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## SECTION II

### POST-AUTHORIZATION CORPS OF ENGINEERS PROJECTS

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#### 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 that are authorized and constructed and (2) those project elements that 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.

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## **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 that have not yet been constructed will be discussed in the next part of Section II.

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## **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--that 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 that 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 that 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 during the period from 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, both 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 occurred 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 the ship building and repair facilities that 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 that 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" on National Ocean Service Nautical Charts; See Appendix B, Table B-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 Pinner's 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 Pinner's 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 that 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 that 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 that 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 that 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 within the area. In addition, numerous recreational vessels are located along the connecting waters and use that the inlet on a regular basis, particularly 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 that 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 that 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 the 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, including 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 that 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 that 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, 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 that 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, Inc., 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 that 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 been 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 that 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.