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

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.

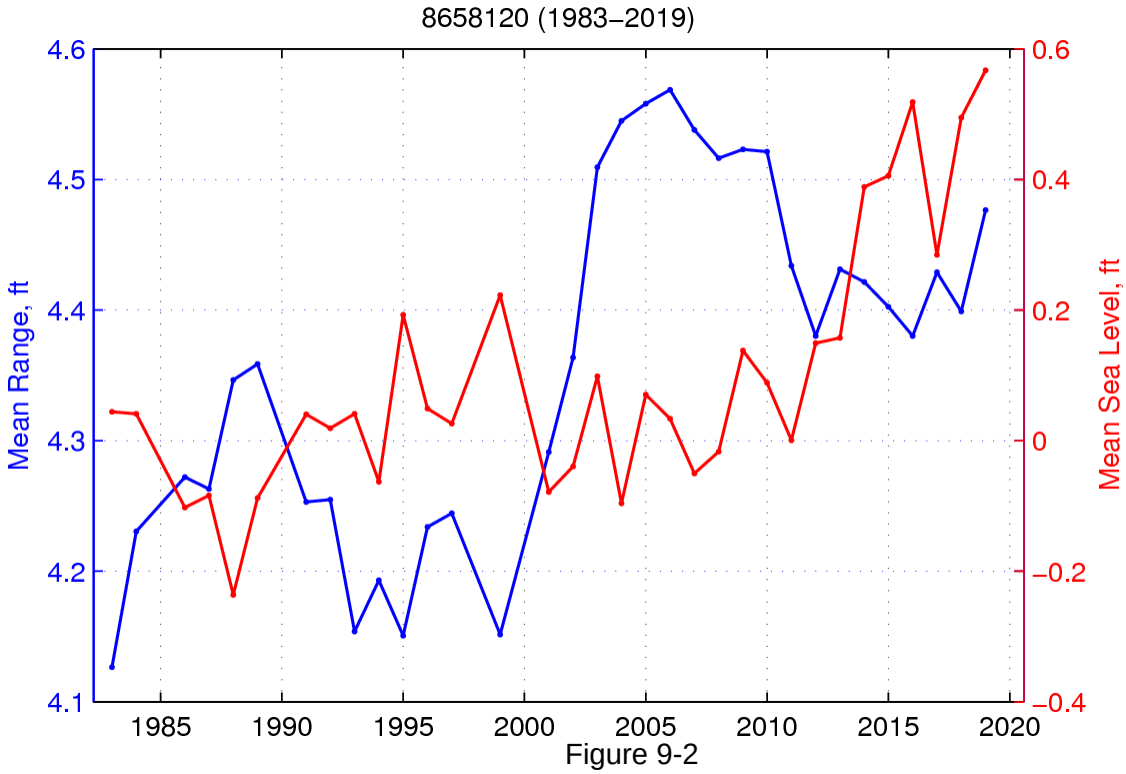

Figure 9-2
Variability of Mean Tidal Range Based on Annual Data

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

Wilmington Harbor 203

id	Comment Text	Discipline	Review Comment	Explanation (What is Missing) if Response Does NOT Address the Comment
8122210	Assuming throughput will be unchanged is questionable when quantifying potential impacts to adjacent shorelines. The assumption conficts with section 2.2.1 of the economic appendix which states the intent of the improvement program is to increase throughput capacity to 1.1 million TEU's by 2025. Even if this assumption is valid for container ships, smaller vessels will be able to transit the new channel dredge dimensions at the same frequency at potentially an alignment that is closer to the shoreline which may result in increased erosion. These impacts should be evaluated in the analysis.	Civil	Response DOES NOT Address the Comment	No modification to the report have been made. The second response still seems to indicate that analysis will be pushed to PED which is not acceptable for quantifying impacts for NEPA and mitigation.
8122242	Limiting draft to 38' without tide restrictions does not represent worst case scenario. Are there currently vessels that call on the port with tide restrictions that draft greater than 38'? If so, this case should be evaluated in the ship wake analysis. Similar, the future larger container ship should be assumed to call the port in a tide restriction condition to evaluate potential shoreline impacts.	Civil	Response DOES NOT Address the Comment	No modification to the report have been made. The second response still seems to indicate that analysis will be pushed to PED which is not acceptable for quantifying impacts for NEPA and mitigation. We have been told these additional investigations would be done verbally only.
8122269	The included ship wake analysis and vessel traffic assumptions (which appear too low draft/frequency) appear to have sufficient wave height and shear stress increases to produce shoreline erosion within the limited analysis area included in the report. The scope of the analysis along the river deepening appears too limited and should be more inclusive of the project limits. There is no evaluation of the bird disposal islands and potential erosion to them, fate of the eroded sediment and from what I can find no inclusion of the maintenance cost associated with this erosion. Island and shoreline erosion should be more comprehensively evaluated and associated costs reflected in the cost analysis and economic evaluation.	Civil	Response DOES NOT Address the Comment	No modification to the report have been made. The second response still seems to indicate that analysis will be pushed to PED which is not acceptable for quantifying impacts for NEPA and mitigation. We have been told these additional investigations would be done verbally only.
8122271	The assumptions of vessel tracking is too limited. A sensitivity of vessel tracking should be included to assume worst case scenario tracks and the associated shoreline impacts rather than limiting the tracking to the modeled high traffic areas.	Civil	Response DOES NOT Address the Comment	No modification to the report have been made. The second response still seems to indicate that analysis will be pushed to PED which is not acceptable for quantifying impacts for NEPA and mitigation. We have been told these additional investigations would be done verbally only.
8122277	Relative comparisons of ship wake modeling within Xbeach is insufficient for this report. The model should be calibrated to existing shipping induced traffic water levels to ensure that potential impacts to shorelines along the river and bird/disposal islands are properly evaluated and captured in the cost/economic evaluations.	Civil	Response DOES NOT Address the Comment	No modification to the report have been made. The second response still seems to indicate that analysis will be pushed to PED which is not acceptable for quantifying impacts for NEPA and mitigation. We have been told these additional investigations would be done verbally only.
8122301	An erosional hotspot has been a concern along Oak Island linked to the recent dredging activity from Jay Bird shoals where material was placed along Bald Head Island as part of the terminal groin construction. This spot is relatively close to the station "gencade33" where there is some modeled change in wave height with the proposed alignment. A closer look at the shoreline impacts associated with this project should be considered and potential costs associated with this should be included in the cost/economic evaluation.	Civil	Response Addresses the Comment	Comment addressed sufficiently
8122314	Recommend including information on the evaluation of the grid size used in the Delft models. Was a sensitivity of grid size alternatives or a grid convergence test conducted to ensure the appropriate grid was being used?	Civil	Response Addresses the Comment	Comment addressed sufficiently
8122337	Applying slope to offshore boundary indicated some issue with model stability/functionality. Please expand on what slope was used, why and how this impacts model calibration.	Civil	Response Addresses the Comment	Comment addressed sufficiently
8122352	The salinity report should include a comparison of existing conditions to with project conditions just after construction is completed in addition to the FwP vs. FwoP 2077 conditions with SLR. The report should address the immediate salinity impacts	Civil	Response DOES NOT Address the Comment	No modification to the report have been made. The applicant says additional analysis will be performed during DEIS, but I cannot verify this at this time.
8122355	The expansion of the model domain to include tributaries along the Cape Fear River appears to be an afterthought. The salinity comparison is of limited value since there is no calibration or sampling (long duration water quality salinity measurements) within the creeks to determine existing conditions. Recommend re-evaluation of the salinity model within these areas to include proper salinity measurement campaign and model calibration.	Civil	Response DOES NOT Address the Comment	No modification to the report have been made. The applicant says additional analysis will be CONSIDERED during DEIS. The applicant has verbally stated they would obtain surveys and sample one creek. Then model the reminder of the model domain and justify their approach. This has not been done or reviewed by USACE.
8122362	It is unclear if modeled bathymetry includes channel slope or just deepening. Side slopes should be accurately updated.	Civil	Response Addresses the Comment	Comment addressed sufficiently
8122368	Why is high SLR evaluated? The rest of the report evaluated low SLR, however intermediate may be more appropriate. The report should be consistent.	Civil	Response Addresses the Comment	Comment addressed sufficiently
8123984	Concern: The low flow river conditions used in the numeric models to evaluate water quality, estuarine salinity and tidal creek impacts of the WHNIP do not stress the system adequately. No statistics or frequency analysis of the model low flow conditions were provided. The study did not address climate change impacts on flow conditions. Basis of Concern: The low flow conditions used in the WHNIP models were based on 2011 USGS flow records of the Cape Fear, Northeast Cape Fear, Black and Waccamaw Rivers to generate a representative one-year low flow hydrograph. The 2011 average annual flow for the rivers was a low flow year but put significantly more stress on the system. The low flow hydrographs provided in Tables 5-5, 5-6 and 5-7 may be underestimating salinity impacts in the upper reaches. The model inflows used a varying one year hydrograph in 2-week blocks with a 42 day continuous low flow of 883 cfs (25 cms) on the Cape Fear, 106 cfs on the Black River and 141 cfs on the Northeast Cape Fear. In the fall of 2007 USGS recorded flows had a 122 day average flow of 802 cfs on the Cape Fear, 10 cfs on the Black River and 9 cfs on the Northeast Cape Fear. The UNCW Wilmington Harbor monitoring report noted the highest recorded salinity levels at the upstream stations during six months in 2007. The average flow at the Waccamaw gage from June to December in 2011 was 130 cfs while in 2007 it was 6.8 cfs. Significance: High Action Needed to Resolve: Recommend model simulations using 2007 low flow conditions. Results can be compared to the 2007 UNCW measured salinity dataset for verification. A frequency analysis of the low flow duration and return period should be included and impacts of climate change on drought conditions in the Cape Fear Basin should be addressed.	Hydraulics	Response DOES NOT Address the Comment	The freshwater inflows used in the estuarine analysis does not stress the system as was experienced on the Cape Fear Rive and Northeast Cape Fear River in 2007. There is readily available data on that water year from UNCW on the Cape Fear River to evaluate the salinity impacts and the Project.
8123986	Concern: Project salinity impacts within the tidal creeks might be underestimated or inadequately studied. The freshwater runoff into the modeled tidal creeks may be overestimated and may not accurately represent flows as experienced during recent droughts in southeast NC. The absence of flow and salinity data collected in the tidal creeks prevents a better estimate of freshwater inflows or calibration of tidal creek model. Basis of Concern: The Tidal Creek Salinity Conclusion Section states salinity levels within the tidal creeks is highly sensitive to decreased freshwater flow inputs. Section 6.1.3.3 describes freshwater inflows as being redistributed from the full estuarine model within each tidal creek subbasin. Inflows from the full model were estimated using a ratio of watershed areas with flows recorded at the Waccamaw River gage. The Waccamaw gage watershed is 680 sq mi and includes large pocosins. Relating the large Waccamaw watershed to the Lilliput 16 sq mi watershed may not be accurate. No freshwater inflow hydrographs were provided and there was also no statistical analysis for the low flow provided. The Waccamaw 2011 USGS gage data was used to represent a low flow condition year in the project evaluation but may not have stressed the system enough compared to recent low flow years. The average flow from June to December flow at Waccamaw and in 2011 was 130 cfs and in 2007 it was 6.8 cfs while from September to December 2007 the average flow was 1.9 cfs. Significance: High Action Needed to Resolve: Prepare a better estimate of freshwater inflows into the tidal creeks based on a field data collection to calibrate the model. Provide a sensitively analysis of freshwater inflows to increase salinity along with statistics. Recommend running the full estuarine and tidal creek model low flow	Hydraulics	Response DOES NOT Address the Comment	The freshwater inflows used in the Tidal Creek Salinity analysis does not stress the system as was experienced on the Cape Fear River in 2007 and with the Waccamaw Gage. There is readily available data on that water year from UNCW on the Cape Fear River.
8123989	Concern: The water quality model calibration was for a relatively short period, from Aug 7 to Sep 15 2017. From the calibration graphs provided in Appendix C-1 many of the calculated curves overlap only one or two measured data points. Total Kjeldahl Nitrogen and phosphate PO4 did not appear to calibrate well. The calculated dissolved oxygen did not replicate changes with the tide cycle at most reference locations. The model validation suffers from the same lack of measure data points. The lack of rigorous model calibration and validation may not have produced a model capable of evaluating the WHNIP under varying riverine flows, boundary loadings, point source loadings, climate conditions and oxygen demands. Basis of Concern: The calibration graphs provided in Appendix C-1 show measured data for water quality parameters were available from July to mid-October 2017. The calibration was only from Aug 7 to Sep 15. Numerous calibration graphs have calculated results for the model time window available for only one measured data point. Extending the calibration run into October may have coincided with four additional measured points (example Chl a and PO4 plots). Is there an impact to the calibration statistics with a longer model run with more measured data points? The majority of the model validation graphs in Appendix C-2 do not have a measured water quality data point that coincides with the computed model time window. The trends in the calculated results also do not accurately extend out to measured data beyond the modeled time window (see graphs on pages 938, 930, 938, 945, 949, 957 in file "WHNIP Sec 203 Appendix A Engineering Sub Appendices 06-28-19.pdf") Significance: High. Action Needed to Resolve: Recommend a USACE subject matter expert review the adequacy of the water quality field data collection effort and a thorough review the DEWAQ model development and calibration.	Hydraulics	Response Addresses the Comment	As in the original review comment, recommend someone currently within the USACE with a water quality modeling background to review field data collection, water quality modeling calibration and results.
8124165	Recommend including a section in the report that discusses climate change and the potential impacts to the project. Climate change should be included in the project analysis throughout the document, in particular salinity, water quality, and ship wake analysis where assumptions are made regarding future discharge rates and water levels. The most recent Corps' guidance is Engineering and Construction Bulletin No. 2018-14. http://www.wbdg.org/FFC/ARMYCOE/COEECB/ecb_2018_14.pdf	Civil	Response Addresses the Comment	N/A

id	Comment Text	Discipline	Review Comment	Explanation (What is Missing) if Response Does NOT Address the Comment
8126953	Concern: Estimates of ship wave impacts along the riverbank might not be accurate. No field data was collected of vessel generated wave energy along the Cape Fear River. There was no calibration of the vessel wave model used to evaluate impacts of vessel waves on the shoreline. Basis for Concern: Measured ship wakes would allow calibration and validation of model results and justify any conclusions. Erosion of the shoreline from vessel generated waves has been on ongoing problem along the lower Cape Fear River. Significance: High Action Needed to Resolve: Conduct a field data collection effort using a suite of pressure sensors at locations of known shoreline erosion hot-spots.	Hydraulics	Response DOES NOT Address the Comment	There was no field data to calibrate the vessel wake model and the results were not verified. There are also additional locations along the River with were not evaluated for vessel wake impacts and the cost needed to protect the eroded shoreline and property.
8127479	Overflow from the dump scow is briefly mentioned under section 6.4.1 Pre-treatment Methods but is not addressed in other sections of the document. Concern: The report needs to address impacts from overflow of scows (during loading) in different reaches of the CFR and acknowledge that overflow is not acceptable by the EPA (under Section 103) during transport to the ODMDS. Recommendation: Address overflow of scows under section 8.11.2.4 and throughout the document as needed. Otherwise, the document should clearly state that overflow of scows during loading will not occur.	Environmental	Response Addresses the Comment	N/A
8127481	It is clearly stated that advanced maintenance is not proposed for the project but then it is suggested in the avoidance and minimization measures (8.25.1). If advanced maintenance is not proposed then it's recommended that it be removed from A&M measures (8.25.1).	Environmental	Response Addresses the Comment	N/A
8127485	Channel width increases are not explained or justified in the main report. Recommend a better explanation of how various proposed widths were determined, and how those widths compare to existing and alternative widths.	Environmental	Response Addresses the Comment	This will be addressed in full during PED.
8127488	The recommended plan suggests thin layer placement of dredged material at the lower end of the CFR (Battery, Shellbed and Striking Islands) and shoreline placement onto Battery Island. These are not prior-approved placement areas for dredged material. Recommendation: Ensure that costs for permitting and construction have been considered for these placement suggestions.	Environmental	Response Addresses the Comment	N/A
8127509	ENVIRONMENTAL WINDOWS proposed: "The current proposed construction schedule assumes that all dredging will be performed during the dredging work windows that occur annually from June 15 through February 15. CU blasting will be limited to October 1 through February 15" (pg 157). "inlet and estuarine dredging operations under the TSP would adhere to the standard and anadromous fish windows, thereby avoiding peak larval ingress periods." (pg 190) "Project construction activities would adhere to the Standard (1 April – 30 September) and Anadromous (1 February – 30 June) fish moratoria established by the NCDMF, thereby limiting the exposure of estuarine-dependent and anadromous species to potential sediment suspension effects." (pg 191) "All dredging will be performed within the voluntary environmental windows established by the USACE (USACE 2017)." (pg 252) Concern: It is not clearly stated in the main report what environmental window(s) applies to which portion(s) of the project. The majority of windows allow for work to occur during the months of December - February. Was this considered in the proposed construction schedule Table 6-6? Recommend: Provide a table of windows and their purposes. The table should explain what time of year dredging and placement is to occur and in what locations. The specific type of dredge (mechanical, pipeline or hopper) to be used should also	Environmental	Response Addresses the Comment	N/A
8127513	Shoreline Erosion (Section 8.2) only takes BHI and Oak Is into account and does not consider effects on shorelines along the lower Cape Fear River. The text indicates that larger ships will have an increased bed sheer stress x3, however it is predicted that fewer ships will call on port in the future. This prediction does not appear to be supported by data. Concern: Deepening and widening of the channel will have a direct effect on the stability of the CFR shoreline. PPX3 vessels will eventually frequent the port as regularly as current vessels, thus creating more larger and frequent ship wakes. Recommendation: The Main Report must take into consideration that shorelines along the CFR already experiencing erosion from ship wakes will experience greater wave energy under the proposed project which likely will affect mitigation requirements. Reference comment 8126953 addressing vessel wakes and need for field data collection on erosion hotspots. Revisions will need to be made to the impact analysis based on this new data.	Environmental	Response Addresses the Comment	N/A
8127514	Soft Bottom Benthic Communities (Section 8.10) – This section gives no relevance to effects of dredging in proposed deepened or newly dredged areas. It assumes effects are temporary and that opportunistic species will return quickly; it does not assume a permanent change in habitats. Recommendation: More documentation and emphasis on habitat loss is needed throughout the main report where slopes are interfacing with shallow bottom habitat and where new dredging is proposed to occur.	Environmental	Response Addresses the Comment	N/A
8127517	The report needs to identify/classify where soft, hard, shell, SAV bottoms exist within the project area before claiming negligible effects. Stating that "SAV beds are apparently absent" based on comms with one NCDMF employee and ground-truthing efforts outside of the impact areas does not constitute their absence from the project area. Recommendation: Provide more/better analysis of potential shell, SAV and hard bottom habitats within the project area.	Environmental	Response Addresses the Comment	Indicates only one type of SAV present existing in the Brunswick River; shell bottom habitat areas downstream of Federal Point not mapped by NCDMF.
8127521	Concern: Erosion effects on Battery Island Audubon Sanctuary (92 acres of privately owned managed lands). Battery Island Turn: Proposing channel realignment; from existing 500 feet to up to 1300 feet in width. A total of 191 dredging acres (111 new) and 4,000-ft radius curve. The Oct 2018 EA completed by the Wilmington District proposes widening to 750 feet with a 3,900-ft radius curve. "Potential effects on the Battery Island shoreline and the need for mitigation would be evaluated further during the PED phase of project development." (pg 199, 212) SLR and erosion effects on Battery Island seem significant (Section 8.2.2) and more should be proposed to protect this island that "provides nesting habitat for the largest assemblage of colonial tree-nesting wading birds in the state" (pg 43). Recommendation: More alternatives need to be suggested for the Battery Island Turn. Additionally, the report should have a more detailed analysis of erosion effects (from dredging and ship wakes) on the island with each alternative, and mitigation/monitoring should be proposed for unavoidable impacts.	Environmental	Response DOES NOT Address the Comment	What the revised 203 Report discusses about placement of dredged material along the southern and western shorline of Battery Island would not be sufficient for long term stabilization of the island; especially considering its close proximity to the channel. The Report indicates that a mangement plan for the lower Cape Fear River bird islands will be developed during the development of the DEIS. These areas need additional analyzing and a plan showing protection measures to avoid loss of habitat need to be proposed.
8127627	Concern that the shoaling analysis was limited to the anchorage basin and the entrance channel reaches of Bald Head Shoal 1, 2, and Smith Island Channel. The remainder of the project area should be included in the shoaling analysis to determine any impacts related to the proposed deepening and/or widening of these reaches. This analysis should be updated and coordinated with the DMMP to ensure sufficient capacity is available within all disposal areas and is reflective of any changes to the shoaling pattern in the modified channel.	Civil	Response Addresses the Comment	N/A
8127703	Review Concern: The tidal creek impacts might not be accurate. The model bathymetry for the tidal creeks was based on NOAA charts and by a trial and error process of changing the model bathymetry until the salinity model results matched the salinity level that the observed vegetation grows in (either fresh, brackish or saltwater). Basis for Concern: Changes in salinity in the tidal creeks and adjacent wetlands would be greatly influenced by the depth and flow area of the tidal creek channels. NOAA chart 11537 had very limited detail only of Town Creek, no others. The bathymetry estimates are not accurate enough to evaluate changes in salinity of 0.5 ppt, the freshwater wetland boundary. Significance of Concern: High. Action Needed to Resolve: Refine the model tidal creek bathymetry with new survey data. Possible use of readily available LiDAR may reduce the amount of surveys needed of the creeks.	Hydrology	Response DOES NOT Address the Comment	It was still unclear what bathymetry data was used in the developing the model of the tidal creeks, where was LiDAR used or NOAA charts and where was engineering experience used to define the channel bathymetry.
8127709	Concern that the estuary behind Bald Head Island appears to not be included in the salinity, water quality and shoaling analyses within the report. These portions of the report should be updated with appropriate sampling and calibration to measure potential changes within the estuary that may result from deepening the harbor and/or creation of bird islands as discussed in section 1.5 of the DMMP appendix. Both of these actions will likely impact flow within the estuary.	Civil	Response Addresses the Comment	N/A
8127922	Concern: No costs for utility relocations. The report states none needed. Basis of Concern: Previous harbor deepening projects had concerns about the height of the high energy power line crossing and gas line relocations. Significance of Concern: Medium: These elements could add significant cost increase if necessary. Action Needed to Resolve Concern: Fully investigate if utility relocations are a concern.	Geotechnical	Response Addresses the Comment	N/A
8127926	Concern: Costs of mobilization is done by reaches. Basis of Concern: Mobilization usually done by contract items. Significance of Concern: Medium: could be incorrectly estimating the cost. Action Needed to Resolve Concern: State why it is done by reach and verify that the cost is correct.	Geotechnical	Response Addresses the Comment	N/A
8128093	Concern: The report does not indicate that the NC Ports Authority has coordinated with NCDOT regarding the proposed navigation improvement project. Basis of Concern: NCDOT is developing plans for constructing a new bypass to re-route traffic traveling back-and-forth from Brunswick County. Although NCDOT has developed multiple proposals, some of their plans include new bridge construction, which will cross the Cape Fear River and may even impact Eagle Island. Significance of Concern: Medium. NCDOT's new road and bridge might interfere with the proposed harbor deepening and widening project. Additionally, the height(s) of NCDOT's planned bridge(s) might not accommodate the larger USEC-Asia vessels. Action Needed to Resolve Concern: NC Ports Authority should coordinate efforts with NCDOT regarding potential conflicts between harbor widening and new road and bridge construction.	Geotechnical	Response Addresses the Comment	NCSPA has noted its intent to coordinate efforts with NCDOT as appropriate.

id	Comment Text	Discipline	Review Comment	Explanation (What is Missing) if Response Does NOT Address the Comment
8128099	Concern: The Wilmington Harbor area lacks the extensive rail infrastructure that already exists in Norfolk, VA and Savannah, GA. Basis of Concern: The report assumes that upgrading the Wilmington harbor alone would be enough to encourage increased USEC-Asia traffic. However, rail infrastructure is an influencing factor with respect to commercial port calls. Significance of Concern: Medium: Assuming the port is upgraded in accordance with the proposal received, USEC-Asia vessels might still avoid Wilmington in lieu of Norfolk and Savannah, which have greater railroad infrastructure for moving freight. As a result, does the NC Ports Authority plan to work with CSX to expand railroad infrastructure, along with harbor improvements? Alternatively, what guarantee does the NC Ports Authority have that upgrading the Wilmington Harbor alone will increase USEC-Asia port calls? Action Needed to Revolve Concern: Coordinate efforts with CSX to consider development of a rail infrastructure improvement plan that could be implemented along with the proposed harbor improvement plan.	Geotechnical	Response Addresses the Comment	NCSPA has noted its intent to develop a rail plan. A mention of future rail plan development should be included in the main report text.
8128756	PDF page 167, Sec 5.3.3 of Main Report - Concern: Project alternatives have not been fully vetted or justified, primarily relocating cargo terminals. Basis of Concern: Potential for relocating terminal to a site closer to the ocean is briefly mentioned, but the measure is disregarded without a lack justifiable evidence. The expense of constructing a new terminal at Southport is not provided nor explained. This option could result in an overall reduced project improvement cost, due to a shorter length of channel to deepen. Also the lack of institutional support is not explained, so not sure if that is internal support by the Ports Authority leadership or some other institution. Needs further explanation.	Specifications	Response Addresses the Comment	N/A
8128894	PDF Page 154, Sec 3.6.2 of Main Report - Concern: Rail service transportation comparisons are not provided. Basis of Concern: Report only compares truck transportation costs for Wilmington, Charleston, and Savannah. Should be more detailed comparison in cost analysis regarding rail services from Wilmington and alternate ports, since those are typically the least cost transportation method.	Specifications	Response Addresses the Comment	N/A
8129057	Concern: The report provides the review comments of only two individuals, one discipline in planning and the other in cost estimating. There is no indication of review completed by any other reviewers nor any other Quality Control/Quality Assurance process was followed. Basis of Concern: EC 1165-2-217 Review Policy for Civil Works and ER Planning Guidance Notebook outlines the requirements for review of all Civil Works projects including initial planning. The EC requires a Review Plan (RP) which is a component of the Project Management Plan (PMP) or Program Management Plan (PgMP). ER 1105-2-100 also requires quality control / quality assurance (4.4). Significance of Concern: Medium. Calls into question what level of quality control was completed when developing the feasibility study and estimates on economic benefits and costs. Action Needed to Resolve Concern: Develop PMP and RP along with completing and documenting all QC and QA activities.	Project Management	Response DOES NOT Address the Comment	Additional QC documentation included (comments for outside individuals) but no PMP or RP was included as the response stated it would.
8129059	Item T-2: Concern: Appendix D, Cost, Section 6.6.1, Item T-2 indicates that stabilization measures are needed but assigns a cost of $0. Additionally, the report lacks any discussion or evaluation on where slope stability could be a concern and what measures could be implemented to stabilize the slope. There is especially the concern in the Anchorage Basin, Between Channel, and Fourth East Jetty reaches were the channel is deepened and along with being widened (Between Channel and Fourth East Jetty) and the daylight of the dredged slope encroaches closer to Eagle Island. Basis of Concern: The Feasibility Study needs to capture everything that would be needed for the project to be implemented. Significance of Concern: Medium. Additional cost to construction and to PED will affect the NED plan. Implementation of stabilization measures could impact additional areas of environmental concern. Action Needed to Resolve Concern: Determine areas in which stabilization measures are likely, especially adjacent to Eagle Island. Evaluate the mean and methods that could be used to stabilize the slopes; and estimate costs. Include this evaluation in the report along with incorporating additional costs into construction costs.	Cost Engineering	Response Addresses the Comment	N/A
8129212	Main Report, Section 4, page 15 of 337: Report states there are no utility relocations. There are known active submarine utility lines crossing Smith Island Channel and Fourth East Jetty Channel that may be impacted by the proposed channel improvements. There are also inactive submarine utility lines at the intersection of Baldhead Shoal Channel Reach 1 and Smith Island Channel that may be encountered. Potential impacts to utilities should be thoroughly evaluated in the report.	Civil	Response Addresses the Comment	N/A
8129218	Drawings, Sheet C301, page 25 of 144: The typical dredge sections for non-rock and rock show various over depths that are not in agreement with paragraph 6.1.4 on page 179 of 337 and paragraph 6.3 of page 183 of 337 of the Main Report. The Main Report states that project dredging volume estimates include the required dredge depth, an additional one foot of overdepth where rock is present, and 2 feet of allowable overdepth. Typical dredge section for non-rock should be revised to show design dredge elevation and 2' allowable overdepth. Typical dredge section for rock should be revised to show design dredge elevation, 1' required overdepth and 2' allowable overdepth. It would be helpful if the table included a column for required dredging depth and another column for dredging depth including required plus allowable overdepth.	Civil	Response Addresses the Comment	N/A
8129342	Review Concern: There is concern about defending the validation of the WHNIP 3D hydrodynamic estuarine salinity model. The salinity parameter of the estuary model was validated with continuous measured data from only two water quality stations deployed along the river. The south station included bottom and surface measurements but the north upstream station collected only surface data. The validation period was short at only 5 days of continuous data. The upstream station was at Eagle Island and no measured data was used in the model validation from the upper estuary. Basis for Concern: The short model validation period did not show how the model performed in simulating salinity transitions between spring and neap tides or during low flows. The Savannah and Mobile Harbor models were calibrated and verified over a period of months to years and were able to captured varying river discharge and tide cycles. The model calibration period was also relatively short at 16 days and showed difficulty in simulating the transition between spring to neap tides, salinity was off 5 ppt (Station KM) between measured and modeled. The WHNIP water quality model (DELWAQ) was validated with a typical flow yearlong simulation (Appendix A page 4-143) but inflows were period averaged and salinity movement in the upper estuary was not under stress conditions. Significance of Concern: High Action Needed to Resolve: Suggest a second year long validation of only the hydrodynamic model with salinity using recorded flows and tides for 2007. Water level and salinity measurements collected along the estuary by UNC-Wilmington as used was in the DELWAQ model can be used in the validation. 2007 represents both high flows and record	Hydraulics	Response DOES NOT Address the Comment	Calibration of the tidal creek salinity model was not based on any data collected from within the tidal creeks. Calibration of salinity was based on vegation may not represent actual conditions with enough resolution. There were no previous salinity impact models or studies conducted with no salinity measurements in the tidal creeks being studied. No results of changes in salinity right after the project is built were provided.
8129596	Concern. Section 2.6.1 is referenced but the question go to the overall future without project scenario referenced in multiple sections of the economic appendix. The analysis assumes that all Far East traffic will transfer from Wilmington to a nearby Port without a channel deepening. Concern is that this assumption means the carriers make all of the decisions and have total control over where this cargo is handled. Under this scenario the carriers are adding an additional 100 to 180 million per year, presumably all to the end of line customer. Would the end of line customer not find another carrier willing to transport these goods on smaller vessels to Wilmington at a substantially lower cost? Basis of Concern: 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, impacts the overall benefits of the proposed deepening Action Needed to Resolve the Concern: Analysis must demonstrate that finding another carrier that will still call on the East Coast on smaller vessel is not possible.	Economics	Response DOES NOT Address the Comment	Same comment applies. Analysis must demonstrate that finding another carrier that will still call on the East Coast on smaller vessel is not possible.
8130124	Main Report: 2.19, HTRW: Please elaborate what is being done concerning the found contamination. was done about them?	Environmental Engineering	Response Addresses the Comment	N/A
8130125	6.1.1: Lower Anchorage basin has 4.2 mcy rock and 22.7 mcy sand and silt. 6.1.2: Dredge mat'l primarily fine to medium sands. Is this reasonable?	Geotechnical	Response Addresses the Comment	N/A
8130126	6.7: 3 years for construction seems questionable.	Cost Engineering	Response Addresses the Comment	N/A
8130130	9.1.1: No indication that dredging will be done within Environmental window. Is this being assumed? Need to clarify.	Environmental	Response Addresses the Comment	N/A
8130132	Table 9-1 shows 20% contingency, other places indicate 23.7%. Need to clarify and be consistent.	Environmental	Response Addresses the Comment	N/A
8130134	Figure 1-3 is represented in NAVD88 datum while the Main Report uses other datum. Need to be consistent.	Design Team Leader	Response Addresses the Comment	N/A
8130136	Figure 1-3 is represented in NAVD88 datum while the Main Report uses other datum. Need to be consistent.	Geotechnical	Response Addresses the Comment	N/A
8130138	1.3 & 2.8: There are no stability analyses completed or indication of slope stability concerns with the proposed deepening and widening.	Hydraulics	Response DOES NOT Address the Comment	The second paragraph of the response was not included in the revised report.
8130141	5.4.3: Shoaling rate in Anchorage Basin also depends on widening. Section only attributes it to deepening. Please clarify.	Hydraulics	Response Addresses the Comment	N/A
8130143	Figures: The existing navigation channel and proposed deepening should be included on the profiles.	Geotechnical	Response DOES NOT Address the Comment	The existing navigation channel and proposed deepeing is not included on the profiles like the response indicated they would be.
8130147	4.1: Is it a good assumption that sand dredged from the channel can be placed on the beaches?	Cost Engineering	Response Addresses the Comment	N/A
8130149	4.7.2: How was it determined that the construction oversight of 4 construction management position and $150,000 per reach for surveys was this enough? Please indicate.	Cost Engineering	Response Addresses the Comment	N/A
8130150	T-2: indicates that stabilization measures are needed but assigns a cost of $0.	Cost Engineering	Response Addresses the Comment	N/A
8130152	Annual maintenance costs should be considered for without project and again with project.	Cost Engineering	Response Addresses the Comment	N/A

id	Comment Text	Discipline	Review Comment	Explanation (What is Missing) if Response Does NOT Address the Comment
8130204	Concern: Multiple costs occurring at the port are not considered financial costs necessary to accrue the benefits calculated in the analysis. Only the cost of deepening the berth. Costs necessary for the benefits should be included as a project cost and therefore in BC ratio. There are multiple reference to work the port is completing today to accommodate vessels that the analysis assumes will not call in the future without project scenario. While they are being implemented today, the analysis assume these costs/improvements are only necessary to achieve benefits in the future with project scenario. There is reference to the dock being approved to handle a 1,200 LOA vessels, cranes being purchased to handle larger vessels more efficiently, channel and turning basin improvements for larger vessels, etc... In this analysis, for the future without project scenario, these costs are not necessary since larger vessels will bypass Wilmington for other harbors. Basis of Concern: Effect on net benefits Significance of Concern: This comments has an impact on the overall project cost and net benefits claimed in the analysis. Action needed to resolve: Include all associated costs necessary to achieve projected benefits in the NED costs section and BC ratio.	Economics	Response Addresses the Comment	N/A
8130217	Concern: It is not clear that the placement areas currently associated with Wilmington Harbor are capable of handling the additional material that will be placed there as of a result of the proposed channel improvement. How does this additional material impact the future overall cost of maintaining this harbor. Basis of Concern: Cumulative impacts on placement areas should be taken into account to determine the overall cost of the project. Significance of Concern: Medium. This additional material could increase the future costs of harbor maintenance. Action Needed to resolve the concern: Confirm the placement area can handle the additional material without impacting the current cost of the O&M or include the additional cost as a project cost if is does.	Economics	Response Addresses the Comment	N/A
8131047	At the beginning of these sections place a map of the project area that clearly defines the reaches by name. The figure 1,1 in Appendix A would be good.	Geotechnical	Response Addresses the Comment	N/A
8131083	Last sentence of first paragraph: State if the difference in rock mapping is due to lack of data or something else. If further investigation is warranted verify that is accounted for in the costs.	Geotechnical	Response Addresses the Comment	N/A
8131088	According to Table 6.3, the Fourth East Jetty is likely to encounter hard rock (over 4,000 psi). This should be stated here as well as the different dredging operations needed.	Geotechnical	Response Addresses the Comment	N/A
8131234	Add verbiage that clearly states where the deepening ends at the Anchorage Basin and whether any dredging occurs from the end of the turning basin to the Cape Fear Memorial Bridge.	Geotechnical	Response Addresses the Comment	N/A
8131237	Drawings, Sheets X114, X115 & X119, pages 139,140 & 144 of 144: Vertical slopes are shown on right side of cross sections 2183+00 through 2209+00 and cross sections 2257+00 through 2270+00. Recommend typical dredge section be added to drawings to address vertical slopes.	Civil	Response Addresses the Comment	N/A
8131248	In previous deepening contracts in the State Ports/Eagle Island area there was vibration monitoring due to the cutterhead work. This included before and after inspections and reports of structures that may be affected by the work as well as the Eagle Island CDF. I think this should be included here and costs for the monitoring included in the cost estimate. This may also have to be done in other places along the river.	Geotechnical	Response Addresses the Comment	N/A
8131254	There is no discussion of the effects of the work on the Eagle Island CDF slope stability of the riverbank and the overall stability of the dikes. This is needed and may affect the cost estimate.	Geotechnical	Response Addresses the Comment	N/A
8131262	Previous deepening of the river took well over 5 years to complete. The 3 year time frame appears to be very optimistic. Variables such as dredge windows and dredge equipment availability are important factors. The longer dredging period obviously has cost implications that may not be factored into the risk summary.	Geotechnical	Response Addresses the Comment	N/A
8131264	For better correlation between this page and the Project Schedule in sub-Appendix B, include the contract number with the year.	Geotechnical	Response Addresses the Comment	N/A
8131625	According to an "Ocean Insights" article from September 2018, the USEC-Asia network typically involves port calls in New York, Norfolk, and Savannah - in that order. Thus, it seems that information from the article conflicts with text in the second paragraph beneath "Alternative Plan Evaluation..." The executive summary states (p. 10), "Savannah is the most likely alternative port...because Savannah comes before Charleston in the port rotation..." Please confirm the accuracy of this statement or make appropriate corrections. Based on port rotation it may be more appropriate to compare Wilmington to Norfolk, instead of comparing Wilmington to Savannah.	Geotechnical	Response Addresses the Comment	Based on the preliminary response from NCPS, this comment has been addressed.
8131628	The third paragraph under section 2.1 states, "...sands are a major component of suspended sediment..." However, sands are generally constitute bed load material and are only part of suspended resulting from storm-induced water velocities and resultant shear stress along the stream bed. Although true that sands are lost to the flood plain during such events, sandy material is generally deposited with the naturally-occurring stream levees, where the subaerial plain meets the stream channel.	Geotechnical	Response Addresses the Comment	N/A
8131632	Please confirm that appropriateness of "Turritellid" as actually being a formal Formation name. The term "turritellid" seems to be an adjective, which refers to gastropod fossils (genus Turitella) within limestone. Additionally, the "Turritellid Limestone" is not a formally-recognized formation name, according to the USGS and the Association of State Geologists lexicon database (https://ngmdb.usgs.gov/Geolex/search), while the Castle Hayne and Peedee are. Finally, some literature indicates that the "Turritellid Limestone" may actually be part of the Castle Hayne or Peedee Formation.	Geotechnical	Response DOES NOT Address the Comment	This so-called "formation" name still appears in Table 3-1. Thus, this table should be revised. However, respective text has been appropriately revised in other document sections.
8131634	A lot of information has already been compiled regarding the top of rock in the Cape Fear River. As a result, please delete all phrases of "At or near surface" and list the top of rock, or the depth ranges for the top of rock for each channel reach, where known. You may consult USACE boring logs, as well as your own Geotechnical Appendix for this information.	Geotechnical	Response Addresses the Comment	N/A
8131635	This section indicates that readings from one monitoring well shows a regional loss of groundwater head. However, multiple monitoring wells, with appropriate spatial distribution are needed to confirm this statement. Please add verbiage some tentative verbiage to explain that while one monitoring well seems to show this trend, other wells are needed for confirmation.	Geotechnical	Response DOES NOT Address the Comment	The response states that the original text referred to "baseline conditions." However, one monitoring well does not provide adequate data to determine regional baseline trends. Please revise text as stated in the original comment.
8131637	Please present these data on a graph. Seeing graphical data trends will be more meaningful than the current table.	Geotechnical	Response Addresses the Comment	N/A
8131639	The second paragraph in this section mentions the extension of the seaward portion of the channel to extend 48,000 ft. offshore. First, please consider changing 48,000 ft. into units of nautical or statute miles. Second, please note that vibracoring will be needed in this specific reach, due to a lack of coring data.	Geotechnical	Response Addresses the Comment	N/A
8131640	The text mentions that siltstone and sandstone is expected to be encountered during dredging operations. However, historical USACE coring data show that limestone is also prevalent. This carbonate material will likely be harder to excavate than unconsolidated sediments and should be considered.	Geotechnical	Response Addresses the Comment	N/A
8131643	Please add two columns to this table. One column would show the proposed depth for each channel reach, while the other would show the expected top of rock for each channel reach.	Geotechnical	Response Addresses the Comment	N/A
8131644	Please add a figure to this section showing the new ODMDS location, as well as the current ODMDS bathymetry.	Geotechnical	Response Addresses the Comment	N/A
8131647	The first sentence in the third paragraph states, "Safety zones will be established and enforced by contractor-provided patrol boats." However, while contractor boat crews might have the ability to advise mariners to stay clear of construction work, these personnel lack the capability to compel safety zone compliance. Thus, does the NC Ports Authority have a plan in place to request and receive USCG law enforcement support, should the need arise?	Geotechnical	Response Addresses the Comment	N/A
8131653	The text mentions that "...sediment sampling will be performed to ensure that materials are suitable for their proposed placement locations..." This step is critical. As a result, sampling should be specifically planned in the proposed offshore entrance channel extension where data area lacking. Additional sampling may also be needed in the more inland reaches too.	Geotechnical	Response Addresses the Comment	N/A
8131656	A figure showing the Cape Fear River and the channel reaches should be included in this section. Although Figure 1-1 is provided, it would be helpful to repeat a similar figure within Section 10. This figure should also show the currently authorized depth of each reach, as well as the proposed authorized depth of each reach.	Geotechnical	Response Addresses the Comment	N/A
8131659	The text mentions that siltstone and sandstone is expected to be encountered during dredging operations. However, historical USACE coring data show that limestone is also prevalent. This carbonate material will likely be harder to excavate than unconsolidated sediments and should be considered.	Geotechnical	Response Addresses the Comment	N/A
8131661	Please define the term "hard rock." As used in the context of the report, the term likely represents a compressive strength limit. Otherwise, the term "hard rock" has specific, yet different meanings for different technical disciplines.	Geotechnical	Response Addresses the Comment	N/A
8131662	The compressive strength presented in this document is based on laboratory analysis of rock samples. However, results from small lab samples generally yield higher compressive strength results compared to the respective large-scale (i.e. outcrop or formation sized) rocks. This phenomenon should be expressed within the report text, or even added as a text box to related data plots, so the reader will understand that in-field rock strength will likely be less. This point is also important since report Section 6 mentions the possibility of using a high-capacity hydraulic hammer to break rock, as opposed to blasting.	Geotechnical	Response Addresses the Comment	N/A
8131664	Please clarify what entity performed this study. It seems that Moffatt Nichol and Fugro were involved, but the text is unclear as to the contractors' specific contributions.	Geotechnical	Response Addresses the Comment	N/A
8131666	Assuming this proposed project moves forward, please note that additional geotechnical sampling will be needed to fill existing data gaps. For instance, additional boring data is needed to better assess material in the entrance channel extension.	Geotechnical	Response Addresses the Comment	N/A

id	Comment Text	Discipline	Review Comment	Explanation (What is Missing) if Response Does NOT Address the Comment
8131672	The second paragraph in this section mentions previous studies. It would help to have a list of the previous study titles to which this paragraph is referring.	Geotechnical	Response Addresses the Comment	N/A
8131677	These figures seem to be missing historical boring data, despite attempts by the author to capture it. For instance, Figure 4-13 only shows one data point from the Reaves Point Reach, but 18 borings have been completed in that area. Supplemental USACE boring data can be made available on request.	Geotechnical	Response Addresses the Comment	N/A
8131681	Each figure should have callout text or a text box to show which of the boring data points are being represented on the plot. Additionally, it is unclear if the plotted dots represent individual samples taken from cores or if the dots represent a statistical composite (i.e. weighted mean) of samples from one or more cores.	Geotechnical	Response Addresses the Comment	N/A
8131686	Does each grain gradation curve represent one sample from a given core? If not, does each curve represent a statistical summary of multiple gradation curves for all samples from a given core? Please clarify.	Geotechnical	Response Addresses the Comment	N/A
8131687	Please annotate either via callout text of text box the samples that are represented as gradation curves. Also, the number of gradation curves on each graph apparently do not correspond with data points on Figures 4-1 through 4-20.	Geotechnical	Response Addresses the Comment	N/A
8131690	Eleven graphs are all labeled as "Figure 6." These graphs should be re-labeled as "6-1...6-11." Additionally, the graphs constituting what should be Figures 6-2 through 6-11 ought to have annotations or text to identify which core samples are being	Geotechnical	Response Addresses the Comment	N/A
8131694	Please add one or more maps showing the locations of the seismic profiles.	Geotechnical	Response Addresses the Comment	N/A
8131697	These figures seem to be missing historical boring data, despite the updates incorporated since February 2019. Supplemental USACE boring data can be made available on request.	Geotechnical	Response Addresses the Comment	N/A
8131702	Each figure should have callout text or a text box to show which of the boring data points are being represented on the plot. Additionally, it is unclear if the plotted dots represent individual samples taken from cores or if the dots represent a statistical composite (i.e. weighted mean) of samples from one or more cores.	Geotechnical	Response Addresses the Comment	N/A
8131707	Does each grain gradation curve represent one sample from a given core? If not, does each curve represent a statistical summary of multiple gradation curves for all samples from a given core? Please clarify.	Geotechnical	Response Addresses the Comment	N/A
8131711	Please provide a text box or callout text to show which core samples were used for these data plots.	Geotechnical	Response Addresses the Comment	N/A
8131714	Please add a column listing the top of rock (with vertical datum) for each channel reach, if known.	Geotechnical	Response Addresses the Comment	N/A
8131718	These diagrams look great. However, please provide the vertical datum for the profile elevations. Although the vertical datum for bathymetry is MLLW, the reader cannot infer that that same datum is used for fence diagram elevations.	Geotechnical	Response Addresses the Comment	N/A
8131720	Please provide denote the vertical datum to which the interpreted top of rock elevation is referenced. Additionally, please consider using a color ramp with more variation, as some printers might have trouble resolving the different shades of brown that are currently being used.	Geotechnical	Response Addresses the Comment	N/A
8131726	Please consider using a legend which matches the USACE-Wilmington's gINT database file for USCS classifications for the unlithified "soil types" shown. Doing so will allow for standardization which will match reports and cross-sections from prior research and future field studies.	Geotechnical	Response Addresses the Comment	N/A
8131731	This appendix addresses railroad infrastructure within the Port of Wilmington. However, seeing as how Wilmington will be economically competing with Norfolk and Savannah for USEC-Asia maritime traffic, adding a discussion about the currently existing rail infrastructure in those port cities would be helpful.	Geotechnical	Response Addresses the Comment	N/A
8131766	This appendix addresses railroad infrastructure within the Port of Wilmington. However, seeing as how Wilmington will be economically competing with Norfolk and Savannah for USEC-Asia maritime traffic, adding a discussion about the currently existing rail infrastructure in those port cities would be helpful.	Geotechnical	Response Addresses the Comment	N/A
8131771	These maps have a legend item called, "Contact Target Location." If this target refers to a hardbottom location, please state so in the legend. Otherwise, please clarify.	Geotechnical	Response Addresses the Comment	N/A
8131775	These maps have a legend item called, "Contact Target Location." If this target refers to a hardbottom location, please state so in the legend. Otherwise, please clarify.	Geotechnical	Response Addresses the Comment	N/A
8131779	The dredged material management plan does not address the possibility of developing Cell #4 on Eagle Island as a disposal option. This option should be evaluated, as it might result in disposal cost-savings.	Geotechnical	Response Addresses the Comment	N/A
8131780	Please note that additional geotechnical sampling and analysis will likely be required to assess dredged material for bird island and beach nourishment. Data are especially lacking in the proposed entrance channel.	Geotechnical	Response Addresses the Comment	N/A
8131783	Please add two columns to this table. One column would show the proposed depth for each channel reach, while the other would show the expected top of rock for each channel reach.	Geotechnical	Response Addresses the Comment	N/A
8131784	Please confirm that appropriateness of "Turritellid" as actually being a formal Formation name. The term "turritellid" seems to be an adjective, which refers to gastropod fossils (genus Turitella) within limestone. Additionally, the "Turritellid Formation" is not a formally-recognized formation name, according to the USGS and the Association of State Geologists lexicon database (https://ngmdb.usgs.gov/Geolex/search), while the Castle Hayne and Peedee are. Finally, some literature indicates that the "Turritellid Limestone" may actually be part of the Castle Hayne Formation or the upper Peedee Formation.	Geotechnical	Response Addresses the Comment	N/A
8131785	Please enlarge the map shown on the first sheet. Additionally, please overlay the project areas, with text labels onto the map. Doing so will allow for a better contextual understanding of the maps on the following pages.	Geotechnical	Response Addresses the Comment	N/A
8131788	Please include a small, inset map showing the general location of the maps and cross-sections with respect to the overall project.	Geotechnical	Response Addresses the Comment	N/A
8131791	Please add a legend to each map to define each of the lines (i.e. contour lines, edge of channel, top of slope, etc.)	Geotechnical	Response Addresses the Comment	N/A
8131792	Please enlarge the size of the image showing "Anchorage Basin 1 (Turning Basin)." Doing so will also mean that a new scale bar needs to be included to match the re-sized image.	Geotechnical	Response DOES NOT Address the Comment	Although not a "show-stopper" enlarging the image per the request would assist with reader comprehension.
8131795	The upper image (Fourth East Jetty Reach) seems to indicate that the harbor widening will impact Eagle Island. What mitigation strategies are being considered to either (1) avoid Eagle Island impacts or (2) mitigate Eagle Island impacts?	Geotechnical	Response Addresses the Comment	N/A
8132066	Discussion of the existing conditions and without-project (FWOP)conditions in Section 3 and 3.1 is very confusing. Text indicates there are differences between existing conditions and the FWOP conditions; however, the differences are difficult to discern. The FWOP is the basis for comparison of impacts and thus is very important. Although follow-on sections may better explain these differences, Section 3 and 3.1 need to be revised to be much more clear.	Environmental	Response Addresses the Comment	N/A
8132081	Several Sections in the report, as well as some appendices reference the Wilmington District's DMMP for Wilmington Harbor. There is no completed DMMP for Wilmington Harbor so text needs to be revised to reference current operations and	Environmental	Response Addresses the Comment	N/A
8132106	In many cases, the discussion of impacts does not clearly distinguish between temporary versus long-term impacts and does not clearly lay out the construction duration or long-term maintenance timeframes. Text either at the beginning of Section 8 or in applicable locations throughout Section 8 should explicitly explain the anticipated duration of construction as well as the frequency and duration of maintenance activities so readers get a clear sense of the extent of impacts.	Environmental	Response Addresses the Comment	N/A
8132119	It's unclear if the impact analyses provided throughout Section 8 considered the slope (full extent)of project impacts. Section 8 should be revised to clearly explain what impacts were considered.....full channel with side slopes? If the impact analyses do not include side slopes then those impacts need to be added for all applicable resources.	Environmental	Response Addresses the Comment	N/A
8132129	Table 8-16, Costs for Alligator Creek Restoration, does not include Real Estate (RE)Costs. The RE cost will be significant and should be included.	Environmental	Response Addresses the Comment	N/A
8132149	Section 10.5 includes a summary of beach erosion impacts; however, it's not clear if the erosion rate takes into account the periodic placement of sand on Bald Head Island and Oak Island. Text should be added to clarify this point.	Environmental	Response Addresses the Comment	N/A
8132162	Section 11.14, Executive Order 11988 (Floodplain Management) does not follow the 8-step decision making process to address E) 11988. Text should be added to address each of the 8 steps.	Environmental	Response Addresses the Comment	N/A
8132178	The impact analyses in Section 8 should clearly address maintenance of the proposed deepened project; particularly, important is that the EFH assessment clearly address long-term maintenance impacts on EFH. Revise applicable Sections of the main text and Appendix I as needed to describe the impacts of long-term maintenance.	Environmental	Response Addresses the Comment	N/A
8132344	The alternatives analysis lacks the detail needed to fully comply with NEPA. A much more detailed analysis of impacts for depths from -43 to -48 is suggested. At a minimum, detailed analysis of the most reasonable alternatives, besides the TSP and no action, should be included in the report.	Environmental	Response DOES NOT Address the Comment	Section 3 of the report clearly states that "The amount of channel widening .....does not change appreciably for any of the action alternatives therefore, the action alternatives are identified by their incremental project depth." However, Section 3 doesn't give any information regarding the amount of widening that will occur with any depth so there's no frame of reference to compare FWOP widths to FWP widths. Also, it's not clear what "appreciably" means and that needs to be explained. This has implications for shoreline and in-water environmental impacts as wells as mitigation requirements.
8132371	Reference comment #8123986,which indicates that project salinity impacts within tidal creeks might be underestimated or inadequately studied. Besides having implications for impacts to tidal freshwater marsh and swamp forest, salinity impacts to other resources (benthos, fisheries, etc.) may be affected. Revise all resource impact sections as needed to reflect any changes to the salinity analysis and conclusions.	Environmental	Response DOES NOT Address the Comment	Significant concerns remain regarding the salinity analysis and impacts of salinity changes on Cape Fear River ecosystems. Calibration of the tidal creek salinity model was not based on any data collected from within the tidal creeks. Calibration of salinity was based on vegetation and may not represent actual conditions. When asked, the Ports could not provide references or literature to support the salinity modeling approach that was used for this project.
8132377	The report does not include a table that compares the impacts of all reasonable alternatives. For comparison purposes, a summary table needs to be added to the document. Besides no action and the TSP, the environmental impact sections and the summary table should describe the impacts of all reasonable alternatives (depths).	Environmental	Response Addresses the Comment	N/A

id	Comment Text	Discipline	Review Comment	Explanation (What is Missing) if Response Does NOT Address the Comment
8132382	The 203 report does not address direct or indirect impacts to local or regional infrastructure, such as roads, railroads, the Wilmington Waterfront, businesses along the river, the USS NC berthing area, etc. Add discussion of impacts to infrastructure and facilities along the river, as applicable.	Environmental	Response DOES NOT Address the Comment	Although the response indicates that additional analyses will be done during PED to address shoreline erosion, shoreline erosion is just one potential impact that could result from the deepening. This comment is in reference to all potential direct and indirect impacts of the project, like changes in truck traffic, rail traffic, impacts on the USS NC, including an increase in flooding of the access road to the USS NC or impacts to the berthing area, impacts to Wilmington
8132844	The statement, "The dikes for all three cells are proposed to be raised to 50 feet above mean sea level, which will extend the useful life of Eagle Island CDF to 2032 (USACE 2017)" is partially correct. Currently cell 2 can be raised to 50 ft NAVD 88, but at a smaller footprint than was cited in referenced 2017 document. Additonally, stability analyses are being re-evaluated in cells 1 and 3. In light of these current re-evaluations the projected life will likely change.	Geotechnical	Response Addresses the Comment	N/A
8132858	Please include limestone in list of sedimentary rock types to be dredged.	Geotechnical	Response Addresses the Comment	N/A
8132910	Where rock is likely, but strengths are unknown and extents are not fully determined, how are the projected dredging costs reflected? Is there a level of conservatism applied to costs in order to capture these unknowns? For instance, in upper Brunswick Reach, Table 6-3 shows that the Pee Dee formation is likely to be encountered, and it lies between 2 reaches where UC Strengths in the Pee Dee indicate blasting will likely be needed, do costs reflect blasting will be likely in Upper Brunswick?	Geotechnical	Response Addresses the Comment	N/A
8133072	In table 6-3, Fourth East Jetty reach shows UCS of 4880 psi, some of the highest strengths recorded in the project, and are above the 4300 psi threshold where blasting is likely required, and yet in Table 6-4, the same reach shows that soft rock is present and blasting will not be required. Please address this discrepancy. It is also highly recommended that it is confirmed that the likely nature of dredging/rock removal is reflected in the dredging costs for this reach.	Geotechnical	Response Addresses the Comment	N/A
8133084	If Fourth East Jetty has UCS >4300 psi, why is it not included in drill barges and mechanical dredge equipment type category? Please address.	Geotechnical	Response Addresses the Comment	N/A
8133112	It may be economically infeasible to build dikes 62 ft MSL for cells 1, 2, and 3 thereby terminating the life of Eagle Island, but was the option of building a Cell 4 (combining old cells 4 and 5 and adding additional Federal and State land to make a much larger 300+ acre cell) evaluated from a benefit to cost perspective? Adding a fourth larger cell, even with required mitigation, should be evaluated in the economics of this project.	Geotechnical	Response Addresses the Comment	N/A
8133313	In the last two full sentences. "The Chief's Report is dated 09 September 1996. The project up to the Cape Fear Memorial Bridge was completed in 2003." there seems to be a discrepancy. Actually the last deepening of new work material related to 96 Act was dredged in 2013 in Anchorage Basin within 800ft of Cape Fear Memorial Bridge. Please rectify.	General	Response Addresses the Comment	N/A
8133373	Upper Brunswick and Fourth East Jetty reaches are designated as being dredged by cutterhead and rather than by drilling/blasting/mechanical means. However, strength data in Main Report & Geotech Appendix show that Fourth East Jetty has rock strengths in excess of blasting threshold of 4300 psi. Additionally, Upper Brunswick has no strength data, but is straddled by reaches on either side, which are expected to penetrate the same Pee Dee Formation, with strengths in excess of 4300 psi. Suggest that either: (1) a better defense be given to not using blasting/mechanical means in these reaches; or (2) change costs and rock removal means to be more reflective of drilling/blasting/mechanical methodology.	Cost Engineering	Response Addresses the Comment	N/A
8133397	Sentence, "Areas with 95% sand can be placed on beaches for beneficial use in lieu of the ocean disposal site." does not agree with assumptions in other parts of report that 90% sand can be placed on beaches. Less than 10% fines passing the #200 sieve (weighted composite), or 90% sand, is one of the criteria used by the Corps to determine viability of beach placement. Please rectify statement and make sure costs in appendix are reflective of using at least 90% sand for beneficial use beach placement.	Cost Engineering	Response Addresses the Comment	N/A
8133479	Do costs reflect performance of splitting tensile strength testing for reaches with rock? It has been found over the years that splitting tensile strength is very useful information for determination of the dredge performance, means, and costs. There are limited data available for project. As far as the reviewer knows, splitting tensile was only performed on rock in Anchorage and Turning Basin prior to last of the 96 Act New Work deepening in 2013.	Cost Engineering	Response Addresses the Comment	N/A
8133487	Do costs reflect additional drilling and testing in Upper Brunswick where strength data are lacking?	Cost Engineering	Response Addresses the Comment	N/A
8133553	The sentence, "A DMMP for the Wilmington Harbor Navigation Channel Project was developed and evaluated by the USACE Wilmington District (SAW) (USACE 2007)." is misleading. This DMMP was never finalized (more of a rough draft, than draft), nor vetted through the full NEPA process. To put much stock in the document as a whole at this stage may be problematic. However, it is the opinion of this reviewer that a more useful and up-to-date DMMP is within reach if the 2007 DRAFT findings and this 203 effort are combined. This, of course, would have to be vetted through programmatic channels within USACE and NCSPA before such an undertaking is allowed.	General	Response Addresses the Comment	N/A
8133622	In the sentence, "The Planning Guidance Notebook indicates that if a Preliminary Assessment identifies a disposal capacity shortage over the next 10 years, then a DMMP needs to be developed. A DMMP is required to identify 20 years of dredged material disposal capacity. The existing DMMP identified 50 more than years of dredged material disposal capacity. This Preliminary Assessment verifies the 50-year dredged material disposal capacity, including new construction and maintenance material generated by the TSP. A new or updated DMMP is not required at this time." may be true from an overall capacity of dredged material placement in the ODMDS standpoint, bud doesn't seem to reflect the potential viability (from both an engineering and economic standpoint) of building a Cell 4 north of cells 1 through 3 for O&M dredged material placement. Until it is determined that a cell 4 is not viable, then the need for a DMMP is still a possibility.	General	Response Addresses the Comment	N/A
8133869	Some improvements that must be completed during PED level simulations include: incorporating accurate bathymetric data with appropriate side slopes, updating the hydrodynamics with the proposed final channel designs, validating bank effects, validating ship-to-ship interaction, completing a more rigorous testing matrix, incorporating fully piloted vessels for passing (no tracked vessels or vessels run from the instructor station), completing a more overlap of different pilots testing area (n should be equal to or greater than 3 if possible), testing of the exact design vessel. It is important to understand that the project provided preliminary solutions that will need to be refined and confirmed during PED.	Navigation	Response Addresses the Comment	N/A
8133875	There does not appear to be any testing of the proposed design in the area between Upper Lilliput and Upper Brunswick.	Navigation	Response Addresses the Comment	N/A
8133880	Design should be updated to include exact design vessel in PED.	Navigation	Response Addresses the Comment	N/A
8133884	How are the forces represented? Please clarify the ship-to-ship interaction forces assumptions and implementation.	Navigation	Response Addresses the Comment	N/A
8133887	With these two statements in the paragraph without any other clarification. It implies 3-3.5 hour transits were performed with the water levels held constant. This would not be standard practice. It is clear later in the text that much shorter transits were simulated making this paragraph contradictory.	Navigation	Response Addresses the Comment	N/A
8133890	There is no mention here of bathymetric data being utilized for the channel. During PED, this must be included with accurate side slopes.	Navigation	Response Addresses the Comment	N/A
8133896	In general, this testing matrix looks good for Feasibility. During PED, a more rigorous testing matrix will be required, with more overlap of different pilots. It should be noted that there does not appear to be any proposed design testing of the area between Upper Lilliput and Upper Brunswick.	Navigation	Response Addresses the Comment	N/A
8133902	The testing for the one-way channel width was really only completed with one pilot (simulation 5, 29, and 30 were all existing conditions). During PED, a greater sample size should be used.	Navigation	Response Addresses the Comment	N/A
8133911	The assumption that ship to ship interaction forces in the simulation are less than real world should be addressed in PED. Both vessels should be piloted with actual pilots, not using a track.	Navigation	Response Addresses the Comment	N/A
8133920	The channel width modeled is likely true, but final passing design should be confirmed in PED simulations with proper bathymetry (including channel side slopes), bank effect, ship-to-ship interaction, and piloted vessels (not on a track).	Navigation	Response Addresses the Comment	N/A
8127461	The report states that "Bulk commodities include fuel and chemicals (liquid bulk), wood chips and potash (dry bulk), and lumber (break bulk). Future without-project commodity tonnages are projected to be consistent with recent historical tonnages. The transport of bulk commodities is not constrained by without-project channel dimensions and will not benefit from the proposed project. Therefore, they have no effect on plan formulation or plan selection." Please expand on this, as it is unclear as to how the determination that there will be no change in the bulk carrier fleet was produced. Suggest a table with projections to clarify.	Economics	Response Addresses the Comment	N/A
8127493	General Comment- Additional explanation is required to guide the reader from the FWO Project conditions to the recommended plan. The primary concern is that the reader is unaware of the screening which has taken place up to selection of a recommended or locally preferred plan. Increased description of the modeling results are required for explanation of	Economics	Response Addresses the Comment	N/A
8129023	Comment generated by Carl Pruitt: Page ES-1 to ES-2, states: "Pursuant to Section 203 of WRDA 1986, this study is intended to determine the feasibility and extent of federal and non-federal participation in improving the federal Wilmington Harbor navigation channel, consistent with the federal objective of maximizing contributions to National Economic Development (NED), and consistent with protecting the nation's environment." This is not entirely accurate. I would suggest that this be amended, as the purpose is not related to the issue of non-federal participation ... the purpose of the feasibility report is to establish why there is a need for the project, and whether there is a federal interest sufficient for Federal participation and Congressional authorization.	Office of Counsel	Response Addresses the Comment	N/A

id	Comment Text	Discipline	Review Comment	Explanation (What is Missing) if Response Does NOT Address the Comment
8129030	Comment generated by Carl Pruitt: Page ES-7, Preliminary Plan Formulation, states". . .Under the No Action Alternative, vessels on USEC- Asia services would not include the Port of Wilmington as a port-of-call due to the high cost (to the carrier) of light-loading at Wilmington." This seems like a drastic assumption that would be extremely restrictive in the analysis, unless it is supported with facts, especially since such vessels are currently calling.	Office of Counsel	Response Addresses the Comment	N/A
8129032	Comment generated by Carl Pruitt: Page 5, Section 1.2, Implementation Guidance for Section 1152 of WRDA 2018, dated 2 May 2019 is not listed. This part of the report was probably written before that was issued.	Office of Counsel	Response Addresses the Comment	N/A
8129033	Comment generated by Carl Pruitt: Page 5, Section 1.3, Study Purpose and Need, Number 3 is one of several references to ". . . and more efficient cargo vessels . . ." I would delete such language, as the ships are larger - but the efficiency is related to the loading of the vessels, and is inherently related to the size of the vessel rather than a separate aspect. This is supported on Page 110, where it states ". . . these larger vessels cannot operate to their full efficiency at Wilmington, due to existing channel constraints." If the need is to accommodate the larger vessels, it will allow the vessels to be utilized accordingly (and more efficiently).	Office of Counsel	Response Addresses the Comment	N/A
8129034	Comment generated by Carl Pruitt: Page 112, Section 3 and 3.1, respectively state: "The major difference between existing conditions and without-project conditions is the completion of many navigation and marine transport improvements which are occurring at other USEC ports and at the Port of Wilmington." and "The major differences between existing conditions and without-project conditions at the Wilmington Harbor Federal navigation project are NCSPA improvements to the turning basin at the Lower Anchorage and the raising of the dikes for increased dredged material placement capacity at the Eagle island CDF." This is not accurate. Existing conditions include projects conducted by the NCSPA - why would that stop if there is no "federal" project to make improvements? Raising the Eagle Island dike and widening the turning basin are being done regardless of whether this federal project is ever authorized, and therefore should not be excluded from the without project conditions. Section 3.1.1. goes on to state ". . . The design vessel, although it may be capable of periodically transiting the without-project condition Federal navigation channel under perfect wind, current, and tide conditions with additional tug assistance, cannot use the without-project condition Federal navigation channel as standard operating procedures with the Port of Wilmington as a regular port-of-call." Is this inconsistent with the prior description of the vessel's currently	Office of Counsel	Response Addresses the Comment	N/A
8129038	Comment generated by Carl Pruitt: Page 135, Section 5.5, states "Asia cargo (imports and exports) on the ZCP and EC2 USEC-Asia services with origins and destinations in the Port of Wilmington hinterland would use alternative ports under the No Action Alternative." What makes this case, as these vessels currently call on the port. What gives them the ability to say it is all or nothing, especially in light of the documented calls? This is highly restrictive, and needs to be supportable.	Office of Counsel	Response Addresses the Comment	N/A
8129040	Comment generated by Carl Pruitt: Page 149, Section 6.2.2., states that rock will likely require blasting. However, it does not appear that tests have determined the extent to which blasting will be required. This is vital for mitigation and a consideration of environmental impacts.	Office of Counsel	Response DOES NOT Address the Comment	It appears that the referenced revisions merely discuss that blasting will be part of the dredging process, and the general type of equipment and process utilized. I saw no quantification of the amount of blasting, other than "deepening in the Fourth East Jetty, Lower Brunswick, and Keg Island reaches may require blasting" in Appendix B. Additionally, Table 3.2 discusses parameters that may exceed thresholds for blasting, but also has no apparent quantification.
8129042	Comment generated by Carl Pruitt: Page 164, Section 8.2.2., there are significant historical sites on the Cape Fear bank (is that encompassed in "Orton Point"?) nothing specifically addresses them , although it is acknowledged that 106 consultation is deferred.	Office of Counsel	Response DOES NOT Address the Comment	Since the USACE did not develop the initial report pushing to PED will require duplication of effort to redevelop these models for further analyses in PED which is cost prohibitive. Additionally, these impacts should be fully evaluated to accuratly develop project cost estimates that inform the project BCR. See response to 8122269. The response to this concern still pushes everything off to PED. Setting aside additional money does not resolve the BCR concern.
8129043	Comment generated by Carl Pruitt: Page 231, Section 8.25.1.6. the discussion of advanced maintenance seems to imply routine applicability. However, ER 1130-2-520, Para 8.2.a.(7) has some specific requirements for advanced maintenance to be utilized. This should be clarified to provide a reasonable expectation of the applicability of this. (I believe earlier in the report, it was stated that it wasn't used. Therefore, I would not sell it a big part of this.)	Office of Counsel	Response Addresses the Comment	N/A
8129044	Comment generated by Carl Pruitt: Page 250, Section 8.25.6. concerns me because they are committing USACE to several things that potentially are long-term and expensive obligations, without authority.	Office of Counsel	Response Addresses the Comment	N/A
8129046	Comment generated by Carl Pruitt: See Page 254, Table 9-1. The proposed costs for mitigation are grossly underestimated, and makes it difficult to assess the true costs of this project. The Table indicates Mitigation and Monitoring costs at $30,000,000.00. However, the costs of the two fish passages at lock and dams 2 and 3 alone are projected to cost almost twice that amount (see page 248).	Office of Counsel	Response Addresses the Comment	N/A
8129047	Comment generated by Carl Pruitt: Page 279, Para. h., is this duplicative of para. f.? Relocations would only be applicable in the event of a widening, I would assume. What is to be removed? Is this talking about removal of sunken vessels?	Office of Counsel	Response Addresses the Comment	N/A
8132289	Comment entered on behalf of Elden Gatwood. The Planning Objectives, as written in Section 4.3.1, are not Federal objectives. Revise the objectives to comply with ER 1105-2-100, which is to contribute to national economic development, is to be consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.	Planning - Plan Formulation	Response Addresses the Comment	N/A
8132318	Comment submitted on behalf of Elden Gatwood: Since the objectives are incorrectly stated, they cannot be used to screen alternatives, which appears arbitrary for depths of -43 to -46. The local, regional and state goals should not be used as screening criteria; therefore the alternatives screening is not suitable for this type of analysis. The solution is to analyze every depth beyond existing depth to the same level of detail.	Planning - Plan Formulation	Response Addresses the Comment	N/A
8132336	Comment submitted on behalf of Elden Gatwood: Many non-structural alternatives were pre-screened based on incorrect objectives and should be reanalyzed based on the basis of contribution to National Economic Development (NED).	Planning - Plan Formulation	Response Addresses the Comment	N/A
8132348	Comment submitted on behalf of Elden Gatwood: Lack of mitigation costs in the project cost estimate calls into question plan selection and economic justification. Mitigation costs need to be included to accurately determine project	Planning - Plan Formulation	Response Addresses the Comment	N/A
8132360	Comment submitted on behalf of Elden Gatwood: The report does not include adequate information regarding benefits for depths of -43 to -46. The fleet transition is not likely to be all to super PPX3s, which calls into question the NED plan. Substantiate and/or reconsider assumptions made for calculating benefits for -43 to -46.	Planning - Plan Formulation	Response Addresses the Comment	N/A
8127604	The cost appendix tables, narrative, etc. identifies all elements necessary to be considered reasonable of cost engineering requirements for a feasibility report pricing. However, no detail backup of labor, equipment, etc has been provided for review to determine what the unit price per cubic yard for dredging would be, what mob-demob costs are, what blasting cost/cy would be, etc. Therefore, this detail would be needed to review and determine the reasonableness of overall pricing presented in the report.	Cost Engineering	Response DOES NOT Address the Comment	A review of additional detail cost engineering documents (NOV 2019 submittal) has been completed to determine compliance with feasibility level study for WHNIP 203. The following comments are provided based on the responses submitted. 1- No TPCS has been provided or could be located. ADDITIONAL DETAIL IS NEEDED AND A TPCS - A Total Project Cost Summary (TPCS) FULLY FUNDED would be included and correspond with an MCACES at top level code of accounts for each year funding would occur and all associated investigations, construction costs, PED, & Const Mgt Costs and mitigation cost estimates. 2- The MCACES (Detail narrative to explain basis for MOB-DEMOB for each acquisition year calculated) and construction schedule of activity needs to be provided with detail cost development. Only the top level of code of accounts by FY should be available for PUBLIC VIEWING. 3---If 203 process requires QC and/or ATR, documentation, this should be provided to show how this was performed under separate cover from the appendix. 4—Contingency of 20% established by Crystal Ball seems low based on reviewers experience for similar projects of this magnitude and complexity. Recommend relook at contingency development. 5-- SAW sections responsible and familiar with subject costs, for subsurface investigations, PED Design, Construction Mgt S&A, ATON, and Mitigation, should comment on reasonableness of price. 6-- Dredge cost labor of dredge estimates is based on DEC 2017. It's not clear what economic costs were developed to escalate for compatible costs, but should be compatible or updated. Local area factors for cost of money, dredge months available, and fuel pricing of $3.14/gallon for 2017 need to be updated/confirmed. It seems likely that 6,000 cy scows would be used vs 5,000 cy scows shown. Basis or historical production comments should be provided under separate cover or noted in MCACES/excel unit price costs for rock and non-rock. 7-- SPREADSHEET PROVIDED excel "VOLUMES with Distributed Areas and Dredge Areas.." will need discussion and explanation by author in order to understand relationship to DREDGING UNIT PRICING AND COSTS FOR BLASTING PER CUBIC YARD. 8-- Appendix identifies blasting cost per day as $76,000/day which seems low based on historic pricing. No details were provided of what makes up this cost for labor, equipment, materials, etc. Production has not been provided per reach of rock in form of sf/day average coverage, blasts/day, relationship to pay cubic yardage vs. blast cy, and how this incorporates into excel spreadsheet noted above in comment 7. 9-- Additional blasting costs for pre inventory of buildings within blast zone and inventory of any damage to structures after blasting, environmental monitoring costs before, during, and after blast is not clear these costs are included. General blasting costs/cy in narrative of appendix do not match excel sheet costs/cy in "VOLUMES with Distributed Areas and Dredge Areas." 10-- Appendix indicates blasted rock would be removed by bucket/barge/scow; however, excel dredge estimates provided only included pipeline to scow with disposal to ODMDS. Needs clarification.
8127606	Discussions with Coastal Engr, it is not clear if a risk was entered in the risk register to cover climate change and how that may impact sedimentation rates within the channel.	Cost Engineering	Response Addresses the Comment	N/A