life of Craney Island Dredged Material Area is a directly-related concern, Port Development of Craney Island Dredged Material Area, which is ranked as Concern Number 4. These two concerns must be considered together due to their integral relationship. As discussed in Section V, the use of a portion of the Craney Island Dredged Material Area for future port development would help provide for continued port growth and would help keep the Port of Hampton Roads, as well as the nation, competitive in world trade. The previously mentioned feasibility study would also address the potential expansion of the Craney Island Dredged Material Area for port development.

ONGOING STRATEGIC ELEMENTS

Maintenance Dredging

The Corps of Engineers' program to provide maintenance dredging of the main channels of the port at appropriate intervals to insure that proper dimensions are available for efficient, effective, and safe navigation is ranked as Concern Number 1. Stakeholders recognize the importance of maintenance dredging in supporting substantial port industry and military activities within the region. Obviously, maintenance dredging activities are accomplished concurrently and continuously with all other elements of the Plan. Proper and timely maintenance dredging will continue into the future, as it has in the past, depending on appropriate funding levels and the continued availability of the Craney Island Dredged Material Area or similar alternative placement site.

Funding

As discussed in Section V, funding is always a concern, since there are seldom sufficient funds to accomplish all that is desired. Ranked as Concern Number 7 (tie), the availability of appropriate funds at the proper time is the key to implementing all the concerns discussed in this Plan. A primary objective of this Plan is to assist decision makers in arriving at more informed judgements regarding the port's future navigation problems, needs, concerns, and opportunities by establishing priorities of action. It is anticipated that the Plan will help in the budgeting and allocation of available funds to the highest prioritized concerns. Also, implementation of the elements of the Plan require, in many instances, appropriate cost sharing between Federal and state interests, as well as coordinated investments by private interests to fully accomplish each element's objectives. The Navigation Management Plan will help facilitate the necessary planning and other actions to coordinate the proper timing of funding so that implementation may be accomplished in an effective manner.

Water Quality

Stakeholders recognize water quality and related environmental preservation actions (ranked as Number 13) as important aspects of port operation, use, and maintenance. It is an ongoing element of the Plan and is given full consideration in the implementation of the other elements, which comprise the comprehensive Plan. Section III discusses two studies, the Elizabeth River Environmental Restoration Study and the proposed Lynnhaven River Restoration Study, which will assist in addressing water quality problems and needs within the area. Federal, state, and local programs currently address water quality concerns within the port. Section V discusses the role of the Virginia DEQ in developing and implementing policies, programs, and procedures to assure the proper use and management of the Commonwealth's water resources. The implementation of the elements of the Plan requires that, at a minimum, all water quality and other environmental requirements are fully complied with by both private and governmental interests. Implementation of voluntary innovative and restorative measures to improve water quality would greatly assist in addressing this concern. Information

regarding various award and financial incentive programs for environmental stewardship may be found in Appendix H.

SUMMARY

The following table shows a summary of the elements of the comprehensive Plan, indicating the proposed order of implementation, Circle "A" priority ranking, current status, estimated future action required for implementation, and estimated time frame for accomplishing the future action required.

INSERT Table VI-4, page 1

INSERT Table VI-4, page 2

INSERT Table VI-4, page 3

CONCLUSIONS

This section of the Plan incorporates the individual concerns of stakeholders into a logical, comprehensive plan based on the priorities established by Circle "A" members. The Plan is developed for planning purposes and to give appropriate decision makers information from which implementation and funding decisions may be made. The Plan is, of necessity, flexible and sensitive to the passing of time and events, and it will require periodic updating to keep it current and viable. It is likely that the future of the port will reflect the past and there will never be enough resources to accomplish all that is desired. The Navigation Management Plan will assist Federal, state, local, and private investors to better allocate scarce port resources based on the prioritized concerns established by port users and interests.

NOTES:

(4/5/99) DID NOT INCLUDE FOOTNOTE ABOUT SUNKEN COSTS IN TABLES AS DISCUSSED IN 1/22/99 MEETING. INSTEAD, PUT IT IN THE TEXT OF THE FIRST CONCERN DISCUSSED.

Table VI-4. LONG-TERM PLANNING STRATEGY SUMMARY (1)

<u>Element</u>	<u>Order of implementation</u>	<u>Circle "A" priority</u>	<u>Current status</u>	<u>Future action required</u>	<u>Time frame for accomplishing future action required (2)</u>
Inbound channels to 50-foot depth	1	5	In PED (3)	Complete PED and construct	Short term
Widening turn at Sewells Point (K-1) anchorage to 50-foot depth	2	10 (tie)	N/A	Obtain formal local sponsor support and funding for PED	Short term
Outbound channels to to 55-foot depth	3	2 and 9	Authorized for construction	Obtain formal local sponsor support and funding for PED	Mid term
Widening turn at Sewells Point (K-1) anchorage to 55-foot depth	4	15	N/A	Obtain formal local sponsor support and funding for PED	Mid term

Table VI-4. LONG-TERM PLANNING STRATEGY SUMMARY (1)
(Cont'd)

<u>Element</u>	<u>Order of implementation</u>	<u>Circle "A" priority</u>	<u>Current status</u>	<u>Future action required</u>	<u>Time frame for accomplishing future action required (2)</u>
Elizabeth River and Southern Branch Channels to 45-foot depth	5	6 and 10 (tie)	Authorized for construction	Obtain formal local sponsor support and funding for PED	Long term
Southern Branch Channel (Upper Reach) to 40-foot depth	6	12	Authorized for construction	Obtain formal local sponsor support for completion of PED	Long term
Inbound channels to 55-foot depth	7	7 (tie) and 14	Authorized for construction	Complete PED	Long term
Extend life of Craney Island Dredged Material Area	Concurrent with channel elements	3	Feasibility report underway	Complete feasibility report and initiate PED	Mid term

Table VI-4. LONG-TERM PLANNING STRATEGY SUMMARY (1)
(Cont'd)

<u>Element</u>	<u>Order of implementation</u>	<u>Circle "A" priority</u>	<u>Current status</u>	<u>Future action required</u>	<u>Time frame for accomplishing future action required (2)</u>
Port development of Craney Island Dredged Material Area	Concurrent with channel elements	4	Feasibility report underway	Complete feasibility report and initiate PED	Mid term
Maintenance dredging	Ongoing	1	Ongoing	Obtain sufficient and timely funding	Ongoing
Funding	Ongoing	7 (tie)	Ongoing	Keep decision maker informed of needs and requirements	Ongoing
Water quality	Ongoing	13	Ongoing	Ensure rules and regulations are clearly defined and adequately enforced	Ongoing

- (1) All depths refer to mean lower low water.
(2) Short term 1 to 3 years; mid term 3 to 10 years; long term over 10 years.
(3) PED stands for Preconstruction Engineering and Design Phase.