DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION
60 FORSYTH STREET SW, ROOM 10M15
ATLANTA, GA 30303-8801

REPLY TO
ATTENTION OF

CESAD-PDP

05 MAR 2014

MEMORANDUM FOR Commander, Wilmington District

SUBJECT: Review Plan Approval for Wilmington Harbor Dredged Material Management Plan

1. References:

a. Memorandum, CESAW-DE, 18 February 2014, subject: Review Plan for Wilmington Harbor Dredged Material Management Plan.

b. EC 1165-2-214, Civil Works Review, 15 December 2012.

c. Memorandum, CECW, 20 December 2012, subject: Programmatic Review Plan for Routine Operations and Maintenance Products.

2. The enclosed Review Plan for the Wilmington Harbor Dredged Material Management Plan (DMMP) has been prepared in accordance with Engineer Circular (EC) 1165-2-214. The Review Plan has been coordinated with the National Deep Draft Navigation Planning Center of Expertise (DDNPCX) of the South Atlantic Division which is the lead office to execute this plan. For further information, please contact the DDNPCX at (251) 694-3884. The Review Plan does not include independent external peer review. This DMMP is considered an Other Work Product in accordance with the Programmatic Review Plan for Routine Operations and Maintenance Products, and is therefore not considered a decision document or implementation document for the purposes of independent external peer review.

3. I hereby approve this Review Plan, which is subject to change as circumstances require, consistent with plan development under the Project Management Business Process. Subsequent revisions to this Review Plan or its execution will require new written approval from this office. The District shall post the approved Review Plan and a copy of this approval memorandum to the District public internet website and provide a link to the DDNPCX for their use. Before posting to the website, the names of USACE employees should be removed.

4. The point of contact for this action is Mr. Patrick O'Donnell at (404) 562-5226.

Encl

DONALD E. JACKSON, JR.
Brigadier General, USA
Commanding

REVIEW PLAN

Wilmington Harbor
Draft
Integrated Dredged Material Management Plan and EA

Wilmington District

MSC Approval Date: 5 March 2014
Last Revision Date: N/A

US Army Corps of Engineers ®

REVIEW PLAN

Wilmington Harbor, Wilmington, North Carolina,
Integrated Dredged Material Management Plan and EA

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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of review for the Wilmington Harbor, New Hanover County, North Carolina, single purpose Dredged Material Management Plan (DMMP).

b. References

1) Engineering Circular (EC) 1165-2-214, Civil Works Review, 15 Dec 2012
2) EC 1105-2-410, Assuring Quality of Planning Models, 31 Mar 2011
3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
5) CESAD Civil Works Planning and Policy Division Quality Management Sub-plan. CESAD R 110-1-8, App C. 28 Feb 2003.
6) Project Cooperation Agreement between Department of the Army and the State of North Carolina dated 26 March 1999, amended 28 August 2012.

c. Requirements. This review plan is a component of the Project Management Plan and was developed in accordance with EC 1165-2-214, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance, Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. The Major Subordinate Command (MSC), South Atlantic Division, and the Wilmington District, have determined through a risked informed decision process that the DMMP is a continuation of prior documents (Operations Plan and previously completed DMMPs) for efficient operational practices and methods for the maintenance of Wilmington Harbor. Per the new guidance in the Programmatic Operations and Maintenance (O&M) Review Plan (RP), dated 20 December 2012, DMMPs are listed as routine O&M products. As the programmatic review plan is specifically for items that are not decision documents or implementation documents, HQUSACE has concluded that DMMPs are "other work products." Although DMMPs are considered routine O&M products, the O&M RP states that all routine O&M products only require a DQC and that the Programmatic RP does not apply to Decision or Implementation documents, or any other products that require ATR or IEPR. The Programmatic RP also states that each routine O&M product must be evaluated against EC 1165-2-214; Paragraph 15, to ensure an ATR and/or IEPR is not required. Based on paragraph 15 of EC 1165-2-214, SAW (in coordination with SAD) determined that the Wilmington Harbor DMMP requires ATR and in fact, one ATR's has been completed (AFB report). For these reasons, the Wilmington Harbor DMMP requires an individual RP.

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The peer review effort for the Wilmington Harbor DMMP has been and will continue to be completed by the Deep Draft Navigation Planning Center of Expertise (DDNPCX). Pursuant to EC 1165-2-214, the MSC (SAD) is the RMO for "other work products," so having the DDNPCX, which is led and managed by SAD, serve as the RMO was appropriate in this circumstance.

The DDNPCX will coordinate with the Cost Engineering Mandatory Center of Expertise (MCX) to ensure

the appropriate expertise is included on the review teams to assess the adequacy of cost estimates and contingencies.

3. STUDY INFORMATION

a. Study Document. The USACE, Wilmington District is responsible for the operation and maintenance of the federally-authorized Wilmington Harbor navigation channel. Engineering Regulation (ER) 1105-2-100 requires that a DMMP be developed for federal navigation projects if a preliminary assessment does not indicate sufficient capacity to accommodate maintenance dredging for at least the next twenty years. The DMMP is a planning document that ensures that sufficient disposal facilities are available for at least the next 20 years and that maintenance dredging activities are performed in an environmentally acceptable manner, use sound engineering techniques, and are economically justified. The final product of this report will be an integrated DMMP and Environmental Assessment pursuant to the National Environmental Policy Act (NEPA). The DMMP addresses O&M of an existing navigation project and does not require any authorization for implementation. Pursuant to EC 1165-2-214, HQUSACE has determined that a DMMP is an "other work product."

b. Study Description. The study area for the DMMP includes the nearshore Atlantic Ocean area (including the ocean bar channel and the EPA designated Wilmington Ocean Dredged Material Disposal Site (ODMDS)) at the mouth of the Cape Fear River to the upstream limit of the Federal Project on the Northeast Cape Fear River, a distance of approximately 38 miles. The existing Wilmington Harbor ship channel extends through the approximate center of the river and small islands border the channel for much of its length. These islands were created by disposal of dredged material in open water prior to the early 1970's. In addition to the Cape Fear River, proper, and the existing disposal islands, the study area also consists of lands on the east (New Hanover County) and west banks (Brunswick County) of the River, the beaches of southern New Hanover County and eastern Brunswick County, and the designated Wilmington Ocean Dredged Material Disposal Site (ODMDS).

The Cape Fear River has a long and active history as one of the earliest and most significant waterways in North Carolina. The State of North Carolina began navigation improvements in the Cape Fear River in 1822 and continued until 1829 when the Federal government assumed these responsibilities. Until 1870, Harbor improvements and maintenance were sporadic, but have been conducted frequently since then. Channel depths and widths have been gradually increased to accommodate the increasingly larger ships calling at the Port.

The Wilmington Harbor Federal navigation project begins as the ocean bar to the entrance of the Cape Fear River in southeastern North Carolina. Authorized navigation channel dimensions are described as follows:

1. Bald Head Shoal Channel through Battery Island Channel (~2 miles) consists of a required depth of -44 feet (-45 feet required in areas containing rock) with an allowable overdepth of 2 feet to -46 feet;
2. Lower Swash Channel through the Anchorage Basin channel to the Cape Fear River Memorial Bridge (~24.5 miles) and including the 1200-foot wide turning basin consists of a required depth of -42 feet (-43 feet required in areas containing rock) with an allowable overdepth of 2 feet to -44 feet;
3. From the Cape Fear Memorial Bridge up to 750 feet above the Hilton Railroad Bridge on

the Northeast Cape Fear River (~3.6 miles) consists of a required depth of -38 feet (-39 feet required in areas containing rock) with an allowable overdepth of 2 feet to -40 feet to include the 800 foot wide turning basin located at the northern end of fully developed areas of the City of Wilmington and

4. From 750 feet above the Hilton Railroad Bridge for approximately 1.3 miles to the project's northern terminus to include the most northern 800 foot wide turning basin consists of a required depth of -34 feet (-35 feet required in areas containing rock) with an allowable overdepth of 2 feet to -36 feet;
5. Authorized channel widths in the lower harbor vary along the project as described above. On average the widths are 500-675 feet wide from Bald Head Shoal up to the Cape Fear Memorial Bridge located at approximate River mile 27.2 with nothing less than 400 feet in width. The authorized width from the Cape Fear Memorial Bridge to the project's northern terminus is 250 feet wide.

The Wilmington Harbor navigation channel is divided into "reaches" or segments of river and dredging methods, and disposal options vary depending on the reach location and quality of material to be dredged (Figure 1-2). The sediment types in the Harbor generally consist of silt, sandy silt, and silty sand with some clay and peat. These alluvial soils are interbedded, generally unconsolidated, and relatively soft. The subsurface sediments are generally silty sands. Sand is described as sediment where 50% or more of the material lies between the number 4 sieve (4.76 mm) and the number 200 sieve (0.074mm). Silty sand is defined has a sand material with more than 12% of the material (silt) passing the number 200 sieve. Beach disposable sand is defined as sand material with less than 10% passing the number 200 sieve. Sediment classification is based on the Engineering Unified Soil Classification System. Table 1, below, contains a summary of all current maintenance dredging activities and includes dredging and disposal methods, sediment volumes, dredging frequency, and sediment classification.

Table 1. Summary of Current Dredging and Disposal Practices for Wilmington Harbor

Reaches	Channel Reaches	Shoaling Cubic Yards per Year	Frequency of dredging (years)	Disposal Location	Dredge Type	Sediment Type
Upper	Upstream Limits of Project to 750 ft above Chemserve	12,600	3	Eagle Island Cells 2/3	pipeline	silt
Upper	750 ft above Chemserve to NC 133 Bridge	70,600	3	EI Cell 2/Cell 3	pipeline	silt
Upper	NC 133 Bridge to Cape Fear Mem Bridge	14,100	3	EI Cell 2/Cell 3	pipeline	silt
Upper	Anchorage Basin	1,200,000	1	EI Cell 1/Cell 2/Cell 3	pipeline	silt
Upper	Between Channel	60,000	1	EI Cell 1/Cell 2/Cell 3	pipeline	silt
Upper	Fourth East Jetty	30,000	2	EI Cell 1/Cell 2/Cell 3	pipeline	silt
Upper	Upper Brunswick	67,000	2	EI Cell 1/Cell 2	pipeline	silt
Upper	Lower Brunswick	60,000	2	EI Cell 1/Cell 2	pipeline	silt
Mid River	Upper Big Island	22,500	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Lower Big Island	35,900	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Keg Island	34,100	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Upper Lilliput	48,900	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Lower Lilliput	43,000	2	ODMDS/DA-10	B&B or Hopper, Pipe.	sandy silt
Mid River	Upper Midnight	107,000	2	ODMDS/DA-8	B&B or Hopper, Pipe.	sandy silt
Mid River	Lower Midnight	25,500	2	ODMDS/DA-8	B&B or Hopper, Pipe.	sandy silt
Mid River	Reaves Point	1,000	9	ODMDS/DA-8	B&B or Hopper, Pipe.	silty sand
Mid River	Horseshoe Shoal	40,000	3	Bird Island/DA-3/4	pipeline	sand
Mid River	Snows Marsh	15,000	3	Bird Island/DA-3/4	pipeline	sand
Mid River	Lower Swash	0	2	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Battery Island	7,000	2	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Southport	5,000	4	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Baldhead-Caswell	11,000	4	ODMDS/DA-3/4	B&B or Hopper, Pipe.	sand
Inner OB	Smith Island	257,800	2	BHI/CB/WOI beaches	Pipeline	sand
Inner OB	Ocean Bar Entrance Channel	545,000	2	BHI/CB/WOI beaches	Pipeline	sand & silt
Outer OB	Ocean Bar Outer Channels	538,000	1	ODMDS	Hopper	silt
	TOTAL	3,251,000				

EI = Eagle Island, ODMDS = Ocean Dredged Material Disposal, BHI=Bald Head Island,CB=Caswell Beach,WOI=West Oak Island, B & B = Bucket and Barge

c. Factors Affecting the Scope and Level of Review.

This section discusses the factors affecting the risk informed decisions on the appropriate scope and level of review. The discussion is intended to be detailed enough to assess the level and focus of review and support the Wilmington Harbor DMMP PDT (PDT), PCX, and vertical team decisions on the appropriate level of review and types of expertise represented on the various review teams. Factors affecting the risk informed decisions on the appropriate scope and level of review include the following:

- *If parts of the study will likely be challenging (with some discussion as to why or why not and, if so, in what ways- consider technical, institutional, and social challenges, etc.);*

  The DMMP addresses O&M of an existing Harbor with typical disposal practices, including the continued use of the Eagle Island confined disposal facility, mid-River upland disposal sites, the beaches of Bald Head Island, Fort Caswell and Oak Island, and the ODMDS. The greatest challenge, which is not considered significant, is estimating the future quantities of dredged material to be removed annually from the navigation channel and developing plans to manage disposal areas and sediment in an efficient manner in order to maximize existing and future disposal area capacity.

- *A preliminary assessment of where the project risks are likely to occur and what the magnitude of those risks might be (e.g., what are the uncertainties and how might they affect the success of the project);*

  Wilmington Harbor has been successfully maintained by the USACE since 1829. This DMMP proposes minimal changes to the current maintenance practices. Changes include improvements at the existing Eagle Island disposal site, including potential dike raises and expansion, and restoration and improvements at the Disposal Area 3 (DA-3) and Disposal Area 4 (DA-4), sand recycling islands. There will also be modifications to the current beach disposal plan. In the past, beach disposal locations were determined on a time/dredging cycle basis. In the future, the beach disposal locations would be based on the location of sediments dredged from the navigation channel, i. e. shoaled material would be placed on the nearest beach. No new disposal facilities are proposed for construction. The DMMP outlines the key assumptions and associated minor risks involved with sediment testing, shoaling rates and sea level rise. When these risks are combined, the cumulative risk to the project is still very low.

- *If the project is likely to have significant economic, environmental, and/or social effects to the Nation (with some discussion as to why or why not and, if so, in what ways);*

  The DMMP will not have significant economic, environmental, or social effects to the Nation, and only minor effects will result from the modifications to Eagle Island, DA-3 and DA-4. Implementation of the DMMP ultimately will have positive economic, environmental and social effects by providing dredged material to the adjacent beaches. Failure to adequately maintain Wilmington Harbor in accordance with the DMMP could have negative economic effects on the Region and Nation. The goal is to maintain the authorized channel in accordance with applicable laws, SOPs, environmental operating practices and stewardship, using the DMMP as a guide to efficiently do so.

- *If the project likely involves significant threat to human life/safety assurance (with some discussion as to why* or *why not and, if so, in what ways - consider at minimum the safety assurance factors described in EC 1165-2-214 including, but not necessarily limited to, the consequences of non-performance on project economics, the environmental and social well-being (public safety and social justice; residual risk; uncertainty due to climate variability, etc.);*

The DMMP addresses O&M of an existing Harbor with typical disposal practices that would not add significant threat to human life/safety assurance. Uncertainties discussed above related to sediment testing, shoaling rates and sea level rise would have no bearing on life safety. Standard safety precautions associated with dredging of federal channels and placement of dredged material on public beaches would be enforced to ensure public safety.

- *If the project/study is likely to have significant interagency interest (with some discussion as to why or why not and, if so, in what ways);*

  The DMMP has been and will continue to be coordinated with the appropriate resource agencies. The current DMMP is supported by the resource agencies and there are no objections to the base plan.

- *If the project/study will be highly controversial (with some discussion as to why or why not and, if so, in what ways);*

  The DMMP is not highly controversial, however, one stakeholder, Bald Head Island, has a different opinion than the USACE as to the extent that the navigation channel impacts the Bald Head Island beaches. Therefore, it is likely that Bald Head Island will have a different opinion as to the beach disposal options. However, the DMMP will not determine the future beach placement options. Future beach placement operations will be based on the Sand Management Plan, another document that is currently being updated by the Wilmington District (completion scheduled for summer of 2014).

- *If the project report is likely to contain influential scientific information or be a highly influential scientific assessment (with some discussion as to why or why not and, if so, in what ways);*

  The DMMP does not contain influential scientific information and is not a highly influential scientific assessment.

- *If the information in the study document or proposed project design will likely be based on novel methods, involve the use of innovative materials or techniques, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices (with some discussion as to why or why not and, if so, in what ways);*

  The information in the DMMP is not based on novel methods, does not use innovative materials or techniques, does not present complex challenges, and is not precedent setting.

- *If the proposed project design will require redundancy, resiliency, and/or robustness (with some discussion as to why or why not and, if so, in what ways- see EC 1165-2-214, Appendix E, Paragraph 2 for more information about redundancy, resiliency, and robustness); and*

  The DMMP does not include features that require redundancy, resiliency or robustness as defined in EC 1165-2-214.

- *If the proposed project has unique construction sequencing or a reduced* or *overlapping design construction schedule (with some discussion as to why or why not and, if so, in what ways).*

  The DMMP does not involve unique construction sequencing or a reduced or overlapping design construction schedule.

d. In-Kind Contributions. There are no planned in-kind sponsor contributions.

4. DISTRICT QUALITY CONTROL (DQC)

DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC.

a. **Documentation of DQC.** DQC will be conducted by the PDT, South Atlantic Division, Wilmington District (SAW) independent reviewers, as well as chiefs of relevant key disciplines, where each of the reviewers will review the documents for accuracy. All reviewers are listed in Attachment 1. All DQC comments and responses will be documented by the Planning Technical Lead and made available to the ATR team for their use.

b. Products to Undergo DQC. The DQC for the DMMP Alternative Formulation Briefing (AFB) report was completed in 2007. The DMMP was put on hold for an extended period due to a combination of significant issues at Eagle Island and limited funding. The Draft and Final Integrated DMMP and Environmental Assessment (EA) will also undergo DQC at the appropriate times.

c. Required DQC Expertise. The PDT consists of key disciplines relevant to the DMMP and EA: Planning, Operations, Environmental, Legal, Cost, Economics, Real Estate, and Engineering, including geotechnical and coastal. DQC reviewers consist of non-PDT experts and experts in the supervisory chain.

5. AGENCY TECHNICAL REVIEW (ATR)

The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. The ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. The ATR teams will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

a. Products to Undergo ATR.

(1) DMMP AFB Report – ATR completed in September 2007

(2) Draft Integrated DMMP and EA – ATR scheduled for fall of 2014

b. Required ATR Team Expertise. The DDNPCX will accomplish ATR of the Wilmington Harbor DMMP. The ATR Team will reflect the major technical disciplines of the Wilmington Harbor DMMP PDT. As such, the ATR team will consist of the following disciplines: Plan Formulation, Operations, Environmental, Real Estate, Legal, Cost, Economics and Engineering, including, geotechnical and coastal.

Table 2. ATR Team Requirements

ATR Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with at least 10 years experience in preparing Civil Works study documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead will also serve as the Plan Formulation reviewer. They should be a senior water resources planner with experience in navigation projects and associated planning reports and documents. The ATR Lead will be from a district outside the MSC.
Plan Formulation	The team member should have a minimum of 7 years experience in plan formulation for O&M of deep draft navigation projects and knowledge of Planning Policy/Guidance for development of DMMPs.
Economics	The team member should have a minimum of 7 years experience in economics appropriate for development of a DMMP for a deep draft navigation project.
NEPA Compliance	The team member should have a minimum of 7 years experience in NEPA compliance for coastal deep draft navigation projects.
Coastal Engineering	The team member should have a P. E. or a minimum of 10 years of experience in coastal engineering, including experience in shoaling analyses and coastal processes.
Geotechnical Engineering	The team member should have a P. E. or a minimum of 10 years experience in geotechnical soils and materials assessments, including experience related to coastal deep draft navigation projects. The team member should also be qualified to review the UTEXAS4 model.
Cost Engineering	The team member should have a P. E. or a minimum of 7 years experience related to deep draft navigation projects.
Operations	The team member should have a minimum of 10 years experience in maintaining deep draft navigation projects.
Real Estate	The team member should have a minimum of 7 years experience in real estate requirements associated with deep draft navigation projects, including real estate requirements for beach disposal.

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments will be limited to those required to ensure adequacy of the product. The four key parts of a quality review comment included:

(1) The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;

(2) The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
(3) The significance of the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs), implementation responsibilities, safety, Federal interest, or public acceptability; and
(4) The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, comments may seek clarification to then assess whether further specific concerns may exist. The ATR documentation in DrChecks will include the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. All ATR concerns will be satisfactorily resolved between the ATR team and the PDT or elevated to South Atlantic Division for resolution.

At the conclusion of each ATR effort, the ATR Lead will prepare a Review Report summarizing the review. This review report is considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team).

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

An IEPR may be required under certain circumstances. IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, described in EC 1165-2-214, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted. There are two types of IEPR:

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for

integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-214.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

a. Decision on IEPR. Per the new guidance in the Programmatic O&M Review Plan, dated 20 December 2012, DMMPs are listed as routine O&M products. As the programmatic review plan is specifically for items that are not decision documents or implementation documents, HQUSACE has concluded that DMMPs are "other work products." Although some changes to current O&M practices are recommended in the DMMP, the changes are limited in scope and impact and therefore would not significantly benefit from an independent external peer review. Based on a risk informed evaluation, SAW determined that a Type I IEPR is not warranted on the Wilmington Harbor DMMP. Based on criteria contained in EC 1165-2-214, the District Chief of Engineering, as the Engineer-In-Charge, has not recommended a Safety Assurance Review (SAR). The Federal action is not justified by life safety, and project failure would not pose a significant threat to human life. Innovative materials or novel engineering methods will not be used. Redundancy, resiliency, or robustness is not required for implementation of the plan. Also, the project does not involve construction of new disposal sites at this time. The risk informed decision for not performing a Type I IEPR explicitly considered the following:

- *If the decision document meets the mandatory triggers for Type I IEPR described in Paragraph 11.d.(1) and Appendix D of EC 1165-2-214; and if it doesn't, then also:*
  - *the consequences of non-performance on project economics, the environmental and social well-being (public safety and social justice);*
    The Wilmington Harbor DMMP is an "other work product", not a decision document. The DMMP proposes minor changes to O&M practices that have performed well in the past, and the consequences of non-performance on project economics, the environmental and social well-being are likely to be insignificant.
  - *whether the product is likely to contain influential scientific information or be highly influential scientific assessment; and*
    The DMMP does not contain influential scientific information or highly influential scientific assessments.
  - *if and how the decision document meets any of the possible exclusions described in Paragraph ll.d.(3} and Appendix D of EC 1165-2-214.*
    The Wilmington Harbor DMMP is an "other work product." Engineering Circular 1165-2-214 lists the factors that trigger the requirement of Type I Independent External Peer Review (IEPR). The details provided below describe how the subject "other work project" addresses these factors.

- *Would a selected plan be likely to pose a significant threat to human life?*
  No. There are no aspects of the proposed DMMP that could pose a threat to human life.
- *Is total project cost estimated to exceed $45M?*
  Although it is expected that improvements at Eagle Island will be required to meet future dredged material disposal needs, the recommended plan and costs are yet to be determined. The costs of the study and the O&M projected for the next 20 years would likely be greater than $45 million, however no IEPR is anticipated. The objective of this DMMP is to ensure that there is sufficient disposal capacity to support O&M of the Wilmington Harbor Navigation Project for at least the next 20 years.

- *Requested by affected State Governor?* No.

- *Significant public dispute over the size, nature, or effects of the project?*
  There may be a degree of public dispute related to the DMMP. It is anticipated that Bald Head Island, a local stakeholder, may question whether the dredged material disposal measures recommended in the DMMP fairly distribute dredged sand amongst area beaches. The Sand Management Plan, which will be incorporated into the DMMP, provides for the distribution of sand on an equitable basis, based on data obtained over several years of monitoring.
- *Significant public dispute as to the economic or environmental cost or benefit of the project?*
  No.
- *Request by head of a reviewing Federal Agency, if determined likely to have an adverse impact on environmental, cultural, or other resources under his/her jurisdiction (after implementation of proposed mitigation plans)?*
  No.
- *Is an Environmental Impact Statement required for this study?*
  No. The DMMP will be integrated with an Environmental Assessment (EA).
- *Plan based on novel methods, presents complex challenges for interpretation, contains precedent setting methods or models, or presents conclusions that are likely to change prevailing practices?*
  No.
- *Any other circumstances where the Chief of Engineers determined IEPR is warranted?*
  No.

Based on the project as currently envisioned, the District Chief of Engineering, as the Engineer-In-Responsible-Charge, does not recommend a Type II IEPR Safety Assurance Review of this project at this time. If the Programmatic Operations and Maintenance (O&M) Review Plan is not determined to adequately address the implementation phase of this effort, a risk-informed decision concerning the timing and the appropriate level of reviews for the project implementation phase will be prepared and submitted for approval in an updated Review Plan prior to initiation of the design/implementation phase of this project.

b. Products to Undergo Type I IEPR. Not Applicable.

c. Required Type I IEPR Panel Expertise. Not Applicable.

d. Documentation of Type I IEPR. Not Applicable.

7. MODEL CERTIFICATION AND APPROVAL

a. Planning Models. No planning models were used in the development of the DMMP.

b. Engineering Models. The following engineering model was used during development of the DMMP: Geotechnical Engineering. The software used to perform the stability analysis for the Eagle Island confined disposal facility is the UTEXAS4 program. The UTEXAS4 program is a general-purpose software program for limit equilibrium slope stability computations. A stability analysis is a way to quantify, with a factor of safety, the hazard that a sliding or overturning failure will occur. Specific engineering criteria for the stability analysis dictates the minimum factor of safety, which is typically between 1.3 and 1.5 depending on the case. The UTEXAS4 computes a factor of safety, F, with respect to shear strength. The method of analysis used to determine the factor of safety for Eagle Island is Spencer's procedure (Spencer 1967, Wright 1970). Spencer's procedure fully satisfies static equilibrium for each slice within the failure area. Both circular and non-circular failure surfaces are analyzed by the UTEXAS4 software program. UTexas4 is the Corps of Engineers- sponsored slope stability program and is one of three slope stability programs recommended by the Geotechnical Community of Practice.

8. REVIEW SCHEDULES AND ATR COSTS

a. ATR Schedule and Cost. ATR of the Wilmington Harbor DMMP AFB report was completed in September 2007 at a cost of $31,000; ATR of the draft DMMP is planned for the fall of 2014 at an estimated cost of $50,000.

b. Type I IEPR Schedule and Cost. Not Applicable.

c. Model Certification/Approval Schedule and Cost. No planning models were used in the development of the DMMP. The UTexas4 program is the Corps of Engineers- sponsored slope stability program and is approved for use by the Geotechnical Community of Practice.

9. PUBLIC PARTICIPATION

In December 2005, a scoping letter for the proposed DMMP was sent to federal and state agencies, interest groups, and the public requesting identification of significant resources and issues of concern. Following the scoping letter, a scoping meeting was also held with resource agencies, interest groups and the public. The purpose of the scoping meeting was to brief attendees on the Wilmington Harbor DMMP project and process, to solicit comments and input and to invite attendees to participate on the Project Delivery Team (PDT). Attendees included representatives from state and federal resource agencies, interest groups, and stakeholders. All concerns identified in response to the scoping letter and at the scoping meeting were considered in the development of the DMMP AFB report. Several attendees of the public meeting expressed an interest in participating on the PDT, occasionally attend PDT meetings and have made important contributions to the planning and development of the DMMP.

A Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) was published in the Federal Register on December 26, 2006. Based on work completed since the NOI was published, it is likely that an Environmental Impact Statement will not be required, therefore an Environmental Assessment will be prepared.

Interested stakeholders and resource agencies had the opportunity to review the AFB read-ahead package and to attend the AFB, which was held on November 19, 2007. Input received during this review and at the AFB has been and will continue to be considered during development of the DMMP.

Following the AFB in 2007, work continued on the DMMP until September 2009. At that time, due to a combination of significant issues at Eagle Island and limited funding, the DMMP was put on hold. Work resumed on the DMMP in November 2012.

Development of the integrated DMMP/EA will be coordinated with the appropriate stakeholders and will be disseminated to resource agencies, interest groups, and the public as part of the NEPA environmental compliance review. The draft DMMP/EA will be provided to the public via the U.S. Postal Service or email and will be posted on the District web page and all input received will be considered in the preparation of the final report. Attachment 1 includes the review team roster (DMMP PDT, Independent Reviewers and the AFB ATR team).

10. REVIEW PLAN APPROVAL AND UPDATES

The South Atlantic Division Commander is responsible for approving this Review Plan, including by delegation of authority within the MSC. The MSC Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for this DMMP. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval will be documented in Attachment 2. Significant changes to the Review Plan (such as changes to the scope and/or level of review) must be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the MSC Commander's approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

11. REVIEW PLAN POINTS OF CONTACT

Questions and/or comments on this review plan can be directed to the following points of contact:

- Wilmington District Project Manager, (910) 251-4671
- Wilmington District Project Technical Lead, (910) 251-4757
- South Atlantic Division Point of Contact, (404) 562-5226
- Deep Draft Navigation Planning Center of Expertise, (251) 694-3804

Attachment 1: Team Rosters

Project Delivery Team (PDT)

ROLE	AGENCY
Project Manager	CESAW-PM-C
Technical & Planning Leader	CESAW-TS-PE
Design	CESAW-TS-ED
Navigation	CESAW-OP-N
Cultural Resources	CESAW-TS-PE
Coastal/H&H	CESAW-TS-EC
Geotechnical Engineering	CESAW-TS-EG
Cost Engineering	CESAW-TS-EE
Economics	CESAW-TS-PF
Real Estate	CESAS-RE-AP
Office of Counsel	CESAW-OC
Operations	CESAW-OP-N
Non-Federal Sponsor	State of North Carolina Division of Water Resources
Resource Agencies	US Fish and Wildlife Service NC Wildlife Resources Commission National Marine Fisheries Service NC Division of Marine Fisheries NC Division of Water Quality
Stakeholders	NC State Ports Authority Village of Bald Head Island

Independent Reviewers

ROLE	Organization
Chief, Planning & Environmental	CESAW-TS-P
Chief, Environmental	CESAW-TS-PE
Chief, Engineering	CESAW-TS-EC
Chief, Geotechnical Engineering	CESAW-TS-EG
Chief, Operations	CESAW-OP
Chief, Office of Counsel	CESAW-OC
Chief, Real Estate	CESAS-RE

AFB ITR Team

DISCIPLINE	NAME	ORGANIZATION
ITR Manager	Ken Claseman	SAM
DDNPCX ITR Coordinator	Bernard Moseby	SAM
District ATR Coordinator	James Baker	SAJ
Plan Formulation	Dick Powell/Stacey Roth	SAJ
Economics	Bernard Moseby	SAM
Environmental	Eric Gasch	SAJ
Civil Design	Jimmy Matthews	SAJ
Geotechnical Engineering	Samir Itani	SAJ
Coastal/H & H	Candida Bronson	SAJ
Operations	Al Fletcher	SAJ
Cost Engineering	Jeff Fersner	SAC

Draft DMMP ATR Team

DISCIPLINE	NAME	ORGANIZATION
DDNPCX ATR Manager	TBD	TBD
District ATR Coordinator	TBD	TBD
Plan Formulation	TBD	TBD
Economics	TBD	TBD
Environmental	TBD	TBD
Civil Engineering	TBD	TBD
Geotechnical Engineering	TBD	TBD
Coastal/H & H	TBD	TBD
Operations	TBD	TBD
Cost Engineering	TBD	TBD

Attachment 2: Review Plan Revisions

Revision Date	Description of Change	Page / Para. Number

Review Plan Checklist
For Decision Documents

Date: 19 July 2013
Originating District: Wilmington District
Project/Study Title: Wilmington Harbor Dredged Material Management Plan and EIS

District POC:
PCX Reviewer:

REQUIREMENT	REFERENCE	EVALUATION
1. Is the Review Plan (RP) a stand alone document?	EC 1165-2-214	Yes ☒ No ☐
a. Does it include a cover page identifying it as a RP and listing the project/study title, originating district or office, and date of the plan?		a. Yes ☒ No ☐
b. Does it include a table of contents?		b. Yes ☒ No ☐
c. Is the purpose of the RP clearly stated and EC 1165-2-214 referenced?		c. Yes ☒ No ☐
d. Does it reference the Project Management Plan (PMP) of which the RP is a component?		d. Yes ☒ No ☐
e. Does it succinctly describe the three levels of peer review: District Quality Control (DQC), Agency Technical Review (ATR), and Independent Technical Peer Review (IEPR)?		e. Yes ☒ No ☐
f. Does it include a paragraph stating the title, subject, and purpose of the decision document to be reviewed?		f. Yes ☒ No ☐
g. Does it list the names and disciplines of the Project Delivery Team (PDT)?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.*	EC 1165-2-214	g. Yes ☒ No ☐
2. Is the RP detailed enough to assess the necessary level and focus of peer review?	EC 1165-2-214	Yes ☒ No ☐
a. Does it indicate which parts of the study	EC 1165-2-214	a. Yes ☒ No ☐

will likely be challenging?		
b. Does it provide a preliminary assessment of where the project risks are likely to occur and what the magnitude of those risks might be?	EC 1165-2-214	b. Yes ☒ No ☐
c. Does it indicate if the project/study will include an environmental impact statement (EIS)? *Is an EIS included? Yes* ☐ *No* ☒ *If yes, IEPR is required.*	EC 1165-2-214	c. Yes ☒ No ☐ Comment: EA required; not an EIS
d. Does it address if the project report is likely to contain influential scientific information or be a highly influential scientific assessment? *Is it likely? Yes* ☐ *No* ☒ *If yes, IEPR is required.*	EC 1165-2-214	d. Yes ☒ No ☐
e. Does it address if the project is likely to have significant economic, environmental, and social affects to the nation, such as (but not limited to):	EC 1165-2-214	e. Yes ☒ No ☐
• more than negligible adverse impacts on scarce or unique cultural, historic, or tribal resources?	EC 1165-2-214	
• substantial adverse impacts on fish and wildlife species or their habitat, prior to implementation of mitigation?	EC 1165-2-214	
• more than negligible adverse impact on species listed as endangered or threatened, or to the designated critical habitat of such species, under the Endangered Species Act, prior to implementation of mitigation? *Is it likely? Yes* ☐ *No* ☒ *If yes, IEPR is required.*	EC 1165-2-214	
f. Does it address if the project/study is likely to have significant interagency interest? *Is it likely? Yes* ☐ *No* ☒	EC 1165-2-214	f. Yes ☒ No ☐ Comment: One stakeholder has concerns.

If yes, IEPR is required.	EC 1165-2-214	
g. Does it address if the project/study likely involves significant threat to human life (safety assurance)? *Is it likely? Yes ☐ No ☒* *If yes, IEPR is required.*	EC 1165-2-214	g. Yes ☒ No ☐
h. Does it provide an estimated total project cost? *What is the estimated cost: Unknown (best current estimate; may be a range)* *Is it > $45 million? Yes ☐ No ☒* *If yes, IEPR is required.*	EC 1165-2-214	h. Yes ☐ No ☒
i. Does it address if the project/study will likely be highly controversial, such as if there will be a significant public dispute as to the size, nature, or effects of the project or to the economic or environmental costs or benefits of the project? *Is it likely? Yes ☐ No ☒* *If yes, IEPR is required.*	EC 1165-2-214	i. Yes ☒ No ☐
j. Does it address if the information in the decision document will likely be based on novel methods, present complex challenges for interpretation, contain precedent-setting methods or models, or present conclusions that are likely to change prevailing practices? *Is it likely? Yes ☐ No ☒* *If yes, IEPR is required.*		j. Yes ☒ No ☐
3. Does the RP define the appropriate level of peer review for the project/study?	EC 1165-2-214	Yes ☒ No ☐
a. Does it state that DQC will be managed by the home district in accordance with the Major Subordinate Command (MSC) and district Quality Management Plans?	EC 1165-2-214	a. Yes ☒ No ☐
b. Does it state that ATR will be conducted or managed by the lead PCX?	EC 1165-2-214	b. Yes ☒ No ☐

c. Does it state whether IEPR will be performed? *Will IEPR be performed? Yes ☐ No ☒*	EC 1165-2-214 EC 1165-2-214	c. Yes ☒ No ☐
d. Does it provide a defensible rationale for the decision on IEPR?		d. Yes ☒ No ☐
e. Does it state that IEPR will be managed by an Outside Eligible Organization, external to the Corps of Engineers?		e. Yes ☐ No ☐ n/a ☒
4. Does the RP explain how ATR will be accomplished?	EC 1165-2-214	Yes ☒ No ☐
a. Does it identify the anticipated number of reviewers?	EC 1165-2-214	a. Yes ☒ No ☐
b. Does it provide a succinct description of the primary disciplines or expertise needed for the review (not simply a list of disciplines)?	EC 1165-2-214	b. Yes ☒ No ☐
c. Does it indicate that ATR team members will be from outside the home district?	EC 1165-2-214	c. Yes ☒ No ☐
d. Does it indicate that the ATR team leader will be from outside the home MSC?	EC 1165-2-214	d. Yes ☒ No ☐
e. Does the RP state that the lead PCX is responsible for identifying the ATR team members and indicate if candidates will be nominated by the home district/MSC?	EC 1165-2-214	e. Yes ☒ No ☐ Comment: Candidates will not be nominated by the home district\MSC.
f. If the reviewers are listed by name, does the RP describe the qualifications and years of relevant experience of the ATR team members?* **Note: It is highly recommended to put all team member names and contact information in an appendix for easy updating as team members change or the RP is updated.*	EC 1165-2-214	f. Yes ☒ No ☐ n/a ☐
5. Does the RP explain how IEPR will be accomplished?	EC 1165-2-214	**Yes ☐ No ☐ n/a ☒**
a. Does it identify the anticipated number of reviewers?	EC 1165-2-214	a. Yes ☐ No ☒

	f	
b. Does it provide a succinct description of the primary disciplines or expertise needed for the review (not simply a list of disciplines)?	EC 1165-2-214	b. Yes ☐ No ☒
c. Does it indicate that the IEPR reviewers will be selected by an Outside Eligible Organization and if candidates will be nominated by the Corps of Engineers?	EC 1165-2-214	c. Yes ☐ No ☒
d. Does it indicate the IEPR will address all the underlying planning, safety assurance, engineering, economic, and environmental analyses, not just one aspect of the project?	EC 1165-2-214	d. Yes ☐ No ☒
6. Does the RP address peer review of sponsor in-kind contributions?		Yes ☒ No ☐
a. Does the RP list the expected in-kind contributions to be provided by the sponsor?	EC 1165-2-214	a. Yes ☐ No ☒ Comment: None
b. Does it explain how peer review will be accomplished for those in-kind contributions?		b. Yes ☐ No ☐ n/a ☒
7. Does the RP address how the peer review will be documented?		Yes ☒ No ☐
a. Does the RP address the requirement to document ATR and IEPR comments using DrChecks?	EC 1165-2-214	a. Yes ☒ No ☐
b. Does the RP explain how the IEPR will be documented in a Review Report?	EC 1165-2-214	b. Yes ☐ No ☐ n/a ☒
c. Does the RP document how written responses to the IEPR Review Report will be prepared?	EC 1165-2-214	c. Yes ☐ No ☐ n/a ☒
d. Does the RP detail how the district/PCX will disseminate the final IEPR Review Report, USACE response, and all other materials related to the IEPR on the internet and include them in the applicable decision document?	EC 1165-2-214)	d. Yes ☐ No ☐ n/a ☒

8. Does the RP address Policy Compliance and Legal Review?	EC 1165-2-214	Yes ☒ No ☐
9. Does the RP present the tasks, timing and sequence (including deferrals), and costs of reviews?	EC 1165-2-214	Yes ☒ No ☐
a. Does it provide a schedule for ATR including review of the Feasibility Scoping Meeting (FSM) materials, Alternative Formulation Briefing (AFB) materials, draft report, and final report?	EC 1165-2-214	a. Yes ☒ No ☐
b. Does it include interim ATR reviews for key technical products?	EC 1165-2-214	b. Yes ☐ No ☒
c. Does it present the timing and sequencing for IEPR?		c. Yes ☐ No ☐ n/a ☒
d. Does it include cost estimates for the peer reviews?		d. Yes ☒ No ☐
10. Does the RP indicate the study will address Safety Assurance factors? Factors to be considered include: • Where failure leads to significant threat to human life • Novel methods\complexity\ precedent-setting models\policy changing conclusions • Innovative materials or techniques • Design lacks redundancy, resiliency of robustness • Unique construction sequence or acquisition plans • Reduced\overlapping design construction schedule	EC 1165-2-214	**Yes** ☐ **No** ☒ **n/a** ☒ **Comments:** Document is not a Flood Risk nor Shore Protection Study
11. Does the RP address model certification requirements?	EC 1165-2-214	Yes ☒ No ☐
a. Does it list the models and data anticipated to be used in developing recommendations (including mitigation models)?	EC 1165-2-214	a. Yes ☒ No ☐

b. Does it indicate the certification/approval status of those models and if certification or approval of any model(s) will be needed?	EC 1165-2-214	b. Yes ☒ No ☐
c. If needed, does the RP propose the appropriate level of certification/approval for the model(s) and how it will be accomplished?	EC 1165-2-214	c. Yes ☐ No ☐ n/a ☒
12. Does the RP address opportunities for public participation?		Yes ☒ No ☐
a. Does it indicate how and when there will be opportunities for public comment on the decision document?	EC 1165-2-214	a. Yes ☒ No ☐
b. Does it indicate when significant and relevant public comments will be provided to reviewers before they conduct their review?	EC 1165-2-214	b. Yes ☒ No ☐
c. Does it address whether the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers?	EC 1165-2-214	c. Yes ☒ No ☐
d. Does the RP list points of contact at the home district and the lead PCX for inquiries about the RP?	EC 1165-2-214	d. Yes ☒ No ☐
13. Does the RP address coordination with the appropriate Planning Centers of Expertise?	EC 1165-2-214	Yes ☒ No ☐
a. Does it state if the project is single or multi-purpose? Single ☒ Multi ☐ List purposes: Dredged Material Disposal		a. Yes ☒ No ☐
b. Does it identify the lead PCX for peer review? Lead PCX: **DDN**		b. Yes ☒ No ☐
c. If multi-purpose, has the lead PCX coordinated the review of the RP with the other PCXs as appropriate?	EC 1165-2-214	c. Yes ☐ No ☐ n/a ☒
14. Does the RP address coordination with the Cost Engineering Mandatory Center of Expertise (MCX) in Walla Walla District for ATR of cost estimates, construction schedules and	EC 1165-2-214 Para 3	Yes ☒ No ☐

contingencies for all documents requiring Congressional authorization?		
a. Does it state if the decision document will require Congressional authorization? b. If Congressional authorization is required, does the state that coordination will occur with the Cost Engineering MCX?		a. Yes ☐ No ☒ b. Yes ☐ No ☐ n/a ☒
15. Other Considerations: This checklist highlights the minimum requirements for an RP based on EC 1165-2-214. Additional factors to consider in preparation of the RP include, but may not be limited to: a. Is a request from a State Governor or the head of a Federal or state agency to conduct IEPR likely? b. Is the home district expecting to submit a waiver to exclude the project study from IEPR? c. Are there additional Peer Review requirements specific to the home MSC or district (as described in the Quality Management Plan for the MSC or district)? d. Are there additional Peer Review needs unique to the project study?	 EC 1165-2-214 EC 1165-2-214	 a. Yes ☐ No ☒ b. Yes ☐ No ☒ c. Yes ☐ No ☒ d. Yes ☐ No ☒
Detailed Comments and Back check: JLG		