



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
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June 30, 2023

Andrea E Walker, CPRP
Office of the Assistant Secretary of the Army (Civil Works)
Pearl River FRM Email Box
U.S. Army Corps of Engineers

Re: Scoping Comments on the Notice of Intent to Prepare a Draft Environmental Impact Statement for the Pearl River Flood Risk Management Project, Pearl River Watershed, Rankin and Hinds Counties, Mississippi

Dear Mr. Clay:

The U.S. Environmental Protection Agency (EPA) has reviewed the U.S. Corps of Engineers (USACE) May 18, 2023, Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) for the Pearl River Flood Risk Management Project, Pearl River Watershed, Rankin and Hinds Counties, Mississippi, consistent with Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The EIS is being developed by the USACE Vicksburg District under Section 211 of the Water Resources Development Act (WRDA) of 1996. The USACE and the non-federal interest (NFI) Rankin-Hinds Pearl River Flood and Drainage Control District propose to construct a 1,500-acre lake totaling approximately 4,900 acres by excavating and widening the Pearl River floodplain and channel and relocating and changing an existing weir to a location downstream of Interstate 20.

Based on information available in the NOI, the USACE predicts the proposed project would convert approximately 2,069 acres of terrestrial habitat to aquatic habitat and impact approximately 1,861 acres of wetlands, other "waters of the United States", and approximately 487 acres of existing surface water bodies, including the Pearl River channel and its tributaries. Additionally, the proposed project is expected to impact federally endangered and threatened species by converting the portion of the Pearl River within the project area from a riverine system to a lake system. According to the NOI, the proposed project goal is to provide a comprehensive solution to flood risk in the Jackson metropolitan area. Planning objectives were developed to include reducing estimated flood risk through 2065, reducing the loss of transportation routes, reducing flood risk to critical infrastructure, and integrating design features into flood risk management features to conserve or improve natural resources.

On 5/26/2023, the USACE invited the EPA to become a cooperating agency on the proposed project. The EPA accepts the USACE's invitation to serve as a cooperating agency. However, please note that our status as a cooperating agency has no effect on our review responsibilities under section 102(2)(C) of the NEPA or Section 309 of the Clean Air Act and acting as a cooperating agency does not imply that the EPA will necessarily concur with all aspects of the EIS.

According to the NOI, the USACE plans to identify the national economic development (NED) plan by comparing the level of flood protection provided by the alternatives presented in the 2018 NFI's Section 211 Study (Alternatives A and C) and two new USACE alternatives (Alternative A1 and

Combination/Hybrid Plan, as allowed for by Section 3104 of the WRDA of 2007); assess the environmental acceptability and technical feasibility of the alternatives; and provide the Secretary of the Army the necessary information to choose a plan to implement. The proposed project will evaluate four alternatives that include a No-Action Alternative, Buy-out (Alternative A from NFI's Section 211 Study), Acquisition, Elevation, and Floodproofing (Alternative A1); and Channel Improvements Plan (Alternative C from the NFI's Section 211 Study and Locally Preferred Plan). In the 2018 Study, Alternative C involved the excavation of 25 million cubic yards of material from the Pearl River floodplain and widening of the existing channel width from 400 feet to 2,000 feet within a 9.5-mile reach of the Pearl River. Because Section 3104 of the WRDA of 2007 authorized consideration of an alternative that is a combination, or hybrid, of these plans, USACE is also analyzing a Combination/Hybrid Plan that may consist of features that demonstrate effectiveness and efficiency in Alternatives A, A1, and C.

The proposed action may result in substantive impacts to riverine wetlands and streams. The EPA has environmental concerns that there may not be sufficient compensatory mitigation to offset the direct impacts to the Pearl River channel or the tributary streams. We understand that the section 404(b)(1) analysis required under the Clean Water Act will be included as part of the EIS analysis and request that our detailed comments below be addressed within that analysis. The EPA is also concerned about the disruption in downstream freshwater flow, changes in water quality, water quality modeling, and habitat impacts which also may affect endangered species, fisheries, and oyster production. The EPA has also identified potential issues to evaluate in the EIS including environmental justice, contaminated sites' proposed remediation, and critical infrastructure. These environmental concerns and infrastructure issues are specifically described in the enclosed detailed technical comments (See enclosure). In addition, new climate change guidance has been issued that should be considered as part of this environmental review.

On 5/26/2023, the USACE invited the EPA to become a cooperating agency on the proposed project. The EPA accepts the USACE's invitation to serve as a cooperating agency. However, please note that our status as a cooperating agency has no effect on our review responsibilities under section 102(2)(C) of the NEPA or Section 309 of the Clean Air Act and acting as a cooperating agency does not imply that the EPA will necessarily concur with all aspects of the EIS.

Thank you for the opportunity to serve as a cooperating agency and provide scoping comments on the NOI. If you have questions regarding these scoping comments, please contact Ms. Ntale Kajumba, NEPA Section Manager, at (404) 562-9620 or by e-mail at kajumba.ntale@epa.gov.

Sincerely,

Ntale Kajumba
NEPA Section Manager

Enclosure: Detailed Technical Comments

Enclosure
**Notice of Intent to Prepare a Draft Environmental Impact Statement for the Pearl River
Flood Risk Management Project, Pearl River Watershed, Rankin and Hinds Counties,
Mississippi**

Detailed Technical Comments

I. Purpose and Need

It is necessary to clarify for the public what risk level or annual exceedance rate is proposed through the locally preferred plan, and how it meets the primary goal to provide a comprehensive solution to reduce flood risk in the Jackson metropolitan area through the year 2065. The 2018 NFI Section 211 Study provides confusing figures and analysis related to the project purpose and how the various alternatives may/may not meet the project purpose. Out of the flood frequencies analyzed, the final design event chosen was the annual 1% chance exceedance event which would *not be protective* of another 1979 flood event. It would be protective of a flood event that is less severe or a 100-year flood event. The Final Array of Alternatives outlines that flood events having 50%, 20%, 10%, 4%, 2%, **1%**, 0.5% (1979 flood) and 0.2% annual chance exceedance were selected for hydrologic and hydraulic analysis and for economic considerations. Page ix under the Alternatives Section explains that several flood frequencies were used to analyze the alternatives but that the design event chosen was the **annual 1% chance exceedance event**. This is equivalent to the **100-year flood event** which is less protective than the 200-year 1979 (0.5%) flood.

Recommendations

- The information regarding flood risk protection afforded by the 1% design event vs the 0.5% should be made clear in the USACE's DEIS.
- Please incorporate a figure that compares the most relevant risk levels, i.e., 2%, 1% and 0.5%.
- The figures in the USACE's DEIS should reflect the accurate floodplain shading of 1% chance exceedance event/100-year flood event rather than the illustrated 200-year floodplain. Examples from the 2018 NFI's Section 211 Study below demonstrate confusion in current depiction of project purpose. Figures demonstrating impacts to structures, existing levees, roads, etc. should clearly identify which flood exceedance events meet the project purpose, and any inclusion of less/more frequent exceedance events should explain whether the proposed alternative will provide for flood risk protection or consider not including.
 - **Figure 1-6** (page 9) illustrates impacts to structures from annual 1% (100-year) and 0.2% chance exceedance flood event and also the shaded 1979 (0.5%) flood event.
 - **Figure 1-7** (page 10) shows existing levees and 1979 flood event – include 1% shading
 - **Figure 2-18** (page 53) illustrates 0.2% chance exceedance flood event, roads inundated
 - **Figure 3-2** (page 107) River Markers is unclear which annual percent exceedance event is being shaded.
 - For clarity **Figure 3-3** (page 111) should illustrate structures only impacted by annual 1% chance exceedance flood event
 - For clarity **Figure 3-4** (page 115) should illustrate non-structural impacts by annual 1% chance exceedance flood - remove the 1979 flood shading to provide clarity
 - **Figure 3-6** Alternative C (page 123) should include annual 1% chance exceedance event shading. It is unclear what is being represented by the shading in the figure.

II. Alternatives:

Federal projects specifically authorized by Congress that involve discharges of dredged or fill material into waters of the U.S., such as this one, must comply with the Clean Water Act Section 404(b)(1) Guidelines (the Guidelines). The Guidelines (40 CFR 230.10(a)) only allow such discharges for the Least Environmentally Damaging Project Alternative (LEDPA). The Guidelines prohibit discharges with a) individual, b) secondary or c) cumulative, effects that result in significant degradation of Waters of the U.S. The EPA notes that low gradient riverine wetland habitat impacted by excavation and fill will lose riverine and adjacent floodplain and wetland functions to store floodwaters; retain sediment; export organic carbon to support downstream aquatic biota; remove and sequester pollutants; and maintain wetland plant and wildlife habitat. When habitat changes to lacustrine (lakes), physical, chemical and biological functional losses occur.

A clearly defined project purpose determines the scope at which the array of alternatives is selected (40 CFR 230.10(a)(2)). First, as written, the proposed alternatives are not equivalent, as only one alternative includes planned and presumed recreation benefits. Specifically, Alternative C from the 2018 NFI's Section 211 Study proposes to build RV pads, trails, fishing piers, wildlife viewing areas, boat ramps, and site-preparation of large areas for future recreational development in the new floodplain. Second, should the floodplain adjacent to the newly constructed reservoir flood, those newly developed areas could be at risk. These factors are either unrelated to, or in direct opposition with, the stated project purpose of flood risk reduction.

The rationale to determine the preferred alternative in the 2018 NFI Section 211 Study was unclear and based on qualitative, not quantitative, data. For instance, the level of flood protection, environmental impacts, and costs associated with each of the 16 alternatives was not made clear, which lead to a questionable selection of the final four alternatives. Of these four, the locally preferred alternative was the most environmentally impactful option, with approximate impacts to more than 1,861 acres of wetlands and "other waters of the U.S." and approximately 487 acres of existing surface water bodies, including the Pearl River channel and its tributaries.

Section 230.10(a) of the CWA Guidelines states that an "alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." The 2018 NFI's Section 211 Study did not accurately or fully represent the required costs of each alternative.

Section 230.10(d) requires demonstration of avoidance and minimization of aquatic resource impacts before compensatory mitigation can be considered; this factor was not addressed in the 2018 NFI's Section 211 Study.

Recommendations

- Select appropriate alternatives that address the stated project purposes. If the recreation elements do not meet project purpose of flood control, we recommend removing such elements. However, should the project purpose be rewritten to include recreation, all alternatives should include elements to improve recreation to compare an array of equivalent alternatives.

- Select alternatives that include non-structural and nature-based designs. Consideration should be given to levee setbacks to increase floodplain area, levee upgrades, and floodplain preservation or restoration to increase flood storage, roughness, and habitat.
- The EPA recommends that the effects of the project on hydrologic, biogeochemical, and plant and animal wetland functions be objectively evaluated. In addition, the effect of the proposed project on gravel or sand point bars should also be evaluated. These bars are important habitats for wildlife species and the inundation area of the lake as well as the reduced velocities in the tailwaters would limit the perpetuation of these important riverine habitat features.
- Consider other alternatives to reinforce current East and West Jackson levees to meet a 0.75%/150-year flood event. The [General Accounting Office after-action report from the 1979 flood](#) stated that the main issues were a lack of early planning, Reservoir actions, and an improperly maintained West Bank Levee. The Drainage District should evaluate enhanced management of the Ross Barnett Reservoir for increased flood control, re-evaluation of a levee option.
- The EPA recommends that the DEIS clearly indicate flood level protection that each project alternative achieves. Alternatives should be compared against the main project purpose to provide flood protection, including loss of any existing features that provide for the project purpose (e.g., wetlands that provide flood retention functions). Additionally, for each alternative, more clarity is needed on pre- and post-project flood risk to primary residences, infrastructure, and other economically important features for a variety of exceedance events (i.e., 100- to 500-year floods).
 - o A clear reservoir management plan is needed where applicable. Information should include engineering plans that detail weir height, reservoir elevations, and flows when managing for flood control, water supply, and recreation. Details on typical release schedules and operations during extreme drought and flood events should also be included.
 - o Special attention should be paid to any increases in urban flash-flooding so that an alternative is selected that maximizes equitable flood risk reduction opportunities to include communities with environmental justice.
 - o Examine flood risk associated with hazardous waste sites, remediation sites, wastewater treatment plants, and water treatment plants (e.g., J.H. Fewell WTP, Savanna Street WWTP, LeFleur's Landing, Gallatin Street Dump Site, Gulf States Creosote Slough, and others). Consideration should be given to alternatives that would help reduce leachate and creosote contamination with and without the need for costly remediation. Consideration should also be given to the risk of Sanitary Sewage Overflows associated with each alternative.
 - o Impacts to any existing recreational areas (e.g., LeFleur's Bluff State Park and Crystal Lake) as well as risk of flooding to future development areas associated with each alternative should be considered (see discussion on environmental impacts below).
 - o Consideration should be given to potential impacts to Fannye Cook Natural Area/Pearl River Basin Mitigation Bank in Rankin County resulting from altered flood regimes associated with each alternative (see discussion on environmental impacts below).
- The EPA recommends an economic assessment and information needs related to project costs that are required to evaluate the LEDPA.
 - o Costs should be updated to include 2023 prices (e.g., buyouts, flood damages, construction costs, etc.) and include a conservative inflation rate for long-term costs.
 - o Remove items associated with assumed recreational development not directly associated with this plan. Any benefits not linked to this plan cannot be presumed to occur in any specified timeframe. For other recreation items directly linked to the proposed plan (if still included), costs and benefits should be clearly indicated as separate line items. If a proposed plan reduces recreation and tourism to other parks (e.g., LeFleur's Bluff State Park and Crystal Lake), those costs should be represented as separate line items to clearly indicate what is being lost and replaced.

- o In the 2018 NFI Section 211 Study, Alternative C would have needed to replace nine bridges, but these costs were not included. If this remains true, these costs should be included.
- o Compensatory mitigation costs were severely underestimated and need to be updated. For example, mitigation for Alternative C was estimated at \$14.5 million, which comes to about \$6100 per acre impacted. Today, bottomland hardwood mitigation can cost \$25,000 to \$50,000 per acre or higher, depending on the site conditions and land value.
- o Alternative C included toxic waste site remediation, but cost estimates were unclear and appeared to have been underestimated. If remediation is still part of the proposed plan, more information is needed to determine the exact remediation measures required, with updated cost analysis per line item. Costs should also include monitoring and adaptive management in the event that remediation efforts are not immediately successful.
- o Operation and maintenance costs for reservoir management can be cost-prohibitive. For example, downstream water quality monitoring is required for the life of the reservoir and should be included in cost estimates. Reasonable inflation rates should also be applied for realistic comparisons.
- Once it has been determined that the LEDPA has been selected, clear demonstration of measures to avoid and minimize environmental impacts should be included. This includes direct and indirect impacts to wetlands and streams, as well as cumulative and secondary downstream impacts.

III. Aquatic Resource & Environmental Impact Assessment

Section 230.11 of the CWA Guidelines describes the factual determinations that must be made to evaluate whether environmental impacts comply with the restrictions on discharge outlined in Section 230.10 and summarized again in Section 230.12. Below we provide recommendations and information needs associated with the analysis of direct, secondary, and cumulative impacts, as well as other factors that are used to evaluate whether an alternative contributes to significant degradation of the aquatic ecosystem.

The majority of the LeFleur's Landing landfill site is located within the annual 1% chance exceedance floodplain of the Pearl River (2018 NFI's Section 211 Study, page 91 Section 2.5.14.1.2 LaFleur's Landing Site). There is insufficient information and analysis regarding the environmental impacts associated, particularly for alternative C that appears to include inundation of this area.

Recommendations:

- A recent (i.e., within the past five years) aquatic resource delineation should be provided as part of the assessment process.
- An updated Hydrologic and Hydraulic (H&H) analysis is likely needed to ascertain any changes in flooding associated with an updated period of record.
- More information is needed to evaluate direct, secondary, and cumulative impacts associated with changes to flow rates and associated changes to flood frequency and duration. The Guidelines require assessment of functional losses to aquatic resources, yet, for this project, only direct impacts were evaluated in terms of acreage, not lost functions.
- For the purposes of wetland assessment, Hydrogeomorphic (HGM) should be used to determine direct and secondary functional impacts, because it can estimate impacts associated with changes to wetland vegetation, soils, and hydrology (i.e., flood frequency and duration). The HGM Approach is used in the Section 404 Regulatory program within the Vicksburg District.
- Full consideration of impacts to the aquatic ecosystem and their dependent species is needed to determine the extent of required in-kind mitigation associated with each proposed alternative. Obligate and facultative riverine species (e.g., aquatic vegetation, invertebrates, and vertebrates)

would be adversely impacted with conversion to a fragmented lacustrine system that is likely to develop a similar suite of issues known to occur in the Ross Barnett Reservoir (e.g., high sedimentation, fecal coliforms, manganese, etc.); yet these effects were downplayed in the 2018 NFI's Section 211 Study.

- The impact assessment should include consideration of downstream impacts to water quality (including, but not limited to, downstream sedimentation during project construction), water quantities (especially during low flows), and the species that could be adversely impacted (with consultation with US Fish and Wildlife Service (U.S. FWS)).
- A cumulative impact assessment should include proposed development intensification adjacent to the Pearl River where appropriate.
- Some of the alternatives will likely require a significant volume of fill material to construct levees and/or land building. The point of extraction and disposal determines whether the material is subject to evaluation under regulations pursuant to Resource Conservation and Recovery Act or the CWA. We recommend a description of the volumes of material proposed for excavation, dredge, fill and disposal based on the point of extraction and disposal being 'upland' or 'waters.' Under CWA, some sediments may require testing. Regardless of the final placement/disposal site, the tiered approach found in both the Inland Testing Manual and the Upland Testing Manual are the same and should be utilized regarding testing needs for material subject to CWA regulation. Further, coordination with the EPA to produce a sampling plan and quality assurance plan is recommended to facilitate shared interpretation of testing results and avoid any future delays.

IV. Mitigation:

According to Section 2036 of the Water Resources Development Act (WRDA) of 2007, "the Secretary shall ensure that the mitigation plan for each water resources project complies with the mitigation standards and policies established pursuant to the regulatory programs administered by the Secretary." 33 U.S.C. § 2283(d)(3)(A). Compensatory mitigation is required for functional losses to waters of the U.S. and must follow the regulations outlined in 40 CFR § 230.91 and 33 CFR Parts 325 and 332. These latter regulations are commonly referred to as the 2008 Mitigation Rule. The 2018 NFI's Section 211 Study lacked sufficient information regarding compensatory mitigation and its ability to offset project impacts with the type and amount of wetland and stream habitats involved. Wetlands and streams in Mississippi are difficult-to-replace resources due to increased challenges in obtaining land for compensatory mitigation, which can increase temporal loss. In particular, bottomland hardwoods and other floodplain wetlands provide unique functions in these ecosystems, including flood retention. The scope of impacts to wetland and stream functions for each alternative, and ability to mitigate for those impacts, warrants further review by the EPA to ensure compliance with the 2008 Mitigation Rule to ensure that both permanent and temporary losses to aquatic environments are minimized. The 2008 Mitigation Rule requires a 12-element mitigation plan that includes site-specific information (40 CFR 230.93). Such information is necessary to determine whether the proposed compensatory mitigation plan is feasible and is the most environmentally preferable option that offsets functional losses to waters of the U.S. However, the 2018 NFI's Section 211 Study only provided species-based estimates for the amount of compensatory mitigation needed and did not provide any details outlining a compensatory mitigation strategy.

Previous species-based estimates included an aquatic and a terrestrial Habitat Evaluation Procedures (HEP) analysis. Aquatic HEP studies were done in 2005; it is unclear if current conditions correspond to the conditions when the HEP study was done (18 years ago). Also, the 2005 HEP report indicates replacement of riverine habitat for obligate and facultative riverine species which will be difficult to

mitigate. But the 2018 NFI's Section 211 Study did not propose mitigation for aquatic species on the basis that a greater acreage of open water would be created with a proposed lake. This flawed rationale obscures functional losses to streams and rivers that would be replaced with a fragmented lacustrine system – an out-of-kind replacement that is generally not considered environmentally preferable mitigation in the 2008 Mitigation Rule.

Terrestrial HEP studies were completed along with the project's wetland delineation in 2014. The terrestrial HEP study estimated the habitat units needed to offset impacts to a variety of upland and wetland-dependent species due to the levee and the channel improvement scenarios. For Alternative B, these values ranged from 1,950 to 2,250 acres depending on the species and mitigation type assessed. For Alternative C, these estimates varied from 5,850 to 17,190 acres. Not only are these estimates too broad to reasonably develop a mitigation plan, but wetland functional losses were not evaluated as required by the 2008 Mitigation Rule.

Recommendations

- The EPA requests an opportunity to evaluate a complete, detailed compensatory mitigation plan prior to publication of the FEIS and ROD. We also recommend that U.S. FWS and other interested agencies have an opportunity to review and comment on the proposal.
- Compensatory mitigation for offsets to project impacts must occur in advance or concurrent with discharges of dredge or fill material to minimize temporary functional loss. A clear statement to this effect must be included in the FEIS and/or the ROD.
- 40 CFR Subpart J requires a 12-element mitigation plan. The EPA recommends that this plan is presented within the DEIS for expedited agency review and comment.
- If sufficient detail cannot be provided in the upcoming DEIS to include all 12 of the required elements specified in 40 CFR Subpart J, including site-specific information, we request the opportunity to carefully evaluate the completed plan prior to publication of the FEIS and ROD to determine its appropriateness to offset lost wetland and stream functions as well as its restoration potential and sustainability.
- Compensatory mitigation should prioritize “in-kind” and “in-basin” restoration opportunities, including floodplain restoration opportunities upstream of Jackson.
- Preference should be given to sites which would replace similar functions lost.
- Offsets should be provided in a similar geomorphic position, support similar communities of fish and wildlife species, and be of an appropriate scale.
- Co-locate stream and wetland restoration work to include floodplain connectivity where feasible.
- Preference should be given to a large contiguous tract of land over multiple fragmented parcels.

V. Water Quality

The NFI's Section 211 Study Appendix D did not adequately address water quality standards (WQS). The Mississippi Department of Environmental Quality (MDEQ) water quality standards are in Part 6, Chapter 2 of Title 11 of the Mississippi Administrative Code. The WQS specify designated uses (classifications) of State waters and applicable water quality criteria. MDEQ's WQS specify downstream waterbody uses and quality of the Pearl River must be maintained and protected.

Based on data from 2006 and 2008, the EPA and MDEQ developed a 2009 Pearl River Nutrient Total Maximum Daily Load (TMDL) for stream segment ID MSUMPRLS1E (Hinds, Rankin and Copiah counties, HUC 03180002). The historical total nitrogen and phosphorus measurements in the stream from 1988 – 2001 were observed to exceed the recommended ecoregion 65 targets. The Algal Growth

Potential Tests indicate the system is nitrogen limited and needs to be driven back to a phosphorus limited system. This TMDL recommends a 56% reduction in total phosphorus (TP) loads from point and nonpoint sources and total nitrogen loads from nonpoint sources to meet the ecoregion TP target of 0.1mg/l to fully support the uses of public water supply, fish and wildlife and recreation in this stream segment. This portion of the Pearl River was originally listed for nutrient pollution, organic enrichment and low DO in the 1996 303d list.

The 2015 TMDL for Total Nitrogen and Total Phosphorus for the Pearl River for MSUMPRLS1E from reservoir to the Strong River updates the 2009 Pearl River Nutrient TMDL. Using updated modeling (Environmental Fluid Dynamics Code and Water Quality Analysis Simulation Program), the 2015 TMDL recommends an overall reduction of 70% TP and 30% TN to restore water quality in this segment. The 2016 305b report listed two segments of the Pearl River in the study area as not meeting aquatic life or secondary contact recreation, which was consistent with the 2014 305b report.

The 2011 Comprehensive Protection and Restoration Plan for the Ross Barnett Reservoir Watershed, Mississippi (the Plan) recognizes several high priority water quality issues in the reservoir and its surrounding watershed including nutrient enrichment/algae growth and erosion/sedimentation that can affect algal growth. The plan recommends measures for reducing nutrient to help manage these issues. The Plan incorporates the Source Water Protection Plan for the O.B. Curtis (Curtis) Drinking Water Intake. Because the reservoir operates as a flow-through reservoir with limited flood storage, current water quality degraded by nutrients and algal growth is passed directly to the Curtis intake within the lake and the J.H. Fewell drinking water intake located on the Pearl River a few miles downstream of the reservoir.

Monitoring data show that nitrogen and phosphorus are present in the reservoir in amounts in excess of what is considered normal for algae and plant growth. MDEQ classified the reservoir as eutrophic based on the Carlson Trophic State Index Secchi depth in 2010. The eutrophic classification does not automatically indicate poor water quality or lack of use support, however, as part of the plan, the reservoir will monitor nutrient levels and implement management strategies to meet public water supply and recreation uses as well as downstream aquatic life uses. Mississippi Department of Wildlife, Fisheries, and Park has observed thick mats of aquatic vegetation in parts of Pelahatchie Bay and the upper reaches of the reservoir. Excess nutrients and subsequent growth of algae and other aquatic plants may occur in any area of the Reservoir within the depth of photic zone and may become a concern if conveyed to the O.B. Curtis drinking water intake. Some types of algae can cause objectionable taste and odor in drinking water and drinking water treatment processes can result in trihalomethanes which can cause health problems to human in high levels. Mississippi Department of Health currently monitors trihalomethane presence. The reservoir watershed (Rankin, Madison, Leake counties) contains some of the most highly erosive soils (silt loam) in the United States. Phosphorus in reservoir sediments can contribute to nutrient enrichment and eutrophication, particularly in shallow lakes (Wetzel 1983, Cole 1983, Cooke et al. 1977) and high phosphorus levels in sediments in shallower areas of the reservoir can support excess growth of aquatic and semi-aquatic plants (macrophytes) (Wetzel 1983). See appendix H Pollutant Source Inventory and Locations of Concern for additional details.

Section 4.5.2.1 Water Quality (NFI's Section 211 Study, page 166) indicates that the new 10-mile impoundment (Alternative C) would “increase water depths similar to the reservoir, reduce water velocity, especially under low flow conditions, reduce dissolved oxygen especially in urban streams already experiencing low DO, increase the possibility for stratification, and possibly increase nutrients and algal growth similar to the Ross Barnett reservoir photic zones.

The inundation of the project area requires significant efforts to remove, or cap identified hazardous waste sites, considerable landfill contamination and automotive salvage yard contaminants. The Gallatin St. Landfill Site includes general industry waste and borings detected leachate with cadmium, lead and nickel above regulatory standards. (MCL and/or aquatic life criteria) Another water sample was collected which contained **cadmium, lead and nickel** above Safe Drinking Water Act MCLs. Due to the continual erosion of the outside bank of the curve (eastern and south sides) in the Pearl River around this landfill, contamination of ground and surface water will remain of concern. LeFleur's Landing Site includes underground fuel storage tanks, asphalt plant, paint shop southern edge adjacent to Pearl River and historical remediation investigations indicate this site is a source of potentially toxic chemicals which contaminate the river, soils and groundwater.

Recommendations

Please include a full analysis of the water quality standards and designated uses, as well as how each alternative will affect these standards and uses.

- The EPA recommends that the EIS should include an evaluation of the EPA approved TMDLs within the Pearl River watershed and whether they would require revisions with the alteration of the Pearl River and a cost analysis to revise and implement these TMDLs.
- Please include additional information on how Alternative C (new lake) will reduce nutrient concentrations to meet the reductions described in the TMDLs and Restoration Plan.
- Please provide an analysis of how each alternative could impact water quality and nutrient issues regarding the Curtis drinking water intake.
- Additional explanation is needed on how preferred Alternative C will result in “long-term, beneficial cumulative impacts on water quality” when the reservoir is classified as eutrophic and the upper Pearl River watersheds are required to meet substantial nitrogen and phosphorus reductions to protect drinking water supply intakes as well as general aquatic life uses. Please provide an explanation of how the proposed new lake is not expected to have many of the same or magnified characteristics of Ross Barnett Reservoir, including increased stagnation during low flows that could intensify algae bloom conditions, incorporation of urban runoff pollutants and sedimentation. The USACE's EIS should address:
 - How will the proposed downstream lake avoid the water quality issues of Ross Barnett?
 - Will the new lake operate similarly as a flow through impoundment like Ross Barnett?
- How will the new lake operate as a flood control lake which Ross Barnett has not been able to do since its construction in 1965. Additional explanation of how water quality concerns from the hazardous waste sites will be addressed with each alternative, including impacts to drinking water, downstream uses, groundwater, and soils. Clarify what actions will be taken to address these issues with each alternative as well as whether they can effectively mitigate these water quality impacts.

Impacts of Hydrologic Alteration: In addition to fragmenting rivers and preventing the passage of aquatic life, other water quality impacts below dams are well documented, including significant changes to dissolved oxygen and temperature. These can have significant impacts to aquatic life affecting both survivability and reproduction. The purpose of providing a downstream flow analysis is to ensure the protection of a healthy aquatic environment throughout the life of the project. A minimum flow is not considered sufficient for deriving downstream flows.

Based on the 2018 NFI's Section 211 Study, it was unclear how future water withdrawals and the operation of the lake would affect downstream flows. For example, should lake levels start to decline in the middle of the summer, it is unclear if more water will be held back to fulfill recreational needs at the

detriment of downstream flows. The EPA notes that 40% of Jackson's water needs are taken from the Pearl River. As urbanization increases because of decreased flood risk, the demand for water will also likely increase. The effect this will have on the availability and levels of downstream flows was not fully assessed and evaluated in the 2018 NFI's Section 211 Study. Timing of the reservoir filling was also not specified in that Study. Filling reservoirs have been found to cause impairments to the receiving downstream waters. Timing of the filling may provide some reduction in the potential to impair the water body.

In Appendix D, Section 2.5, the 2018 NFI's Section 211 Study notes that, '*...the water quality in the impounded waters of the upstream Ross Barnett Reservoir sediment/turbid water, nutrient enrichment and algal growth, bacteria/pathogens, invasive aquatic species, pesticides...*'. In addition, the NFI's Section 211 Study does not address the impacts of pollution from the impoundment. The Guidelines provide that no discharge of dredge or fill material will be permitted if the discharge causes or contributes to violations of state water quality standards (after considering disposal site dilution and dispersion), violates any applicable toxic effluent standard, or jeopardizes threatened or endangered species or results in the likelihood of destruction or adverse modification of critical habitat. The EPA notes that the proposed weir will result in substantial fragmentation of the Pearl River environment.

Recommendations

- The 2018 NFI's Section 211 Study should provide information that addresses water quality in the flooded riverine section, as well as addresses the impacts on the river downstream or the downstream flow requirements needed for protection of the Pearl River during the life of the project.
- It is recommended that an instream flow study should be undertaken to determine the flows needed to meet state water quality standards and ensure that the design of the proposed project will minimize impacts to aquatic life downstream of the weir. The flow study should be designed to determine the needed flows to meet narrative and numeric water quality standards and to maintain and improve the biological integrity of the waters of the State.
- The EPA further recommends that the flows be developed consistent with current scientific literature regarding both the flows selected and the time increments at which they apply. The EPA notes that the downstream flow should not be derived solely as a low flow analysis. When a downstream flow study is completed for this river, it should not be done strictly to derive a Minimum Instream Flow. Downstream flow studies should be done that incorporate natural patterns of intra- and inter-annual variability in a manner that maintains and/or restores riverine form and function, to best maintain ecological integrity. The natural fluctuation of water (i.e., high, low, and normal flows) in rivers and streams is critical for maintaining aquatic ecosystems because aquatic biota have developed life history strategies in response to these fluctuations.
- The EPA recommends that the proposed project be evaluated on how increased withdrawals will impact flow availability and downstream water quality. The EPA also recommends that the USACE's EIS include a discussion on the timing of the filling of the reservoir. In addition, the EPA requests clarification on how it is possible to avoid water quality issues similar to those stemming from the Ross-Barnett Reservoir when impounding waters for this proposed reservoir. The EIS should address fragmentation and its associated impacts. The EPA understands that the USACE is coordinating with the U.S. FWS to assess potential impacts to threatened and

endangered species, such as the Ring-backed Turtle. The EPA principally defers to the U.S. FWS on impacts to endangered species.

Water Quality Modeling Approach: The EPA had concerns related to the modeling approach used to determine potential impacts to water quality of the proposed alternatives in the 2018 NFI's Section 211 Study. Modeling results are only useful in predicting changes when they adequately represent the system, the parameters, and the variability of those parameters. The water quality model simulation period was only one month, July of 2014, and did not provide the necessary range of wet and dry weather conditions to support a meaningful representation of hydrological conditions in the Pearl River. The selection of a longer-term continuous simulation, such as multi-year simulations, ensures that average, wet and dry conditions are included in the model.

Recommendation: The EPA recommends that the modeling timeframe be extended to include seasonal variations and both dry and wet years.

Water Quality Modeling Calibration: In the 2018 NFI's Section 211 Study, the modeling calibration, for both flow and water quality, consists solely of x/y plots of observed and modeled data for a station over time. To ensure the model is appropriately calibrated, the model must be evaluated both quantitatively and qualitatively. In addition, the water quality calibration relied solely on water quality data collected in July of 2014, resulting in time series plots comparing model predictions to only 3, 2 or sometimes 1 data point per station. The limited data did not provide the data density (amount of data available over time) to judge model performance or constrain the model calibration.

Recommendation: The EPA notes that quantitative analysis consists of statistically comparing the model predictions with measured field observations. The following statistical comparisons should be considered for calibration: Mean, Normalized Root Mean Square Error, Index of Agreement, Tails of Distribution data, Qualitative inspections, Time Series Plot, Probability Distribution Plot, and 1 to 1 Plot. The EPA also recommends using all available water quality data, including data collected by other agencies (i.e., MDEQ, U.S. Geological Survey, EPA, etc.) in the watershed for calibration.

Water Quality Permits: The 2018 NFI's Section 211 Study stated one objective of the water quality modeling exercise is to determine if the downstream assimilative capacity will be impacted by the weir, but only provides information about the large current National Pollutant Discharge Elimination System (NPDES) permits and future proposed NPDES permit discharges not impacting assimilative capacity. There is no analysis or discussion about how the discharge of fill and habitat changes (i.e., reduced natural filtration functions) for the proposed project would impact assimilative capacity. The 2018 NFI's Section 211 Study conclusions do not address the stated objective.

Recommendation: The EPA recommends that the EIS should evaluate whether downstream dischargers with existing NPDES permits will have to reevaluate their discharge permits to account for the change in flows due to the proposed project.

VI. Watersheds

Considering the potential significant environmental impacts to wetlands and streams, disruption in downstream freshwater flows, habitat destruction and alterations, changes in water quality, etc., and the social and economic impacts associated with the TSP, a less disruptive and environmentally damaging alternatives should be carefully considered.

Recommendation: The EPA recommends expanding or further examining some of the non-structural options presented in the study in conjunction with green-gray infrastructure solutions in the upper parts of the watershed to create more for flood storage capacity. This effort might also require improved land use planning, zoning, and building code changes. The project sponsor might also explore some of the innovative grey stormwater technology available on the market today that allows for underground stormwater storage in tightly knitted urban areas in combination with the aforementioned.

VII. Environmental Justice (EJ)

The 2018 NFI's Section 211 Study indicated that U.S. Census data from 2010 was used for the Environmental Justice Analysis. In addition, demographic information from three Counties along the project area was shown in relationship to Statewide demographic areas. There, locations or areas were highlighted as areas that experience flooding from the 1% flood event. The Study also stated that no disproportionate adverse impacts would occur if the No Action Alternative was selected.

It is recognized that additional areas with communities with environmental justice concerns experience flooding in response to 4% and 2% chance exceedance flood event (page 57 Section 2.4.8.1 Historic and Existing Conditions). Alternative C notes that several areas are expected to continue to experience flooding during events like the 1979 flood event (0.5%) and during an annual 1% chance exceedance flood event. These are addressed in further detail in Appendix E. Although these areas are expected to experience significant reductions in flooding during flood events of lesser magnitude than an annual 1% chance exceedance flood event.

Recommendation: The EPA recommends the EIS include the most recent demographic information available. In addition, this information should be provided at an appropriate scale. The EIS does not include information needed to understand how people of color/and or low-income populations were identified, nor does it explain how its conclusions were reached. Additional information and guidance regarding EJ considerations and the methodologies used can be found in a more recent document developed by the Federal Interagency Working Group on EJ entitled, "*Promising Practices for Environmental Justice Methodologies in NEPA Reviews*" (Please see: <https://www.epa.gov/environmentaljustice/ej-iwg-promising-practices-ej-methodologies-nepa-reviews>).

- Evaluate flooding impacts on communities identified for environmental justice considerations.
- Explain how alternative C meets the flood control objective to reduce flood risk through 2065, particularly regarding the identified impacts to communities with EJ concerns.

VIII. Increased flash flooding in Jackson neighborhoods

The proposed elevation of water that would be pooled at the new One Lake weir is 258' or 8 feet higher than the water level of the current weir at Jackson Waterworks (250'). According to the 2018 NFI's Section 211 Study ([Appendix C, pages 32-36](#)), the new impoundment water level of 258' will *increase* the flood profiles along all 8 Jackson tributaries. The City of Jackson storm drain and tributary channel system is currently not capable of efficiently managing stormwater flash flooding. Heavy rains often cause Lynch Creek to overtop its banks, flooding neighborhood streets, businesses and homes. Due to the deterioration of century-old sewer infrastructure, this stormwater typically contains raw sewage and other contaminants. The current flash flooding events in these Jackson neighborhoods will not be helped by the One Lake project and will instead be exacerbated as the storm drain runoff is slowed down by the backed-up tributaries. (Pearl Riverkeeper One Lake Impacts page).

Major downtown Jackson tributaries (2018 NFI's Section 211 Study page 2) include Richland Creek, Lynch Creek, Town Creek, Eubanks Creek, Prairie Branch, Hog Creek, Hanging Moss Creek and Purple Creek. Town creek and two other EJ areas located in Northeast Jackson and South Jackson (page 57) are especially affected. Page 69 discusses the urban major tributaries that are the backwater flooding sources for the Pearl River and experience flash flooding 3 days prior to the Pearl River peaks (page 69) Page 5 of 2018 NFI's Section 211 Study states that "The existing levee system only provides protection to approximately 30% of the structures within the flood-risk area. Most of the Jackson metropolitan area remains unprotected." Please clarify in the USACE's DEIS the structures that these statements refer to. Also, identify the metropolitan areas that will remain unprotected. It is unclear whether the downtown tributaries are included in this unprotected area, therefore, please provide this information in the upcoming EIS.

The 2018 NFI's Section 211 Study, Appendix C Engineering 4.2 Tributary Impacts (pages 32-36), states that "some tributaries may be directly affected by the channel improvement concept" including Richland Creek, Lynch Creek, Town Creek, Eubanks Creek, Prairie Branch, Hog Creek, Hanging Moss Creek and Purple Creek which convey flood water from urbanized areas within Jackson Metro area. A subset of tributaries including Town and Lynch Creek near the upstream side of the proposed weir location were reviewed through various models to determine preliminary backwater impacts based on the proposed pool elevation of 258.0 ft. Estimates for two of eight streams determined that increases in flood profiles for short reaches upstream during flood events would occur for Town Creek and Lynch Creek. Additional analysis of all tributaries has not been performed and is expected during the next updated version of the feasibility study.

Recommendation: The EPA recommends that the analysis of all 8 urbanized EJ tributaries be conducted so that the estimated flood risk for communities within these floodplain areas can be identified.

IX. Hazardous, Toxic, and Radiological Waste (HTRW) Sites

The 2018 NFI's Section 211 Study referenced a September 2014 report entitled: Environmental Evaluation of Hazardous, Toxic, and Radiological Waste (HTRW) Sites. Sections 2.5.14 and 4.5.14 of the 2018 NFI's Section 211 Study provide information concerning three contaminated sites that may be impacted by the TSP (i.e., Gulf States Creosote Company Site, Jefferson Street Landfill, and Gallatin Street Landfill Site). Groundwater contamination is suspected at all three sites which drain to the Pearl River. A summary of required remediation measures is included on page 227 of the 2018 NFI's Section 211 Study. Some of remediation measures include construction of slurry walls, excavation of contaminated materials, bank stabilization and groundwater controls. The EPA could not identify specific remediation plans in the 2018 NFI's Section 211 Study (e.g., Quantities of materials needing excavation, lengths of slurry walls, types and locations of groundwater recovery wells, etc.). The EPA also could not identify proposed cleanup standards that would need to be met to protect human health and the environment as portions of these sites would be submerged under the TSP.

Recommendations: The EPA recommends that the USACE develop detailed remediation plans for the TSP that demonstrate how chemical contamination and the sources will be controlled during project implementation. The EPA also recommends that the chemical contamination be fully characterized and that detailed remediation plans with relevant cleanup standards be submitted to the MDEQ for review. Further, every effort should be made during the USACE EIS process to avoid and minimize impacts to HTRW.

X. Transportation

In a September 5, 2018, letter to the Levee Board, Mississippi Department of Transportation (MDOT) stated that “there are nine (9) bridges owned by the State of Mississippi and maintained by MDOT within the proposed project's study area which are directly affected. The bridges of concern are the two (2) main channel bridges on SR 25 (aka Lakeland Drive), two (2) relief bridges on SR 25, two (2) main channel bridges on I-55, one (1) main channel bridge on US 80, and two (2) main channel bridges on I-20 as well as MDOT's wetlands/waters mitigation bank.”

The 2018 NFI's Section 211 Study states that Alternative C, the tentatively selected plan (preferred alternative), will involve the dredging of the Pearl River. The EPA recommends that potential impacts to local transportation infrastructure be addressed in the EIS. Of concern are 1) If dredging activities are conducted beneath any of the nine (9) bridges, it will reduce foundation embedment directly affecting the capacity of the bridges, 2) If dredging activities are conducted upstream and downstream of any of the nine (9) bridges but not under the bridges, a collapse due to sudden loss of the non-dredged material could occur. The most recent collapse of a MDOT Bridge was due to this exact situation.

It has been shared with the EPA that there may be potential impacts associated with the predicted scour depths at each bridge. If the predicted scour depths occur, there are likely to be catastrophic failure of all even (7) of the main channel bridges mentioned above and the capacity of the relief bridges on SR 25 will be severely reduced. For this reason, all nine (9) bridges will need to be replaced and the cost to replace the nine (9) bridges should be reflected in the cost of the Pearl River Basin Federal Flood Risk Management Project.” Appendix C Engineering (2018 NFI's Section 211) includes improvement estimates but not replacement estimates.

Recommendation- The EIS should compare each alternatives' ability to avoid and minimize impacts to bridges and provide estimated infrastructure repair and/or replacement costs. The EPA recommends that the USACE coordinate with MDOT and Federal Highway Administration on the proposed action to fully account for transportation facility impacts and costs and to help identify opportunities for further avoidance and minimization.