

## 1 Introduction

The purpose of this investigation is to determine appropriate future actions, if any, concerning navigation improvements to the Federal navigation channel at Savannah Harbor. This General Re-Evaluation Report (GRR) documents the planning process undertaken for the Savannah Harbor Expansion Project (SHEP), which assesses potential navigation improvements at Savannah Harbor (Figures 1-1 and 1-2).

Garden City Terminal, which is the Georgia Ports Authority-operated container terminal at Savannah Harbor, is currently the second largest container port on the US east coast and the fourth largest in the Nation. However, Savannah Harbor also currently has the shallowest controlling depth for a major port. Although the 42-foot controlling depth and 38-foot unrestricted access depth at Savannah Harbor is similar to current constraints at the Panama Canal (39 feet), the Panama Canal Expansion Project will be fully operational by 2014, which will allow passage for vessels with up to 50 feet of draft. The Georgia Ports Authority has planned and funded improvements at Garden City Terminal to coincide with the Panama Canal Expansion Project. With these improvements in place, this terminal will be the largest single container handling facility in the Nation with more than 1,200 acres of terminal space, 9,000 feet of berth, 33 post-Panamax size cranes, and two on-site intermodal transfer facilities serviced by two major rail lines. The facility, at full build out, will have a throughput capacity of 6.5 million Twenty-Foot Equivalent Units (TEUs).

Navigation improvements at Savannah Harbor present the opportunity to reduce future waterborne transportation costs and to enhance efficiency in international trade associated with larger, more efficient vessels. Garden City Terminal infrastructure improvements and off-terminal landside transportation infrastructure improvements to increase the container handling efficiency of the terminal are ongoing.

United States Army Corps of Engineers (USACE) project planning follows the six-step process first described in the Principles and Guidelines<sup>1</sup> (P&G [1983]) adopted by the Water Resources Council and promulgated by Executive Order and further elaborated in the Planning Guidance Notebook, ER 1105-2-100 (22 April 2000). Although presented in series, these steps are applied in an iterative process, which focuses emphasis on succeeding steps. Steps in the plan formulation process include:

- The specific problems and opportunities to be addressed in the study are identified, and the causes of the problems are discussed and documented. Planning goals are set, objectives are established, and constraints are identified.

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<sup>1</sup> The Water Resources Council's P&G (February 3, 1983) are comprised of two parts: The Economic and Environmental *Principles* for Water and Related Land Resources Implementation Studies and The Economic and Environmental *Guidelines* for Water and Related Land Resources Implementation Studies.

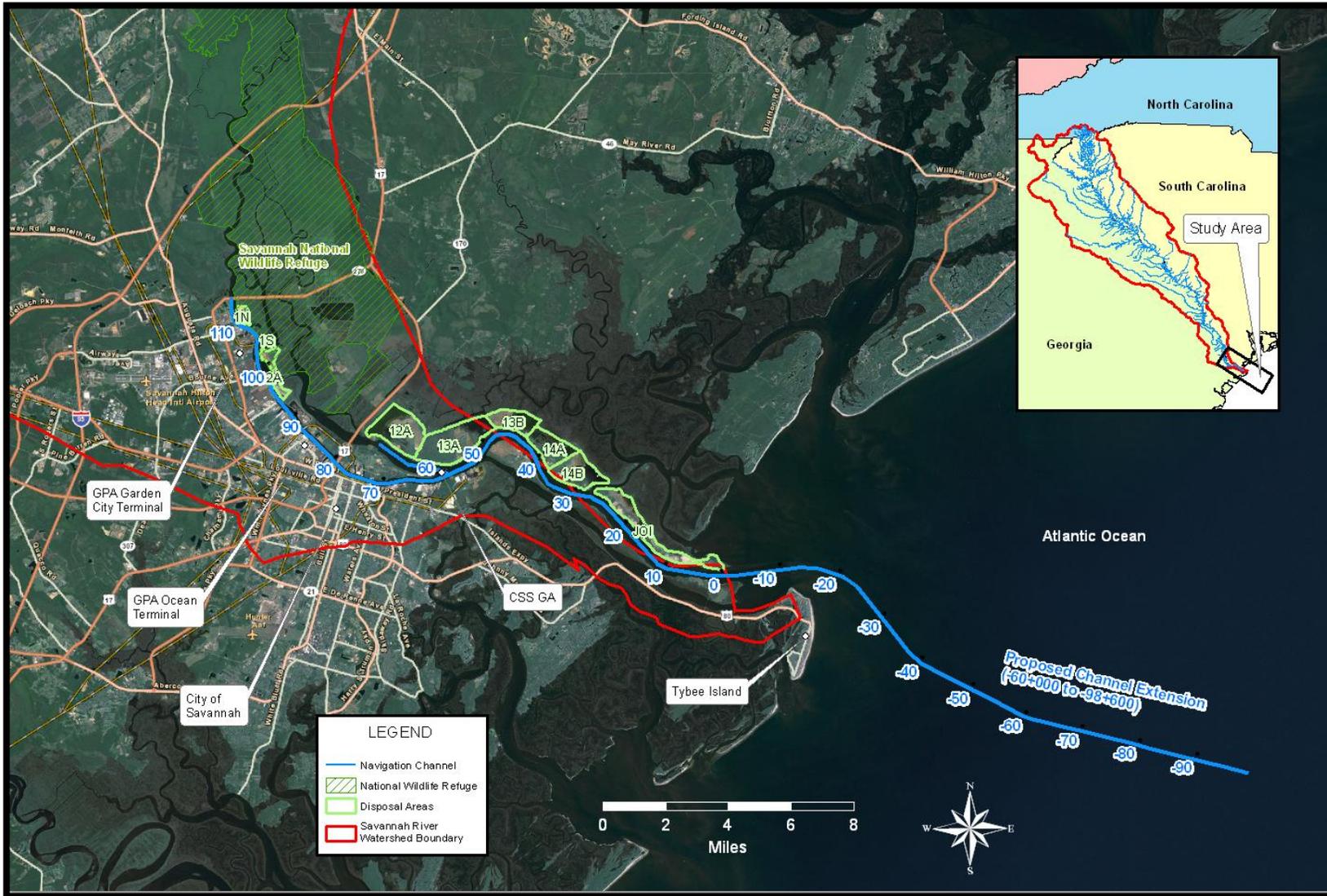


Figure 1–1: Savannah Harbor Expansion Project

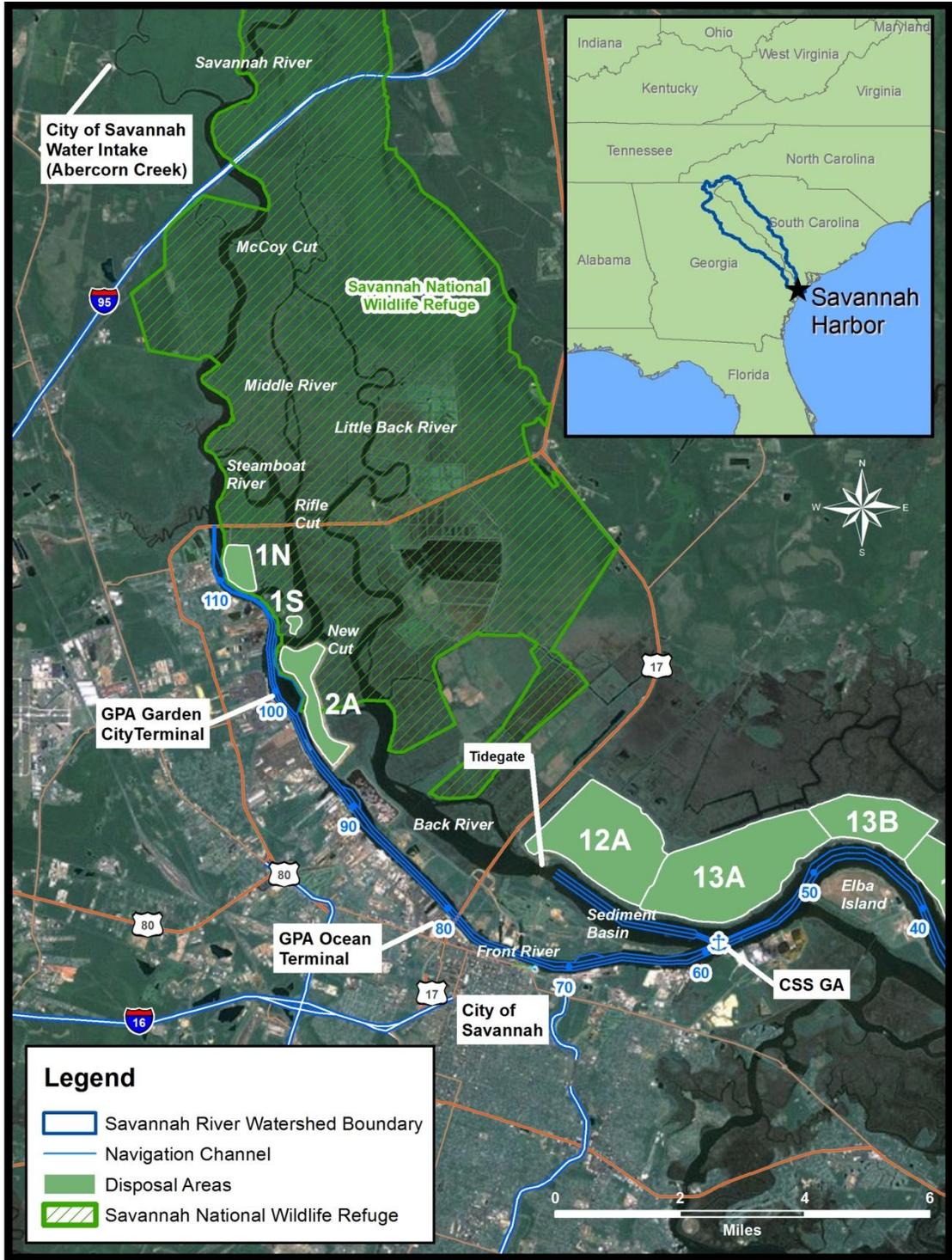


Figure 1-2: Inner Harbor

- Existing and future without-project conditions are identified, analyzed, and forecast. The existing condition resources, problems, and opportunities critical to plan formulation, impact assessment, and evaluation are characterized and documented.
- The study team formulates alternative plans that address the planning objectives. A range of alternative plans is identified at the beginning of the planning process and screened and refined in subsequent iterations throughout the planning process.
- Alternative project plans are evaluated for effectiveness, efficiency, completeness, and acceptability. The impacts of alternative plans are evaluated using the system of accounts framework specified in the Principles and Guidelines and ER 1105-2-100.
- Alternative plans are compared. Contributions to National Economic Development (NED) are used to prioritize and rank alternatives. The public involvement program is used to obtain public input to the alternative identification and evaluation process.
- A plan is selected for recommendation, and a justification for plan selection is prepared.

The USACE Civil Works planning community employs definitions for problems, opportunities, goals, objectives, and constraints that have specific meanings in the Federal water resources planning process. Problems are defined by the planner as the undesirable conditions or characteristics that need to be changed. Opportunities are conditions or characteristics which may be exploited to address or resolve the problems identified in the planning process. Opportunities often include the means to favorable outcomes which would result from plan implementation. Planning study objectives describe the favorable outcomes of a successfully implemented plan. Objectives are developed so as to solve the problems and take advantage of the opportunities. Alternative plans are formulated to achieve policy level goals, such as contribute to NED, and meet planning study objectives. Constraints are restrictions which limit the set of potential alternative plans. Alternative plans are formulated to avoid violating planning constraints.

This document describes the planning process and technical investigations used in the analysis of potential navigation improvements at Savannah Harbor.

## **1.1 Location and Setting**

Savannah Harbor is a deep-draft harbor located on the South Atlantic U.S. coast, 75 statute miles south of Charleston Harbor, South Carolina, and 120 statute miles north of Jacksonville Harbor, Florida. The harbor comprises the lower 21.3 miles of the Savannah River (which, with tributaries, forms the boundary between Georgia and South Carolina along its entire length of 313 miles) and 11.4 miles of channel across the bar to the Atlantic Ocean.

Within the harbor limits, the Savannah River is generally divided into two channels by a series of islands. From the Atlantic Ocean to River Mile 10, where the river converges, the harbor is separated into South and North Channels. Within this area, the navigation channel is maintained in the North Channel. After divergence of the river into Front and Back Rivers at River Mile 11, the navigation channel is maintained in the Front River and passes by the business district of the City of Savannah. The navigation channel is maintained in the Front River to the upper limits of the harbor at River Mile 21.3. The Atlantic Intracoastal Waterway (AIWW) crosses the navigation channel approximately 5.5 miles upstream of the entrance to the harbor. The Savannah River Below Augusta Project, which is a shallow-draft navigation channel authorized for 9 feet deep and 90 feet wide, extends upstream from the harbor (River Mile 21.3) to River Mile 202.6 at Augusta, Georgia.

## **1.2 Authorizations**

Below is a list of Federal actions in Savannah Harbor ending with the Water Resources and Development Act of 1999, which conditionally authorized the deepening of the Savannah Harbor Navigation Project:

- 1793 – Commissioners and Pilotage authorized to “turn and alter”
- 1826 – Rivers & Harbors Act (Deepen the Back River at a cost between \$3,250 and \$10,833)
- 1873 – (22 feet), 1907 (26 feet), 1917 – 1935 (30 feet), 1945 – 1954 (34 feet), 1965 (38feet), 1986 (Widening)
- 1994 – Savannah Harbor Deepened to 42 feet
- 1998 – The Georgia Ports Authority (GPA) completed a feasibility study under Section 203 of the Water Resources Development Act (WRDA) of 1986
- 1999 – Congress conditionally authorized deepening the Savannah Harbor Navigation Project to a maximum controlling depth of 48 feet (14.6 meters) within the river channel contingent upon completion of an Environmental Impact Statement (EIS), a final mitigation plan, and an incremental analysis of the channel depths from 42 to 48 feet below mean lower low water (MLLW).

The applicable provision in WRDA 1999 (Public Law 106-53 – August 17, 1999) states as follows:

*“SEC. 101. PROJECT AUTHORIZATIONS.*

*(b) PROJECTS SUBJECT TO A FINAL REPORT.—The following projects for water resources development and conservation and other purposes are authorized to be carried out by the Secretary substantially in accordance with the plans, and subject to the conditions, recommended in a final report of the Chief of Engineers if a favorable report of the Chief is completed not later than December 31, 1999:*

*(9) SAVANNAH HARBOR EXPANSION, GEORGIA.—*

*(A) IN GENERAL.—Subject to subparagraph (B), the project for navigation, Savannah Harbor expansion, Georgia, including implementation of the mitigation plan, with such modifications as the Secretary considers appropriate, at a total cost of \$230,174,000 (of which amount a portion is authorized for implementation of the mitigation plan), with an estimated Federal cost of \$145,160,000 and an estimated non-Federal cost of \$85,014,000.*

*(B) CONDITIONS.—The project authorized by subparagraph (A) may be carried out only after—*

*(i) the Secretary, in consultation with affected Federal, State of Georgia, State of South Carolina, regional, and local entities, reviews and approves an environmental impact statement for the project that includes—*

*(I) an analysis of the impacts of project depth alternatives ranging from 42 feet through 48 feet; and*

*(II) a selected plan for navigation and an associated mitigation plan as required under section 906(a) of the Water Resources Development Act of 1986 (33 U.S.C. 2283(a)); and*

*(ii) the Secretary of the Interior, the Secretary of Commerce, the Administrator of the Environmental Protection Agency, and the Secretary approve the selected plan and determine that the associated mitigation plan adequately addresses the potential environmental impacts of the project.*

*(C) MITIGATION REQUIREMENTS.—The mitigation plan shall be implemented before or concurrently with construction of the project.”*

### **1.3 Study Purpose and Scope**

The Savannah District of the USACE in conjunction with the USACE Deep-Draft Navigation Planning Center of Expertise has developed this GRR to determine the feasibility of improvements to the Federal navigation project at Savannah Harbor. This GRR and accompanying Environmental Impact Statement (EIS) have been developed to fulfill the conditions of the conditional authorization granted in WRDA 1999, and together, assemble the information and analysis required by the National Environmental Policy Act of 1969 (NEPA). The conditional authorization was based

on the 1998 feasibility study of navigation improvements to Savannah Harbor conducted by the Georgia Ports Authority under the authority of Section 203 of the Water Resources Development Act of 1986 (P.L. 99-662) and was based on the concurrent Tier I EIS. This GRR and EIS provide documentation of the technical and plan formulation analyses conducted in the development of a recommended plan for navigation improvement and environmental mitigation. The GRR and EIS assess mitigation plans for alternative channel depths. The GRR includes a final mitigation plan and an incremental analysis of alternative channel depths from -42 to -48 feet, as required by the conditional authorization.

A GRR is a reanalysis of a previously completed study, using current planning criteria and policies, which is required due to changed conditions and/or assumptions. The results may affirm the previous plan; reformulate and modify it, as appropriate; or find that no plan is currently justified.

Tiering is recommended by the CEQ NEPA regulations when a broad (Tier I) EIS has been prepared. A Tier II EIS is prepared later on an action included within the scope of the initial, broader (Tier I) EIS.

The 1998 Feasibility Study Report and Tier I EIS was prepared by GPA and provided to the Corps and to Congress for authorization. After Congress conditionally authorized the project, the Corps completed its review of the documents. The Corps determined that the project was not formulated in accordance with applicable US Army Corps of Engineers planning procedures, and that an acceptable mitigation plan was not determined. Analyses included in the SHEP Tier I EIS only evaluated the potential impacts for a -50-foot MLW channel depth. The Corps required a special report and EIS be prepared to indentify the NED Plan and the appropriate mitigation. This EIS was prepared to fulfill the environmental portion of those requirements. It should be noted that the Draft EIS was referred to as a Tier II EIS, but, as discussed, the Final EIS is more appropriately considered a full EIS.

The Corps prepared a full EIS (not tiered) in this phase of the project to reconsider methods that may be available to meet the needs for the project, more completely identify and evaluate the potential impacts of project alternatives, develop acceptable mitigation plans, and conclusively determine the NED plan. These include refinement of the hydrodynamic and water quality models, and obtaining agreement from USACE and the natural resource agencies in the models' ability to reasonably predict the impacts of the proposed project alternatives, including mitigation features. In-depth investigations were performed of issues identified through the NEPA scoping process. The findings and conclusions of these additional evaluations are complete, and the information is included in the Final GRR and EIS.

Since the last major navigation improvements were completed by the USACE in April 1994, Savannah Harbor has experienced significant growth in containerized cargo volume, vessel traffic, and the size and frequency of container ships calling at the Port. The 1994 navigation improvements were designed to accommodate a class of newly

built container ships with a dead weight tonnage of approximately 60,000 tons and a maximum TEU (Twenty-foot Equivalent Unit) capacity of 4,024 TEUs. The design vessel for the 1994 improvements had a length of 951 feet, a maximum operating draft of 42.6 feet, and a Panamax beam (106 feet). The largest vessels currently calling at the Port are rated at more than 8,100 TEUs, with a dead weight tonnage of 85,900 tons, an overall length of 984 feet, a Post-Panamax beam of 131 feet, and a maximum operating draft of 48 feet. Over the intervening years, the Georgia Ports Authority has made major investments in landside infrastructure to accommodate increasingly larger vessels and burgeoning trade growth at the Port and the region it serves. At the present time, Savannah Harbor is the second busiest container port on the U.S. east coast, and the fourth busiest in the Nation.

Potential navigation improvements include deepening and widening of navigational channels, Kings Island Turning Basin expansion, and channel wideners. The purpose of these potential improvements is to increase the efficiency of cargo vessel operations and to accommodate larger container ships, which are already calling at the Port and which are projected to use the Port in larger numbers in the very near future. The improvements are aimed at alleviating the draft restrictions which impact container ship operations in the harbor. In 2008, approximately 82% of the container ships that called on the Port of Savannah had design drafts that were too deep to allow unrestricted access to the channel. These vessels were required to light-load, use tidal advantage, or both.

This study identifies and evaluates alternatives that will:

- Reduce congestion in the river channel;
- Accommodate recent and anticipated future growth in containerized cargo and container ship traffic;
- Improve the efficiency of operations for container ships within the Savannah Harbor Navigation Project; and
- Allow larger and more efficient container ships to use the Port.

Environmental mitigation actions address expected adverse impacts to tidal wetlands (including freshwater, brackish, and salt marshes), levels of dissolved oxygen in the harbor, endangered Shortnose sturgeon habitat, Striped bass spawning and nursery areas, and periodic increases in chloride levels at the City of Savannah water intake. Additionally, a cultural resource mitigation plan is included for the CSS *Georgia*, a site listed on the National Register of Historic Places. These actions would mitigate all significant adverse impacts from the proposed project.

## **1.4 Existing Navigation Project**

### **1.4.1 Navigation Channel**

The authorized deep-draft navigation channel (Table 1-1) is 44 feet deep and 600 feet wide from deep water in the ocean (mile 11.4B with the letter B indicating that section

of the channel is part of the outer bar channel and not part of the inner harbor channel) to the channel between the jetties (mile 2.6B), thence 42 feet deep and 500 feet wide to the harbor entrance (River Mile 0.0) and on to the upstream end of the Kings Island Turning Basin (River Mile 19.5). The channel is 36 feet deep and 400 feet wide from mile 19.5 to the upstream end of the Argyle Island Turning Basin (River Mile 19.9). The upper end of the harbor from River Mile 19.9 to its upstream limit at River Mile 21.3 is maintained at 30 feet deep and 200 feet wide.

**Table 1-1: Savannah Navigation Channel Dimensions**

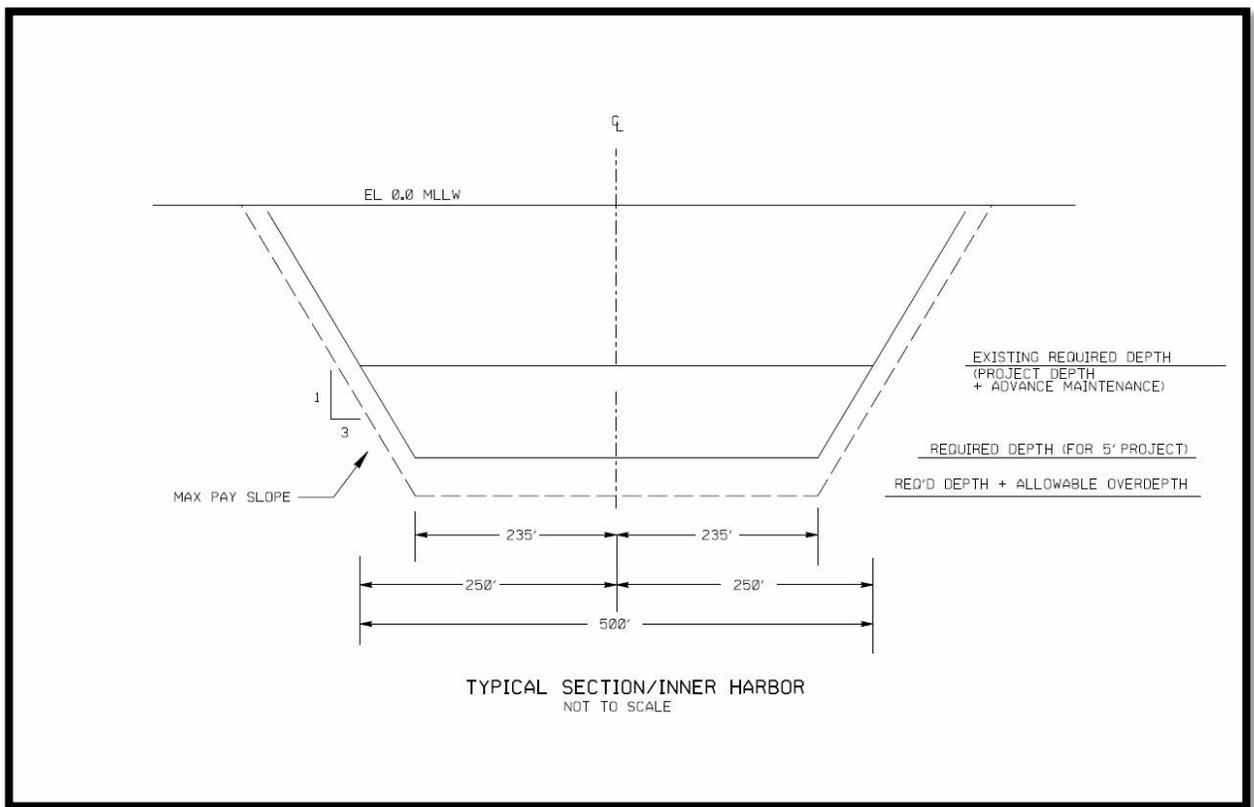
Feature	Station	River Miles	Authorized Depth (ft below MLLW)	Authorized Width (ft)
Atlantic Ocean	-60+000B	11.4B *		
To		(8.7 miles)	44	600
Entrance Channel	-14+000B	2.7B *		
To		(2.7 miles)	42	500
Harbor Entrance	0+000	0.0		
To		(19.5 miles)	42	500
Kings Island Turning Basin	103+000	19.5		
To		(0.4 miles)	36	400
Argyle Island Turning Basin	105+500	19.9		
To		(1.4 miles)	30	200
Upstream limit of authorized Project	112+500	21.3		
Total Miles		32.7 miles		

Note: Station Numbers are measured in feet from the harbor entrance (Sta. 0+000). Currently maintained width from Station 58+000 to 59+000 is 400 feet to avoid the CSS *Georgia*. \* Indicates section is part of the outer bar channel.

#### 1.4.2 Advance maintenance

Advance maintenance dredging extends the length of time during which authorized channel depths are available, reduces the frequency of dredging, reduces annual maintenance costs, and by concentrating the sediment to be removed at these locations, allows the dredge to operate at a higher efficiency. This sediment management technique is accomplished by enlarging the channel cross-section to provide storage for deposited sediments outside or at depths greater than the authorized channel dimensions (Figures 1-3 and 1-4). Under present USACE policy, a District office must request approval for all advance maintenance from USACE Division offices. Decisions to implement advance maintenance can be made at any time based upon performance and review of dredging cost analyses and sediment accumulation records, and they are effective until future information indicates they are no longer necessary or economically justified. Environmental clearances must also be obtained prior to implementation of authorized advance maintenance features.

Due to the rapidity of shoaling development and the large quantity of annual shoaling in the Savannah Harbor (6.2 million cubic yards), nearly every channel reach in the Savannah Harbor receives some degree of advance maintenance. Table 1-2 presents Savannah Harbor’s existing advance maintenance areas. Table 1-2 also includes allowable overdepth, which is typically a dredging allowance of an additional two feet of dredged depth that will be paid for to account for the inaccuracies of dredging and ensure that the authorized depth is achieved. In addition, there may be a maximum three-foot depth of disturbance, which is the depth that a cutterhead dredge might influence or disturb below the Maximum Sediment Removal Depth. The material within the disturbance depth is not being removed. No advance maintenance is presently performed between Stations 58+000 and 59+000 to reduce potential impacts to CSS *Georgia*, which is located along that reach.



**Figure 1-3: Typical Dredging Section – Inner Harbor**

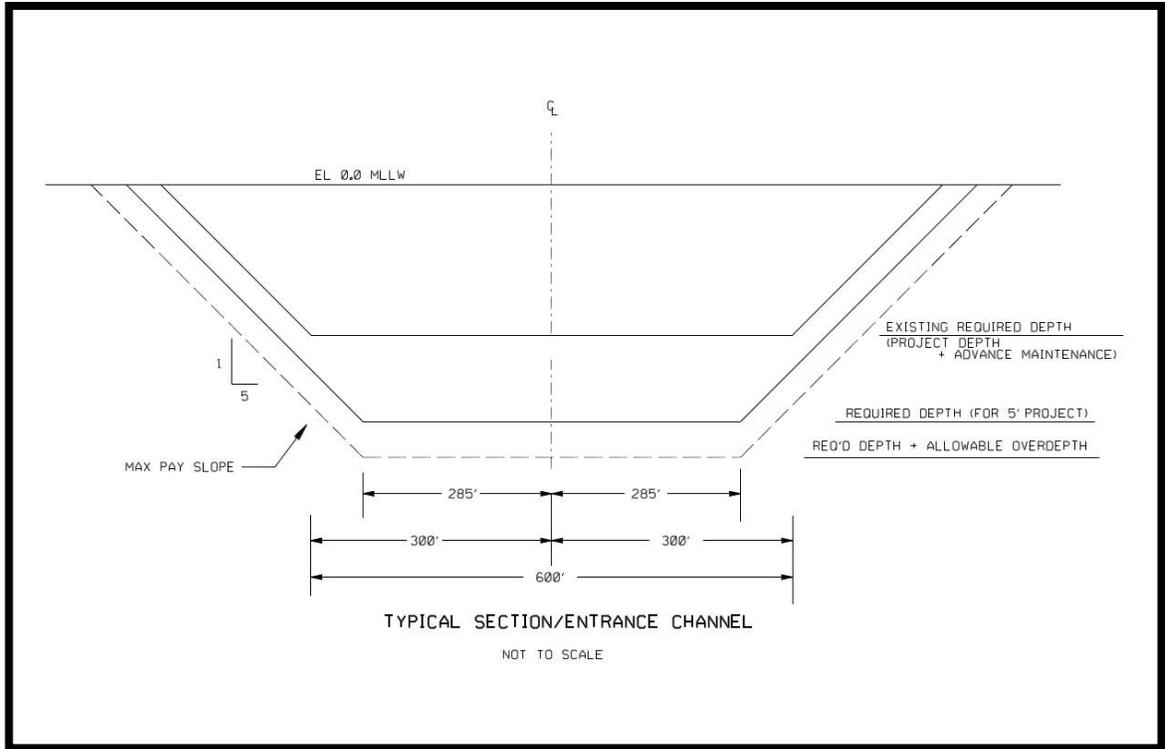


Figure 1-4: Typical Dredging Section – Entrance Channel

**Table 1-2: Advance Maintenance Areas (feet below MLLW)**

<b>Station (1000 ft)</b>	<b>Authorized Depth</b>	<b>Advanced Maintenance</b>	<b>Sediment Removal Depth</b>
112.5 to 105.5	30	2	32
105.5 to 103	36	2	38
103 to 102	42	0	42
102 to 70	42	2	44
70 to 37	42	4	46
37 to 35	42	6	48
35 to 24	42	4	46
24 to 0	42	2	44
0 to 14B	42	2	44
14B to 60B	44	0	44
Oysterbed Island TB	40	0	42
Fig Island TB	34	4	40
Marsh Island TB	34	0	36
Kings Island TB	42	8	52
Argyle Island TB	30	0	32
Port Wentworth TB	30	2	34
Sediment Basin	40	0	40
Sediment Basin Throat	38	0	38

Note: Sediment removal depth includes advance maintenance. A maximum allowable over-depth of an additional two feet is permitted to allow for inaccuracies in the dredging process; Depths are shown in feet MLLW EPOCH 1983-2001.

### 1.4.3 Turning Basins

Five authorized turning basins (Table 1-3 and Figure 1-5) are located within the reaches proposed for deepening to allow ships to be turned before transiting the harbor. There is also a private turning basin at Elba Island between Oysterbed and Fig Island turning basins, which is not presently maintained by the USACE.

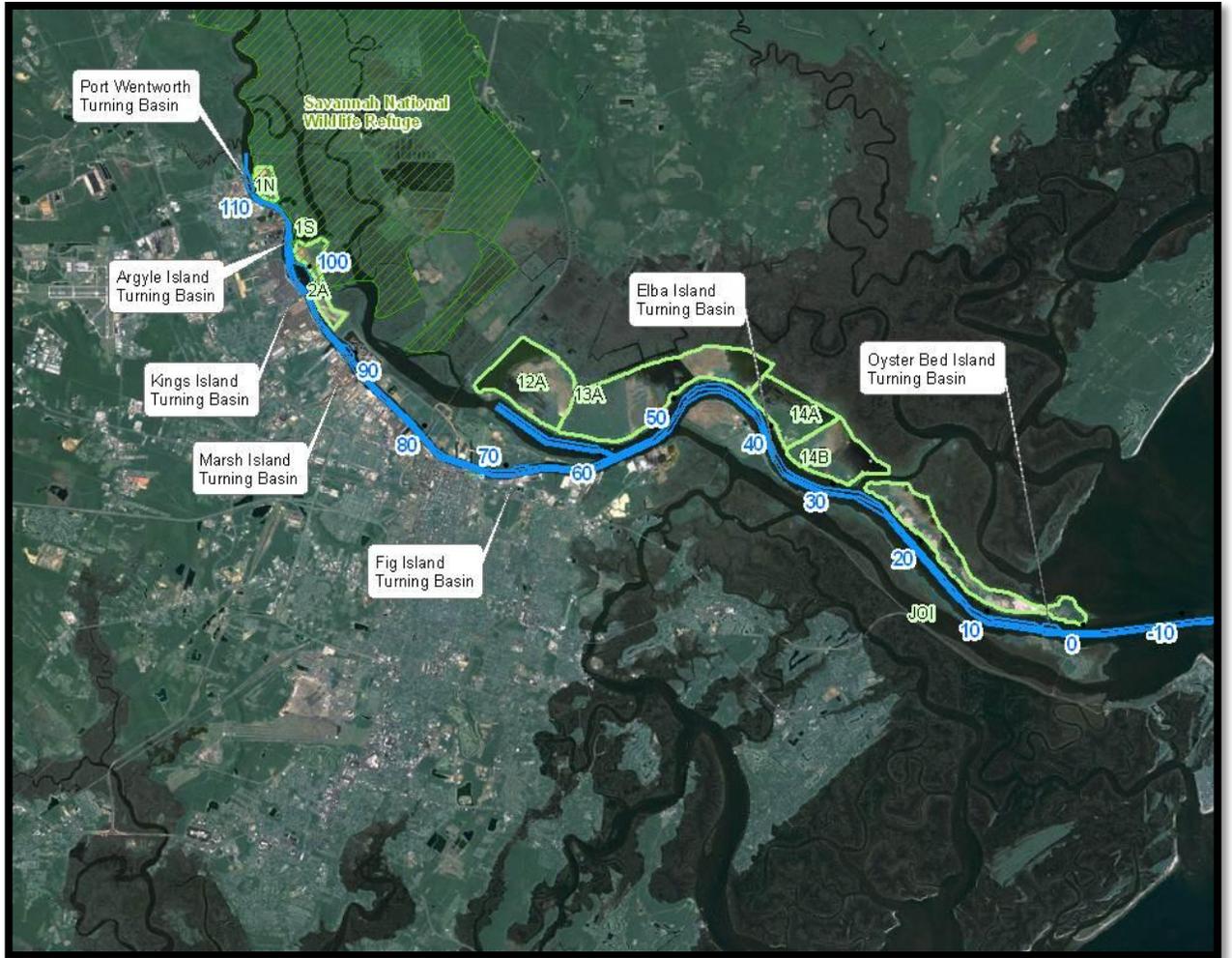


Figure 1-5: Savannah Harbor Turning Basins

**Table 1-3: Turning Basin Locations and Dimensions**

Name	Length (Ft)	Width (Ft)	Authorized Depth	Sediment		Station
				Removal Depth*	River Mile	
Port Wentworth	600	600	30	32	20.9	111+363 to 109+757
Argyle Island	600	600	30	30	19.6	104+185 to 103+085
Kings Island	1,600	1,500	42	50	18.8	101+298 to 97+750
Marsh Island	900	1000	34	34	17.1	91+610 to 89+485
Fig Island	1500	1000	34	38	13.0	69+740 to 67+386
Elba Island (LNG Private)	2,300	1,500	48**	48	6.8	
Oysterbed Island	1050	1200	40	40	0.7	4+395 to 2+345
Rehandling Basin	5,000	300	40	40		10+175 to 4+395

\*Includes approved advance maintenance. A maximum allowable over depth of an additional two feet is permitted to allow for inaccuracies in the dredging process.

\*\*Elba Island Turning Basin is not part of the Federal Project. Depth is authorized to 48' but currently dredged to 40' Depths measured in feet below MLLW

#### 1.4.4 Sediment Control Works

Construction of the Sediment Basin Project was authorized by Public Law 89-298, enacted by the 89<sup>th</sup> Congress, on October 27, 1965. Authorized sediment control works in the harbor consist of the Tidegate structure across Back River (Figure 1-6) and a sediment basin immediately downstream of the Tidegate. These structures were designed to concentrate sedimentation outside the navigation channel in a location close to confined disposal areas. Both the concentration of sediment and the short pumping distance that the shoaling location provided a reduction in the cost of sediment removal in the harbor. The Sediment Basin was authorized at a 40-foot depth, 600-foot width and approximately 2-mile length, with an entrance channel 38 feet deep and 300 feet wide. The Tidegate became operative in May 1977 but was taken out of service in March 1991 due to adverse environmental impacts. A drainage canal, known as New Cut, located across Argyle Island was constructed along with the Tidegate. New Cut was closed in March 1992 to reduce salinity levels in the Savannah National Wildlife Refuge, restore approximately 4,000 acres of freshwater marsh, and reduce the flushing of Striped bass eggs and larvae into the Front River, thereby improving the Striped bass fishery in the Savannah River. Closure of New Cut and discontinued operation of the Tidegate, which remains in place although not in operation, has resulted in a significant increase in the cost of maintaining adequate depths in the harbor. Maintenance dredging of the sediment basin continues; however, the sediment trap operates at reduced efficiency without a functioning Tidegate.



Figure 1-6: Tidegate

### **1.4.5 Freshwater Control Works**

During the development of the Tidegate/Sediment Basin project and harbor deepening in 1970, it was recognized that the saltwater wedge would move further upstream as a result of the project. A freshwater supply system (Freshwater Control Works) was included in the project (Figure 1-7) to provide freshwater at the Savannah National Wildlife Refuge intake off Little Back River and to offset impacts to tidal freshwater marshes. This system had the following five components:

1. A 5,500-foot long canal through McCoys Cut to provide freshwater to the Savannah NWR. The canal was constructed with a 200-foot bottom width at EL -7' Mean Lower Low Water (MLLW) using EPOCH 1982 – 2001 datum and 2H:1V side slopes. The design flow through McCoys Cut was 4,000 CFS.
2. A channel in Middle River with a 90-foot bottom width at EL -6' MLLW and 2H:1V side slopes. The design flow in Middle River was 1,500 CFS.
3. A channel in Little Back River with a 200-foot bottom width at EL -5.1' MLLW and 2H:1V side slopes. The design flow in Little Back River was 2,500 CFS.
4. A 28,000-foot long freshwater supply canal with a 28-foot bottom width at EL -4' MLLW, 2H:1V side slopes, and water control structures.
5. A 3,700-foot long connecting canal with a 6-foot bottom width at EL -4' MLLW, 2H:1V side slopes.

Congress also authorized a freshwater canal extending from the Savannah NWR to private lands located north of the US Highway 17A Bridge on the South Carolina side of the river. That canal was designed with a 6-foot bottom width at EL -4' MLLW and 2H:1V side slopes.

The Federal Government is responsible for maintenance of the Diversion Canal (McCoys Cut), the channels in Little Back River and Middle River, and the canals and control works for the Refuge. For reasons related to funding and agency coordination, maintenance of these features has not been regularly performed. However, the Corps recently completed (December 2011) repairs to system components on Federal lands. Non-Federal interests are responsible for the canal serving private lands southeast of the Refuge. Originally, Chatham County and the Corps obtained easements from private land owners, provided water control structures, and conducted routine maintenance of the dikes. In 1982, the County entered into a supplemental agreement with the private property owners, transferring responsibility for normal dike maintenance to those property owners.

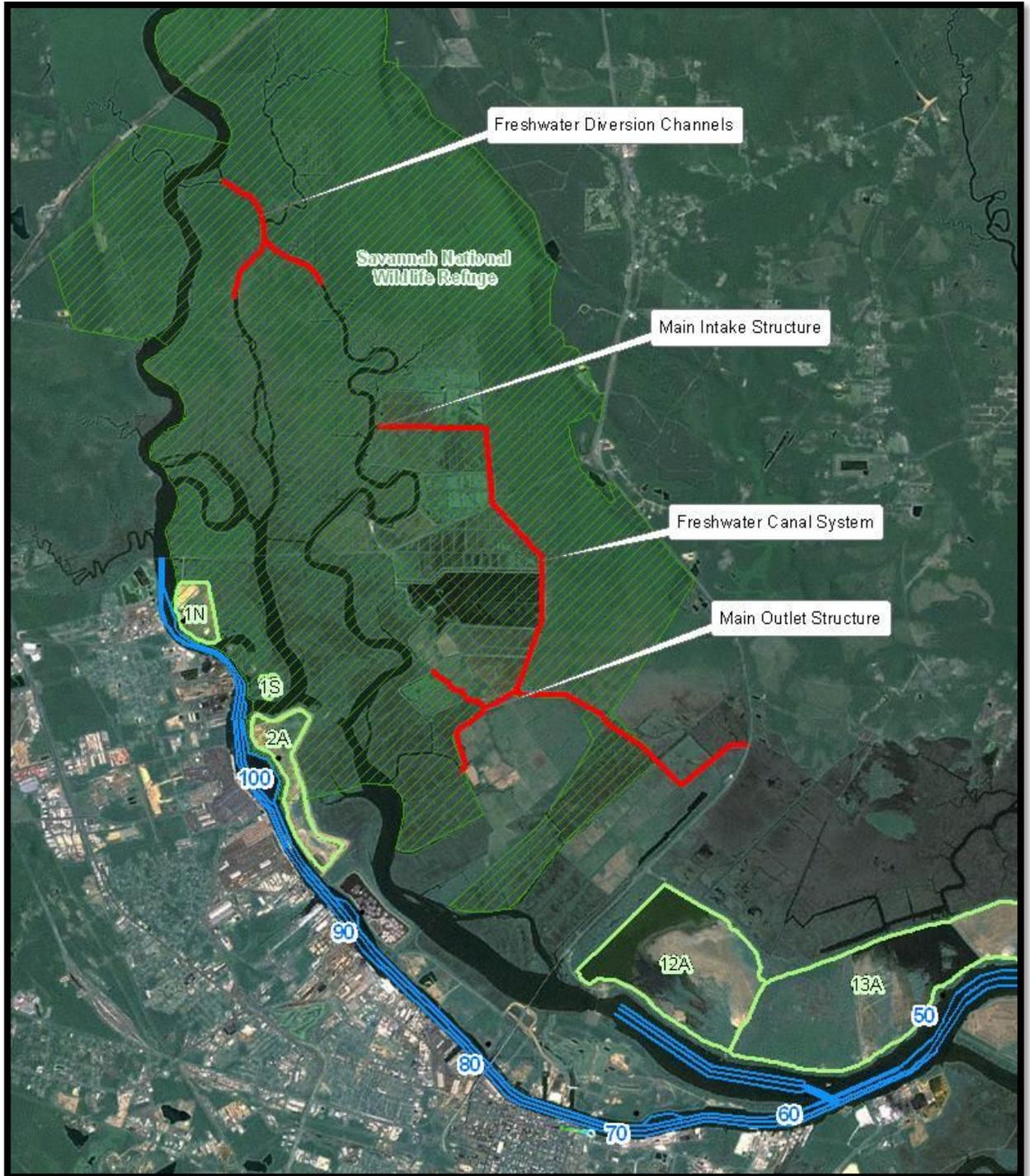


Figure 1-7: Freshwater Control Works

#### **1.4.6 Long Term Management Strategy**

Savannah District completed a Long-Term Management Strategy (LTMS) study for Savannah Harbor in 1996 in response to House and Senate Reports on the Energy and Water Resources Appropriations for Fiscal Year 1993 (P.L. 104-303). The LTMS identifies numerous structural and operational management measures, which are being implemented to maintain environmental quality throughout the Savannah Harbor Navigation Project. The LTMS also identifies restoration measures (increasing fish and wildlife habitat) which were constructed and are currently maintained. In addition, the LTMS provides the District's initial Dredged Material Management Plan (DMMP) for the harbor. The LTMS documents specific commitments by the Savannah District concerning maintenance, operation, and any other new work associated with the Savannah Harbor Navigation Project. An EIS documented the environmental analyses that were performed as components of the Savannah Harbor LTMS Study. A Record of Decision (ROD) was signed in February 1997 documenting the final environmental decisions made in the LTMS Study and outlining how the Savannah Harbor Navigation Project would be operated and maintained. The Savannah Harbor Navigation Project continues to be operated and maintained in accordance with the LTMS. A Dredged Material Management Plan Update was completed in April 2003 (revised September 2003) to implement the provisions of the Water Resources Development Act of 1996 for cost-sharing in the construction of dredged material confined disposal areas needed for the Savannah Harbor Federal Navigation Project.

#### **1.4.7 Dredged Material Management Plan**

The Corps performed a limited update to the Savannah Harbor DMMP in 2003. The document updated and implemented cost sharing for new disposal areas as defined in WRDA 1996 and extended the disposal area rotational time frame from 2- to 3-years. The Corps has published Annual Work Plans that supplement the DMMP in 2006, 2007, 2008, and 2010.

According to the Planning Guidance Notebook (ER 1105-2-100), all Federally maintained navigation projects require the preparation of a DMMP to demonstrate that there is sufficient dredged material disposal capacity for a minimum of 20 years. The assessment is required for all Federal navigation projects to document the continued viability of the project and the availability of dredged material disposal capacity sufficient to accommodate 20 years of maintenance dredging.

The Savannah Harbor dredged material disposal area system design, which includes a series of dredged material containment areas (DMCAs), was begun in the 1970's by the USACE Waterways Experiment Station (now the Engineer Research and Development Center). The DMCAs encompass over 8,000 acres predominantly in South Carolina. There are approximately 5,038 acres available in the existing floor areas of the DMCAs in Jasper County, SC. The DMCAs are paired based on their location within the inner harbor. Under the LTMS and 2003 DMMP, DMCAs 12A

and 12B/13A are paired, DMCAs 13B and 14A are paired, and DMCAs 14B and Jones/Oysterbed are paired. In 2010, the cross dike between DMCAs 12B and 13A was removed to create a larger DMCA called 13A (at this point DMCA 12B ceased to exist).

When each of the paired DMCAs is in use (accepting dredged material), the others are being dried. Each DMCA has two bird islands (each approximately 1 acre in size) constructed within it. When that DMCA is in use, being actively disposed into, the DMCA is managed to keep those bird islands surrounded by water to decrease predator access to nesting and feeding birds, and beyond that a percentage of the disposal DMCA is kept moist for feeding water birds. The other DMCAs are being dried so that the dewatered dredged materials can be reclaimed and incorporated into the dike structures themselves, thus increasing the capacity in the most economic manner possible. Using the dewatered dredged materials for dike raising ultimately reduces the need for additional disposal areas in sensitive wetland areas and provides for perpetual use of existing areas. DMCAs are dried on a 3-year rotational basis.

The DMCAs are a haven for birds and animals that inhabit the manmade environment adjacent to the marsh. Alligators, wild hogs, otters, deer, and over 250 species of birds have been recorded there.

The USACE currently holds easements for deposition of dredged sediment on DMCAs 2A, 12A, 13A, 13B, 14A, 14B, and Jones Oysterbed Island. These perpetual disposal easements encumber the land for the maintenance of the Federal channel. Two upstream areas, DMCAs 1N and 1S, are owned by the US Fish and Wildlife Service, and they have been used in the past under a right of access easement. These areas have very limited capacity. There are no plans to use DMCA 1N in the foreseeable future, and DMCA 1S has not been used for disposal of dredged material in many years. Disposal Area 1S is a part of the SHEP mitigation plan. Dredged material deposits would be graded down to allow marsh restoration on approximately 40.3 acres of what is currently known as Disposal Area 1S.

The DMMP Annual Work Plan – FY 10 for the Savannah Harbor Navigation Project is based on the requirement to remove 6.2 million cubic yards (MCY) of dredged material from the inner harbor and 1.0 MCY from the bar channel on an annual basis. The quantity anticipated for the inner harbor is expected to remain constant for the 20-year period covered by the DMMP. To accommodate the inner harbor maintenance sediment, a 3-year rotational plan for DMCAs in the middle harbor was developed as part of the harbor operations “Base Plan”. Table 1-4 presents the Savannah Harbor Navigation Project DMCAs. Figure 1-8 presents the DMCA locations. Use of DMCA 2A, the only DMCA available in the upper harbor, was minimized to keep it available for the entire 20-year period covered by the DMMP. That DMCA would not be used during a harbor deepening. The mitigation plan developed in the LTMS would continue to be implemented.

**Table 1-4: Savannah Harbor Navigation Project Dredged Material Containment Areas**

Containment Area	Location (Station)	Acreage
1N	107+500 to 112+500	130
2A	93+000 to 103+000	240
12A	6+500BR to 10+500BR	1040
13A	47+800 to 6+600BR	1307
13B	43+000 to 47+000	540
14A	37+000 to 47+000	647
14B	28+000 to 37+000	703
Jones/Oysterbed	10+000 to 27+000	890

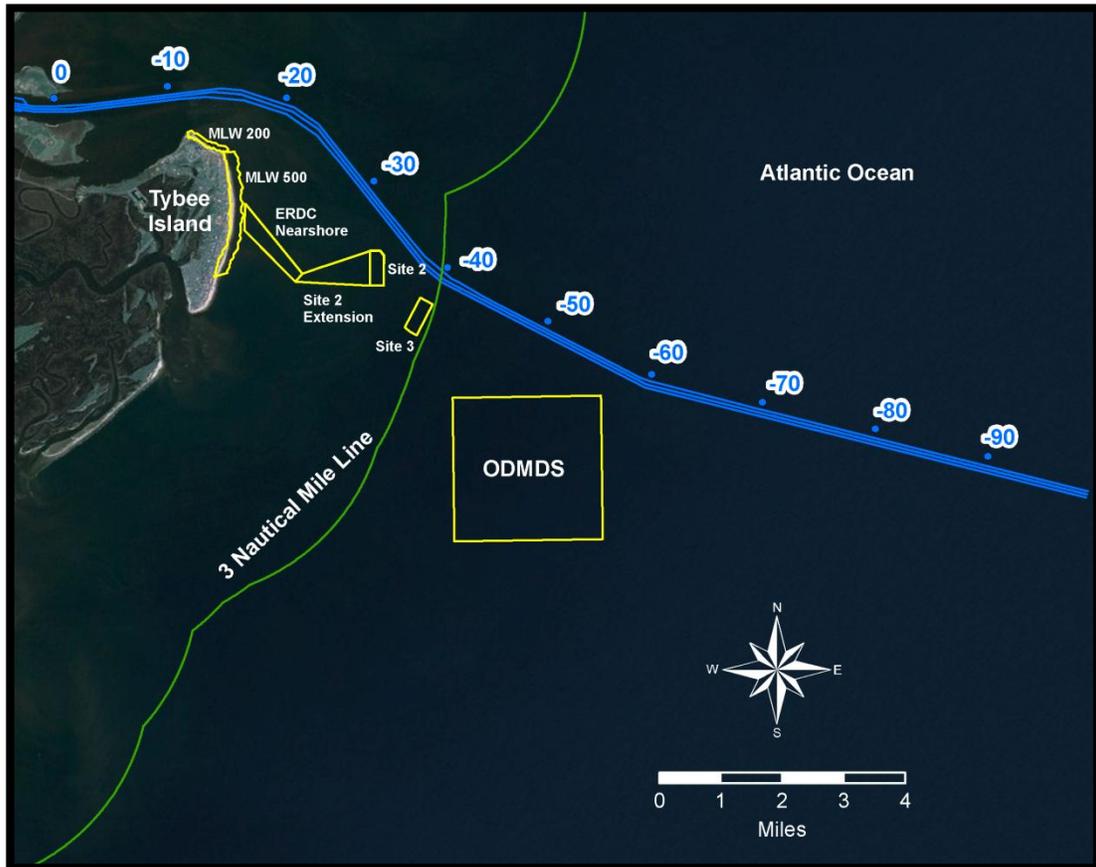
Note: Acreage is measured from the inside toe of the surrounding dikes



**Figure 1-8: Savannah Harbor Disposal Areas**

Sediment removed from the Bar Channel (Stations 0+000 to -60+000B) is placed in the EPA-approved Ocean Dredged Material Disposal Site (ODMDS). The ODMDS is a 4.26 square mile site is centered at 31 56' 54" N and 80 45' 34" W (Figure 1-9). The

site is used for placement of the 1 million cubic yards of sediment that is removed by hopper dredges each year from that channel reach. The final designation of the site as an ODMDS was made by EPA on August 3, 1987. A Management Plan for the site is included as Appendix I of the LTMS. That plan includes periodic site management and monitoring work performed by the USACE.



**Figure 1-9: Approved Unconfined Placement Areas for Maintenance Material**

In addition to the ODMDS, there were seven sites where maintenance material could have been deposited to construct submerged feeder berms which were developed as part of the LTMS pursuant to Section 404 of the Clean Water Act. These sites were located on the south side of the entrance channel 2,000 feet away from the channel, in water averaging 15 feet deep. These sites would effectively serve as nearshore placement areas for use by dredges working in the bar channel. These sites would provide a cost effective place for the dredges to deposit the dredged material since they are located relatively close to the channel. If constructed, the berms would be constructed with 200,000 to 300,000 CY of material to provide a berm that is elliptical in shape and oriented away from the channel so that tidal currents which converge and

diverge away from the channel are not significantly restricted. Sediment placed on these berms would replenish littoral drift.

Since the DEIS was published, the EPA informed the Corps that they consider any dredged material placement site beyond the 3-mile line to be an ocean dredged material disposal site which would require their authorization pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act. Consequently, any sites beyond the 3-mile line would require the appropriate Section 103 site designation studies and EPA approval as ocean dredged material disposal sites. Based on the EPA determination, only the ODMDS, Site 2, Site 3, and other designated placement sites (See Figure 1-9 above) can be used for maintenance material from the entrance channel.

In addition to the placement sites adjacent to the entrance channel, the LTMS also authorized suitable maintenance material to be placed into the nearshore off Tybee Island. As shown in Figure 1-9, suitable maintenance material can also be placed into the areas designated as MLW 200, MLW 500, ERDC Nearshore and Site 2 Extension. Material placed into these sites would be used to construct feeder berms to benefit the beach of Tybee Island. The LTMS also authorized the placement of suitable maintenance material directly onto the beach at Tybee Island.

The Base Plan (most cost effective and environmentally acceptable) for maintenance of the Savannah Harbor entrance channel is to place the material into the Jones-Oysterbed Island DMCA, the ODMDS, or Sites 2 and 3. Consequently, any placement of maintenance material into the nearshore sites off Tybee Island or directly onto the beach at Tybee Island would require a non-Federal sponsor willing to pay the additional costs of placing material into these areas.

Maintenance sediments from the bar channel may be placed in these nearshore sites. Maintenance sediments from Stations 0+000 to 28+000 may also be placed in these sites when the average fines content does not exceed 15 percent. If the SHEP is constructed, maintenance material from the area of the bar channel extension (Station -60+000B to -97+680B) may also be suitable for these sites.

## **1.5 Public Involvement**

This study was conducted as a partnership between the USACE Savannah District, as the lead Federal agency, representatives of three other Federal agencies that need to approve the project (EPA Region 4, NMFS-Southeast Regional Office, and the USFWS-Southeast Region), and the Georgia Ports Authority (for their shipping expertise). Representatives from the Cooperating Agencies met on a periodic basis to reach decisions on technical work to be conducted and review results of evaluations.

The P&G requires that USACE planning include coordination with State and local agencies, interested and affected groups, and individuals. Plan evaluation must also be consistent with all applicable Federal laws, such as NEPA. The Record of Decision

for the Tier I Environmental Impact Statement was completed in 1999 (Chapter 2.2: Savannah Harbor Deepening Feasibility Report (Section 203) and Tier I EIS 1998).

A Notice of Intent (NOI) to prepare a Draft EIS for this project was filed with the USEPA on January 22, 2002. Within the NOI, the public and agencies were notified that a scoping meeting would be conducted for the proposed project. On February 21, 2002, a scoping meeting was held for the proposed action at the Savannah International Trade and Convention Center.

The Stakeholders Evaluation Group (SEG) is a public body that was created to advise the Georgia Ports Authority, the non-Federal interest, on issues related to this proposed harbor deepening project and to develop a consensus mitigation plan which could be used for the development of a Federal EIS.

USACE used several methods to ensure the entire public was aware of the project and project-related studies. The District prepared and distributed brochures that described the environmental field work that was being conducted and discussed the project at local professional and community groups such as the American Society of Civil Engineers. The hydrodynamic modeling approach, wetland impact evaluation approach, and the project in general have been the subject of presentations at the Georgia Water Resources Conference in 2001, 2003, 2005, and 2007. Interim plan formulation results (Formulation of Alternatives Report) were approved by USACE Headquarters and distributed for public comment in 2005.

Agency involvement includes the South Carolina Department of Health and Environmental Control (SC DHEC), the Georgia Department of Natural Resources (GA DNR) Coastal Resources Division, GA DNR Wildlife Resources Division, GA DNR Environmental Protection Division, and the City of Savannah. Cultural resources investigations and reconnaissance have been coordinated with the South Carolina Division of Archives and History, Underwater Archaeology Unit, and with both the Georgia and South Carolina State Historic Preservation Officers. Additional discussion of public involvement in the project, including identification of investigations conducted in response to agency and public comments on the November 2010 Draft GRR and DEIS is presented in Chapter 13: Public Involvement, Review and Consultation.

## **1.6 Planning Process and Report Organization**

The planning process employed by the Savannah District in the development of the GRR has followed the Corps of Engineers' six step planning process as described in the Corps' Planning Guidance Notebook (ER 1105-2-100, dated 22 April 2000). These steps include:

- Specify water resources problems and opportunities;
- Inventory, forecast, and analyze the water and related land resource conditions within the study area;

- Formulate alternative plans which address the identified problems and take advantage of the opportunities;
- Evaluate the effect of alternative plans;
- Compare alternative plans; and
- Select the recommended plan.

The P&G guide the formulation and evaluation of Federal water resource projects. P&G requires that the plan recommended for Federal action will be the alternative plan with the greatest net economic benefit consistent with protecting the Nation's environment (the NED plan), unless the Secretary of Army grants an exception to this rule.

Planning for navigation improvements and environmental mitigation has been a dynamic process resulting in multiple iterations of the six-step planning process. Through these iterations, the study has been refined and has resulted in a selected plan for Federal action that is consistent with the P&G and ER 1105-2-100. A final recommended plan will be included in the final GRR and EIS. The remainder of this report documents the results of the six step planning process.

The remainder of the GRR is organized as follows:

- Chapter 2 – Prior Studies, Reports, and Existing Projects
- Chapter 3 – Problems and Opportunities
- Chapter 4 – Inventory of Existing Conditions
- Chapter 5 – Forecast of Without-Project Conditions
- Chapter 6 – Formulation of Alternative Plans
- Chapter 7 – Alternative Plan Evaluation: Benefits
- Chapter 8 – Alternative Plan Evaluation: Environmental Impacts
- Chapter 9 – Alternative Plan Evaluation: Mitigation Planning
- Chapter 10 – Alternative Plan Evaluation: Costs
- Chapter 11 – Plan Comparison
- Chapter 12 – Uncertainty Consideration
- Chapter 13 – Public Involvement, Review, and Consultation
- Chapter 14 – Plan Selection
- Chapter 15 – Plan Implementation Requirements
- Chapter 16 – Conclusions
- Chapter 17 – Recommendation