



Proposed Report ¹

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

DAEN (1105-2-10a)

SUBJECT: Charleston Harbor Post 45 Navigation Study, Final Integrated Report and Environmental Impact Statement, Charleston, South Carolina

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress the final integrated feasibility report and environmental impact statement on navigation improvements for Charleston Harbor, Charleston, South Carolina. It is accompanied by the report of the District and Division Engineers. This report was prepared as a response to Section 216 of the Flood Control Act of 1970, Public Law 91-611, 91st Congress, H.R. 19877, December 31, 1970. Planning, engineering, and design activities for the Charleston Harbor Post 45 Navigation Project will continue under the authority provided by the resolution cited. Charleston Harbor has strategic national importance. It supports Joint Base Charleston, which includes the U.S. Air Force 628th Air Base Wing, Air Mobility Command at Charleston Air Force Base and the U.S. Navy Naval Support Activity, Charleston containing the Naval Weapons Station Charleston. It is also identified as a critical infrastructure project in the President's "We Can't Wait" Initiative, Executive Order 13604, March 22, 2012.

2. The reporting officers recommend a project that will contribute to the economic efficiency of commercial navigation. The national economic development (NED) plan includes a channel project depth of -50 feet Mean Lower Low Water (MLLW) with associated channel widening and turning basins. Based on Fiscal Year (FY) 2015 price levels, a 3.375-percent discount rate, and a 50-year period of analysis, the project first cost of the NED plan is \$448,700,000, with average annual benefits of \$103,100,000; average annual costs of \$25,700,000; and a benefit-to-cost ratio of 4.0. The non-federal sponsor, the South Carolina Ports Authority (SCPA), subsequently requested a locally preferred plan (LPP) with a project depth of -52 feet MLLW containing associated channel widening and turning basins. The LPP has positive net benefits and is economically justified. In accordance with U.S. Army Corps of Engineers (USACE) policy, the LPP was submitted for consideration to the Assistant Secretary of the Army for Civil Works (ASA-CW) and approved for consideration as the recommended plan on October 1, 2014. The recommended plan is the LPP and consists of the following navigation improvements (depths do not include overdepth or advance maintenance depths):

¹ This report contains the proposed recommendation of the Chief of Engineers. The recommendation is subject to change to reflect Washington level review and comments from Federal and State agencies.

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a. Deepen the existing entrance channel from a project depth of -47 feet to -54 feet MLLW over the existing 800-foot bottom width, while reducing the existing stepped 1,000-foot width to 944 feet at the same time it is deepened from an existing depth of -42 feet to a depth of -49 feet. The entrance channel will be extended approximately three miles seaward from the existing location to a depth contour of -54-foot MLLW.

b. Deepen the inner harbor from an existing project depth of -45 feet to -52 feet MLLW to the Wando Welch container facility on the Wando River and the New Navy Base Terminal on the Cooper River, and -48 feet MLLW for the reaches above that facility to the North Charleston container facility (over expanded bottom widths from 400 to 1,800 feet).

c. Enlarge the existing turning basins to a 1800-foot diameter at the Wando Welch and New Navy Base terminals to accommodate Post Panamax Generation 2 and 3 container ships and widen selected reaches including Mt. Pleasant Reach, Bennis Reach, Horse Reach, Hog Island Reach, Wando River Lower Reach, Wando River Upper Reach, Drum Island Reach, Myers Bend Reach, Daniel Island Reach, Clouter Creek Reach, North Charleston Reach, Filbin Creek Reach, Port Terminal Reach, and Ordnance Reach.

d. Enlarge the North Charleston Terminal turning basin to a 1650-foot diameter for Post Panamax Generation 2 container ships.

e. Place dredged material and raise dikes at the existing upland confined disposal facilities at Clouter Creek, Yellow House Creek, and/or Daniel Island. Place material dredged from the lower harbor at the Ocean Dredged Material Disposal Site (ODMDS) and modify the ODMDS. Place rock to create a berm around the ODMDS and create hardbottom habitat as a least cost placement of dredged material which includes placing rock at two mitigation reef sites (1 required, 1 contingency); placing rock at 6 new rock placement (i.e., beneficial use) sites for reef habitat; and placing rock at the existing SCDNR Charleston Nearshore Reef. The total rock placement is anticipated to create approximately 664 acres of hardbottom habitat.

f. An environmental impact statement (EIS) was prepared in accordance with the National Environmental Policy Act. The recommended plan has been determined to be

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economically justified and environmentally acceptable. The recommended plan includes mitigation in the form of purchase and preservation of up to an estimated 666 acres of wetlands to compensate for indirect impacts (salinity increases) to up to about 324 acres of freshwater forested and herbaceous wetlands and creation of about 33 acres of artificial reef habitat to compensate for direct impacts to about 29 acres of existing hardbottom habitat within the entrance channel. Creation of the artificial reef is part of the project's base disposal plan. Once acquired, the land would be transferred to the USFWS to manage in conjunction with National Forest. The LPP mitigation plan total cost is \$3,030,000. In comparison, the NED Plan would impact about 232 acres of wetlands and require mitigation, consisting of the purchase and preservation of up to an estimated 476 acres at a total mitigation plan cost of \$2,180,000.

g. Under the least cost disposal option, about 29 million cubic yards would be placed in the modified ODMDS; about 2.9 million cubic yards would be placed in Daniel Island Disposal Area; about 900,000 cubic yards would be placed in Clouter Creek Disposal Area; about 2.3 million cubic yards would be placed in Yellow House Creek Disposal Area; about 360,000 cubic yards would be used for artificial reef mitigation; approximately about 6.3 million cubic yards for ODMDS berm construction; about 1.9 million cubic yards for reef construction along either side of the Entrance Channel; and about 240,000 cubic yards would be placed at an existing SCDNR artificial reef site.

h. Based on an analysis of historical operation and maintenance (O&M) activities and the proposed modifications, the recommended plan would increase annual maintenance dredging requirements by about 831,000 cubic yards per year. The existing project footprint would continue to be maintained according to current practice at project depth plus 2 feet of advanced maintenance and 2 feet of allowable overdepth in most channel areas.

i. Environmental monitoring of wetlands, water quality, and hardbottoms will include an estimated 9 years of monitoring, including pre-construction monitoring (1 year), construction-concurrent monitoring (3 years), and post-construction monitoring (5 years) at an estimated cost of \$10,620,000. The project is expected to reduce vessel wake energy by reducing the total number of vessel calls; hence, no shoreline erosion impacts from the project are anticipated. However, in order to address concerns expressed by resource agencies about uncertainty in the ability to predict changes at specific locations and the potential for unanticipated erosion impacts, particularly at Fort Sumter, monitoring will also include a 9-year evaluation of wave, current, and shoreline changes at an estimated cost of \$5,310,000. If post-construction monitoring indicates that additional monitoring or corrective action as part of the federal project is warranted, the USACE could share in the cost of the additional efforts.

3. Project Cost Breakdown based on Fiscal Year 2015 (October 2014) Prices.

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a. Project First Cost: The estimated project first cost is \$493,300,000, which includes the cost of constructing the General Navigation Features (GNFs) and the value of any lands, easements, rights of way, and relocations (LERR) estimated as follows: \$452,700,000 for channel modifications, \$5,310,000 for monitoring of shoreline erosion, \$10,620,000 for environmental monitoring of wetlands and hardbottom, \$9,110,000 environmental mitigation hardbottoms, \$3,030,000 for environmental mitigation of wetlands and associated real estate administrative costs, \$5,600,000 Planning Engineering and Design (PED), and \$6,930,000 Construction Management. The South Carolina Port Authority is the non-federal cost-sharing sponsor for all features.

b. Estimated Federal and Non-Federal Cost Shares: The estimated federal and non-federal shares of the project first cost are \$224,300,000 and \$269,000,000 respectively, as apportioned in accordance with the cost sharing provisions of Section 101 of WRDA 1986, as amended (33 U.S.C. 2211), as follows:

(1) The cost for the deepening of the GNFs from greater than -45 feet MLLW to -50 feet will be shared at a rate of 50 percent by the government and 50 percent by the non-federal sponsor. Accordingly, the federal and non-federal shares of the estimated costs in this zone are estimated to be \$224,300,000 each; plus

(2) The cost for the deepening of the GNFs from -50 feet MLLW to -52 feet will require the non-federal sponsor to pay the difference between the NED Plan project depth of -50 feet and the sponsor's Locally Preferred Plan (LPP) project depth of -52 feet. Accordingly, the federal and non-federal shares of the estimated costs for the LPP are estimated to be \$224,300,000 and \$269,000,000 respectively.

c. Additional 10 Percent Payment. In addition to the non-federal sponsor's estimated share of the project first cost of constructing the project in the amount of \$269,000,000 pursuant to Section 101(a)(2) of WRDA 1986, as amended (33 U.S.C. 2211(a)(2)), the non-federal sponsor must pay an additional 10% of the costs for NED GNFs of the project, \$44,870,000 before interest is applied, in cash over a period not to exceed 30 years, with interest. Interest is applied at the time of construction using the applicable interest rate. The value of the lands, easements, rights-of-way and relocations provided by the non-federal sponsor under Section 101(a)(3) of WRDA 1986 as amended (33 U.S.C. 2211 (a)(3)) normally would be credited toward this payment, but for this project the land payments are for preservation of lands for wetland mitigation and are therefore GNF costs. The LERR credit is \$0. No utility relocation costs have been identified.

d. Operations and Maintenance Costs (O&M). It is estimated that there will be an average annual increase of approximately 831,000 cubic yards (CY) of shoal material to be dredged each year from the new project with an added annual O&M cost of

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\$3,740,000. O&M costs for the NED depth increment of -50 feet is 100% federal. All O&M costs in excess of -50 feet depth as part of the LPP are a 100% non-federal responsibility. The annual cost attributable to O&M for the depth in excess of -50 feet is estimated at \$210,000 with the non-federal sponsor solely responsible for this cost.

e. Associated Costs. Estimated associated federal costs of \$620,000 include navigation aids, (a U.S. Coast Guard expense). The modifications to navigation aids also result in a \$50,000 cost annually for increased O&M.

f. Local Service Facilities. The associated costs for local service facilities are approximately \$22,000,000 for upgrading the bulkheads and \$4,970,000 for berths at facilities, which benefit from the deeper channel. These costs are 100% non-federal and are not included in the project first costs of the recommended plan.

g. Authorized Project Cost and Section 902 Calculation. The project first cost, for the purposes of authorization and calculating the maximum cost of the project pursuant to Section 902 of WRDA 1986, as amended, includes estimates for GNFs construction costs, the value of lands, easements, and rights-of-way and the value of relocations provided under Section 101(a)(3) of WRDA 1986, as amended. Accordingly, as set forth in paragraph 3.a. above, based on a FY 2015 Price Level (October 2014), the estimated project first cost for these purposes is \$493,300,000 with an estimated federal share of \$224,300,000 and an estimated non-federal share of \$269,000,000.

4. Based on October 2014 (FY2015) price levels, a 3.375-percent discount rate, and a 50-year period of analysis, the total equivalent average annual costs of the project are estimated to be \$28,000,000. The average annual equivalent benefits are estimated to be \$108,900,000. The average annual net benefits are \$80,900,000. The benefit-to-cost ratio for the recommended plan is 3.9.

5. Risk and uncertainty were evaluated for economic benefits, costs and sea level rise. Economic sensitivities examined the effects of commodity forecasts which had lower growth rates or capped the growth earlier in the period of analysis. In accordance with the Corps' Engineer Regulation on sea level change the study analyzed three sea level rise rates; historic low (baseline), intermediate, and high. The historic low sea level change rate was determined to be 2.94 mm/yr or .00096 feet/yr. The projected rise in sea levels at the end of the 50-year period of analysis for the historic, intermediate, and high rates are 0.57 feet, 1.08 feet, and 2.74 feet, respectively. In general, regional sea level rise (baseline, intermediate, and high) will not affect the function of the project alternatives or the overall safety of the design vessel. There is expected to be a minor impact to non-federal structures or berths that the non-federal sponsor would manage without effects to the project. The

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majority of salinity changes will occur due to sea level change; with only minor impacts attributable to the project.

6. In accordance with the Corps of Engineers Policy on review of decision documents, all technical, engineering and scientific work underwent an open, dynamic and vigorous review process to ensure technical quality. This included District Quality Control (DQC), Agency Technical Review (ATR), Policy and Legal Compliance Review, Cost Engineering Directory of Expertise (DX) Review and Certification, Independent External Peer Review (IEPR), and Model Review and Approval. The IEPR was completed by Battelle Memorial Institute. A total of 18 comments were documented. The IEPR comments identified concerns in the areas of plan formulation, economics, engineering hydraulic analysis, and environmental analyses. The review comments resulted in expanded narratives throughout the report to support the decision-making process and justify the recommended plan. All comments from the above referenced reviews have been addressed and incorporated into the final documents. Overall the reviews resulted in improvements to the technical quality of the report.

7. Washington level review indicates that the plan recommended by the reporting officers is technically sound, environmentally and socially acceptable, and on the basis of congressional directives, economically justified. The plan complies with all essential elements of the 1983 U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Land Related Resources Implementation Studies. The recommended plan complies with other administration and legislative policies and guidelines.

8. I concur with the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that navigation improvements for Charleston Harbor be authorized in accordance with the reporting officers' recommended plan at an estimated first cost of \$493,300,000 with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to cost sharing, financing, and other applicable requirements of federal and state laws and policies, including Section 101 of WRDA 1986, as amended. This recommendation is subject to the non-federal sponsor agreeing to comply with all applicable federal laws and policies including that the non-federal sponsor must agree with the following requirements prior to project implementation.

a. Provide, during the periods of design and construction, funds necessary to make its total contribution for commercial navigation equal to:

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(1) 50 percent of the cost of design and construction of the GNFs attributable to dredging to a depth in excess of -45 feet MLLW but not in excess of -50 feet MLLW, plus

(2) 100 percent of the costs attributable to dredging to a depth over -50 feet MLLW.

b. Provide all lands, easements, rights-of-way, and relocations (LERR), including those necessary for the borrowing of material and placement of dredged or excavated material, and perform or assure performance of all relocations, including utility relocations, all as determined by the government to be necessary for the construction or operation and maintenance of the GNFs. Provide and maintain during the authorized life of the project the mitigation lands (approximately 666 acres) determined to be required for mitigation for impacts for the project.

c. Pay with interest, over a period not to exceed 30 years following completion of the period of construction of the GNFs, an additional amount equal to 10 percent of the total cost of construction of the NED GNFs less the amount of credit afforded by the government for the value of the LERR and relocations, including utility relocations, provided by the non-federal sponsor for the GNFs. If the amount of credit afforded by the government for the value of LERR, and relocations, including utility relocations, provided by the non-federal sponsor equals or exceeds 10 percent of the total cost of construction of the GNFs, the non-federal sponsor shall not be required to make any contribution under this paragraph, nor shall it be entitled to any refund for the value of LERR and relocations, including utility relocations, in excess of 10 percent of the total costs of construction of the GNFs.

d. Provide, operate, and maintain, at no cost to the government, the local service facilities in a manner compatible with the project's authorized purposes and in accordance with applicable federal and state laws and regulations and any specific directions prescribed by the government.

e. Provide 100 percent of the excess cost of operation and maintenance of the project over that cost which the government determines would be incurred for operation and maintenance a project depth in excess of the NED plan.

f. Accomplish all removals determined necessary by the federal government other than those removals specifically assigned to the federal government.

g. Give the federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the Sponsor owns or controls for access to

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the project for the purpose of completing, inspecting, operating and maintaining the GNFs.

h. Hold and save the United States free from all damages arising from the construction or operation and maintenance of the project, any betterments, and the local service facilities, except for damages due to the fault or negligence of the United States or its contractors.

i. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under LERR that the government determines to be necessary for the construction or operation and maintenance of the GNFs. However, for lands, easements, or rights-of-way that the government determines to be subject to the navigation servitude, only the government shall perform such investigation unless the government provides the non-federal sponsor with prior specific written direction, in which case the non-federal sponsor shall perform such investigations in accordance with such written direction.

j. Assume complete financial responsibility, as between the government and the non-federal sponsor, for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under LERR that the government determines to be necessary for the construction or operation and maintenance of the project.

k. Agree, as between the federal government and the non-federal sponsor, that the non-federal sponsor shall be considered the operator of the local service facilities for the purpose of CERCLA liability.

l. To the maximum extent practicable, perform its obligations in a manner that will not cause liability to arise under CERCLA.

m. Provide the non-federal share of that portion of the costs of mitigation and data recovery activities associated with historic preservation, that are in excess of 1 percent of the total amount authorized to be appropriated for the project.

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9. The recommendation contained herein reflects the information available at this time and current departmental policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national civil works construction program or the perspective of higher review levels within the executive branch. Consequently, the recommendation may be modified before it is transmitted to the Congress as a proposal for authorization and implementation funding. However, prior to transmittal to the Congress, the State of South Carolina, the South Carolina Port Authority (the non-federal sponsor), interested federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.

THOMAS P. BOSTICK
Lieutenant General, USA
Chief of Engineers