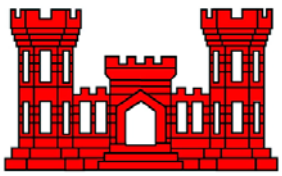
Volume 2
Part 3

Response to Draft EIS Comments



U.S. Army Corps of Engineers
Memphis District

DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS, TN 38103-1894

Reply to
Attention of
Executive Office

3 JAN 13

Mr. Ken Kopocis
Assistant Administrator for the Office of Water
Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Re: St. Johns Bayou and New Madrid Floodway, Missouri Project

Dear Mr. Kopocis:

Enclosed is a compact disc containing an advanced copy of the *St. Johns Bayou and New Madrid Floodway Project Draft Environmental Impact Statement* and supporting appendices. The draft EIS has not been released to the public. We anticipate that the 45-day public review will begin on January 18, 2013 with publication of the Notice of Availability in the Federal Register. We look forward to receiving your agency's official comments on the project. We will continue to coordinate with members of your staff as the NEPA process progresses. Please contact Danny Ward for any questions at (901) 544-0709 or daniel.d.ward@usace.army.mil.

Sincerely,

Vernie L. Reichling
Colonel, Corps of Engineers
District Commander

(Enclosure)

Copies Furnished:
Mr. Dan Ashe, U.S. Fish and Wildlife Service
Mr. Charles Wooley, U.S. Fish and Wildlife Service, Midwest Region
Ms. Amy Salveter, U.S. Fish and Wildlife Service, Columbia, Missouri Ecological Services Field Office
Ms. Karen Flournoy, EPA Region VII, Water, Wetlands, and Pesticide Division
Dr. Ron Hammerschmidt, EPA Region VII, Environmental Services Division

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MEMPHIS DISTRICT CORPS OF ENGINEERS
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Reply to
Attention of
Executive Office

3 JAN 13

Dr. Ron Hammerschmidt
Director, Environmental Services Division
U.S. Environmental Protection Agency Region VII
11201 Renner Blvd.
Lenexa, KS 66219

Re: St. Johns Bayou and New Madrid Floodway, Missouri Project

Dear Dr. Hammerschmidt:

Enclosed is a compact disc containing an advanced copy of the *St. Johns Bayou and New Madrid Floodway Project Draft Environmental Impact Statement* and supporting appendices. The draft EIS has not been released to the public. We anticipate that the 45-day public review will begin on January 18, 2013 with publication of the Notice of Availability in the Federal Register. We look forward to receiving your agency's official comments on the project. We will continue to coordinate with members of your staff as the NEPA process progresses. Please contact Danny Ward for any questions at (901) 544-0709 or daniel.d.ward@usace.army.mil.

Sincerely,

Vernie L. Reichling.
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District Commander

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Mr. Ken Kopocis, EPA Headquarters, Office of Water
Ms. Karen Flournoy, EPA Region VII, Water, Wetlands, and Pesticide Division

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Attention of
Executive Office

3 JAN 13

Ms. Karen Flournoy
Director, Water, Wetlands and Pesticide Division
U.S. Environmental Protection Agency Region VII
11201 Renner Blvd.
Lenexa, KS 66219

Re: St. Johns Bayou and New Madrid Floodway, Missouri Project

Dear Ms. Flournoy:

Enclosed is a compact disc containing an advanced copy of the *St. Johns Bayou and New Madrid Floodway Project Draft Environmental Impact Statement* and supporting appendices. The draft EIS has not been released to the public. We anticipate that the 45-day public review will begin on January 18, 2013 with publication of the Notice of Availability in the Federal Register. We look forward to receiving your agency's official comments on the project. We will continue to coordinate with members of your staff as the NEPA process progresses. Please contact Danny Ward for any questions at (901) 544-0709 or daniel.d.ward@usace.army.mil.

Sincerely,

Vernie L. Reichling.
Colonel, Corps of Engineers
District Commander

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DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT CORPS OF ENGINEERS
167 NORTH MAIN STREET B-202
MEMPHIS, TN 38103-1894

Reply to
Attention of
Executive Office

3 JAN 13

Mr. Dan Ashe
Director, U.S. Fish and Wildlife Service
Main Interior
1849 C Street NW, Room 331
Washington, DC 20240-0001

Re: St. Johns Bayou and New Madrid Floodway, Missouri Project

Dear Mr. Ashe:

Enclosed is a compact disc containing an advanced copy of the *St. Johns Bayou and New Madrid Floodway Project Draft Environmental Impact Statement* and supporting appendices. The draft EIS has not been released to the public. We anticipate that the 45-day public review will begin on January 18, 2013 with publication of the Notice of Availability in the Federal Register. We look forward to receiving your agency's official comments on the project. We will continue to coordinate with members of your staff as the NEPA process progresses. Please contact Danny Ward for any questions at (901) 544-0709 or daniel.d.ward@usace.army.mil.

Sincerely,

Vernie L. Reichling.
Colonel, Corps of Engineers
District Commander

(Enclosure)

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MEMPHIS DISTRICT CORPS OF ENGINEERS
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MEMPHIS, TN 38103-1894

Reply to
Attention of
Executive Office

3 JAN 13

Mr. Charles Wooley
Regional Director
U.S. Fish and Wildlife Service, Midwest Region
5600 American Blvd. West
Bloomington, MN 55437-1458

Re: St. Johns Bayou and New Madrid Floodway, Missouri Project

Dear Mr. Wooley:

Enclosed is a compact disc containing an advanced copy of the *St. Johns Bayou and New Madrid Floodway Project Draft Environmental Impact Statement* and supporting appendices. The draft EIS has not been released to the public. We anticipate that the 45-day public review will begin on January 18, 2013 with publication of the Notice of Availability in the Federal Register. We look forward to receiving your agency's official comments on the project. We will continue to coordinate with members of your staff as the NEPA process progresses. Please contact Danny Ward for any questions at (901) 544-0709 or daniel.d.ward@usace.army.mil.

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Colonel, Corps of Engineers
District Commander

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Columbia Ecological Services Field Office
101 Park DeVille Drive, Suite A
Columbia, Missouri 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

January 18, 2013

Colonel Vernie L. Reichling, Jr.
Commander, Memphis District
U.S. Army Corps of Engineers
167 North Main Street B-202
Memphis, Tennessee 38103-1894

Dear Colonel Reichling:

Thank you for the January 2013 IAT advance copy of the Draft Environmental Impact Statement (DEIS) for the St. Johns Bayou and New Madrid Floodway Project in southeast Missouri. Because of workload, the U.S. Fish and Wildlife Service (Service) has been able to conduct only a cursory review of the main body of the DEIS; however, we believe it is important to provide these preliminary comments in the interest of addressing our outstanding resources concerns as efficiently as possible. The Service will continue our more detailed review and will forward those comments within the next month.

In our preliminary review of the document, we have identified the following concerns that have not been adequately addressed:

- The document appears to discredit previous and continuing Service input regarding the value of fish and wildlife resources within the project area. This includes mischaracterizing Service input regarding recent updates to the National Wetlands Inventory, a long-standing, nationally recognized mapping tool for wetlands data.
- The proposed mitigation actions lack scientific validation, are logistically infeasible, and inadequate both in kind (i.e., batture lands for lost floodplain and backwaters) and amount. Based on the descriptions provided in the DEIS, the proposed mitigation does not appear to comply with the current Mitigation Rule under the Clean Water Act.
- The Adaptive Management program does not include details on what actions will be taken to rectify mitigation measures that do not work. This would include additional lands and changes in the project operations and the effects to the resource as well as the cost and benefit of the project.
- The DEIS does not address cumulative impacts of lost flood water storage capacity of the floodway on the surrounding river communities under the preferred alternative, nor does it characterize the impacts of the 2011 flood on both the Floodway and adjacent river reaches. The Independent Expert Panel Review Panel urged the Corps to use actual

economic and flood data in evaluating project effects, and not rely solely on model results.

The principal difference between the Service and the U.S. Army Corps of Engineers (Corps) on the project is encapsulated in second paragraph of the DEIS Abstract (page i). In this paragraph the Corps states that the connection between the Mississippi River and its floodplain (referred to by the Corps as the "flood pulse") is no longer the driving force for the existence, productivity, and interactions of biota in the project area. The Corps contends that agricultural disturbances are now the principle force that limits ecological productivity and habitat. The Service agrees with two aspects of the Corps' position stated here: 1) that the river-floodplain connection has been permanently eliminated for the St. Johns Bayou Basin; and 2) that agricultural land use has reduced both the quantity and quality of physical habitat. However, the Service strongly disagrees with the Corps pertaining to the ecological and biological importance of the hydrologic connection of the New Madrid Floodway with the river. There is a huge volume of scientific literature on the river-floodplain continuum and the resource effects when the connection is eliminated. This issue has been extensively studied along the Lower Mississippi River, an area which has experienced significant impacts to the river-floodplain ecosystem by levees, control structures, drainage, and land use changes.

The 1,500 foot gap in the frontline levee of the New Madrid Floodway constitutes the only remaining place in the State of Missouri where the river is connected to its floodplain. Furthermore, there are few similar areas left throughout the Lower Mississippi River. The Service fully acknowledges that alterations in the form of levees, drainage, and agriculture have affected the quantity and quality of habitat in the Floodway. However, based on sound scientific information, it is clearly evident to the Service and others that the hydrologic connection between the river and the Floodway is the principal biological driver. This occasional hydrologic connection is responsible for maintaining a full spectrum of natural resources typically associated with a river-floodplain landscape (e.g., wetlands, fish, waterfowl, shorebirds). During the Independent Expert Panel Review process for the project, the experts discussed in detail the value of this connection as a biological driver in the Floodway. Its value was further validated in a recent study of the Floodway after breach of the Birds Point Levee in May 2011 (Phelps, Tripp, and Herzog 2012. Temporary Connectivity: A Comparison of the New Madrid Floodway and the Adjacent Main River, Big Rivers and Wetland Field Station, Missouri Department of Conservation). This study documented higher levels of fish diversity, density, and growth in the Floodway than in the Mississippi River.

Based on our abbreviated review, the Service believes the Corps' preferred alternative continues to result in unacceptable losses of nationally significant fish, wildlife, and aquatic resources. Notwithstanding the Independent Expert Panel Review process, the science of wetlands and big rivers ecology, as well as an ever increasing community of practice in habitat restoration provide no valid justification that the proposed resource loss can be mitigated. Small projects are difficult to mitigate, and the scale of this project is one of the largest flood damage reduction projects proposed in the nation. As noted in the Assistant Secretary of the Interior's August 26, 2011, letter to ASA Darcy, we continue to urge the Corps to focus on flood damage reduction project features that protect public health, safety, and infrastructure. The Service continues to strongly advocate the Corps adopt the St. Johns Bayou-only alternative to address the flood

protection needs of the communities and public infrastructure (e.g., I-55) in that basin. We believe adopting a St. Johns Bayou-only alternative will avoid another exhaustive, repetitive cycle of rebuttal between the federal agencies, and most efficiently and effectively address the most pressing, long-standing flood control issues in the project area.

Thank you for the opportunity to review the DEIS. We will continue our more detailed review of the document. Please don't hesitate to call me if you have questions concerning our comments.

Sincerely,

Amy Salveter
Field Supervisor

cc: DOI, HQ, Washington, D.C. (Bean)
EPA, Region 7, Lenexa, KS (Horchem)
FWS, Region 3, Bloomington, MN (Wooley)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

March 20, 2013

Mr. Edward E. Belk, Jr., PE
Director of Programs
U.S. Army Corps of Engineers
Mississippi Valley Division
1400 Walnut Street
Vicksburg, Mississippi 39108

Dear Mr. Belk:

As per our earlier discussion, the United States Environmental Protection Agency, Region 7, is providing our final comments on major issues previously identified in January 2013, regarding the Preliminary DEIS for the Saint Johns/New Madrid Project. The eight issues discussed below highlight areas for improvement with respect to compliance pursuant to NEPA and with the Clean Water Act Section 404(b) (1) Guidelines. Detailed comments specific to both NEPA and CWA compliance are contained as an attachment.

1. Purpose and Need

The document does not adequately describe the purpose and need of the proposed action in a clear and transparent way as to allow the public and decision makers the opportunity to understand the basic information regarding the project. This section must transmit information including who, what, where, how, and why as they relate to the underlying purpose and need to which the agency is responding in proposing the alternatives, including the proposed action. A more clearly defined project purpose is also necessary to facilitate the analysis of alternatives under both NEPA and CWA Section 404. As currently written, this section of the EIS does not provide a clear purpose, and confuses the reader by attempting to explain distinctions between flood risk, flood control, flood damage reduction, and flood risk management.

2. Implications of the 2011 Flood and Executive Order 11988

Information from the 2011 flooding should be incorporated such as the impact flooding would have on the alternatives proposed or the alternative selected. It is unclear what impact the flooding would have on the alternatives proposed or the alternative selected. Additionally, it is unclear to what extent the project is consistent with Executive Order 11988: Flood Plain Management.

3.Flood Risk Management and Environmental Justice Executive Order 12898

The document acknowledges the project will result in increases in Mississippi River elevation, but does not adequately address or quantify the increase in flood risk to those affected areas and communities. The document provides some discussion regarding environmental justice (EJ), yet does not sufficiently acknowledge the extent EJ communities down or upstream will be impacted by the project.

4. Jurisdiction:
The Jurisdictional Determinations for the project area should be included. This analysis is needed to adequately quantify impacts within the project area.

5. Alternatives Analysis:
Analysis of the full range of reasonable alternatives and selection of the least environmentally damaging practicable alternative, consistent with the CWA Section 404(b)(1) Guidelines, has not been adequately demonstrated.

Additional information/analysis in needed to: determine water dependency; demonstrate that all avoid and minimize measures have been incorporated; demonstrate that the full range of practicable alternatives have been evaluated; evaluate and compare of direct, secondary, and cumulative impacts of each alternative; and select the Least Environmentally Damaging Practicable Alternative.

6. Impacts to Wetlands and Streams
The 404(b)(1) analysis in Appendix E Part 7 does not appear to sufficiently consider cumulative, direct or secondary/indirect impacts to water quality, special aquatic sites (wetlands, riffle and pool complexes), and/or recreation. The document should provide a complete scientific evaluation of current functions provided by project area resources (i.e., fish and wildlife habitat, water quality maintenance, water storage, recreational use), most importantly, those linked to the connectivity (flood pulse) of the Mississippi River, and potential impacts to those functions under each alternative. Analysis of potential impacts to resources above the five year floodplain should also be considered in the DEIS.

Jurisdictional Determinations, a responsibility of the Corps describing Waters of the United States, have not been included. This information is essential in identifying wetlands during project implementation for purposes of avoiding impacts during construction, operation and maintenance of project activities.

7. Adequacy of Compensatory Mitigation:
The Advance DEIS has not demonstrated that the proposed compensatory mitigation actions would fully comply with the Compensatory Mitigation for the Losses of Aquatic Resources Final Rule (40 CFR Part 230, Subpart J). The rigor and detail of the comprehensive mitigation plan to demonstrate adequate compensation is commensurate with the degree of impacts (40 CFR 230.93(a)(1)). Sufficient information is not provided to demonstrate that compensation is likely to succeed or can offset significant impacts. Therefore, the document does not support the conclusions of "no significant adverse effect" under the Evaluation of Extent of Degradation of the Waters of the Unites States in Appendix E, Part 7 Section 404(b)(1) Evaluation Report and does not demonstrate compliance with the requirements of 40 CFR 230.10(c).

Section 2.3 of the document states "There is a level of uncertainty with mitigation since specific tracts have not been identified to date." Because specific lands have not yet been identified, it is difficult to discern whether the DEIS demonstrates that unavoidable impacts to aquatic resources can be adequately compensated. This information must be provided in the DEIS or in a separate supplemental document with public comment if the Corps decides to pursue this option.

The document does not fully address previous comments provided by the EPA, including: hydrologic alteration, management of the flood pulse, restoration of forested wetlands, and adequate compensation for stream impacts.

Also, the document does not indicate that mitigation sites will be designed to be self sustaining and protected in perpetuity. The document also does not address the requirements for proposed preservation activities (40 CFR § 230.93(h)).

Use of State land (MDC Ten Mile Pond Conservation Area and Big Oak Tree State Park) as mitigation may not be compliant with 40 C.F.R. § 230.93(a)(3) because these lands are a part of "public programs already planned or in place." Also, these lands may not meet 40 C.F.R. § 230.92(h) requirements for preservation.

The costs of mitigation are not adequately assessed and the cost/benefit ratio cannot be fully determined. The document should clearly outline how mitigation costs were derived and these costs should be specified when comparing alternatives.

8. Use of Models:
The Advance DEIS is unclear if the models used in support of decisions have been certified. Several issues and criteria identified by the Model Certification Review Report have not been addressed. There are also a number of questions on the way HGM is used to calculate impacts further described in the attached comments.

Thank you for the opportunity to provide our comments on the preliminary DEIS. We look forward to our continued collaboration on this interagency effort. Please do not hesitate to contact us if you have questions or need additional information. You may also contact Steve Kovac at 913-551-7698 or Jeffery Robichaud at 913-551-7146 of our staffs for questions or clarifications regarding compliance with Section 404 of the CWA or NEPA (respectively).

Sincerely,

Karen A. Flournoy
Director
Water, Wetlands and Pesticides Division

Ronald F. Hammerschmidt, Ph.D.
Director
Environmental Services Division

Enclosure

cc:Brian Chewning
U.S. Army Corps of Engineers

Major Issues Identified by the Environmental Protection Agency With Additional Comments IAT Advance Copy Draft Environmental Impact Statement for the St. Johns Bayou New Madrid Floodway Project March 20, 2013

1. Purpose and Need

Justification for the project is inadequate in the "Purpose and Need for Project" section.

- The Advance DEIS does not does not provide a clearly defined purpose and need for the project beyond "flood risk management." Previous comments provided in September 2011 included the following: The EPA appreciates the acknowledgement that since the time of project inception, national and Corps policy has transitioned from "flood control" to "flood risk reduction." Concurrent with this policy transition, environmental restoration has also become a priority mission of the Corps. This evolution in policy should compel precision and exactness in describing the public safety, property, infrastructure, activity, etc. that needs to be afforded flood risk reduction, and to what degree, as well as the project's implications on environmental restoration of the St. Johns and New Madrid basins.

Basic Project Purpose is Unclear

The stated project purpose in Sections S2 Project Purpose and Need, page xii and 1.1 Project Purpose, page 1, is flood risk management. These sections do not include economic growth or agricultural intensification as the basic project purpose, but the document discusses these interests elsewhere as objectives for the project ("Project Specific Objectives" in Section 1.3.2, the "Federal Objective" in Section 2.1, and "Principles and Guidelines" in Section 2.4). These interests must be included in the basic project purpose if they are to be used to evaluate alternatives. It is only the basic project purpose for which alternatives can be evaluated per the Clean Water Act Section 404 (40 CFR 230.10(a)). Evaluation of alternatives against interests not specified in the basic project purpose is not in compliance with the regulations.

The EPA recommends the DEIS be revised to clearly state the basic project purpose and describe the "Project Specific Objectives" and other interests in the appropriate context. Some of these factors may be better described as benefits of the proposed action, such as social well-being and economic development. Others are mandated by law, such as compensation for unavoidable impacts. Recognizing the importance of the flood pulse is a stated objective; but this is a resource function that should be a major component of evaluating impacts of each alternative in the environmental impact analysis. Restoration of Big Oak Tree State Park is a potential compensatory mitigation strategy and does not belong in the discussion of purpose and need or alternatives. The Federal Objective is a factor in determining project feasibility. Each of these interests should be considered and discussed in the appropriate context and section of the DEIS. Within Section 2.1 Preliminary Alternatives, phrasing of one of the Project Specific Objectives changes from "manage flood risks for social well-being" to "managing the flood pulse for social well-being." Reducing flood risk and damages can be quite different from managing the flood

pulse. In addition, "managing" the flood pulse contradicts the objective to "recognize the importance of the flood pulse."

Need for Action Has Not Been Adequately Demonstrated

The discussion in Sections S2 Project Purpose and Need and 1.2 Need for Action does not provide precision and exactness in describing the public safety, property, infrastructure, activity, etc. that needs to be afforded flood risk reduction, and to what degree. Maps, tables, and other description of the populations affected by flooding, the frequency of isolation, and the associated costs should be provided. Similarly, the exact location, frequency, duration, and damages of public infrastructure should be described. The need of the project should be based on an actual goal for reduction of these damages. While the document appears to have fully considered agricultural damages and the potential benefits of agricultural intensification, the facts and figures pertaining to public safety, property, infrastructure, etc. are not included.

The document states that the flooding problems of East Prairie are not due to impounded interior runoff (page 19), and Section 1.2 page 3 states that "the project would not entirely alleviate all of the city's flooding and drainage problems." However, no alternatives have been developed with the express purpose of addressing these drainage problems for East Prairie. Similarly, the document does not provide essential information regarding the repopulation of the New Madrid Floodway post 2011 activation. On page 28 the document states that the Village of Pinhook has expressed a desire to relocate, but relocation of these residents is being considered outside of this project. The document must clearly articulate the degree of flood risk reduction needed for public safety and infrastructure and evaluate alternatives against that measure.

The need for action is not clearly presented in the document. The Abstract, page i that states, "The flood pulse is no longer the driving force in the St. Johns Bayou and New Madrid Floodway project area. The annual disturbance associated with farming (*e.g.,* disking, plowing, land leveling, herbicide application, etc.) is the current principle driving force that limits ecological productivity and habitat." This statement is not supported by scientific evidence and negates the need for flood management. Page 121 states "current conditions show that farming is very profitable and would likely remain so under future without-project conditions." This fact calls into question the concept presented in the Advance DEIS that meeting the needs for social well-being is dependent on increasing economic benefits to agricultural areas. Section 1.2, page 2, states that flooding of adjacent agricultural land is an impediment to the area's future prosperity; however specific information regarding flood damages and the effects on the local economy are not provided.

The document lacks an adequate description of the needs of the proposed action and without maps and clear language in the Executive Summary, Introduction, and Purpose and Need Statement may not engage the public and decision makers in a call to action.

2. Alternatives Analysis

- **It is unclear that the Advance DEIS adequately demonstrates to the public that the Tentatively Selected Plan (TSP) complies with the Clean Water Act 404(b)(1) Guidelines (Guidelines).**

Full Range of Alternatives and Selection of the Least Environmentally Damaging Practicable Alternative Has Not Been Adequately Demonstrated

- It is unclear that the Advance DEIS demonstrates the TSP represents the least environmentally damaging practicable alternative, consistent with 40 CFR Part 230.10(a). Section 2.1 indicates that several structural alternatives for the New Madrid Floodway portion of the project now appear to have been eliminated from further consideration without presenting to the public the current analysis supporting such a decision. The evaluation of practicable alternatives which would have less adverse impacts on the aquatic ecosystem, as presented in the Section 404(b)(1) Evaluation Report (Appendix E Part 7 of the Advance DEIS) consists of one sentence, "Alternative to avoid and minimize project impacts has been selected as part of the Recommended Plan."

40 CFR § 230.10(a) prohibits the discharge of dredge or fill material if there is a less environmentally damaging practicable alternative to the proposed discharge. The level of detail of the alternatives analysis and assessment of impacts is insufficient given the complexity of issues, scale of the project, and the potential severity and magnitude of adverse impacts to the aquatic ecosystems (see also the 1993 Memorandum to the Field, *Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements*).

The Advance DEIS does not adequately support the position that the project is water dependent. A more clearly defined project purpose will facilitate the analysis of water dependency under the CWA Section 404(b)(1) Guidelines. In accordance with the Guidelines "practicable alternatives that do not involve special aquatic sites [e.g. wetlands, riffle/pool complexes] are presumed to be available, unless clearly demonstrated otherwise. In addition, where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise" (40 CFR 230.10(a)(3)).

The document lists a range of potential actions but does not demonstrate consideration of the full range of practicable alternatives. The alternatives analysis appears to narrowly focus on one activity at a time to determine the ability of an activity to meet project objectives, rather than combining activities to generate a meaningful range of alternatives. Alternatives that combine multiple non structural approaches, or both structural and non structural approaches, should be considered. Those alternatives should be re-examined and carried through a full analysis of their environmental impacts and compared to each other in order to allow for a fully-informed decision on how to best meet the project's basic purpose.

Additionally, considering activities individually as standalone alternatives for both NMF and SJB basins combined, rather than separately for each basin, presents unnecessary obstacles in the

evaluation. The environmental factors, including those influencing flooding, are not the same for the two basins; therefore, evaluation of the feasibility and impacts of each alternative should be evaluated separately. For example, the activity of relocation was discussed in Section 2.1.4.5, pages 28-29, as a standalone alternative for both basins. The populations of the basins are not similar, and the flood risks for the communities are not due to the same factors. Additionally, Pinhook residents in the NMF must live with the constant risk of floodway activation, and according to the document, have expressed an interest in relocation since the 2011 floodway activation. However, the discussion states that "relocation of the community [Pinhook] is being considered independently of this project or USACE." Evaluation of relocation of Pinhook is both essential as an alternative for the NMF as well as to establish the need for the project.

The discussion regarding the alternative of raising road surfaces would also benefit from a basin-specific evaluation. The DEIS does not address whether there are key roads/corridors that could be raised to eliminate problems of community isolation. Examining this alternative independently for the each basin would generate additional alternatives and/or identify avoidance and minimization measures. By evaluating raising road surfaces as a standalone alternative, the effects of potential relocation of Pinhook were not considered in the analysis. An alternative that allows flooding up to approximately 296.4 feet in the St. Johns Basin should be developed. At this elevation Interstate 55 could remain open.

Other examples include the Refuge/Conservation Area alternative in Section 2.1.4.1, page 23, which was considered as a "standalone" alternative. However, it may be more reasonable to consider this activity in combination with other activities, such as community relocations, elevation of roadways, and silviculture. Different sizes of refuges could also be evaluated. Additionally, consideration of a Refuge alternative to resolve issues for both the St. Johns and the New Madrid Floodway basins creates unnecessary difficulties in the analysis. The refuge activity should be fully considered for the New Madrid Floodway basin in combination with other activities that may address issues in the St. Johns basin. Similarly, the activities of silviculture and conversion to flood-tolerant crops (Sections 2.1.4.2 pages 23-24 and 2.1.4.3 pages 24-25, respectively) were considered as standalone alternatives and should be considered in combination with other activities.

The DEIS should provide a clear explanation of what is meant by "net economic development" and how alternatives were analyzed in terms of meeting this objective. A recurring theme of the document is that elimination of alternatives appears to be based on economic justification rather than an evaluation of impacts and practicability (examples: levee alignments, refuge/conservation area, agriculture to silviculture, elevation of road surfaces, relocations). The Guidelines state that practicable alternatives are those that are "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes" (40 CFR 230.10(a)(2)). The 1993 Memorandum to the Field further clarifies that "the determination of what constitutes an unreasonable expense should generally consider whether the projected cost is substantially greater than the costs normally associated with the particular type of project." The practicality of the activities/alternatives should be screened against each other and normal or average costs for flood risk reduction, rather than potential economic benefits of the alternatives. Further, the alternatives analysis should include a

breakdown of all known costs for each activity/alternative as a basis for comparison and evaluation of practicability.

The tables in the DEIS that compare alternatives are lacking the full range of alternatives and their associated impacts. For example, Table 2.3, page 31, is insufficient for comparison and screening of alternatives:

- All preliminary activities/alternatives are not included in the table.
- Environmental impacts of each activity/alternative are not provided.
- Inclusion of measures to avoid and minimize impacts is out of place as this is a requirement of the CWA Section 404(b)(1) Guidelines, not an alternative, and should be specified for the overall project and each activity/alternative.

Similarly, Table 2.8, page 57, does not include Alternative 1 – No Action in the comparison, except indirectly as the baseline for FCUs.

We recommend more closely examining an alternative that would limit work to the St. Johns Basin. We also recommend that alternatives that examine different alignments for the levee closure in the Floodway be examined to determine if there are other alignments that would reduce environmental impacts and provide opportunities for environmental restoration as well as needed flood damage reduction. Evaluation of alternative levee alignments should be updated from past analyses (much of this appears to date from the 1980s) and should include the direct and indirect impacts, benefits and costs associated with each of these alternatives.

Discussions of compensatory mitigation are included throughout the document rather than in the appropriate sequencing process of avoid, minimize, then mitigate, according the CWA 404(b)(1) Guidelines. For example, the mitigation discussion in Section 2.3, pages 43-51, is within Section 2.0 Alternatives Including the Proposed Action. However, this section does not provide a comprehensive discussion demonstrating that all potential avoidance and minimization measures have been included in the assessment, as required by the CWA Section 404 (b)(1) Guidelines. Avoid and minimize measures are only discussed for channel construction access and pump operation activities, but other potential avoidance and minimization measures are not provided (such as placing dredged material from ditches in uplands). The 1993 Memorandum to the Field states "it is not appropriate to consider compensatory mitigation in determining whether a proposed discharge will cause only minor impacts for purposes of the alternatives analysis required by Section 230.10(a)." In comparing the alternatives in Table 2.8, page 57, it is unclear how mitigation may be reflected in these numbers. Comparison of FCUs is more applicable in the context of indirect impacts and mitigation planning and should not be used in lieu of a direct comparison of wetland acres and linear feet of streams impacted in the alternatives analysis.

The document does not define the needed flood risk reduction for East Prairie or provide information regarding the degree of protection afforded by each alternative. Page 19 states flooding in East Prairie "is not necessarily due to impounded interior runoff," yet a few sentences later indicates "flood problems associated with impounded interior runoff can affect flooding conditions in East Prairie." The document would benefit from addressing this discrepancy, and clearly explaining the causes(s) of flooding in East Prairie to aid in assessing alternatives to attenuate this flooding.

Some alternatives appear to have been dismissed based without providing a clear post-project assessment of direct, secondary, and cumulative impacts. For example, the discussion of conversion to silviculture and flood-tolerant crops in Sections 2.1.4.2 and 2.1.4.3, respectively, appear to have been dismissed largely on the assumption that since farmers haven't already converted to these crops, they will never convert. These alternatives were also considered to provide only temporary flood risk management. However, this concept of permanent versus temporary flood risk reduction was not discussed for other alternatives. Any alternative that includes engineering structures or requires continued operation and maintenance could be considered temporary.

Analysis and Consideration of All Potential Impacts Has Not Been Adequately Demonstrated

- The Advance DEIS lacks a clear articulation of the secondary effects of the proposed project would be on the aquatic ecosystem in terms of altered hydrology, e.g., timing, extent, frequency, duration and depth of inundation and/or saturation. The draft document appears to limit evaluation of wetland impacts to only those resources within the current 5-year floodplain. Without a detailed explanation of what the actual hydrologic effects would be, it is difficult to determine whether this limitation is appropriate. We note in Appendix B: Economics of Alternatives that it appears benefits attributed to proposed project features extend to areas beyond the 5-year floodplain. It is unclear why the scope of analysis for analyzing project impacts would be different than that used for analyzing benefits.
- The Section 404(b)(1) Evaluation Report contained in Appendix E Part 7 asserts that there are "no significant adverse effects expected" through completion of the project. This assertion is unsubstantiated in the Advance DEIS.

Analysis and Comparison of Direct Impacts:

The document does not clearly describe how impacts were calculated, or provide an estimate and comparison of direct, secondary and cumulative impacts for all alternatives. Discussion of significant degradation of Waters of the United States is not provided to support the conclusions of "no significant adverse effect" under the Evaluation of Extent of Degradation of the Waters of the Unites States in Appendix E, Part 7 Section 404(b)(1) Evaluation Report and demonstrate compliance with the requirements of 40 CFR 230.10(c). The burden of proof to demonstrate compliance with the CWA Section 404 Guidelines rests with the applicant of the project (40 CFR 230.12(a)(3)(iv)).

The DEIS does not clearly define direct impacts of the proposed alternatives. Assessment of direct impacts appears to have been combined with assessment of indirect impacts in the hydrogeomorphic model. This is inconsistent with USACE and EPA national practice. Section 4.8.1, page 127, states "the HGM is considered the best tool available to quantify *indirect* impacts associated with the project" [emphasis added]. Figures for direct, indirect or secondary, and cumulative impacts should be provided separately for each resource and discussed clearly and early in the document. However, tables provided in the Introduction and Section 2 Alternatives Including the Proposed Action do not provide detailed figures of the direct, secondary, and cumulative impacts to both wetlands and streams for each activity/alternative.

Figures for direct impacts to wetlands are not provided until the HGM discussion on pages 131 and 135. Page 131 states that the Alternative 2.1 will result in total direct impacts (total clearing or filling) of 673 acres of vegetated wetlands "due to channel modifications." Then page 135 states that the TSP, Alternative 3.1, "would result in a 264 acre reduction in the direct impact footprint from the direct clearing, ditch excavation width, and spoil pile reductions when compared to alternative 2.1." So, the TSP would result in 409 acres of direct wetland impacts in the SJB, plus page 153 states that 9 acres of impact (resource not specified) will be directly impacted in the NMF. Additionally, these figures for the TSP (409 acres for SJB + 9 acres for NMF = 418 acres total) do not add to the 416 acres of direct impacts provided on page 9 of Appendix E Part 7.

It is unclear which specific activities cause which direct impacts and if the impacts of the proposed levee footprint at the NMF opening are included. The DEIS should clearly break out which activities result in which impacts and further describe and document each impact on maps. Calculations based on the figures provided for the levee footprint (1500 feet long with a base of 302') sum to 10.4 acres. However, only 9 acres of direct impacts are discussed. Is some of the area of the levee footprint considered to be upland or stream? Direct impacts to streams in the NMF have not been provided. Has the USACE determined area to be upland based on clearing already conducted, or have wetland delineations been completed for the entire area? The DEIS should also address direct temporary impacts that may be associated with construction activities. These issues should be clearly addressed in the EIS.

Section 2.2.3, page 36 compares magnitude of direct stream and wetland impacts in the SJB basin to the magnitude of secondary impacts in the NMF. This comparison is inappropriate because the resources and functions are different and cannot be directly correlated to one another.

Primary Impact Area and Calculation of Indirect Impacts:
The document does not support the concept that the primary impact area of the project is within the 5-year floodplain. The document states, page 74, "the Village of Pinhook becomes isolated at the approximate 10-year flood elevation." If the project is designed to reduce flooding at Pinhook, then there would be significant impacts at the 10-year floodplain elevation. However, page 90 indicates that, "Although, USACE acknowledges that wetlands are located at elevations greater than the five-year flood frequency and that the project would reduce periodic flooding through flood risk reduction measures, wetland functions associated with lands above this elevation were not assessed because of the insignificant potential impact of the project on these lands." How was it determined that potential impacts in areas above the 5-year floodplain would be insignificant?

Page 286 suggests that impounded interior runoff or backwater flooding do not play a significant role in maintaining wetlands status in areas above the five year floodplain, rather, hydrology is maintained by precipitation and groundwater interactions. The DEIS acknowledges some uncertainty exists regarding this assumption and to address that risk, the project would be monitored after constructed. This assumption is fundamental to an accurate assessment of project impacts, comparison of those impacts across alternatives, and formulation of mitigation necessary to offset unavoidable impacts. The scientific basis for this assumption needs to be

provided in the context of a natural river floodplain with backwater flooding, and the primary hydrological and ecological drivers of the floodplain system need to be defined. To address uncertainty we recommend concomitant hydrologic modeling in areas where the greatest uncertainty exists, e.g., areas above the five year floodplain, on both mitigation sites and other lands as appropriate.

Page 54 states that the greatest impact to project area wetlands is due to an indirect impact associated with changed frequency and duration of flooding. Impacts could also stem from project-induced changes in timing, location, and degree of inundation/saturation of flooding. The DEIS does not appear to clearly describe the full component of potential indirect impacts to project area resources and how these impacts might vary across different alternatives. The DEIS needs to acknowledge that the TSP and other alternatives involving pump operations only provide *limited* connectivity with *altered* hydrology to the area. Page 41, the document states that "natural wetlands would still be seasonally connected" however this amounts to only 26 days during the growing season. After April 15 no back water flooding would be passed into the NMF at elevations over 284 feet and pumps would be turned on, draining water from the area. The majority of flooding during fish spawning and rearing time, shorebird use, and wetland growing season would be eliminated. This also seems to disregard the important hydrologic interactions not only between backwater and headwater flooding, but also those interactions involving surface (inundation) and ground water (saturation) that occur in these areas, and that significant changes in the backwater flooding due to the project would likely have repercussions on the extent, frequency, duration and depth of inundation and/or saturation in these areas as well. Further clarification on this important issue is necessary and additional analysis and modeling of hydrologic alterations due to proposed activities may need to be conducted. A comparison of model output and/or hydrographs for the area for the alternatives is needed.

The descriptions of gate and pump management avoidance and minimization strategies, page 38, regarding isolating flood pulse for certain species is not consistent with recognizing the importance of the flood pulse for overall ecological health. This section does not address the hydrologic requirements for plants that make up the vegetated wetlands in the area and provide shelter, food, and migration corridors between flooded agricultural lands. The hydrologic regime for maintenance of area plant communities appears to have only been considered in the context of restoration of Big Oak Tree State Park rather than the entire project area.

Page 61 concludes that, "the greater the area removed from flooding, the greater the environmental impacts." Yet, the preliminary document does not provide a clear description of the amount of area that would be removed from flooding for each of the alternatives. Figure 3.12 is a very helpful depiction of the existing flood return intervals in the New Madrid Floodway. It would also be useful to include similar images depicting flood return intervals for each alternative. Furthermore, we recommend a table be included in the DEIS that shows the corresponding amount of total acreage and wetland acreage that would and would not be flooded (compared to current conditions) for each alternative.

Page 114 indicates "no changes to overall land use classification would be expected regardless of the chosen alternative" and "no conversion of forested areas to agriculture would be expected." We recommend the DEIS clearly describe the basis for these assumptions. Similarly,

consideration of Wetland Reserve Program enrollment in the document is not well supported and may not have been realistically calculated in assessment of impacts, practicability of alternatives, and future scenarios for the area post project (Section 2.1.4.2, page 24).

Gaps in Impacts Assessment:
There are functional and geographic areas where additional analysis of potential impacts is needed. Information is not provided regarding the secondary impacts to streams as a result of levee closure and pumping, such as how hydrology of the ditches will be impacted. Increasing the depth of area ditches could cause stability problems for connected ditches, such as head cuts, culvert replacements, impacts to roads, etc. Additionally, what will be the secondary impacts to adjacent wetlands due to increasing the depth of the ditches, and presumably the lowering of the water table? These impacts should be addressed in the DEIS.

Section 2.1.3 Levee Closure Alternatives, pages21-23, only provides the figures for costs of alternate levee alignments and does not provide numbers on impacts of these alternatives. What is the source or basis for the figure used for mitigation costs? The description of these alternative alignments does not include a breakdown of the direct impacts of the levee footprints themselves. The Interagency Review Team in Missouri has prioritized forested wetlands, particularly bottomland hardwood forests with river connectivity, as one of the most important resources to avoid damages. Mitigation of unavoidable impacts to forested wetlands is required at a ratio of 4 or more acres replacement for every one acre of impact. The analysis of each alternative, including alternate levee alignments, should clearly articulate impacts to forested wetlands. The description of impacts for alternate levee alignments should also include numbers on the acreage that would remain hydrologically connected to the Mississippi River.

Impacts to Water Quality, Recreation, and Special Aquatic Sites Have Not Been Adequately Addressed

- The 404(b)(1) analysis contained in Appendix E Part 7 does not appear to sufficiently consider cumulative, direct or secondary/indirect impacts to water quality, special aquatic sites (wetlands, riffle and pool complexes), and/or recreation.

The EPA recommended in the September 2011 comments that the DEIS needs to:

- Provide a complete scientific evaluation of current functions provided by project area resources (i.e., fish and wildlife habitat, water quality maintenance, water storage, recreational use), most importantly, those linked to the connectivity (flood pulse) of the Mississippi River, and potential impacts to those functions under each alternative. Additional analysis is recommended to adequately describe the resources within the project area.

Water Quality:
Page vii states that "water quality will be improved as a result of mitigation." However, this has not yet been demonstrated. We recommend the DEIS consider additional measures to maintain and improve water quality. Water quality should also be monitored post-project; we recommend installing a real time water monitoring station (such as used by the US Geologic Survey) at the mouth of both the St. Johns and New Madrid basins. Pre-construction, construction period, and post construction real time water monitoring should be conducted until mitigation is considered

to meet all performance standards. If at any time water quality is worse than pre-project monitoring then adaptive management should be triggered and additional mitigation required.

Page 232 indicates that the water quality analysis for the project show the authorized project would reduce total phosphorus and nitrogen export by 15% or more. What assumptions were used for this model, and have these finding been corroborated with appropriate water quality experts on the Independent Expert Panel Review, US Department of Agriculture, US Geologic Survey or others involved in the previous SPARROW modeling effort? Furthermore, page 275 suggests project implementation would provide a reduction or delay in the growth of the hypoxic zone in the Gulf of Mexico. The basis for these conclusions needs to be provided in the document.

Recreation and Flood Storage:
The DEIS does not adequately address impacts to recreation and flood storage functions. These resources are not included in the assessment and comparison of impacts for each alternative and are not listed in Table 1.2, page 16, "Relevant issues, resources, and concerns," for the project area.

For example, impacts to hunting/fishing and tourism in the project area and on the Mississippi River as a result of the TSP, or potential increases in these and other recreational activities for each of the alternatives, is not provided in the DEIS. Recreation is not addressed until Appendix E, Part 3, Wetland Goods and Services and the conclusion (as well as others within this Appendix) is not supported by science. This does not include a full assessment of the recreational value of area resources, such as Big Oak Tree State Park, hunting and fishing habitat on private and publicly owned lands, Ten Mile Conservation Area, or recreation on the Mississippi River.

The flood storage and attenuation benefits that occur because of the flood pulse are not being adequately quantified. Page 92 describes discussions held during the 1-2 October 2012 site visit by agency representatives. We recommend deleting this discussion from the DEIS. Major factors in the impacts assessment should be based on the best available science and suitably referenced in literature and other documentation. The EPA has comments on the project recommending that the EIS fully consider flood water storage of all lands (regardless of wetland status) as a major area resource. The function of flood storage, both of Mississippi River backwater flooding and interior runoff, is a major factor for the purpose and need of the project and comparison of alternatives. Flood storage should be quantified for each alternative.

The discussion regarding economic benefits of the flood pulse and lands connected to the Mississippi River and area ditches should include an assessment of the monetary value of flood storage and recreation. Increases in flood water storage result in decreased flooding and flood damages elsewhere. Economic gain as a result of fishing, hunting, tourism, and other recreational activities can also be included.

Section 2.1.4.1 Refuge/Conservation Area, page 23 states that this alternative would "offer no relief from flooding to the remaining 62, 797 acres of land in the five-year flood frequency." We recommend providing the scientific basis for this statement. A substantial refuge or conservation area may significantly increase the flood storage capacity of the New Madrid Floodway basin

thus reducing flood pressures on other areas. The impacts, both adverse and beneficial, of this activity are not provided. The analysis should include acreages of wetlands preserved or restored, acreages of lands connected to the Mississippi River, recreational values, increases in water storage, as well as benefits to water quality and fish and wildlife. This section also indicates that a refuge is not "economically justified" but does not provide any figures to support this. The value of potential increase in recreation for the area is absent from the evaluation of this alternative. It is unclear why the expansion of refuge and conservation areas is not feasible as an alternative due to the local community being unwilling to sell the necessary lands, yet expansion of Big Oak Tree State Park is considered feasible as an activity for compensatory mitigation.

Special Aquatic Sites:
Special aquatic sites are sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes (40 CFR 230 Subpart E). "They are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region" (40 CFR 230.3(q-1)).

There are functional and geographic areas where additional identification of special aquatic sites and analysis of potential impacts is needed. For example, discussion of area streams/ditches is insufficient, including identification of riffle/pool complexes. The purpose and need for the proposed activities on area ditches has not been provided. No assessment of alternatives was provided for ditch work, such as, incorporating Natural Stream Channel Design, and developing side channels and/or additional adjacent wetlands to increase flood capacity. The DEIS should provide a clear purpose and need for activities on area streams as well as describe the expected benefits and adverse impacts. Impacts to streams should be included in the comparison of alternatives in Table 2.8.

The potential for significant degradation of area streams is not included, and assessment of the presence of riffle/pool Special Aquatic Sites is not provided. Page 48 of the document states, "some of these artificially created canals have stream characteristics and functions" yet Appendix E Part 7, page 9, simply states that effects on special aquatic sites, riffle and pool complexes, is "not applicable." Additionally, page 37 of the document states "the decrease in mussel populations is most likely due to the recent basin-wide ditch maintenance that has occurred (vegetative and sediment removal)." This indicates that the type of ditch maintenance proposed in the TSP can have significant adverse impacts. In addition, secondary impacts to area streams as a result of hydrologic alteration and elimination/reduction of the flood pulse in the NMF are not discussed for all the alternatives, nor are they reflected in the comparison of alternatives in Table 2.8.

There is also no specific or geographic information provided regarding the direct impacts to wetlands within the areas where ditch maintenance will occur. How were the estimates of impacts to wetlands assessed for these areas? Can fill of these wetlands be avoided, or are there alternatives that would have less impact, such as placing dredged material in uplands?

3. Adequacy of Compensatory Mitigation

Adequate Compensation for Impacts Has Not Been Demonstrated

- **The Advance DEIS does not clearly demonstrate that the proposed actions would be fully compliant with the Compensatory Mitigation for the Losses of Aquatic Resources Final Rule (40 CFR Part 230, Subpart J).**
  - Section 2.3 of the Advance DEIS states "There is a level of uncertainty with mitigation since specific tracts have not been identified to date." Because specific lands have not yet been identified, it is challenging to discern whether the DEIS demonstrates that unavoidable impacts to aquatic resources can be adequately compensated.
  - The DEIS does not provide a clear, detailed articulation of how proposed compensatory mitigation features specifically compensate for the project's effects on area hydrology, in particular, the timing, extent, frequency, duration and depth of inundation and/or saturation.
  - The DEIS lacks complete information to address the project's indirect impacts on areas proposed as mitigation sites. The TSP's avoid and minimize features allow for riverine flooding only during winter months, not during the growing season. As a result, the alternative would appear to inhibit wetland functions during the growing season thereby minimizing benefits of any mitigation within the project area.
  - The Missouri Interagency Review Team requires a minimum of 4:1 replacement for direct impacts to forested wetlands.
  - The EPA questions the use of batture lands for compensatory mitigation. Because these lands are already connected to the Mississippi River, such areas would not appear to provide replacement of lost functions associated with severing wetlands within the project area from natural connectivity to the River.

Compliance with CWA Section 404:

The DEIS does not adequately demonstrate compliance with the Mitigation Rule (33 CFR 332 and 40 CFR Part 230, Subpart J), or address technical and ecological feasibility of the proposed activities to effectively compensate for impacts. The document does not address previous comments provided by the EPA, including: hydrologic alteration, management of the flood pulse, restoration of forested wetlands, and adequate compensation for stream impacts. Similar to the requirements for the evaluation of alternatives, the rigor and detail of the comprehensive mitigation plan (which should be included in the DEIS) to demonstrate adequate compensation is commensurate with the degree of impacts (40 CFR 230.93(a)(1)). Sufficient information is not provided to demonstrate that compensation is likely to succeed or can offset significant impacts. Therefore, the document does not support the conclusions of "no significant adverse effect" under the Evaluation of Extent of Degradation of the Waters of the Unites States in Appendix E, Part 7 Section 404(b)(1) Evaluation Report and does not demonstrate compliance with the requirements of 40 CFR 230.10(c).

In evaluating whether compensation could offset significant impacts, the DEIS should consider, among other things, the severity of the impact at issue and the likelihood of being able to recreate the lost values. Some values (e.g., flood storage) are easier to offset than others (e.g., ground water recharge). Likewise, some types of compensation (e.g., in-kind restoration in an appropriate geographic area) are more likely to succeed in offsetting impacts than are other types

(e.g., preservation or offsite creation). Comments submitted by the EPA advised that functional losses resulting from elimination of the flood pulse and altered hydrology would be difficult to replace and may only be successfully mitigated by reconnecting equivalent areas within the Middle Mississippi River to natural flood pulses. To demonstrate that it's possible to compensate for all losses and to achieve compliance with 230.10(c), the mitigation plan must meet two basic tests:

1. It should prevent or offset the adverse impacts that would otherwise give rise to a finding of significant degradation;
2. It should have a good chance of success.

The DEIS should be revised to include the appropriate level of planning and documentation elements (c)(2) through (c)(14) required by the Mitigation Rule (40 CFR §230.94 and 33 CFR § 332.4). A map of each mitigation parcel specifying type of mitigation should be provided; Figure 2.7 does not provide sufficient detail. It is unclear where overlap between the different types of mitigation occurs and how everything fits together. The document breaks out resource types (shorebirds, wetlands, ducks, fish, etc.) however it is not clearly described how the sum of all the parts adequately offsets impacts. The DEIS should address overall ecological integrity and condition of the watersheds pre and post project. Separating components to the extent provided in the DEIS does not adequately address ecological concerns.

The DEIS does not indicate that mitigation sites will be designed to be self sustaining and protected in perpetuity as required by the Mitigation Rule 40 CFR § 230.97 (and 33 CFR § 332.7). The DEIS needs to be revised to address the requirements of the rule to:

- minimize active engineering features (e.g., pumps);
- appropriately locate mitigation sites to ensure that natural hydrology and landscape context will support long-term sustainability;
- provide active long-term management and maintenance to ensure long-term sustainability (e.g., invasive species control, maintenance of water control structures, easement enforcement);
- provide long-term financing mechanisms.

The proposed mitigation relies on extensive engineering and management of water levels through gates and pumps. This significantly increases the risk of the mitigation, both of structural failure and failure to manage the water levels as proposed. The DEIS must describe assurances that will be put in place to ensure that water levels and mitigation sites would be managed appropriately in perpetuity.

More description is needed regarding the coordination requirements (who, how, when) for implementation of compensatory mitigation activities. Specifically, the details of how the Interagency Review Team will be consulted to review and approve site specific mitigation designs, conduct compliance reviews, consult and approve adaptive management plans, and ensure corrective measures are implemented if needed. On page 299 the details of how this will be implemented should be spelled out in the DEIS, and should include discussions of third party oversight of mitigation activities and financial assurances.

Similar to the discussion of assessment of impacts, the assessment of required compensatory mitigation needed to offset the direct impacts to forested wetlands must be separately and

explicitly described in the document. Mitigation for direct impacts should be consistent with current Interagency Review Team policies and procedures. The EPA has recommended that the USACE should consult with the Missouri IRT to determine appropriate levels of compensation for this project and standards to which it holds permittees and mitigation providers. Absent site specific consultation, the DEIS should, at a minimum, incorporate the normal standard for mitigation of forested wetlands in Missouri at a rate of no less than four acres of mitigation for every one acre of impact (4:1 replacement). Temporal lag of functional replacement should be more clearly described in the DEIS so that adequate mitigation ratios can be determined. Use of the HGM model to calculate mitigation for direct impacts is not the standard practice in Missouri and does not directly meet the requirements of the Mitigation Rule to ensure that compensation occurs at a minimum ratio of 1:1.

Ecological feasibility of proposed mitigation activities is not adequately addressed in the DEIS. For example, page xx, states "the tentatively selected plan proposes to take agricultural land, most of which is at low elevation and frequently subject to Mississippi River flood pulses, and revert it to historic forest habitat." With the addition of the project pumps the areas that are wet will be quickly pumped dry during the growing season. Any acres of forest planted will unlikely become forested wetland because of the altered hydrology (inappropriate timing, frequency, and duration of flow to support the desired habitat).

Preservation:
The DEIS does not adequately address the requirements of the Mitigation Rule for proposed preservation activities (40 CFR § 230.93(h)). Preservation means the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions. The mitigation rule requires that for preservation all several tests must be met (40 CFR § 230.93(h)).

A description of how each proposed parcel for preservation credits meets these requirements must be provided. The assessment of threats should include how the TSP will threaten existing wetlands through drainage and altered hydrology, and if it's possible for the proposed mitigation areas to meet test iv of 40 CFR § 230.93(h). The standard practice for the Missouri IRT is to require preservation of 10 acres of land for every one acre of impact (10:1 replacement ratio). HGM calculations should be also adjusted accordingly.

Monitoring:
Page 322: Table 6.5 provides a list of monitoring requirements. The table does not appear to use the HGM variables. If the project is going to use HGM to project mitigation needs then it should also use HGM to evaluate mitigation parcel success. One of the ecological performance standards should be to meet the reference standard for each of the variables in the project area for each HGM class. The DEIS should define where and how the reference standard was determined.

The DEIS needs to clarify (such as on page 323) if the mitigation plans will rely on natural revegetation rather than planting the sites. Natural revegetation of sites generally is not

ecologically feasible and is not a standard practice accepted by the Interagency Review Team. The DEIS should specify the process for providing the Missouri Interagency Review Team with each site specific mitigation design with planting lists for review and approval. Ecological performance standards need to be developed and included in the DEIS for vegetation diversity (number of species), number of strata, and percent cover appropriate for that vegetation type based on reference information.

The EPA recommends that the DEIS provide a process for all the agencies of the Missouri Interagency Review Team to review and approve the monitoring reports (page 323). Annual Interagency Review Team mitigation site visits are recommended. The DEIS should clarify what is meant by "vegetation is established" and describe how will this be measured and what will the target be for each habitat type. That is, each site plan must include specific vegetative diversity and cover standards to determine success.

Page 330 indicates project adaptive management reports would be developed at 5, 15, 25 and 50 years. We would recommend planning for annual reporting periods in the early years during and after project construction until interim performance standards are met in order to more quickly identify and correct issues at their onset.

On page 298 the DEIS states does not define "risk register." It is unclear what role this will have in ecological performance standards.

Adaptive Management:
The DEIS does not adequately describe the adaptive management plan and uses concepts and terms that are not standard practice for the Missouri IRT (page ii). The Mitigation Rule discusses adaptive management plans; however the DEIS is unclear what is meant by "adaptive mitigation strategy." Page x, the DEIS recommends adaptive management to overcome any mitigation shortfalls as a result of uncertainty by utilizing future "monitoring point estimates" to determine if "adaptive management decision thresholds" have been met; but the DEIS does not describe these estimates or decision thresholds. The DEIS needs to define key terminology and provide sufficient detail to demonstrate that the adaptive management strategy sufficiently reduces risk such that the plan has a reasonable chance of success to offset impacts.

The processes for monitoring and calculating total adaptive management costs are not well documented. The document states on page ii, "In the event that future monitoring determines that there is a mitigation deficiency, operation of gates and pumps would be changed to reduce the environmental impacts of the project." Page 333 states "Any changes to the project operation must still be economically viable." The process and criteria for making these determinations is not described in the document and creates unacceptable risk. If the monitoring shows that the gates need to be open year round to offset impacts, will that be acceptable to project sponsors and the operation of the Mississippi River and Tributaries Project?

The DEIS does not specify what assurances would be put in place that adaptive management would be conducted according to plan. The Advance DEIS should be modified to include detailed description and logistics of the adaptive management plan and third party monitoring and oversight. For example, more information and clarity is needed at pages 13, 57-58, and 61.

Page 191, the DEIS states "Increases in rice production and the potential benefit to shorebirds would be monitored through adaptive management." The DEIS should clarify the functions provided by rice fields, how these functions are assessed, and how potential increase or decrease in function due to project activities might be incorporated into the comprehensive mitigation plan.

The DEIS should be revised to clarify that site specific remedial actions will be necessary for each mitigation site whenever the site-specific performance criteria have not been met. On page 333 the DEIS states "Remedial actions would only be necessary when a cumulative need was lacking, not a site-specific need." This implies that if a tract fails for one resource class, it will be counted towards another class. This is inconsistent with the requirements of the Mitigation Rule and would present extreme difficulties in tracking in-kind replacement for losses to Waters of the US.

Watershed Approach:
Page xix: the DEIS states "As seen in the proposed mitigation measures, a holistic watershed approach to compensatory mitigation has been proposed." Based on the information provided to date, the DEIS does not represent a watershed approach as it is outlined in the Mitigation Rule (see 40 CFR 230.93(c)).

The potential conflict between goals of the Lower Mississippi River Conservation Committee and the TSP should be addressed in the watershed context for the Mississippi River (page 271). Will the TSP impact efforts to improve fish and wildlife habitat and recreational opportunities on the River? How do the proposed mitigation activities fit within other watershed planning and improvement efforts?

Mitigation Costs:
The costs of mitigation are not adequately assessed, and leave many factors undetermined. Thus the cost/benefit ratio cannot be fully determined. The DEIS should clearly outline how mitigation costs were derived and these costs should be specified when comparing alternatives (Table 2.6).

Mitigation costs are not fully accounted for in the economic analysis. The difference between property value of cropland and woodland is the only cost included in the discussion. However, once an area is set aside from mitigation its property value may be different due the requirements of the conservation easement. The costs of monitoring, maintenance, management and protection into perpetuity are not accounted for. Other types of mitigation costs beyond woodland planting are not mentioned, including: stream mitigation, borrow pit construction, wetland planting, legal fees, and engineering design for water control structures. Information is lacking on what species would be planted at sites or over how many acres. There is also no indication of seeding rate or planting spacing which could dramatically change mitigation costs. Additionally, page 333, the DEIS states "a 25% contingency has been added to the calculated cost of mitigation features." What is this cost, and where is it documented in the DEIS? The DEIS underestimated the cost of mitigation, which would alter the cost benefit ratios for the alternatives.

It is unclear in the DEIS what mitigation costs were included in the economics assessment. In Appendix B, page 26, two figures are provided: $40,358,000 is estimated for reforestation cost, but this section also indicates only $16,915,000 of that cost was incorporated in the economics assessment. As a routine part of the mitigation plan review process, the EPA reviews potential mitigation costs in order to determine if a mitigation provider has fully accounted for all potential costs and to evaluate feasibility of the plan. Based on information provided in the Advance DEIS and known mitigation costs in Missouri, the EPA estimated mitigation costs for the TSP. Based on our estimate, and the absence of several types of mitigation costs in the Advance DEIS, the EPA estimates mitigation costs have been significantly underestimated.

Ecologically Designed Borrow Pits:
Page xx, and Page 49: the document discusses "ecologically designed borrow pits and floodplain lakes," and page 147, Table 4.29 states that 194 acres of wetland function will be provided by borrow pits. The EPA disagrees that borrow pits will replace lost functions of area wetlands. While these may be appropriate to offset some impacts to fisheries, they are not acceptable mitigation for vegetated wetlands. The depth of the pits would provide only open water habitat because the depth of the water will not allow emergent plant growth. These areas should be removed from wetland acreage and functional assessments.

Batture Lands:
The EPA and other agencies have commented previously that mitigation in the batture land would not adequately compensate for wetland losses due to the TSP. This land is already connected to Mississippi River and subject to the flood pulse, and much of the area is already wetland. Therefore, mitigation in the batture will not increase functions related to the flood pulse, which is the most difficult aspect of the project to mitigate. These areas would also likely not be appropriate for preservation credits under the Mitigation Rule because they are under no threat for development.

The DEIS should clarify if batture lands have already been purchased for the purposes of mitigation of this project. If not, how has it been determined that all these lands are available for mitigation? The DEIS needs to provide more information on the current status of these lands, including, a breakdown of which lands are located in the state of Missouri. More information should be provided regarding the functional losses proposed activities in the batture are intended to replace and which regulatory requirements will be satisfied.

Page xx: the document states that batture land lakes are degraded due to the high sediment load in the Mississippi River. Would other areas of the batture also be degraded? The DEIS needs to include a discussion of the ecological feasibility and suitability of restoring these lands given these conditions.

Ten Mile Conservation Area and Big Oak Tree State Park

- Use of State land (MDC Ten Mile Pond Conservation Area and Big Oak Tree State Park) as mitigation may not be compliant with 40 C.F.R. § 230.93(a)(3) because these lands are a part of "public programs already planned or in place." Also, these lands may not meet 40 C.F.R. § 230.92(h) requirements for preservation. EPA observes that the brief citation included on page 301 to the Congressional Authorization allowing for use of Ten Mile Pond for mitigation is specific only to fish and wildlife protection. See discussion in the preliminary DEIS in Section 2.3.5.

In addition, the Water Resources Development Act of 1986 states that mitigation lands must be acquired from willing sellers. The DEIS does not detail if MDC is a willing seller or will participate in mitigation activities for these lands.

Page xix, the proposed mitigation at existing areas of 10 Mile Pond do not meet the test for preservation under the Mitigation Rule and therefore could not receive mitigation credits for CWA Section 404 compliance.

Big Oak Tree State Park:

Section 1.3.2, page 5: Identifies BOTSP as a priority for mitigation. However, mitigation priorities must be generated from a comprehensive mitigation plan that includes a watershed approach for identifying the most desirable sites for restoration activities. Siting of restoration parcels has not been discussed in the context of the watershed.

The DEIS does not provide a clear description of how and by whom the park and associated mitigation lands will be managed in the future. Who will own the land and provide long term management, maintenance, and financial assurances? The mitigation plan needs to provide an agreement between the state and the USACE for management of these lands as well as everything required by the Mitigation Rule (40 CFR §230.94), including: performance standards, financial assurances, ownership, site protections, and long-term stewardship.

The DEIS describes proposed activities at BOTSP as "restoring" hydrology. However, the proposed work may be more accurately described as enhancement of hydrology. The proposed work is highly engineered and susceptible to failure or high maintenance and management costs. Some areas that are currently wetland may change class or be converted to open water if the water control structure and/or regime are operated incorrectly. Additional description and design parameters of the controlled water levels are needed to determine technical and ecological feasibility of the proposed activities.

The DEIS should clearly describe the proposed water control structure operations for BOTSP and other mitigation lands. This information cannot be deferred until the Record of Decision, as implied on page 47, as it is crucial to determining net benefit of proposed mitigation.

The EPA is a strong proponent of efforts to restore more natural hydrology to floodplain areas cut off from the Mississippi River by the Corps' Mississippi River and Tributaries Project features. Our recent understanding from experience with similar efforts in coastal Louisiana is that such modifications to the Mississippi Mainline Levee would elicit the need for authorization

pursuant to Section 408 of the Rivers and Harbors Act. It is not clear from the DEIS whether that is the case and, if so, whether this has been addressed for purposes of this proposed mitigation feature.

Adequate Compensation for Impacts to Streams Has Not Been Demonstrated

- Proposed stream and wetlands mitigation is lacking documentation and does not address several previous comments provided by the EPA, including comments regarding technical and ecological feasibility of planned activities. Additionally, the preliminary DEIS does not appear to follow processes outlined in the Mitigation Rule or contain all the elements of a mitigation plan required under 40 CFR § 230.94(c).

The description of stream mitigation activities is incomplete and is not sufficient to determine if impacts have been adequately assessed and if proposed mitigation activities will adequately compensate for losses. Detailed maps of areas of proposed mitigation areas with type of mitigation activity are needed.

The worksheets provided in Appendix P Part 2 and 3 do not describe what each of the dominant impacts and net benefits are, or how the value for each of the factors was chosen. Additionally, it appears that not all of the impacts are accounted for in the worksheets. Adding up the linear feet in the adverse impact sheet equals 15.35 miles, however the DEIS describes on page xvi that 23.1 miles will be impacted.

The EPA and other IRT agencies have previously commented that forested buffers should be used instead of grass buffers. Grassed buffers, and any buffers placed upon spoil piles, would not be provided mitigation credits because they do not provide in-kind replacement of functional losses for the environmental setting. Additionally, any buffers that will be impacted in the future during maintenance activities would not receive mitigation credits because the Mitigation Rule requires that mitigation areas be protected in perpetuity. The document, page 34, states that areas would be allowed to revegetate naturally. The IRT requires that stream buffers be planted with the appropriate density and species composition of trees and understory plants.

The EPA provided comments outlining several factors that should be considered to determine if proposed riparian buffers are appropriate. Credit for riparian buffers on only one side of a stream is not recommended unless a net benefit can be demonstrated. The DEIS should include discussion of factors such as orientation of the buffers to provide shading, how on-going channel maintenance might impact the mitigation resource, if there are more appropriate areas in the watershed for stream mitigation, and opportunities for enhancing streams utilizing Natural Stream Channel Design.

The DEIS must clearly describe how revetment and culvert replacement activities have been included in the assessment. The EPA has previously commented that placement of hard structures in streams, such as these proposed activities, are considered to be impacts rather than enhancements and should be included in the assessment of debits; however it is unclear if these changes have been made.

Page 239: it is unclear in the DEIS how stream credits for borrow pits created near streams will be determined.

4. Wetlands Extent

CWA Jurisdiction

- **The EPA notes that the preliminary DEIS contains confusing and perhaps unnecessary statements regarding Clean Water Act (CWA) jurisdiction that may prove unhelpful to the public.**
  - For example, the Advance DEIS states on page 95, "Wetlands that are potentially regulated by the Clean Water Act are indicated in Bold Calibri Font to distinguish the different wetland terminology used by others." We recommend that language used in regard to CWA jurisdiction throughout the draft document be reviewed for clarity and revised as necessary.

Clarity could be added to the DEIS by outlining the role and responsibility of the resource agencies and clearly citing the regulations and sources of definitions. Providing the USACE Jurisdictional Determinations, as well as a discussion of normal procedures for conducting JDs and how the DEIS followed those procedures, would help clarify this issue.

In the DEIS the distinction between the definition of wetlands and the definition of Waters of the U.S. should be clarified.

To date, Jurisdictional Determinations have not been provided by USACE describing Waters of the United States in text and with maps, and the NRCS wetland determination report and methodology for farmed wetlands and prior converted cropland under the Food Security Act have not been included. This information is essential to determining impacts to Water of the US and its exclusion will also present difficulties in identifying wetlands during project implementation for the purposes of 1) avoiding impacts during construction, operation, and maintenance of project activities; and 2) placing borrow pits and other proposed activities in PCC lands. For example, the Introduction on pg xx indicates that the TSP will use 1,800 acres of PCC for restoration, but no information is provided on how these lands will be identified.

Wetland Reserve Program:

Page 114-116, the methodology for determining future Wetland Reserve Program participation does not appear to have considered impacts of the TSP and likely results in an overestimate of acreage. With the TSP in place, the area would be drier, it would be more difficult to provide the appropriate hydrology to restore sites resulting in fewer acres restored, and there would be fewer economic drivers for restoring wetlands. Existing WRP sites will be degraded due to lack of water and/or altered hydrology. Has the NRCS provided an assessment on TSP impacts to WRP sites, their potential degradation over time, and how this may impact the NRCS and landowners' ability to meet program requirements?

5. Description of the Affected Environment

- **The Advance DEIS does not appear to adequately consider implications of the 2011 flood or future activation of the New Madrid Floodway in evaluating alternatives in Section 2.0.**

The EPA recommended in September 2011 that the DEIS include an assessment of the impacts of the 2011 activation of the floodway (on social, cultural and natural resources and infrastructure) and resulting implications on this project. Inclusion of 2011 information may lend support to the project needs statement.

However, the DEIS does not appear to include information concerning the operation of the floodway in 2011 and the potential for operating it again in the future if the project is implemented. Damages and shifts in population as a result of the 2011 floods were not described in the Sections that discuss need for action. It is not clear if alternatives were analyzed based on their ability to reduce damages in the event of activation of the floodway. Assessment of the 2011 activation of the floodway provides current information on the costs of repairs to the levee system the government will realize for rebuilding. This information should be used to determine the costs for rebuilding post-project for each alternative, including what the additional cost would be to repair two levee breaches (inlet and outlet) should the levee gap be closed.

The DEIS states that estimates regarding frequency of floodway operation are based on past frequency of operation. This may be insufficient to provide a basis for analysis of future operations due to changes in land use in the watershed and the affects of climate change. The potential for more frequent activation of the floodway does not appear to have been considered in the needs statement, impacts assessment, or economic assessment. The EPA recommends these factors be given additional consideration in the DEIS.

Executive Order 11988: Flood Plain Management (May 24, 1977)
Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

The Interagency Task Force on Floodplain Management clarified the EO with respect to development in flood plains, emphasizing the requirement for agencies to select alternative sites for projects outside the flood plains, if practicable and to develop measures to mitigate unavoidable impacts.

The EO requires federal agencies to develop measures to minimize the impacts and restore and preserve the floodplain, as appropriate. The DEIS should address:

- Will the proposed action create significant environmental impacts on communities above or below the new structure, since this is the last open floodplain on the lower basin of the Mississippi River?
- What is the expected increase in development post-project? The Introduction, Section S8 Floodplain Management, states there will be no increase in floodplain development and

no development of residential areas, but doesn't address potential redevelopment of Pinhook post 2011 flood and conflicts with the statement made on page xxiii that "Indirect impacts from this action may include residential and commercial growth within the protected area."

6. Flood Risk on Mississippi River and Environmental Justice Executive Order 12898 (February 11, 1994)

- **The Advance DEIS acknowledges there will be some increases in Mississippi River elevation, but does not quantify increase in flood risk to those affected areas and communities. Additionally, the assumptions concerning river elevation are based on potentially outdated modeling (pre-1990). It is unclear if the modeling accounted for effects of proposed pumping operations or only closure of the levee gap. See Appendix C page C-18.**

According to EO 12898, Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

The document provides comment on some of the communities that will see beneficial changes with the proposed action; however, EJ communities adversely impacted by the 2011 flood are not adequately addressed. Page 257, mentions there are no environmental justice issues, however concerns have been expressed by citizens in Cairo, Hickman, Paducah, Olive Branch, Cape Girardeau, and others that this project would increase flooding in their communities. The extent of flooding increase to all communities that might be impacted due to post project changes in hydrology needs to be provided.

7. Use of Models

The Advance DEIS is unclear if all the models have been officially certified. For example, Appendix H Part 2 states that results of the Shorebird model validation will not be available until November or December of 2014. Impacts to shorebird populations are expected to be significant. Will the project move forward before this and other models are validated?

The EPA observes that there are several issues or criteria identified by the Model Certification Review Report that have not been addressed:

- HGM, Volume 3 Part 6.3, page 30 lists "risks associated with its [HGM] continued use." See also page v, pages 27-29, and Appendix B pages 1-29.
- Fish, Volume 3 Part 6.1, page vi;
- Waterfowl Assessment Methodology, Volume 3 Part 6.2, pages iv-v;
- Shorebirds, Volume 3 Part 6.4, page ii and page v.

Page x: The documents states that risk and uncertainty associated with each of the models as well as future mitigation tracts have been qualitatively discussed and quantified where appropriate. Where in the document did this occur?

HGM Model

Page iv states "Conservative estimates within each specific mitigation zone have been made in the DEIS to ensure that significant resources are compensated to the extent justified." Outlined below are a number of concerns with the way HGM is being used to calculate impacts.

The EPA comments from our March 8, 2010 letter to Gregg Williams have not been addressed. See PDF Page 93-105 in Volume 2 Part 2 Interagency Correspondence and Memorandums for Record.

The EPA has requested that the HGM sample points GIS layer and copies of the HGM data forms or spreadsheet of data collected at each sampling point be provided; however this information has not been provided to date. This information is needed in order to assess the conclusions of the DEIS.

The HGM functional assessment method tends to blend complex concepts making it complicated to use, and difficult to interpret the results generated. The DEIS should clearly describe for the public what the HGM results mean in terms of wetland functional impacts and how they will be mitigated.

Pg 38 (PDF page 39) Table 23: Functional Losses in FCUs Associated with the Authorized Project within the New Madrid Floodway, and a Calculation of Mitigation Acres Based on Mitigation Annualized FCIs from Table 22. There is an error in the table and text. In the last column the highlighted cell says that the highest value for CD is 431, however the cell for maintain plant communities 514 should be highlighted because it is the highest value. The description in the table also needs to be corrected.

The page also states: "It is assumed that mitigation is taking place within the 5-year floodplain, in large (1200 acre) well-connected tracts, but that no structure has been installed to restore flooding. Thus, the mitigation is maturing while subject to the altered hydrology associated with the Authorized Project. This leads to a much smaller functional lift per acre (or Annualized FCI), and larger acreage requirements for mitigation to offset the losses associated with the project." The mitigation amount should be increased to take into account the loss of hydrology within the project area.

Standard practice of the Missouri IRT is to require 10:1 mitigation ratio for preservation and a 2:1 ratio for enhancement activities. Any HGM FCU calculations need to take this into account. Preserved areas function units should be reduced by a factor of 10, and any enhancement areas function units need to be reduced by half. When taking this into account the project is lacking mitigation, and recalculations to mitigation need and the cost benefit analysis need to occur.

HGM calculations for removing the flood pulse could not be found in the document but should be calculated. The number of acres that no longer have the detain floodwater function should be quantified and added to the mitigation needs.

The Corps has limited the area of impact to investigate in the DEIS; however, the statement on Volume 3 Part 6.3, pages 14-15, supports the need to expand calculation of impacts to a larger area to take into account extreme events.

Pages B-5 through B-6 of Volume 3 Part 6.3 state that HGM does not adequately assess variables of flood duration and frequency in order to track changes in wetland condition. Considering that flooding extent and duration are crucial variables for evaluating impacts and proposed compensatory mitigation for this project, HGM is not appropriate.

Memorandum For Record 23 June 2013

Subject: Interagency Comments and Responses from the January 2013 Advanced Copy of the Draft St. Johns Bayou and New Madrid Floodway Environmental Impact Statement

1. An advanced copy of the DEIS was transmitted to the EPA and Fish and Wildlife Service on 3 January 2013.

2. The Fish and Wildlife Service provided comments on 18 January 2013.

3. EPA provided comments on 20 March 2013.

4. The overall response letters were divided into specific comments and grouped by theme. Responses to each of the individual comments are provided in the attachment. Applicable revisions were made to the DEIS.

Respectfully submitted,

Daniel Ward, Project Manager

(Attachment)

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-1	Purpose and Need	Justification for the project is inadequate in the "Purpose and Need for Project" section.	The purpose and need section has been revised to clarify the project's justification.
EPA	EPA-2	Purpose and Need	The Advance DEIS does not provide a clearly defined purpose and need for the project beyond "flood risk management."	Section 1 has been revised clarifying the purpose and need for the project and its authorization regarding flood control.
EPA	EPA-3	Purpose and Need	Previous comments provided in September 2011 included the following: The EPA appreciates the acknowledgement that since the time of project inception, national and Corps policy has transitioned from "flood control" to "flood risk reduction."	Comment noted.
EPA	EPA-4	Purpose and Need	Concurrent with this policy transition (flood control to flood risk reduction), environmental restoration has also become a priority mission of the Corps.	Neither the 1954 Act nor the 1986 Act include ecosystem restoration as a project purpose.
EPA	EPA-5	Purpose and Need	This evolution in policy (flood control to flood risk reduction) should compel precision and exactness in describing public safety, property, infrastructure, activity, etc. that needs to be afforded flood risk reduction, and to what degree.	Section 1 has been revised to clarify (see Footnote 1).
EPA	EPA-6	Purpose and Need	The evolution in policy (flood control to flood risk reduction) should compel precision and exactness in describing the project's implications on environmental restoration of the St. Johns and New Madrid basins.	Section 1 has been revised to clarify (see Footnote 1).
EPA	EPA-7	Purpose and Need	The basic project purpose is unclear.	Section 1 has been revised clarifying the purpose and need for the project.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-8	Purpose and Need	The stated project purpose in Sections S2 Project Purpose and Need, page xii and 1.1 Project Purpose, page 1, is flood risk management. These sections do not include economic growth or agriculutral intensification as the basic project purpose, but the document discusses these interests elsewhere as objectives for the project (Project Specific Objectives in Section 1.3.2, the Federal Objective in Section 2.1, and Principles and Guidlines in Section 2.4)	Section 1 has been revised clarifying the purpose and need for the project.
EPA	EPA-9	Purpose and Need	These interests (economic growth and agricultural intensification) must be included in the basic project purpose if they are to be used to evaluate alternatives.	Section 1 has been revised clarifying the purpose and need for the project.
EPA	EPA-10	Purpose and Need	It is only the basic project purpose for which alternatives can be evaluated per the Clean Water Act Section 404 (40 CFR 230.10(a)).	Section 1 has been revised clarifying the purpose and need for the project and its authorization regarding flood control. Section 2 has been revised clarifying the range of alternatives and screening process.
EPA	EPA-11	Purpose and Need	Evaluation of alternatives against interests not specified in the basic project purpose is not in compliance with regulations.	Section 1 has been revised clarifying the purpose and need for the project and its authorization regarding flood control. Section 2 has been revised clarifying the range of alternatives and screening process.
EPA	EPA-12	Purpose and Need	The EPA recommends the DEIS be revised to clearly state the basic project purpose and describe the "Project Specific Objectives" and other interests in the appropraite context.	Section 1 has been revised clarifying the purpose and need for the project.
EPA	EPA-13	Objectives	Some of these factors (Project Specific Objectives) may be better described as benefits of the proposed action, such as social well being and economic development.	Project specific objectives and constraints were clarified in the revised DEIS. See section 1.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-14	Objectives	Others (Project Specific Objectives) are mandated by law, such as compensation for unavoidable impacts.	Project specific objectives and constraints were clarified in the revised DEIS. See section 1.
EPA	EPA-15	Objectives	Recognizing the importance of the flood pulse is a stated objective; but this is a resource function that should be a major component of evaluating impacts of each alternative in the environmental impact analysis.	This has been revised to a constraint. See Section 1.
EPA	EPA-16	Objectives	Restoration of Big Oak Tree State Park is a potential compensatory mitigation strategy and does not belong in the discussion of purpose and need or alternatives.	Although restoration of Big Oak Tree State Park remains a mitigation priority, it has been deleted as a project specific objective.
EPA	EPA-17	Objectives	The Federal Objective is a factor in determining project feasibility.	The purpose and need section has been revised to clarify project purpose, objectives, and constraints.
EPA	EPA-18	Objectives	Each of these interests (flood pulse, BOTSP, Federal Objective) should be considered and discussed in the appropriate context and section of the DEIS.	The purpose and need section has been revised with these interests considered and discussed in other appropriate sections of the report.
EPA	EPA-19	Editorial	Within Section 2.1 Preliminary Alternatives, phrasing of one of the Project Specific Objectives changes from "manage flood risks for social well being" to "manage flood pulse for social well being."	Section 2 of the DEIS has been revised to clarify criteria (objectives and constraints), preliminary alternatives, the screening process, and alternatives considered for detailed analysis.
EPA	EPA-20	Editorial	Reducing flood risk and damages can be quite different from managing the flood pulse.	Sections 1 and 2 of the DEIS has been clarified with additional discussion of flood control and flood risk management as well as clarification of project objectives.
EPA	EPA-21	Editorial	In addition, "managing" the flood pulse contradicts the objective to "recognize the importance of the flood pulse."	Sections 1 and 2 of the DEIS has been clarified with additional discussion of flood control and flood risk management as well as clarification of project objectives.
EPA	EPA-22	Purpose and Need	Need for action has not been adequatley demonstrated.	Section 1 has been revised clarifying the purpose and need for the project.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-23	Purpose and Need	The discussion in Sections S2 Project Purpose and Need and 1.2 Need for Action does not provide precision and exactness is describing the public safety, property, infrastructure, activity, etc. that needs to be afforded flood risk reduction, and to what degree.	Section 1 and the Executive Summary have been revised clarifying the purpose and need for the project.
EPA	EPA-24	Purpose and Need	Maps, tables, and other description of the populations affected by flooding, the frequency of isolation, and the associated costs should be provided.	Section 1 has been revised with additional flooding data.
EPA	EPA-25	Purpose and Need	Similarly, the exact location, frequency, duration, and damages of public infrastructure should be described.	Section 1 has been revised with additional flooding data.
EPA	EPA-26	Purpose and Need	The need of the project should be based on an actual goal for reduction of these damages (costs of flooding).	Section 1 has been revised with additional flooding data and results of economic modeling.
EPA	EPA-27	Purpose and Need	While the document appears to have fully considered agricultural damages and the potential benefits of agricultural intensification, the facts and figures pertaining to public safety, property, infrastructure, etc. are not included.	Section 1 has been revised with additional socio-economic discussion.
EPA	EPA-28	Editorial	The document states that the flooding problems of East Prairie are not due to impounded interior runoff (pg 19), and Section 1.2 page 3 states that "the project would not entirely alleviate all of the city's flooding and drainage problems."	Section 2 has been revised clarifying flood conditions in and around East Prairie as well as remaining areas in the St. Johns Bayou Basin.
EPA	EPA-29	Alternatives	No alternatives have been developed with the express purpose of addressing these drainage problems for East Prairie.	Section 2 has been revised clarifying that East Prairie requires channel modifications and a pump station.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-30	2011 Flood	The document does not provide essential information regarding the repopulation of the New Madrid Floodway post 2011 activation.	Visual observations indicate that much of the agricultural land within the floodway (75 to >90%) was replanted with crops within a few months following activation. Although there is no formal survey to date, observations also indicate residents are continuing to repopulate the floodway. It is anticipated that with time and the infrequency of Floodway operation, more residents would return. The DEIS has been revised to better describe this issue.
EPA	EPA-31	Alternatives	On page 28 the document states that the Village of Pinhook has expressed a desire to relocate, but relacation of these residents iss being considered outside of this project.	noted
EPA	EPA-32	Purpose and Need	The document must clearly articulate the degree of flood risk reduction needed for public safety and infrastructure and evaluate alternatives against that measure.	Section 1 has been revised with additional socio-economic discussion.
EPA	EPA-33	Purpose and Need	The need for action is not cleary presented in the document.	Section 1 has been revised clarifying the purpose and need for the project.
EPA	EPA-34	General	The abstract, page I that states, "The flood pulse is no longer the driving force in the St. Johns Bayou and New Madrid Floodway project area. The annual disturbance associated with farming (e.g., disking, plowing, land leveling, herbicide application, etc.) is the current principle driving force that limits ecological productivity and habitat." This statement is not supported by scientific evidence and negates the need for flood management.	The DEIS has been revised to clarify the conclusions in the abstract about the current degraded condition of the project area.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-35	Purpose and Need	Page 121 states "current conditions show that farming is very profitable and would likely remain so under future without-project conditions." This fact calls into question the concept presented in the Advance DEIS that meeting the needs for social well being is dependent on increasing economic benefits to agricultural areas.	The DEIS has been clarified.
EPA	EPA-36	Purpose and Need	Section 1.2, page 2, states that flooding adjacent agricultural land is an impedement to the areas future prosperity; however specific information regarding flood damages and the effects on the local economy are not provided.	Economic benefits were determined for the national economic development account, not the local.
EPA	EPA-37	Purpose and Need	The document lacks an adequate description of the needs of the proposed action and without maps and clear language in the executive summary, introduction, and purpose and need statement may not engage the public and decision makers in a call to action.	The Executive Summary and Section 1 has been revised clarifying the purpose and need for the project.
EPA	EPA-38	TSP	It is unclear that the Advance DEIS adequately demonstrates to the public that the Tentatively Selected Plan (TSP) complies with the Clean Water Act 404(b)(1) Guidelines (Guidelines).	The 404(b)(1) evaluation has been revised to clarify this concern.
EPA	EPA-39	TSP	Full range of alternatives and selection of the least environmentally damaging practicable alternative has not been adequately demonstrated.	The purpose and need sections as well as the alternatives section have been revised to help clarify the scope of practicable alternatives. The 404(b)(1) analysis has been revised to discuss LEDPA. While the TSP represents the "tentatively selected plan", it does not represent the final selection of the agency, which will be documented in the ROD.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-40	TSP	It is unclear that the Advance DEIS demonstrates the TSP represents the least environmentally damaging practible alternative, consistent with 40 CFR Part 230.10(a).	The purpose and need sections as well as the alternatives section have been revised to help clarify the scope of practicable alternatives. The 404(b)(1) analysis has been revised to discuss LEDPA. While the TSP represents the "tentatively selected plan", it does not represent the final selection of the agency, which will be documented in the ROD.
EPA	EPA-41	Alternatives	Section 2.1 indicates that several structureal alternatives for the New Madrid Floodway portion of the project now appear to have been eliminated from further consideration without presenting to the public the current analysis supporting such a decision.	The DEIS has been revised to provide additional documentation regarding alternative screening criteria.
EPA	EPA-42	404b1	The evaluation of practible alternatives which would have less adverse impacts on the aquatic ecosystem, as presented in the Section 404(b)(1) Evaluation Report (Appendix E Part 7 of the DEIS) consists of one sentence, "Alternative to avoid and minimze project impacts has been selected as part of the Recommended Plan."	Section 404(b)(1) Report has been revised to clarify the evaluation of alternatives.
EPA	EPA-43	404b1	40 CFR § 230.10(a) prohibits the discharge of dredge or fill material if there is a less environmental damaging practicable alternative to the prosed discharge.	The Section 404(b)(1) evaluation has been revised to include additional documentation regarding the discharge of fill material and additional discussion regarding the least environmentally damaging practicable alternative in consideration of cost, existing technology, and logistics in light of the project purpose..

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-44	404b1	The level of detail of the alternatives analysis and the assessment of impacts is insufficient given the complexity of issues, scale of the project, and the potential severity and magnitude of adverse impacts to the aquatic ecosystems (see also the 1993 Memorandum to the Field, *Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements*).	Section 404(b)(1) Report has been revised to include the level of detail that demonstrates the alternatives analysis and impact assessments are commensurate with the complexity, scale and magnitude of impacts.
EPA	EPA-45	General	The DEIS does not adequately support the position that the project is water dependent.	The project's purpose is to manage flood risks based upon the project's authorization. The DEIS and 404(b)(1) has been clarified to discuss the water dependency of the project.
EPA	EPA-46	Purpose and Need	A more clearly defined project purpose will facilitate the analysis of water dependency under the CWA Section 404(b)(1) Guidelines.	Section 1 and the 404(b)(1) has been revised clarifying the purpose and need and the water dependency determination.
EPA	EPA-47	404b1	In accordance with the Guidelines "practicable alternatives that do not involve special aquatic sites [e.g. wetlands, riffle/pool complexes] are presumed to be available, unless clearly demonstrated otherwise.	Section 404(b)(1) Report and Section 2 of the DEIS have been revised to include a discussion on practicability determinations of various project alternatives.
EPA	EPA-48	404b1	Where a discharge is proposed for a special aquatic site, all practicable alternatives to the proposed discharge which do not involve a discharge into a special aquatic site are presumed to have less adverse impact on the aquatic ecosystem, unless clearly demonstrated otherwise" (40 CFR 230.10(a)(3)).	Section 404(b)(1) Report and Section 2 of the DEIS have been revised to include a discussion on practicability determinations of various project alternatives.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-49	Alternatives	The document lists a range of potential actions but does not demonstrate consideration of the full range of practicable alternatives.	The DEIS has been revised to provide additional documentation regarding alternative screening criteria.
EPA	EPA-50	Alternatives	The alternatives analysis appears to narrowly focus on one activity at a time to determine the ability of an activity to meet project objectives, rather than combining activities to generate a meaningfull range of alternatives.	The DEIS has been revised to include an analysis of standalone preliminary alternatives as well as a combination of preliminary alternatives.
EPA	EPA-51	Alternatives	Alternatives that combine multiple non-structural approaches, or both structural and non-structural appraoches, should be considered.	The DEIS has been revised to include an analysis of a combination of preliminary alternatives.
EPA	EPA-52	Alternatives	Alternatives that combine multiple non-structural approaches should be re-examined and carried through a full analysis of their environmental impacts and compared to each other in order to allow for a fully-informed decision on how to best meet the projects basic purpose.	The DEIS has been revised to include an analysis of a combination of preliminary alternatives. However, a combination of non-structural preliminary alternatives were not carried forward for detailed analysis for reasons stated in the DEIS. The DEIS has been revised to explain the screening process.
EPA	EPA-53	Alternatives	Considering activities individually as standalone alternatives for both NMF and SJB basins combined, rather than seperately for each basin, presents unnecessary obstacles in the evaulation.	The DEIS has been revised to discuss problems and solutions to flood problems separately for each basin.
EPA	EPA-54	General	The environmental factors, including those influencing flooding, are not the same for the two basins; therefore, evaluation of the feasibility and impacts of each alternative should be evaluated separately.	The DEIS has been revised to describe flooding problems separately for each basin. Likewise, impacts were assessed separately for each basin. Lastly, mitigation is proposed for each basin.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-55	Alternatives	The activity of relocation was discussed in Section 2.1.4.5, pages 28-29, as a standalone alternative for both basins. The populations of the basins are not similar, and the flood risks for communities are not due to the same factors.	The DEIS has been revised to discuss problems and solutions to flood problems separately for each basin.
EPA	EPA-56	Alternatives	Pinhook residents in the NMF must live with the constant risk of Floodway activation, and according to the document, have expressed interest in relocation since the 2011 Floodway activation.	The DEIS has been revised to discuss Pinhook, repopulation of the Floodway, and the desire for a buyout.
EPA	EPA-57	Alternatives	The discussion states that "relocation of the community [Pinhook] is being considered independently of this project or USACE." Evaluation of relocation of Pinhook is both essential as an alternative for the NMF as well as to establish the need for the project.	Purpose and Need of the project have been clarified in Section 1. Section 2 has been revised with additional information regarding the alternative screening process.
EPA	EPA-58	Alternatives	The discussion regarding the alternative of raising road surfaces would also benefit from a basin-specific evaluation.	The DEIS has been revised to discuss problems and solutions to flood problems separately for each basin, including raising surface elevations of roads.
EPA	EPA-59	Alternatives	The DEIS does not address whether there are key roads/corridors that could be raised to eliminate problems of community isolation.	The DEIS has been revised to discuss problems and solutions to flood problems separately for each basin, including raising surface elevations of roads.
EPA	EPA-60	Alternatives	Examining this alternative (raising road surfaces) independently for the each basin would generate additional alternatives and/or identify avoidance and minimization measures.	The DEIS has been revised to discuss problems and solutions to flood problems separately for each basin, including raising surface elevations of roads.
EPA	EPA-61	Alternatives	By evaluating raising road surfaces as a standalone alternative, the effects of potential relocation of Pinhook were not considered in the analysis.	The DEIS has been revised with additional analysis regarding raising road surfaces. Relocation of Pinhook is not being considered for this project.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-62	Alternatives	An alternative that allows flooding up to approximately 296.4 feet in the St. Johns Basin should be developed. At this elevation Interstate 55 could remain open.	Although such an alternative may keep traffic and commerce on I-55 moving, it would still isolate roads leading to I-55 from East Prairie. Likewise, this alternative would not reduce agricultural flood damages. Therefore, it is not practicable.
EPA	EPA-63	Alternatives	Other examples include the Refuge/Conservation Area alternative in Section 2.1.4.1, page 23, which was considered as a "standalone" alternative. However, it may be more reasonable to consider this activity in combination with other activities, such as community relocations, elevation of roadways, and silviculture.	The DEIS has been revised to combine preliminary stand alone alternatives.
EPA	EPA-64	Alternatives	Different sizes of refuges could also be evaluated.	Two different refuge sizes were considered. The DEIS has been revised to include additional clarification on why refuges were not considered for detailed analysis.
EPA	EPA-65	Alternatives	Additionally, consideration of a Refuge alternative to resolve issues for both the St. Johns and the New Madrid Floodway basins creates unnecessary difficulties in the analysis.	Refuges were considered in each individual basin. The DEIS has been clarified.
EPA	EPA-66	Alternatives	The refuge activity should be fully considered for the New Madrid Floodway basin in combination with other activities that may address issues in the St. Johns basin.	The DEIS has been revised by combining refuges with other preliminary alternatives.
EPA	EPA-67	Alternatives	Similarly, the activities of silviculture and conversion to flood-tolerant crops (Sections 2.1.4.2 pages 23-24 and 2.1.4.3 pages 24-25, respectively) were considered as standalone alternatives and should be considered in combination with other activities.	The DEIS has been revised to combine preliminary stand alone alternatives.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-68	Purpose and Need	The DEIS should provide a clear explanation of what is meant by "net economic development" and how alternatives were analyzed in terms of meeting this objective.	Section 2 has been revised regarding Net Economic Development and the screening process.
EPA	EPA-69	Alternatives	A recurring theme of the document is that elimination of alternatives appears to be based on economic justification rather than an evaluation of impacts and practicability (examples: levee alignments, refuge/conservation area, agriculture to silviculture, elevation of road surfaces, relocations).	The DEIS has been revised with additional clarification regarding the screening process undertaken for different flood risk management alternatives. Cost is a consideration in defining practicability.
EPA	EPA-70	Alternatives	The Guidelines state that practicable alternatives are those that are "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes" (40 CFR 230.10(a)(2)).	The DEIS has been clarified with additional discussion regarding practicable alternatives.
EPA	EPA-71	Alternatives	The 1993 Memorandum to the Field further clarifies that "the determination of what constitutes an unreasonable expense should generally consider whether the projected cost is substantially greater than the costs normally associated with the particular type of project."	The DEIS has been revised with additional clarification regarding the screening process.
EPA	EPA-72	Alternatives	The practicality of the activities/alternatives should be screened against each other and normal or average costs for flood risk reduction, rather than potential economic benefits of the alternatives.	Measures and alternatives were screened against each other. The DEIS has been revised to include additional information regarding the screening process.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-73	Alternatives	Further, the alternatives analysis should include a breakdown of all known costs for each activity/alternative as a basis for comparison and evaluation of practicability.	The DEIS has been revised to include the project cost estimates.
EPA	EPA-74	Alternatives	The tables in the DEIS that compare alternatives are lacking the full range of alternatives and their associated impacts.	Preliminary alternatives underwent a screening process. The DEIS has been revised to provide additional information regarding the screening process.
EPA	EPA-75	Alternatives	Table 2.3, page 31, is insufficient for comparison and screening of alternatives: All preliminary activities/alternatives are not included in the table.	Only those alternatives carried into detailed analysis are presented. Preliminary alternatives that were not practicable were not carried forward. The DEIS has been revised to explain the screening process.
EPA	EPA-76	Alternatives	Table 2.3, page 31, is insufficient for comparison and screening of alternatives: Environmental impacts of each activity/alternative are not provided.	DEIS has been revised to provide additional explanation regarding the screening process.
EPA	EPA-77	Alternatives	Table 2.3, page 31, is insufficient for comparison and screening of alternatives: Inclusion of measures to avoid and minimize impacts is out of place as this is a requirement of the CW A Section 404{b)(1) Guidelines, not an alternative, and should be specified for the overall project and each activity/alternative.	The DEIS and 404(b)(1) has been revised to include additional discussion of avoid and minimize measures.
EPA	EPA-78	Alternatives	Table 2.8, page 57, does not include Alternative 1- No Action in the comparison, except indirectly as the baseline for FCUs.	The purpose of the table is to compare different construction alternatives.
EPA	EPA-79	Alternatives	We recommend more closely examining an alternative that would limit work to the St. Johns Basin.	Comment noted. A St. Johns Bayou only alternative is presented in the DEIS.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-80	Alternatives	We also recommend that alternatives that examine different alignments for the levee closure in the Floodway be examined to determine if there are other alignments that would reduce environmental impacts and provide opportunities for environmental restoration as well as needed flood damage reduction.	The DEIS has been revised clarifying the screening process for practicable alternatives in regards to the purpose and need for the project.
EPA	EPA-81	Alternatives	Evaluation of alternative levee alignments should be updated from past analyses (much of this appears to date from the 1980s) and should include the direct and indirect impacts, benefits and costs associated with each of these alternatives.	The DEIS has been revised to provide additional documentation on why alternate levee alignment were not retained for detail analysis.
EPA	EPA-82	General	Discussions of compensatory mitigation are included throughout the document rather than in the appropriate sequencing process of avoid, minimize, then mitigate, according the CW A 404(b)(1) Guidelines.	The DEIS and Section 404(b)(1) Report have been revised to discuss how alternatives were formulated, impacts minimized, and impacts compensated.
EPA	EPA-83	General	The mitigation discussion in Section 2.3, pages 43-51, is within Section 2.0 Alternatives Including the Proposed Action. However, this section does not provide a comprehensive discussion demonstrating that all potential avoidance and minimization measures have been included in the assessment, as required by the CWA Section 404 {b)(1) Guidelines.	Section 2 has been revised. Impacts of each alternative are described in detail in Section 4. Compensatory mitigation is discussed in Section 5. Avoid and minimize measures are discussed throughout the DEIS and the 404(b)(1) analysis.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-84	Alternatives	Avoid and minimize measures are only discussed for channel construction access and pump operation activities, but other potential avoidance and minimization measures are not provided (such as placing dredged material from ditches in uplands).	Avoid and minimize measures place spoil material in prior converted cropland to the extent practical.
EPA	EPA-85	404b1	The 1993 Memorandum to the Field states "it is not appropriate to consider compensatory mitigation in determining whether a proposed discharge will cause only minor impacts for purposes of the alternatives analysis required by Section 230.10(a)."	Section 404(b)(1) Report has been revised. The proposed disposal of dredged material would not likely result in significant adverse effects on human health or welfare, municipal or private water supplies, recreational or commercial fishing, plankton, fish, shellfish, wildlife, or special aquatic sites.
EPA	EPA-86	General	In comparing the alternatives in Table 2.8, page 57, it is unclear how mitigation may be reflected in these numbers.	Mitigation cost is included in total first costs. A footnote has been provided.
EPA	EPA-87	Wetlands	Comparison of FCUs is more applicable in the context of indirect impacts and mitigation planning and should not be used in lieu of a direct comparison of wetland acres and linear feet of streams impacted in the alternatives analysis.	USACE civil works policy permits mitigation based on the replacement lost function, not ratios, when an accepted model such as the HGM model is used. This is consistent with the mitigation rule 33 CFR 332.2(f).
EPA	EPA-88	Alternatives	The document does not define the needed flood risk reduction for East Prairie or provide information regarding the degree of protection afforded by each alternative.	The DEIS has been revised to include additional information regarding the degree of protection for each preliminary alternative.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-89	Editorial	Page 19 states flooding in East Prairie "is not necessarily due to impounded interior runoff," yet a few sentences later indicates "flood problems associated with impounded interior runoff can affect flooding conditions in East Prairie." The document would benefit from addressing this discrepancy, and clearly explaining the causes(s) of flooding in East Prairie to aid in assessing alternatives to attenuate this flooding.	The DEIS has been revised to clarify flood conditions in and around East Prairie as well as remaining areas in the St. Johns Bayou Basin.
EPA	EPA-90	Alternatives	Some alternatives appear to have been dismissed based without providing a clear post-project assessment of direct, secondary, and cumulative impacts.	The DEIS has been revised to include additional documentation regarding screening of alternatives and an explanation on why they have been dismissed.
EPA	EPA-91	Alternatives	The discussion of conversion to silviculture and flood-tolerant crops in Sections 2.1.4.2 and 2.1.4.3, respectively, appear to have been dismissed largely on the assumption that since farmers haven't already converted to these crops, they will never convert.	The DEIS has been revised to include additional explanation and analysis on why conversion to silviculure was not retained for detailed analysis.
EPA	EPA-92	Alternatives	These alternatives were also considered to provide only temporary flood risk management. However, this concept of permanent versus temporary flood risk reduction was not discussed for other alternatives.	The DEIS has been revised to clarify that existing programs would only provide temporary protection. Therefore, the preliminary alternatives were modified to provide a restricted easement in perpetuity.
EPA	EPA-93	Alternatives	Any alternative that includes engineering structures or requires continued operation and maintenance could be considered temporary.	Comment noted.
EPA	EPA-94	Alternatives	Analysis and consideration of all potential impacts has not been adequately demonstrated.	Impacts have been considered and discussed throughout the DEIS.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-95	General	The Advance DEIS lacks a clear articulation of the secondary effects of the proposed project would be on the aquatic ecosystem in terms of altered hydrology, e.g., timing, extent, frequency, duration and depth of inundation and/or saturation.	Appendix C provides information regarding changes to hydrology including the timing, extent, frequency, duration, and depth of flooding. Hydrographs for each year over the period of record from 1943-2009 are provided to document the changes in hydrology as a result of each alternative. The impact of these changes to aquatic ecosystems are discussed throughout the DEIS.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-96	Wetlands	The draft document appears to limit evaluation of wetland impacts to only those resources within the current 5-year floodplain. Without a detailed explanation of what the actual hydrologic effects would be, it is difficult to determine whether this limitation is appropriate.	See EPA 118 for a discussion regarding the utilization of the five-year flood frequency. Actual hydrologic effects are presented in Table 4.3 (Section 4.4.1). Detailed explanation is found in Appendix C, which states: "St. Johns Bayou water surface elevations are affected by existing and authorized project conditions. Project elevations may be higher during December and January due to intentional flooding of the interior; late winter and spring elevations are lowered for agricultural requirements; summer and fall elevations are only slightly lower than existing conditions. The results of the St. Johns Bayou sump analysis are presented graphically in Plates 3-72. Plates 3-70 present yearly plots (1942-2009) of existing and authorized project conditions for interior pool water surface elevations. Plate 71 presents a 365-day plot of interior pool elevation maxima, means, medians, and minima for the simulation period under existing conditions. Plate 72 presents a 365-day plot of interior pool elevation maxima, means, medians, and minima for the simulation period under authorized project conditions. New Madrid Floodway water surface elevations are affected by existing, authorized, alternative 3.1, alternative 3.2, and alternative 4 project conditions. The results of the New Madrid Floodway analysis are presented graphically in Plates 73-145. Plates 73-140 present yearly plots (1942-2009) of existing, authorized project, and alternative project conditions for interior pool water surface elevations. Plate 141 presents a 365-day plot of interior pool elevation maxima, means, medians, and minima for the simulation period under existing conditions. Plate 142, Plate 143, Plate 144, and Plate 145 present 365-day plots of interior pool elevation maxima, means, medians, and minima for the simulation period for the authorized project, alternative 3.1, alternative 3.2, and alternative 4, respectively."

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-97	General	We note in Appendix B: Economics of Alternatives that it appears benefits attributed to proposed project features extend to areas beyond the 5-year floodplain. It is unclear why the scope of analysis for analyzing project impacts would be different than that used for analyzing benefits.	The primary impact area (PIA) for each resource analyzed was based on the ecological or economic characteristics of the resource and the potential affect of the project could have on those characteristics. For example, the five-year flood frequency elevation was used to differentiate between riverine wetlands and flats (Klimas et al, 2009). Therefore, the five year floodplain served as the PIA for wetland analysis. Additionally, the five-year frequency elevation was used as the upper limit of suitable spawning and rearing fish habitat (J. Jackson, personal communication) for Mississippi River fishes. However, seasonally inundated habitat is exploited by waterfowl and shorebirds regardless of flood frequency as long as it occurs during the appropriate migration windows and is of appropriate depths (Battelle, 2010). Therefore, the upper limit for shorebirds was the maximum observed stage, and the corresponding limit for waterfowl was the 100-year flood frequency elevation. Likewise, economic benefits occur and were assessed at elevations greater than the 5-year flood frequency. Further information regarding the PIA for each significant resource can be found in the relevant section of the DEIS. Revisions have been made to the DEIS with additional citations.
EPA	EPA-98	General	The Section 404(b)(1) Evaluation Report contained in Appendix E Part 7 asserts that there are "no significant adverse effects expected" through completion of the project. This assertion is unsubstantiated in the Advance DEIS.	The Section 404(b)(1) analysis was revised to clarify and further document the supporting data and discussion.
EPA	EPA-99	General	The document does not clearly describe how impacts were calculated, or provide an estimate and comparison of direct, secondary and cumulative impacts for all alternatives.	Discussion on how impacts were quantified for each particular resource is found in Section 4.
EPA	EPA-100	404b1	Discussion of significant degradation of Waters of the United States is not provided to support the conclusions of "no significant adverse effect" under the Evaluation of Extent of Degradation of the Waters of the Unites States in Appendix E, Part 7 Section 404(b)(1) Evaluation Report and demonstrate compliance with the requirements of 40 CFR 230.10(c).	Section 404(b)(1) Report has been revised.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-101	404b1	The burden of proof to demonstrate compliance with the CWA Section 404 Guidelines rests with the applicant of the project (40 CFR 230.12(a)(3)(iv)).	Section 404(b)(1) Report has been revised to demonstrate compliance of the tentatively selected plan.
EPA	EPA-102	General	The DEIS does not clearly define direct impacts of the proposed alternatives.	The DEIS has been revised to clarify the direct impacts attributed to channel enlargement and fill operations and the indirect impacts attributed to changes to hydrology.
EPA	EPA-103	Wetlands	Assessment of direct impacts appears to have been combined with assessment of indirect impacts in the hydrogeomorphic model. This is inconsistent with USACE and EPA national practice.	Direct and indirect impacts have been addressed independently by the HGM model. A summary of direct and indirect impacts to each specific function within each wetland subclass can be found in Appendix E, Part 6.
EPA	EPA-104	Wetlands	Section 4.8.1, page 127, states "the HGM is considered the best tool available to quantify *indirect* impacts associated with the project" [emphasis added].	Section 4.8.1 does state that the HGM is considered the best tool available to quantify indirect impacts associated with the project (Battelle 2010) and was used in lieu of any less rigorous methods that are not intended to represent an exact or statistically proven scientific method. This is critical due to the fact that a majority of wetland impacts associated with the project are indirect impacts. As noted in Section 4.8.1., direct impacts to wetlands in the New Madrid Floodway total only 9 acres, however, changes in both flood frequency and flood duration would affect multiple functions. In addition to functional decreases within subclasses, the hydrologic changes associated with this alternative would be significant enough to cause changes in wetland subclass from riverine subclasses [e.g., LGRB, connected depressions (CD)] to flats or unconnected depressions (UCD).
EPA	EPA-105	General	Figures for direct, indirect or secondary, and cumulative impacts should be provided separately for each resource and discussed clearly and early in the document.	The DEIS has been revised. Impacts for each alternative are described in Section 4.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-106	General	Tables provided in the Introduction and Section 2 Alternatives Including the Proposed Action do not provide detailed figures of the direct, secondary, and cumulative impacts to both wetlands and streams for each activity/alternative.	The DEIS has been revised. Detailed information regarding direct, indirect, and cumulative impacts can be found in section 4 within each specific resource category.
EPA	EPA-107	Wetlands	Figures for direct impacts to wetlands are not provided until the HGM discussion on pages 131 and 135. Page 131 states that the Alternative 2.1 will result in total direct impacts (total clearing or filling) of 673 acres of vegetated wetlands "due to channel modifications." Then page 135 states that the TSP, Alternative 3.1, "would result in a 264 acre reduction in the direct impact footprint from the direct clearing, ditch excavation width, and spoil pile reductions when compared to alternative 2.1." So, the TSP would result in 409 acres of direct wetland impacts in the SJB, plus page 153 states that 9 acres of impact (resource not specified) will be directly impacted in the NMF.	Impacts of the project are discussed in Section 4 - Environmental Consequences. However, to specify the resource requested by EPA, Section 4.8.1.3, Alternative 2.2, has been revised by adding the following sentence: "Due to the closure footprint, a total of 9 acres of LGRB vegetated wetlands would be completely cleared and or filled and assumed to lose all wetland function."
EPA	EPA-108	Wetlands	These figures for the TSP (409 acres for SJB + 9 acres for NMF = 418 acres total) do not add to the 416 acres of direct impacts provided on page 9 of Appendix E Part 7.	The 404(b)(1) evaluation will be corrected to show correct amount of direct impacts.
EPA	EPA-109	Wetlands	It is unclear which specific activities cause which direct impacts and if the impacts of the proposed levee footprint at the NMF opening are included.	Section 4.8.1 has been revised to site appropriate sections that detail activities that result in direct impact. See revised write up. Additionally, a summary of direct and indirect impacts to each specific function within each wetland subclass can be found in Appendix E, Part 6.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-110	Wetlands	The DEIS should clearly break out which activities result in which impacts and further describe and document each impact on maps.	Wetland section has been revised to document which activities result in impacts.
EPA	EPA-111	wetlands	Calculations based on the figures provided for the levee footprint (1500 feet long with a base of 302') sum to 10.4 acres. However, only 9 acres of direct impacts are discussed. Is some of the area of the levee footprint considered to be upland or stream?	Although the closure footprint would be incorporated into the existing levee system, the footprint area subject to environmental impacts would be approximately 9 acres.
EPA	EPA-112	ditch impacts	Direct impacts to streams in the NMF have not been provided. Has the USACE determined area to be upland based on clearing already conducted, or have wetland delineations been completed for the entire area?	The DEIS has been revised to document direct impacts associated with the closure levee and structure in Mud Ditch. Construction would result in a need to mitigate 1,087.2 stream credits in the New Madrid Floodway. Impacts of the project and mitigation are discussed in Section 4.11.
EPA	EPA-113	general	The DEIS should also address direct temporary impacts that may be associated with construction activities. These issues should be clearly addressed in the EIS.	The DEIS has been revised by adding a short description of temporary construction effects to the last paragraph in the section 4.10.1, Water Quality Effects on Waters Within the Project Area.
EPA	EPA-114	wetlands	Section 2.2.3, page 36 compares magnitude of direct stream and wetland impacts in the SJB basin to the magnitude of secondary impacts in the NMF. This comparison is inappropriate because the resources and functions are different and cannot be directly correlated to one another.	Section 2 has been revised.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-115	general	The document does not support the concept that the primary impact area of the project is within the 5-year floodplain.	This was clarified in Figure 3.6 as well as Section 3, Affected Environment, which states that: "The project area was further refined into a Primary Impact Area (PIA)... An elevation of 300 feet was used as the upper limit of the PIA (Figure 3.6).... The PIA can be further refined based upon the resource being analyzed due to the response threshold that results in an adaptation or produces a community structure. For example, the five-year flood frequency elevation was used to differentiate between riverine wetlands and flats (Klimas et al, 2009). Therefore, the five year floodplain served as the primary impact area for wetland analysis because floods greater than the five-year frequency do not play a major ecological role for wetlands at elevations greater than the corresponding five year flood frequency. Additionally, the five-year frequency elevation was used as the upper limit of suitable spawning and rearing fish habitat (J. Jackson, personal communication) for Mississippi River fishes. However, seasonally inundated habitat is exploited by waterfowl and shorebirds regardless of flood frequency as long as it occurs during the appropriate migration windows and is of appropriate depths (Battelle, 2010). The upper limit for shorebirds was the maximum observed stage, and the corresponding limit for waterfowl was the 100-year flood frequency elevation. Further information regarding the primary impact area for each significant resource can be found in the section of the draft EIS devoted to that specific resource."

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-116	general	The document states, page 74, "the Village of Pinhook becomes isolated at the approximate 10-year flood elevation." If the project is designed to reduce flooding at Pinhook, then there would be significant impacts at the 10-year floodplain elevation.	The primary impact area (PIA) for each resource analyzed was based on the ecological or economic characteristics of the resource and the potential affect of the project could have on those characteristics. For example, the five-year flood frequency elevation was used to differentiate between riverine wetlands and flats (Klimas et al, 2009). Therefore, the five year floodplain served as the PIA for wetland analysis. Additionally, the five-year frequency elevation was used as the upper limit of suitable spawning and rearing fish habitat (J. Jackson, personal communication) for Mississippi River fishes. However, seasonally inundated habitat is exploited by waterfowl and shorebirds regardless of flood frequency as long as it occurs during the appropriate migration windows and is of appropriate depths (Battelle, 2010). Therefore, the upper limit for shorebirds was the maximum observed stage, and the corresponding limit for waterfowl was the 100-year flood frequency elevation. Likewise, economic benefits occur and were assessed at elevations greater than the 5-year flood frequency. Further information regarding the PIA for each significant resource can be found in the relevant section of the DEIS. Revisions have been made to the DEIS with additional citations.
EPA	EPA-117	Wetlands	However, page 90 indicates that, "Although, USACE acknowledges that wetlands are located at elevations greater than the five-year flood frequency and that the project would reduce periodic flooding through flood risk reduction measures, wetland functions associated with lands above this elevation were not assessed because of the insignificant potential impact of the project on these lands."	The DEIS has been revised.
EPA	EPA-118	Wetlands	How was it determined that potential impacts in areas above the 5-year floodplain would be insignificant?	Section 3.8.1 has been revised regarding the utilization of the 5-year floodplain

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-119	Wetlands	Page 286 suggests that impounded interior runoff or backwater flooding do not play a significant role in maintaining wetlands status in areas above the five year floodplain, rather, hydrology is maintained by precipitation and groundwater interactions. The DEIS acknowledges some uncertainty exists regarding this assumption and to address that risk, the project would be monitored after constructed. This assumption is fundamental to an accurate assessment of project impacts, comparison of those impacts across alternatives, and formulation of mitigation necessary to offset unavoidable impacts. The scientific basis for this assumption needs to be provided in the context of a natural river floodplain with backwater flooding, and the primary hydrological and ecological drivers of the floodplain system need to be defined.	Section 3.8.1 has been revised explaining the utilization of the 5-year floodplain .
EPA	EPA-120	uncertainty	To address uncertainty we recommend concomitant hydrologic modeling in areas where the greatest uncertainty exists, e.g., areas above the five year floodplain, on both mitigation sites and other lands as appropriate.	The Corps recognizes that uncertainty exists (See Section 6). To address this uncertainty, the Corps proposes to monitor existing wetlands within the pre-project five-year floodplain to determine whether or not the areas are still wetlands even though the project resulted in a wetland subclass shift. Although the Corps is of the opinion that the greatest uncertainty occurs within the primary impact area (within the pre project five year flood frequency), the Corps will monitor additional sites at elevations greater than the pre-project five year flood frequency. The DEIS has been revised to include the additional areas.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-121	wetlands	Page 54 states that the greatest impact to project area wetlands is due to an indirect impact associated with changed frequency and duration of flooding. Impacts could also stem from project-induced changes in timing, location, and degree of inundation/saturation of flooding.	Comment noted.
EPA	EPA-122	Connectivity	The DEIS does not appear to clearly describe the full component of potential indirect impacts to project area resources and how these impacts might vary across different alternatives. The DEIS needs to acknowledge that the TSP and other alternatives involving pump operations only provide limited connectivity with altered hydrology to the area.	Section 4 of the DEIS describes the significant impacts as a result of different project alternatives. Please refer to Section 2, Alternatives 3.1 and 3.2 are titled *Manage Connectivity* and Alternatives 4.1 and 4.2 are titled *Maintain Connectivity.* The Corps acknowledges that connectivity would be managed during different periods of the year.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-123	Wetlands	Page 41, the document states that "natural wetlands would still be seasonally connected" however this amounts to only 26 days during the growing season. Aftter April 15 no back water flooding would be passed into the NMF at elevations over 284 feet and pumps would be turned on, draining water from the area. The majority of flooding during fish spawning and rearing time, shorebird use, and wetland growing season would be eliminated. This also seems to disregard the important hydrologic interactions not only between backwater and headwater flooding, but also those interactions involving surface (inundation) and ground water (saturation) that occur in these areas, and that significant changes in the backwater flooding due to the project would likely have repercussions on the extent, frequency, duration and depth of inundation and/or saturation in these areas as well. Further clarification on this important issue is necessary and additional analysis and modeling of hydrologic alterations due to proposed activities may need to be conducted. A comparison of model output and/or hydrographs for the area for the alternatives is needed.	The Corps acknowledges that flood risks would be managed after 15 April in the New Madrid Floodway to provide agricultural economic benefits. The impacts associated with this reduced flooding have been quantified by the utilization of the fish, shorebird, and wetland models. All of these model have a hydrologic parameter that rely on the extensive hydrologic period of record. Although the project limits the extent of flooding past 15 April, it is important to note that the "majority of flooding" occurs prior to 15 April not after 15 April as indicated in the comment. The average daily sump elevation in the New Madrid Floodway is presented in the DEIS. The analysis indicates that, on average, the interior sump elevation reaches its maximum height in early April. Appendix C provides information regarding changes to hydrology including the timing, extent, frequency, duration, and depth of flooding. Hydrographs for each year over the period of record from 1943-2009 are provided that demonstrates the changes in hydrology as a result of each alternative are also provided. This extensive analysis was used in each of the models. A comparison of model results is found throughout Section 4 and each respective appendix.
EPA	EPA-124	General	The descriptions of gate and pump management avoidance and minimization strategies, page 38, regarding isolating flood pulse for certain species is not consistent with recognizing the importance of the flood pulse for overall ecological health.	The flood pulse is not restricted by species use, rather it is managed by correlation to Mississippi River hydrographs. The significant ecological resources (waterfowl, wetlands, fish, and shorebirds), social impact thresholds (elevation of roads), and planting dates were used to formulate management options.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-125	Wetlands	This section (pg38) does not address the hydrologic requirements for plants that make up the vegetated wetlands in the area and provide shelter, food, and migration corridors between flooded agricultural lands.	Section 2 has been revised. Wetlands are discussed in Section 3.8.1 and 4.8.1.
EPA	EPA-126	wetlands	The hydrologic regime for maintenance of area plant communities appears to have only been considered in the context of restoration of Big Oak Tree State Park rather than the entire project area.	Maintain plant communities is a wetland function that was specifically addressed with the HGM Model (see DEIS, Section 4.8.1).
EPA	EPA-127	General	Page 61 concludes that, "the greater the area removed from flooding, the greater the environmental impacts." Yet, the preliminary document does not provide a clear description of the amount of area that would be removed from flooding for each of the alternatives.	The DEIS has been revised to include a table that compares acreages associated with different flood frequencies for each different alternative.
EPA	EPA-128	Editorial	Figure 3.12 is a very helpful depiction of the existing flood return intervals in the New Madrid Floodway. It would also be useful to include similar images depicting flood return intervals for each alternative.	The DEIS has been revised with the suggested figures.
EPA	EPA-129	Wetlands	Furthermore, we recommend a table be included in the DEIS that shows the corresponding amount of total acreage and wetland acreage that would and would not be flooded (compared to current conditions) for each alternative.	The recommended tables are provided in Section 4.8.1-Wetlands. The tables provide acreages (including projected WRP acreages) as well as the associated functional capacity units for each different alternative. Impacts to functional capacity units are also provided. Tables are provided in the Wetland Appendix that demonstrate the shift (in acres) to wetland subclasses as a result of each alternative. Additionally, Table 4.3 provides flood return frequencies for all project alternatives and Table 4.2 provides land cover data by elevation. Using these two tables, estimates can easily be compared. Impacts of the project are appropriately based on habitat/function. Therefore, tables in the EIS express impacts as a unit of function or habitat, not acres.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-130	General	Page 114 indicates "no changes to overall land use classification would be expected regardless of the chosen alternative" and "no conversion of forested areas to agriculture would be expected." We recommend the DEIS clearly describe the basis for these assumptions.	The DEIS has been clarified to describe the basis for this assumption and monitoring is proposed to validate the uncertainty regarding the assumption (see DEIS section 6 and 7).
EPA	EPA-131	WRP	Consideration of Wetland Reserve Program enrollment in the document is not well supported and may not have been realistically calculated in assessment of impacts, practicability of alternatives, and future scenarios for the area post project (Section 2.1.4.2, page 24).	During the model certification review (Volume 3, Part 6.4) conducted for the shorebird model, the expert panel advised the team to: "Estimate the effects of future changes in land use by projecting future changes based on a recent history of land-use changes in the study area. (e.g., If “x” % of the agricultural land has been retired to the Conservation Reserve Program (CRP) in the past 10 years, it may be reasonable to assume that “y” % will be retired in the next 10 years.)" The WRP predictions are provided in Section 4.3 of the DEIS and Appendix M, Part 1. These estimates were developed in consultation with the NRCS, coordinated with the interagency team, and reviewed during IEPR.
EPA	EPA-132	General	There are functional and geographic areas where additional analysis of potential impacts is needed.	Based on interagency coordination during the development of the Project Work Plan and three IEPR phases, the Corps is of the opinion that all significant functional and geographic areas were identified and assessed in the DEIS. However, the DEIS has been revised to include further analysis regarding recreation.
EPA	EPA-133	ditch impacts	Information is not provided regarding the secondary impacts to streams as a result of levee closure and pumping, such as how hydrology of the ditches will be impacted.	No significant secondary impacts to ditch habitat as a result of the levee closure and pumping station is anticipated. The Draft EIS has been revised to clarify this issue.
EPA	EPA-134	ditch impacts	Increasing the depth of area ditches could cause stability problems for connected ditches, such as head cuts, culvert replacements, impacts to roads, etc.	The Corps concurs that there could be instability issues at the confluence of construction reaches and other ditches as well as culverts that drain adjacent farm fields. The TSP recommends the construction of weirs/hard points at the confluence of tributaries as well as the replacement of adjacent culverts to ensure the proposed project does not inadvertently lead to channel incision problems. The DEIS has been revised to include a discussion on channel incision (see DEIS Section 4)

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-135	Wetlands	What will be the secondary impacts to adjacent wetlands due to increasing the depth of the ditches, and presumably the lowering of the water table? These impacts should be addressed in the DEIS.	The hydrologic impacts have been accounted for in the hydrologic model and are incorporated into post-project return interval frequencies. Frequency and duration of flooding was calculated for each HGM site used in the analysis, which compared pre- and post-project conditions.
EPA	EPA-136	Alternatives	Section 2.1.3 Levee Closure Alternatives, pages21-23, only provides the figures for costs of alternate levee alignments and does not provide numbers on impacts of these alternatives. What is the source or basis for the figure used for mitigation costs?	No mitigation costs were used. The DEIS has been revised to discuss the screening process used to dismiss alternate levee locations.
EPA	EPA-137	Alternatives	The description of these alternative levee alignments does not include .a breakdown of the direct impacts of the levee footprints themselves.	The DEIS has been revised to provide additional documentation on why alternate levee alignment were not retained for detail analysis.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-138	Mitigation - Policy	The Interagency Review Team in Missouri has prioritized forested wetlands, particularly bottomland hardwood forests with river connectivity, as one of the most important resources to avoid damages. Mitigation of unavoidable impacts to forested wetlands is required at a ratio of 4 or more acres replacement for every one acre of impact.	The amount of mitigation required to compensate for the significant unavoidable impacts of the project are described in detail in Section 4 and the supporting appendices. Although mitigation ratios are commonly used for private regulatory applicants, this project has utilized more rigorous functional/condition assessments to determine the overall amount of compensatory mitigation. Each of the applicable ecological models has undergone an independent review and has been determined to be suitable for the project. 33 CFR 332.2(f) states: "If the district engineer determines that compensatory mitigation is necessary to offset unavoidable impact to aquatic resources, the amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. In cases where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required. If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio must be used." See Section 5 of the revised DEIS.
EPA	EPA-139	wetlands	The analysis of each alternative, including alternate levee alignments, should clearly articulate impacts to forested wetlands.	Impacts to wetlands are addressed in Section 4.8.1. The screening process regarding alternate levee alignments is discussed in Section 2. The goal of avoiding and or reducing environmental impacts can be economically and practically achieved by modifying the operation of the gated structure. Therefore, alternative levee closures were not addressed in detail.
EPA	EPA-140	Alternatives	The description of impacts for alternate levee alignments should also include numbers on the acreage that would remain hydrologically connected to the Mississippi River.	The DEIS has been clarified by showing acreages that would remain hydrologically connected.
EPA	EPA-141	General	Impacts to Water Quality, Recreation, and Special Aquatic Sites Have Not Been Adequately Addressed	Water quality section, recreation and 404(b)(1) evaluation were revised to provide additional detail and clarity.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-142	404b1	The 404(b)(l) analysis contained in Appendix E Part 7 does not appear to sufficiently consider cumulative, direct or secondary/indirect impacts to water quality, special aquatic sites (wetlands, riffle and pool complexes), and/or recreation.	Section 404(b)(1) Report and applicable sections of the DEIS have been revised to clarify analysis regarding cumulative, direct or secondary/indirect impacts to water quality, special aquatic sites, and or recreation.
EPA	EPA-143	General	The EPA recommended in the September 2011 comments that the DEIS needs to: Provide a complete scientific evaluation of current functions provided by project area resources (i.e., fish and wildlife habitat, water quality maintenance, water storage, recreational use), most importantly, those linked to the connectivity (flood pulse) of the Mississippi River, and potential impacts to those functions under each alternative. Additional analysis is recommended to adequately describe the resources within the project area.	Revisions were made to clarify impact and mitigation analyses of these functions.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-144	water quality	Page vii states that "water quality will be improved as a result of mitigation." However, this has not yet been demonstrated.	DEIS Section 4.10.3 states: "However, the effect of the authorized project on export, relative to the existing condition, remained similar (i.e., 15% reduction in total phosphorous (TP) and total nitrogen (TN) export, up to 60% reduction in sediment export)." It has been documented that grass buffer strips as narrow as 15 feet trap approximately 90 percent of NH4-N, NO3-N and PO4-P, and that trapping efficiencies increased to between 96 percent and 99.9 percent when the buffer width was increased to 30 feet. The proposed ditch mitigation includes over 45.8 miles of riparian buffer along area ditches. Proposed mitigation involves a 25-foot wide tree buffer on one bank; in addition, a 40-foot wide grass buffer on the opposite bank would be implemented as an environmental design feature, which is anticipated to be highly ecologically beneficial to the project area as many of the area ditches are currently farmed to top bank. Likewise, buffer strips are proposed around ecologically designed borrow pits. Based on the conclusions of the DEIS, it was determined that over 12,000 tons of nitrogen would not be applied cropland over the course of the project life due to the conversion of these agricultural areas to forested areas through project mitigation. Considering the vast amount of published scientific information detailing the negative effects of agricultural practices on water quality, the effectiveness of riparian buffers in preventing nutrients and sediment from entering waterways, coupled with the removal of over 10,000 acres of land currently in agricultural production, USACE is confident that the project and associate mitigation will result in an improvement in water quality.
EPA	EPA-145	water quality	We recommend the DEIS consider additional measures to maintain and improve water quality.	See response to EPA-144 for the additional water quality improvements offered by forested riparian buffer strips (implemented as a mitigation measure), grass riparian buffer strips (implemented as an environmental design feature), and the reduction of non-point source pollution and sediment retention that would provided through project implementation. Through these measures, USACE is of the opinion that the project would result in improvements to water quality within the project area ditches themselves as well as the receiving Mississippi River. No changes to DEIS are warranted.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-146	monitoring	Water quality should also be monitored post-project; we recommend installing a real time water monitoring station (such as used by the US Geologic Survey) at the mouth of both the St. Johns and New Madrid basins.	The DEIS (Section 7.2.7) has been revised to include the recommendation of installing "real-time" water quality stations.
EPA	EPA-147	monitoring	Pre-construction, construction period, and post construction real time water monitoring should be conducted until mitigation is considered to meet all performance standards.	Section 7.2.7 has been revised based on the recommendation.
EPA	EPA-148	Adaptive Management	If at any time water quality is worse than pre-project monitoring then adaptive management should be triggered and additional mitigation required.	No significant impacts to water quality are anticipated. However, water quality will be monitored in Phase 2 Adaptive Management. Phase 2 Adaptive Management will include thresholds for water quality decisions that will be used if monitoring determines that water quality is degrading as a result of implementation of project mitigation.
EPA	EPA-149	water quality	Page 232 indicates that the water quality analysis for the project show the authorized project would reduce total phosphorus and nitrogen export by 15% or more. What assumptions were used for this model, and have these finding been corroborated with appropriate water quality experts on the Independent Expert Panel Review, US Department of Agriculture, US Geologic Survey or others involved in the previous SPARROW modeling effort?	The water quality analysis for the project was conducted by Dr. Steve Ashby and Dr. David Soballe of the Engineer Research Development Center. Both of these individuals are considered experts in the field of water quality. The analysis consisted of a revision to the original work conducted by Ashby in 2000. As stated in the Water Quality Appendix Executive Summary (pg ii)t: "In Ashby et al. (2000), spreadsheet calculations were used to assess relative impacts with and without the project. The rationale for inputs and assumptions in the spreadsheets was discussed with representatives of Federal and state agencies prior to application. In this revision, those earlier assumptions and inputs are carried forward." Revisions to the original Ashby (2000) report are provided. The Phase III IEPR has reviewed the current water quality analysis and suggested minor revisions (See Phase 3 IEPR, Comment Response 27). Although the draft EIS has not been submitted to other agencies such as the Department of Agriculture and US Geological Survey for comment, these agencies will be included to the project's public distribution list.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-150	water quality	Furthermore, page 275 suggests project implementation would provide a reduction or delay in the growth of the hypoxic zone in the Gulf of Mexico. The basis for these conclusions needs to be provided in the document.	Discussion referenced on page 275 concerns cumulative impacts and ecosystem services which summarizes results from Section 4.12, Ecosystem Services. The basis for these conclusions is provided in Section 4.12.2, Nutrient Cycling, which states: "Nutrient cycling analysis consisted of estimating nitrogen loading using conventional agricultural practices for five main crop species (all others were classified as “other”) in the project area. Estimated nitrate (NO3) losses on agricultural land as well as the denitrification potential of wetlands were obtained from Jenkins et al. (2010)." Furthermore, Section 4.12.2.2 adds: "The tentatively selected plan would remove 12,183.92 tons of nitrogen from the project area over the course of the project life due to compensatory mitigation for fish and wildlife impacts (Tables 4.92 and 4.93). As with the no action alternative, tremendous gains in nitrogen reduction are seen by the removal of agricultural land from production, and when coupled with reforestation, the effects on adjacent and downstream landscapes would be very beneficial." Finally, Section 4.12.3, Ecosystem Services Conclusion, provides a reference to a widely recognized peer reviewed publication which concluded that: "Management efforts must be made at specific landscape locations to reduce nutrient runoff, which would improve the water quality of streams and rivers, leading to a reduction of the hypoxic zone in the Gulf of Mexico (Robertson et al., 2009).", thereby providing the basis for the referenced conclusion contained on page 275.
EPA	EPA-151	recreation	The DEIS does not adequately address impacts to recreation and flood storage functions.	The DEIS has been revised to include a discussion on recreation. Likewise, the DEIS has been revised to include a discussion on flood storage function.
EPA	EPA-152	Flooding	The DEIS does not adequately address impacts to recreation and flood storage functions.	The DEIS has been revised indicating that no increase in flood risk will result to areas and communities after implementation of the project based on the location of the surrounding river communities and the corresponding protective Mississippi River Levee system.
EPA	EPA-153	General	These resources are not included in the assessment and comparison of impacts for each alternative and are not listed in Table 1.2, page 16, "Relevant issues, resources, and concerns," for the project area.	While recreation was not identified as a significant concern during initial public and interagency scoping, the DEIS has been revised to include a discussion on recreation.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-154	recreation	For example, impacts to hunting/fishing and tourism in the project area and on the Mississippi River as a result of the TSP, or potential increases in these and other recreational activities for each of the alternatives, is not provided in the DEIS.	The DEIS has been revised to include a discussion on recreation.
EPA	EPA-155	recreation	Recreation is not addressed until Appendix E, Part 3, Wetland Goods and Services and the conclusion (as well as others within this Appendix) is not supported by science.	The DEIS and 404(b)(1) has been revised to include a discussion on recreation.
EPA	EPA-156	recreation	This does not include a full assessment of the recreational value of area resources, such as Big Oak Tree State Park, hunting and fishing habitat on private and publicly owned lands, Ten Mile Conservation Area, or recreation on the Mississippi River.	The DEIS has been revised to include a discussion on recreation.
EPA	EPA-157	Flooding	The flood storage and attenuation benefits that occur because of the flood pulse are not being adequately quantified.	The DEIS has been revised indicating that no increase in flood risk will result to areas and communities after implementation of the project based on the location of the surrounding river communities and the corresponding protective Mississippi River Levee system.
EPA	EPA-158	Editorial	Page 92 describes discussions held during the 1-2 October 2012 site visit by agency representatives. We recommend deleting this discussion from the DEIS.	The discussion regarding the 1-2 October 2012 site visit has been removed from the DEIS.
EPA	EPA-159	general	Major factors in the impacts assessment should be based on the best available science and suitably referenced in literature and other documentation.	The Corps concurs and conducted an exhaustive independent review of its models and the project report.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-160	Flooding	The EPA has comments on the project recommending that the EIS fully consider flood water storage of all lands (regardless of wetland status) as a major area resource.	The DEIS has been revised indicating that no increase in flood risk will result to areas and communities after implementation of the project based on the location of the surrounding river communities and the corresponding protective Mississippi River Levee system.
EPA	EPA-161	Flooding	The function of flood storage, both of Mississippi River backwater flooding and interior runoff, is a major factor for the purpose and need of the project and comparison of alternatives.	See response to EPA-152 comment. The DEIS has been revised indicating that the loss of flood storage available to the Mississippi River through closure of the 1500-foot gap in the New Madrid Floodway would have a negligible effect on stages and durations in the Mississippi River from the authorized St. Johns-New Madrid project. Since no alternative considered in the DEIS would result in a condition that would provide a greater loss of flood storage available to the Mississippi River from the New Madrid Floodway than that provided by the authorized project, a comparison of alternatives related to flood storage is unnecessary.
EPA	EPA-162	Flooding	Flood storage should be quantified for each alternative.	See response to EPA-152 comment. The DEIS has been revised indicating that the loss of flood storage available to the Mississippi River through closure of the 1500-foot gap in the New Madrid Floodway would have a negligible effect on stages and durations in the Mississippi River from the authorized St. Johns-New Madrid project. Since no alternative considered in the DEIS would result in a condition that would provide a greater loss of flood storage available to the Mississippi River from the New Madrid Floodway than that provided by the authorized project, a comparison of alternatives related to flood storage is unnecessary.
EPA	EPA-163	Flooding	The discussion regarding economic benefits of the flood pulse and lands connected to the Mississippi River and area ditches should include an assessment of the monetary value of flood storage and recreation.	The EIS has been revised to discuss that there is no significant economic loss associated with changes in floodplain storage with the project. See EPA-152. However, there is a value regarding flood conveyance during Floodway activation.
EPA	EPA-164	Flooding	Increases in flood water storage result in decreased flooding and flood damages elsewhere.	The DEIS has been revised indicating that no increase in flood risk will result to areas and communities after implementation of the project based on the location of the surrounding river communities and the corresponding protective Mississippi River Levee system.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-165	recreation	Economic gain as a result of fishing, hunting, tourism, and other recreational activities can also be included.	The DEIS has been revised to include a discussion on recreation. Although benefits to recreation are anticipated, economic gains were not quantified.
EPA	EPA-166	Alternatives	Section 2.1.4.1 Refuge/Conservation Area, page 23 states that this alternative would "offer no relief from flooding to the remaining 62, 797 acres of land in the five-year flood frequency." We recommend providing the scientific basis for this statement.	The DEIS has been revised to clarify. The acreages refer to the total available acreages of land in the 5-year flood frequency.
EPA	EPA-167	Alternatives	A substantial refuge or conservation area may significantly increase the flood storage capacity of the New Madrid Floodway basin thus reducing flood pressures on other areas.	The DEIS has been revised to clarify the screening process.
EPA	EPA-168	Alternatives	The impacts, both adverse and beneficial, of this activity (refuge/conservation area) are not provided.	The DEIS has been revised to clarify the screening process indicating that a refuge is not practicable in light of the project purpose.
EPA	EPA-169	Alternatives	The analysis should include acreages of wetlands preserved or restored, acreages of lands connected to the Mississippi River, recreational values, increases in water storage, as well as benefits to water quality and fish and wildlife.	The DEIS has been revised to clarify the screening process indicating that a refuge is not a practicable alternative in light of the project purpose.
EPA	EPA-170	Alternatives	This section also indicates that a refuge is not "economically justified" but does not provide any figures to support this.	The DEIS has been revised to include additional analysis documentation why a refuge was not retained for detailed analysis.
EPA	EPA-171	recreation	The value of potential increase in recreation for the area is absent from the evaluation of this alternative.	The DEIS has been revised to include a discussion on recreation. Although benefits to recreation are anticipated, economic gains were not quantified.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-172	Alternatives	It is unclear why the expansion of refuge and conservation areas is not feasible as an alternative due to the local community being unwilling to sell the necessary lands, yet expansion of Big Oak Tree State Park is considered feasible as an activity for compensatory mitigation.	The FWS stated that the refuge was not practicable as a standalone measure. Based on discussion with the project sponsor, restoring Big Oak Tree State Park is practicable for mitigation that involves reducing agricultural flood damages.
EPA	EPA-173	General	Special aquatic sites are sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes (40 CFR 230 Subpart E). "They are geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region" (40 CFR 230.3(q-1)).	The DEIS has been revised to clarify the analysis on special aquatic sites (see 404(b)(1) Evaluation and references to specific sections of the DEIS).
EPA	EPA-174	General	There are functional and geographic areas where additional identification of special aquatic sites and analysis of potential impacts is needed.	Based on interagency coordination during the development of the Project Work Plan, three IEPR phases, and interagency preliminary review, the Corps finds that all significant functional and geographic areas are identified and assessed through the recent revisions to the DEIS.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-175	ditch impacts	Discussion of area streams/ditches is insufficient, including identification of riffle/pool complexes.	Agricultural ditches within the project area consist of straight, trapezoidal channels with a relatively flat, uniform bed devoid of substantial bar structures. This is in contrast to natural streams with meandering channels with complex structure consisting of riffles, pools, and runs. Smaller ditches usually contain more bed vegetation and are usually located further from receiving streams. Larger ditches contain less bed vegetation and are often in closer proximity to receiving streams. While some reaches of larger ditches and streams have areas of appropriate riparian buffer, a vast majority of the project area ditches have little to no buffer and are farmed to top bank. The DEIS has been revised to include a discussion on channel geomorphologic characteristics.
EPA	EPA-176	Purpose and Need	The purpose and need for the proposed activities on area ditches has not been provided.	Section 1 has been revised clarifying the purpose and need for the project, including a discussion of project area ditches.
EPA	EPA-177	Alternatives	No assessment of alternatives was provided for ditch work, such as, incorporating Natural Stream Channel Design, and developing side channels and/or additional adjacent wetlands to increase flood capacity.	The existing ditches are not natural streams. They are artificially created drainage canals. Therefore, no assessment was made to change an artificial drainage canal to a natural stream. However, mitigation is proposed to provide additional stream habitat by creating stream sinuosity with the construction of transverse dikes.
EPA	EPA-178	Purpose and Need	The DEIS should provide a clear purpose and need for activities on area streams as well as describe the expected benefits and adverse impacts. Impacts to streams should be included in the comparison of alternatives in Table 2.8.	Section 1 has been revised clarifying the purpose and need for the project, including a discussion of project area ditches. Impacts to ditches have been clarified in Section 5.
EPA	EPA-179	ditch impacts	The potential for significant degradation of area streams is not included, and assessment of the presence of riffle/pool Special Aquatic Sites is not provided.	Although construction activities in the St. Johns Bayou Basin will enlarge ditches, significant degradation is not expected because these ditches are not natural streams. The ditches were constructed decades ago to convert bottomland hardwoods to cropland. Agricultural ditches in the project area consist of straight, trapezoidal channels with a relatively flat, uniform bed devoid of substantial structure. All ditches undergo routine vegetation and sediment removal. Following channel enlargement, ditches will still be morphologically similar (straight, trapezoidal channels, limited structure, etc.).

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-180	ditch impacts	Page 48 of the document states, "some of these artificially created canals have stream characteristics and functions" yet Appendix E Part 7, page 9, simply states that effects on special aquatic sites, riffle and pool complexes, is "not applicable."	The full sentence reads "Although some of these artificially created canals have stream characteristics and functions, many ecological functions are impaired." Appendix E has been revised.
EPA	EPA-181	ditch impacts	Page 37 of the document states "the decrease in mussel populations is most likely due to the recent basin-wide ditch maintenance that has occurred (vegetative and sediment removal)."	The DEIS has been revised to state that these cleanouts may explain the low number of live mussels collected in 2010 when compared to previous unionid mussel surveys within the project area. Overall mussel numbers were reduced, but similar species were collected in comparison to previous studies in the project area. Habitat could be potentially decreased as a result of the project, in a similar fashion as the recent ditch cleanouts, but the population would be expected to return to pre-disturbance levels.
EPA	EPA-182	ditch impacts	This indicates that the type of ditch maintenance proposed in the TSP can have significant adverse impacts.	Based on the most up to date mussel surveys, no significant adverse impacts to mussel populations are expected because the mussels are no longer found in numbers that occurred during the past. Previous mitigation originally proposed in 2006 after consultation with the Missouri Department of Conservation and U.S. Fish and Wildlife Service recommended relocation and monitoring of recolonization. Based on mussel surveys conducted in the adjacent St. Francis basin (USACE, unpublished mussel survey reports), mussels are expected to recolonize the ditches after project channel modification. Prior to channel modifications, the Corps will conduct additional surveys to ensure the conclusions are still valid. These surveys will be coordinated with the interagency team to determine if any additional mitigation is necessary.
EPA	EPA-183	ditch impacts	In addition, secondary impacts to area streams as a result of hydrologic alteration and elimination/reduction of the flood pulse in the NMF are not discussed for all the alternatives, nor are they reflected in the comparison of alternatives in Table 2.8.	The DEIS has been revised to clarify that no secondary impacts to streams are expected in the New Madrid Floodway as a result of constructing the closure levee and gated structure.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-184	Wetlands	There is also no specific or geographic information provided regarding the direct impacts to wetlands within the areas where ditch maintenance will occur.	Section 4.8.1.2 has been revised to state: "A total of 673 acres of LGRO vegetated wetlands would be directly impacted due to channel modifications discussed in Section 2.2.2.1 and would be assumed to lose all wetland function." Section 2.2.2.1 provides details and locations of channel modifications.
EPA	EPA-185	Wetlands	How were the estimates of impacts to wetlands assessed for these areas (ditches)?	As stated in Section 4.8.1, impacts to wetlands associated with channel modification have been assumed to be a total loss and assumed to lose all wetland function.
EPA	EPA-186	wetlands	Can fill of these wetlands (ditches) be avoided, or are there alternatives that would have less impact, such as placing dredged material in uplands?	The avoid and minimize alternative, Alternative 3.1, reduces the impact from a two sided enlargement proposed in the authorized project to a one side enlargement (right descending bank). In addition, alternative 3.1 reduces the proposed bottom width increase by 80 feet. Furthermore, rights of way along St. James Ditch would be obtained along alternate sides to protect areas of riparian vegetation (i.e., spoil material would be placed into areas that are likely prior converted cropland as opposed to vegetated areas, where practical). Moving spoil material to uplands is not practical and may not reduce wetland losses. Hauling the material is not practical because a temporary disposal area would still have to be obtained at the construction site and an additional permanent disposal area would have to be obtained elsewhere. Hauling disposal significantly increases cost as well as construction of access roads. Vegetation would still have to be cleared and spoil material would still be placed in the project right of way, even if only temporary. Thus, impacts would still occur. Access road construction may result in additional wetland losses. Lastly, the project sponsor will still impact the site through future maintenance. Therefore, the current plan proposes to place the material at the areas identified in the EIS. However, during the development of detailed plans and specification and prior to construction, the project right of way will be reexamined to determine if plans require alteration. Any changes to the plan will be coordinated with the interagency team.
EPA	EPA-187	Mitigation - Policy	The Advance DEIS does not clearly demonstrate that the proposed actions would be fully compliant with the Compensatory Mitigation for the Losses of Aquatic Resources Final Rule (40 CFR Part 230, Subpart J).	Although mitigation will not be achieved until tract-specific detailed mitigation plans are developed, coordinated with the interagency team, approved by the Missouri Department of Natural Resources, confirmed with monitoring, and adaptively managed, the Corps is of the opinion that there is adequate discussion in Section 5 to demonstrate compliance.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-188	Mitigation - Implementation	Section 2.3 of the Advance DEIS states "There is a level of uncertainty with mitigation since specific tracts have not been identified to date." Because specific lands have not yet been identified, it is challenging to discern whether the DEIS demonstrates that unavoidable impacts to aquatic resources can be adequately compensated.	Although specific tracts have not been identified, specific zones have been established. Post-project hydrology has been determined from each specific zone and the DEIS has made conservative estimates regarding benefits to aquatic resources from each zone (see applicable sections in Section 4). The risk associated with not knowing tract-specific areas for each habitat/function is provided in Section 6. Section 5 has been revised to include additional discussion regarding mitigation implementation.
EPA	EPA-189	Mitigation - Science	The DEIS does not provide a clear, detailed articulation of how proposed compensatory mitigation features specifically compensate for the project's effects on area hydrology, in particular, the timing, extent, frequency, duration and depth of inundation and/or saturation.	Although each ecological model measures hydrologic components (timing, extent, frequency, duration, depth, etc.) somewhat differently, hydrology and underlying land use were considered in the quantification of project impacts. Model specific hydrologic parameters are discussed in Section 4, the H+H appendix, and each ecological resource specific appendix. In a consistent manner, hydrology and underlying land use are considered in the determination of mitigation. Detailed discussions regarding each specific resource are found in Section 4 and the applicable appendices.
EPA	EPA-190	General	The DEIS lacks complete information to address the project's indirect impacts on areas proposed as mitigation sites.	Benefits provided by proposed compensatory mitigation features were calculated using post project hydrology (See Section 5). Therefore, any indirect adverse hydrology impacts were accounted for prior to assessing the value of a compensatory mitigation feature.
EPA	EPA-191	General	The TSP's avoid and minimize features allow for riverine flooding only during winter months, not during the growing season.	The TSP, which includes avoid and minimize features, allows for flooding to occur during the growing season. Impacts as a result of managing the flood pulse have been quantified and mitigation is proposed to compensate unavoidable adverse impacts.
EPA	EPA-192	General	As a result (of the TSP's avoid and minimize features allow for riverine flooding only during winter months, not during the growing season), the alternative would appear to inhibit wetland functions during the growing season thereby minimizing benefits of any mitigation within the project area.	The TSP, which includes avoid and minimize features, allows for flooding to occur during the growing season. Impacts as a result of managing the flood pulse have been quantified and mitigation is proposed to compensate unavoidable adverse impacts.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-193	Mitigation - Policy	The Missouri Interagency Review Team requires a minimum of 4:1 replacement for direct impacts to forested wetlands.	See EPA 138
EPA	EPA-194	Mitigation - Science	The EPA questions the use of batture lands for compensatory mitigation.	The utilization and justification of batture land as suitable mitigation are discussed in Section 5. Additional information regarding the suitability of batture lands for mitigation can be found in the Phase 2 IEPR Comments/Responses 3 and 4 and Phase 3 IEPR Comment 9.
EPA	EPA-195	Mitigation - Science	Because these (batture) lands are already connected to the Mississippi River, such areas would not appear to provide replacement of lost functions associated with severing wetlands within the project area from natural connectivity to the River.	Restoring bottomland hardwoods and riverfront forest in the batture land compensates for many impacted functions and habitat associated with the project. For example, the greatest impacts to wetland function in the New Madrid Floodway occurs to the Detain Floodwater function (see DEIS Section 4.8.1). According to the model, the Detain Floodwater Function is based on changes to flood frequency and the "roughness" of the underlying land use (see Appendix E, Part 5, at page 65). Mitigation in the batture land is not anticipated to change flood frequencies. However, reforestation and other micro/macro-topographical improvements will increase roughness. Thus, there is a functional lift in providing mitigation in the batture lands. Likewise, reforestation in the batture land will not increase Average Daily Flooded Acres for the fish model (see EIS, Section 4.8.5). However, forested areas provide a Habitat Suitability Index of 1.0 compared to a 0.2 for agricultural areas. Thus, reforesting agricultural areas in the batture provides a habitat lift. The compensatory mitigation objective is to replace functional value lost as a result of unavoidable adverse impacts. Detailed discussion is found in the applicable subsections of Section 4 and each applicable appendix.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-196	Mitigation - Policy	The DEIS does not adequately demonstrate compliance with the Mitigation Rule (33 CFR 332 and 40 CFR Part 230, Subpart J), or address technical and ecological feasibility of the proposed activities to effectively compensate for impacts.	See FWS-7. EPA's concerns relating to the technical and ecological feasibility of the proposed mitigation are noted, however, the Corps has taken measures to ensure the likelihood of mitigation success through the following approaches: (1) basing mitigation on a watershed approach (Section 5); (2) using mitigation methods that are common practices throughout the Lower Mississippi Valley (reforestation, ecologically designed borrow pits, restoring agricultural fields to wetland conditions); (3)obtaining independent review on impact and mitigation calculations to ensure the scientific validity of those analyses; (4) incorporating interagency participation in the acquisition, planning and implementation of tract-specific mitigation plans; (5) identifying risk and utilizing monitoring to reduce risk and validate mitigation; and (6) adaptively managing the project to ensure any mitigation deficiencies are resolved.
EPA	EPA-197	General	The document does not address previous comments provided by the EPA, including: hydrologic alteration, management of the flood pulse, restoration of forested wetlands, and adequate compensation for stream impacts.	The DEIS has been revised from previous versions to address previous comments on hydrologic alteration, management of the flood pulse, restoration of forested wetlands, and adequate compensation for stream impacts .
EPA	EPA-198	Mitigation - Science	Similar to the requirements for the €valuation of alternatives, the rigor and detail of the comprehensive mitigation plan (which should be included in the DEIS) to demonstrate adequate compensation is commensurate with the degree of impacts (40 CFR 230.93(a)(l)).	Section 5 has been clarified to inform reviewers that they should reference the applicable sections of the EIS (Section 4 and appendices) regarding technical discussions regarding mitigation. While the DEIS provides assurance on the types of mitigation that would be implemented, that the mitigation would offset project impacts, and provide an estimate of costs required for mitigation and adaptive management actions, further refinement of mitigation actions will occur during detailed planning for individual mitigation projects. Any future mitigation planning would go through additional agency coordination.
EPA	EPA-199	Mitigation - Implementation	Sufficient information is not provided to demonstrate that compensation is likely to succeed or can offset significant impacts.	The Corps believes Section 5 fully demonstrates that project mitigation is likely to succeed or offset significant impacts. See responses to FWS-5 and EPA-188 above.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-200	404b1	The document does not support the conclusions of "no significant adverse effect" under the Evaluation of Extent of Degradation of the Waters of the Unites States in Appendix E, Part 7 Section 404(b)(l) Evaluation Report and does not demonstrate compliance with the requirements of 40 CFR 230.10(c)	The Section 404(b)(1) analysis has been revised to clarify and further document the supporting data and discussion regarding the conclusions of the Draft Section 404(b)(1) Report.
EPA	EPA-201	Mitigation - Science	In evaluating whether compensation could offset significant impacts, the DEIS should consider, among other things, the severity of the impact at issue and the likelihood of being able to recreate the lost values. Some values (e.g., flood storage) are easier to offset than others (e.g., ground water recharge).	Mitigation is not intended to recreate all lost values. Instead mitigation is intended to compensates for impacts to waters of the United States pursuant to Section 404 of the Clean Water Act and pursuant to Corps of Engineers Civil Works policy as justified. The DEIS has been clarified to expand on the discussion of flood storage. Since there is no appreciable change in flood stage and discharge, no significant impacts to flood storage is anticipated. Likewise, the project will not effect groundwater interactions. The DEIS has been revised to include a discussion on groundwater interactions. Mitigation is intended to compensate for impacted functions according to the model.
EPA	EPA-202	Mitigation - Implementation	Likewise, some types of compensation (e.g., in-kind restoration in an appropriate geographic area) are more likely to succeed in offsetting impacts than are other types (e.g., preservation or offsite creation).	The Corps concurs that some types of mitigation are more successful than others. The greatest opportunity for success comes through flexibility. The Corps approach will retain interagency flexibility in the mitigation planning, acquisition, and implementation of mitigation features. This will ensure that a carefully considered, ecologically effective and sustainable compensatory mitigation plan will be implemented.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-203	Mitigation - Science	Comments submitted by the EPA advised that functional losses resulting from elimination of the flood pulse and altered hydrology would be difficult to replace and may only be successfully mitigated by reconnecting equivalent areas within the Middle Mississippi River to natural flood pulses.	The tentatively selected plan will not eliminate the flood pulse. The flood pulse will be managed on a large portion of the project area that will remain subject to flooding during periods of the year that are beneficial to fish and wildlife resources. However, the Corps acknowledges impacts will still occur. As seen in the gains associated with Big Oak Tree State Park, restoring hydrology/connection provides mitigation benefits. However, restoring hydrology to Big Oak Tree State Park does not provide sufficient mitigation to fully compensate project impacts. Therefore, additional mitigation is necessary. In determining project impacts and mitigation benefits, the hydrologic component is only one parameter. The underlying land use also needs to be considered. Impacts and mitigation are expressed as habitat units or functional capacity units. Since the flood pulse will not be eliminated under the tentatively selected plan, locating mitigation sites within the area that will still be connected (i.e., within the post project five year flood frequency) is desirable. When both parameters (i.e., post project hydrology and changes to underlying land use) are considered, compensatory mitigation
EPA	EPA-204	Mitigation - Science	To demonstrate that it's possible to compensate for all losses and to achieve compliance with 230.10(c), the mitigation plan must meet two basic tests: 1. It should prevent or offset the adverse impacts that would otherwise give rise to a finding of significant degradation;	Compliance with this section is described in the revised 404(b)(1) Evaluation (see Appendix E, Part 7) as well as in Section 4.
EPA	EPA-205	Mitigation - Science	To demonstrate that it's possible to compensate for all losses and to achieve compliance with 230.10(c), the mitigation plan must meet two basic tests: 2. It should have a good chance of success.	The Corps intends to utilize Monitoring and Adaptive Management to ensure mitigation success. (See revised Adaptive Management and Monitoring - Section 7). The Corps has taken measures to ensure the likelihood of mitigation success through the following approaches: (1) basing mitigation on a watershed approach (Section 5); (2) using mitigation methods that are common practices throughout the Lower Mississippi Valley (reforestation, ecologically designed borrow pits, restoring agricultural fields to wetland conditions); (3)obtaining independent review on impact and mitigation calculations to ensure the scientific validity of those analyses; (4) incorporating interagency participation in the acquisition, planning and implementation of tract-specific mitigation plans; (5) identifying risk and utilizing monitoring to reduce risk and validate mitigation; and (6) adaptively managing the project to ensure mitigation deficiencies are resolved.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-206	Mitigation - Policy	The DEIS should be revised to include the appropriate level of planning and documentation elements (c)(2) through (c)(14) required by the Mitigation Rule (40 CFR §230.94 and 33 CFR § 332.4).	Each of the elements isdiscussed in Section 5. Each tract-specific plan will also incorporate all 12 elements.
EPA	EPA-207	Mitigation - Implementation	A map of each mitigation parcel specifying type of mitigation should be provided; Figure 2.7 does not provide sufficient detail.	Site-specific tracts have not been identified, however several tracts have already been purchased. Figures have been revised to include previous purchased mitigation tracts. Because of the scale of compensatory mitigation, it is impracticable to identify all mitigation tracts that will be acquired. Rather, the DEIS identifies mitigation zones with expected values for each functional replacement expected within that mitigation zone. These zones can be found on figures and a discussion of the zones can be found in Section 5.
EPA	EPA-208	Mitigation - Implementation	It is unclear where overlap between the different types of mitigation occurs and how everything fits together.	Tables 5.3 and 5.4 provide overall relationship of mitigation features.
EPA	EPA-209	general	The document breaks out resource types (shorebirds, wetlands, ducks, fish, etc.) however it is not clearly described how the sum of all the parts adequately offsets impacts.	Section 5 of the DEIS has been revised including tables for each basin that presents the sum of compensatory mitigation benefits to each significant resource category.
EPA	EPA-210	General	The DEIS should address overall ecological integrity and condition of the watersheds pre and post project.	See section 4.12 for a description of the project area in terms of ecological integrity pre- and post-project.
EPA	EPA-211	General	Separating components to the extent provided in the DEIS does not adequately address ecological concerns.	See responses to EPA-209 and 210
EPA	EPA-212	Mitigation - Implementation	The DEIS does not indicate that mitigation sites will be designed to be self sustaining and protected in perpetuity as required by the Mitigation Rule 40 CFR § 230.97 (and 33 CFR § 332.7).	Section 5 has been revised indicating that mitigation lands will be protected in perpetuity. Although there will be maintenance required for some mitigation tracts, most mitigation sites will be relatively maintenance free. Additional clarification will be made to the DEIS.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-213	Mitigation - Policy	The DEIS needs to be revised to address the requirements of the rule (Mitigation) to: minimize active engineering features (e.g., pumps);	While the mitigation rule does not preclude engineering features, the mitigation objectives will be revised to state that self-sustaining mitigation will be preferred over active engineering features. 40 CFR 332.7(b) states: mitigation projects should be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. This includes minimization of active engineering features (e.g., pumps) and appropriate siting to ensure that natural hydrology and landscape context will support long-term sustainability. Where active long-term management and maintenance are necessary to ensure long-term sustainability (e.g., prescribed burning, invasive species control, maintenance of water control structures, easement enforcement), the responsible party must provide for such management and maintenance. This includes the provision of long-term financing mechanisms where necessary." A discussion regarding maintenance is found in Section 5.
EPA	EPA-214	Mitigation - Policy	The DEIS needs to be revised to address the requirements of the rule (Mitigation) to: appropriately locate mitigation sites to ensure that natural hydrology and landscape context will support long-term sustainability;	As recommended by the Mitigation Rule, a watershed approach was used to locate potential mitigation sites that compensate for project impacts. The approach used in the DEIS considers the importance of landscape position and resource type for the sustainability of aquatic resource functions within the watershed. The watershed approach is discussed in Section 5.
EPA	EPA-215	Mitigation - Policy	The DEIS needs to be revised to address the requirements of the rule (Mitigation) to: provide active long-term management and maintenance to ensure long-term sustainability (e.g., invasive species control, maintenance of water control structures, easement enforcement);	Long term management and maintenance is discussed in Section 5.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-216	Mitigation - Policy	The DEIS needs to be revised to address the requirements of the rule (Mitigation) to: provide long-term financing mechanisms.	Financial assurances are discussed in Section 5.
EPA	EPA-217	Mitigation - Implementation	The proposed mitigation relies on extensive engineering and management of water levels through gates and pumps. This significantly increases the risk of the mitigation, both of structural failure and failure to manage the water levels as proposed.	The Corps acknowledges that some mitigation features require the utilization of engineered structures such as the one proposed to restore hydrology to Big Oak Tree State Park. Since this structure is located within the Mississippi Mainline Levee, it will undergo routine maintenance and inspection. Any deficiencies will be corrected. Adherence to water levels would be a requirement of the Project Cooperation Agreement between the Federal government and the non-federal sponsor.
EPA	EPA-218	Mitigation - Implementation	The DEIS must describe assurances that will be put in place to ensure that water levels and mitigation sites would be managed appropriately in perpetuity.	Adherence to water levels would be a requirement of the Project Cooperation Agreement between the Federal government and the non-federal sponsor. The adaptive management section has been changed to clarify that the sponsor must adhere to established water levels. Daily gage readings will be available on the Internet. Therefore, USACE, other regulatory agencies, interested stakeholders, or the general public would be able to view daily project data. Corrective actions either by USACE or the MDNR would occur in the event that the project is not being operated as intended.
EPA	EPA-219	Mitigation - Implementation	More description is needed regarding the coordination requirements (who, how, when) for implementation of compensatory mitigation activities.	Section 5 has been revised to clarify the coordination requirements of mitigation activities.
EPA	EPA-220	Mitigation - Implementation	The DEIS needs details of how the Interagency Review Team will be consulted to review and approve site specific mitigation designs, conduct compliance reviews, consult and approve adaptive management plans, and ensure corrective measures are implemented if needed.	see EPA 219

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EPA	EPA-221	Mitigation - Implementation	On page 299 the details of how this will be implemented should be spelled out in the DEIS, and should include discussions of third party oversight of mitigation activities and financial assurances.	Financial assurances are discussed in Section 5. Third party oversight of mitigation activities is not proposed since mitigation banks and in-lieu fee programs are not proposed and are currently not available. The interagency team will be consulted throughout mitigation planning, acquisition, implementation, monitoring, and adaptive management. Approval from MDNR would be required for any activities regarding the state water quality certification.
EPA	EPA-222	Mitigation - Science	Similar to the discussion of assessment of impacts, the assessment of required compensatory mitigation needed to offset the direct impacts to forested wetlands must be separately and explicitly described in the document.	Section 5 has been revised to indicate mitigation required for direct impacts and indirect impacts.
EPA	EPA-223	Mitigation - Policy	Mitigation for direct impacts should be consistent with current Interagency Review Team policies and procedures.	See EPA 138
EPA	EPA-224	Mitigation - Policy	The EPA has recommended that the USACE should consult with the Missouri IRT to determine appropriate levels of compensation for this project and standards to which it holds permittees and mitigation providers.	See EPA 138
EPA	EPA-225	Mitigation - Policy	Absent site specific consultation, the DEIS should, at a minimum, incorporate the normal standard for mitigation of forested wetlands in Missouri at a rate of no less than four acres of mitigation for every one acre of impact (4:1 replacement).	See EPA 138
EPA	EPA-226	Mitigation - Policy	Temporal lag of functional replacement should be more clearly described in the DEIS so that adequate mitigation ratios can be determined.	See EPA 138. Although mitigation is not based on ratios, the ecological models incorporated a temporal lag where justified. For example, Section 4.8.1.8 states that FCIs were annualized using the following year intervals: 0, 1, 5, 15, 25, and 50. Likewise, Section 4.8.5.10 discusses the temporal lag that was incorporated into fish mitigation.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-227	Mitigation - Policy	Use of the HGM model to calculate mitigation for direct impacts is not the standard practice in Missouri and does not directly meet the requirements of the Mitigation Rule to ensure that compensation occurs at a minimum ratio of 1:1.	See EPA 138
EPA	EPA-228	Mitigation - Science	Ecological feasibility of proposed mitigation activities is not adequately addressed in the DEIS. For example, page xx, states "the tentatively selected plan proposes to take agricultural land, most of which is at low elevation and frequently subject to Mississippi River flood pulses, and revert it to historic forest habitat."	Response combined with EPA 229.
EPA	EPA-229	Mitigation - Science	With the addition of the project pumps the areas that are wet will be quickly pumped dry during the growing season. Any acres of forest planted will unlikely become forested wetland because of the altered hydrology (inappropriate timing, frequency, and duration of flow to support the desired habitat).	As stated in Section 5, vegetated wetland restoration sites would reestablish microtopography and restore site-specific hydrology (i.e., plugging farm drains). All vegetated wetland sites will be located in the post-project five year flood frequency or adjacent batture area. All of these sites would remain seasonally connected following construction of flood risk management features. Although hydrology (timing, frequency, duration) will be modified as a result of operating the gates and pumps, the altered hydrology has been accounted for in the environmental models that quantify impacts and mitigation.
EPA	EPA-230	Mitigation - Policy	The DEIS does not adequately address the requirements of the Mitigation Rule for proposed preservation activities (40 CFR § 230.93(h)).	Proposed preservation activities are discussed in Section 5.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-231	Mitigation - Implementation	Preservation means the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms.	combined with EPA-232
EPA	EPA-232	Mitigation - Implementation	Preservation does not result in a gain of aquatic resource area or functions.	Net habitat/function provided on any type of mitigation, including preservation, is determined as the difference between future without mitigation in place and future with mitigation in place. Therefore, if a site is threatened by a future activity and mitigation preserves the site (*i.e.,* removes the threat), then mitigation will result in a net gain over the future without mitigation aquatic resources and functions.
EPA	EPA-233	Mitigation - Policy	The mitigation rule requires that for preservation all several tests must be met (40 CFR § 230.93(h)).	The Mitigation Rule allows for preservation specific circumstances. A discussion of those circumstances is found in Section 5.
EPA	EPA-234	Mitigation - Implementation	A description of how each proposed parcel for preservation credits meets these requirements must be provided.	Any preservation credit would be included in the preparation of detailed tract-specific mitigation plans (see Section 5).
EPA	EPA-235	Mitigation - Policy	The assessment of threats should include how the TSP will threaten existing wetlands through drainage and altered hydrology, and if it's possible for the proposed mitigation areas to meet test iv of 40 CFR § 230.93(h).	Test iv of 40 CFR 230.93(H) refers to preservation and whether or not the resources are under threats of destruction or adverse modification. As stated in Section 5, the Bogle Woods tract was under threat of clearing for timber production. If a determination is made to proceed with the project, the gains in mitigation from preserving this tract would be quantified during the completion of the site-specific mitigation plan and coordinated with the interagency team. Following coordination, a determination would be made regarding the applicability of the site as preservation. If no longer desirable or cost effective, the tract would likely be transferred back to its original owner or heirs and timber likely removed, with a commensurate degrading of the site’s ecological value.

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EPA	EPA-236	Mitigation - Policy	The standard practice for the Missouri IRT is to require preservation of 10 acres of land for every one acre of impact (10: 1 replacement ratio). HGM calculations should be also adjusted accordingly.	See EPA-138 regarding the utilization of ratios. If a determination is made to proceed with the project, the gains in mitigation from preserving this tract would be quantified during the completion of the site-specific mitigation plan and coordinated with the interagency team. Following coordination, a determination would be made regarding the applicability of the site as preservation. If no longer desirable or cost effective, the tract would likely be transferred back to its original owner or heirs and timber likely removed, with a commensurate degrading of the site's ecological value.
EPA	EPA-238	monitoring	If the project is going to use HGM to project mitigation needs then it should also use HGM to evaluate mitigation parcel success.	The DEIS has been revised to include specific HGM monitoring.
EPA	EPA-239	monitoring	One of the ecological performance standards should be to meet the reference standard for each of the variables in the project area for each HGM class.	The Corps does not anticipate that mitigation would result in reference standard wetlands. Thus, ecological performance standards are not based on reference standards. The definition of reference wetlands and standards is provided in the HGM Regional Guidebook (Appendix E, Part 5 at pp 9). Specific FCI values used to determine mitigation requirements are found in Appendix E, Part 6, Tables 28a and 28b. Estimated FCI used in mitigation are less than what would be expected for reference standard wetlands. Ecological performance standards are based on these estiamtes, not reference standards.
EPA	EPA-240	wetlands	The DEIS should define where and how the reference standard (HGM) was determined.	Reference standards are defined and described in Appendix E, Part 5 (pg 9).
EPA	EPA-241	Mitigation - Science	The DEIS needs to clarify (such as on page 323) if the mitigation plans will rely on natural revegetation rather than planting the sites.	Trees would be established by utilizing a variety of techniques but could include direct seeding/acorns, seedlings, or natural regeneration. The species of trees as well as the appropriate establishment method would be described in the detailed tract-specific mitigation plan.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-242	Mitigation - Policy	Natural revegetation of sites generally is not ecologically feasible and is not a standard practice accepted by the Interagency Review Team.	Recent literature indicates otherwise. See Mitsch et al. 2012. With the exception of batture land reforestation, the majority of vegetated wetland restoration sites will be planted with appropriate species of trees. Forest composition in the batture land includes pioneer species (black willow and cottonwood). Due to the rapid colonization of both of these pioneer species, there is no need to plant these areas. Instead, the Corps plans to restore the microtopography and site specific hydrologic restoration (plug ditches, remove farm drains, etc.). Vegetation will colonize naturally.
EPA	EPA-243	Mitigation - Implementation	The DEIS should specify the process for providing the Missouri Interagency Review Team with each site specific mitigation design with planting lists for review and approval.	Section 5 of the DEIS has been revised that describes the process for the interagency team to review and comment on tract-specific mitigation plans.
EPA	EPA-244	Mitigation - Implementation	Ecological performance standards need to be developed and included in the DEIS for vegetation diversity (number of species), number of strata, and percent cover appropriate for that vegetation type based on reference information.	The DEIS has been revised to include additional discussion on ecological performance standards.
EPA	EPA-245	Mitigation - Implementation	The EPA recommends that the DEIS provide a process for all the agencies of the Missouri Interagency Review Team to review and approve the monitoring reports (page 323).	Section 5 has been revised indicating that monitoring reports will be coordinated with the interagency team.
EPA	EPA-246	Mitigation - Implementation	Annual Interagency Review Team mitigation site visits are recommended.	Section 5 has been revised indicating that the interagency team can participate in monitoring.
EPA	EPA-247	monitoring	The DEIS should clarify what is meant by "vegetation is established" and describe how will this be measured and what will the target be for each habitat type.	The DEIS has been revised to include a discussion of vegetation diversity and percent coverage (see 5.5.9).
EPA	EPA-248	monitoring	Each site plan must include specific vegetative diversity and cover standards to determine success.	The DEIS has been revised. See section 5.5.9.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-249	Adaptive Management	Page 330 indicates project adaptive management reports would be developed at 5, 15, 25 and 50 years. We would recommend planning for annual reporting periods in the early years during and after project construction until interim performance standards are met in order to more quickly identify and correct issues at their onset.	Phase 1 adaptive management has been revised to include annual reporting requirements for five years or until tract-specific ecological success has been demonstrated.
EPA	EPA-250	uncertainty	On page 298 the DEIS states does not define "risk register." It is unclear what role this will have in ecological performance standards.	Risk is discussed in Section 6.
EPA	EPA-251	Adaptive Management	The DEIS does not adequately describe the adaptive management plan and uses concepts and terms that are not standard practice for the Missouri IRT (page ii).	The Adaptive Management Plan has been clarified to explain concepts and terms used in the document.
EPA	EPA-252	Mitigation - Science	The Mitigation Rule discusses adaptive management plans; however the DEIS is unclear what is meant by "adaptive mitigation strategy."	The term "adaptive mitigation strategy" has been clarified in Section 5.
EPA	EPA-253	Adaptive Management	Page x, the DEIS recommends adaptive management to overcome any mitigation shortfalls as a result of uncertainty by utilizing future "monitoring point estimates" to determine if "adaptive management decision thresholds" have been met; but the DEIS does not describe these estimates or decision thresholds.	The DEIS has been revised. Point estimates are presented in Section 4 of the DEIS. Risk and uncertainty is discussed in Section 5. Adaptive management decisions (Phase 2) are discussed in Section 7.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-254	Adaptive Management	The DEIS needs to define key terminology and provide sufficient detail to demonstrate that the adaptive management strategy sufficiently reduces risk such that the plan has a reasonable chance of success to offset impacts.	The Adaptive Management Plan (both phases) has been further developed and refined to include more specific information where possible regarding the monitoring, assessment, performance measures, targets and thresholds that would trigger when an Adaptive Management Action.
EPA	EPA-255	Adaptive Management	The processes for monitoring and calculating total adaptive management costs are not well documented. The document states on page ii, "In the event that future monitoring determines that there is a mitigation deficiency, operation of gates and pumps would be changed to reduce the environmental impacts of the project." Page 333 states "Any changes to the project operation must still be economically viable." The process and criteria for making these determinations is not described in the document and creates unacceptable risk.	Phase 2 AM will be clarified by explain the overall process of changing the operation plan of the project. Although benefits would be reduced and operating costs may be reduced (decrease days of pumping), there are no additional costs from changing project operation.
EPA	EPA-256	Adaptive Management	If the monitoring shows that the gates need to be open year round to offset impacts, will that be acceptable to project sponsors and the operation of the Mississippi River and Tributaries Project?	The TSP provides economic benefits of managing floods in the project area. Environmental impacts have been avoided and minimized by keeping gates open during portions of the year. The Corps is committed to adaptive management to ensure that project benefits are obtained and ecological impacts compensated.
EPA	EPA-257	Adaptive Management	The DEIS does not specify what assurances would be put in place that adaptive management would be conducted according to plan.	The DEIS has been clarified by specifying the assurances. Assurances are based on the project's authorizations. The Corps will conduct adaptive management for the MRL item and the remaining cost wills be cost shared with the non-federal sponsor.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-258	Adaptive Management	The Advance DEIS should be modified to include detailed description and logistics of the adaptive management plan and third party monitoring and oversight. For example, more information and clarity is needed at pages 13, 57-58, and 61.	The DEIS has been clarified to provide additional details regarding adaptive management. Third party monitoring and oversight is not anticipated. Monitoring and adaptive management will be coordinated with the interagency team.
EPA	EPA-259	Adaptive Management	Page 191, the DEIS states "Increases in rice production and the potential benefit to shorebirds would be monitored through adaptive management." The DEIS should clarify the functions provided by rice fields, how these functions are assessed, and how potential increase or decrease in function due to project activities might be incorporated into the comprehensive mitigation plan.	The discussion regarding rice acreage has been deleted.
EPA	EPA-260	Mitigaiton - Implementation	The DEIS should be revised to clarify that site specific remedial actions will be necessary for each mitigation site whenever the site-specific performance criteria have not been met.	The DEIS has been revised to clarify what will be necessary to trigger a remedial action. Since the project will be adaptively managed, this may include addressing mitigation adjustments on the site-specific area, or modifying the operation of the project.
EPA	EPA-261	Mitigation - Implementation	On page 333 the DEIS states "Remedial actions would only be necessary when a cumulative need was lacking, not a site-specific need." This implies that if a tract fails for one resource class, it will be counted towards another class. This is inconsistent with the requirements of the Mitigation Rule and would present extreme difficulties in tracking in-kind replacement for losses to Waters of the US.	The DEIS has been clarified. Remedial actions will be necessary in the event that the project does not compensate for project impacts.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-262	Mitigation - Policy	Page xix: the DEIS states "As seen in the proposed mitigation measures, a holistic watershed approach to compensatory mitigation has been proposed." Based on the information provided to date, the DEIS does not represent a watershed approach as it is outlined in the Mitigation Rule (see 40 CFR 230.93(c)).	The DEIS has been revised to incorporate the information outlined in the Mitigation Rule.
EPA	EPA-263	General	The potential conflict between goals of the Lower Mississippi River Conservation Committee and the TSP should be addressed in the watershed context for the Mississippi River (page 271).	The DEIS discusses project implementation relative to LMRCC. Furthermore during the public review period, the LMRCC will be provided the opportunity to provide comment.
EPA	EPA-264	General	Will the TSP impact efforts to improve fish and wildlife habitat and recreational opportunities on the River?	It is anticipated that the conversion of agricultural land to bottomland hardwoods within the project area and the batture will increase the availability of scare bottomland hardwood spawning and rearing habitat to Mississippi River fish assemblages. Likewise, there will be secondary recreation and wildlife benefits as a result of the conversion.
EPA	EPA-265	Mitigation - Science	How do the proposed mitigation activities fit within other watershed planning and improvement efforts?	Large Scale Ecosystem Restoration Initiatives are discussed in the cumulative impacts section. USACE has recently completed the Lower Mississippi River Resource Assessment reconnaissance level report. A watershed study is being considered that would look for opportunities to restore habitat within and along the Mississippi River. Compensatory mitigation as a result of the St. Johns Bayou and New Madrid Floodway Project could be used to complement this potential project. Large scale restoration in the project area is not likely in the future because of the existing highly productive farmland. Future demands on agriculture products would cause a higher demand on existing agricultural areas like the St. Johns Bayou Basin and New Madrid Floodway. Therefore, a greater emphasis on agriculture than environmental restoration in the project area would be likely.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-266	Mitigation - Costs	The costs of mitigation are not adequately assessed, and leave many factors undetermined. Thus the cost/benefit ratio cannot be fully determined.	The DEIS has been revised to include project cost estimates.
EPA	EPA-237	monitoring	Page 322: Table 6.5 provides a list of monitoring requirements. The table does not appear to use the HGM variables.	The DEIS has been revised to include HGM variables in the applicable locations.
EPA	EPA-267	Mitigation - Costs	The DEIS should clearly outline how mitigation costs were derived and these costs should be specified when comparing alternatives (Table 2.6).	The DEIS has been revised to include project cost estimates.
EPA	EPA-268	Mitigation - Costs	Mitigation costs are not fully accounted for in the economic analysis.	The DEIS has been revised to include project cost estimates.
EPA	EPA-269	Mitigation - Costs	The difference between property value of cropland and woodland is the only cost included in the discussion. However, once an area is set aside from mitigation its property value may be different due the requirements of the conservation easement.	The economics appendix contains a discussion regarding the difference between a financial cost and an economic cost. This includes a discussion on the value of cropland versus the value of forest land and why only the difference is included as an economic cost of the project.
EPA	EPA-270	Mitigation - Costs	The costs of monitoring, maintenance, management and protection into perpetuity are not accounted for.	The DEIS has been revised to include project cost estiamtes.
EPA	EPA-271	Mitigation - Costs	Other types of mitigation costs beyond woodland planting are not mentioned, including: stream mitigation, borrow pit construction, wetland planting, legal fees, and engineering design for water control structures.	The DEIS has been revised to include project cost estiamtes.
EPA	EPA-272	Mitigation - Implementation	Information is lacking on what species would be planted at sites or over how many acres.	Section 5 has been revised clarifying that tree species would not be finalized until the tract-specific plans are developed.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-273	Mitigation - Implementation	There is also no indication of seeding rate or planting spacing which could dramatically change mitigation costs.	Section 2.3.2 states that trees would be planted utilizing a variety of techniques but could include direct seeding/acorns, seedlings, or natural regeneration. The species of trees as well as the appropriate planting method would be described in the detailed tract-specific mitigation plan. For the purpose of determining planting costs, the Corps assumed $450 per acre. Please note that this does not include other associated costs of mitigation (i.e. land acquisition). The DEIS has been revised to include mitigation cost estimates.
EPA	EPA-274	Mitigation - Costs	Additionally, page 333, the DEIS states "a 25% contingency has been added to the calculated cost of mitigation features." What is this cost, and where is it documented in the DEIS?	The DEIS has been revised to include project cost estiamtes. The 25% contingency has been applied to the cost of real estate in the event that additional lands are required and the cost of mitigation measures in the event that monitoring requires additional work.
EPA	EPA-275	Mitigation - Costs	The DEIS underestimated the cost of mitigation, which would alter the cost benefit ratios for the alternatives.	The DEIS has been revised to include project cost estimates.
EPA	EPA-276	Mitigation - Costs	It is unclear in the DEIS what mitigation costs were included in the economics assessment.	The economics appendix includes a discussion on the difference between a financial cost and an economic cost.
EPA	EPA-277	Mitigation - Costs	In Appendix B, page 26, two figures are provided: $40,358,000 is estimated for reforestation cost, but this section also indicates only $16,915,000 of that cost was incorporated in the economics assessment.	Appendix B has been clarified. Only the economic costs, not financial costs are used in the determination of the project's net economic benefits.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-278	Mitigation - Costs	As a routine part of the mitigation plan review process, the EPA reviews potential mitigation costs in order to determine if a mitigation provider has fully accounted for all potential costs and to evaluate feasibility of the plan. Based on information provided in the Advance DEIS and known mitigation costs in Missouri, the EPA estimated mitigation costs for the TSP. Based on our estimate, and the absence of several types of mitigation costs in the Advance DEIS, the EPA estimates mitigation costs have been significantly underestimated.	The DEIS has been revised to include project cost estiamtes.
EPA	EPA-279	Mitigation - Science	Page xx, and Page 49: the document discusses "ecologically designed borrow pits and floodplain lakes," and page 147, Table 4.29 states that 194 acres of wetland function will be provided by borrow pits. The EPA disagrees that borrow pits will replace lost functions of area wetlands.	The Phase 1 IEPR panel stated, "Borrow pits may have the most potential of becoming and staying as wetlands for a very long duration as they fill with sediments and organic matter. If half of them are 3 ft deep or less, they can be designed with littoral zones for vegetation and contribute significantly to biodiversity. Ecological engineering help to design these ponds appropriately is needed." Thus the Corps intends to ecologically design the borrow pits. The design is discussed in Section 5. Borrow pits would be designed so that half of each pit would have an average depth of less three feet. Wetland vegetation is expected. Thus, wetland benefits were quantified for half of the surface acreage.
EPA	EPA-280	Mitigation - Science	While these (borrow pits) may be appropriate to offset some impacts to fisheries, they are not acceptable mitigation for vegetated wetlands.	Ecologically designed borrow pits provide benefits to the connected depression wetland sub-class (see Tables 4.29 and 4.34). The majority of wetland impacts occur to low gradient riverine backwater and overbank wetlands. Although, the ecologically designed borrow pits compensate for impacts to fish and wildlife resources (fish, waterfowl, etc), the only wetland impacts they compensate for are connected depression wetland sub-classes.
EPA	EPA-281	Mitigation - Science	The depth of the pits (borrow) would provide only open water habitat because the depth of the water will not allow emergent plant growth.	As stated, half of each pit would have an average depth of three feet. Emergent wetland vegetation is anticipated. The remaining half would have an average depth of six feet. Vegetation is not anticipated in the deeper areas. Thus, wetland benefits were only quantified for the shallower portions of the ecologically designed borrow pits.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-282	Mitigation - Science	These areas (borrow pits) should be removed from wetland acreage and functional assessments.	A watershed approach has been utilized to quantify impacts of the project as well as mitigation benefits. Although the ecologically designed borrow pits will primarily compensate for impacts to fish, they still provide a wetland function. Thus, the DEIS quantifies the wetland value.
EPA	EPA-283	Mitigation - Science	The EPA and other agencies have commented previously that mitigation in the batture land would not adequately compensate for wetland losses due to the TSP.	Previous comments are noted. However, subject matter experts that conducted the project specific analyses have indicated that batture land is suitable for mitigation. The Corps consulted with the Independent External Peer Review Panel to get an unbiased opinion from nationally recognized experts. The panel also indicated that batture land is suitable for mitigation (see Phase 2 IEPR Comment 3 and 4 and Phase 3 Comment 9).
EPA	EPA-284	Mitigation - Science	This land is already connected to Mississippi River and subject to the flood pulse, and much of the area is already wetland. Therefore, mitigation in the batture will not increase functions related to the flood pulse, which is the most difficult aspect of the project to mitigate.	As previously stated, impacts and mitigation are expressed as habitat/function units and are based on the flood pulse and underlying land use. See EPA-195.
EPA	EPA-285	Mitigation - Science	These areas (batture) would also likely not be appropriate for preservation credits under the Mitigation Rule because they are under no threat for development.	The Corps does not intend to preserve agricultural land in the batture land as part of mitigation. Instead, the Corps will restore bottomland hardwoods and riverfront forests on agricultural land in the batture land. These lands were previously forested and were converted to agriculture.
EPA	EPA-286	Mitigation - Implementation	The DEIS should clarify if batture lands have already been purchased for the purposes of mitigation of this project. If not, how has it been determined that all these lands are available for mitigation?	No lands have been previously acquired from the batture. The Corps made a determination that batture lands would be available based on the following: (1) Willing sellers identified themselves when the Corps was previously acquiring mitigation sites for this project and (2) discussion with the local sponsor and other stakeholders have identified potential batture locations.
EPA	EPA-287	Mitigation - Science	The DEIS needs to provide more information on the current status of these lands, including, a breakdown of which lands are located in the state of Missouri.	The DEIS has been clarified to state that proposed mitigation sites located within the batture area will only be obtained in the State of Missouri.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-288	Mitigation - Science	More information should be provided regarding the functional losses proposed activities in the batture are intended to replace and which regulatory requirements will be satisfied.	Section 5 provides an overview of anticipated mitigation benefits from restoration activities in the batture land. Technical resource specific discussion is found in the applicable sub-section of Section 4 and their applicable appendices.
EPA	EPA-289	Mitigation - Science	Page xx: the document states that batture land lakes are degraded due to the high sediment load in the Mississippi River. Would other areas of the batture also be degraded?	Yes. Conversion to cropland has degraded the habitat value of the batture land. Thus, mitigation is targeting restoration of forested areas on cropland to restore habitat/function.
EPA	EPA-290	Mitigation - Science	The DEIS needs to include a discussion of the ecological feasibility and suitability of restoring these lanqs given these conditions.	Section 5 provides a discussion on the ecological feasibility and suitability of conducting mitigation in the batture lands.
EPA	EPA-291	Mitigation - Policy	Use of State land (MDC Ten Mile Pond Conservation Area and Big Oak Tree State Park) as mitigation may not be compliant with 40 C.F.R. § 230.93(a)(3) because these lands are a part of "public programs already planned or in place."	CFR 230.93(a)(3) states, "(3) Compensatory mitigation projects may be sited on public or private lands. Credits for compensatory mitigation projects on public land must be based solely on aquatic resource functions provided by the compensatory mitigation project, over and above those provided by public programs already planned or in place. All compensatory mitigation projects must comply with the standards in this part, if they are to be used to provide compensatory mitigation for activities authorized by DA permits, regardless of whether they are sited on public or private lands and whether the sponsor is a governmental or private entity." Additionally, the project's authorization includes specific language directing it to take fish and wildlife credit for certain additions to Ten Mile Pond Conservation as mitigation, which is discussed in the EIS.
EPA	EPA-292	Mitigation - Policy	Also, these lands (TMPCA) may not meet 40 C.F.R. § 230.92(h) requirements for preservation.	See EPA 291

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-293	Mitigation - Policy	EPA observes that the brief citation included on page 301 to the Congressional Authorization allowing for use of Ten Mile Pond for mitigation is specific only to fish and wildlife protection. See discussion in the preliminary DEIS in Section 2.3.5.	Credits from Ten Mile Pond will only be taken for fish and wildlife impacts.
EPA	EPA-294	Mitigation - Policy	The Water Resources Development Act of 1986 states that mitigation lands must be acquired from willing sellers. The DEIS does not detail if MDC is a willing seller or will participate in mitigation activities for these lands.	Ten Mile Pond will not be acquired from the State of Missouri. Pursuant to the project's authorization, lands purchased by the State of Missouri within the Ten Mile Pond Conservation area will only be counted as part of the project's overall mitigation needs. Furthermore, the State of Missouri will maintain such lands.
EPA	EPA-295	Mitigation - Policy	Page xix, the proposed mitigation at existing areas of 10 Mile Pond do not meet the test for preservation under the Mitigation Rule and therefore could not receive mitigation credits for CWA Section 404 compliance.	See EPA 291
EPA	EPA-296	Mitigation - Implementation	Section 1.3.2, page 5: Identifies BOTSP as a priority for mitigation. However, mitigation priorities must be generated from a comprehensive mitigation plan that includes a watershed approach for identifying the most desirable sites for restoration activities.	The watershed approach is presented in Section 5.
EPA	EPA-297	Mitigation - Implementation	Siting of restoration parcels (BOTSP) has not been discussed in the context of the watershed.	Location of mitigation sites and zones in the project area are based on post-project flood frequencies (see Section 5).
EPA	EPA-298	Mitigation - Implementation	The DEIS does not provide a clear description of how and by whom the park (BOTSP) and associated mitigation lands will be managed in the future.	The DEIS has been revised to provide additional description regarding Big Oak Tree State Park.
EPA	EPA-299	Mitigation - Implementation	Who will own the land (BOTSP) and provide long term management, maintenance, and financial assurances?	Long-term management and financial assurances are discussed in Section 5.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-300	Mitigation - Implementation	The mitigation plan needs to provide an agreement between the state and the USACE for management of these lands as well as everything required by the Mitigation Rule (40 CFR §230.94), including: performance standards, financial assurances, ownership, site protections, and long-term stewardship.	The Corps of Engineers has entered into a Memorandum of Understanding for mitigation associated with Big Oak Tree State Park. Section 5 will be revised to clarify performance standards, financial assurances, ownership site protections, and long-term stewardship.
EPA	EPA-301	Mitigation - Science	The DEIS describes proposed activities at BOTSP as "restoring" hydrology. However, the proposed work may be more accurately described as enhancement of hydrology.	Constructing a culvert in the Mainline levee to reconnect Big Oak Tree State Park to the Mississippi River is restoration, not enhancement. The Interagency Workgroup on Wetland Restoration (NOAA, EPA, USACE), defines enhancement as increasing one or more of the functions performed by an existing wetland beyond what currently or previously existed in the wetland. There is often an accompanying decrease in other functions. Whereas restoration is defined as returning a degraded wetland or former wetland to pre-existing condition or as close to that condition as possible. The restored flood pulse to Big Oak Tree State Park would inundate the park and mimic a flood regime as if the levees had not been constructed.
EPA	EPA-302	Mitigation - Science	The proposed work (BOTSP) is highly engineered and susceptible to failure or high maintenance and management costs.	The Corps acknowledges that engineering is required to restore hydrology to the park. Since the structure will be located within the Mississippi Mainline Levee system, it will be designed, monitored, and inspected in a consistent manner to other items and structures located within the comprehensive levee system. Since the structure relies on gravity, operation costs only consist of opening and closing the structures. With the exception of routine maintenance provided by the project sponsor, the Federal government would be responsible for maintaining the structure (See DESI Section 5).
EPA	EPA-303	Mitigation - Science	Some areas (BOTSP) that are currently wetland may change class or be converted to open water if the water control structure and/or regime are operated incorrectly.	Since the park is experiencing drier conditions, restoration will result in wetter conditions that occurred prior to alteration. This is a goal of the restoration. Continued coordination with the Missouri Department of Natural Resources will take place to ensure that the structure is operated correctly.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-304	Mitigation - Science	Additional description and design parameters of the controlled water levels are needed to determine technical and ecological feasibility of the proposed activities (BOTSP).	Section 5 has been revised to include additional details regarding the hydrologic restoration feature. Similar to other construction items, detailed plans and specifications will not be developed until after the Record of Decision.
EPA	EPA-305	Mitigation - Science	The DEIS should clearly describe the proposed water control structure operations for BOTSP and other mitigation lands. This information cannot be deferred until the Record of Decision, as implied on page 47, as it is crucial to determining net benefit of proposed mitigation.	see EPA 304
EPA	EPA-306	Mitigation - Science	The EPA is a strong proponent of efforts to restore more natural hydrology to floodplain areas cut off from the Mississippi River by the Corps' Mississippi River and Tributaries Project features.	Comment noted.
EPA	EPA-307	Mitigation - Policy	Our recent understanding from experience with similar efforts in coastal Louisiana is that such modifications to the Mississippi Mainline Levee would elicit the need for authorization pursuant to Section 408 of the Rivers and Harbors Act. It is not clear from the DEIS whether that is the case and, if so, whether this has been addressed for purposes of this proposed mitigation feature.	Restoring hydrology to Big Oak Tree State Park will not impair the usefulness of the levee. Likewise, it will not result in the inadvertent flooding of properties that are not acquired for mitigation.
EPA	EPA-308	Mitigation - Science	Proposed stream and wetlands mitigation is lacking documentation and does not address several previous comments provided by the EPA, including comments regarding technical and ecological feasibility of planned activities.	Mitigation proposed to compensate for impacts to ditches have been revised. Likewise, Section 5 has been revised based on comments received from EPA and the Fish and Wildlife Service.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-309	Mitigation - Policy	Additionally, the preliminary DEIS does not appear to follow processes outlined in the Mitigation Rule or contain all the elements of a mitigation plan required under 40 CFR § 230.94(c).	See EPA 206.
EPA	EPA-310	ditch impacts	The description of stream mitigation activities is incomplete and is not sufficient to determine if impacts have been adequately assessed and if proposed mitigation activities will adequately compensate for losses.	The ditch impact and mitigation section has been revised to include additional specifics regarding ditch impacts and mitigation activities.
EPA	EPA-311	Mitigation - Policy	Detailed maps of areas of proposed mitigation areas with type of mitigation activity are needed.	The DEIS provides figures of proposed mitigation zones. Specific tracts would be acquired from these zones and mitigation options for each zone are described in Sections 2.3.1 to 2.3.8.
EPA	EPA-312	ditch impacts	The worksheets provided in Appendix P Part 2 and 3 do not describe what each of the dominant impacts and net benefits are, or how the value for each of the factors was chosen.	Additional clarification has been provided to the worksheets and the DEIS has been revised accordingly.
EPA	EPA-313	ditch impacts	Additionally, it appears that not all of the impacts (ditches) are accounted for in the worksheets. Adding up the linear feet in the adverse impact sheet equals 15.35 miles, however the DEIS describes on page xvi that 23.1 miles will be impacted.	Following interagency team guidance, the Corps' project team consulted with the Memphis District USACE Regulatory Branch to determine the construction reaches along project area ditches that would trigger the MSMM. The Regulatory Branch concluded that the proposed activity along the upper 7.8 miles of St. James Ditch would not be considered an impact as bottom widths would remain unchanged. The reach, however, should be a target location for mitigation as the ditch is commonly planted and farmed to top bank. The EIS has been clarified.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-314	ditch impacts	The EPA and other IRT agencies have previously commented that forested buffers should be used instead of grass buffers.	Due to future maintenance activities that require a construction right of way along the top bank of project area ditches, it is impractical to place a forested buffer on both sides of the channel. Thus, warm season grasses are recommended on one side because they are conducive to future maintenance activities and there is a wealth of scientific data that recommends their use for water quality benefits. Therefore, warm season grasses are still proposed on one side of the channel. However, the DEIS was revised to remove the mitigation credit previously determined for the grass buffer. The DEIS has been revised to state that "Although USACE would ensure buffer strips are established on both banks, credit will only be taken for woody vegetation, therefore, grass buffers will be planted and maintained as an environmental design feature."
EPA	EPA-315	ditch impacts	Grassed buffers, and any buffers placed upon spoil piles, would not be provided mitigation credits because they do not provide in-kind replacement of functional losses for the environmental setting.	See EPA 317 and EPA 314.
EPA	EPA-316	ditch impacts	Additionally, any buffers that will be impacted in the future during maintenance activities would not receive mitigation credits because the Mitigation Rule requires that mitigation areas be protected in perpetuity.	The DEIS has been revised to state "However, as previously stated, due to interagency team concerns of the grass buffer being used as access to periodically maintain agricultural ditches in the project area, the grass buffer will be implemented as an environmental design feature and no mitigation credit will be taken through the MSMM."
EPA	EPA-317	ditch impacts	The document, page 34, states that areas would be allowed to revegetate naturally. The IRT requires that stream buffers be planted with the appropriate density and species composition of trees and understory plants.	The DEIS has been revised to state that the spoil pile would be allowed to revegetate naturally, providing many ecological benefits, however, no mitigation credit will be offered as this will be done as a an environmental design feature.
EPA	EPA-318	ditch impacts	The EPA provided comments outlining several factors that should be considered to determine if proposed riparian buffers are appropriate. Credit for riparian buffers on only one side of a stream is not recommended unless a net benefit can be demonstrated.	The DEIS has been revised. A net benefit has been demonstrated by the utilization of the MSMM.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-319	ditch impacts	The DEIS should include discussion of factors such as orientation of the buffers to provide shading, how on-going channel maintenance might impact the mitigation resource, if there are more appropriate areas in the watershed for stream mitigation, and opportunities for enhancing streams utilizing Natural Stream Channel Design.	The DEIS has been revised to include additional discussion regarding ditch impacts and appropriate mitigation.
EPA	EPA-320	ditch impacts	The DEIS must clearly describe how revetment and culvert replacement activities have been included in the assessment. The EPA has previously commented that placement of hard structures in streams, such as these proposed activities, are considered to be impacts rather than enhancements and should be included in the assessment of debits; however it is unclear if these changes have been made.	Direct footprints of hard points have been included in the impact assessment, and the benefits from establishment of the nine transverse dikes were also calculated as a benefit for the ditch reach.
EPA	EPA-321	ditch impacts	Page 239: it is unclear in the DEIS how stream credits for borrow pits created near streams will be determined.	The DEIS has been revised documenting how credits were determined.
EPA	EPA-322	wetlands	The EPA notes that the preliminary DEIS contains confusing and perhaps unnecessary statements regarding Clean Water Act (CWA) jurisdiction that may prove unhelpful to the public.	Issue has been clarified in DEIS, see revised write up. Only the Corps definition of wetlands is presented.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-323	wetlands	The Advance DEIS states on page 95, "Wetlands that are potentially regulated by the Clean Water Act are indicated in Bold Calibri Font to distinguish the different wetland terminology used by others." We recommend that language used in regard to CWA jurisdiction throughout the draft document be reviewed for clarity and revised as necessary.	Issue has been clarified in DEIS, see revised write up. Only the Corps definition of wetlands is presented.
EPA	EPA-324	wetlands	Clarity could be added to the DEIS by outlining the role and responsibility of the resource agencies and clearly citing the regulations and sources of definitions.	Issue has been clarified in DEIS, see revised write up. Only the Corps definition of wetlands is presented.
EPA	EPA-325	wetlands	Providing the USACE Jurisdictional Determinations, as well as a discussion of normal procedures for conducting JDs and how the DEIS followed those procedures, would help clarify this issue.	Preliminary JDs are not warranted. Due to the fact that the project assumed that all naturally vegetated areas located at and below the pre-project five-year flood frequency elevation were wetlands, vegetated areas were not assessed as the only possible outcome would be that fewer acres would be classified as wetlands. Thus, the project assumes a worst case scenario for impacts so the project is inherently in compliance with the Clean Water Act. Furthermore, in the absence of evidence to the contrary, the Corps of Engineers generally accepts the NRCS farmed wetland and prior converted cropland determinations for land that is devoted to agricultural use. Coordination with the Memphis District Regulatory Branch concluded the NRCS determination represents the best available information regarding the extent of farmed wetland and prior converted cropland within the project area. Although formal jurisdictional wetland determinations were not conducted, the analysis conducted is more than adequate to demonstrate compliance with Section 404 of the Clean Water Act.
EPA	EPA-326	wetlands	In the DEIS the distinction between the definition of wetlands and the definition of Waters of the U.S. should be clarified.	Issue has been clarified in DEIS, see revised write up.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-327	wetlands	To date, Jurisdictional Determinations have not been provided by USACE describing Waters of the United States in text and with maps, and the NRCS wetland determination report and methodology for farmed wetlands and prior converted cropland under the Food Security Act have not been included.	Preliminary JDs are not warranted. Due to the fact that the project assumed that all naturally vegetated areas located at and below the pre-project five-year flood frequency elevation were wetlands, vegetated areas were not assessed as the only possible outcome would be that fewer acres would be classified as wetlands. Thus, the project assumes a worst case scenario for impacts so the project is inherently in compliance with the Clean Water Act. Furthermore, in the absence of evidence to the contrary, the Corps of Engineers generally accepts the NRCS farmed wetland and prior converted cropland determinations for land that is devoted to agricultural use. Coordination with the Memphis District Regulatory Branch concluded the NRCS determination represents the best available information regarding the extent of farmed wetland and prior converted cropland within the project area. Although formal jurisdictional wetland determinations were not conducted, the analysis conducted is more than adequate to demonstrate compliance with Section 404 of the Clean Water Act.
EPA	EPA-328	wetlands	This information (USACE JD and NRCS Data) is essential to determining impacts to Water of the US and its exclusion will also present difficulties in identifying wetlands during project implementation for the purposes of 1) avoiding impacts during construction, operation, and maintenance of project activities;	Preliminary JDs are not warranted. Due to the fact that the project assumed that all naturally vegetated areas located at and below the pre-project five-year flood frequency elevation were wetlands, vegetated areas were not assessed as the only possible outcome would be that fewer acres would be classified as wetlands. Thus, the project assumes a worst case scenario for impacts so the project is inherently in compliance with the Clean Water Act. Furthermore, in the absence of evidence to the contrary, the Corps of Engineers generally accepts the NRCS farmed wetland and prior converted cropland determinations for land that is devoted to agricultural use. Coordination with the Memphis District Regulatory Branch concluded the NRCS determination represents the best available information regarding the extent of farmed wetland and prior converted cropland within the project area. Although formal jurisdictional wetland determinations were not conducted, the analysis conducted is more than adequate to demonstrate compliance with Section 404 of the Clean Water Act.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-329	wetlands	This information (USACE JD and NRCS Data) is essential to determining impacts to Water of the US and its exclusion will also present difficulties in identifying wetlands during project implementation for the purposes of 2) placing borrow pits and other proposed activities in PCC lands.	Preliminary JDs are not warranted. Due to the fact that the project assumed that all naturally vegetated areas located at and below the pre-project five-year flood frequency elevation were wetlands, vegetated areas were not assessed as the only possible outcome would be that fewer acres would be classified as wetlands. Thus, the project assumes a worst case scenario for impacts so the project is inherently in compliance with the Clean Water Act. Furthermore, in the absence of evidence to the contrary, the Corps of Engineers generally accepts the NRCS farmed wetland and prior converted cropland determinations for land that is devoted to agricultural use. Coordination with the Memphis District Regulatory Branch concluded the NRCS determination represents the best available information regarding the extent of farmed wetland and prior converted cropland within the project area. Although formal jurisdictional wetland determinations were not conducted, the analysis conducted is more than adequate to demonstrate compliance with Section 404 of the Clean Water Act.
EPA	EPA-330	wetlands	The Introduction on pg xx indicates that the TSP will use 1,800 acres of PCC for restoration, but no information is provided on how these lands will be identified.	The DEIS has been revised. Land acquisition and mitigation implementation is discussed in Section 5.
EPA	EPA-331	WRP	Page 114-116, the methodology for determining future Wetland Reserve Program participation does not appear to have considered impacts of the TSP and likely results in an overestimate of acreage.	Methodology used to determine future WRP was developed in accordance with IEPR recommendations (see comment response to EPA-131). The future with and without project condition includes estimated changes in WRP lands. Hydrologic changes resulting from the TSP to WRP (existing and future projections) were considered in the environmental models and mitigation is proposed to compensate for the impact.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-332	WRP	With the TSP in place, the area would be drier, it would be more difficult to provide the appropriate hydrology to restore sites resulting in fewer acres restored, and there would be fewer economic drivers for restoring wetlands.	NRCS data show that 5,800 acres of cropland have been enrolled in the WRP within the project area. Of this total, 77% are in the St. Johns Bayou Basin. If flood frequency was the only driver for WRP conversion, a greater percentage of enrollments would be located in the New Madrid Floodway since flooding is more frequent due to the 1,500-foot gap. Likewise, a greater percentage of enrollments would occur at lower elevations since these lands flood more frequently and for longer durations. However, the greatest percentage of WRP lands occur at higher elevations in the St. Johns Bayou Basin located to the north of Highway 80 (see Appendix M, Part 1, Figure 2). This area is not flooded as frequently or for as long durations as lands located closer to the structure. Based on discussions with the project sponsor, WRP enrollment is correlated to duck hunting opportunities. Lands at the lowest elevations cannot be accessed. Thus, landowners enroll lands at higher elevations (L. Bock, St. John Levee and Drainage District, personal communication).
EPA	EPA-333	WRP	Existing WRP sites will be degraded due to lack of water and/or altered hydrology.	The Corps considered all existing WRP sites and future projections under the without project condition as functioning habitat. Thus, the hydrologic changes to these areas as a result of the project were considered in the environmental models and mitigation is proposed to compensate for the impact. The Corps considers this a conservative assessment since a portion of the WRP sites visited by EPA/Corps field teams were being actively managed by the utilization of perimeter levees, water control structures, and groundwater pumps.
EPA	EPA-334	WRP	Has the NRCS provided an assessment on TSP impacts to WRP sites, their potential degradation over time, and how this may impact the NRCS and landowners' ability to meet program requirements?	All assumptions, methodology, and resulting timeline were coordinated with and reviewed by NRCS. NRCS will also be furnished a copy of the DEIS for comment.
EPA	EPA-335	2011 Flood	The Advance DEIS does not appear to adequately consider implications of the 2011 flood or future activation of the New Madrid Flood way in evaluating alternatives in Section 2.0.	The DEIS has been clarified in that all alternatives consider and allow for future Floodway activation. Under all alternatives, the Birds Point-New Madrid Floodway would continue to operate as currently authorized.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-336	2011 Flood	The EPA recommended in September 2011 that the DEIS include an assessment of the impacts of the 2011 activation of the floodway (on social, cultural and natural resources and infrastructure) and resulting implications on this project.	Detailed information regarding the flood of 2011, including activation of the floodway, resource impacts and the ongoing flood recovery efforts, can be found in Appendix L (2011 Post Flood Report). USACE is currently unaware of any implications to the SJNM project resulting from activation of the floodway.
EPA	EPA-336	2011 Flood	The EPA recommended in September 2011 that the DEIS include an assessment of the impacts of the 2011 activation of the floodway (on social, cultural and natural resources and infrastructure) and resulting implications on this project.	Detailed information regarding the flood of 2011, including activation of the floodway, resource impacts and the ongoing flood recovery efforts, can be found in Appendix L (2011 Post Flood Report). USACE is currently unaware of any implications to the SJNM project resulting from activation of the floodway.
EPA	EPA-338	2011 Flood	The DEIS does not appear to include information concerning the operation of the floodway in 2011 and the potential for operating it again in the future if the project is implemented.	Additional information regarding future Floodway activation can be found in Section 4.17.2. The Floodway would continue to be operated as authorized for all alternatives. Detailed information on the 2011 flood can be found in Appendix L, 2011 post flood report.
EPA	EPA-339	2011 Flood	Damages and shifts in population as a result of the 2011 floods were not described in the Sections that discuss need for action.	EIS has been revised to describe shifts in population
EPA	EPA-340	2011 Flood	It is not clear if alternatives were analyzed based on their ability to reduce damages in the event of activation of the floodway.	Alternatives were not analyzed based on their ability to reduce damages in the event of floodway activation. Current authorization calls for floodway operation with the 1,500-gap closure levee constructed.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-341	2011 Flood	Assessment of the 2011 activation of the floodway provides current information on the costs of repairs to the levee system the government will realize for rebuilding. This information should be used to determine the costs for rebuilding post-project for each alternative, including what the additional cost would be to repair two levee breaches (inlet and outlet) should the levee gap be closed.	The cost for future activation of the floodway and associated levee repairs is the same across all alternatives. Please note that there are three crevasses, one inflow and two inflow/outflow.
EPA	EPA-342	2011 Flood	The DEIS states that estimates regarding frequency of floodway operation are based on past frequency of operation. This may be insufficient to provide a basis for analysis of future operations due to changes in land use in the watershed and the affects of climate change.	The phase 3 IEPR (Volume 3, Part 4) review panel concurred with the USACE methodology to use the period of record to establish and evaluate future H & H conditions (including flood regimes). Details on the potential for land use changes and effects of climate change are discussed in Section 4.19, Cumulative Impacts. The conclusions discussed in Section 4.19 can similarly be used in regards to future operation of the floodway. Operation of the floodway and associated flood recovery efforts would continue at the levels authorized by Congress. Because the floodway closure will not affect hydrology upstream of the closure, there is not expected to be an increase in how often the floodway will be operated post-project.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-342	Flooding	The DEIS states that estimates regarding frequency of floodway operation are based on past frequency of operation. This may be insufficient to provide a basis for analysis of future operations due to changes in land use in the watershed and the affects of climate change.	The operation of the Floodway is currently estimated to have a 1.25 percent chance of annual occurrence, the level of occurrence used for the DEIS. Closure of the 1500-foot gap at the lower end of the New Madrid Floodway will have no effect on the timing and frequency of operation of the New Madrid Floodway. Also, no reliable climate change trends have been established that would require revision of the currently estimated frequency of operation of the New Madrid Floodway. The Project Design Flood (PDF) for the Lower Mississippi River is detailed in House Document No. 308 of the 88th Congress, 2d Session, Mississippi River and Tributaries Project, Volume II, Annex C - Project Design Flood Study. The development of the PDF included a review of about 35 different storm combinations. The 13 most likely combinations were selected for preliminary study based on the floods produced on the Lower Mississippi River. The tributary storms of the various combinations were arranged in meteorologically feasible sequences that would cause the resulting peak flows to coincide as nearly as practicable at key discharge stations of the Mississippi River. The resulting runoffs from the storm combinations were called hypo floods. Four storm combinations were selected for detailed study. The storm combinations were considered plausible from a meteorological viewpoint and to have a reasonable probability of occurrence, judging from past flood and storm sequences; a possibility was recognized that the occurrence of unusual combinations of meteorological and hydrological events could produce a flood of a larger magnitude than any of the four selected hypo floods but the occurrence of such a sequence would be considered very rare. On the basis of the study, Hypo-Flood 58A, which produced the maximum unregulated and regulated peak flows at all key stations on the Lower Mississippi River, with Group EN reservoirs operating was adopted as the PDF for the Lower Mississippi River. Hypo-Flood 58A consists of the combination of one storm as it actually occurred increased by ten percent, one storm as it actually occurred, and one transposed storm. Hypo-Flood 58A is described as follows: The actual 6-24 January 1937 storm over all areas above the Latitude of Red River Landing with rainfall excess increased ten percent, followed four days later by the actual 3-16 January 1950 storm over all areas above Cairo, Illinois, and followed three days later by the 14-18 February 1938 storm transposed over all areas between Cairo, Illinois and Latitude of Red River Landing. The adequacy of the existing Mississippi River and Tributaries (MR&T) PDF was reviewed and verified in a Corps of Engineers report entitled “Mississippi River 2011 Post Flood Assessment, Task 1 – Adequacy of MR&T Project Design Flood,” dated March 2013.

Organization	Unique Identifier**	Theme(s)	Comment (may be paraphrased or summarized)	Response
EPA	EPA-343	2011 Flood	The potential for more frequent activation of the floodway does not appear to have been considered in the needs statement, impacts assessment, or economic assessment. The EPA recommends these factors be given additional consideration in the DEIS.	See response to EPA-342.
EPA	EPA-344	General	Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.	The TSP complies with EO 11988 for the reasons specified in the Executive Summary.
EPA	EPA-345	General	The Interagency Task Force on Floodplain Management clarified the EO with respect to development in flood plains, emphasizing the requirement for agencies to select alternative sites for projects outside the flood plains, if practicable and to develop measures to mitigate unavoidable impacts.	EPA is referring to the joint guidance on the "Unwise Use of Floodplains" dated 9 March 2012, which was not intended to supersede the missions, legislative requirements or policies of any agency. The purpose and need of the project has been revised to clarify the water-dependent nature of the activity and allow for a meaningful discussion of practicable alternatives. For this project, it is not practicable to select an alternative site outside of the floodplain and measures to mitigate unavoidable impacts were developed.
EPA	EPA-346	General	The EO 11988 requires federal agencies to develop measures to minimize the impacts and restore and preserve the floodplain, as appropriate.	See response to EPA-344.
EPA	EPA-347	Flooding	The DEIS should address: Will the proposed action create significant environmental impacts on communities above or below the new structure, since this is the last open floodplain on the lower basin of the Mississippi River?	The DEIS has been revised indicating that no increase in flood risk will result to areas and communities after implementation of the project based on the location of the surrounding river communities and the corresponding protective Mississippi River Levee system.

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EPA	EPA-348	Flooding	The DEIS should address: What is the expected increase in development post-project? The Introduction, Section S8 Floodplain Management, states there will be no increase in floodplain development and no development of residential areas, but doesn't address potential redevelopment of Pinhook post 2011 flood and conflicts with the statement made on page xxiii that "Indirect impacts from this action may include residential and commercial growth within the protected area."	See response to EPA-152 comment. The H+H appendix has been revised to include model tests. The DEIS has been revised to state that very little additional residential or commercial growth is expected in the Floodway after project construction. Populations are expected to remain very low.
EPA	EPA-349	Flooding	The Advance DEIS acknowledges there will be some increases in Mississippi River elevation, but does not quantify increase in flood risk to those affected areas and communities.	See response to EPA-152 comment. The H+H appendix will be revised to include model tests. DEIS will be revised to include a summary of the model test DEIS acknowledges the increase in stages within the New Madrid Floodway from operation with the 1500-foot closure as compared to current conditions. This is the main justification for the need to raise the elevation of the Setback Levee.
EPA	EPA-350	Flooding	Additionally, the assumptions concerning river elevation are based on potentially outdated modeling (pre-1990).	See response to EPA-152 comment. The Corps is of the opinion that model results are still applicable. Theoretical storms used to calibrate the model and determine the project design flood are still valid and applicable.
EPA	EPA-351	Flooding	It is unclear if the modeling accounted for effects of proposed pumping operations or only closure of the levee gap. See Appendix C page C-18.	The DEIS has been revised with an EJ section to demonstrate no anticipated impact to flood risk.

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EPA	EPA-352	Flooding	According to EO 12898, Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The document provides comment on some of the communities that will see beneficial changes with the proposed action; however, EJ communities adversely impacted by the 2011 flood are not adequately addressed.	The DEIS has been revised with an EJ section to demonstrate no anticpated impact to flood risk.
EPA	EPA-353	Flooding	Page 257, mentions there are no environmental justice issues, however concerns have been expressed by citizens in Cairo, Hickman, Paducah, Olive Branch, Cape Girardeau, and others that this project would increase flooding in their communities.	EIS has been revised with an EJ section to demonstrate no anticpated impact to flood risk.
EPA	EPA-354	Flooding	The extent of flooding increase to all communities that might be impacted due to post project changes in hydrology needs to be provided.	The DEIS has been revised indicating that no increase in flood risk will result to areas and communities after implementation of the project based on the location of the surrounding river communities and the corresponding protective Mississippi River Levee system.
EPA	EPA-355	General	The Advance DEIS is unclear if all the models have been officially certified.	The DEIS has been revised to clarify that the ecological models have been certified or approved for use by USACE.
EPA	EPA-356	shorebirds	Appendix H Part 2 states that results of the Shorebird model validation will not be available until November or December of 2014. Impacts to shorebird populations are expected to be significant. Will the project move forward before this and other models are validated?	USACE proposes, to which the IEPR panel concurred, to validate the shorebird impact model after a Record of Decision is issued, while the process of formulating construction plans and specifications continues. At that time, still prior to construction, additional consideration will be given to shorebird impacts and to what, if any, additional mitigation may be appropriate

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EPA	EPA-357	wetlands	The EPA observes that there are several issues or criteria identified by the Model Certification Review Report that have not been addressed: HGM, Volume 3 Part 6.3, page 30 lists "risks associated with its [HGM] continued use." See also page v, pages 27-29, and Appendix B pages 1-29.	Although there were concerns with the HGM model, the model certification panel noted that it could be used in its current form. Please note page vi of the Model Certification Review Report for AR HGM Guidebook which states that: "During a teleconference on April 5, 2010 to discuss the review findings with USACE, the model reviewers were asked whether the guidebook was usable prior to making the suggested revisions (as described above). The model reviewers' response was that there could be continued conditional use. The guidebook has been in use for approximately five years and could potentially be used with the same level of accuracy under the condition that existing users will be the ones who continue to use the method. Upon further consideration of this question, the model reviewers agreed that, at the very least, the errors noted in the spreadsheets and the potential for errors in transferring data among field sheets and spreadsheets must be corrected to improve the ability of the models to yield accurate results." Corrections to the spreadsheet were made prior to model application by ERDC.
EPA	EPA-358	Fish	The EPA observes that there are several issues or criteria identified by the Model Certification Review Report that have not been addressed: Fish, Volume 3 Part 6.1, page vi;	The model certification panel supported immediate use of the model, provided three conditions were met (defensible HSI values, model developers run model, and coordination with experts) . All three conditions have been met.
EPA	EPA-359	Waterfowl	The EPA observes that there are several issues or criteria identified by the Model Certification Review Report that have not been addressed: Waterfowl Assessment Methodology, Volume 3 Part 6.2, pages iv-v;	The Model Certification Review Panel (comprised of three independent experts), along with the USACE National Ecosystem Planning Center of Expertise, found that the Waterfowl Assessment Methodology (WAM) is of high technical quality and usability and on that basis certified it for use in the Mississippi Alluvial Valley. The Panel's recommendations to alter the model, to give it greater utility for more widespread use in future planning, are noted. USACE proposes to use WAM, as certified.
EPA	EPA-360	shorebirds	The EPA observes that there are several issues or criteria identified by the Model Certification Review Report that have not been addressed: Shorebirds, Volume 3 Part 6.4, page ii and page v.	The three issues raised in the Model Certification Review Report are addressed in section 5.1.3 (issues one and three) and in App. M, pt. 4 (issue two). Further consideration of these issues will occur during the shorebird impact model verification process

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EPA	EPA-361	uncertainty	Page x: The documents states that risk and uncertainty associated with each of the models as well as future mitigation tracts have been qualitatively discussed and quantified where appropriate. Where in the document did this occur?	Section 6 addresses risk and uncertainty.
EPA	EPA-362	General	The EPA comments from our March 8, 2010 letter to Gregg Williams have not been addressed. See PDF Page 93-105 in Volume 2 Part 2 Interagency Correspondence and Memorandums for Record.	The referenced letter was submitted to the Corps commenting on the Project Work Plan. The Corps' intent of requesting interagency feedback was to ensure that the IEPR panel was aware of any concerns contrary to that of the Corps. Therefore, EPA's comments were fully considered. Ultimately, the Corps and the IEPR panel reached concurrence on the overall methodology (see Phase 2 IEPR Addendum).
EPA	EPA-363	General	The EPA has requested that the HGM sample points GIS layer and copies of the HGM data forms or spreadsheet of data collected at each sampling point be provided; however this information has not been provided to date. This information is needed in order to assess the conclusions of the DEIS.	Requested information has been sent.
EPA	EPA-364	wetlands	The HGM functional assessment method tends to blend complex concepts making it complicated to use, and difficult to interpret the results generated.	The Corps concurs that the HGM assessment is complex and may be complicated to use and difficult to interpret results for those not familiar with wetland hydrogeomorpic processes. To address this risk, the Corps had the model independently reviewed prior to conducting the analysis, contracted with model developers to conduct the project-specific analysis, and had all of the results subject to the Independent External Peer Review.
EPA	EPA-365	wetlands	The DEIS should clearly describe for the public what the HGM results mean in terms of wetland functional impacts and how they will be mitigated.	The DEIS describes wetland function (as assessed by HGM) in Section 3.8.1.

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EPA	EPA-366	wetlands	Pg 38 (PDF page 39) Table 23: Functional Losses in FCUs Associated with the Authorized Project within the New Madrid Floodway, and a Calculation of Mitigation Acres Based on Mitigation Annualized FCIs from Table 22. There is an error in the table and text. In the last column the highlighted cell says that the highest value for CD is 431, however the cell for maintain plant communities 514 should be highlighted because it is the highest value. The description in the table also needs to be corrected.	Table 23 demonstrates impacts for the authorized project. EPA is correct that the wrong cell is highlighted. However, the correct cell is highlighted for the table describing mitigation needs for the Tentatively Selected Plan (Table 29). Although there is a mistake in the table, it does not influence overall mitigation needs since this table was not used to determine mitigation needs for the tentatively selected plan. Regardless, the report's author has been contacted and the appendix will be revised prior to public review of the DEIS.
EPA	EPA-367	wetlands	The page also states: "It is assumed that mitigation is taking place within the 5-year floodplain, in large (1200 acre) well-connected tracts, but that no structure has been installed to restore flooding. Thus, the mitigation is maturing while subject to the altered hydrology associated with the Authorized Project. This leads to a much smaller functional lift per acre (or Annualized FCI), and larger acreage requirements for mitigation to offset the losses associated with the project." The mitigation amount should be increased to take into account the loss of hydrology within the project area.	The FCU mitigation requirements assume post-project hydrology (frequency, duration, etc). The "smaller" functional lift has been considered and the appropriate amount of mitigation is proposed.
EPA	EPA-368	Mitigation - Policy	Standard practice of the Missouri IRT is to require 10:1 mitigation ratio for preservation and a 2:1 ratio for enhancement activities. Any HGM FCU calculations need to take this into account.	See EPA 138

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EPA	EPA-369	Mitigation - Policy	Preserved areas function units should be reduced by a factor of 10, and any enhancement areas function units need to be reduced by half. When taking this into account the project is lacking mitigation, and recalculations to mitigation need and the cost benefit analysis need to occur.	See EPA 138
EPA	EPA-370	wetlands	HGM calculations for removing the flood pulse could not be found in the document but should be calculated.	The functions assessed in the HGM model are provided in Section 3.8.1.4, as well as in Appendix E, Parts 5 & 6. The term flood pulse is not necessarily a function, rather it is a concept that includes a spectrum of geomorphological and hydrological conditions. The functions assessed by HGM are representative of that spectrum, which were calculated and used to determine impacts and mitigation necessary to replace the lost functions as a result of project implementation.
EPA	EPA-371	wetlands	The number of acres that no longer have the detain floodwater function should be quantified and added to the mitigation needs.	As stated in Section 4.8.1, the project results in a wetland sub-class shift from riverine (provide the detain flood water function) to flats (do not provide the detain flood water function). Mitigation is proposed to compensate for this impact. In fact, this is the greatest impact to the wetland resource category and what requires the greatest amount of wetland mitigation.
EPA	EPA-372	wetlands	The Corps has limited the area of impact to investigate in the DEIS; however, the statement on Volume 3 Part 6.3, pages 14-15, supports the need to expand calculation of impacts to a larger area to take into account extreme events.	See comment responses to EPA357 & 373.

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EPA	EPA-373	wetlands	Pages B-5 through B-6 of Volume 3 Part 6.3 state that HGM does not adequately assess variables of flood duration and frequency in order to track changes in wetland condition. Considering that flooding extent and duration are crucial variables for evaluating impacts and proposed compensatory mitigation for this project, HGM is not appropriate.	While the model certification panel did suggest several improvements to the HGM model, the expert panel concluded that the guidebook is usable once the spreadsheet errors and data transfer issues are corrected, which has been done. The HGM analysis clearly shows impacts to wetlands associated with the hydraulic (and hydrologic) modifications of the project. The vast majority of these involve a change in flood frequency that it actually changes the subclass of the wetland from a river connected subclass (typically Riverine Backwater) to an unconnected subclass (Flat), and a loss of the riverine backwater functions associated with shift in subclass. This functional loss was addressed in the mitigation requirements, despite the fact that in most cases the wetlands are still present on the ground, and there was a gain in functions associated with the increase in acreage in the Flats subclass. These shifts, as well as other project impacts (direct clearing/filling) were used to calculate mitigation requirements. The remaining Riverine Backwater wetlands were also subject to a more modest decrease in FCIs. These are the Riverine Backwater wetlands closest to the channel, where the impacts of the project were least severe. This modest drop in FCI is the smaller impact of the project; the majority of the wetland functional loss in the New Madrid Floodway is due to the shift of large acreages of wetlands completely out of the Riverine Backwater subclass. River-dependant functions, such as the ability to Detain Floodwater, were completely lost for these wetlands. Since the Corps calculated mitigation for wetlands based on the greatest functional loss, all of these wetlands were treated as if they were completely converted to non-wetland, despite the fact that they are still in the landscape, and providing some functions. Additionally, the Phase II IEPR Panel (Volume 3, Part 3) stated that; "The IEPR panel recognizes that the HGM approach, even with its shortcomings, is one of the few methods available to compare wetland functions."; "Most importantly we believe that the Corps is too far along in using and reusing the HGM technique to abandon it now, and there is no other appropriate model out there, save for ecosystem simulation models, that could provide any resolution needed for mitigation ratios."; "We could not agree more that a system was needed to divide the wetlands into hydrological categories and the HGM system does that part fairly well."; and finally, "We appreciate the answers that the Corps provided to the panel on these recommendations and have no further questions on wetland area determination."

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USFWS	FWS-1	General	Thank you for the January 2013 IAT advance copy of the Draft Environmental Impact Statement (DEIS) for the St. Johns Bayou and New Madrid Floodway Project in southeast Missouri. Because of workload, the U.S. Fish and Wildlife Service (Service) has been able to conduct only a cursory review of the main body of the DEIS; however, we believe it is important to provide these preliminary comments in the interest of addressing our outstanding resources concerns as efficiently as possible. The Service will continue our more detailed review and will forward those comments within the next month.	This is an USFWS statement. No response required.
USFWS	FWS-2	General	The document appears to discredit previous and continuing Service input regarding the value of fish and wildlife resources within the project area.	The USACE has fully considered all input and did not discount USFWS input. Previous USFWS input was used to determine the expertise required for IEPR. For example, previous FWCA reports identified wetlands, shorebirds, waterfowl, terrestrial wildlife, and fish spawning and rearing habitat as significant resource categories. Nationally recognized experts were chosen independent of USACE from each of these fields to serve on the IEPR panel. These experts commented on the state of previous documentation (Phase 1), the Project Work Plan (Phase 2), and the draft EIS (Phase 3). Based on their comments, substantial changes were made to the project and project documents. However, many aspects of previous FWCA documentation are no longer applicable because the analysis has undergone significant revisions.

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USFWS	FWS-3	Wetlands	The document mischaracterizes Service input regarding recent updates to the National Wetlands Inventory, a long-standing, nationally recognized mapping tool for wetlands data.	In their draft FWCA report, USFWS reported that in 2011 the National Wetlands Inventory (NWI) conducted an update of wetlands in the project area, and included wetlands in agricultural production according to their current methodology developed in response to requests from stakeholders to capture restorable lands in their database. The update was only conducted for the St. Johns Bayou and New Madrid Floodway immediate project area and was not conducted in other parts of Missouri including the adjacent batture lands. Although the FWCA uses the term "wetlands in agricultural," in previous coordination with USFWS and their contractors, these areas were classified as "restorable wetlands." According to the USFWS NWI website, for special projects, the NWI has inventoried potential wetland restoration sites. These sites include former wetlands that have been drained or filled but are still in a condition where restoration is possible (Type 1) and existing wetlands that have functions impaired by ditching, excavation, impoundment or cultivation (farmed wetlands). Type 1 sites are identified using soil maps and locating hydric soil areas that are not mapped as NWI wetlands and do not have buildings or structures built upon them. Type 1 sites are mostly cropland on hydric soils, but may also include former wetlands that have been used as dredge material disposal sites and other impoundments. In addition, the wetland classification code for NWI farmed wetlands, PEM1Adf, is now obsolete for Missouri and has been replaced by PEM1Ad, which removed the "farmed" classification and relies on the presence of emergent herbaceous hydrophytes, which are usually dominated by perennial plants and unlikely to be found on an actively farmed agricultural field. Therefore, additional clarification is requested from the USFWS on whether the farmland in question are restorable wetlands (former wetlands that have been converted to cropland) or existing wetlands. Furthermore, there is a discrepancy with the USFWS estimates with results that are furnished to Congress. USFWS systematically monitors wetland trends for the conterminous 48 states and reports the results to Congress. The USFWS (Dahl, 2011) states the following: "Ephemeral waters, which are not recognized as a wetland type, and certain types of "farmed wetlands" as defined by the Food Security Act were not included in this study because they do not meet the Cowardin et al. definition." Although USFWS stated that agricultural areas do not meet the Cowardin et al. definition of wetlands in reports going to Congress, and contrary to previously submitted data, they indicate that agricultural areas in the project area are wetlands in their FWCA (USFWS, 2012). There appears to be a large discrepancy regarding wetland estimates in USFWS reports that are submitted to Congress or USFWS is utilizing inconsistent methods in its analysis. The USFWS CAR offered no explanation on why agricultural lands do not meet the Cowardin et al. definition on a national scale, but somehow meet the definition in the project area. Most scientific literature reviewed for the completion of the draft EIS does not include agricultural land in their description of wetlands. Additional clarification is requested from the USFWS.

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USFWS	FWS-4	Mitigation - Science	The proposed mitigation actions lack scientific validation.	The Corps finds the proposed mitigation is scientifically valid for the following reasons: (1) mitigation is based on the same models that were used to determine impacts. The models were developed by subject matter experts and each model underwent peer review, (2) the model developers were the ones that conducted the project-specific analysis that was used to determine impacts and quantify mitigation, and (3) the project has undergone three separate phases of Independent External Peer Review.
USFWS	FWS-5	Mitigation - Implementation	The proposed mitigation actions are logistically infeasible.	The Corps disagrees and finds that mitigation is logistically feasible for the following reasons: (1) Mitigation is based on a watershed approach (Section 6); (2) mitigation methods (reforestation, ecologically designed borrow pits, inundated agricultural fields) are all common practices that are utilized throughout the Lower Mississippi Valley; (3) the project has undergone extensive IEPR that resulted in major revisions to the document to ensure that impacts and mitigation are based on scientifically valid assumptions; (4) continued coordination with the interagency team will take place throughout the acquisition, planning, and implementation of tract-specific mitigation plans; (5) risk has been identified and monitoring is proposed to reduce the level of risk to acceptable levels; and (6) based on the monitoring needed to address the risk, the project will be adaptively managed to rectify any adaptive management deficiencies.
USFWS	FWS-6	Mitigation - Science	The proposed mitigation actions are inadequate both in kind (i.e., batture lands for lost floodplain and backwaters) and amount.	Consistent with the methods in which impacts were determined, mitigation is based on underlying land use (*e.g.*, forest, agriculture, lake, etc.) and hydrology (*e.g.*, frequency, depth, duration, etc.). Thus, mitigation is based on habitat units or functional units, not on an acre for acre floodplain lost. The utilization of batture land as mitigation is discussed in Section 5. Furthermore, the utilization of batture land as mitigation has been discussed numerous times with the IEPR panel (Phase 2 IEPR Comment 3 and 4 and Phase 3 Comment 9).The Corps recognizes that FWS's position is that the only true way to mitigate this lost function in-kind is through restoration of other disconnected floodplain. However, such mitigation is extremely expensive, in-feasible, and outside the scope of what can be accomplished with this project. FWS's position regarding this variable will be disclosed in the mitigation section of the DEIS.

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USFWS	FWS-7	Mitigation - Policy	Based on descriptions provided in the DEIS, the proposed mitigation does not appear to comply with the current Mitigation Rule under the Clean Water Act.	Section 5 provides a Compensatory Mitigation Plan that complies with both Section 2036(a) WRDA 2007 guidance as well as the Mitigation Rule. That section discusses all twelve elements required by the mitigation rule as well as the subsections indicated in the implementation guidance.
USFWS	FWS-8	Adaptive Management	The Adaptive Management program does not include details on what actions will be taken to rectify mitigation measures that do not work.	The adaptive management has been revised. Adaptive management discussion has been split into two distinct phases. Phase 1 Adaptive Management will occur on tract-specific mitigation sites. Section 5 of the DEIS explains the adaptive management actions in regards to tract-specific mitigation measures. Additional information has been included regarding monitoring, assessment, performance measures, targets, and thresholds that would trigger when an Adaptive Management Action should be implemented. After a determination that an individual tract(s) has reached ecological success, an adaptive management watershed approach (Phase 2) will be used to demonstrate that all of the individual mitigation parcels are working synergistically to provide a watershed mitigation effect. Phase 2 Adaptive Management is discussed in Section 7.
USFWS	FWS-9	Adaptive Management	(See above comment for context). This would include additional lands and changes in the project operations and the effects to the resource as well as the cost and benefit of the project.	Ecological thresholds which would trigger specific adaptive management actions are further refined and described in the Phase 1 Adaptive Management. Potential adaptive management actions could include things such as additional land purchases, modifying or restoring mitigation features, and other ecosystem modifications to enable the project to meet ecological success.
USFWS	FWS-10	Flooding	The DEIS does not address cumulative impacts of lost flood water storage capacity of the floodway on the surrounding river communities under the preferred alternative.	The DEIS has been revised indicating that no increase in flood risk will result to areas and communities after implementation of the project based on the location of the surrounding river communities and the corresponding protective Mississippi River Levee system.
USFWS	FWS-11	2011 Flood	The DEIS does not characterize the impacts of the 2011 flood on both the floodway and adjacent river reaches.	The DEIS has been revised to characterize the impacts of the 2011 flood. Please see Appendix L - 2011 Post Flood Report.
USFWS	FWS-12	IEPR	The Independent Expert Panel Review urged the Corps to use actual economic and flood data in evaluating project effects, and not rely solely on models results.	As part of the IEPR comment/response process, the Corps responded to the IEPR panel that Corps guidance (ER 1105-2-100) requires the utilization of "flood free" yields in evaluating potential projects. Therefore, the economic analysis is based on an economic model that accounts for the potential risk of flooding. (See Phase 3 IEPR, Comment/Response 1, Recommendation 3).

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USFWS	FWS-13	Connectivity	The Service agrees that the river-floodplain connection has been permanently eliminated for the St. Johns Bayou Basin.	The Fish and Wildlife Service has stated that the connection between the Mississippi River and St. Johns Bayou Basin has been permanently eliminated for the Mississippi River and that the only way to mitigate in-kind for this lost function in the New Madrid Floodplain is through restoration of other disconnected floodplain. The Corps acknowledges that construction of the closure levee and flood control structure in the St. Johns Bayou Basin has impacted connectivity, however, fish have been documented moving from the Mississippi River through the culverts into the St. Johns Bayou Basin. In addition, the river-floodplain connection cannot be permanently eliminated. Groundwater connections will always remain. The Phase 2 IEPR Panel stated, "High river stages mean high groundwater and backwater effects, if only due to local runoff and precipitation, in the sites themselves. Floodplains can never be totally isolated from the rivers and streams that used to nourish them, even if the nourishment has been replaced by more subtle backwater and groundwater effects" (See Phase 2 IEPR Comment/Response 3, Volume 3 Part 3).
USFWS	FWS-14	General	The Service agrees that agricultural land use has reduced both the quantity and quality of the physical habitat.	The Corps concurs that agricultural land use has reduced both the quantity and quality of the physical habitat.

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USFWS	FWS-15	Connectivity	The Service strongly disagrees with the Corps pertaining to the ecological and biological importance of the hydrologic connection of the New Madrid Floodway with the river. There is a huge volume of scientific literature on the river-floodplain continuum and the resource effects when the connection is eliminated. This issue has been extensively studied along the Lower Mississippi River, an area which has experienced significant impacts to the river-floodplain ecosystem by levees, control structures, drainage and land use changes.	The FWS' position is that the hydrologic connection between the SJBB and the Mississippi River has been lost, whereas USACE believes the flood pulse provides some value in that basin. This is the main justification for why the Corps has undertaken a suite of environmental models to quantify the value of the flood pulse in the project area. Additionally, past anthropogenic influences in both basins in the project area, including extensive drainage that has resulted in the conversion of 80% of the project area to cropland, further limit the ecological productivity of the flood pulse in both basins. FWS has previously acknowledged this loss in their 18 January 2013 response. The Corps has to measure this loss in terms of the habitat presently available, access to the remaining habitat, and recognition that agriculture has reduced both the quantity and quality of habitat in the floodplain. Additionally, the Corps proposed measures to minimize the impacts by managing a level of connectivity between the Mississippi River and the New Madrid Floodway during periods of the year that are beneficial to ecological resources, mitigating impacts in areas that would still be connected (i.e., post-project five year flood frequency), and restoring the hydrologic connection to Big Oak Tree State Park.
USFWS	FWS-16	Connectivity	The 1,500 foot gap in the frontline levee of the New Madrid Floodway constitutes the only remaining place in the State of Missouri where the river is connected to its floodplain.	The New Madrid Floodway is not the only remaining place in the State of Missouri where the river is connected to its floodplain. Likewise, it is not the last remaining natural backwater area along the Mississippi River. This issue is further addressed in Section 4.19.
USFWS	FWS-17	Connectivity	(See above comment for context). Furthermore, there are few similar areas left throughout the Lower Mississippi River.	There are 320,000 acres (500 square miles) of backwater area located within 120 miles of the project area (See Table 4.98).
USFWS	FWS-18	General	The Service fully acknowledges that alterations in the form of levees, drainage, and agriculture have affected the quantity and quality of habitat in the Floodway.	The Corps concurs that conversion to cropland limits the available habitat in the project area.

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USFWS	FWS-19	Connectivity	Based on sound scientific information, it is clearly evident to the Service and others that the hydrologic connection between the river and the Floodway is the principle biological driver.	The Corps recognizes and documents the role of existing flood pulse to the project area ecological function. However, the flood pulse value is limited due to the degree of past alterations in the project area (See DEIS Section 3.5). The role the flood pulse has on the project area was also extensively modeled through environmental models, potential impacts were qualitatively described and quantified where appropriate, and compensatory mitigation was proposed for adverse impacts.
USFWS	FWS-20	Connectivity	(See above comment for context). This occasional hydrologic connection is responsible for maintaining a full spectrum of natural resources typically associated with a river-floodplain landscape (e.g., wetlands, fish, waterfowl, shorebirds).	See Response to USFWS-15
USFWS	FWS-21	Connectivity	The value of the hydrologic connection was further validated in a recent study of the Floodway after breach of the Birds Point Levee in May 2011 (Phelps, Tripp, and Herzog 2012. Temporary Connectivity: A Comparison of the New Madrid Floodway and the Adjacent Main River, Big Rivers and Wetland Field Station, Missouri Department of Conservation).	See response to USFWS-22.

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USFWS	FWS-22	Connectivity	Phelps, Tripp, and Herzog 2012. Temporary Connectivity: A Comparison of the New Madrid Floodway and the Adjacent Main River, Big Rivers and Wetland Field Station, Missouri Department of Conservation documented higher levels of fish diversity, density, and growth in the Floodway than in the Mississippi River.	The Corps appreciates the information provided by USFWS. The Floodway will continue to be operated with the proposed additional features to the project. Temporary changes to fish communities as a result of Floodway operation, particularly in comparison to fish communities in the Mississippi River, would still occur. Although short term diversity may increase in the floodway (any area off the main channel that is flooded will attract fish), widespread agricultural influences and pervasive adverse conditions in the floodway streams (low water, sedimentation), will eventually return the fish assemblage to pre-operation levels. As stated in Section 3.8.5, agriculture limits ecological value in delta streams and surrounding floodplains. Without suitable habitat (forested areas, riparian vegetation, stable streams/ditches, structure, and adequate depth/flow), meaningful and sustained changes in biota would not occur.
USFWS	FWS-23	General	Based on our abbreviated review, the Service believes the Corps' preferred alternative continues to result in unacceptable losses to nationally significant fish, wildlife, and aquatic resources.	FWS's continuing position that project cannot be adequately mitigated is noted. The DEIS contains the Corps' analysis of mitigation of significant fish, wildlife and aquatic resources impacts of the project. Furthermore, the DEIS has undergone additional revisions to clarify impacts of the project to fish, wildlife, and aquatic resources.
USFWS	FWS-24	Mitigation - Science	Notwithstanding the Independent Expert Panel Review process, the science of wetlands and big rivers ecology, as well as an ever increasing community of practice in habitat restoration provide no valid justification that the proposed resource loss can be mitigated.	The Corps is of the opinion that the proposed mitigation is scientifically valid. See FWS-4.
USFWS	FWS-25	Mitigation - Implementation	Small projects are difficult to mitigate, and the scale of this project is one of the largest flood damage reduction projects proposed in the nation.	FWS's concern with the size of this project is noted. However, the Corps has documented that proposed compensatory mitigation is commensurate with unavoidable impacts and that adequate safeguards are in place to ensure mitigation occurs concurrent with project impacts.

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USFWS	FWS-26	Alternatives	As noted in the Assistant Secretary of the Interior's August 26, 2011, letter to ASA Darcy, we continue to urge the Corps to focus on flood damage reduction project features that protect public health, safety and infrastructure.	Project specific objectives have been clarified. In addition to protecting public health and safety, objectives for this project also include a reduction in agricultural flood damages.
USFWS	FWS-27	Alternatives	The Service continues to strongly advocate the Corps adopt the St. Johns Bayou-only alternative to address flood protection needs of the communities and public infrastructure (e.g., I-55) in that basin.	noted
USFWS	FWS-28	Alternatives	We believe that adopting a St. Johns Bayou-only alternative will avoid another exhaustive, repetitive cycle of rebuttal between the federal agencies, and most efficiently and effectively address the most pressing, long-standing flood control issues in the project area.	In addition to the alternative recommended by the Service, the DEIS analyzes other alternatives as well. A final decision regarding on how to proceed with this project will be made after the public has the opportunity to provide comment on the Final EIS. It would be premature for the Corps to make a determination at this time.