Prairie du Pont and Fish Lake (PdP/FL)
Limited Reevaluation Report (LRR)
Independent External Peer Review
Comment Tracking Form

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For the best of reasons

Comment #: 1
The benefit-cost (B/C) analysis suggests that the B/C ratio (BCR) of the tentatively selected plan (TSP) is only 1.2 with little confidence that the B/C ratio even exceeds 1, but some important benefits are not included.
Basis for Comment:
The B/C ratio is 1.2. From Page J-20, Table 8, the probability that the net benefit from quantified benefits exceeds zero is about 55 percent; conversely, the probability that the B/C ratio is less than 1 is about 45 percent. This result does not provide confidence that the TSP is an economical project, but some important benefits have not been counted.
Significance: High
The low BCR does not bode well for this project considering that the minimum BCR required by past administrations to start projects has often been over 1.5. (GAO, 2010)[1]
Recommendation for Resolution:
Quantify benefits that have not been quantified, including operations and maintenance (O&M) cost savings, railroad delay benefits, and benefits of avoided damaged within adjacent protected areas. At a minimum, include the O&M cost savings, update the traffic costs to May 2012 price levels, and expand the discussion in the LRR Page J-21 to J-22.
USACE Evaluator Response: CONCUR
Concur. The BCR is low but the actual benefits are likely higher than the quantified benefits in the report. While MVS acknowledges that a low BCR is not likely to receive construction funding, it is a positive BCR that will qualify for consideration. Recommendation: **ADOPT IN PART**. The O&M cost savings will be included ($154k). The railroad delay benefits will be further explained in the report, but the calculation (based on the example provided) would not result in a significant change in the BCR (less than 0.05). The traffic costs have been updated to 2012 price levels and the language has been corrected to make it clearer.
IEPR Panel Backcheck Comment: CONCUR
Concur, but an improved quantitative analysis of railroad and intermodal delay benefits might significantly improve the BCR and chance of funding for this project.

[1] United States Government Accountability Office. 2010. Report to the Subcommittee on Energy and Water Development, Committee on Appropriations, House of Representatives. Army Corps of Engineers Budget Formulation Process Emphasizes Agencywide Priorities, but Transparency of Budget Presentation Could Be Improved. GAO-10-453. April.

Comment #: 2
O&M cost savings associated with closure of the existing relief wells are not counted as a benefit.
Basis for Comment:
The operating costs of 162 existing wood stave relief wells would be eliminated by the TSP. This should be counted as a benefit.
Significance: High
A benefit of over $100,000 annually would significantly affect the B/C ratio and would reduce the calculated risk of having a B/C less than one.
Recommendation for Resolution:
Calculate current annual O&M for the 162 existing wood stave relief wells. Consider if these without-project O&M costs are likely to increase in the future, and if so, include.
USACE Evaluator Response: CONCUR
Concur. Recommendation: **ADOPT**. This change will be included in the report ($154k in additional annual benefits).
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 3

Railway transportation delay costs were not included, but a reasonable estimate could have been included.

Basis for Comment:

Page J-21.

> This station sees 40 to 60 trains passing through each day. This yard is a vital hub for the St. Louis area and the company expressed that a closure of 1 day would immediately add anywhere from a 24 to a 36 hour delay per train.

This information could be used with an estimate of value per hour of delay to provide a conservative estimate of the delay cost per day. Duration of flooding has been estimated, so total cost could be estimated.

Significance: High

Not quantifying this benefit may significantly understate the BCR.

Recommendation for Resolution:

Try to obtain a simple estimate, and see if it is an important part of the expected annual damage (EAD). An estimate of cost per hour duration based on data from the 2006 Statistical Abstract of the US Table 1103 is provided below. The depth-duration curve would be needed to calculate EAD.

Calculations to obtain an estimate of train delay cost per day of flood duration		
National averages from Statistical Abstract		
Train Operating Revenues	$36,639	Million $
Net Revenues	$5,199	Million $
Train miles	516	Million
Train miles per train hour	20	Miles
Calculations for Dupo		
Average Dupo trains/day	50	Avg from Page J-21
Average delay per train	30	Avg from Page J-21
Hours delay per day duration	1500	Hrs, 50 times 30
Net revenue per train-mile	$10.08	$5,199/516
Miles lost per day duration	30000	20 times 1500
Net rev. lost per day duration	$302,267	30000 times $10.08

USACE Evaluator Response: CONCUR

Concur. The railway transportation delay costs are an important consideration and should be quantified when possible.

Recommendation:

ADOPT IN FUTURE. MVS will look into better ways of computing railroad delays for future reports and very much appreciate the example provided above. We believe the delays would

have an even larger impact at this location since there is an intermodal switching yard at Dupo. Using this information, we could expect approximately an increase of $108k average annual benefits. This is not enough to change the BCR from a 1.2 to a 1.3. Additional explanation will be included in the economic appendix, but adding additional computations (and the associated review) to this report does not appear to be feasible with the results from the above example.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 4
The probability of failure for the levee is not the same for all events, although the text assumes that this is the case. Therefore, the probability of unsatisfactory performance for the with-project condition may overstate the reliability of the improved levee system.
Basis for Comment:
Table 4, economics appendix, shows that the with-project levee probability of failure for every event from 415 to 425 feet is assumed to be 0.01 percent, i.e., one in ten-thousand. The stage height of 425 feet, 51 feet at the St. Louis gage, has apparently never been experienced. It seems unlikely that the reliability of the with-project facility will be the same at 415 feet as it is at 425 feet. The probability of levee failure varies significantly by event. This is due in part to the reliability indexes, performance function, uncertainty parameters, and other values used in the calculation of failure probability for each event under consideration. There is broad literature discussing the calculation methods and assumptions used in this topic. The present study, however, uses the same value of failure probability for each event. The study, therefore, either under- or over-states the probability of failure for the different events relative to one another.
Significance: High
Even if EAD is not much affected, unrealistic assumptions cast uncertainty on the entire analysis.
Recommendation for Resolution:
Update the design chance of failure for the different water surface elevations/design events. Add a brief discussion of the methods used in the calculations of failure probability, and cite any design calculation standards and assumptions in the text.
USACE Evaluator Response: CONCUR
Concur that the stated .01% (1 in 10,000) chance of unsatisfactory performance for all river stages with the proposed project in-place is incorrect. Given the thorough geotechnical exploration and testing program, proven USACE methodologies, USACE required factors of safety, and the St. Louis District's 50-year experience with the levee district, including the flood-fight of the 1993 Mississippi River flood (flood of record), the stated probability is correct for the project flood with the project in place. Lower flood levels will exhibit a more remote chance of unsatisfactory performance, so the current assumption provides conservative results. However, it is mathematically and economically impractical to quantify these more remote probabilities for the purposes of this study. In addition, a full risk and uncertainty analysis will be done during the plans and specifications phase. This analysis will provide more accurate information on the probability of failure, but will not be included in the current economic analysis. Recommendation: **ADOPT IN PART**. A discussion of the assumptions and methods used in the calculations of the probabilities of unsatisfactory performance will be added. Because of

the reasons stated above, the design PUPs will not be updated at this point.
IEPR Panel Backcheck Comment: CONCUR
Concur. References to the higher probability event likelihood of failure should be removed from the text and the text should explain that the design event provides a more conservative estimate of failure.

Comment #: 5
The Environmental Assessment (EA) does not fully identify potential hazards and management actions for organic contaminants, including contamination from proposed dredge material from the Mississippi River, impacts to surface water quality from dredge material effluent return, and downstream impacts to human and aquatic populations that might result from disturbing sediments at the dredge borrow sites.
Basis for Comment:
The EA notes that the Environmental Protection Agency (EPA) (2006) found polychlorinated biphenyls (PCBs) in the vicinity of the project site. While the EA states that contaminated areas specified in the EPA report will be avoided, the potential for other similarly contaminated sites would appear possible based on the soils, adjacent land uses, and upstream sources. It is the panel's understanding that it is standard procedure on USACE projects to conduct contaminant analysis of dredge material prior to placement as necessitated by Section 404 of the Clean Water Act (CWA). When testing is determined to be necessary to comply with the Section 404(b)(1) guidelines, the USACE has provided that contaminant analysis generally follows the guidance found in the Inland Testing Manual (EPA-823-B-98-004). Based on the data within the 2006 EPA study, the panel believes that there is sufficient evidence to suggest that there is potential for contaminants to be present in dredge sediment proposed for use in this project. The study noted levels of contaminants exceeding screening levels, including benzo(a)pyrene, heptachlor epoxide, 4,4'-dichlorodiphenyldichloroethane (DDD), 4,4'-dichlorodiphenyltrichloroethane (DDT), PCB-1016, and PCB-1260 at multiple sites located within the Mississippi River stretch from upstream of the project boundary to sample locations south of the project boundary. One sample site (S-1) from the study located approximately 8 miles upstream from the sample location found benzo(a)pyrene at nearly 5 times over the Ecological Screening Level (ESL). Nearly all of the sites sampled are characterized by sediments composed primarily of fine sands, silt, and clay, which have the potential to harbor these and other similar organic contaminants. Additionally, the project site is located approximately 5 miles downstream from the Sauget & County Landfill Superfund Site (EPA I.D.: ILD000605790). EPA data (Oct/Nov 2000) indicates that sediments in the Mississippi River adjacent to the superfund site showed high levels of contaminants including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, an herbicide, and PCBs. Additionally, the EPA noted that VOC and SVOC-contaminated groundwater was being released to the Mississippi River from the site. It does not appear from the LRR that the footprint of the dredge-borrow site(s) have been identified specifically at this time. Based on the distribution of contaminants near and adjacent to the study area, composition of the sediments in the river, and potential upstream sources of these contaminants, the panel believes that the criteria triggering testing have been met as detailed in Part 230.60 of the 404(b)(1) guidelines, should the borrow area be located anywhere in the Mississippi River adjacent to the project site. The LRR and EA should be revised to better reflect this potential and note specifically that sediments from the dredge material would be analyzed prior to disturbance and placement according to the Inland Testing Manual, and that appropriate protective measures will be taken to ensure compliance with the CWA.

Return water (effluent) from dredge material placement can introduce significant sources of direct impairment due to high turbidity, temperature, and other chemical and physical factors. These potential sources of impairment should be noted as a potential impact in the EA and applicable sections of Section III A, C, and D of Appendix A. It is not clear from Section III F 2 or Section IV C of Appendix A whether National Pollutant Discharge Elimination System (NPDES) limitations and performance standards would apply specifically to dredge effluent. This should be revised to indicate that NPDES limitations would apply and demonstrate how the USACE proposes to meet those performance standards as they apply to the dredge effluent.

Dredging can disturb sediments in the river, temporarily increase turbidity downstream, and mobilize previously covered contaminants located in the areas of dredging activity to downstream locations, thus increasing the risk of exposure to the public and downstream environment. These impacts (effects) should be identified and assessed in Appendix A. Additionally, number 2c indicates, "Toxic metals or organics are not expected to be encountered during construction." This statement is not well justified in the LRR materials. Assessing this risk fully would allow for determination of any required mitigation to reduce downstream migration of sediments (i.e., silt curtains, etc.).

Significance: High

The documentation does not include an adequate assessment of environmental impacts that affect key considerations in the justification and implementation of the project.

Recommendation for Resolution:

1. Revise the LRR, EA, and relevant appendices to better reflect potential organic hazard contamination and specify that sediments from the dredge material would be analyzed prior to disturbance and placement according to the criteria in the Inland Testing Manual, and that appropriate protective measures (mitigation) will be taken to ensure compliance with Section 404 of the CWA.
2. Note potential impact to surface water from dredge material return (effluent) and whether NPDES limitations would apply in Section 4.7 of the EA and applicable sections of Appendix A, and demonstrate how the USACE proposes to meet those standards as they apply to the dredge effluent.
3. Revise the referenced section in Appendix A to fully reflect potential effects from turbidity and toxic metals/organics associated with the proposed dredging work and propose mitigation for these impacts if necessary.

USACE Evaluator Response: CONCUR

Concur that more discussion of management actions for potential hazards should be included in the EA. The Illinois Environmental Protection Agency (IEPA) will issue Section 401 water quality certification (WQC) with conditions that relate to the discharge of materials into waters of the United States. The specific conditions that IEPA describes in their 401 WQC will become part of the Section 404(b)(1) evaluation that the Regulatory Branch will conduct.

Recommendations:

1. **ADOPT**. Revisions will be made to include more information on potential organic hazard contamination and the process and criteria for dredge placement according to the

ITM will be discussed. 2. **ADOPT**. It will be noted that the Section 401 WQC will address limitations and ensure that the standards are met and that the dredging permit will also regulate the effluent. 3. **ADOPT**. More discussion of proposed dredging work and potential impacts will be added. The dredging would take place in the main channel where the sediment is composed of mostly sands and very little organics. The dredging permit will specify maximum turbidity limits as well as monitoring for toxic metals/organics.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 6
Noise and light impacts to endangered bat species are not included in the EA and Appendix A.
Basis for Comment:
The proposed plan to survey for Indiana bats and avoid tree felling during summer periods when bats are likely to be present is good. However, noise, light, and vibration should be considered as potential impacts as applied to endangered bat species. Insectivorous bats, including Gray and Indiana bats, are ecologically important species, and are declining rapidly in population size, reducing their ability to fill their ecologic niche. Research indicates these organisms are sensitive to noise, and are often displaced as a result (Shaub, et al, 2008). Noise can disrupt forage patterns and activity, and may alter roost selection and gestation success. The bat species of concern in this project currently suffer significant losses annually from white-noise syndrome (linked to the fungus *Geomyces destructans*), habitat disturbance, and pesticides. As these species are already in decline, they are likely more vulnerable to other environmental stressors. Temporary direct effects can lead to permanent secondary and cumulative effects, such as additional displacement and habitat fragmentation. Generally, threatened/endangered species are keystone species within their ecologic communities. Careful protection of these species can greatly benefit the community overall through the fulfillment of the species ecologic niches. According to the US Forest Service, these bats feed on nuisance and pest species, including alfalfa weevil and gypsy moth (pests that inflict significant economic and environmental damage nationally). Avoiding impacts to local bat populations could provide economic and environmental benefits to the surrounding community. In addition to the proposed impact avoidance from any tree clearing between April 1st and September 30th, additional mitigation for impacts might include structural sound and vibration attenuation during construction near locations likely to include bats at any time that construction activities are underway.
Significance: High
The documentation does not include a complete assessment of project impacts to endangered species that affect key considerations in the justification and implementation of the project.
Recommendation for Resolution:
Include potential noise and light impacts regarding bat populations, and develop appropriate strategies to reduce these impacts for construction activities adjacent to and during periods bats are likely to be present (i.e., sound attenuation, etc.).
USACE Evaluator Response: CONCUR
We concur that noise and light may impact bat foraging behavior. However, construction activities would occur primarily on the landside of the levee in unforested agricultural fields, which are not adjacent to potential bat roosting sites. It is anticipated that construction activities would occur during daylight hours when bats are not actively foraging. Therefore, sound and/or light attenuation would be unwarranted. Additionally, the Prairie Du Pont and Fish Lake Levee Districts Levee Improvements, St. Clair and Monroe Counties, Illinois, Project was reviewed by the U.S. Fish and Wildlife Service

(USFWS) under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973, as amended; and, the National Environmental Policy Act. The USFWS concurred with the U.S. Army Corps of Engineers (USACE) St. Louis District finding that the proposed project is not likely to adversely affect the Indiana bat (*Myotis sodalis*). Coordination with the U.S. Fish and Wildlife Service will continue throughout the pre-construction engineering and design phase, as well as the construction phase. Recommendation: **NOT ADOPT.**
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 7
In EA Section 4.16.3, the EA does not include information or quantitative data (field data) to support the statement, "Since the project area does not contain least tern nesting or adjacent foraging habitat, the St. Louis District has determined that the project poses "no effect" to the least tern."
Basis for Comment:
Aerial photos appear to show sand berms and shoreline habitat potentially suitable for nesting and foraging for Interior Least Terns along the southern half of the project area adjacent to the Mississippi River. Interior Least Terns have been described as adaptable by the U.S. Fish and Wildlife Service (USFWS) and have been noted to occasionally nest in unexpected locations, including on a levee structure in Indiana adjacent to the Wabash River in 1986. Given the endangered status of the Interior Least Tern, and the documented decline in suitable nesting and foraging habitat for this species in the region, the panel recommends conducting field surveys prior to the commencement of construction, dredging operations, or other project related activities to verify that Interior Least Terns are not making use of the project shoreline or adjacent sandbars for nesting. In the event that Interior Least Terns or evidence of nesting are found, coordination with the USFWS to avoid, minimize, and/or mitigate impacts is highly recommended.
Significance: High
The documentation does not include an adequate assessment of project impacts to endangered species that affect key considerations in the justification and implementation of the project.
Recommendation for Resolution:
Note in the EA that field survey(s) will be conducted prior to construction activities to verify that Interior Least Tern nesting and foraging activity is absent along the project area shoreline. Make note that if Interior Least Tern nesting or foraging activity is detected during proposed project actions, the USFWS would be contacted immediately.
USACE Evaluator Response: CONCUR
Concur that more information should be included to support statement of "no effect" to the least tern. There is no suitable habitat for interior least tern within the project area. The known interior least tern nesting colonies within the entire St. Louis District are located over 100 river miles south of the project area. The only other interior least tern sightings over the past 25 years of data review (IDNR reports, North American Birds quarterly journal) and personal field experiences (KAM) are of post-breeding wanderers over large interior impoundments with no suitable habitat for nesting colonies. The District believes field surveys are not necessary because of the absence of suitable nesting and foraging habitat within the project area. If at any time interior least tern nesting colonies are observed during proposed project actions, the USFWS would be contacted immediately. Additionally, the Prairie Du Pont and Fish Lake Levee Districts Levee Improvements, St. Clair and Monroe Counties, Illinois, Project was reviewed by the U.S. Fish and Wildlife Service (USFWS) under the authority of and in accordance with the provisions of the Fish and Wildlife

Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973, as amended; and, the National Environmental Policy Act. The USFWS concurred with the U.S. Army Corps of Engineers (USACE) St. Louis District finding that the proposed project will have no effect on the least tern (*Sterna antillarum*). Coordination with the U.S. Fish and Wildlife Service will continue throughout the pre-construction engineering and design phase, as well as the construction phase.

Recommendation:

ADOPT IN PART. The rationale provided above will be included in the report to support the "no effect" conclusion and it will be noted that if Interior Least Tern nesting or foraging activity is detected during project actions, the USFWS will be contacted immediately.

IEPR Panel Backcheck Comment: CONCUR

Concur, but the impact considerations do not appear to fully consider potential impacts associated with dredging work in the Mississippi river. Work in the river and foraging/nesting activity on the waterside (west) of the levee should be included as part of the overall impact considerations as they apply to this species.

Comment #: 8
The Finding of No Significant Impact (FONSI) is premature based on the need to gather additional information and provision of additional documentation regarding Hazardous Toxic Radioactive Waste (HTRW) impacts associated with dredge and fill operations, endangered species impacts, alternative analysis, and mitigation.
Basis for Comment:
According to Section 1508.9 of the Council on Environmental Quality regulations, an EA is to provide evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a FONSI. In this case, there is insufficient information and supporting data regarding HTRW impacts, endangered species, alternative analysis, and mitigation to support a FONSI at this time. It may be possible to provide additional information to support such a finding in the EA, or an EIS may be required. The FONSI would be better supported should the USACE choose to acknowledge and provide a strategy for addressing the above issues as the project proceeds in the LRR and/or EA.
Significance: High
Comment describes a fundamental problem with the project that could affect the recommendation or justification of the project.
Recommendation for Resolution:
Provide a strategy in the LRR and/or EA to address the noted issues as the project proceeds to better justify the FONSI, or remove the FONSI until the data is complete, or recommend an EIS.
USACE Evaluator Response: NOT CONCUR
The FONSI is included as a draft, unsigned document for review purposes only. A FONSI would not be signed until after the public review, and would only be signed once it has been determined that no significant impacts would occur as a result of the project. Additionally, Mississippi Valley Division comments state, "For environmental clearance, this LRR includes what is called a mitigated FONSI. There are unavoidable wetland impacts we have to mitigate for, but the areas being impacted are of lower quality and/or function as stated on page 48. An EA is an appropriate NEPA mechanism in this case in my opinion." We do not concur that there is insufficient information and supporting data regarding HTRW impacts, endangered species, alternative analysis, and mitigation to support a FONSI at this time. Regarding HTRW associated with dredge and fill operations: Sand dredged from the channel of the Mississippi River would be used as fill in some areas of this project. Therefore, an EPA sediment study of the Mississippi River, which was conducted in 2006 from Chain of Rocks to Jefferson Barracks, was reviewed. The study indicated the presence of PCB's and pesticides at 3 sites on the eastern bank between RM 167.5 and 170 in the area of Jefferson Barracks. The contaminated sites were restricted to areas along the eastern bank of the river. Having identified the presence of PCB's within the area protected by the project, all activities associated with design deficiency corrections will be completed with the intention to avoid work in or near the identified locations. Additional evaluations will be conducted as the final plans and specifications are developed and borrow requirements are more accurately identified. Samples will be taken at the determined dredging locations during the final design phase to determine that

contaminants are not present, as with all Corps dredging projects. If samples are suspected to be contaminated, then the samples will be sent to a lab for analysis. It is Corps policy to avoid contaminated areas if possible. USACE and EPA have joint guidance on the placement of dredge material called the Inland Testing Manual, originally produced in 1998.

Regarding endangered species: The Prairie Du Pont and Fish Lake Levee Districts Levee Improvements, St. Clair and Monroe Counties, Illinois, Project was reviewed by the Illinois Department of Natural Resources (IDNR), and with the U.S. Fish and Wildlife Service (USFWS) under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973, as amended; and, the National Environmental Policy Act. The USFWS concurred with the U.S. Army Corps of Engineers (USACE) St. Louis District on all determinations regarding endangered species. The USACE was given an incidental take statement for two pallid sturgeon, which could be taken as a result of the proposed dredging action. IDNR did not respond to the public review, which is typically the case when they are in agreement with USACE projects and findings. Coordination with the U.S. Fish and Wildlife Service and the Illinois Department of Natural Resources will continue throughout the pre-construction engineering and design phase, as well as the construction phase.

Regarding alternatives analysis: A thorough analysis of alternatives was completed and is described in detail in Section 5 of the LRR. Alternative selection was based on life-cycle cost analysis, which included environmental affects/mitigation costs. The placement of berms, relief wells, and pump stations will have environmental affects that will be mitigated as part of the proposed plan.

Regarding mitigation: Additional evaluations will be conducted as the final plans and specifications are developed and mitigation requirements and a site are more accurately identified. All impacts to wetland function would be fully mitigated, and a final mitigation plan with detailed performance standards would be developed.

Recommendation:

ADOPT IN PART. Additional rationale will be added to the report.

IEPR Panel Backcheck Comment: CONCUR

Concur, considering that the concerns expressed by the panel regarding the FONSI would be addressed by actions to be adopted in part by the USACE here and as noted in the responses to other comments specific to the individual concerns.

Comment #: 9
In the Mitigation Plan (MP), Section 4- Conservation Servitude and Section 12- Financial Assurances, the conservation servitude (easement) does not include financial provisions *specific to the servitude instrument* to ensure that the terms of the instrument can be monitored and enforced in perpetuity.
Basis for Comment:
A discussion of financial provisions are included in general in Section 12- Financial Assurances, but are not specific to the servitude monitoring and enforcement, which is a separate consideration from the ecologic site performance monitoring that was discussed in the mitigation plan (i.e., percent target plant cover). These assurances are typically in the form of servitude (easement) stewardship and enforcement fees that are designated specifically for easement monitoring and enforcement (if necessary). At the time that the easement is signed, filed with the property title, and put into force, these funds are typically transferred to a third party land trust charged with monitoring and enforcing the easement. Conservation easements and similar tools can be excellent instruments for ensuring that a conservation site remains protected as intended in perpetuity. This is especially true when a third party entity is clearly identified and charged with monitoring and enforcing the easement, and has the financial and organizational capacity to do so indefinitely. Developing provisions for in-perpetuity monitoring of the site and enforcement of the terms of the conservation easement ensures that the intent and integrity of the conservation site remain intact after performance-monitoring requirements under the CWA permit have been met and permit-related monitoring has ceased. Typically, representatives of the land trust would conduct annual site visits to the mitigation site, inspecting the site to ensure that the provisions of the conservation easement have not been violated since the previous inspection, and that the ecologic and environmental parameters of the site continue to meet or exceed the baseline measures developed at the time that the easement was put into force. If violations are determined to have occurred, a plan is developed with the landholder to correct that violation. Failure to correct violations and adhere to the terms of the easement are enforceable in court. It is highly recommended that a third-party, dedicated land trust that is accredited by the Land Trust Alliance (LTA) be charged with the responsibility of monitoring and enforcing the provisions of the conservation servitude instrument (easement). LTA generally recommends that when a land trust accepts a contract to monitor and enforce an easement, that the landholder also provide funding to the land trust to offset the cost of annual monitoring and enforcement of the provisions of the easement. These financial assurances (fees) vary, but are very important to the viability of the easement across time, and should be negotiated with the land trust in advance, and incorporated as a cost of the project mitigation. Failure to accurately assess and incorporate funding for these costs specifically can lead to a failure of the conservation property's function and value across the 50-year life span of the project, thus resulting in a long-term failure of the mitigation site and potentially a net loss of ecologic functions and values associated with the project. Funding for this aspect of the mitigation should be incorporated into the project planning process, rather than externalized to the non-federal partner or third-party land trust.

More information can be found at http://www.landtrustalliance.org/.

Significance: High

Comment describes a fundamental problem with the project that could affect the recommendation or justification of the project.

Recommendation for Resolution:

Revise the mitigation plan to reflect that the terms of the conservation servitude agreement will be monitored and enforced in perpetuity, preferably by a third-party land trust accredited by LTA. Specify in the mitigation plan that financial assurances will spell out monitoring and enforcement funding of the conservation servitude to ensure that monitoring and enforcement are funded in perpetuity.

USACE Evaluator Response: CONCUR

Concur that the conservation servitude (easement) does not include financial provisions specific to the servitude instrument to ensure that the terms of the instrument can be monitored and enforced in perpetuity. However, specific details for the draft compensatory mitigation plan have not been finalized. It has not been decided that a third-party would be involved with long-term monitoring of the mitigation site. Financial assurances are required for all mitigation banks within the St. Louis District; however, these generally have not been required of applicants who perform permittee responsible mitigation. The St. Louis District does not propose to require financial assurances for this project (i.e., set a new operation procedure precedence); however, it will require the applicant to provide a letter to the District detailing the specifics relative to the required funding and associated costs for the implementation and successful development of the compensatory mitigation site. During the plans and specs stage of the project, another round of public review will likely occur as project design may result in additional impacts to wetlands and water resources. Additional details will be presented to the public with final facts and figures describing overall project impacts. The actual compensatory wetland mitigation plan can be developed, the site secured and specific details can be presented. These details would be relative to acreage, plantings, timing, spacing, corrective measures, maintenance, monitoring and compliance, etc., and would be coordinated with the Federal and State resource agencies who can then offer comments and suggestions (standard procedure through our Public Review processes) relative to the draft mitigation plan.

In addition, USACE has an internal monitoring mechanism for wetland mitigation sites through its 404 permitting process. USACE uses a wetland database that it references when an application is submitted. If the applicant is proposing to do work that would affect a mitigation site, it would be flagged and damage to the site would be prevented.

Recommendation:

NOT ADOPT.

IEPR Panel Backcheck Comment: CONCUR

Concur, but the applicant letter to the USACE should also acknowledge and/or discuss funding and associated costs for perpetual monitoring and protection of the fully developed site, in addition to the implementation and development mentioned above. The 404 permitting protections mentioned would only offer protection in the event of discrete project related impacts

(i.e., fill or other work) where a permit is sought out, but not necessarily other site related degradation that should be considered (i.e., invasive species) in order to maintain the ecologic functions. Failure to adequately plan for onging site protection and maintenance beyond the perfomance monitoring associated with the mitigation site development required by the USACE opens the door for potential site degradation and loss of ecologic function and value after that monitoring has ceased. It is reasonable to consider how the perpetual site monitoring and maintenance needs will be accomplished during the planning stages of the project rather than addressing it adhoc at a later date.

Comment #: 10
In the MP, Appendix EA, Section 8- Performance Standards the invasive species land cover component is much too high to ensure success in what is described as a long-disturbed environment.
Basis for Comment:
Invasive species are characterized by high fecundity and few (if any) natural controls in their non-native environment, giving them a significant competitive advantage over native species and allowing them to imbed and become pervasive over time (often in spite of efforts to control them). Many, including kudzu, can easily overgrow adjacent native vegetation in a single growing season, killing resident native plant species. In disturbed environments (including fallow agricultural lands, maintenance right-of-ways, etc.), many invasive plant species simply outcompete native plants for resources over time, especially once a seedbed is established in the soils. By the time 25% site coverage has occurred, many invasive plant species have had ample opportunity to become well established and are much more difficult to remove permanently. Once a seedbed is established, it can allow many invasive plant species to recover and reemerge well after monitoring and control efforts have ceased. In both cases, functional value of the restored habitat decreases as the biologic ecosystem becomes simplified. Impacts from invasive species can include biodiversity reduction, hydrologic changes to wetlands, and changes to native faunal uses. It is typically more cost-effective over time to manage these invasive plants when the populations are low. It is highly recommended that the performance standard target for invasive species land cover be reduced to 10% (the most common standard nationally) or less to prevent establishment of invasive plant species and a subsequent reduction in habitat values. In addition to studies investigating the prevalence and functional ecologic impacts of invasive species, there have been additional studies investigating invasive species performance standards for compensatory mitigation. There is some evidence in the literature to suggest that performance standards applied to invasive plant species might best be set individually for each species, and on a case-by-case basis for mitigation sites to reflect differences in the ecologic risk associated with different species in specific habitats, and the in-situ conditions of the proposed mitigation site relative to natural reference sites in the same watershed or ecologic region.
Significance: High
The performance standard specified is inadequate affecting concerns in project implementation.
Recommendation for Resolution:
Revise the invasive species performance standards to reflect a lower overall coverage (10% or less is recommended), or a standard that is clearly detailed and demonstrated to meet the ecologic goals of the site based on quantitative data or recommendations from relevant literature.
USACE Evaluator Response: CONCUR
Concur. This recommendation will be implemented when the Mitigation Plan is revised during the pre-construction engineering and design phase, in coordination with federal and state natural resource agencies.

Recommendation: **ADOPT IN THE FUTURE.**
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 11
The estimated operation, maintenance, repair, rehabilitation, and replacement (OMRR&R) annual cost in LRR Table 6-3 appears to be calculated incorrectly.
Basis for Comment:
The annual OMRR&R cost estimate in the document is $164,000. A calculation of the annualized OMRR&R cost based on data in LRR Table 6-3, without the year-50 costs for Inspection & Minor Repair and Mech./Elec. Major Rehab. Costs, shows that it should be $177,851.
Significance: Medium
Approximately $13,000 of annualized cost added may affect the BCR.
Recommendation for Resolution:
Recalculate OMRR&R costs and BCR, and change text in the economics appendix and LRR.
USACE Evaluator Response: CONCUR
Concur. In the calculation of OMRR&R, 14 wells were left unaccounted for. Recommendation: **ADOPT**. The correction will be made in the report.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 12
In the LRR, OMRR&R costs, Inspection & Minor Repair and Mech./Elec. Major Rehab. Costs for year-50 were not counted.
Basis for Comment:
All economic costs anticipated within the stated planning horizon should be counted. The OMRR&R costs presented in Table 6-2 Page 42. With the year 50 costs, OMRR&R costs should be $180,353 instead of the corrected $177,851. This is an insignificant change to the B/C ratio. However, the net benefit of the National Economic Development (NED) plan (Berms with Relief wells) is only $3,000 more than the "Berms Only" plan (Page J-20, Table 8). It appears that inclusion of the year 50 costs would reduce net benefits of the NED plan by $2,500.
Significance: Medium
The BCR is affected by a small amount, but the NED plan could be affected.
Recommendation for Resolution:
Include year-50 costs in the OMRR&R, or better justify why year-50 costs are not included.
USACE Evaluator Response: CONCUR
Concur. Since the project life is 50 years, you would not necessarily rehab anything in year 50. At that point in time, analysis would be done to see what needed to be done and a new project lifecycle would begin. Recommendation: **ADOPT**. The need to include year 50 inspection costs will be evaluated and included if needed, or if not, justification will be provided.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 13

The agricultural benefit estimate is likely overstated because it does not include agricultural production costs that would be avoided because of a flood. On the other hand, the agricultural benefit is understated because clean-up costs have not been included.

Basis for Comment:

The agricultural damage estimates are less than crop revenue primarily because only about 50% of the cost of crops can be counted under NED. However, the economic loss from flooding of agricultural lands is less than revenue also because floods can occur when crops are not planted, and floods can occur before all costs are sunk. The measure of benefit should be crop revenue, minus cropping expenditures not yet incurred. This measure can be developed for different times of the year and weighted by the probability of damaging events at different times of the year.

The agricultural damage estimates should include clean-up and land restoration costs required to return the land to a productive state. These costs may include debris removal, excavation of sediment from roads and other improvements, re-grading, and soil treatment.

Significance: Medium

If agriculture damages are reduced by half, EAD would be reduced by about $14,000.

Recommendation for Resolution:

1. At a minimum, crop revenues should be reduced for harvest costs. Harvest costs will clearly not be incurred if cropland ready for harvest is flooded.
2. Include agricultural land clean-up costs as damages in addition to lost crop net revenue. At a minimum, discuss agricultural land clean-up and restoration costs.

USACE Evaluator Response: CONCUR

Concur. The crop damages already take into account the harvest and production costs. This will be more clearly stated in the narrative.

Recommendation:

1. **NOT ADOPT**.
2. **ADOPT**. An explanation of the clean-up costs will be added to the report.

IEPR Panel Backcheck Comment: CONCUR

Concur, but general procedures for agricultural damages should be developed that explicitly include a distribution of expected annual flood timing and net revenue losses at those times, and land damages and clean-up benefits (avoided costs) should be quantified.

Comment #: 14
Other O&M cost savings may have not been counted as a benefit.
Basis for Comment:
Other O&M cost savings might be identified and counted as a benefit. Page 42 of the LRR shows an Additional Grass Mowing Annual Cost of $19,500 for the 195 acres of berm. It is not clear whether the berms cover an area that, without-project, would also be mowed.
Significance: Medium
There is not much additional O&M cost savings expected that would affect project implementation.
Recommendation for Resolution:
Consider if any other with-project O&M costs would reduce or replace existing costs. Consider monitoring costs that may not be required with-project. Include these cost savings as a benefit.
USACE Evaluator Response: CONCUR
Concur. The PDT will review the changes to the existing O&M caused by the new improvements. Recommendation: **ADOPT.**
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 15
Erosion loss on the landward side of the levee because of water ponded or flowing along the landward side of the levee has the potential to exacerbate or increase the impact of piping, sand boils and other potential failure mechanisms. The method of mitigating landward levee erosion is not clear.
Basis for Comment:
Where water can pond or flow on the landward side of the levee there is the potential for erosion independent of piping or sand boils. This ponded and/or flowing water may result from surface runoff, high water tables, pumping, and other factors. Moreover, the shear force from water flowing along the landward side of the levee can exacerbate the impact of piping and sand boils by increasing erosion on the levee and further decreasing stability.
Significance: Medium
The lack of discussion of mitigation of landward levee erosion affects the complete understanding of actions to manage project impacts.
Recommendation for Resolution:
Address in the text what methods to mitigate landward levee erosion from ponded or flowing water (on the landward side of the levee).
USACE Evaluator Response: CONCUR
Concur that erosion of the landward side of the levee is an important consideration. The area is currently not experiencing any landward-side erosion problems. All flow, including relief well flow, enters designed ditches that convey the flow to the project pump stations. The ditch carrying the greatest flow (37 cfs) at the greatest slope (.005) creates a maximum velocity of 3 fps in the ditch. The ditches will be seeded with a mix of rye and fescue grasses, which provide ample erosion protection against this low velocity. Given the likely, very long inundation time associated with the project design flood, these grasses will drown, but their stalk and root system will remain intact still providing a measure of erosion protection. Even if bare spots develop in the ditch, a flow velocity of 3 fps will not erode the clayey soils. In addition, the ditch and pipe collector system will be designed to be at least 50 feet from the nearest leave feature (levee toe or berm toe) at all locations, which will minimize the impact on the actual levee. Recommendation: **ADOPT IN PART**. A description of how the proposed project should not produce landside levee erosion and how the drainage system will handle flow will be included in the report.
IEPR Panel Backcheck Comment: CONCUR
Concur. Please note that language should be included that describes how scour from non-well-related surface flows will be addressed.

Comment #: 16
Comprehensive hydraulic design of the relief wells are absent from the present study.
Basis for Comment:
To understand how the present design is to be implemented, the design information for the relief wells should be given within the text. Some design calculations are included in the Plates in Appendix D, but without accompanying explanations, equations, or supporting documentation. If, however, the relief wells will be design/build in a future phase then this should be clearly stated in the text. Additionally, the design standards, basis of design documents, variability of relief well design within the project, and other relief well design considerations should be referenced. A general design drawing wells should be included.
Significance: Medium
The lack of information and discussion affects the understanding of the appropriateness of key design details.
Recommendation for Resolution:
Update the text to include information related to the design of project relief wells.
USACE Evaluator Response: CONCUR
Detailed design of relief wells is not present in this LRR decision document. The detailed design will not occur until the plans and specifications phase of the Prairie Du Pont project. At that time, CEMVS will complete a "pilot hole" at every proposed relief well location obtaining detailed geotechnical exploration, sampling, and testing to support the final design of the well. In a pilot hole, split spoon samples are typically obtained at 2.5-foot intervals. Subsequent soils testing on these samples (Atterberg Limits and mechanical analyses) support the final well design, which includes screen diameter, start/stop elevations of the well screen, filter pack and screen slot-size selections. Recommendation: **ADOPT**. A paragraph similar to the one above will be added to the Geotech Appendix (Appendix D).
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 17
The documentation lacks key graphics that are needed to support the text in several cases.
Basis for Comment:
There are presently no figures illustrating historical problem locations. Moreover, it is unclear to the reader where improvement locations are in relation to the historical seepage, piping, and sand boils. A map or other graphic illustrating where the most recent (1993, 1998, etc.) event seepage areas occurred should be included. Also, a graphic or map to illustrate where project improvements will be implemented to address these areas of concern and/or potential failure locations should be included. The project justification will be strongly supported by these graphics. There are also insufficient graphics within the LRR or EA to allow the reader to evaluate the text discussion or tabular data (Tables EA-MP-2, EA-MP-3, and EA-MP-4) on existing conditions or project impacts. It is not clear how these tables correspond to where the impacted site locations are within the project area included in the EA (or text that refers the reader to the appropriate appendices or plates in Appendix D). Also, it is not clear why the tables are not completed by impact location (station), and instead are completed with "NA's." This is a matter of clarity and is important for an understanding of the project and public notice. Evaluating the proposed project on the basis of National Environmental Policy Act compliance and the underlying scientific accuracy/assumptions/completeness is difficult when the spacial locations are not clear in the supporting materials, and information regarding individual impacted sites is not complete. The text does not adequately present a clear understanding of where cultural resources are relative to the points of impact. The text describes the cultural resources and potential impact resulting from the proposed project, but lacks any significant graphics showing where the cultural resources fall relative to the points of impact. This is important for reviewer, including the public, understanding of the overall impacts of the project.
Significance: Medium
The documentation lacks sufficient graphics that would greatly assist in providing a complete understanding of key aspects of the project.
Recommendation for Resolution:
1. Update the text to include historical failure and proposed improvement graphics in the same figure. 2. Include a map depicting the impact locations and include missing data (or rationale for excluding it). 3. Include graphics (i.e., maps or diagrams) detailing relative locations of cultural resources and impact sites.
USACE Evaluator Response: CONCUR
Concur that graphics showing the areas of concern identified during previous floods and their relationships to the proposed improvements are not present but would provide a

good perspective of the project. However, the text and Table 1 in the Geotech Appendix (Appendix D) do describe these areas in sufficient detail to allow the reader to mark-up the drawings. At this time, such maps are being created for inclusion in the report of the recent Periodic Inspection of the Prairie Du Pont/Fish Lake system, but these maps are preliminary work products, have not been fully reviewed, and may not be included in this report at this time.

For graphics of tabular data (such as wetland area), the plates in the design appendix (Appendix E) do show some information along with the proposed project features. Specific impact locations (station) are not specified for some impacts (e.g., Table EA-MP-3) because similar land cover types are aggregated for calculations in the Wildlife Habitat Appraisal Guide (WHAG) instead of being calculated at each specific location.

Recommendation:

1. **ADOPT IN FUTURE**. Future decision documents will include key graphical maps illustrating spatial relationships between proposed solutions and areas of concern identified from flood fight experience. If such a graphic is approved before this report is finalized, it will be included.
2. **ADOPT IN PART**. Text will be added to refer the reader to appropriate plates in the appendices.
3. **NOT ADOPT**. The specific location of cultural resources is privileged information and is not included in public documents. Site location is specifically exempt from disclosure and from FOIA requests.

IEPR Panel Backcheck Comment: CONCUR

Concur given that the maps will be included in future drafts. Moreover, the reader should not need to "mark up" maps with data in other parts of the text as a reader may make assumptions not included or intended by the study. Graphics should stand alone. References in the text should reference the maps and vice versa.

Comment #: 18
The heterogeneity of the soils underlying the project site is not adequately discussed.
Basis for Comment:
Section 4 of Appendix D discusses the horizontal and vertical distribution of sediments in a relatively cursory fashion. Locations within the project watershed typically have great variation in stratigraphy owing to the very active geologic and hydrologic history of the Mississippi River. This high level of heterogeneity of the sediments within the project is important to the design and placement of the relief wells owing to the related variability in conductivity, porosity, pore distribution, and other sediment parameters.
Significance: Medium
A complete understanding of the high level of heterogeneity of the sediments is a critical aspect of project implementation.
Recommendation for Resolution:
Update the text to more fully address the variability of the soils, particularly related to the design of the relief wells, how the design of the wells of the will be determined by the local stratigraphy, and how design considerations will be addressed according to the specific design and technical manuals.
USACE Evaluator Response: CONCUR
Concur that how the variability of soils was taken into consideration for the underseepage design could be discussed more and that it is an important consideration in relief well design. SSI (Site Specific Investigation) exploration included landside and riverside exploratory borings at an average rate of 16 per mile, all completed to support the analyses of the underseepage failure mode. Three of every four landside borings completely penetrated the surficial blanket and extended 20-feet into the aquifer. One of every four landside borings was carried to refusal on the top of rock forming the valley floor. All riverside cone penetrometer borings completely penetrated the surficial blanket and extended 20-feet into the aquifer. The detailed analyses of the exploration and testing results included transforming the layered fine-grained blankets (landside and riverside) into equivalent layers of clay (per USACE underseepage guidance) to support the underseepage analyses. Detailed analyses of the deep borings and associated laboratory testing described the aquifer materials and their permeability, also to support the underseepage analyses. These analyses exemplify CEMVS efforts to include the heterogeneity of the alluvial plain into its analyses. Final design of the relief wells will be completed in the plans and specifications phase and will include these analyses. The response to Comment #16 lays out the efforts that will occur in this phase of the project. Recommendation: **ADOPT IN PART**. A paragraph similar to the one above will be added to the Geotechnical Report (Appendix D).

IEPR Panel Backcheck Comment: CONCUR
Concur. Please note that brief language should be included that describes the nature of the heterogeneity of the soils and a reference to the borings in Appendix D.

Comment #: 19
Cumulative and secondary effects are not fully considered in the EA.
Basis for Comment:
Cumulative effects analysis within the EA and Appendix A appear to be limited to federal and local partner projects. It is not clear whether any attempt to identify non-federal, commercial projects in the vicinity may have been completed or are reasonably foreseeable. This may be partly a result of the narrowly defined geographic area, which may not accurately envelop projects that could impact the project area or organisms making use of the project area (including endangered species).
Significance: Medium
The documentation does not include discussion necessary for a complete understanding of the project scope.
Recommendation for Resolution:
Note in the EA and Appendix A whether any non-federal, commercial projects were scoped or identified. This may require expanding the geographic boundary to recognize effects from upstream and across the river from the project area, and other adjacent locations.
USACE Evaluator Response: CONCUR
Concur. This recommendation will be addressed and implemented should the same or similar kind of public comment be submitted. Recommendation: **ADOPT IN THE FUTURE.**
IEPR Panel Backcheck Comment: CONCUR
Concur, but this recommendation should be addressed as a matter of comliance with NEPA, rather than being contingent on additional public comments reflecting the same. NEPA, the Council on Environmental Quality, and a considerable amount of subsequent case law on the subject address the need for thorough cumulative impacts consideration as part of project planning. Failure to fully consider these impacts could unnecessarily expose the project to legal challenge.

Comment #: 20
The performance standards in Section 8 of the MP appear arbitrary, and there is no discussion in the text to support how the standards were determined.
Basis for Comment:
Some discussion of how and why performance standards are set for compensatory mitigation should be included in the MP. Currently, the selection of the performance standards noted in the MP are not backed up in the document in terms of how the coverage ratios chosen would ensure ecologic success. This is extremely important in order to determine that there will be no net loss of functions or values associated with the proposed project, and that the mitigation site will achieve the desired outcome. While the standards are quantitative and verifiable in nature (percent cover), the plant coverage ratios for the three communities identified appear arbitrarily chosen and not tied to any specific outcome related to ecologic function (i.e., ecologic niche provision, habitat values, etc.). It is common practice to identify a reference site that meets the desired performance standard, and match the mitigation site design criteria accordingly. It is not clear from the EA whether the St. Louis District Regulatory Division currently has compensatory mitigation guidance that provides a rationale for developing performance standards. If so, these should be referred to in the text of the EA.
Significance: Medium
The documentation does not include discussion of key considerations affecting a complete understanding of the project.
Recommendation for Resolution:
Include a discussion of how the performance standards for the project are developed and set, including reference to the relevant science and regulatory protocols.
USACE Evaluator Response: CONCUR
Concur. The St. Louis District Regulatory Branch does not have specific, standardized compensatory mitigation site performance standard guidelines. The Regulatory Branch would draft special conditions for the Section 404 evaluation that would include specifics on the compensatory wetland mitigation plan as well as maintenance, monitoring and compliance guidelines. All of this would occur once a project was approved, received funding and survived to the plans and specs stage. Recommendation: **ADOPT IN THE FUTURE.** This recommendation will be implemented when the Mitigation Plan is revised during the pre-construction engineering and design phase, in coordination with federal and state natural resource agencies.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 21
In the EA-MP Section 10- Long-term Management Plan, it is not clear if the entity responsible for long-term monitoring and the entity conducting any corrective action in the event of a violation of the conservation servitude are two distinct entities to avoid a conflict of interest should a violation of the servitude agreement occur.
Basis for Comment:
LTA and its partners typically require that servitude (easement) enforcement be the role of a third-party, accredited land trust, and that site management be the responsibility of the landowner or named managing entity separate from the land trust. This is important to ensure the integrity of the servitude agreement, in that the entity responsible for meeting the terms of the servitude agreement is not also responsible for enforcing these same terms (thereby monitoring and possibly enforcing on itself).
Significance: Medium
The documentation does not include discussion necessary for a complete understanding of the project.
Recommendation for Resolution:
Revise Section 10 to reflect that enforcement of the servitude and any required correction to meet the terms of the agreement will be by different parties.
USACE Evaluator Response: CONCUR
Concur that information is not present. Nothing specific relative to the compensatory wetland mitigation plan has been decided at this time. It has not been determined whether a third party would be involved in maintenance, monitoring and compliance associated with the mitigation site or not. Recommendation: **ADOPT IN THE FUTURE**. This recommendation will be implemented when the Mitigation Plan is revised during the pre-construction engineering and design phase, in coordination with federal and state natural resource agencies.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 22
In the EA-MP Section 13- Cost, and Table EA-MP-6, the costs shown appear to be arbitrary. There is no discussion included regarding how these monitoring costs were established.
Basis for Comment:
These should be based on real estimates of time and effort required to mobilize field personnel, collect data, etc., and should reflect likely cost increases across time (i.e., travel costs, personnel, materials, etc.).
Significance: Medium
The documentation does not include information that affects a complete understanding of the project.
Recommendation for Resolution:
Revise costs to reflect real estimates.
USACE Evaluator Response: CONCUR
Concur. Nothing specific relative to the compensatory wetland mitigation plan has been decided at this time including costs necessary for construction, monitoring and maintenance. Recommendation: **ADOPT IN THE FUTURE.** This recommendation will be implemented when the Mitigation Plan is revised during the pre-construction engineering and design phase, in coordination with federal and state natural resource agencies.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 23
The level of information in the evaluation of alternatives involving slurry cutoff walls is not consistent with other alternatives analysis.
Basis for Comment:
Section 2 of the EA indicates that slurry cutoff walls were not evaluated as an alternative in this project due to high cost relative to the relief well and berm alternatives. The EA indicates that slurry walls were in fact considered for the PdP/FL project, but were dismissed as being too costly based on work done on a previous project, but does not specify that project or provide reference to the costs that were developed. If the action was considered, enough information should be included for the reader to evaluate this alternative relative to the others considered, and to provide enough information for the reader to understand the rationale for the ultimate alternative recommendation. In this case, there is not enough information in the EA to support the USACE decision not to carry consideration of the slurry wall alternative forward. This could rely on the data developed for the prior project, but should be included in this EA for review.
Significance: Medium
The documentation does not include discussion necessary for a complete understanding of the project scope.
Recommendation for Resolution:
Include some additional information regarding the slurry wall alternative under Section 2 of the EA- Alternatives Considered by Decision Segment, and in appropriate appendices.
USACE Evaluator Response: CONCUR
Concur that more information on the analysis of other alternatives was included than on cutoff walls. Cutoff walls were screened out very early in the plan formulation process because of life-cycle cost analysis, including mitigation and O&M costs. A full analysis was done on a similar design for this project last year, and that analysis included cutoff walls. The basis of screening out the walls on this updated design was the analysis that was done last year. Because it was a different design, the previous analysis of cutoff walls could not be included for a side-by-side comparison with relief wells and seepage berms in this report. More documentation/explanation of this rationale can be included in the report. Recommendation: ADOPT. The additional information provided above will be included in the EA. EA Section 2 - Alternatives Considered By Decision Segment, was revised.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 24
The potential effects of climate change do not appear to be considered in the LRR or supporting documents.
Basis for Comment:
Climate change is projected to increase extreme weather events over the 50-year project life. These could include both extreme drought and extreme precipitation and flood events. It is not clear from the LRR and supporting materials whether this has been taken into consideration, what effect (if any) these extreme events might have on the levee or other elements of the proposed project, including proposed mitigation, and whether this might have an effect on the alternatives analysis and selection.
Significance: Medium
The documentation does not include discussion of key considerations that affect a complete understanding of the project.
Recommendation for Resolution:
Include some discussion of climate change within the LRR and/or supporting documents.
USACE Evaluator Response: CONCUR
Concur that the effects of climate change are not discussed in this report. Although more extreme weather could lead to more extreme flood events, the proposed design (and original authorized design) is based on a stage elevation (52 feet) on the St. Louis gage, not a frequency event. Therefore, the underseepage corrections are designed to whatever flood event produces this stage. This stage is tied to an elevation on the earth that does not change with changing climate or hydrological conditions. Given that the design was not specifically tied to a specific frequency, any discussion of the effects of global climate change on this event is not pertinent to the discussion of the Prairie du Pont and Fish Lake levee. For a reference on that subject, the Corps' Upper Mississippi River System Flood Flow Frequency Study (2004) investigated climate change and found that no definitive numerical adjustment could be quantified for flow frequency determination. As for mitigation, any changes due to climate change should be covered by the monitoring and adaptive management requirements of the mitigation. If conditions change, the performance standards described in the mitigation plan would still be binding. Adaptive management would be employed in order to accomplish the performance standards. Recommendation: ADOPT. A discussion of climate change will be included in the LRR and EA. Added Section 6.5 Global Climate Change to the EA.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 25
The subject levee provides indirect protection from flooding of other areas. The benefit of this indirect protection is not discussed or quantified as a benefit.
Basis for Comment:
LRR Section 5.2.1 Page 24. If the levee failed in the north part of the levee system, the river water flowing through the breach could build up force and could cause breaches in the PdP/FL south flank and the north flank of the Columbia levee immediately to the south of the PdP/FL system. The economic benefit of avoiding this effect is not counted.
Significance: Low
The expected benefits potentially gained would not affect project implementation.
Recommendation for Resolution:
At a minimum, include a discussion of this potential benefit within the economics appendix. If the probability of a breach in the north part of the system can be quantified, and potential damages in the other areas have been quantified, then a benefit estimate should be provided.
USACE Evaluator Response: CONCUR
Concur. While this is a reasonable assumption and it has happened in the past, it is very difficult to quantify and would likely only occur at very low frequency events. A discussion of this type of event will be included in the report. Recommendation: **ADOPT IN PART**. A discussion of this type of event will be included in the report.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 26
Vehicle and mobile home damages do not consider probable notification time.
Basis for Comment:
From the mid-point call, the USACE stated "If the levee were going to be overtopped, the Corps would generally be able to predict that it would be and give advanced notice" Notification time has a large influence on damages to mobile assets. Presumably, a large share of vehicles present in the study area would be removed, but some would not. On the other hand, some of the mobile homes would be removed.
Significance: Low
Since no vehicle damages were counted, but all mobile homes were counted, it is unclear whether or not a realistic treatment of notification time would increase EAD.
Recommendation for Resolution:
Discuss the notification system in place and how vehicle and mobile home costs might be affected.
USACE Evaluator Response: CONCUR
Concur. There currently is no formal notification system on file at the St. Louis District Office and the local levee district does not have an emergency action plan on file. While most of the mobile homes in the levee are permanent in nature, a discussion of the possible effects will be added to the report. Recommendation: **ADOPT IN PART**.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 27
The new Mississippi River bridge project is not considered within the traffic delay analysis.
Basis for Comment:
Page J-21: the ongoing construction for the addition of a new bridge from Illinois into St. Louis very close to this project area. The Mississippi River bridge project should be considered within the traffic delay analysis.
Significance: Low
It is expected that inclusion of the bridge project would not have much effect on the traffic delay analysis.
Recommendation for Resolution:
If practical, include the Mississippi River bridge project in the traffic analysis. Describe how the bridge affects the traffic cost analysis. If it has no effect, explain why.
USACE Evaluator Response: CONCUR
Concur the new bridge is not included in the analysis. However, the new bridge will not impact delay times. The traffic analysis included in this report is based on the distance required to travel to the Poplar Street Bridge. The Poplar Street Bridge is about 3 miles south of the new bridge and will remain the closest available option to cross the Mississippi River if access to the Jefferson Barracks Bridge is blocked by a flood event in the Prairie du Pont Levee. Recommendation: **ADOPT**. Discussion of why it has no effect will be included.
IEPR Panel Backcheck Comment: CONCUR
Concur, but the idea that the new bridge will have "no effect" may not be accurate. With extensive traffic delays, some drivers may opt for the new bridge instead of the Poplar Street Bridge. It might be better to argue that the new bridge would have "little effect." It is not clear whether or not the traffic delay analysis includes delays caused by the additional traffic on the remaining routes. If not, traffic delay costs may be understated. Note: quadratic programming can be used to consider how loss of a route affects route choice, crowding on the remaining routes, and travel costs for all users.

Comment #: 28

The economics appendix is not consistent regarding whether or not specific costs are included in the economics analysis.

Basis for Comment:

Specific costs include railway transportation delay, railway facility damage, vehicle damages; and commercial, industrial, and public contents damages.

Regarding transportation delay costs, from Page J-6:

> The economic impacts on transportation interruptions within the project area due to a project flood were estimated for both vehicular and railway interruptions.

But on Page J-21:

> The total cost expressed within this report relating to the inundation impacts to the Dupo, IL switching station are greatly understated. While the structure and infrastructure costs were attained, the truly large and complex costs of delay impacts were not provided.

The incorrect statement on Page J-6 could lead some to believe that this benefit has been counted.

Regarding railway facility damage costs, from Page J-5:

> Within Dupo, IL, there is a moderately sized rail yard and truck-transfer station. No value was given to this as of the current date. The railway lies within the floodplain so there are known damages and we are currently working with executives within the organization to quantify costs associated with this site.

But on Page J-21:

> While the structure and infrastructure costs were attained, the truly large and complex costs of delay impacts were not provided.

The statement on Page J-5 suggests that facility damages were counted, but the statement on Page J-21 suggests that they were not.

Regarding vehicles, from Page J-14:

> In order to calculate the damages from the inundation of structures, their contents, and ***vehicles*** that would occur at each stage, three relationships were developed for this analysis: depth-damage relationships, stage-frequency relationships, and levee system failure probabilities. . .

From the mid-point call, the USACE stated "no vehicle damages or estimates were done for this report."

Regarding contents, on Page J-14 to J-15:

> Commercial, Industrial and Public structures were not assigned a content value for this study. All damages associated with these structures are based on the depreciated replacement value of only the structure in question, not the value of any contents within the structure.

In contrast, the next paragraph states (***emphasis added***):

> A normal probability density function was used for each of the residential and ***commercial content categories***. . . .***An uncertainty range was not assigned to the content value of the structures on the industrial complex.*** The facility operators provided the value of the contents for these buildings. It must be noted here that ***no content or other damage value was obtained for the commercial or industrial structures.***

Significance: Low

This comment suggests text revisions that would not affect the economic analysis, but are suggested to make the analysis documentation more understandable.

Recommendation for Resolution:

Correct all text to show that:

- railway delay costs were not counted
- railway facility damages were counted
- vehicle damage costs were not counted
- all content damages were included, and how

USACE Evaluator Response: CONCUR

Concur. The text needs to be clearer.

Recommendation:

ADOPT. All text will be reviewed and corrected.

IEPR Panel Backcheck Comment: CONCUR

Concur. The response addresses the stated concern.

Comment #: 29
There is no information for the Regional Economic Development (RED) account included.
Basis for Comment:
Review of Economics Appendix, LRR, Environmental Assessment, and confirmed by mid-point review confirms that the RED account is not included.
Significance: Low
The missing information does not affect plan selection, but local interests may want to see it.
Recommendation for Resolution:
Include a small RED section. Include discussion of potential costs of not maintaining accreditation for the 100-year flood event.
USACE Evaluator Response: CONCUR
Concur. Including an RED section about the impacts to the local levee district would be beneficial to the report. This suggestion will be considered for future reports, but will not affect the decision process. Recommendation: **ADOPT IN THE FUTURE**.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 30
The source of EAD for agriculture is not completely documented.
Basis for Comment:
From Page J-6: . . .the total annual gross revenue from crop production in the project area for a typical year approximates $4,501,000. From Page J-15, Table 2, the maximum EAD for agriculture is $2,505,000. From Page J-15: The agricultural depth-damage curve was developed using Geographic information system (GIS) software to identify what percentage of the fields would be covered at each flood frequency. For the midpoint review, the USACE responded: About 95-98% of the fields are covered by a 0.200 flood frequency, but only about 50% of the cost of crops can be counted under NED.
Significance: Low
The manner in which references and analysis are presented can affect understanding of the project.
Recommendation for Resolution:
Mention that only about 50% of the cost of crops can be counted under NED, and explain why, and state that this is the main reason why full agricultural revenues are not claimed as potential benefits.
USACE Evaluator Response: CONCUR
Concur. More documentation is needed. Recommendation: **ADOPT**. A more complete description of the agricultural damage estimation will be included in the report.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 31
It is not clear in the EA how wetland resource determinations were conducted to calculate impacts.
Basis for Comment:
The EA does not include discussion of how the wetland resources in the project area were determined. Presumably, these were either delineated in the field or calculated using a GIS overlay (using National Wetlands Inventory maps, or other resource). The method used is important to the accuracy of the impact calculation and resulting mitigation calculations.
Significance: Low
The documentation does not include discussion necessary for a complete understanding of the project scope.
Recommendation for Resolution:
Identify the method for wetland resource determination in the EA and Appendix A.
USACE Evaluator Response: CONCUR
Concur the discussion of how wetland resources were determined should be included. The wetlands were determined by using NWI maps and our local GIS database. Biologists from our Environmental and Regulatory Offices field verified the wetlands and made the necessary adjustments to the maps based on the data gathered in the field. No actual wetland delineations with data sheets, transects, etc. were conducted. Recommendation: **ADOPT**. This information will be included in the report.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 32
The sentence on Page EA-404-8 under "Description of Proposed Discharge Sites": "Although exact locations have yet to be identified, wetland sites will be avoided," is unclear and potentially misleading.
Basis for Comment:
The EA details a number of wetland impacts associated with the discharge of dredge material.
Significance: Low
Comment affects the technical quality and understanding of the project, but there is limited concern regarding project implementability.
Recommendation for Resolution:
Revise the sentence accordingly.
USACE Evaluator Response: CONCUR
Concur. Recommendation: **ADOPT.** The sentence on Page EA-404-8 under "Description of Proposed Discharge Sites" was revised, and states, "Although the exact sand stockpile locations have not been identified, stockpiling the material in wetland sites will be avoided."
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 33
There are no recommendations or qualifications related to the inspections of the project improvements for future maintenance and operation.
Basis for Comment:
The continued safe operation of the project improvements will be based, in part, on continued inspections and maintenance of project features. Some discussion of the project improvement's maintenance and inspection should be included, particularly if a local agency will be assuming these duties. Moreover, any associated costs should be included in the economic analysis.
Significance: Low
Comment affects the understanding of the project but has little effect on project implementability.
Recommendation for Resolution:
Add project improvements inspection requirements or a reference to inspection requirements such that improvements can be maintained at design operating levels.
USACE Evaluator Response: CONCUR
The local levee districts are responsible for the operation and maintenance of all project features, including features that would be constructed with this plan. To ensure proper O&M is performed, levee districts are provided O&M manuals and levee handbooks that describe the proper methods and intervals related to O&M to ensure that project features will maintain performance levels. In addition, USACE performs routine inspections every year as well as periodic inspections, typically every five years. Routine inspections are intended to verify proper maintenance, owner preparedness, and component operation. Periodic inspections are more detailed and are intended to verify proper maintenance and component operation and to evaluate operational adequacy, structural stability, and safety of the system. Recommendation: **ADOPT**. This information will be added to Section 6 of the report.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 34
The understanding that the present design standard for water surface elevation (WSE) exceeds the Federal Emergency Management Agency (FEMA) standard, and the extent of this exceedance, is not discussed in the LRR.
Basis for Comment:
In Appendix C, the test refers to the FEMA 1% event for the project to be developed in the future by an outside engineer. The present study's design standard appears to significantly exceed FEMA event. It will be beneficial to the reader to understand that the present design standard exceeds the FEMA standard, and the extent of this exceedance. An approximate WSE at the gage location is an acceptable comparison.
Significance: Low
Comment affects the technical quality and understanding of the project, but there is limited concern regarding project implementability.
Recommendation for Resolution:
Add a comparison between the current design and FEMA WSE.
USACE Evaluator Response: CONCUR
Concur that including the WSE on the St. Louis gage of the FEMA 1% event would add clarity and aid in understanding of the project. Recommendation: **ADOPT**. A comparison between the 1% and 52-foot water surface elevation at the St. Louis gage will be added into the report.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.

Comment #: 35
Various tables within the documentation are lacking important details that make specific information unclear.
Basis for Comment:
Several tables within the text (for example: D-1, C-1) lack units, headings and other data to understand what is being presented to the reader. The meaning and intent of the data within the tables are unclear to the reader. Additionally, it would be helpful to the reader to have the decision segments referred to in imbedded tables also be depicted graphically in accompanying maps for reference. Tables in the EA document routinely refer to decision segments (i.e., "Old Prairie du Pont", "Falling Springs", etc.), but a map showing the relative locations of these decision segments within the project footprint is not prominent within the EA (other than Figure EA-1, which does not specifically delineate the decision segments). This is a special case given the overall high quality of the supporting figures (maps) within the EA. All of the maps would benefit from an imbedded layer showing the decision segments for reference. Incorporating this layer into the figures would be a benefit for reviewers during the public notice phase and aid in understanding the proposed project.
Significance: Low
Comment affects the technical quality and understanding of the project, but there is limited concern regarding project implementability.
Recommendation for Resolution:
1. Review and update the tables within the study to include units, column headings and other information to increase legibility, and hence value, of the tables. 2. Include a map showing the decision segments and/or incorporate layers within each figure in the EA depicting the decision segments.
USACE Evaluator Response: CONCUR
Concur that the several tables need to be revised with more descriptive headings and units added for clarity. Also concur that delineating the decision segments within maps would be helpful for reviewers' understanding. However, the documents have already gone under public review. Recommendations: 1. **ADOPT**. 2. **ADOPT IN FUTURE**. In the future, layers will be added to the maps to clearly show the decision segments.
IEPR Panel Backcheck Comment: CONCUR
Concur. The response addresses the stated concern.