



DEPARTMENT OF THE ARMY  
CHIEF OF ENGINEERS  
2600 ARMY PENTAGON  
WASHINGTON, DC 20310-2600

OCT 23 2019

DAEN

SUBJECT: Gulf Intracoastal Waterway, Brazos River Floodgates and Colorado River Locks, Navigation Feasibility Study, Texas

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on inland navigation for the Gulf Intracoastal Waterway (GIWW), Brazos River Floodgates (BRFG) and Colorado River Locks (CRL), Texas. It is accompanied by the Final Integrated Feasibility Report - Environmental Impact Statement (FIFR-EIS) of the Galveston District Engineer and the Southwestern Division Engineer. This report is an interim response to the study authority, Section 216 of the Flood Control Act (FCA) of 1970 (Public Law [P.L.] 91-611), as amended. These reports were prepared under the authority of Section 216 of the 1970 FCA, which authorizes the Secretary of the Army to review the operation of projects constructed by the Corps of Engineers when found advisable due to significantly changed physical, economic, or environmental conditions.

2. The GIWW channel from Colorado River to Brazos River, Texas, was completed in the 1940's. The main channel of the GIWW was designated as part of the Inland Waterways System by Section 206 of the 1978 Inland Waterways Revenue Act (Public Law 95-502). Since the completion of the channel, problems have been identified which affect the safety and economic efficiency of the waterway as well as the environment. By reducing navigational difficulties, delays and accidents occurring as tow operators transit the Brazos and Colorado Rivers, system wide improvements to the economic efficiency of commercial navigation in the region can be achieved.

3. The reporting officers recommend a plan to improve the existing GIWW inland navigation project at the Brazos River Flood Gate (BRFG) and Colorado River Lock (CRL) structures. The recommended system plan is comprised of the BRFG component and the CRL component.

a. At BRFG, the main features of the recommended plan are the removal of the existing gates on both sides of the river crossing, the construction of a 125-foot wide open channel on the west side and a new 125-foot wide sector gate structure on the east side. The open channel would have a bottom depth of -12 feet NAVD88 with a bank-to-bank width of approximately 500 feet. The new sector gate on the east side would be set back approximately 1,200 feet from the existing gate structure, providing increased safety and efficient vessel operation through the system, reducing allisions. The gate would be constructed to a top elevation (El) of 16-feet NAVD88 with a sill at El -16 feet NAVD88. New control houses, an administrative office building, warehouse and boat house would be constructed to support the maintenance and operation of the new gate structures. Approximately 13.8 acres of tidal wetlands would be

DAEN

SUBJECT: Gulf Intracoastal Waterway, Brazos River Floodgates and Colorado River Locks, Navigation Feasibility Study, Texas

impacted. These impacts would be mitigated by the creation of tidal wetlands along the original footprint of the facilities utilizing dredged material and/or rock barriers.

b. At CRL, the main features of the recommended plan are the construction of new 125-foot sector gate structures on the east and west sides of the river crossing. The new sector gates would be set back approximately 1,000 feet from the river crossing. The gates would be constructed to a top El of 16-feet NAVD88 with a sill at El -16 feet NAVD88. New control houses, an administrative office building, warehouse and boat house would be constructed to support the maintenance and operation of the new gate structures. Approximately 0.7 acre of tidal wetlands would be impacted. These impacts would be mitigated by the creation of tidal wetlands along the original footprint of the facilities utilizing dredged material and/or rock barriers.

4. The first cost of the recommended plan, based on October 2019 price levels, is estimated at \$409,777,000 and allocated to the inland navigation purpose. The estimated project first cost includes the cost of constructing the General Navigation Features (GNFs) and the value of lands, easements, right-of-way, and relocations (LERR) estimated as follows: \$311,134,000 for GNF; \$249,000 for LERRs, \$63,523,000 for Planning, Engineering and Design (PED), \$34,871,000 for Construction Management. Operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the Recommended Plan after construction will have average annual costs \$2,658,000. The average annual benefits of \$60,197,000 for the project exceeds the total average annual cost of \$18,468,000, yielding net benefits of \$41,729,000 and a benefit-cost ratio (BCR) of 3.26.

a. For the Brazos River Flood Gate component, the first cost is estimated at \$158,147,000. The average annual benefits and costs are estimated at \$44,177,000 and \$8,765,000, respectively, with annual net benefits of \$35,411,000, and a benefit to cost ratio of 5.04 to 1 at a 2.75 percent discount rate. The recommended plan would reduce accident risk by approximately 80 percent at the BRFG.

b. For the Colorado River Lock component, the first cost is estimated at \$251,630,000. The average annual benefits and cost are estimated at \$16,026,000 and \$9,709,000, respectively, with annual net benefits of \$6,317,000, and a benefit to cost ratio of 1.65 to 1 at a 2.75 percent discount rate. The recommended plan would reduce accident risk by approximately 99 percent at CRL.

5. Section 1405 of WRDA 1986, P.L. 99-662, amended Section 203 and 204 of the Inland Waterways Revenue Act of 1978, P.L. 95-502, which originally established the Inland Waterways Trust Fund (IWTF). Expenditures from the IWTF may be made available, as provided by Appropriation Acts, for making construction and rehabilitation expenditures for navigation on those Inland Waterways described in Section 206 of P.L. 95-502, as amended, including the GIWW. Consistent with Section 1405 and appropriations acts providing IWTF funding, these projects are cost shared 50 percent from the IWTF.

DAEN

SUBJECT: Gulf Intracoastal Waterway, Brazos River Floodgates and Colorado River Locks, Navigation Feasibility Study, Texas

6. The goals and objectives included in the Campaign Plan of the U.S. Army Corps of Engineers (USACE) have been fully integrated into the study process. The recommended plan has been designed to avoid or minimize environmental impacts while maximizing future safety and economic benefits to the navigation system. Risk and uncertainty were addressed during the study by sensitivity analysis that evaluated the NED plan performance. This evaluation included sensitivity to the crude oil market condition in West Texas due to significant increases in supply as well as the regional opportunities for exporting those commodities. There are significant uncertainties regarding the oil transportation system's adaptation to different modes of transport. The effect in capacity, volumes and rates of oil productions, and annual volumes shipped through the study area may vary considerably in the future as the oil delivery system adapts to market conditions. Part of the delivery system adaptation includes capacity increases to the navigation system by enlarging the Brazos River Flood Gates and Colorado River Lock from 75 feet to 125 feet, creating an opportunity for increased efficiencies to the coastal oil delivery system. Upon completion of both project components the system is expected to experience system wide behavior changes. The system wide assessment of the oil delivery system was not performed during the feasibility stage. With the receipt of PED funds an assessment of the system wide behavior is expected to change the project justification significantly. In addition, ship simulation will be completed in PED that would provide greater refinement of navigation performance but it is unlikely to change the selection of the plan. The probability of shipping accidents being prevented at both Brazos River Flood Gates and Colorado Locks is also a source of uncertainty. The capital investment required by shippers is a variation of the overall accident consequences. Both the probability of accidents and the consequence of accidents will be better informed in PED using ship simulation.

7. In accordance with the Engineer Circular (EC 1165-2-217) 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 Agency Technical Review (ATR), Type I Independent External Peer Review (IEPR) and USACE Headquarters policy and legal review. All concerns have been addressed and incorporated into the final report.

8. Resolution of comments received from ATR, public review, and Policy Review of the draft report resulted in refinement of the engineering design and economics traffic forecast and environmental evaluation. Additional coordination with the National Marine Fisheries Service under the Marine Mammal Protection Act (MMPA) is required to address the potential impact of noise levels resulting from the installation of pilings on bottlenose dolphin behavior. As the take permit for this potential impact is only valid for one year, USACE will reinitiate and complete MMPA coordination during the Pre-construction, Engineering, and Design phase of the project before construction activities would commence. Comments have since been addressed and resolved and support the Recommended System Plan as described here-in. The final integrated report and environmental impact statement were provided for state and agency review. All comments from the above referenced reviews were addressed and incorporated into the final documents as appropriate.

9. Washington level review indicates that the project recommended by the reporting officers is technically sound, environmentally and socially acceptable, cost effective, and economically

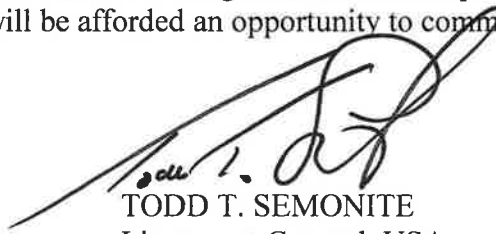
DAEN

SUBJECT: Gulf Intracoastal Waterway, Brazos River Floodgates and Colorado River Locks, Navigation Feasibility Study, Texas

justified. The plan complies with all essential elements of the U.S. Water Resources Council's *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* and complies with other administrative and legislative policies and guidelines. Also, the views of interested parties, including federal, state, and local agencies have been considered.

10. I concur in the findings, conclusions, and recommendations of the reporting officers. Accordingly, I recommend that the navigation improvements for the BRFG and CRL Recommended System Plan be authorized in accordance with the reporting officer's Recommended Plan at an estimated first cost of \$409,777,000, with such modifications as in the discretion of the Chief of Engineers may be advisable. My recommendation is subject to 50 percent of the cost of construction from amounts appropriated from the general fund of the treasury and 50 percent from amounts appropriated from the Inland Waterways Trust Fund.

11. 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 Congress, the sponsor, the State, interested Federal agencies, and other parties will be advised of any significant modifications and will be afforded an opportunity to comment further.



TODD T. SEMONITE  
Lieutenant General, USA  
Chief of Engineers

VITAL PROJECT  
PROVIDING SAFE AND  
EFFICIENT NAVIGATION  
ON THE NATION'S  
ENERGY CORST!!