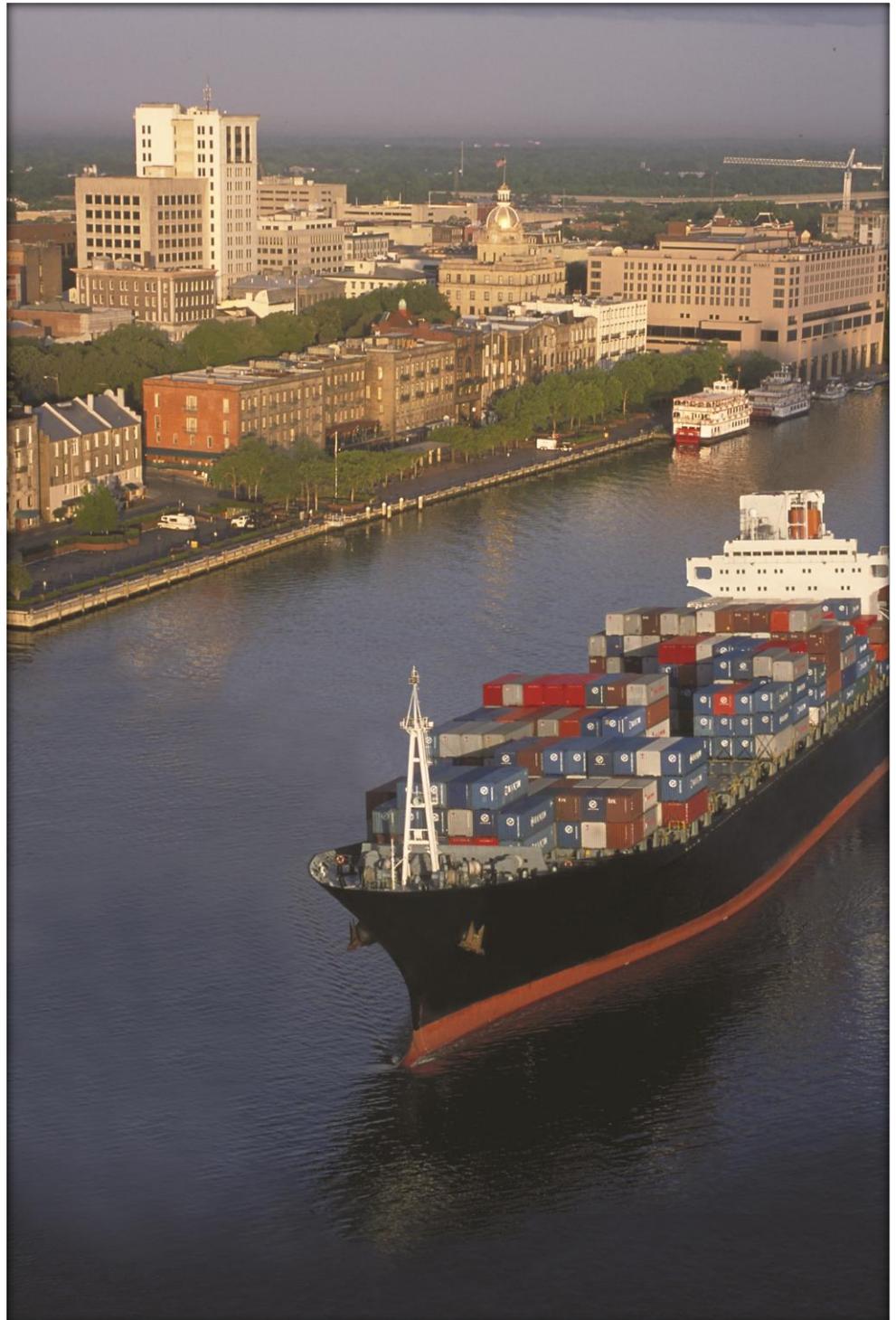

FINAL GENERAL RE-EVALUATION REPORT

SAVANNAH HARBOR EXPANSION PROJECT

Chatham County, Georgia and Jasper County, South Carolina

January 2012



**US Army Corps
of Engineers**
*Savannah District
South Atlantic Division*

EXECUTIVE SUMMARY

Authority and Purpose

The Georgia Ports Authority (GPA) conducted a feasibility study of potential navigation improvements at Savannah Harbor, Georgia under the authority granted by Section 203 of Water Resources Development Act (WRDA) of 1986 (P.L. 99-662). The US Army Corps of Engineers (the Corps) adopted these documents prepared by the GPA and published a Draft Tier I EIS in May 1998 and the Final Tier I EIS in September 1998. In the Water Resources Development Act of 1999 (Section 101(b)(9)), the US Congress conditionally authorized deepening the Savannah Harbor navigation channel to a maximum depth of -48 feet Mean Low Water (MLW). The conditional authorization stipulated that approval of additional studies and the project is required from the Administrator of the Environmental Protection Agency, the Secretary of Commerce, the Secretary of Interior, and the Secretary of the Army.

The Corps completed the Tier I EIS process when it signed a Record of Decision (ROD) in December 1999. The ROD included additional requirements, including additional review by the Corps of Engineers and approval of the Chief of Engineers to ensure that construction of the project would comply with all applicable laws and policies.

The Savannah District of the Corps in conjunction with the USACE Deep-Draft Navigation Center of Expertise has developed this General Re-evaluation Report (GRR) to fulfill the conditions of the conditional authorization granted in 1999 and to conduct investigations required by the National Environmental Policy Act of 1969 (NEPA). This GRR and EIS provide documentation of the technical and plan formulation analyses conducted in the development of a recommended plan for navigation improvement at Savannah Harbor and associated environmental mitigation. The GRR and EIS assess mitigation plans for alternative channel depths. The EIS includes a final mitigation plan and an incremental analysis of alternative channel depths from -42 to -48 feet, as required by the conditional authorization.

This study identifies and selects the National Economic Development (NED) plan, the plan that has the greatest net economic benefits consistent with protection of the Nation's environment.

Problems and Needs

Garden City Terminal at Savannah Harbor is currently the second largest container port on the US east coast (by Twenty-foot Equivalent Unit [TEU] volume) and the fourth largest in the Nation. Garden City Terminal is a port of call for more than 40 container ship services, which call weekly on a fixed day schedule (liner services). However, Savannah Harbor also currently has the shallowest controlling depth for a major container port. The last major navigation improvements to the Federal navigation project at Savannah Harbor were completed by the Corps of Engineers in 1994, deepening the main navigation channel from -38 feet to -42 feet.

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 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 beam of 106 feet, which was then the maximum beam for vessels transiting the Panama Canal. 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 beam of 131 feet, and a maximum operating draft of 48 feet. Over the intervening years, the GPA has made major investments in landside infrastructure to accommodate increasingly larger vessels and burgeoning trade growth at the Port and the region it serves. The GPA 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.

The increase in the size of container ships calling at the world's major ports, including Savannah Harbor, has been driven by economic efficiency. The world's major ports, including Savannah Harbor's trading partners, maintain channel depths that accommodate the efficient operation of the world's fleet. The primary problems identified in this analysis relate to the inefficient operation of container ships in the Federal channel at Savannah Harbor, which affects the Nation's international trade transportation costs.

Operating costs for container ships calling at Savannah Harbor are increased because vessels need to light load in order to navigate the Federal channel, which reduces vessel efficiency. Vessels using tidal advantage to accommodate arrival or departure drafts, which require additional channel depth, incur the cost of tidal delays. Light loading and tidal delays will increase in the future as present harbor users increase their annual tonnage and as larger, more efficient ships replace older, smaller ones. In addition, existing ships are experiencing problems associated with turning capabilities and overall maneuverability in some reaches of the inner harbor. The severity of problems associated with turning capabilities and overall maneuverability in some reaches of the inner harbor will increase as vessel size increases. The opportunity exists to reduce transportation cost of import and export trade through Savannah Harbor and contribute to increases in national net income.

Alternatives Considered

Several management measures were identified to address the navigation-related problems at Savannah Harbor including operational (i.e., non-structural) measures, locally implemented structural measures, structural measures implemented at other ports, and structural modification of the Federally-authorized channel. The management measures identified and evaluated in this feasibility study were developed through discussions and interviews with GPA, Garden City Terminal operations and management personnel, Savannah Harbor Pilots Association members, and public input.

Evaluated non-structural measures include reducing underkeel clearance requirements and modifications to Garden City infrastructure and operations. Evaluated structural measures include alternative terminal locations within the South Atlantic region, development of a Regional Southeastern US Container Port, and modifications to the Federal channel at Savannah Harbor. Modifications to the Federal channel include

construction of meeting areas, bend wideners, straightening of river bends, turning basin expansion, and channel deepening.

Management measures advanced for more detailed investigation and formulation into alternative plans include channel deepening, turning basin expansion, bend widener, and meeting area construction. The alternative plans evaluated in a feasibility level investigation include the Plan A - No Action, in which no improvements would be made to the existing Savannah Harbor Federal Navigation Project. The navigation channel would remain at its presently authorized 42-foot depth in the inner harbor and 44-foot depth in the entrance channel. Plan B – Channel Deepening Alternatives includes incremental channel deepening, widening, meeting area construction, and turning basin expansion.

Plan B includes several scales, ranging from a 44-foot to a 48-foot channel depth. The channel deepening plans have the following components:

- **Channel Length:** From the ocean to Station 103+000, plus an upstream transition;
- **Channel Width:** Maintain existing side slopes. The bottom width for a 48-foot channel would be 464-feet;
- **Channel Depth:** Channel depth in one-foot increments to 48-feet;
 - Plan B-44: a 2-foot channel deepening,
 - Plan B-45: a 3-foot channel deepening,
 - Plan B-46: a 4-foot channel deepening,
 - Plan B-47: a 5-foot channel deepening,
 - Plan B-48: a 6-foot channel deepening,
- **Entrance Channel Extension:** From Station -60+000 to Station -98+600;
- **Turning Basins:** Deepen and enlarge Kings Island Turning Basin to 1,600-foot x 1,600-foot (radius determined by ship simulation analysis);
- **Bend Wideners:** Use the three bend wideners identified as necessary by ship simulation analysis; and
- **Meeting Areas:** Use the three alternative meeting area alternatives in an incremental analysis (dimensions determined by the ship simulation analysis):
 - Long Island Meeting Area – 8,000 foot meeting area located from approximately Station 14+000 to Station 22+000;
 - Oglethorpe Meeting Area – 4,000 foot meeting area located from approximately Station 55+000 to Station 59+000;
 - Combination of both Long Island and Oglethorpe Meeting Areas.

The formulation of alternative plans carefully considered the optimization of channel widths and depths to maximize net average annual benefits and contributions to the NED account. This included identification of design vessels and associated dredging

requirements, identification of structural and non-structural improvements, and estimation of incremental costs and benefits. The plan formulation process also considered the characteristics and quality of dredged material and requirements for disposal. All non-Federal ancillary facilities that are required to deliver project benefits were identified, costs estimated, and are included as associated costs in the alternative evaluation and economic analysis. All plans were evaluated using the System of Accounts framework established in the Principles and Guidelines (P&G 1983) promulgated by the Water Resources Council. The final alternatives were evaluated based on comparison to the No Action Plan, in order to identify the plan that maximized net economic benefits to the nation.

Extensive investigations were conducted to project potential impacts of the alternative plans. Savannah District used hydrodynamic and water quality models to identify many of the impacts to natural resources from the proposed project alternatives. These included impacts to salinity, water quality, wetlands, and fisheries. Impacts to other resources were evaluated using separate analyses. Those evaluations included potential impacts to the drinking water aquifer, the City of Savannah's raw water intake at Abercorn Creek, adjacent ocean beaches, riverine shorelines, and air quality. The Stakeholders Evaluation Group, which includes concerned members of the general public and agency officials, was instrumental in identifying potential environmental impacts, identifying appropriate impact assessment tools and techniques, and identifying mitigation measures.

The Selected Plan

The Selected Plan is the NED Plan, which includes navigation improvements to the existing channel and mitigation that extends into the upper harbor beyond the extent of the navigation improvements. The 47-foot depth alternative maximizes net benefits at an average annual equivalent of \$174 million (FY 2012 price levels and discount rate; 4.00%). At the next increment (48-foot plan), there would be a decrease in net benefits, which indicates that a plan deeper than the 47-foot alternative is not the most economically efficient. Therefore, the NED plan is identified as the 47-foot plan.

The navigation components of the NED Plan consist of the:

- 47-foot deepening alternative, which includes channel bend wideners, and expansion of the Kings Island Turning Basin;
- Deepening of the entrance channel to -47 feet from Stations 0+000 to Station -14+000B and to -49 feet from Station -14+000B to Station -60+000B and extending the entrance channel from Station -60+000B to -97+680B;
- Long Island Meeting Area at -47 feet; and
- Oglethorpe Meeting Area at -47 feet.

The FY 2012 Project First Cost is \$652 million for the Selected Plan. The Selected Plan FY 2012 annual average equivalent cost (including annual maintenance) is \$39 million. The average annual equivalent benefits for the Selected Plan are \$213 million, which result in average annual equivalent net benefits of \$174 million and a benefit-to-cost ratio of 5.5. The project was authorized in Section 101(b)(9) of WRDA 1999 to be carried out at a total cost of \$230,174,000. When escalated to October 2011 price levels in accordance with the procedure set out in ER 1105-2-100, Appendix G, implementing Section 902 of WRDA 1986, the authorized total project cost amounts to \$469 million. The current estimated Project First Cost of \$652 million exceeds that amount by more than 20 percent, necessitating a statutory modification to the project to increase its authorized total cost

The Selected Plan would result in marsh conversion and brackish marsh loss. Impacts to fisheries would include some loss of habitat for Striped bass and Shortnose sturgeon. The Project would increase chloride concentrations in Abercorn Creek at the water intake for the City of Savannah's water treatment plant during droughts and at industrial intakes on the Savannah River.

The natural resource mitigation plan consists of the following components:

- Constructing and operating flow re-routing features in and near the Savannah National Wildlife Refuge to reduce salinity impacts to tidal freshwater and brackish wetlands and fishery habitat;
- Acquiring bottomland hardwoods/freshwater wetlands to compensate for salinity increases to tidal freshwater wetlands. The acquired lands would become part of the Savannah National Wildlife Refuge and be managed by the USFWS;
- Marsh restoration in Disposal Area 1S to compensate for loss of 15.68 acres of brackish marsh that would be lost due to excavation requirements of the project;
- Constructing and operating an oxygen injection system to remove the incremental effects of the harbor deepening project;
- Constructing and operating a fish bypass channel at the New Savannah Bluff Lock and Dam to compensate for impacts to Shortnose sturgeon habitat;
- Funding a Striped bass stocking program to compensate for adverse impacts to Striped bass spawning and nursery habitats within the estuary;
- Constructing a raw water impoundment to supply the City of Savannah water treatment plant with water during periods of high chloride concentrations;
- Implementing adaptive management features if post-construction monitoring shows them to be needed. Those features include removing the Tidegate sill, enlarging the diversion structure at the mouth of McCoys Cut, a diversion structure at the junction of Middle and Back Rivers, and acquisition of additional freshwater wetlands if required. Implementation of any or all of these features may not be needed, but the project would include funding sufficient to implement all of them. Which of these features would be implemented would depend on the findings of the monitoring.

Other features of the mitigation plan include:

- Recovery and preservation of the remains of the CSS *Georgia*; and
- Construction of a public boat ramp on Hutchinson Island.

Plan Implementation

In accordance with the provisions of Federal laws and policies, the Federal share of the first cost of implementing the Selected (NED) Plan is estimated to be \$454,000,000 (FY 2012). The estimated non-Federal share of the recommended plan is \$198,000,000 (FY 2012), including lands, easements, rights-of-way, relocations, disposal areas, and associated non-Federal costs. Additional annual maintenance costs to the United States are estimated to be \$5,100,000 (FY 2012). Maintenance of any non-Federal ancillary facilities is a 100% non-Federal responsibility.

The GRR and EIS serve as decision documents regarding whether to implement the conditionally authorized deepening. Upon approvals, the study will proceed through preconstruction, engineering and design (PED), and construction by the Corps of Engineers. The schedule to proceed with construction is estimated to be as early as Fiscal Year 2013, subject to approvals by the Secretary of the Army, Secretary of the Department of Commerce, and Secretary of the Interior, and the Administrator of the Environmental Protection Agency, and subject to Congressional appropriations. The project base year is estimated to be Fiscal Year 2017.

Environmental Considerations

The GRR and the EIS were prepared in accordance with the requirements of the National Environmental Policy Act. The EIS was prepared with the assistance of the following Cooperating Agencies: USEPA Region IV, USFWS Southeast Region, NOAA Fisheries Service Southeast Region, and Georgia Ports Authority. Some potential environmental impacts have been avoided through modified channel design, dredged material placement location selection, dredged material placement technique, and mitigation plan design. Remaining unavoidable significant adverse impacts are mitigated through implementation of the mitigation plan. The Selected Plan has been found to be in conformance with Federal, State, and local statutes and policies.

Agency and Public Coordination

After the conditional authorization, the GPA formed the Stakeholders Evaluation Group (SEG) in 1999 to provide a recurring public forum about the project and to assist them and the Corps in identifying scientific studies and technical analyses that should be performed to identify environmental impacts that may result from proposed deepening of the harbor. The SEG has as its principal charge the development of consensus amongst the participants regarding:

- the scope and content of the scientific investigations and analyses to be performed pursuant to the development of the Final EIS; and
- the appropriate increment of channel depth and the appropriate mitigation measures.

As those studies were identified, GPA and the Corps began conducting those tasks. Since its inception, the SEG has provided input to GPA and Federal and State agencies on all aspects of the scientific investigations, analyses, and mitigation options for the proposed action. The Corps performed additional studies and investigations which it believed were necessary to properly evaluate the alternatives.

Substantial efforts have been made to inform and listen to the public, the SEG, local communities, and State and Federal resource agencies regarding the proposed harbor deepening. Since its inception in January 1999 to the present day, the Corps has met with the SEG approximately 70 times to discuss the proposed action. In addition to the Public Scoping Meeting on February 21, 2002 and the NEPA scoping meeting on April 12, 2002, a number of meetings with the public and agencies have discussed the project issues including salinity, lowered dissolved oxygen, conversion of freshwater wetlands to brackish wetlands, nekton, benthos, contaminated sediments, economics, and other impacts related to the proposed harbor deepening. A public information meeting was also held 30 days after release of the Draft EIS, on December 15, 2010, to provide opportunity for public and agency input. The models used to quantify impacts to water quality, DO, chlorides, salinity, fisheries, and conversion of freshwater wetlands to brackish wetlands have been reviewed and agreed to by the State and Federal agencies. The conclusions from these meetings and subsequent comments are incorporated into the GRR and EIS.