Review Assessment

of

Wilmington Harbor, North Carolina Navigation Improvement Project Integrated Section 203 Study & Environmental Report (February 2020)

May 2020

Executive Summary

The North Carolina State Ports Authority (NCSPA) conducted a feasibility study to address navigation improvements for the Wilmington Harbor. The study was conducted under Section 203 of the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), as amended. The office of the Assistant Secretary of the Army for Civil Works (OASACW) has conducted a concurrent review of this submittal with the Headquarters, U.S. Army Corps of Engineers (Corps) with the purpose of determining federal interest and that the study demonstrates engineering, economic and environmental feasibility that all reports seeking construction authorization must demonstrate.

This Review Assessment provides the results of the Washington-level review of the study. This review has been conducted to determine whether the NCSPA study and the process under which the study was developed, each comply with Federal laws and regulations; a determination of whether the project is feasible; and identification of any conditions that the Secretary may require for construction of the project. Based on the results of the review process, the Secretary has made the determination that the NCSPA's recommended plan is technically feasible. However, this review has identified technical, policy and legal concerns as detailed within this assessment. In the event the NCSPA's recommended plan is authorized for federal participation, the unresolved issues contained within this Review Assessment will need to be addressed prior to construction.

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I. Background

The North Carolina State Ports Authority (NCSPA) conducted a feasibility study to address navigation improvements for the Wilmington Harbor. The study was conducted under Section 203 of the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), as amended. The office of the Assistant Secretary of the Army for Civil Works (OASACW) conducted a concurrent review of the submittal with the Headquarters, U.S. Army Corps of Engineers (Corps, also referred to as USACE) with the purpose of determining federal interest and that the study demonstrates engineering, economic and environmental feasibility that all reports seeking construction authorization must demonstrate.

This Review Assessment provides the results of the Washington-level review. This review has been conducted to determine whether the study and the process under which the study was developed, each comply with Federal laws and regulations; a determination of whether the project is feasible; and identification of any conditions that the Secretary may require for construction of the project.

II. The North Carolina State Ports Authority Section 203 Recommended Plan

This section provides a summary of the NCSPA's recommended plan, as contained within the Wilmington Harbor, North Carolina, Integrated Section 203 Study and Environmental Report (February 2020).

A. Location: The Port of Wilmington, in southeastern North Carolina, is approximately 28 miles up the Cape Fear River from the Atlantic Ocean. The Cape Fear River borders Brunswick County to the west and New Hanover County to the east.

B. Congressional Interest: David Rouzer (NC-7)

C. Senators: Richard Burr and Thom Tillis (North Carolina)

D. Problems: The NCSPA conducted this Section 203 study to determine the feasibility of improvements to the Federal navigation project at Wilmington Harbor. The purpose of the study is to identify and evaluate alternatives to increase transportation efficiencies for the current and future fleet of container vessels operating at the Port of Wilmington and to improve overall conditions for vessel operations and safety.

E. Project Objectives: Based on the problems posed by channel dimensions and the opportunities available through channel improvements, the following planning objectives have been established to assist in the development of management measures and evaluation of alternative plans:

> **Planning Objective 1:** Contribute to National Economic Development (NED) by reducing origin to destination transportation costs, at the Port of Wilmington from 2027 to 2076;

Planning Objective 2: Contribute to NED by reducing trucking miles and trucking costs for the Port of Wilmington's hinterland cargo, from 2027 to 2076; and

Planning Objective 3: Contribute to NED by reducing waterborne transportation costs at the Wilmington Harbor Federal navigation project by accommodating the transit of larger and more efficient vessels, from 2027 to 2076.

F. NCSPA's Recommended Plan:
The NCSPA's recommended plan is to deepen the Federal Navigation Channel to -47ft. The NCSPA's recommended plan also includes corresponding widening to provide for passage of the project design vessel. All construction material will be either disposed at the New Wilmington Off-shore Dredged Material Disposal Site (ODMDS) or placed at one or multiple beneficial use sites evaluated for this project.

G. Price Level: October 2019

H. Interest Rate: 2.75%

I. Total Project First Cost: The first cost of NCSPA's recommended plan is estimated at $834,093,000 (Fiscal Year 2020 price levels), which equates to an estimated average annualized cost of $33,890,000. The cost of operation, maintenance, repair, replacement and rehabilitation (OMRR&R) is estimated at $1,160,000 annually.

J. Benefits: Deepening the Wilmington Harbor Federal Navigation Project to −47 feet would achieve transportation cost savings from more efficient transportation. Benefits, in the form of transportation savings, are estimated at $85,161,000 and a benefit to cost ratio of 2.5 to 1.

K. Cost Sharing: The project cost sharing will be determined in accordance with section 101 of the Water Resources Development Act of 1986, as amended.

III. Section 203 Review Assessment Summary

In accordance with section 203 of WRDA 1986, as amended, the Secretary is required to provide a report to Congress that describes the following:

A. Feasibility determination (Whether the project is feasible (i.e. technically sound, economically justified and environmentally compliant)?

The Secretary has determined that the NCSPA's recommended plan is technically sound and feasible from an engineering perspective. In the event NCSPA's recommended plan is authorized for federal participation, the unresolved issues contained within this Review Assessment will need to be addressed prior to construction.

B. Recommendations concerning the plan or design of the proposed project.

The majority of the initial concerns with the plan and design of the project, as documented within this Review Assessment, have been resolved. Concerns requiring further action, should the recommended plan be authorized, are related to real estate, sea level rise, and economics.

C. Identify any conditions required for construction of the project.

The review assessment has identified conditions that must be completed prior to construction of the project. A brief summary of these conditions are identified below. Detailed discussion can be found in Appendix A.

All National Environmental Policy Act and other environmental coordination has not been completed nor has a final Mitigation or Monitoring and Adaptive plan been submitted. It is expected that the unresolved issues contained within the review assessment would need to be addressed and the associated NEPA requirements and environmental compliance activities must be completed prior to implementation of the project. Additional analysis of environmental consequences may be necessary once all issues regarding legal and policy compliance have been resolved. (Comments B-4 and B-6)

All economic assumptions need to be justified using USACE methodology before project construction. A post authorization economic analysis should address the following concerns:

> Many of the screening criteria that are listed are unnecessary and could potentially eliminate solutions for the identified problems. The improper utilization of these criteria could have affected the formulation and evaluation of measures/alternatives (Comment A-2)

The screening of measures for the study is flawed. The study evaluated some measures similar to alternatives, determined the measure was incomplete and eliminated the measure from further consideration. A measure, by definition, is not an alternative and should not outright be judged as incomplete. A measure although it is possible for a stand-alone measure to function as an alternative, measures can be combined to develop alternatives for further evaluation. (Comment A-3)

The economic analysis and Future Without Project Condition in the draft report is based on the assumption that the Port of Wilmington will be removed from service if not deepened; however, there is no data to support this assumption. There is no discussion regarding whether the Port of Wilmington could be added to another service or if traffic would be reduced rather than service being completely eliminated. The report also indicates that traffic would go to the Port of Savannah rather than the Port of Charleston, which does not appear substantiated. Additionally, the report did not include an evaluation of the use of rail as an option to transport cargo. (Comments: A-4, C-4, C-6, and C-8)

If authorized, Independent External Peer Review (IEPR) will be undertaken on implementation documents prior to project construction. (Comment C-10)

The draft Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12 (Real Estate Handbook). The Real Estate Plan will be finalized during development of the DEIS at such time that the mitigation plan is finalized and final real estate acquisition requirements have been determined. (Comment E-2 and comments E-6 through E-21)

Compliance with ER 1100-2-8162 (Incorporating Sea Level Change in Civil Works Programs) is also necessary to provide a sufficient Sea Level Change analysis and an accurate evaluation of project effects. (Comments D-2 and D-3)

IV. Review History and Findings

Two review cycles were conducted for the study: Policy Review and Agency Technical Review. Both reviews were conducted for the June 2019 Study submittal and the revised Study, dated February 2020.

Appendix A contains the issue resolution documentation for the Policy Review.
Appendix B contains the documentation of the Agency Technical Review.

Appendix A – Policy Review Documentation

A. Plan Formulation

1. Objectives

Concern: As written, the planning objectives are unclear and could potentially lead to the pre-selection of an alternative plan. The first two objectives, "reduce access restrictions and accommodate efficient loading," do not identify the effect desired, which is used to measure and compare alternatives. Typically, objectives for deep draft navigation studies would have an effect to reduce the transportation costs, which would then result in cost reduction benefits as noted in ER 1105-2-100. In this instance, the objectives are not linked to a method to analyze beneficial contributions to national economic development. The third objective, "Maintain the Port of Wilmington as a port-of-call for USEC-Asia services from 2027-2076," seems to be a corporate objective rather than a planning objective. As written, it is not quantifiable or measureable against other plans, and seems to have been used to eliminate potential measures or alternatives that include light loading by establishing a minimum depth for the deepening alternatives.

Basis of Concern: ER 1105-2-100, Section 2-3.a.(4) indicates: Objectives must be clearly defined and provide information on the effect desired (quantified, if possible), the subject of the objective (what will be changed by accomplishing the objective), the location where the expected result will occur, the timing of the effect (when would the effect occur) and the duration of the effect. Additionally, ER 1105-2-100, Section 2-3.c.(1) indicates that "alternative plans shall be formulated to identify specific ways to achieve planning objectives within constraints, so as to solve the problems and realize the opportunities that were identified in Step1." In this instance, as the objectives were not correctly written, the planning process and selection of a plan would be inherently flawed.

Significance of Concern: High, as it seems that depths between 42' and 46' were eliminated from consideration due to flawed objectives.

Action Needed to Resolve the Concern: Revise the objectives to be policy compliant and conduct a new iteration of plan formulation and evaluation.

Sponsor Response:

Path to resolution:
Present reviewer with alternative set of objectives, such as:

- Reduce origin-to-destination transportation costs;
- Improve the navigability of the channel for the existing and projected future fleet; and
- Develop an environmentally acceptable and sustainable alternative.

Objectives have been revised as presented below and used in a revised plan formulation and evaluation.

4.3.1 Planning Objectives

In addition to the Federal objective, project-specific planning objectives have been identified, and these objectives guided the plan formulation process in this study. Objectives must be clearly defined and provide information on:

- the effect desired (quantified, if possible);
- what will be changed by accomplishing the objective;
- the location where the expected result will occur, and
- the timing of the effect (when would the effect occur) and the duration of the effect.

Based on the problems posed by channel dimensions and the opportunities available through channel improvements (as detailed in Sections 4.1 and 4.2), the following planning objectives have been established to assist in the development of management measures and evaluation of alternative plans:

Objective 1: Reduce origin to destination transportation costs at the Port of Wilmington and contribute to NED from 2027 to 2076.

Objective 2: Reduce navigation restrictions to the Port of Wilmington for the projected future fleet from 2027 to 2076.

Objective 3: Develop an alternative for navigation improvements that is environmentally acceptable and sustainable from 2027 to 2076.

Review Assessment: Without a revised report, it is not possible to evaluate the revised objectives due to the lack of context; however, observations can be made just be reviewing the draft response. The objectives, while improved, are still not sufficient in regard to policy. Objective 2 does not indicate what would be changed by accomplishing the objective. Objective Number 3, develop an alternative, is a study task blended with a constraint.

Action Taken: Planning Objectives have been revised in Section 5.3.1 Planning Objectives of the Main Report. The revised planning objectives are also copied below:

Consistent with the Federal objective identified in Section 4.3 Federal Objective, project-specific planning objectives have been identified, and these objectives guided the plan formulation process in this study. Planning objectives must be clearly defined and provide information on:

- the effect desired (quantified, if possible);
- what will be changed by accomplishing the objective;
- the location where the expected result will occur; and
- the timing of the effect (when would the effect occur) and the duration of the effect.

Based on the problems posed by channel dimensions and the opportunities available through channel improvements (as detailed in Sections 4.1 and 4.2), the following planning objectives have been established to assist in the development of management measures and evaluation of alternative plans:

Planning Objective 1: Contribute to NED by reducing origin to destination transportation costs, at the Port of Wilmington from 2027 to 2076;

Planning Objective 2: Contribute to NED by reducing trucking miles and trucking costs for the Port of Wilmington's hinterland cargo, from 2027 to 2076; and

Planning Objective 3: Contribute to NED by reducing waterborne transportation costs at the Wilmington Harbor Federal navigation project by accommodating the transit of larger and more efficient vessels, from 2027 to 2076.

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

2. Screening Criteria

Concern: Section 5.2. Pages 128.-130. Many of the criteria that are listed are unnecessary and could potentially eliminate solutions for the identified problems. The criteria that were listed, technical, economic, environmental, social, etc., should actually be used to establish assumptions for projecting the planning setting in the future with project settings; however, in this instance, by using these elements incorrectly as screening criteria, it seems that the plan formulation and evaluation process may have been unnecessarily restricted. Additionally, some of the elements, such as "the selected plan should be consistent with local, regional, and state goals for water resources development," are not required for USACE Civil Works projects.

Basis of Concern: ER 1105-2-100, E-10.c.(3)(b) indicates that the planner should "specify the significant technical, economic, environmental, social and other elements of the planning setting to be projected over the period of analysis. Also, the planner should "discuss the rationale for selecting these elements."

Significance of Concern: Medium, as improper utilization of these criteria could have affected the formulation and evaluation of measures/alternatives.

Action Needed to Resolve the Concern: Correctly utilize these criteria in the future project condition and eliminate any screening criteria that may errantly or artificially constrain the planning process. Review the study plan formulation to ensure that potential measures and/or alternatives were not errantly eliminated from consideration.

Sponsor Response:

Path to resolution: Present reviewer with revised set of screening criteria. Use the standard four criteria from the P&G: Completeness, effectiveness, efficiency, and acceptability.

Response: Text has been revised to focus on the four primary criteria.

5.2 Plan Formulation and Screening Criteria

Management measures were identified and evaluated in the development of alternative plans that address the problems of navigation restrictions and increased transportation costs in the without-project condition. Management measures were evaluated with respect to their ability to meet the planning objectives based on the four general criteria for plan formulation that are identified in the Principles and Guidelines (1983):

- Completeness: does the alternative provide and account for all necessary investments or actions to ensure the realization of the planning objectives;
- Effectiveness: does the alternative contribute to achieving the planning objectives;
- Efficiency: is the alternative the most cost-effective means of addressing the specified problems and realizing the specified opportunities, consistent with protecting the nation's environment; and
- Acceptability: is the alternative plan acceptable in terms of applicable laws, regulations, and policies.

Review Assessment: Without the context of a revised draft report, it is not possible to make any conclusions in regard to the response.

Action Taken: Screening criteria have been revised. The revised criteria are presented in section 6.2.1 Management Measures Screening of the Main Report and copied below:

Management measures were evaluated with respect to their ability to meet the planning objectives based on the four general criteria for plan formulation that are identified in the Principles and Guidelines (1983):

- Completeness: does the alternative provide and account for all necessary investments or actions to ensure the realization of the planning objectives;
- Effectiveness: does the alternative contribute to achieving the planning objectives;
- Efficiency: is the alternative the most cost-effective means of addressing the specified problems and realizing the specified opportunities, consistent with protecting the nation's environment; and
- Acceptability: is the alternative plan acceptable in terms of applicable laws, regulations, and policies.

Each measure was screened to determine if the measure should be retained for further, more detailed, evaluation. Screening was based on each measure's ability to perform based on the metrics identified below. Note that none of the measures in question would be able to realize all the planning objectives and therefore a completeness metric was not developed. The management measures advanced for more detailed evaluation would be combined into preliminary alternatives prior to additional evaluation.

Effectiveness Metrics

- Potential to meet planning objectives
  - 1 indicates the measure is very unlikely to support meeting the planning objectives
  - 3 indicates the measure is very likely to support meeting the planning objectives
- Magnitude of transportation cost savings
  - 1 indicates the measure is very unlikely to generate transportation cost savings
  - 3 indicates the measure is very likely to generate transportation cost savings

Efficiency Metrics

- Preliminary costs
  - 1 indicates that the costs of implementing the measure are likely to be very high compared to other measures
  - 3 indicates that the costs of implementing the measure are likely to be very low compared to other measures
- Preliminary benefits
  - 1 indicates that the preliminary benefits of the measure are likely to be very low
  - 3 indicates that the preliminary benefits of the measure are likely to be very high
- Preliminary net benefits
  - 1 indicates that the preliminary net benefits of the measure are likely to be very low
  - 3 indicates that the preliminary net benefits of the measure are likely to be very high

Technical Feasibility Metrics

- Technically feasible
  - 1 indicates that the technical requirements of the measure would make it very difficult to implement
  - 3 indicates that the technical requirements of the measure are commonly implemented in the industry and there are no foreseen difficulties with implementation at Wilmington Harbor

Acceptability Metrics

- Environmental impact

- 1 indicates that the measure will likely have an environmental impact that will require extreme mitigation measures
- 3 indicates that the measure will likely have an environmental impact that can be mitigated using common mitigation practices

- Meets applicable laws and regulations
  - 1 indicates that the measure will very likely not meet applicable laws and regulations
  - 3 indicates that the measure will very likely meet applicable laws and regulations

OASACW/HQUSACE Final Assessment: The analysis remains unresolved. An environmental impact alone does not make a measure or alternative unacceptable according to the definition of the P&G Criteria. High cost is not a criterion for efficiency. High costs and/or high benefits do not make an alternative more efficient. A comparison of cost effectiveness is necessary. Additionally, as transportation costs savings are included in objectives, using the criteria under effectiveness would likely lead to double counting and a skewed analysis towards a certain measure or alternative.

3. Screening of Measures

Concern: The screening of measures for the study is flawed. According to Table 5-1 on page 134, a stepped channel would meet all 3 project objectives; however, the measure was then eliminated from consideration. Additionally, the Table indicates tidal advantage is carried forward even though it does not meet the third objective. What is the criteria for retaining measures? Do they need to meet all 3 of the objectives, or just one? This issue is related to the non-compliant study objectives as mentioned previously.

Basis of Concern: ER 1105-2-100, Section 2-3.d.(2) indicates the following: "Criteria to evaluate the alternative plans include all significant resources, outputs and plan effects. They also include contributions to the Federal objective, the study planning objectives, compliance with environmental protection requirements, the P&G's four evaluation criteria (completeness, effectiveness, efficiency and acceptability) and other criteria deemed significant by participating stakeholders."

Significance of Concern: Medium, as the study plan formulation may not include all reasonable alternatives.

Action Needed to Resolve the Concern: After revision of the project objectives, conduct a new iteration of the formulation and screening of management measures.

Sponsor Response:

Path to resolution: Revise formulation and screening based on revised objectives and criteria; provide more explanation as to why stepped channel doesn't work.

Response: The following table has replaced the preliminary screening table

Table 5-1

Preliminary Screening

Structural Measures	Completeness	Effectiveness	Efficiency	Acceptability	Other	Retain	Reason for Screening Out
Channel Deepening	Incomplete, may be combined with channel widening and berth deepening to fully realize planning objectives	Effective when combined with berth deepening	Efficient	Acceptable	Meets the primary planning objective and the NEPA purpose and need	Yes	
Stepped Channel	Incomplete	Ineffective	A stepped channel does not realize the planning objectives	Acceptable	Containerships use the full channel depth inbound and outbound, so deepening only for one direction would not address restrictions in the other direction	No	Only reduces restrictions in one direction. Both directions need reduced restrictions.

Structural Measures	Completeness	Effectiveness	Efficiency	Acceptability	Other	Retain	Reason for Screening Out
Turning Basin	Incomplete	Ineffective	Increasing the turning basin dimensions to more than the currently permitted basin does not realize the planning objectives	Acceptable	The turning basin as currently permitted supports the primary planning objective and NEPA purpose and need	No	Increasing the turning basin dimensions to more than the currently permitted basin is unnecessary to realize the primary planning objective and the NEPA purpose and need
Anchorage basin	Incomplete	Ineffective	Increasing the anchorage basin dimensions does not realize the planning objectives	Acceptable	The turning basin is located within the anchorage basin. Increasing the anchorage function is not needed	No	Increasing the anchorage basin dimensions does not contribute to realizing the primary planning objective and the NEPA purpose and need
Channel widening to reduce navigation restrictions	Incomplete but may be combined with channel and berth deepening to achieve planning objectives	Effective	Efficient	Acceptable	Channel widening is required for the design vessel to regularly use the channel	Yes	

Structural Measures	Completeness	Effectiveness	Efficiency	Acceptability	Other	Retain	Reason for Screening Out
Channel widening to accommodate vessel meeting	Incomplete but may be combined with channel and berth deepening to achieve planning objectives	Effective	Inefficient	Acceptable	Meeting of the design vessel and another post-panamax vessel is projected to occur infrequently	No	The benefits of building a meeting area for two post-panamax vessels would be less than the cost of construction and maintain the meeting area

Non-Structural Measures	Completeness	Effectiveness	Efficiency	Acceptability	Other	Retain	Reason for Screening Out
Reduce vessel speed	Incomplete	Ineffective	Inefficient	Acceptable	Vessel speed often cannot be reduced due to the need to maintain maneuverability and to reduce crabbing in the channel	No	Reducing vessel speed does not contribute to realizing the primary planning objective and the NEPA purpose and need
Additional tug assistance	Incomplete	Ineffective	Inefficient	Acceptable	Additional tugs are included in the without and with-project conditions as required for the design vessel		Additional tug assistance does not contribute to realizing the primary planning objective and the NEPA purpose and need

Non-Structural Measures	Completeness	Effectiveness	Efficiency	Acceptability	Other	Retain	Reason for Screening Out
Relocate aids to navigation	Incomplete but can be a component of channel widening.	Effective in some channel reaches	Relocating aids to navigation can be a very efficient way to widen the channel	Acceptable, but must be approved by USCG	There are channel reaches in the Entrance Channel and at Bald Head where deeper water is adjacent to the existing channel	Yes	
Tidal advantage	Incomplete	Effective	Efficient	Acceptable	Use of tidal advantage is an existing practice that is projected to be used in the without and with-project condition	Yes	
Lightering	Incomplete	Ineffective	Inefficient	Unacceptable	Lightering containerships at sea is potentially dangerous and not practiced. Lightering other types of vessels is unnecessary because they are not restricted by existing channel conditions	No	Lightering does not contribute to realizing the primary planning objective and the NEPA purpose and need

Local service facility Improvements	Completeness	Effectiveness	Efficiency	Acceptability	Other	Retain	Reason for Screening Out
Container Terminal Improvements	Incomplete. Must be combined with channel improvements and berth deepening	Ineffective	Inefficient	Acceptable	Terminal improvements have been completed, which are sufficient for the design vessel and planned improvements are sufficient for projected commodity flow	No	Terminal improvements beyond recently completed improvements and planned future improvements do not contribute to realizing the primary planning objective and the NEPA purpose and need
Relocate cargo terminals	Incomplete. Must be combined with channel improvements and berth deepening	Effective	Inefficient	Unacceptable	Development of a new container terminal at Southport was investigated prior to this study and it was determined to be prohibitively expensive and environmentally damaging	No	The construction cost and environmental degradation associated with a new terminal make the measure infeasible

Local service facility Improvements	Completeness	Effectiveness	Efficiency	Acceptability	Other	Retain	Reason for Screening Out
Berth Deepening	Incomplete but must be combined with channel deepening to achieve planning objectives	Effective	Efficient	Acceptable	Berth deepening is necessary for the realization of channel deepening benefits	Yes	
Bulk Terminal Improvements	Incomplete	Ineffective	Inefficient	Acceptable	Bulk vessels are not restricted under the without-project condition	No	Bulk terminal improvements do not contribute to realizing the primary objective or the NEPA purpose and need
Breakbulk/General Cargo Improvements	Incomplete	Ineffective	Inefficient	Acceptable	Breakbulk and general cargo vessels are not restricted under the without-project conditions		Breakbulk and general cargo terminal improvements do not contribute to realizing the primary objective or the NEPA purpose and need

Review Assessment: The analysis remains flawed. A measure, by definition, is not an alternative and should not outright be judged as incomplete. Although it is possible for a stand-alone measure to function as an alternative, measures such as deepening should not be deemed "incomplete" because they have not been combined with other measures to form an alternative.

Also, what is the criteria for retaining a measure or eliminating one? Some have been deemed incomplete, but were retained. Others were deemed incomplete, and were carried forward. In other cases, it seems that the P&G Criteria didn't matter as a measure was screened for infeasibility or cost. The report should be reviewed to ensure that all parts of the measure formulation and evaluation are consistent with federal policy.

Action Taken: The screening of measures has been revised in section 6.2.1 Management Measures Screening of the Main Report. The revised screening criteria are presented in the response to comment #3 above. The revised screening is presented in Table 6-1 Preliminary Screening of the Main Report and copied below:

Table 6-1 Preliminary Screening

Non-Structural Measures	Effectiveness	Efficiency	Technical Feasibility	Acceptability	Total	Retained
Reduce vessel speed	1	1	2	3	7	No
Additional tug assistance	1	1	2	3	7	No
Relocate aids to navigation	1	1	3	2	7	No
Tidal advantage	2	3	3	3	11	Yes
Lightering	1	1	1	1	4	No
Structural Measures	**Effectiveness**	**Efficiency**	**Technical Feasibility**	**Acceptability**	**Total**	**Retained**
Channel deepening	3	3	3	2	11	Yes
Stepped channel	1	1	3	2	7	No
Turning basin expansion	1	1	3	1	6	No
Turning basin deepening	3	3	3	2	11	Yes
Anchorage basin	1	1	3	2	7	No
Channel widening to reduce navigation restrictions	3	3	3	2	11	Yes

Channel widening to accommodate vessel meeting	1	1	3	2	7	No
Local Service Facility Improvements	**Effectiveness**	**Efficiency**	**Technical Feasibility**	**Acceptability**	**Total**	**Retained**
Container terminal improvements	1	1	3	2	7	No
Relocate cargo terminals	1	1	3	1	6	No
Berth deepening	3	3	3	3	12	Yes
Bulk terminal improvements	1	1	3	2	7	No
Breakbulk/General cargo improvements	1	1	3	2	7	No

Text describing the screening is presented in the following Main Report sections:

- 6.2.2 Non-Structural Measures
- 6.2.3 Structural Measures, and
- 6.2.4 Local Service Facility Improvements.

OASACW/HQUSACE Final Assessment: Unresolved. See Review Assessment and notes about P&G Criteria for Number 2 above.

4. Assumptions/FWOP Condition

Concern: The report indicates that the vessels for USEC-Asia services would not call on the port in the future without project condition due to the high cost of light loading; however, no documentation from the shipping companies has been provided to support this project assumption, which has in turn been used to eliminate full examination of alternatives. As noted in ER 1105-2-100, Section E-10.c.(1)(a), basic assumptions for all studies are non-structural measures within the authority and ability of port agencies, other public agencies, and the transportation industry.

Basis of Concern: ER 1105-2-100, Appendix E, Section E-10.c.(1) indicates the following: “Assumptions specific to the study should be stated and supported.”

Significance of Concern: High, as the project assumptions/future without project conditions significantly affect the plan formulation and selection of a plan.

Action Needed to Resolve the Concern: Fully document all assumptions for the study, providing letters or agreements where necessary to evidence conclusions. All assumptions, data, and other information must be specific to the current study and the

port of Wilmington, unless it is clear that utilization of data or information from other studies will provide identical conclusions.

Sponsor Response:

Path to resolution: present list of assumptions & discuss substantiation of each assumption. Assumptions:

- Turning basin complete;
- Duke wires raised;
- USEC port depths – Economics Appendix Section 2.3 & Economics Appendix Table 2-1;
- fleet shift to PPX3 (design vessel) – Economics Appendix Section 1.8.2; and
- design vessel by-pass Wilmington – Economics Section 2-3 & Economics Appendix Table 2-2;

Upgrade emphasis on terminal upgrades for design vessel

Response: Text has been revised to include the following discussion of assumptions:

4.5 Study Assumptions

There are five assumptions that are integral to the problems and opportunities identified in this study:

1. Container terminal improvements currently under construction or in the design phase, including the turning basin expansion, will be completed to allow the design vessel and future cargo to use the terminal;
2. Federal channel deepening projects currently under construction at Savannah, Charleston, Boston, and Jacksonville will be completed and maintained to project depth, which will allow vessels to operate at the drafts required to realize the transportation cost savings calculated for those projects;
3. The future fleet for the two Asia services is represented by the design vessel;
4. Under without-project conditions, channel depth constraints, draft restrictions, and the resulting light loading of the design vessel for the two Asia services will cause the two Asia services to drop Wilmington as a port-of-call; and
5. Under with-project conditions, deeper channel depths at Wilmington will increase vessel operating drafts, reduce light loading, and increase vessel operating efficiency allowing the two Asia services to include Wilmington as a port-of-call.

Assumption 1 is substantiated by the ongoing construction and continuous funding for the terminal improvements as described in Section 2.26.1 Existing Conditions: Container Terminal and section 3.2.1 Future Without-project Conditions: Container Terminal. These without-project condition terminal improvements enhance terminal operations and efficiency regardless of improvements to the federal channel. The NCSPA is currently realizing benefits of larger and faster cranes, improved mooring

facilities, and yard configuration. Planned future improvements will further increase the efficiency of cargo flow at the terminal.

Assumption 2 is substantiated by work plan construction funding that has been allocated to each of these authorized projects over the years. It is highly unlikely that projects with a history of work plan construction funding would not be completed and maintained as authorized.

Assumption 3 is substantiated by historical trends in the size of vessels transiting the Panama Canal (Section 2.28.2 Existing Containership Fleet and Tables 2-38 through 2-40) which indicates that prior to the expansion of the Panama Canal, 99% of containerships on the major Asia-USEC routes were Panamax vessels and after the expansion in 2015, vessels on these services are trending towards the neo-Panamax vessels (PPX3Max).

The shift towards PPX3 Max vessels on the two Asia services in question is also supported by the historical trend in carriers reducing the transportation cost per TEU by shifting to larger more efficient vessels. Tables 2-35 and 2-36 show the decrease in transportation cost per TEU and show how the fleet is adding predominantly larger and more efficient vessels.

The shift to PPX3Max vessels on the two services is further substantiated by statements by the carriers indicating that economic forces are driving them to use PPX3Max vessels on these two services when the USEC ports are able to handle them in an efficient manner and on a regular schedule (See Attachment X to the Economics Appendix).

The risk and uncertainty associated with Assumption 3 is addressed in a sensitivity analysis in which, one of the services remains a PPX3 vessel and the second service shifts to the PPX3Max vessel.

Assumption 4 is substantiated by the enormity of the inefficiency of having vessels light-loaded on 82% of calls and light-loaded by as much as seven feet. The vessel loading cumulative distribution functions developed for the design vessel used in the Charleston Post-45 Study, which is the same design vessel used for this study, were used to compare weighted average waterborne transportation cost per TEU per 1,000 nautical miles and also to compare the weighted average number of TEUs on board per vessel call. The draft restrictions imposed by the without-project condition channel depth at Wilmington increases the waterborne cost by 40% per TEU per 1,000 miles. The weighted average number of TEUs on board at Wilmington under without-project conditions is 2,605 TEUs fewer than the weighted average number of TEUs for the same vessel at Charleston or Savannah. Over the course of a single year, the two services would leave a combined 271,000 TEUs at the docks due to draft restrictions at Wilmington, which also affects the departure draft at the prior port and the arrival draft at the next port. It would take an additional 38 trips per year (under without-project draft

restrictions), just to get this cargo to its destinations. It is economically infeasible for the design vessel to regularly call at Wilmington under without-project conditions.

The Economics Appendix Section XX displays the calculations used to support Assumption 4. The risk and uncertainty associated with this assumption is addressed in a sensitivity analysis in which the design vessel calls at Wilmington in the without-project condition.

Assumption 5, PPX3Max vessels on the two services in question will call at Wilmington under with-project conditions, is substantiated by historical precedent and economic rationality. Under existing conditions, channel depths at other USEC ports are very similar to Wilmington's depth (Table 3-1 Existing and Future USEC Port Depths) and vessel draft restrictions at these same ports are very similar to draft restrictions at Wilmington. Under existing conditions, the USEC ports-of-call for the two services in question can service the existing fleet with similar vessel loads and operating costs per TEU (Table 3-2 Waterborne Transportation Costs for Selected Vessel Drafts). Over many years under these historical conditions, Wilmington has developed a longstanding relationship with the carriers on these two services and managed to substantially increase the amount of cargo handled for these two services (New Table: Asia services TEUs over time). Under with-project conditions, channel depth and draft restrictions at the other USEC ports would again be similar to those at Wilmington (Table 3-2 Again with load per foot). Vessel loading and operating costs per TEU at the other USEC ports would also be similar to those at Wilmington (Revised Table 5-5). If future with-project operating and economic conditions are comparable to existing operating and economic conditions, then it is reasonable to assume that the two services would continue to call at Wilmington. The carriers have indicated that they would stay in Wilmington if the channel were deeper or return to Wilmington if the channel were deepened in the future.

Review Assessment: Without the context of a revised draft report and given the risk and uncertainty associated with the assumptions, it is recommended that additional effort be placed on improving the documentation of all study assumptions with supporting analysis.

Action Taken: Revised study assumptions may be found in section 5.5 Study Assumptions of the Main Report and copied below. In addition, the reviewer is directed to Attachment II of the Economics Appendix, which contains letters from six carriers on the two services in question supporting the basic without-project condition assumption that their vessels will not regularly call at the Port of Wilmington without-channel improvements.

There are five assumptions that are integral to the problems and opportunities identified in this study:

1. Container terminal improvements currently under construction or in the design phase, including the turning basin expansion, will be completed to allow the design vessel and future cargo to use the terminal;

2. Federal channel deepening projects currently under construction at Savannah, Charleston, Boston, and Jacksonville will be completed and maintained to project depth, which will allow vessels to operate at the drafts required to realize the transportation cost savings calculated for those projects;
3. The future fleet for the two Asia services currently calling at the Port of Wilmington is represented by the design vessel;
4. Under without-project conditions, channel depth constraints, draft restrictions, and the resulting light loading of the design vessel for the two Asia services will cause the two Asia services to drop Wilmington as a port-of-call prior to the base-year of the project (2027); and
5. Under with-project conditions, deeper channel depths at Wilmington will increase vessel operating drafts, reduce light loading, and increase vessel operating efficiency inducing the two Asia services to include Wilmington as a port-of-call.

Assumption 1 is substantiated by the ongoing construction and continuous funding for the terminal improvements as described in Section 2.26.1 Existing Conditions: Container Terminal and section 3.2.1 Future Without-project Conditions: Container Terminal. These without-project condition terminal improvements enhance terminal operations and efficiency regardless of improvements to the federal channel. The NCSPA is currently realizing benefits of larger and faster cranes, improved mooring facilities, and yard configuration. Planned future improvements will further increase the efficiency of cargo flow at the terminal.

Assumption 2 is substantiated by work plan construction funding that has been allocated to each of these authorized projects over the years. It is highly unlikely that projects with a history of work plan construction funding would not be completed and maintained as authorized.

Assumption 3 is substantiated by historical trends in the size of vessels transiting the Panama Canal (Section 2.5.2 Existing Containership Fleet and Tables 2-15 through 2-18) which indicates that prior to the expansion of the Panama Canal, 99% of containerships on the major Asia-USEC routes were Panamax vessels and after the expansion in 2015, vessels on these services are trending towards the neo-Panamax vessels (PPX3Max). This assumption is further substantiated by the 01Jan20 announcement by the THE Alliance that the vessels on the EC2 service will begin transitioning to 13,100 TEU vessels, which are equivalent in size to the design vessel, commencing in April 2020.

The shift towards PPX3 Max vessels on the two Asia services in question is also supported by the historical trend in carriers reducing the transportation cost per TEU by shifting to larger more efficient vessels. The Economics Appendix Section 2.5 Without-project Condition Status of Wilmington as a Port of Call on the EC2 and ZCP Services provides a detailed discussion of the relative efficiency of PPX3 Max vessels. Note that THE Alliance has announced the transition to 13,000 TEU vessels on the EC2 service, beginning in April 2020.

Assumption 4 is substantiated by the enormity of the inefficiency of having vessels light-loaded on 82% of calls and light-loaded by as much as seven feet. Sections 2.3 and 2.5 of the Economics Appendix provides the calculations displaying the relative inefficiency of calling at Wilmington under without-project conditions. The draft restrictions imposed by the without-project condition channel depth at Wilmington increases the waterborne cost by 40% per TEU per 1,000 miles. The weighted average number of TEUs on board at Wilmington under without-project conditions is 2,605 TEUs fewer than the weighted average number of TEUs for the same vessel at Charleston or Savannah. Over the course of a single year, the two services would leave at combined 271,000 TEUs at the docks due to draft restrictions at Wilmington, which also affects the departure draft at the prior port and the arrival draft at the next port. It would take an additional 38 trips per year (under without-project draft restrictions), just to get this cargo to its destinations. It is economically infeasible for the design vessel to regularly call at Wilmington under without-project conditions. Six carriers on the EC2 and ZCP services have provided letters supporting this assumption (see Economics Appendix: Letters of Support).

The future without-project assumption that the EC2 and the ZCP services will transition to the design vessel by the project base year of 2027 is developed in Economics Appendix Section 1.8.2 Existing Containership Fleet and Economics Appendix Sections 2.3 through 2.4:

- Section 1.8.2 Existing Containership Fleet
- Section 2.3 Without-project Conditions at other USEC Federal Navigation Projects
- Section 2.4 Without-project Condition Containership Fleet for the EC2 and ZCP Services

Assumption 5, PPX3Max vessels on the two services in question will call at Wilmington under with-project conditions, is substantiated by historical precedent and economic rationality. Under existing conditions, channel depths at other USEC ports are very similar to Wilmington's depth (Table 4-1 Existing and Future USEC Port Depths) and vessel draft restrictions at these same ports are very similar to draft restrictions at Wilmington. Under existing conditions, the USEC ports-of-call for the two services in question can service the existing fleet with similar vessel loads and operating costs per TEU (Economics Appendix Table 2-4 Operating Costs for Selected Vessel Drafts). Over many years under these historical conditions, Wilmington has developed a longstanding relationship with the carriers on these two services and managed to substantially increase the amount of cargo handled for these two services. Under with-project conditions, channel depth and draft restrictions at the other USEC ports would again be similar to those at Wilmington. Vessel loading and operating costs per TEU at the other USEC ports would also be similar to those at Wilmington (Table 4-1 of the Economics Appendix). If future with-project operating and economic conditions are comparable to existing operating and economic conditions, then it is reasonable to assume that the two services would continue to call at Wilmington.

OASACW/HQUSACE Final Assessment: Comment is **resolved**. The analysis is based on the assumption that Wilmington will be removed from the service if not deepened.

However, there is no discussion if Wilmington could be added to another service or if it would just see reduced traffic. While Section 203 does not require using Corps driven analyses, this assumption would need to be supported with data that this would not occur.

B. Environmental

1. Number of Alternatives

Concern: The document only includes one implementation alternative. Normally, navigation improvement projects include increments of dredging depth in the detailed environmental analysis. According to the Principles and Guidelines, the recommended plan will contribute to national economic development consistent with protecting the Nation's environment. Environmental effects of the alternative plans must be considered and can drive the selection of the recommended plan; that's not possible if only one plan is considered. Reasonable alternatives other than channel depth increments with less significant environmental effects, such as relocating facilities should be considered in the report in greater detail to compare the economic and environmental advantages and disadvantages. Decision makers need sufficient information to identify the recommended plan.

Basis of Concern: Principles and Guidelines; NEPA requires agencies to consider reasonable alternatives and the guidance for Studies of Water Resources Development Projects by Non-Federal Interests (ER 1165-2-209) requires Non-Federal Interests to evaluate reasonable alternatives.

Significance of Concern: *High.*

Action Needed to Resolve the Concern: Include additional alternatives in the detailed evaluation.

Sponsor Response:

Path to resolution: Need to get clarification on which alternative is reasonable when no other alternative passed the preliminary screening. Single alternatives are used in navigation EA's and for flood control projects. Also need to explain the extent of the environmental analysis, which focused on the proposed action. LPP (-48 feet) was not selected to avoid additional environmental effects.

More detail on Southport especially environmental is needed. Need to add more enviro to prelim screening. Make sure to address all reasonable alternatives. Need to give environmental the opportunity to influence plan selection.

Response: An Environmental Quality table that compares the impacts of incremental depth alternatives is under development and will be included in the preliminary

alternatives analysis section of the revised Feasibility Study/Environmental Report back-check submittal document. An example from the preliminary draft Environmental Quality table is provided below. Note that that the table as presented is not complete, additional resources are being included, and "TBD" values are currently being assessed.

Resource	Alternatives					
	No Action	**-44 ft**	**-45 ft**	**-46 ft**	**-47 ft**	**-48 ft**
Groundwater	Modeling results indicate negligible RSLR effects on groundwater flow and discharge patterns, and no increase in potential for salinity intrusion via downward surface water migration.	Interpolated modeling results indicate no measurable effects on groundwater flow and discharge patterns, and no increase in potential for salinity intrusion via downward surface water migration.	Interpolated modeling results indicate no measurable effects on groundwater flow and discharge patterns, and no increase in potential for salinity intrusion via downward surface water migration.	Interpolated modeling results indicate no measurable effects on groundwater flow and discharge patterns, and no increase in potential for salinity intrusion via downward surface water migration.	Modeling results indicate no measurable effects on groundwater flow and discharge patterns, and no increase in potential for salinity intrusion via downward surface water migration.	Interpolated modeling results indicate no measurable effects on groundwater flow and discharge patterns, and no increase in potential for salinity intrusion via downward surface water migration.
Water Levels and Tides	Modeling results indicate a maximum MHW increase of 4.1 inches in the lower estuary at Battery Island due to RSLR. Projected increases are progressively smaller through the estuary above.	Interpolated modeling results indicate a maximum relative MHW increase of 0.3 inch in the Anchorage Basin. Projected increases are progressively smaller through the up-estuary and down-estuary reaches above and below.	Interpolated modeling results indicate a maximum relative MHW increase of 0.7 inch in the Anchorage Basin. Projected increases are progressively smaller through the up-estuary and down-estuary reaches above and below.	Interpolated modeling results indicate a maximum relative MHW increase of 1.0 inch in the Anchorage Basin. Projected increases are progressively smaller through the up-estuary and down-estuary reaches above and below.	Modeling results indicate a maximum relative MHW increase of 1.3 inches in the Anchorage Basin. Projected increases are progressively smaller through the up-estuary and down-estuary reaches above and below.	Interpolated modeling results indicate a maximum relative MHW increase of 1.6 inches in the Anchorage Basin. Projected increases are progressively smaller through the up-estuary and down-estuary reaches above and below.
Currents	Modeling results indicate negligible RSLR effects on current speeds. Maximum projected changes are +/- 0.2 ft/s.	Interpolated modeling results indicate that channel deepening would have minor relative effects on current speeds. Projected maximum relative increases and decreases are +0.2 ft/s and -0.1 ft/s.	Interpolated modeling results indicate that channel deepening would have minor relative effects on current speeds. Projected maximum relative increases and decreases are +0.3 ft/s and -0.2 ft/s.	Interpolated modeling results indicate that channel deepening would have minor relative effects on current speeds. Projected maximum relative increases and decreases are +0.5 ft/s and -0.3 ft/s.	Modeling results indicate that channel deepening would have minor relative effects on current speeds. Projected maximum relative increases and decreases are +0.6 ft/s and -0.4 ft/s.	Interpolated modeling results indicate that channel deepening would have minor relative effects on current speeds. Projected maximum relative increases and decreases are +0.8 ft/s and -0.5 ft/s.
Salinity	Modeling results indicate that RSLR will cause maximum bottom and surface layer salinity increases of 0.7 and 0.5 ppt, respectively.	Interpolated modeling results indicate maximum bottom and surface layer relative salinity increases of 1.0 and 0.3 ppt, respectively.	Interpolated modeling results indicate maximum bottom and surface layer relative salinity increases of 2.1 and 0.6 ppt, respectively.	Interpolated modeling results indicate maximum bottom and surface layer relative salinity increases of 3.1 and 0.9 ppt, respectively.	Modeling results indicate that channel deepening would cause maximum bottom and surface layer salinity increases of 4.1 and 1.2 ppt, respectively.	Interpolated modeling results indicate maximum bottom and surface layer relative salinity increases of 5.1 and 1.5 ppt, respectively.

Wetlands *Interpolated salinity isopleth shifts were used to delineate affected tidal floodplain wetland areas for the incremental depth alternatives. Wetland impact acreages for the -44 to -46 and -48 alternatives are being calculated via GIS and will be included in the table.*	Model-projected upstream shifts in the 0.5 ppt salinity isopleth due to RSLR would affect ~278 acres of tidal freshwater wetlands. Projected surface salinity increases of ≤0.2 ppt would have negligible to minor effects on the composition of freshwater tidal wetlands in the isopleth shift zones.	Channel construction and maintenance would not have any direct impacts on wetlands. Interpolated upstream shifts in the 0.5 ppt salinity isopleth would affect ~TBD acres of tidal freshwater wetlands. Projected surface salinity increases of ≤0.3 ppt would have negligible to minor effects on the composition of freshwater tidal wetlands in the isopleth shift zones.	Channel construction and maintenance would not have any direct impacts on wetlands. Interpolated upstream shifts in the 0.5 ppt salinity isopleth would affect ~TBD acres of tidal freshwater wetlands. Projected surface salinity increases of ≤0.3 ppt would have negligible to minor effects on the composition of freshwater tidal wetlands in the isopleth shift zones.	Channel construction and maintenance would not have any direct impacts on wetlands. Interpolated upstream shifts in the 0.5 ppt salinity isopleth would affect ~TBD acres of tidal freshwater wetlands. Projected surface salinity increases of ≤0.3 ppt would have negligible to minor effects on the composition of freshwater tidal wetlands in the isopleth shift zones.	Channel construction and maintenance would not have any direct impacts on wetlands. Model-projected upstream shifts in the 0.5 ppt salinity isopleth would affect ~340 acres of tidal freshwater wetlands. Projected surface salinity increases of ≤0.3 ppt would have negligible to minor effects on the composition of freshwater tidal wetlands in the isopleth shift zones.	Channel construction and maintenance would not have any direct impacts on wetlands. Interpolated upstream shifts in the 0.5 ppt salinity isopleth would affect ~TBD acres of tidal freshwater wetlands. Projected surface salinity increases of ≤0.3 ppt would have negligible to minor effects on the composition of freshwater tidal wetlands in the isopleth shift zones.
Hardbottom	Continuing maintenance of the currently authorized channel would not affect hardbottom communities.	Widening of the Baldhead Shoal entrance channel would have minor direct impacts on naturalized hardbottom rubble mounds in the old ODMDS.	Widening of the Baldhead Shoal entrance channel would have minor direct impacts on naturalized hardbottom rubble mounds in the old ODMDS.	Widening of the Baldhead Shoal entrance channel would have minor direct impacts on naturalized hardbottom rubble mounds in the old ODMDS.	Widening of the Baldhead Shoal entrance channel would have minor direct impacts on naturalized hardbottom rubble mounds in the old ODMDS.	Widening of the Baldhead Shoal entrance channel would have minor direct impacts on naturalized hardbottom rubble mounds in the old ODMDS.
SAV	Continuing maintenance of the currently authorized channel would not affect SAV.	The -44 ft alternative would not affect SAV.	The -45 ft alternative would not affect SAV.	The -46 ft alternative would not affect SAV.	The -47 ft alternative would not affect SAV.	The -48 ft alternative would not affect SAV.
Shell Bottom	Continuing maintenance of the currently authorized channel would not have any direct mechanical impacts on shell bottom. Sediment resuspension and redeposition during maintenance dredging would have short-term, localized effects on shell bottom communities.	No direct mechanical impacts on shell bottom. Short-term and localized sediment resuspension and redeposition effects during construction and maintenance dredging. Relative increase in dredging intensity and magnitude of resuspension effects during construction.	No direct mechanical impacts on shell bottom. Sediment resuspension and redeposition during construction and maintenance dredging would have short-term, localized effects on shell bottom communities. The relative increase in resuspension effects during construction would be slightly greater than the -44 ft alternative.	No direct mechanical impacts on shell bottom. Sediment resuspension and redeposition during construction and maintenance dredging would have short-term, localized effects on shell bottom communities. The relative increase in resuspension effects during construction would be slightly greater than the -45 ft alternative.	No direct mechanical impacts on shell bottom. Sediment resuspension and redeposition during construction and maintenance dredging would have short-term, localized effects on shell bottom communities. The relative increase in resuspension effects during construction would be slightly greater than the -46 ft alternative.	No direct mechanical impacts on shell bottom. Sediment resuspension and redeposition during construction and maintenance dredging would have short-term, localized effects on shell bottom communities. The relative increase in resuspension effects during construction would be slightly greater than the -47 ft alternative.

Review Assessment: To be determined once a revised draft report is submitted with more than one alternative being analyzed.

Action Taken: Revisions have been made throughout the Report to display the evaluation of all alternative plans. Section 6.5 Comparison of Final Array of Alternatives of the Main Report presents detailed comparisons across the final array of alternatives (six alternatives) for NED (section 6.5.2), RED (section 6.5.3), and environmental quality

(section 6.5.4). The environmental quality assessment is presented in detail in Table 6-21 Environmental Quality – Direct and Indirect Effects of the Alternative Plans, which assesses effects to 34 categories of resources. Additional evaluation of effects to greenhouse gas emissions are presented in tables 6-22 through 6-24 of the Main Report.

OASACW/HQUSACE Final Assessment: The revised report **resolves** the concern. Multiple deepening alternatives were presented in the revised report.

2. Accuracy Effects Determinations

Concern: The report provides very good information to form the basis of effects determinations, but in many cases, it understates environmental effects in summary statements without fully and objectively relating impacts to the resource characterizations and analysis that preceded it. An example is the treatment of project effects on benthic habitats - which affects the impact analysis for many other resources, e.g. fisheries, threatened and endangered species. The project will change a substantial area of shallow subtidal habitat to deep subtidal habitat. The benthic community in those areas will change because of the physical and chemical changes to the habitat that result. Therefore, a conclusion such as the following for Atlantic sturgeon critical habitat understates the effects, "Based on existing conditions within the new dredging areas, it is anticipated that the recovering benthic communities would provide prey resources similar to those of the existing communities. Therefore, it is expected that effects on foraging habitat PBFs would be short-term." By increasing the depth of shallow areas, the channel deepening and widening will produce a benthic community more similar to that of the existing deep channel bottom, which could be described and quantified by sampling and comparing both areas. This is a long term effect; overall, there will be less shallow subtidal habitat in the estuary and the benthic species composition of those areas will be affected over the long term because of the change in depth and frequency of disturbance.

Basis of Concern: NEPA regulations, Clean Water Act, Section 404(b)(1) Guidelines, Marine Protection, Research and Sanctuaries Act regulations

Significance of Concern: Medium

Action Needed to Resolve the Concern: Review the report and ensure that summary statements accurately reflect the magnitude of effects described in the preceding text, particularly, accurately describing long term or permanent effects vs. short term effects. Clearly distinguish the difference in effects between the new areas affected by improvement dredging and those that are regularly exposed to maintenance dredging.

Sponsor Response: The soft bottom impact analysis sections (8.10.1 and 8.10.2) have been thoroughly revised to provide clarification of new vs existing channel dredging impacts and additional analysis of long-term effects based on a Wilmington Harbor benthic characterization and recovery study that was conducted for the 96 Harbor Act

Project (Ray 1997). Changes to the soft bottom impact analyses in Sections 8.10.1 and 8.10.2 have been incorporated into follow-on fisheries, EFH, and protected species impact sections, as applicable. A portion of the revised soft bottom impact section is provided below.

8.10 Soft Bottom

Section 8.10.2 Effects of the TSP

Construction of the proposed Wilmington Harbor navigation channel improvements, inclusive of the channel slopes, would directly impact ~3,151 acres of soft bottom habitat over a three-year period; including ~2,226 acres of disturbed (periodically dredged) habitat within the existing channel and ~925 acres of relatively undisturbed (new dredging) habitat in the proposed channel widening and extension areas (Table 8-9). The new dredging acreages in Table 8-9 include areas between the existing channel top-of-slope and proposed channel top-of-slope, along with the channel bottom and side slopes of the offshore entrance channel extension reach. Based on projected post-construction maintenance intervals, soft bottom communities in both the existing channel and new dredging areas would experience periodic maintenance dredging disturbance every one to four years for the duration of the 50-year project. In relation to the No Action alternative, long-term maintenance of the new dredging areas under the TSP would increase the area of recurring soft bottom disturbance by ~925 acres; including 567 acres of estuarine soft bottom and 368 acres of marine softbottom.

Channel construction and subsequent maintenance events would remove benthic infaunal invertebrate communities along with the extracted sediments. The reestablishment of relatively stable benthic invertebrate communities would occur at rates similar to those described for maintenance dredging under the No Action alternative. However, the extent to which the recovered communities resemble those of pre-construction conditions in terms of taxa richness, abundance, biomass, and community structure would vary according to the extent of long-term habitat modification. Channel deepening would permanently alter the physical soft bottom environment through the conversion of relatively shallow bottom to deep bottom. At greater depths, decreased sunlight penetration and DO concentrations would be expected to have negative effects on benthic microalgal primary productivity and secondary benthic invertebrate productivity. Additionally, soft bottom habitats in the new dredging areas would be exposed to new or intensified periodic disturbances from maintenance dredging and ship prop wash.

The long-term effects of channel deepening and maintenance dredging on benthic communities in the CFR were previously investigated through a benthic characterization and recovery study that was undertaken by the USACE Waterways Experiment Station (WES) for the 96 Harbor Act Project (Ray 1997). The channel bottom, side slopes, and adjacent undisturbed flats were sampled along 14 transects, which were distributed throughout the inner and outer harbor in reaches representing 1, 2, and 3-year post-dredging conditions.

Similarly, the conclusions do not flow from the information that precedes the following case related to effects on sea turtle habitat and is repeated in many locations within the report, "Operations under the TSP would not be expected to increase the frequency of beach disposal events, as excavation to construct the channel reaches would effectively eliminate the need for a scheduled maintenance dredging event. Based on the proposed conservation measures, it is expected that any adverse indirect effects on sea turtle nesting habitat would be minor and short term." Increasing the depth and width of the project would increase the volume of sediment removed and the area affected by its disposal, including during future maintenance dredging. That is a long term effect.

Response: The sea turtle impact analysis section has been revised to clarify the short-term effects of construction-related increases in beach placement and the long-term effects of maintenance-related increases over the 50-year project life. In conducting federal Section 7 consultations for beach placement projects, the USFWS Raleigh Field Office quantifies direct impacts on sea turtle nesting habitat in terms of linear miles of beach placement. Although it is assumed that linear miles of beach placement would substantially increase during channel construction, a substantial portion of the additional material would almost certainly be used to construct a wider and higher berm with a longer project life, which would not increase nesting habitat impacts. The specific construction-related increase in beach placement miles will not be known until the beach project reaches design phase. In the case of post-construction maintenance dredging events, the projected increase in compatible material that would be available for beach placement is ~57,000 cy/yr. Thus, long-term maintenance-related increases in beach placement would be minimal.

Applicable revised text from the sea turtle impact analysis section is provided below.

8.14.5.2 Effects of the TSP
Beach Placement
During channel construction, the availability of compatible dredged material for beach placement would increase substantially in relation to the No Action alternative. Due to expanded beach placement, sea turtle nesting habitat impacts would increase substantially during channel construction. In the case of post-construction maintenance dredging events, the projected increase in beach compatible dredged material is ~57,000 cy/yr, thus indicating that long-term maintenance-related increases in beach placement would be relatively small.

Section 8.24.3.3 Benthic Communities seems to be describing the effects of maintenance dredging for improvement dredging: “New dredging in the channel expansion areas would remove the majority of the associated soft bottom benthic invertebrate infauna and epifauna, resulting in an initial sharp reduction in community levels of abundance, diversity, biomass, and availability of prey for predatory demersal fishes within the dredged areas. Dredging involves direct, short term impacts to softbottom communities in the dredge footprint during construction; however the communities are not expected to be negatively affected over the long term.”

Sponsor Response: The above described revisions to the soft bottom impact analyses in section 8.10 have been applied to the cumulative effects analysis in Section 8.24.3.3. Additional analysis of cumulative effects on soft bottom communities has been included based on the above described Wilmington Harbor benthic characterization and recovery study.

In addition to the above described revisions, information describing the timing, duration, and frequency of construction and maintenance activities has been added at the beginning of Section 8. Where applicable, the follow-on impact analysis sections have also been revised to clarify the timing, duration, and frequency of projected impacts. Applicable revised text from Section 8 is provided below.

8.0 Environmental Consequences

The timeframe of the effects analysis encompasses the projected three-year project construction period and the subsequent 50-year project life through 2077. The timing, location, and duration of various construction activities over the course of the three-year construction period would vary according to the construction sequence and annual environmental work windows that were previously described in Section 6.7. Post-construction maintenance of the federal navigation channel for the duration of the 50-year project would involve the continuation of current dredging and disposal practices and maintenance intervals for the existing channel reaches, with the addition of periodic maintenance dredging of the nine-mile offshore entrance channel extension reach.

Example of impact analysis revision from follow-on soft bottom impact section (8.10.1.2):

Construction of the proposed Wilmington Harbor navigation channel improvements, inclusive of the channel slopes, would directly impact ~3,151 acres of soft bottom habitat over a three-year period; including ~2,226 acres of disturbed (periodically dredged) habitat within the existing channel and ~925 acres of relatively undisturbed (new dredging) habitat in the proposed channel widening and extension areas (Table 8-9).

Based on projected post-construction maintenance intervals, soft bottom communities in both the existing channel and new dredging areas would experience periodic maintenance dredging disturbance every one to four years for the duration of the 50-year project. In relation to the No Action alternative, long-term maintenance of the new dredging areas under the TSP would increase the area of recurring soft bottom disturbance by ~925 acres; including 567 acres of estuarine soft bottom and 368 acres of marine softbottom.

Channel deepening would permanently alter the physical soft bottom environment through the conversion of relatively shallow bottom to deep bottom. At greater depths, decreased sunlight penetration and DO

concentrations would be expected to have negative effects on benthic microalgal primary productivity and secondary benthic invertebrate productivity. Additionally, soft bottom habitats in the new dredging areas would be exposed to new or intensified periodic disturbances from maintenance dredging and ship prop wash.

Review Assessment: Potentially resolved pending re-evaluation of a revised draft report.

Action Taken: The requested revisions have been made throughout the report. The environmental effects of the No Action alternative are presented in sections 4.7 through 4.21 of the Main Report. The environmental effects of the six alternative plans are presented in section 6.5 Comparison of Final Array of Alternatives of the Main Report. The detailed presentation of the environmental effects of the tentatively selected plan are presented in section 8: Environmental Consequences of the Main Report.

OASACW/HQUSACE Final Assessment: This concern is **resolved** by the revised report.

3. Presentation of Effects Determinations

Concern: In many cases, the report uses qualifying words, such as may, potentially, and just, to lessen the description of project impacts. For instance, Section 8.11.2.1 provides several examples highlighted in italics in the following paragraph:

"Temporary losses of benthic invertebrates in the new dredging areas may negatively affect the foraging activities of predatory demersal fishes (e.g., flounders, rays, spots, and croakers), *potentially* inducing fishes to seek out alternative soft bottom foraging habitats (Byrnes et al. 2003). It is expected that rapid recolonization of disturbed soft bottom habitats in the new dredging areas would provide substantial prey resources within a relatively short period of time. However, increases in depth and subsequent periodic disturbance from maintenance dredging *may* permanently shift community composition towards a more early successional benthic assemblage. At greater depths, lower DO concentrations and reduced sunlight penetration *may* limit the productivity of benthic communities as a prey resource for demersal fishes. However, the vast majority of the ~547 acres of estuarine softbottom habitat that would be affected by new dredging are located in relatively deep waters (97% >12ft and 99% >6ft) along the margins of the existing navigation channel, and thus are presently subject to frequent disturbance from strong tidal currents, ship prop wash, and maintenance dredging; as well as depth limitations on productivity. Therefore, the recovering communities would generally be expected to provide benthic prey resources that are similar to those of the existing communities. The proposed new dredging areas encompass *just* 5.9 acres of shallow (<6 ft) soft bottom habitat. In contrast, the Cape Fear River estuary contains an estimated 37,800 acres of shallow softbottom habitat in waters <6 ft and an estimated 188,549 acres of softbottom habitat in waters >6 ft (NCDEQ 2016). However, it is anticipated that the effects of prey loss on demersal fishes would be localized and short-term based on the following considerations: 1) early recruitment of opportunistic benthic taxa to the disturbed areas would provide substantial prey resources within a

relatively short period of time, 2) demersal fishes are highly mobile and capable of seeking out alternative habitats, and 3) the distribution of alternative shallow soft bottom habitats within the overall project area is expansive."

Basis of Concern: NEPA – Planning Guidance Notebook. The NEPA requires that decision making should proceed with full awareness of the environmental consequences that follow from a major federal action that significantly affects the environment.

Significance of Concern: Low.

Action Needed to Resolve the Concern: Remove qualifiers to provide more objective predictions of effects.

Sponsor Response:

Path to resolution: Will remove qualifiers and revise text accordingly.

Response: The qualifiers have been removed from the impact analysis sections. Revised Section 8.10.2.1 is provided below as an example of the changes that that have been applied throughout Section 8.

8.10 Soft Bottom
Section 8.10.2 Effects of the TSP

Construction of the proposed Wilmington Harbor navigation channel improvements, inclusive of the channel slopes, would directly impact ~3,151 acres of soft bottom habitat over a three-year period; including ~2,226 acres of disturbed (periodically dredged) habitat within the existing channel and ~925 acres of relatively undisturbed (new dredging) habitat in the proposed channel widening and extension areas (Table 8-9). The new dredging acreages in Table 8-9 include areas between the existing channel top-of-slope and proposed channel top-of-slope, along with the channel bottom and side slopes of the offshore entrance channel extension reach. Based on projected post-construction maintenance intervals, soft bottom communities in both the existing channel and new dredging areas would experience periodic maintenance dredging disturbance every one to four years for the duration of the 50-year project. In relation to the No Action alternative, long-term maintenance of the new dredging areas under the TSP would increase the area of recurring soft bottom disturbance by ~925 acres; including 567 acres of estuarine soft bottom and 368 acres of marine softbottom.

Channel construction and subsequent maintenance events would remove benthic infaunal invertebrate communities along with the extracted sediments. The reestablishment of relatively stable benthic invertebrate communities would occur at rates similar to those described for maintenance dredging under the No Action alternative. However, the extent to which the recovered communities resemble those of pre-construction conditions in terms of taxa richness, abundance, biomass, and community structure would vary according to the extent of long-term habitat

modification. Channel deepening would permanently alter the physical soft bottom environment through the conversion of relatively shallow bottom to deep bottom. At greater depths, decreased sunlight penetration and DO concentrations would be expected to have negative effects on benthic microalgal primary productivity and secondary benthic invertebrate productivity. Additionally, soft bottom habitats in the new dredging areas would be exposed to new or intensified periodic disturbances from maintenance dredging and ship prop wash.

Review Assessment: Potentially resolved pending resubmittal.

Action Taken: Similar to above comment #3. The requested revisions have been made throughout the report. The environmental effects of the No Action alternative are presented in sections 4.7 through 4.21 of the Main Report. The environmental effects of the six alternative plans are presented in section 6.5 Comparison of Final Array of Alternatives of the Main Report. The detailed presentation of the environmental effects of the tentatively selected plan are presented in section 8: Environmental Consequences of the Main Report.

OASACW/HQUSACE Final Assessment: The revised report **resolves** this concern.

4. Mitigation Plan

Concern: The mitigation recommendations are not linked to an explicit consideration of the level of significance of the resources and impacts and may imply a greater commitment to mitigation than is justified.

Basis of Concern: Planning Guidance Notebook - Justification of mitigation features recommended for inclusion in projects shall be based upon analyses that demonstrate the combined monetary and non-monetary values of the last increment of losses prevented, reduced, or replaced is at least equal to the combined monetary and non-monetary costs of the last added increment so as to reasonably maximize overall project benefits. In addition, an incremental cost analysis, to the level of detail appropriate, will be used to demonstrate that the most cost effective mitigation measure(s) has been selected. And, Non-monetary value shall be based upon technical, institutional, and public recognition of the ecological, cultural and aesthetic attributes of resources within the study area. Criteria for determining significance shall include, but not be limited to, the scarcity or uniqueness of the resource from a national, regional, state, and local perspective.

Significance of Concern: Medium.

Action Needed to Resolve the Concern: Recognizing that the cost effectiveness/incremental cost analysis would be premature at this stage, revise the mitigation plan section to clearly establish the significance of the resources and impacts following the procedures in ER 1105-2-100, then provide only those mitigation options (without commitments) that would be required to ensure that the recommended plan

would not have more than negligible adverse impacts on ecological resources and may fully justified.

Sponsor Response:
Path to resolution: An evaluation of mitigation measures is currently being performed with SAW and agencies.

Response: The mitigation plan, which is currently being revised and further developed, will incorporate the requested changes. The revised mitigation plan will be included in the revised Feasibility Study/Environmental Report back-check submittal document.

Review Assessment: Awaiting next submittal.

Action Taken: A preliminary Mitigation, Monitoring, and Adaptive Management Plan has been developed to ensure that the environmental consequences of the project can be appropriately mitigated. The preliminary plan is presented in section 8.25 Mitigation, Monitoring, and Adaptive Management Plan of the Main Report and is developed in more detail in Appendix N: Mitigation and Monitoring Plan. Mitigation, mitigation-related real estate acquisition costs, and monitoring costs are developed in the Cost Appendix (Appendix D) and included in total project costs (Table 6-10 in the Main Report). The Mitigation, Monitoring, and Adaptive Management Plan costs are sufficient to ensure that revisions to the plan during development of the DEIS will not have a substantive impact on the project's economic justification or congressionally authorized cost limits. The final Mitigation, Monitoring, and Adaptive Management Plan will be developed by USACE with support by the NCSPA during development of the DEIS.

OASACW/HQUSACE Final Assessment: Unresolved. As long as the mitigation plan is formulated and justified in accordance with current policy requirements, this revised report addresses the policy concern. A word of caution to not over plan the mitigation or include too much habitat mitigation. The use of acceptable habitat models or other means of measuring impacts and formulating a plan is required.

5. Environmental Commitments

Concern: The report indicates that "The USACE commits to completing or implementing the following analyses and measures."

Basis for Concern: Studies of Water Resources Development Projects by Non-Federal Interests (ER 1165-2-209)

Significance of Concern: High.

Action Needed to Resolve the Concern: Revise the text to say, “8.25.6 Future Environmental Considerations – The following actions will be considered during the preparation of a NEPA document.”

Sponsor Response:

Path to resolution: Revise text as requested.

Response: The requested revision to Section 8.25.6 has been made.

Review Assessment: Potentially resolved pending submission of a revised draft report.

Action Taken: The revised text may be found in section 8.25.8 Future Environmental Considerations of the Main Report and is copied below:
“The following actions will be considered during the preparation of a NEPA document.”

OASACW/HQUSACE Final Assessment: The revised report **resolves** the concern. Future NEPA and associated environmental analyses will be needed.

6. Technical Analysis for FWOP and Environmental Setting

Concern: The report seems to conduct too much technical analysis for the FWOP and ENV setting, which errs on the side of identifying too much environmental impact and consequently too much potential habitat mitigation being formulated.

Basis of Concern: ER 1105-2-100 Appendix C Mitigation Formulation.

OASACW/HQUSACE Final Assessment: Unresolved. Future NEPA and environmental compliance efforts should take care to ensure that the impact analyses and project mitigation is formulated and scaled to address impacts attributable to the project. Acceptable habitat models and other decision making tools should be used.

C. Economics

1. Price Levels

Concern: The report correctly uses the FY 19 price level and discount rate. However, if future versions of the report cross into FY 20 then it will be necessary to update the recommended plan at that time.

Basis of Concern: Reference ER 1105-2-100 Appendix D-3.d.(2).

Significance of Concern: Low. Reporting requirement not likely to impact plan selection.

Action needed to resolve the concern: This is a proactive comment for awareness and requires no action at this time. Appropriate updates should be made prior to the final report to ASA(CW).

Sponsor Response:

Path to resolution: update to 2020 price level & discount rate prior to public release of FS/DEIS.

Response: Concur. The economic analysis has been revised to include FY20 price levels and discount rate.

Review Assessment: Resolved pending re-evaluation.

Action Taken: FY 2020 price levels and federal discount rate have been used throughout the analysis. For example, the following statement has been taken from section 6.5.1 Alternative Plan Costs in the Main Report: “Alternative plan costs are developed using FY 2020 price levels. Average annual equivalent costs and interest during construction are calculated using the FY 2020 discount rate of 2.75%.”

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

2. Interest during Construction (IDC)

Concern: It is unclear from the economic analysis if IDC was calculated correctly.

Basis of Concern: IDC is an important economic cost that must be accounted for in plan selection and justification; ER 1105-2-100 Appendix D Para D-3.e. (11).

Significance of Concern: Low to Medium. Not likely to impact plan selection or justification if it was calculated, but full extent of an incorrect calculation cannot be determined without additional information.

Action needed to resolve the concern: Update the economic analysis to demonstrate that IDC was calculated correctly.

Sponsor Response:

Path to resolution: Provide IDC calculation. Provide example to demonstrate how IDC was calculated.

Response: Interest during construction was calculated for each month for the duration of construction based on the construction implementation plan identified in the feasibility report. Interest during construction calculations used the FY20 discount rate and include

costs for PED, construction S&A, real estate acquisition, relocations, mitigation, and dredging.

Review Assessment: Resolved pending re-evaluation of revised report.

Action Taken: The following text is included in section 6.5.1 Alternative Plan Costs in the Main Report and is copied below: “Interest during construction (IDC) was calculated using the FY20 federal discount rate (2.75%). The construction schedule was used to identify a schedule of costs incurred during PED and construction. Costs were escalated by month up to the base year to calculate the investment costs of the project.” Details on IDC development are included in the Cost Appendix: Appendix D.

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

3. Commodity Forecast for TEUs

Concern: The only benefitting containerized trade in the economic analysis is the USEC-Asia route. The commodity forecast presented for that one trade route far exceeds what could be supported by empirical data from the Waterborne Commerce Statistics Center (WCSC) for all

Port of Wilmington containerized trade. For example, Table 2-4 of the economic appendix shows the economic analysis assumes 272,615 TEUs for USEC-Asia traffic for 2025 and total Port TEUs of 425,328 (179,713 + 272,615) – see image below. However, the most recent WCSC data for 2017 for total Port TEUs is only 178,865. Even accounting for growth between 2017 and 2025, the forecast assumes a 137% ((425,328 - 178,865 / 178,865) increase of TEUs, as compared to WCSC officially collected data. It appears that the commodity forecast has been significantly overestimated. Correcting that error would result in a dramatic reduction in project benefits.

Table 2-4
Port of Wilmington Containerized Cargo Forecast (TEUs)

Region	Port	2025	2030	2035	2040	2045
Non-Asia	Wilmington, NC	179,713	223,554	252,930	286,168	323,772
Asia	USEC Alternate	272,615	339,119	383,682	434,101	491,145

Basis of Concern: Validity of assumptions that form a building block of the economic analysis.

Significance of Concern: *High. Directly impacts both plan selection and justification.*

Action Needed to Resolve the Concern: Correct the economic analysis to use appropriate number of TEUs for the benefitting USEC-Asia traffic or clearly explain and defend the dramatic difference in the number of TEUs used (i.e., between the WCSC data and that used in the analysis).

Sponsor Response:

Path to resolution: Discussion concerning Economics Appendix Table 1-13. Explain impact of Hanjin, new service EC2, and Zim, and consolidation of services Zim/Maersk TP10/ZCP; Three year average as alternative (2017-2019)?

Response: The discrepancy identified by the reviewer is based on the difference in the number of loaded vs. total containers, which includes empties. The 178,865 TEUs based on WCSC data matches exactly the data provided by the port for loaded containers. Empty containers are not included in the landside transportation cost calculations. The report has been revised to identify the difference in the total number of containers moved and the total number of loaded containers. The report has also been revised to focus on the total number of loaded containers. For the two Asia services, loaded containers account for 77% of TEUs and empty containers account for 23% of TEUs.

Review Assessment: Given the enormity of the analysis that relies on this value, the comment cannot be resolved without the presentation of the analysis. Suggest further coordination in advance of a revised report submittal.

Action Taken: The commodity forecast is developed in section 2.7 Containerized Commodity Projections of the Economics Appendix. The forecast for loaded TEUs only is presented in table 2-11 and the forecast for all TEUs (loaded and empty) is presented in Table 2-12. Benefits are calculated only for loaded TEUs.

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

4. Future Without Project Assumptions – Alternative Port (1)

Concern: The economic analysis assumes that the Future Without Project (FWOP) condition of no additional depth at the Port of Wilmington would result in a transfer of all USEC-Asia TEUs to alternative Ports and that the TEUs would then be trucked to their final destinations. This appears to be a faulty assumption in that the Port of Wilmington is currently still getting TEUs on smaller vessels even though most of the alternative east coast ports are already deeper than Wilmington.

Basis of Concern: Validity of assumption.

Significance of Concern: High. This comment has direct impact on all of the economic benefits claimed.

Action Needed to Resolve the Concern: Update the economic analysis using a more reasonable and defensible assumption of the FWOP as TEUs continuing to go through the Port of Wilmington.

Sponsor Response:

Path to resolution: Discuss Economics Appendix Tables 1-19 through 1-22. Show existing schedule and discuss.

Response: Please note that the statement "Port of Wilmington is currently still getting TEUs on smaller vessels" is not fully accurate. It is correct that smaller vessels call at Wilmington, but not on the two Asia services that provide benefits in the with-project condition. These services have been upgrading their fleets to larger vessels after the Panama Canal expansion allowed them to do so. Table 2-41 shows that, prior to the Panama Canal expansion (2009 & 2013 in the table) vessel calls on the Asia services were 99% Panamax vessels, which were the largest size vessel that could be on those services at that time. After the Panama Canal expansion (2018 & 2019 in the table), there is a shift to larger vessels with 74% of the vessel calls on these services for 2019 being PPX3 vessels. Tables 2-38 through 2-40 indicate that PPX3Max vessels, which are the neo-Panamax vessels, i.e., the largest vessels that can fit through the new locks at the Panama Canal, are a substantial component of the fleet – even with the existing draft restrictions at many USEC ports. If history is any indication of the future, neo-Panamax vessels would become the predominant size vessel using the Panama Canal in the future as the fleet transitions over time, in the same way that Panamax vessel predominated Panama Canal transits in the past. Note that the benefits calculated for this project require that only the two services in question transition to PPX3Max vessels, not that all services transition to these larger vessels. Also please note that the design vessel is among the smallest of the neo-Panamax vessels and was the same design vessel used for the Charleston Post-45 Study

Please note that the statement "most of the alternative east coast ports are already deeper than Wilmington" is not fully accurate. Boston, Jacksonville, and Savannah, which are the USEC prior and next ports in the port rotations for the two services in question (Table 2-42) are all currently under construction (see the FY19 USACE Construction Work Plan). These ports are still operating at their pre-construction channel depths (Boston 40 feet, Savannah 42 feet, and Jacksonville 40 feet – see Table 3-1). Wilmington's 42-foot channel depth is comparable with the existing depths at these other ports and currently operates with draft restrictions that are very similar to these other ports. When construction is completed at these other ports their channel depths will be substantially deeper than Wilmington's 42 feet (Boston 48 feet, Savannah 47 feet, and Jacksonville 47 feet – Table 3-1), which will upset the historical and existing balance of channel depths for the USEC ports on these two services. The thrust of the economic argument is that it will be economically infeasible for these two services to continue to incur the existing draft restrictions at Wilmington and thereby **NOT** take advantage of the port-construction deeper depths at Boston, Savannah, and Jacksonville. The economic justifications for the deepening projects at Boston,

Savannah, and Charleston are based on carriers taking advantage of the deeper depths.

Review Assessment: Given the risk and uncertainty in utilizing non-trending assumptions and changing behavior in the market, suggest further coordination in advance of a revised report submittal.

Action Taken: The future without-project assumption of Wilmington's hinterland Asia cargo on the EC2 and ZCP services using Savannah as the primary alternative port is developed in Economics Appendix Section 2.3 through Section 2.5:

- Section 2.3 Without-project Conditions at other USEC Federal Navigation Projects
- Section 2.4 Without-project Condition Containership Fleet for the EC2 and ZCP Services
- Section 2.5 Without-project Condition Status of Wilmington as a Port of Call on the EC2 and ZCP Services

Additionally, letters from six carriers on the EC2 and ZCP services are included as an attachment to the Economics Appendix. These letters confirm the projection that carriers will not regularly call at Wilmington under without-project conditions.

OASACW/HQUSACE Final Assessment: The comment is **resolved**. The analysis is based on the assumption that Wilmington will be removed from the service if not deepened. However, there is no discussion if Wilmington could be added to another service or if it would just see reduced traffic. While Section 203 does not require using Corps driven analyses, this assumption would need to be supported with data that this would not occur.

5. Future Without Project Assumptions – Fleet Transition

Concern: The economic analysis assumes that the Future Without Project (FWOP) condition has a USEC-Asia transition to virtually all PPX3 and larger vessels. While it is acknowledged that the world fleet is transitioning to larger vessels with the opening of the newly expanded Panama Canal, it is not realistic to assume that 100% of the fleet for USEC-Asia will transition to the largest containership vessel classes. This is a critical assumption because if the fleet did not transition 100% as assumed and Panamax vessels remained in the fleet mix, then the assumption of FWOP TEUs leaving to alternative ports would not be valid (see comment on Future Without Project Conditions – Alternative Ports).

Basis of Concern: Validity of assumption.

Significance of Concern: High. This comment has direct impact on all of the economic benefits claimed.

Action Needed to Resolve the Concern: Update the economic analysis to document a more reasonable assumption of the FWOP as the USEC-Asia fleet having a distribution rather than an unrealistic assumption of 100% PPX3 and greater.

Sponsor Response:

Path to resolution: USEC-Asia was 100% 106-foot beam Panamax with the old locks. Add updated supporting data on vessel size – existing Wilmington Asa-USEC Fleet.

Note that not all vessels that call on Wilm are going to shift – just Asia services

Response: Please note that the realization of with-project benefits is based on the **two** USEC services currently calling at Wilmington transitioning to the design vessel, which is among the smaller of the PPX3Max vessel class (Tables 2-33 and 2-34). Project benefits do not require all vessels on Asia services to be PPX3Max vessels.

Tables 2-33 through 2-37 show that it is **not** the case that the vessels on those two services will" transition to the largest containership vessel classes" because there are 440 vessels in the world fleet as of 01Jan2019 that are larger than the design vessel (including vessels in design and under construction).

The statement that "Panamax vessels remained in the fleet mix" is not fully accurate. The fleet for the two Asia services in question **no longer includes Panamax vessels** as indicated by Table 2-41. In addition, Tables 2-38 through 2-40 indicate that Panamax vessels have been transitioned out of the Asia services fleet at other USEC ports also, not just for those services calling at Wilmington.

Overall, the without-project condition assumption that the TWO Asia services calling at Wilmington will transition to PPX3Max vessels is not unrealistic and is the most likely future condition (Please see comment A.4 concerning assumptions, which also addresses this issue.).

Review Assessment: Given the risk and uncertainty in utilizing non-trending assumptions and changing behavior in the market, suggest further coordination in advance of a revised report submittal.

Action Taken: The future without-project assumption that the EC2 and the ZCP services will transition to the design vessel by the project base year of 2027 is developed in Economics Appendix Section 1.8.2 Existing Containership Fleet and Economics Appendix Sections 2.3 through 2.4:

- Section 1.8.2 Existing Containership Fleet
- Section 2.3 Without-project Conditions at other USEC Federal Navigation Projects
- Section 2.4 Without-project Condition Containership Fleet for the EC2 and ZCP Services

In addition, please see the following 01Jan20 announcement by Hyundai Merchant Marine that states that the EC2 service will transition into a fleet characterized by the design vessel in April 2020.

Subject: PR News Service - Copy 12754 - HMM to deploy neo-panamax capacity on THE Alliance Asia/USEC service - EXCLUSIVE

news@prnewsservice.com +44 (0)1449 677380

COPY : 12754 DATE : 1.01.20

HMM to deploy neo-panamax capacity on THE Alliance Asia/USEC service - EXCLUSIVE

HMM is to progressively phase in neo-panamax vessels on to THE Alliance Asia/USEC EC2 service from the beginning of the second quarter 2020, as replacements for chartered vessels in the 10,000 teu capacity range

EC2 service :

Port rotation :

*Qingdao, Ningbo, Shanghai, Pusan, (Panama Canal), Manzanillo (Pan), New York, Wilmington, Savannah, Charleston, Manzanillo (Pan), (Panama Canal), Pusan, Qingdao

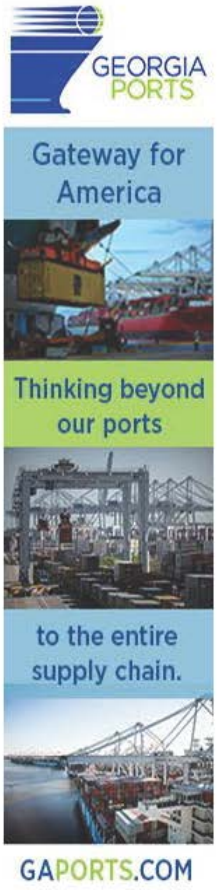
New weekly capacity : 13,100 teu

By July, HMM will deploy 11 x 13,000+ teu vessels as replacements for the 10,000 teu chartered vessels presently operating on the EC2 service

The first of the eleven vessels, the 13,154 teu Hyundai Victory, will phase in on the EC2 service on April 16th

Importantly, at least three of the 13,000+ teu vessels will be switching from the HMM Asia/Middle East (KME) service where they will be replaced by vessels in the 6,500 teu capacity range, cutting weekly capacity on that service by almost 50%

(See PR News Service, Copy 12752, December 30th)



OASACW/HQUSACE Final Assessment: The comment is **resolved**. The analysis is based on the assumption that Wilmington will be removed from the service if not

deepened. However, there is no discussion if Wilmington could be added to another service or if it would just see reduced traffic. While Section 203 does not require using Corps driven analyses, this assumption would need to be supported with data that this would not occur.

6. Overstating of Landside Benefits

Concern: Please note Future Without Project (FWOP) Condition Assumption comments that question the validity of the transition to other ports.

Notwithstanding other concerns, if it is assumed that USEC-Asia TEUs would transition to alternative ports in the future FWOP condition, it appears that the benefits are significantly overstated. The reason for this is (1) all of the alternative ports have rail connections to the hinterland and rail was not considered as a land transportation alternative despite rail being significantly cheaper than trucking and (2) Wilmington is not the closest port to a number of the destinations, including Charlotte, which is almost a wash with Charleston.

Table B-2
Round Trip Distances Between Ports and Cities

	Round Trip Port Distance (mi)			
City	**Wilmington**	**Norfolk**	**Charleston**	**Savannah**
Fayetteville, NC	196	454	432	524
Raleigh, NC	284	390	572	666
Columbia, SC	396	778	224	318
Charlotte, NC	416	648	428	520
Winston-Salem, NC	450	508	596	688
Greenville, SC	574	854	404	496
Nashville, TN	1278	1412	1108	974
Cleveland, OH	1376	1080	1412	1506
Chicago, IL	2008	1794	1842	1934

Basis of Concern: Validity of assumption. Next Least Costly Alternative - ER 1105-2-100 Appendix E Page E -6 Paragraph E-3.a.(4)(a)(2)(c).

Significance of Concern: High. This comment has direct impact on all of the economic benefits claimed.

Action Needed to Resolve the Concern: Notwithstanding the other comments that could change the economic analysis and assuming the transition assumption remains, the economic analysis must be updated to only count landside costs for those TEUs where the Port of Wilmington is actually closer than alternative ports AND the analysis must include rail as a potential least cost alternative.

Sponsor Response:

Path to resolution: We can use a rail/truck split for alternative ports. However, rail is not used for short haul and nearly all savings are short haul and currently using truck – need to discuss. Always using least cost port is not realistic but we can see what that does to benefits by calculating cost savings only for cargo that has Wilmington as the least cost port.

Response: The port of Savannah was selected as the most likely alternative port because, under without-project conditions, Savannah is the first port in the port rotation that is reasonably close to Wilmington's hinterland (Table 2-42). Other ports on this service include Boston and Jacksonville, which are too far from Wilmington's hinterland to reasonably be considered an alternative port. Charleston was not selected as an alternative port because it comes after Savannah in the port rotation (Savannah comes before Charleston in the port rotation in-part because Savannah has a larger share of cargo on the vessel than Charleston). The risk and uncertainty associated with this without-project condition assumption is addressed in a sensitivity analysis that uses Charleston as the alternative port (the project is economically justified using Charleston as the alternative port). Note that for any Wilmington hinterland cargo that is closer to the alternative port (whether it be Charleston or Savannah) the transportation cost for that cargo is greater in the with-project condition and is included in the transportation cost calculations as having a negative effect on with-project benefits. This occurs because it is never the case that 100% of cargo goes through the nearest port and the analysis was conducted for all cargo, not only benefitting cargo.

Rail is not considered as a least cost alternative because it is not a least cost alternative for the short haul distances between Wilmington's hinterland and the alternative ports. Rail service from Wilmington's hinterland to either Savannah or Charleston is inefficient and more expensive than truck service because there is limited cargo in any single area within the hinterland that would be used to make up trains, which means that cargo would need to be trucked to the rail yard (double handling) and the cargo would have to wait for a sufficient volume of cargo to arrive to build the train (time delay). The port of Wilmington currently has rail service that is under-utilized, even though it is subsidized with government funds, due to the transportation inefficiencies mentioned above. Rail is only an efficient alternative for cargo travelling the equivalent of multi-day truck distances, in which the inefficiencies of double handling and waiting for sufficient cargo to accumulate at the rail yard is more than offset by travelling 24 hours-a-day on a double-stacked train carrying 400 TEUs.

Review Assessment: Given the risk and uncertainty of the assumption on changed behavior of the shippers, suggest further coordination in advance of a revised report submittal.

Action Taken: The inefficiency and under-utilization of rail at the Port of Wilmington is discussed in Economics Appendix Section 2.9.2 Without-project Landside Transportation Costs. A sensitivity analysist hat uses Savannah as the alternative port for Wilmington's hinterland Asia imports (maintaining the time advantage) and using Charleston as the alternative port for Wilmington's hinterland Asia exports is developed throughout the document beginning in Economics Appendix Section 2.9.1 Without-project Waterborne Transportation Costs culminating in Table 5-11 Sensitivity Analysis Project Net Benefits. The sensitivity analysis results confirm the NED Plan.

OASACW/HQUSACE Final Assessment: The comment is **resolved**. The report makes an assumption that traffic will go to Savannah rather than Charleston. However, the distance to Wilmington's hinterland is shorter for Charleston for every destination except for Nashville, TN. The report also does not use rail and opines that cargo would have to wait. However, both Savannah and Charleston have two services with daily lines going to inland ports in Charlotte, NC and they do not have the issue of limited cargo having to wait. While Section 203 does not require using Corps driven analyses, both of these assumptions would need to be justified in a post authorization economic analysis.

7. Evidence for Supporting Assumptions

Concern: There are a number of assumptions used in the analysis that do not have sufficient evidence to support the assumptions. Two examples are the assumption that 100% of the vessel fleet for the USEC-Asia will be PPX3 or greater and that TEUs will transfer to other Ports. We are now going into the 4th year of the newly expanded Panama Canal and if the trends that are assumed are really underlying, there would seem to be evidence of it already starting to happen. However, Waterborne Commerce Statistics Center (WCSC) data does not support these conclusions. What has happened to Wilmington shipping since the Panama Canal third lock opened in 2016?

Basis of Concern: Validity of key underlying assumption.

Significance of Concern: High. This comment has direct impact on all of the economic benefits claimed.

Action needed to resolve the concern: Present clear evidence that validates the assumptions being made.

Sponsor Response:

Path to resolution: WCSC data is two years old. Need to provide additional supporting current data. We can show what has happened at Wilmington since new locks: Economics Appendix Tables 1-15 through 1-22 and current schedule.

Response: The new Panama Canal locks opened on 26June2016, after having been delayed due to cracks in the Pacific side locks which required repair. Vessel schedules for the major liner services are set six months in advance and often further in advance because multiple carriers work together in official (contractually obligated) alliances that determine the number of TEU slots allocated to each member carrier. These slot allocations are negotiated periodically, as are the size and ownership of vessels being deployed on any service. The uncertainty concerning the opening of the new locks added to the time it would take the carriers to respond to the new lock capacity.

WCSC data for 2017 would not be expected to show anything but the very beginning of the transition to higher efficiency vessels. The reviewer's question "What has happened to Wilmington shipping since the Panama Canal third lock opened in 2016?" is directly answered by Table 2-41, which shows that the vessels on the two Asia services calling at the port of Wilmington **prior to the opening** of the new Panama Canal locks were **99% Panamax** vessels and in **2019 are 0% Panamax** vessels. Now that the lock capacity has been expanded, 74% of the vessel calls are PPX3-size vessels. There could be no stronger evidence of a transition to more efficient vessels. The same table also shows that there was an increase in vessel size for these services at Wilmington from 2018 to 2019.

Now that the new locks are fully operational, the constraint on the operational efficiency of neo-Panamax vessels is the existing channel depth and draft restrictions at USEC ports, which are being addressed by the construction identified in the current (FY19) and recent historical USACE Construction Work Plans. When construction is completed at Boston, Savannah, and Jacksonville the remaining constraint on the operational efficiency of the design vessel will be the channel depth and associated draft restrictions at Wilmington.

Review Assessment: Given the risk and uncertainty of the assumption on changed behavior of the shippers, suggest further coordination in advance of a revised report submittal.

Action Taken: Please note that the THE Alliance published a press release on 01Jan20 stating that it will transition vessels on the EC2 service to 13,100 TEU capacity vessels starting in April 2020 (see copy inserted into Action Taken for Economics Comment #5). Please see the same sections as identified for Comment #5. The future without-project assumption that the EC2 and the ZCP services will transition to the design vessel by the project base year of 2027 is developed in Economics Appendix Section 1.8.2 Existing Containership Fleet and Economics Appendix Sections 2.3 through 2.4:

- Section 1.8.2 Existing Containership Fleet
- Section 2.3 Without-project Conditions at other USEC Federal Navigation Projects
- Section 2.4 Without-project Condition Containership Fleet for the EC2 and ZCP Services

Also please see letters from six carriers on the EC2 and ZCP services are included as an attachment to the Economics Appendix. These letters confirm the projection that carriers will not regularly call at Wilmington under without-project conditions.

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

8. Overall Economic Feasibility and Selection of the NED Plan

Concern: Based on Economic comments 12-16, there is a high likelihood that neither -47FT nor -48FT are the NED plan. Further, project justification (positive NED benefits) at those depths is uncertain.

Basis of Concern: Cumulative effect on benefits resulting from the number of high significance concerns.

Significance of Concern: High. Directly calls into question the NED plan and demonstrating economic feasibility as required for Sec 203 reports.

Action Needed to Resolve the Concern: Update the economic analysis to use reasonable assumptions, determine the NED Plan, and document/support plan selection.

Sponsor Response:

Path to resolution: Need to resolve previous economic comments.

Response: The responses to the previous comments are being incorporated into the economic analysis and selection of the NED Plan. The updated economic analysis will be used to evaluate economic feasibility.

Review Assessment: Pending resolution and re-valuation of prior comments.

Action Taken: Please see responses to previous comments.

OASACW/HQUSACE Final Assessment: The comment is **resolved**. The report makes an assumption that traffic will go to Savannah rather than Charleston. However, the distance to Wilmington's hinterland is shorter for Charleston for every destination except for Nashville, TN. The report also does not use rail and opines that cargo would have to wait. However, both Savannah and Charleston have two services with daily lines going to inland ports in Charlotte, NC and they do not have the issue of limited cargo having to wait. While Section 203 does not require using Corps driven analyses, both of these assumptions would need to be justified in a post authorization economic analysis.

9. Sufficient Array of Alternatives to Identify the NED Plan

Concern: Reference Table 4-7 of the economic appendix. The economic analysis only evaluates -47FT and -48FT and identifies -47FT as the NED Plan because it has

greater net benefits than -48FT. However, -47FT cannot be determined to be the NED Plan because a lesser alternative was not evaluated. The argument presented is that there are $0 in landside costs for -44FT, -45FT, and -46FT. This does not seem reasonable as there is no evidence that larger ships could not call on Wilmington harbor at those depths. Data for other east coast ports shows PPX3 and larger vessels calling at depths below -47FT. If this singular assumption did not hold true, the NED Plan would not be -47FT.

Basis of Concern: Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies 1983 Section VI; ER 1105-2-100 2-4.

Significance of Concern: High. Directly calls into question the identification of the NED plan.

Action Needed to Resolve the Concern: Update the economic analysis to show benefits for depths below -47FT and then identify the NED Plan.

Sponsor Response:

Path to resolution: Does this comment rely on previous comments? We can show total waterborne costs at -44 ft through – 47 ft, with and without Wilmington's -42-foot constraint to substantiate economic cost to carrier.

Response: The economic analysis has been revised to include an incremental analysis for the design vessel calling at Wilmington under with-project conditions for -44, -45, -46, -47, and -48 feet.

Review Assessment: Resolved pending re-evaluation.

Action Taken: The alternatives evaluated in the analysis are identified in Section 6.4 Final Array of Alternatives of the Main Report. The description of the alternative plans is copied here:

"The alternatives that are the most effective in reducing unit transportation costs are alternatives that combine channel widening to allow regular transit of the design vessel and channel, turning basin, and berth deepening to allow greater vessel operating drafts. Note that berth deepening is a local service facility improvement that is the responsibility of the NCSPA and not a component of the federal General Navigation Features. The amount of channel widening was determined by ship simulation modeling of the design vessel and does not change appreciably for any of the action alternatives, therefore the action alternatives are identified by their incremental project depth:

- No Action Alternative – no improvements are made to the federal channel and economic conditions are described by the without-project condition;
- 44-foot Alternative – The channel, turning basin, and container terminal berths are deepened to -44 feet, the entrance channel is deepened to -46

feet and extended to meet project depth, the channel is widened to accommodate the design vessel based on requirements identified in ship simulation modeling;

- 45-foot Alternative – The channel, turning basin, and container terminal berths are deepened to -45 feet, the entrance channel is deepened to -47 feet and extended to meet project depth, the channel is widened to accommodate the design vessel based on requirements identified in ship simulation modeling;
- 46-foot Alternative – The channel, turning basin, and container terminal berths are deepened to -46 feet, the entrance channel is deepened to -48 feet and extended to meet project depth, the channel is widened to accommodate the design vessel based on requirements identified in ship simulation modeling;
- 47-foot Alternative – The channel, turning basin, and container terminal berths are deepened to -47 feet, the entrance channel is deepened to -49 feet and extended to meet project depth, the channel is widened to accommodate the design vessel based on requirements identified in ship simulation modeling; and
- 48-foot Alternative – The channel, turning basin, and container terminal berths are deepened to -48 feet, the entrance channel is deepened to -50 feet and extended to meet project depth, the channel is widened to accommodate the design vessel based on requirements identified in ship simulation modeling.

Alternative project depth increments start at -44 feet because there is no non-federal interest in a one-foot deepening resulting in a -43-foot channel. Alternative project depths increments are truncated at -48 feet because at this depth vessel operating drafts at Wilmington would be constrained at the same level as vessel operating drafts at the prior and post US ports on the two services. A channel deeper than -48 feet would not be expected to provide additional benefits because vessel operating drafts would be constrained by depths at the prior and post US ports on the two services (Boston -48 feet, Savannah and Jacksonville -47 feet)."

Please also see Economics Appendix Section 3 Economic Evaluation of Measures, which evaluates the structural measures identified in plan formulation (further discussed in the Main Report) and Economics Appendix Section 4 Alternative Plan Economic Evaluation, which includes an economic evaluation of incremental channel depths. In addition, please see the Review Certification attached to the Economics Appendix that supports the economic evaluation and determination of the NED Plan.

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

10. Independent External Peer Review (IEPR)

Concern: IEPR is required for Section 203 project just like USACE led projects. Given the magnitude of the project implementation costs and the non-traditional economic analysis and the assumptions used, IEPR is recommended.

Basis of Concern: ER 1165-2-209.

Significance of Concern: Medium to high. This comment has direct impact on all of the economic benefits claimed.

Action Needed to Resolve the Concern: Conduct an IEPR or obtain an IEPR exclusion from the Chief of Engineers.

Sponsor Response:

Path to resolution: IEPR is being scheduled

Response: The non-Federal sponsor has been informed by the ASA(CW)'s office that an IEPR is not required at this time.

Review Assessment: Comment **resolved** at this time. IEPR will be undertaken as part of project implementation.

D. Climate Preparedness and Resilience

1. Climate Hydrology Analysis

Concern: The report lacks a discussion relevant information about observed and expected climate change impacts in hydrologic analyses developed for the study. These impacts combined with sea level change will profoundly impact the future with project conditions and inform cost and cost risk assumptions of future OMRR&R costs related to dredging.

Basis of Concern: ECB 2018-14 requires a qualitative analysis of climate-impacted hydrology to describe future conditions, which includes a literature review. Climate change information for hydrologic analyses includes direct changes to hydrology through changes in temperature, precipitation, evaporation rates and other climate variables, as well as dependent basin responses to climate drivers, such as sedimentation loadings. For the Wilmington Harbor Section 203 study, this analysis would inform future potential changes to streamflow, precipitation and sedimentation in the project area which is currently lacking the report.

Significance of concern: Low to medium. The qualitative analysis required by this ECB should focus on those aspects of climate and hydrology relevant to the project's

problems, opportunities, and alternatives, and include consideration of both past (observed) changes as well as projected, future (modeled) changes.

Future with project impacts on water quality should be informed by changes in water temperature and freshwater inputs. Sediment delivery and transport to the project area are impacted by these changes and would impact the shoaling rates developed in the analysis, adding uncertainty to future with project assumptions informed by the analysis conducted for the study.

Action Needed to Resolve the Concern: A policy compliant climate hydrology analysis should be performed using ECB 2018-14 guidance. The climate discussion should be summarized in the main report, with the detailed material included in Appendix A (Engineering). The results should be integrated into the key assumptions in the future with and without project assumptions, and inform any adjustments to risk register and current cost risk assumptions in the report.

Sponsor Response:

Path to Resolution: A qualitative analysis of climate-impacted hydrology and any potential resulting impacts on the proposed project will be prepared and added to the report including the cost risk analysis.

Initially it appears that precipitation may increase resulting in higher flow rates. However, sediment concentrations are mainly a factor of land use and could not be predicted to change. Even if they do, modeling results show that sedimentation rates in the anchorage basin are primarily, but not completely, driven by its depth and width and tidal influences; not by the river flows and associated concentrations. Therefore, a limited cost risk will likely be assumed for this potential impact.

Increase flows would mitigate the increased salinity intrusion due to RSLR and the proposed project.

HQ Suggestion: Work with Wilmington to be consistent with USACE requirements. This is an information requirement.

Response: A qualitative analysis of climate-impacted hydrology and any potential resulting impacts on the proposed project was prepared and added as Section 1.6 of the Engineering Appendix and a summary has been added to the Main Report section 10.7.1 Risk and Uncertainty Climate Change (provided below). Climate Change was added to the risk register in the Cost Appendix but was determined to be low risk.

10.7.1 Climate Change

The USACE's Engineering and Construction Bulletin (ECB) 2018-14, issued in September 2018, requires a qualitative climate hydrology analysis that discusses the

relationships between climate, streamflows, and the USACE project, to ensure that changes in climate with the potential to significantly affect the project with respect to hydrology are identified, and the potential impacts are assessed with respect to the project over its life cycle. The USACE recommends that projects be evaluated for potential vulnerabilities to planning, engineering and operational activities affected by climate change. Navigation and associated dredging projects like the TSP may be impacted.

ECB 2018-14 was developed by the USACE as an update to ECB 2016-25, Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Works Studies, Designs, and Projects. The ECB provides guidance for incorporating climate change into the USACE planning process for long term projects. The analysis was performed for this project based on literature review and two USACE tools in accordance with this guidance. The full analysis is presented in the Engineering Appendix Section 1.6: Climate Change Impacts. The conclusions of the analysis are presented below.

The project itself is not expected to have a significant effect on climate change per se. Furthermore, potential climate change impacts do not impact the decision regarding the selection of the TSP. However, the project will be affected by the results of climate change. Increases in extreme precipitation events and resulting increases in streamflow have the potential to move more nutrients and sediment into the navigation channel. This combined with increases in air temperatures has the potential to impact water quality and dissolved oxygen (DO) levels through increases in oxygen demanding materials and nuisance algal blooms. Furthermore, increases in sediment transport may increase the need for channel maintenance in the future.

Review of the model results presented in Appendix A, though, indicates that the project impacts on water quality (DO) are most pronounced during the winter months when DO is at its highest levels (and temperature is lowest). Therefore, the potential impacts from increased temperatures and nutrients will likewise have the largest relative changes during the winter months when these impacts will not further adversely affect fishery resources under the with-project conditions as compared to without-project conditions.

With respect to the increase of salinity intrusion into the estuary due to the project (as well as future RSLR), increases in streamflow will actually be a mitigating factor reducing the potential impacts of the project on wetland vegetation composition and fishery resources.

Increases in streamflow and suspended sediment will likely increase potential maintenance dredging activities. If any changes in predicted future dredging volumes are observed, these will ultimately have to be incorporated into future dredge material management practices. However, given the project itself is expected to only increase these volumes by about 10%, climate change impacts should also be relatively minor and adaptive responses can be undertaken.

Review Assessment: The comment is resolved pending review of a revised feasibility report.

Action Taken: The summary response presented above may be found in section 9.8.1: Climate Change in the Main Report and a more detailed discussion may be found in section 1.6 Climate Hydrology Analysis of the Engineering Appendix (Appendix A).

OASACW/HQUSACE Final Assessment: The comment is unresolved. The language above does not provide a summary of the results of the analysis but rather a description of the guidance and, in paragraph 3, a statement unsupported by Appendix A. All that is needed here is a summary of the acceptable information presented in Appendix A, Section 1.6, perhaps abstracted from the summary discussions on p. 1-53. The response does address the issues raised in the cumulative impacts analysis of the Tidal Wetlands on pp. 263-264 of the main report, which lays out some of the SLR impacts, as does water quality on p. 265 and the summary on p. 269 of the main report. EP 1100-2-1 required that any adaptive measures be described here. Simply list potential measures.

2. Sea Level Change (SLC) Analysis

Concern: The report and analysis are not fully compliant with USACE policy on SLC.

Basis of concern: Review of the documents provided and analysis indicate that SLC was incorporated into analyses and discussion, in various sections of the main report; however, application and presentation is piecemeal in the report and does not appear to inform performance and impact risk of TSP. Specific concerns by discipline/section follow.

> Sea Level Change – The sea level rates are presented in section 2.6, presenting the 50 year project projections for the Wilmington, NC NOAA tide gauge. These projections are understating the changes in future water levels. Due to the alteration of the Cape Fear River Estuary (CFRE) by the federal navigation project over the last 150 years, the Wilmington tidal gauge has experienced an anomalously large increase in tidal constituents and tidal range since the current NOAA tidal gauge records in the 1930's. The tidal datum which is defined by the tidal range is not stable and is increasing at a greater rate than the mean sea level trend. The significance of this phenomena is that tide level and extreme water level projections should not be based on the published observed 2006 mean sea level trend (2.13 mm/year), but on the MHW trend, 4.26 mm/yr. (Zervas, 2013) This is approximately double the rate used in the study analysis, and result in a RSLR increase between 0.70 to 2.92 feet compared to 0.34 to 2.56 feet respectively.

Plan Formulation – Future without project and future with project discussions do not fully integrate impacts of climate change to hydrology and changes in sea level. Future changes in water levels, salinity intrusion due to RSLR and further channel alteration are likely understated. The section listing constraints does not include increases in water levels or induced flooding.

Economics/Planning – The non-structural measure "tidal advantage" should perform better under the intermediate/high scenarios since the tidal range is increasing. Has a sensitivity analysis been done showing performance of larger tidal ranges on tidal advantage?

Engineering Analysis/Hydrodynamic Modeling – Future without project, future with project modeling is likely underestimating impacts since the RSLR rates are low by a significant amount. Changes in flood risk for the with project condition was not investigated.

ER 1100-2-8162/Hydrodynamics – "As used in this ER, locations with oceanic astronomical tidal influence, as well as connected waterways with base-level controlled by sea level. In the latter waterways, influence by wind driven tides may exceed astronomical tidal influence. Coastal areas include marine, estuarine, and riverine waters and affected lands." In addition to the impacts of future conditions described in earlier comments, when assessing coastal storm risk in the estuary, wind loading should be considered.

NEPA/Impacts – The CFRE is a funnel shaped estuary, which has an increasing tidal range due to incremental deepening and channel maintenance over the last 150 years. Further deepening will increase these changes and create additional flood risk from coastal storms due to storm surge amplification (Familkhalili and Talke, 2016). Nuisance flooding frequency will likely increase as a result of the project. As the tide range expands, some stormwater drainage outfalls to Wilmington harbor will be impacted, resulting in decreased gravity drainage performance. Future salinity changes in the estuary have been underestimated. Future freshwater inputs from the watersheds may trend upward under climate change ameliorating the impacts of the deepening slightly.

Significance of concern: High.

Action Needed to Resolve the Concern: Coordinate with Navigation PCX, HH&C, CPR CoP's, vertical team for specific direction.

Sponsor Response:

Response:
The Sea Level Rise scenarios (Low, Intermediate and High) used in the modeling follow USACE guidance ER 1100-2-8162, Incorporating Sea Level Changes in Civil Works

Programs and were calculated using the USACE on-line sea level calculator. They range from a 0.34' RSLR change to a 2.57' RSLR change through the Year 2077.

The change in tidal range is not due to climate effects, but rather due to the alteration of the Cape Fear River Estuary by federal navigation projects over the past 150 years. Thus, this trend in MHHW (and tide range) should not be expected to continue in the future in the absence of any future navigation projects and should not be used as the future sea level for the FWOP and FWP conditions.

With respect to potential project impacts that may affect flood risk and tidal ranges, Appendix A – Section 5.4.1 presents the potential FWP effects. They indicate that FWP will slightly increase the tidal prism with the largest increase of the tidal range occurring at the Anchorage Basin (~0.3 ft). The change in tide range, though, is disproportional as MHW increases up to 0.12 ft while MLW decrease up to 0.18 ft at that location. For the High SLR scenario, these values are minimally greater by approximately 0.01 ft for MHW and MLW, and by 0.02 ft for the tide range. The smallest changes occurred at the upstream riverine sites and downstream at the mouth of the Cape Fear Estuary.

Hurricane conditions, including wind effects, were also investigated with the maximum water level difference occurring at lower Big Island with an increase of 0.13 ft. At the Battleship (Wilmington), the difference was an increase of only 0.08 ft.

HQ Feedback: Flood risk not included as a constraint – residual risk. Reviewer did not see the methodology used to project tide range. Impacts to surge and gravity drains need to be addressed. Importance of how higher sea level rise will impact mitigation projects. Also potential for increased freshwater flow due to sea level rise to impact sedimentation. Look at ranges to see how O&M costs may be impacted. May use Florence data.

Review Assessment: The comment is unresolved. Anecdotal, physical data, and peer-reviewed studies support the comment on tidal range instability. The response also did not address impacts on future flood risk and impacts to storm water drainage which were not investigated in the report, nor was flood risk increases a planning constraint. The rest of the response did not fully address other parts of the comment (which covered several areas).

Action Taken: The Main Report has been revised to include section 9.8.2 Tidal Datum Instability, which is copied below. Additional graphic representations of the data are provided in the attached Technical Memorandum.

9.8.2 Tidal Datum Instability

Tidal range instability has been identified as a potential risk factor concerning future project performance. Historically, the river channel has been modified numerous times, and quite substantially, which has led to the observed changes in tidal datums (MHW, MLW) and mean tidal range. Previous analysis of tidal range at the Cape Fear River (Zervas, 2013) recognize this important point, and previous modeling efforts have

shown that the prior deepening and widening of the river channel has increased the tidal range over time. It is this increase in tidal range due to previous channel modifications that has then been manifested in the apparently higher historical rate of increase of MHW over MSL (which encompasses these periods of channel modifications) referenced anecdotally and in prior studies.

Going forward in time, though, it is expected that MHW should generally increase at the same rate as MSL increases absent any alterations to the river channel, which would reduce risks to project performance. To support this assumption, analyses of the water levels at Wilmington over the past four decades were performed. These analyses consisted of investigating two distinct time periods:

1. From April 2004 to December 2019 which represents the time since the most recent channel deepening / widening project; and

2. From January 1983 to July 2000 which represents the time between the most recent two channel deepening / widening projects.

It is noted that the most recent project was performed in phases between August 2000 and March 2004, so this time interval was not included in the two analysis periods. The prior deepening / widening project was completed in October 1982.

9.8.2.1 Tidal Analyses

The present tidal analysis was performed using hourly observations at the NOAA CO-OPS Station 8658120 Wilmington, NC. Continuous data was available from 1936 until the present. The analysis of tidal constituents and tidal datums was performed based on monthly and annual (January to December) intervals. The tidal datums values (MHW and MLW) were referenced to the local MSL. MSL values was computed as the arithmetic mean of observations over each interval. Mean tidal range was computed as the difference between MHW and MLW.

As shown in Table 9-5 and Figure 9-2 the rate of increase during the aforementioned time periods for MHW and MLW is similar to the rate of increase of MSL. Specifically, it was observed that MHW is increasing at a slower rate (by 15–20%) than MSL during the periods when no major alterations were made to the river channel.

Table 9-5: Tidal Datum Rate of Change

Tidal Datum	1983-2000 (ft/yr)	2004-2019 (ft/yr)
MHW	0.006	0.033
MSL	0.008	0.039
MLW	0.008	0.043
Mean Range	-0.002	-0.010

Table 9-6 shows a notable change in the mean tide range as a result of the channel improvements that occurred between 2000 and 2004. This is especially clear in Figure 9-2 based on yearly data. Figure 9-2 a significant but gradual increase in the tidal range which occurred between 2000 and 2004 due to the most recent channel deepening / widening project.

Table 9-6: Tidal Datum Absolute Changes

Tidal Datum	1983-2000 (ft-MSL)	2004-2019 (ft-MSL)	Change (ft)	Change Relative to MSL (ft)
MHW	1.958	2.251	+0.293	+0.081
MSL	-0.017	0.195	+0.212	0.000
MLW	-2.242	-2.177	+0.065	-0.147
Mean Range	4.200	4.429	+0.228	n/a

Additionally, with respect to the modeling performed for the proposed project, a comparison can be made between the changes that occurred previously and the model predictions for the current project. One can expect similar in magnitude changes given the similar scopes of each project. In fact, Table 9-6 shows an increase in MHW of 0.081 ft compared to the model prediction of 0.12 ft; a decrease in MLW of 0.147 ft compared to the model prediction of -0.18 ft, and an increase in the tidal range of 0.228 ft compared to the model prediction of 0.31 ft. This provides a validation that the model is predicting similar tendencies and changes in magnitudes that are comparable to those measured previously for a similar magnitude of modifications to the river channel.

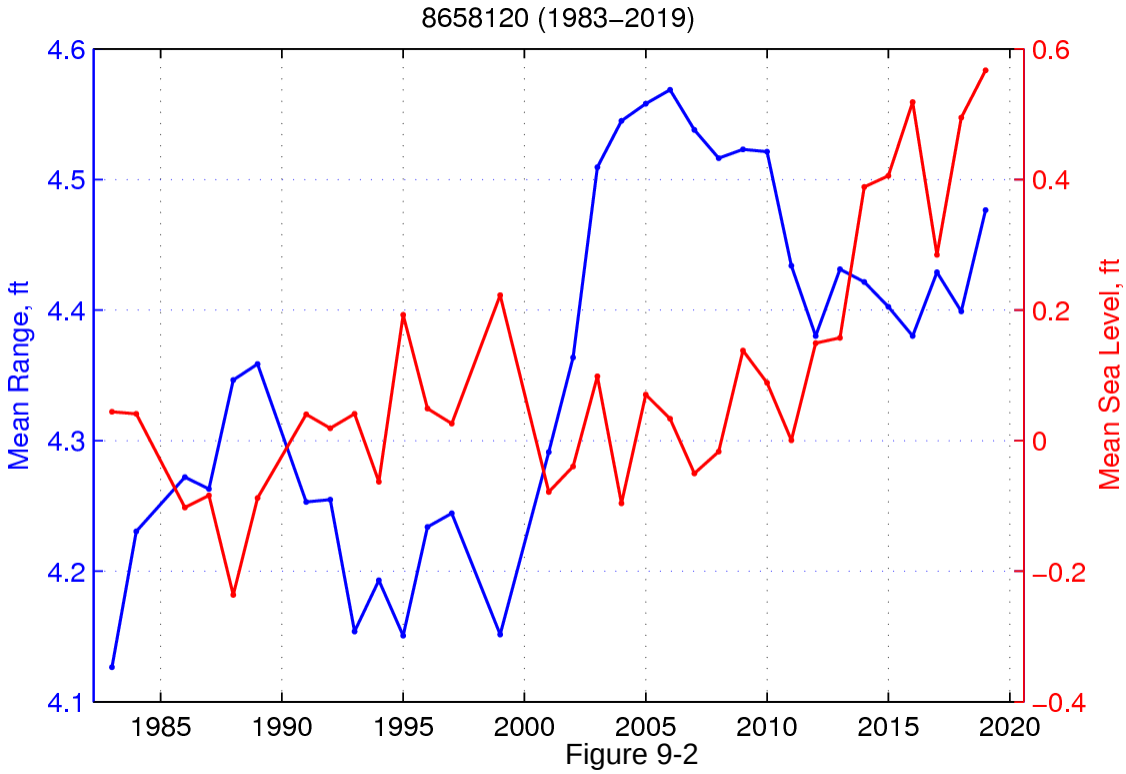


Figure 9-2
Variability of Mean Tidal Range Based on Annual Data

OASACW/HQUSACE Final Assessment: The comment is unresolved. In particular, the response states that "The change in tidal range is not due to climate effects, but rather due to the alteration of the Cape Fear River Estuary by federal navigation projects over the past 150 years. Thus, this trend in MHHW (and tide range) should not be expected to continue in the future in the absence of any future navigation projects and should not be used as the future sea level for the FWOP and FWP conditions." In fact, this project will exacerbate the situation by deepening the channel further with potential nonlinear increases in tidal prism upstream. Risks to shoreline development, bridge clearance, if any, coastal flood risk reduction measures, if any, and the performance of gravity drainage infrastructure, should be addressed. . Where these systems were federally-funded in whole or in part, this project cannot reduce their design performance. A description of the potential issues and any necessary adaptation measures is sufficient.

Note: The statement on p. 133 "4.7.6 Sea Level Rise. Although sea level rise is a critical factor in the analyses of potential impacts, the rate of RSLR within the study area would be unaffected by any actions that may occur under without-project conditions." entirely misses the point. The FWOP conditions are indeed affected by changing sea level.

3. Engineering Feasibility
Concern: With respect to changing sea level, a condition for approval is that the sponsor/district must address the following prior to the project moving forward:

a. The base year and future potential impacts presented in the report caused by the project TSP, specifically tidal range and hurricane storm surge, do not fully integrate the observed and future instability in the tidal prism in to the analysis presented into the report. While the report states that the MHW will increase 1.3 inches over the period 2027 -2077 in Wilmington Harbor due to the proposed deepening of 5 feet (42 feet to 47 feet), a larger impact has already been noted since the deepening project authorized in 1996 and completed in 2004 deepened the channel 4 feet (38 feet to 42 feet). The observed rate of change in MHW has significantly accelerated in the post deepening period 2004-2020, which resulted in an estimated increase from the observed gauge record of 0.6 feet over 16 year (~ 7 inches).

b. The impacts stated in the report with regard to hurricane surge impacts and the tidal prism instability are understated. The potential increase in MHW, a high frequency water level, will impact the discharge capacity of the gravity-drained stormwater outfalls into Wilmington Harbor, which are already impacted by the current instability in the tidal prism caused by the multiple channel improvement projects from 1881 to 2004. Where stormwater systems were federally-funded in whole or in part, this project cannot reduce their design performance. Any capacity-impacted stormwater drainage must be identified and risk mitigation measures planned.

c. Hurricane storm surge modeling (low frequency events) was based on the low sea level change scenario(2.3 mm/yr). This is not policy-compliant per ER 1100-2-8162. Use all three scenarios, or use one and assess sensitivity on the others. Based on observed 19-yr and 5-yr moving averages at Wilmington tide gauge, suggest using the intermediate scenario. Increases in storm surge due to the 5 foot deepening should use the NOAA recommend high rate based on MHW trend to bracket performance and impacts.

Basis of Concern: Accuracy of project effects/impact assessment and compliance with ER 1100-2-8162.

OASACW/HQUSACE Final Assessment: Unresolved. Compliance with ER 1100-2-8162 is necessary to provide a sufficient Sea Level Change analysis and an accurate evaluation of project effects.

E. Counsel

1. Study Authority

Concern: The study authority cited in section 1.2 of the report is not cited correctly.

Basis of Concern: Section 203 of the Water Resources Development Act (WRDA) of 1986, Public Law 99-662 (33 U.S.C. 2231) was further amended by section 1152 of WRDA 2018, Public Law 115-270. Specifically, section 1152 amended subsections (c) and (e) of section 203.

Significance of Concern: Medium. The non-federal interest should understand the revisions to the study authority, as explained in the implementation guidance for section 1152 approved by the Assistant Secretary of the Army for Civil Works on 2 May 2019.

Action Needed to Resolve the Concern: The study authority cited in section 1.2 of the report should be updated to include the modifications to the authority made by section 1152 of WRDA 2018. The non-federal interest also should review the "Implementation Guidance for Section 1152 of the Water Resources Development of 2018, Studies of Water Resources Development Projects by Non-Federal Interests," dated 2 May 2019.

Sponsor Response:

Path to Resolution: Update study authority

Response: The study authority identified in the report has been revised as identified in the comment. The revised text now states

Study Authority

This study of potential navigation improvements to the Wilmington Harbor Federal navigation channel leading from the Atlantic Ocean to the Port of Wilmington, North Carolina has been prepared by the North Carolina State Ports Authority (NCSPA) under the authority granted by Section 203 of Water Resources Development Act (WRDA) of 1986 (P.L. 99-662), as amended.

Section 203 of WRDA 86, as amended, states:

> *SEC 203. STUDIES OF PROJECTS BY NON-FEDERAL INTERESTS. PUBLIC LAW 99-662, NOV. 17, 1986. 33 USC 2231.*
>
> *(a) SUBMISSION TO SECRETARY*
>
> 1 *In general. A non-Federal interest may on its own undertake a federally authorized feasibility study of a proposed water resources development project and submit the study to the Secretary.*
>
> 2 *Guidelines. To assist non-Federal interests, the Secretary shall, as soon as practicable, issue guidelines for feasibility studies of water resources development projects to provide sufficient information for the formulation of studies.*
>
> *(b) REVIEW BY SECRETARY - The Secretary shall review each feasibility study received under subsection (a) (1) for the purpose of determining whether or not the study, and the process under which the study was developed, each comply*

with Federal laws and regulations applicable to feasibility studies of water resources development projects.

(c) SUBMISSION TO CONGRESS =

(1)REVIEW AND SUBMISSION OF STUDIES TO CONGRESS - Not later than 180 days after the date of receipt of a feasibility study of a project under subsection (a) (1), the Secretary shall submit to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of representatives a report that describes

(A) the results of the Secretary's review of the study under subsection (b), including a determination of whether the project is feasible;

(B) any recommendations the Secretary may have concerning the plan or design of the project; and

(C) any conditions the Secretary may require for construction of the project.

(2) LIMITATION – The completion for the review by the Secretary of a feasibility study that has been submitted under subsection (a)(1)may not be delayed as a result of consideration being given to changes in policy or priority with respect to project consideration;

(d) CREDIT. If a project for which a feasibility study has been submitted under subsection (a) (1) is authorized by a Federal law enacted after the date of the submission to Congress under subsection (c), the Secretary shall credit toward the non-Federal share of the cost of construction of the project an amount equal to the portion of the cost of developing the study that would have been the responsibility of the United States if the study had been developed by the Secretary.

(e) REVIEW AND TECHNICAL ASSISTANCE. –

(1) REVIEW – The Secretary may accept and expend funds provided by non-federal interests to undertake reviews, inspections, certifications, and other activities that are the responsibility of the Secretary in carrying out this section.

(2) TECHNICAL ASSISTANCE - At the request of a non-Federal interest, the Secretary may provide to the non-Federal interest technical assistance relating to any aspect of a feasibility study if the non-Federal interest contracts with the Secretary to pay all costs of providing such technical assistance.

(3) LIMITATION – Funds provided by non-Federal interests under this subsection shall not be eligible for credit under subsection (d) or reimbursement.

(4) IMPARTIAL DECISIONMAKING – In carrying out this section, the Secretary shall ensure that the use of funds accepted from a non-Federal interest will not affect the impartial decisionmaking of the Secretary, either substantively or procedurally.

(5) SAVINGS PROVISION – The provision of technical assistance by the Secretary under paragraph (2) –

(A) shall not be considered to be an approval or endorsement of the feasibility study; and

(B) shall not affect the responsibilities of the Secretary under subsections (b) and (c).

This report has been developed based on the policy guidance provided in:

- ER 1165-2-209 (04 February 2016), which provides guidance for implementation of Section 203 of WRDA 1986, as amended by Section 1014(a) of WRRDA 2014;
- Memorandum for Commanding General U.S. Army Corps of Engineers (21 June 2018): Implementation Guidance for Section 1126 of WRDA 2016 – Study of Water Resources Development Projects by Non-Federal Interests (Revised); and
- Implementation Guidance for Section 1152 of the Water Resources Development of 2018, Studies of Water Resources Development Projects by Non-Federal Interests," dated 2 May 2019.

Review Assessment: Comment resolved with inclusion of above revised text in the report.

Action Taken: The revised text may be found in section 1.2 Study Authority of the Main Report.

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

2. Tentatively Selected Plan

Concern: Sections 6.1 and 10.1 of the report describe the recommended plan as "dredging" the federal navigation channel.

Basis of Concern: Dredging may occur for construction, operation, or maintenance of navigation projects. For clarity and to avoid confusion with operation and maintenance dredging activities, the tentatively selected plan should be described as "deepening" the federal navigation channel instead.

Significance of Concern: Low.

Action Needed to Resolve the Concern: The tentatively selected plan recommended generally should be referred to in sections 6.1 and 10.1 and throughout the report and its appendices as "deepening" the federal navigation channel, rather than simply "dredging" the federal navigation channel.

Sponsor Response:

Path to resolution: Revise text as recommended.

Response: Change made throughout as requested.

Review Assessment: Comment resolved with implementation of response.

Action Taken: Please see revised text throughout the Main Report including section 6 Formulation and Evaluation of Alternative Plans and section 9: Recommended Plan.

OASACW/HQUSACE Final Assessment: Comment is **resolved**.

3. Recommendations

Concern: For the recommendations in section 14, the report describes only the first cost and annual incremental operations and maintenance cost to the federal government. No reference is made to the mitigation required for the project.

Basis of Concern: When a project is authorized by Congress, the recommendations contained in the feasibility report become the basis for proceeding with the project as a Federal undertaking. ER 1105-2-100, App'x G, para. G-9.i.(1). The wording of recommendations, incorporated by reference in the authorizing act, has the force of law for the project, and therefore requires special attention. The recommendations must contain a "clear reference to the plan being recommended for implementation, including appropriate mitigation." ER 1105-2-100, App'x G, para. G-9.i.(4)(a).

Significance of Concern: Medium. While total project costs and mitigation are summarized elsewhere in the report, the recommendations section needs to clear reference these items as well.

Action Needed to Resolve the Concern: Provide the total project cost at FY 2019 price levels in the recommendations section of the report. Indicate the expected federal and non-federal cost-share amounts. Summarize the mitigation for the project as well.

Sponsor Response:

Path to Resolution: Mitigation is currently being determined and will be included in report.

Response: The mitigation plan will be included in the description of the recommended plan, including federal and non-federal cost shares. The mitigation plan is currently being developed in coordination with the Wilmington District and will be included in the revised report.

Review Assessment: Comment is resolved pending review of the implemented response.

Action Taken: The Federal and non-Federal cost shares of the project are presented in section 9.4.1 Cost Sharing Table 9-4 Project Cost Shares (copied below), A preliminary mitigation, monitoring, and adaptive management plan is presented in section 8.25 Mitigation, Monitoring, and Adaptive Management Plan and presented in greater detail in Appendix N: Mitigation and Monitoring Plan. The preliminary plan will be finalized during development of the DEIS. The preliminary plan identifies a mitigation alternative that is appropriate to the level of environmental effects. Mitigation and monitoring plan costs are included in the economic analysis at FY2020 price levels. Table 9-4 includes $74 million for mitigation, $10 million for monitoring and $21 million for mitigation-related land acquisition plus a contingency of 21.4%.

Table 9-4
Project Cost Shares

Cost Item	Total Cost	75% Federal	25% Non-Federal
Dredging Cost	$547,882,000	$410,912,000	$136,971,000
Mitigation & Monitor	$84,000,000	$63,000,000	$21,000,000
Construction S&A	$10,800,000	$8,100,000	$2,700,000
PED	$21,100,000	$15,825,000	$5,275,000
Contingency (21.4%)	$142,049,000	$106,537,000	$35,512,000
Total Construction of GNF	**$805,831,000**	**$604,373,000**	**$201,458,000**
Lands & Damages	$28,262,000	$0	$28,262,000
Total project First Costs	**$834,093,000**	**$604,373,000**	**$229,720,000**
Berthing Area Dredging Costs	$1,760,000	$0	$1,760,000
Aids to Navigation	$10,531,000	$10,531,000	$0
10% GNF Non-Federal		-$52,321,000	$52,321,000
Total Cost	**$846,384,000**	**$562,583,000**	**$283,801,000**

OASACW/HQUSACE Final Assessment: Comment **resolved** as originally raised, but new legal comment #6 below is unresolved. Per the real estate plan in Appendix E, the non-Federal sponsor will not be required to provide any new real estate interests or relocations for the deepening or widening of the Federal channel, or for the placement and disposal of dredged material, per the recommended plan. Instead, the real estate plan states that all real estate interests and relocations required for the project are a component for the preliminary mitigation plan. If this is not correct, this needs to be clarified in the report and real estate plan. Otherwise, in accordance with section 906(c)

of WRDA 1986, as amended (33 U.S.C. 2283(c)), costs incurred for lands, easements, rights-of-way, and relocations required for mitigation shall be allocated among the authorized project purposes that caused the requirement for mitigation, and shall be cost-shared as construction costs to the same extent as project costs allocated to those purposes. See also ER 1105-2-100, Appendix C, Section C-4, "Mitigation Planning." Thus, the costs for all lands, easements, rights-of-way, and relocations for this project should be included in the mitigation costs of the general navigation features and cost-shared. All lands, easements, rights-of-way, and relocations associated with mitigation are not creditable against the additional 10 percent of construction costs required by section 101(a)(4) of WRDA 1986 (33 U.S.C. 2211(a)(2)). Only any lands, easements, rights-of-way, and relocations required for the general navigation features or dredged material disposal facilities for the project are creditable toward the additional 10 percent payment. See 33 U.S.C. 2211(a)(2). Table ES-8 and Table 9-4 should be updated accordingly, as well as any discussion in the report and real estate plan pertaining to the crediting of these costs against the additional 10 percent of construction costs required by section 101(a)(4) of WRDA 1986.

4. Items of Local Cooperation

Concern: The non-federal responsibilities listed in the recommendations section of the report states the North Carolina State Ports Authority will "[a]ccomplish all removals determined necessary by the Federal Government other than those removals specifically assigned to the Federal Government."

Basis of Concern: It is not clear to what "removals" refers, particularly given that no real estate plan was provided.

Significance of Concern: Medium.

Action Needed to Resolve the Concern: Explain what "removals" refers to in the recommendations section of the report. As noted in a few paragraphs above this reference, the non-federal sponsor would be responsible to perform or ensure performance of all relocations determined necessary for the project.

Sponsor Response:

Path to resolution: We are currently clarifying if there are any removals or relocations. There were none identified when the draft was written. Is this standard language for this section of the report?

Response: The following information has been added to the main report:

6.1.3 Pipeline Relocation
There are four pipelines crossing the channel in the Fourth East Jetty Reach just south of Eagle Island that are owned by Exxon Mobile with the operation and maintenance of the pipelines contracted to Kinder Morgan. Two pipelines are active but currently have

no commercial flow. These two pipelines are six-inch nominal diameter and are currently pressurized with nitrogen awaiting future business opportunities. Two pipelines are not active. These two pipelines are four-inch nominal diameter, filled with sea water and capped. One of the active six-inch lines is directionally drilled to a depth in excess of 68 feet MLLW and does not need to be relocated. The second active six-inch line is at a depth of ~49 feet MLLW and needs to be relocated. The two inactive four-inch lines are at a depth of ~47 feet MLLW and need to be removed. Table X provides the disposition of each pipeline.

Table 6-2
Pipeline Disposition

Size	Status	Depth (MLLW)	Action Needed
4-inch	Inactive	~47 feet	Remove
4-inch	Inactive	~47 feet	Remove
6-inch	Active	~49 feet	Relocate
6-inch	Active	>68 feet	No Action

Pursuant to Section 101(a) of the Water Resources Development Act of 1986 (WRDA 86), as amended, the non-Federal Sponsor is responsible for performing, or assuring the performance, of all relocations, including utility relocations, which are necessary for the navigation improvement project. All relocations, including utility relocations, are to be accomplished at no cost to the Federal Government. The estimated cost of the six-inch pipeline relocation is $2 million. This cost is included in the project cost as a 100% non-federal expense and the non-Federal Sponsor will receive equivalent credit toward its additional 10 percent cash payment required by Section 101(a)(4) of WRDA 86.

The two four-inch pipelines do not need to be relocated because they are no longer active. The non-Federal Sponsor has contacted the owner to reach a determination as to whether the owner has an interest in the existing line for which compensation is owed by the non-Federal Sponsor. If the owner has a compensable interest, the non-Federal Sponsor, as part of its requirement to provide lands, easements, and rights-of-way required for the navigation improvement project, will be responsible for acquiring this interest, at no cost to the Federal Government. At this time, it appears that there is no compensable interest in these pipelines.

If there is a compensable interest, the non-Federal Sponsor will receive credit toward its additional 10 percent cash payment required by Section 101(a)(2) of WRDA 86 for the value of the interest acquired, and the Corps will revoke any existing Section 10 permit and remove the line as part of construction of the navigation improvement project, with the costs of the removal shared by the Corps and Sponsor as part of the costs of the general navigation features.

If no compensation is owed to the owner of the line, then the Corps will revoke any existing Section 10 permit and remove the line as part of construction of the navigation project, with the costs of the removal shared by the Corps and non-Federal Sponsor as

part of the costs of the general navigation features. The estimated removal cost for the two four-inch pipelines is $300,000.

The non-Federal Sponsor will receive credit toward its additional 10 percent cash payment required by Section 101(a)(2) for the value of relocations provided under Section 101(a)(3) and for the costs of utility relocations borne by the Sponsor under Section 101(a)(4). Such credit will include any payment made by the Sponsor to the Corps associated with the Corps' exercise of the navigation servitude.

Review Assessment: Comment addressed, but further demonstration of understanding non-Federal responsibilities is needed in the report. Section 101(a)(4) of WRDA 1986 (33 U.S.C. § 2211(a)(4)) requires non-Federal sponsors to perform or assure the performance of all relocations of utilities necessary to carry out Federal navigation improvements. The law apportions payment responsibility between the owner of the utility and the non-Federal sponsor only in the case of utility relocations necessitated by projects with an authorized depth of greater than 45 feet ("deep-draft utility relocations"). For such deep-draft utility relocations, the non-Federal sponsor must bear at least 50 percent of the cost of relocation. Thus, except as to deep-draft utility relocations, whether the non-Federal sponsor owes compensation to the utility owner is determined by principles of just compensation under state law and the terms of any non-Federal permits, licenses, or rights-of-way instruments for the utility. Under section 101(a)(2) of WRDA 1986, the costs borne by the non-Federal sponsor for utility relocations are credited toward the non-Federal sponsor's additional payment of 10 percent of the cost of general navigation features. The amount of credit to be afforded for the total cost of each relocation shall not exceed the amount the Corps determines to be necessary to provide a functionally equivalent facility. The exercise of the navigation servitude to compel relocations of utilities is within the Government's discretion. The Corps will only exercise the navigation servitude to compel relocations for a project under limited circumstances set forth in Director of Civil Works (CECW-P) Policy Guidance Letter No. 44 (27 September 2017), which will not affect the non-Federal sponsor's responsibility for payment of relocation costs under section 101(a)(4) and administrative costs associated with the exercise of the navigation servitude. The report should recognize the non-Federal sponsor's obligation to perform or assure the performance of all relocations of utilities necessary to carry out Federal navigation improvements in accordance with 33 U.S.C. § 2211 and CECW-P Policy Guidance Letter No. 44 (27 September 2017).

Action Taken: The Main Report has been revised to include section 6.4.7 Pipeline Relocation (copied below). In addition, Appendix E: Real Estate Plan includes a discussion of pipeline relocations.

6.4.7 Pipeline Relocation
There are no utility relocations required for the project. As-built drawings for the Carolina Power and Light company and for the Brunswick County, NC display an 8" HDPE waterline and cable in a joint bore at -63 feet MLLW. The waterline and cable

diverge outside of the channel. The existing overhead cable crossing has a vertical clearance of 210 feet, which does not interfere with projected future navigation.

There are four pipelines crossing the channel in the Fourth East Jetty Reach just south of Eagle Island that are owned by Exxon Mobile with the operation and maintenance of the pipelines contracted to Kinder Morgan. Two pipelines are active but currently have no commercial flow. These two pipelines are six-inch nominal diameter and are currently pressurized with nitrogen awaiting future business opportunities. Two pipelines are not active. These two pipelines are four-inch nominal diameter, filled with sea water and capped. One of the active six-inch lines is directionally drilled to a depth in excess of 68 feet MLLW and does not need to be relocated. The second active six-inch line is at a depth of ~49 feet MLLW and needs to be relocated. The two inactive four-inch lines are at a depth of ~47 feet MLLW and need to be removed. Table 6-8 provides the disposition of each pipeline.

Table 6-8
Pipeline Disposition

Size	Status	Depth (MLLW)	Action Needed
4-inch	Inactive	~47 feet	Remove
4-inch	Inactive	~47 feet	Remove
6-inch	Active	~49 feet	Relocate
6-inch	Active	>68 feet	No Action

Pursuant to Section 101(a) of the Water Resources Development Act of 1986 (WRDA 86), as amended, the non-Federal Sponsor is responsible for performing, or assuring the performance, of all relocations, including utility relocations, which are necessary for the navigation improvement project. All relocations, including utility relocations, are to be accomplished at no cost to the Federal Government. The estimated cost of one six-inch pipeline relocation is $2,000,000. This cost is included in the project cost as a 100% non-federal expense and the non-Federal Sponsor will receive equivalent credit toward its additional 10 percent cash payment required by Section 101(a)(4) of WRDA 86.

The two four-inch pipelines do not need to be relocated because they are no longer active. The non-Federal Sponsor has contacted the owner to reach a determination as to whether the owner has an interest in the existing line for which compensation is owed by the non-Federal Sponsor. If the owner has a compensable interest, the non-Federal Sponsor, as part of its requirement to provide lands, easements, and rights-of-way required for the navigation improvement project, will be responsible for acquiring this interest, at no cost to the Federal Government. At this time, it appears that there is no compensable interest in these pipelines.

If there is a compensable interest, the non-Federal Sponsor will receive credit toward its additional 10 percent cash payment required by Section 101(a)(2) of WRDA 86 for the

value of the interest acquired, and the Corps will revoke any existing Section 10 permit and remove the line as part of construction of the navigation improvement project, with the costs of the removal shared by the Corps and Sponsor as part of the costs of the general navigation features.

If no compensation is owed to the owner of the line, then the Corps will revoke any existing Section 10 permit and remove the line as part of construction of the navigation project, with the costs of the removal shared by the Corps and non-Federal Sponsor as part of the costs of the general navigation features. The estimated removal cost for the two four-inch pipelines is $300,000.

The non-Federal Sponsor will receive credit toward its additional 10 percent cash payment required by Section 101(a)(2) for the value of relocations provided under Section 101(a)(3) and for the costs of utility relocations borne by the Sponsor under Section 101(a)(4). Such credit will include any payment made by the Sponsor to the Corps associated with the Corps' exercise of the navigation servitude. At this time there is no indication that the exercise of navigation servitude will be required.

OASACW/HQUSACE Final Assessment: Comment **resolved**, except as to statements regarding the non-Federal sponsor receiving credit for lands, easements, rights-of-way, and relocations provided toward its additional 10 percent payment, per the new legal comment (#6) below.

5. Real Estate Plan

Concern: There is no Real Estate Plan (REP).

Basis of Concern: Section 12-16(b) in Chapter 12 of ER 405-1-12 specifies that "A REP must be prepared in support of decision documents for all types of water resources projects whether full Federal or cost shared, specifically authorized or continuing authority. The level of detail required for each item described in subparagraph c below will vary depending on the scope and complexity of each project."

Significance of Concern: *High. The significance of this concern is high because it describes a fundamental problem with the project that could affect the recommendation, success, or justification of the project.*

Action Needed to Resolve the Concern: A REP consistent with the requirements of Section 12-16(c) in Chapter 12 of ER 405-1-12 should be added to the report. Per the guidance from Section 12-16(c), the Real Estate Plan must identify a number of requirements, such as "a description of the LER required for the construction, operation and maintenance of the project including those required for relocations, borrow material and dredged or excavated material disposal." The Corps recognizes that if it is doing the construction for the project, no land must be acquired for the dredging itself, but the

Mitigation, Monitoring, and Adaptive Management Plan is missing a number of requirements relating to the lands needed for mitigation that would be in the REP.

Sponsor Response:

Path to resolution: A real Estate Plan will be developed based on the outcome of mitigation planning. We purposely did not include a mitigation plan because mitigation is the only aspect of the plan with any real estate effects.

Response: A Real Estate Plan (REP) is being developed that identifies and describes the lands, easements, and rights-of-way (LER) required for the construction, operation and maintenance of the proposed project, including those required for relocations and mitigation. The REP also identifies and describes the facility/utility relocations that are necessary to implement the project. Further, the REP describes the estimated LER value, together with the estimated administrative and incidental costs attributable to providing project LER, and the acquisition process.

Review Assessment: Comment is unresolved until a Real Estate Plan in compliance with the requirements of paragraph 12-16 in Chapter 12 of ER 405-1-12 has been completed and reviewed.

Action Taken: A preliminary Real Estate Plan has been developed and is presented in Appendix E: Real Estate. The Real Estate Plan will be finalized during development of the DEIS at such time that the mitigation plan is finalized and final real estate acquisition requirements have been determined.

OASACW/HQUSACE Final Assessment: Comment is resolved; however, see following comments in regard to policy compliance with ER 405-1-12.

6. Real Estate Costs

Concern: The report (e.g. pp. ES-9, 174, 310) and Real Estate Plan in Appendix Estate that the non-Federal sponsor will receive credit for lands, easements, rights-of-way, and relocations required for mitigation toward the additional 10 percent payment required pursuant to section 101(a)(2) of the Water Resources Development Act (WRDA) of 1986, as amended (33 U.S.C. 2211(a)(2)).

Basis of Concern: In accordance with section 906(c) of WRDA 1986, as amended (33 U.S.C. 2283(c)), costs incurred for implementation and operation, maintenance, and rehabilitation of mitigation, including for lands, easements, rights-of-way, and relocations, shall be allocated among the authorized project purposes that caused the requirement for mitigation, and shall be cost-shared as construction costs to the same extent as project costs allocated to those purposes. See also ER 1105-2-100, Appendix C, Section C-4, “Mitigation Planning.” The Real Estate Plan in Appendix E to the draft report states that all real estate acquisition for the recommended plan is a component of the preliminary mitigation plan. Thus, the costs for all lands, easements, rights-of-way,

and relocations for this project should be included in the mitigation costs for the general navigation features. All lands, easements, rights-of-way, and relocations associated with mitigation will be considered construction costs that are cost-shared and not creditable against the additional 10 percent of construction costs required by section 101(a)(4) of WRDA 1986. Only any lands, easements, rights-of-way, and relocations required for the general navigation features or dredged material disposal facilities for the project are creditable toward the additional 10 percent payment. See 33 U.S.C. 2211(a)(2). The non-federal sponsor remains responsible for providing all lands, easements, rights-of-way, and relocations required for mitigation regardless, however. See ER 1105-2-100, Appendix C, Section C-4.

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

7. Access/Staging Areas

Concern: In Paragraph 8 of the REP, it is unclear when the areas for the access/staging areas were already provided, and whether this refers to the general navigation features or mitigation.

Basis for Concern: Inadequate information or detail provided in the report.

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

8. Black River Wetland Mitigation Site

Concern: It is unclear from the REP if any features will be built on Black River Wetland Mitigation Site, and therefore whether the real estate interests are sufficient.

Basis for Concern: Paragraph 12-16(c)(2) in Chapter 12 of ER 405-1-12 states that "[f]or each project purpose and feature," the REP must include "description of the LER required for the construction, operation and maintenance of the project including those required for relocations, borrow material and dredged or excavated material disposal. This information should include acreage, estates, number of tracts and ownerships, and estimated value. The total acreage will be broken down as to fee and the various types and duration of easements required. Information should also be included regarding the extent that project LER is owned by private parties, by the non-Federal sponsor if applicable, and by other public entities. If the project will have more than one stage or phase, then the acreage will be further broken down by stage or phase consistent with the description of the project contained in the main report."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

9. Dredged Material

Concern: The REP does not explain why no real estate is needed to deposit the dredged material, or where the dredged material will be placed.

Basis for Concern: Paragraph 12-16(a) in Chapter 12 of ER 405-1-12 states the REP "identifies and describes the lands, easements and rights-of-way (LER) required for the construction, operation and maintenance of a proposed project, including those required for relocations, borrow material, and dredged or excavated material disposal."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

10. Publicly Held Lands

Concern: The REP does not include a description of how the publicly held lands will be acquired.

Basis for Concern: Paragraph 12-16(c)(13) in Chapter 12 of ER 405-1-12 requires the REP to include " [f]or cost shared projects, a thorough assessment of the non-Federal sponsor's legal and professional capability and experience to acquire and provide the LER for the construction, operation and maintenance of the project, including its condemnation authority and quick-take capability. The Capability Assessment checklist, included as Appendix 12-E to this chapter, must be completed and included as part of the REP. This paragraph should also indicate that the non Federal sponsor has been advised of P.L. 91-646 requirements and the requirements for documenting expenses for credit purposes. If it is proposed that the Government will acquire project LER on behalf of the non Federal sponsor, the REP must fully explain the reasons for the Government performing such work. See paragraph 12-34 for information regarding acquisition by the Government on behalf of a non-Federal sponsor."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

11. Privately versus Publicly Held Lands

Concern: It is unclear from Table 1 which parcels are privately held and which parcels are publicly held.

Basis for Concern: Paragraph 12-16(c)(2) in Chapter 12 of ER 405-1-12 states that “[f]or each project purpose and feature,” the REP must include “description of the LER required for the construction, operation and maintenance of the project including those required for relocations, borrow material and dredged or excavated material disposal. This information should include acreage, estates, number of tracts and ownerships, and estimated value. The total acreage will be broken down as to fee and the various types and duration of easements required. Information should also be included regarding the extent that project LER is owned by private parties, by the non-Federal sponsor if applicable, and by other public entities. If the project will have more than one stage or phase, then the acreage will be further broken down by stage or phase consistent with the description of the project contained in the main report.”

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

12. Mitigation Land Ownership

Concern: It is not clear which agency owns the federally-owned land needed for mitigation, or how many parcels of land it owns. Also, the REP does not explain if there is an existing Federal project there.

Basis for Concern: Paragraph 12-16(c)(6) in Chapter 12 of ER 405-1-12 states, in relation to “federally owned land included within the LER required for the project[,] that “[i]f there is such land, the REP must also describe the purpose for which the land is required for the project; the identity of the managing agency for the land, the acreage and estate owned by the United States, and the acreage and estate required for the project; the views of the local representative of the managing Federal agency as to use for the project; and the acquisition plan for acquiring the required real property interests or other possessory rights. (Note: for interchange of national forest land, see 16 U.S.C. §505a).” Additionally, Paragraph 12-16(c)(5) in Chapter 12 of ER 405-1-12 requires the REP to include "[w]hether there is an existing Federal project that lies fully or partially within the LER required for the project. If so, the REP must also briefly describe the existing project; the extent of overlap of the two projects; the identity of the sponsor, if any, of the existing project; whether the LER that supports the existing project was previously provided as an item of local cooperation for such project; the owner of the LER that supports the existing project; the nature of the estate(s) owned; and the sufficiency and availability of the existing estate(s) for the new project."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

13. Eagle Island CDF

Concern: It is not clear which parcels will be used to construct the Eagle Island CDF by USACE.

Basis for Concern: Paragraph 12-16(c)(2) in Chapter 12 of ER 405-1-12 states that "[f]or each project purpose and feature," the REP must include "description of the LER required for the construction, operation and maintenance of the project including those required for relocations, borrow material and dredged or excavated material disposal."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

14. Navigation Servitude

Concern: There is no discussion of navigation servitude.

Basis for Concern: Paragraph 12-16(c)(7) in Chapter 12 of ER 405-1-12 requires the REP to include "[t]he extent, if any, that the LER required for the project lies below the ordinary high water mark, or the mean high water mark, as the case may be, of a navigable watercourse together with a brief discussion of whether the navigation servitude is available and will be exercised for project purposes. See paragraph 12-7 of this chapter for further discussion. Any proposed deviations from this policy or questions as to the availability of the navigation servitude should be identified as early as possible in the study phase and forwarded for resolution to CERE-AP who will coordinate with appropriate HQUSACE elements."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

15. Zoning

Concern: There is no discussion of zoning.

Basis for concern: Paragraph 12-16(c)(14) in Chapter 12 of ER 405-1-12 requires the REP to include "[i]f application or enactment of zoning ordinances is proposed in lieu of, or to facilitate, acquisition in connection with the project, a discussion of the type of ordinance, its intended purpose, and whether application or enactment and enforcement of the ordinance will result in a taking of a real property interest for which compensation must be paid."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

16. Land Acquisition

Concern: There is no schedule for land acquisition milestones.

Basis for Concern: Paragraph 12-16(c)(15) in Chapter 12 of ER 405-1-12 requires the REP to include "[a] reasonable and detailed schedule of all land acquisition milestones, including LER certification. The dates reflected in the schedule must be agreed upon by Real Estate, the PM and the non-Federal sponsor, if any."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

17. Impacts on RE Acquisition Process

Concern: Paragraph 18 addresses HTRW and "Other Environmental Contaminants," but does not include a "concise discussion of the impacts on the real estate acquisition process and the LER value estimate due to known or suspected presence of contaminants that are located in, on, under, or adjacent to the LER required for the construction, operation or maintenance of the project including LER that is subject to the navigation servitude."

Basis for Concern: Paragraph 12-16(c)(17) in Chapter 12 of ER 405-1-12 requires the REP to include "[a] concise discussion of the impacts on the real estate acquisition process and the LER value estimate due to known or suspected presence of contaminants that are located in, on, under, or adjacent to the LER required for the construction, operation or maintenance of the project including LER that is subject to the navigation servitude. See paragraph 12-37g of this chapter and Chapter 4 of this regulation for information on appraisal assumptions for contaminated lands. The discussion must include the status of the district's investigation for such contaminants, whether such contaminants are regulated under the Comprehensive Environmental Response, Compensation and Liability Act, as amended, 42 U.S.C. §9601 et seq., (CERCLA); other Federal statutes [e.g., the Resource Conservation and Recovery Act, as amended, 42 U.S.C. §6921 et seq.(RCRA)]; or specified state law. In the alternative, the status of the districts investigation may be included by referencing to a specific report section that contains such information. The REP must also disclose whether clean-up or other response actions of non-CERCLA regulated material will be required to implement the project and, if the project is cost shared, who will be responsible for performing, and paying the costs of performing such work, as between the Government and the non-Federal sponsor."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

18. Support/Opposition for project

Concern: There is no discussion of the anticipated support or opposition to the project.

Basis for Concern: Paragraph 12-16(c)(18) in Chapter 12 of ER 405-1-12 requires the REP to include "[a] discussion of known or anticipated support for, or opposition to, the project by landowners in the project area and any known or anticipated landowner concerns related to issues that could impact the acquisition process (e.g., selection of estates, willing seller provisions, amount of acreage)."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

19. Relocation of Utilities

Concern: Based on the discussion in Paragraph 17 of the REP, it is not clear whether the non-Federal Sponsor is aware of the requirements explained in Policy Guidance Letter 44 Revisions – Relocation of Utilities at Navigation Projects Under Section 101 of the Water Resources Development Act (WRDA) of 1986, as Amended, dated 27 September 2017. Depending on whether the non-Federal sponsor constructs the project under Section 204 of WRDA 1986, this may change the requirements under this guidance.

Basis for Concern: See full text of Policy Guidance Letter 44 Revisions – Relocation of Utilities at Navigation Projects Under Section 101 of the Water Resources Development Act (WRDA) of 1986, as Amended, dated 27 September 2017.

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

20. Condemnation Authority

Concern: It is not clear if the non-Federal Sponsor has condemnation authority or quick-take capability to acquire the lands needed for mitigation if the landowners are not willing to sell. Paragraph 11.2 also mentions conservation easements, but does not explain how this real estate interest is sufficient for this purpose, and does not address the possibility of a non-standard estate.

Basis for Concern: Paragraph 12-16(c)(13) in Chapter 12 of ER 405-1-12 requires the REP to include "a thorough assessment of the non-Federal sponsor's legal and professional capability and experience to acquire and provide the LER for the construction, operation and maintenance of the project, including its condemnation authority and quick-take capability. The Capability Assessment checklist, included as Appendix 12-E to this chapter, must be completed and included as part of the REP."

Paragraph 4 in Real Estate Policy Guidance Letter No. 31-Real Estate Support to Civil Works Planning, dated 11 January 2019 states “[a]s outlined in reference g., the minimum interests in real property necessary to support various types of projects must be identified.” Paragraph 12-9 in Chapter 12 of ER 405-1-12 states that fee title is generally required for "fish and wildlife mitigation lands, ecosystem restoration, and other environmental purposes. However, a lesser, or easement estate, may be appropriate based on the extent of interest required for the operation or requirements of a project." Paragraph 12-16(c)(4) in Chapter 12 of ER 405-1-12 requires the REP to include "[c]opies of proposed non-standard estates, if available, together with adequate justification therefor if approval of such estates is desired through approval of the decision document for the project."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

21. Percentage of Total Cost

Concern: It is unclear from the REP what percentage of the total project costs is the value of real estate. Table 3 calculates the total LERRDs cost, but does not say what percentage of total project cost this is.

Basis of the Concern: Paragraph 4(a)(1) in Real Estate Policy Guidance Letter No. 31-Real Estate Support to Civil Works Planning, dated 11 January 2019, states that “[f]or projects in which the value of real estate (lands, improvements, and severance damages) are not expected to exceed 15 percent of total project costs (total cost to implement project), a cost estimate (or rough order of magnitude) will be acceptable for purposes of the feasibility phase.” The non-Federal sponsor should verify what percentage of the total project costs is the value of real estate so that the review team can determine if a cost estimate is sufficient, or a brief or full gross appraisal is required under Paragraph 4(a)(2) or Paragraph 4(a)(3). Additionally, this percentage will help determine whether a preliminary opinion of compensability must be performed in lieu of a real estate assessment. Paragraph 4b of Real Estate Policy Guidance Letter No. 31-Real Estate Support to Civil Works Planning, dated 11 January 2019, states (some formatting of the original document has been modified to insert language):
"As described in paragraph 12-17 of Chapter 12, utility/facility relocations may require preliminary attorney's opinions of compensability. While the practice of obtaining preliminary attorney's opinions of compensability provides a high degree of certainty with regard to project costs during the feasibility phase, attorney's opinions can, in some cases be performed at later stages of the civil works planning process. This is particularly true when, considering the risks involved, such opinions may provide more certainty than may be optimal for feasibility purposes when potential utility/facility relocation costs do not constitute a large percentage of total project costs. In support of the goals set out for delivery of civil works, Districts may adhere to the following guidance:

(1) Where the estimated total cost to modify all project utility/facility relocations, including the value of any additional lands that may be required to perform the relocations does not exceed 30 percent of estimated total project costs, the District Office of Real Estate may, in lieu of an attorney's opinion of compensability prepare a real estate assessment. Such a real estate assessment, will address the following two questions: (a) Is the identified utility/facility generally of the type eligible for compensation under the substitute facilities doctrine (e.g., school, highway, bridge, water and sewer systems, parks, etc.)? (b) Does the District have some valid data or evidence that demonstrates that it has identified an owner with a compensable interest in the property? For a commercial navigation project, a third question must also be addressed: (c) Is the project a navigation project with a channel depth of 45 feet or less? If the answers to all the relevant questions above are yes, the District Office of Real Estate shall reflect the cost of providing a substitute facility in the REP and all other feasibility study cost estimates. If the answer to any of the relevant questions is no, the District shall not reflect the cost of a substitute facility as a LERRD or LERR cost in the REP or other real estate feasibility study cost estimates. Those costs would instead be reflected elsewhere in the planning documents as construction costs. However, the REP narrative should still include a discussion on the utility/facility with results of analysis and project impact. For cost shared projects, the non-federal sponsor must be advised that the inclusion of substitute facilities costs in the REP or other use feasibility study estimates is for planning and budgeting purposes only and does not constitute a preliminary or final determination of compensability by the agency regardless of whether the cost of substitute facilities are reflected in the feasibility study documents. Using a real estate assessment does not eliminate the need to obtain a final attorney's opinion of compensability prior to execution of the Project Partnership Agreement. (2) Where the estimated total cost to modify all project utility/facility relocations, including the value of any additional lands that may be required to perform the relocations, has public or political significance, the proposed project is a deep draft project, or the costs exceed 30 percent of estimated total project costs, a preliminary opinion of compensability shall be prepared for each owner's facilities. In addition, when significant controversy, unusual circumstances, or potential for litigation exists, the District Office of Real Estate may obtain a preliminary attorney's opinion of compensability even though the criteria in 4.b(1) above would not otherwise require one. The level of documentation for each relocation item should be based on the significance of the relocation item to project formulation and estimated project costs."

OASACW/HQUSACE Final Assessment: The Real Estate Plan does not adequately address USACE policy contained in Chapter 12 of Engineering Regulation (ER) 405-1-12. A revised Real Estate Plan will be required before construction of the project.

Appendix B – Agency Technical Review Documentation

See Excel spreadsheet