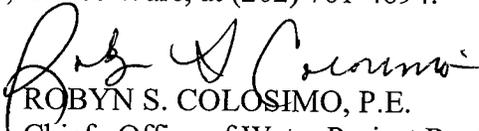


MEMORANDUM FOR CECW-LRD (MS.MUTSCHLER)

SUBJECT: Documentation of Review Findings for Licking River, Cynthiana, Kentucky, Flood Damage Reduction Study, Final Feasibility Report and Final Environmental Assessment.

1. Reference CELRL-PM-P Memorandum for Commander, Great Lakes and Ohio River Division (CELRD-PDS-P) dated 21 September 2005, subject, Licking River, Cynthiana, Kentucky (CWIS No. 010576) - Feasibility Report and Environmental Assessment.
2. The Headquarters Documentation of Review Findings is attached. All concerns from review of the AFB materials, draft report, and final report with revised pages have been resolved. Also attached for your information and future use in conducting the Preconstruction Engineering and Design are supplemental review comments on the final report with regard to dam safety. Although the feasibility analyses completed to date appear adequate it appears that a significant amount of geotechnical work remains to be completed during PED and there is potential for cost growth as design progresses. Headquarters suggests that coordination with the vertical team be continued during PED, particularly with reference to the dam safety aspects of the design.
3. The HQUSACE review team is available to discuss the basis for the concerns. If you have questions, call the Review Manager, C. Lee Ware, at (202) 761-4694.

2 Encl
as


ROBYN S. COLOSIMO, P.E.
Chief, Office of Water Project Review
Planning and Policy Division
Directorate of Civil Works

**DOCUMENTATION OF REVIEW FINDINGS
FINAL FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT
LICKING RIVER
CYNTHIANA, KENTUCKY**

SEPTEMBER 2005

PART I. REVIEW OF ERRATA PAGES TO THE FINAL FEASIBILITY REPORT AND EA. The review of the revisions to the Final Feasibility Report and Environmental Assessment dated September 2005 identified no new concerns. Section I.B. below documents the resolution of all the review concerns that were unresolved in the final policy review assessment. **All of the concerns resulting from review of the September 2005 final report and EA with revised pages have been resolved.** The full documentation on resolution of the review concerns from the September 2005 Final Feasibility Report and EA, the July 2005 Draft Feasibility Report and EA, and the AFB materials are furnished as Parts II., III. and IV., respectively.

A. BACKGROUND.

1. Study Area. The study investigated flooding problems along the South Fork of the Licking River and its tributaries. The South Fork lies in northeastern Kentucky in Harrison, Bourbon, Nicholas, Clark, and Montgomery Counties. The South Fork is formed by the confluence of the Hinkston and Stoner Creeks 16 miles above Cynthiana. The drainage area at Cynthiana is 621 square miles, including 260 square miles for the Hinkston Creek watershed and 284 square miles for the Stoner Creek basin. The South Fork flows northward into the Licking River at Falmouth, Kentucky, which then continues northward to its confluence with the Ohio River across from Cincinnati, Ohio.

2. Study Authority. The study is being conducted in response to a resolution by the Committee on Environment and Public Works of the United States Senate adopted on January 21, 1987.

3. Flooding Problems. The most significant flooding problems have been experienced in the City of Cynthiana in Harrison County. A 1 percent chance flood occurrence is estimated to damage about 315 residences and 100 commercial and public structures with damages totaling \$34,781,000. Average annual damages for the study area were estimated to be \$3,639,000. Flooding is also experienced along the South Fork and its tributaries in the towns of Paris in Bourbon County and Millersburg in Nicholas County and rural areas within those counties. The flood of record in 1997 resulted in damages of \$60 million in Cynthiana and Paris alone, including \$50 million in physical damages and \$10 million in non-physical damages.

4. Plan Formulation. The study considered various structural and nonstructural measures for flood control. The non-structural measures which were considered included flood proofing, permanent evacuation, raising buildings in place, and flood warning and evacuation. Consideration was also given to numerous structural alternatives including cut-through channel

improvements below Cynthiana, dry and permanent pool reservoir sites along tributaries of the South Fork, and combination plans. Optimization analyses evaluated 30 alternatives.

5. Recommended Plan. The tentatively recommended plan consists of two dry bed detention reservoirs located on the Hinkston Creek and Strodes Creek, a tributary of Stoner Creek. Both structures would be constructed of roller compacted concrete. The Hinkston detention structure would be about 30 feet high, 680 feet long and would include a 150-foot wide spillway. It would provide for 8,188 acre-ft. of storage at the spillway crest elevation of 772.0 feet msl. (1% chance or 100-year event). Drainage would be by gravity through a 16-foot wide by 12-foot high box culvert. The Strodes Creek detention structure would be about 25 feet high, 700 feet long and would include a 200-foot wide spillway. It would provide for 3,923 acre-ft. of storage at spillway crest elevation 823.0 msl. (0.2% chance or 500-year event). Drainage would be by gravity through a 10-foot wide by 12-foot high box culvert. The plan would reduce flood damages in the study area by about 86% with reductions of 89% in Cynthiana, 71% in Paris, and 96% in Millersburg.

6. Economic Analysis. The economic analysis for the recommended plan is shown below at a 2005 price level and Federal discount rate of 5.375% using a 50-year period of analysis.

	Final Report NED Plan
Total Project Costs	\$17,458,000
IDC	\$995,000
Total Investment Costs	\$18,453,000
Amortized Costs	\$1,070,000
OMRR&R	\$25,000
Inspection	\$1,000
Annual Cost	\$1,096,000
Annual Benefits	\$3,350,000
Net Benefits	\$2,254,000
BCR	3.1

7. Cost Sharing. Total initial costs of \$17,458,000 are to be cost shared \$11,348,000 Federal (65%) and \$6,111,000 local (\$5,136,000 LERRD and \$974,000 cash). OMRR&R costs of \$25,000 are also a local responsibility. The local sponsor for the feasibility study is the City of Cynthiana. As the project design and construction progress Cynthiana will continue to act as the non-Federal sponsor, relying on financial assistance from the Commonwealth of Kentucky (65%) and Harrison County (17.5%).

B. RESOLUTION OF CONCERNS ON THE FINAL REPORT AND EA. Review of the final feasibility report and EA identified one new issue, the need for the report to contain the final U.S. Fish and Wildlife Coordination Act Report, as well as several editorial comments. In addition, there were several editorial corrections and unresolved comments from prior reviews regarding the use of additional benefits for evaluation of the selected plan, non-physical damages, mitigation, and the sponsors' preliminary financing plan. Revised report pages were provided to address these remaining concerns and the information below documents the resolution of those remaining concerns from review of the final report. **All policy concerns have been resolved.**

1. Fish and Wildlife Coordination Act Report. It appears that the District has not obtained a final Coordination Act Report (CAR) or recent letter from the FWS pursuant to the Fish & Wildlife Coordination Act. The Feasibility Report/EA references a draft Coordination Act letter (dated 09/27//01), which is included in Appendix K. Pages 261 and 262 indicate that the identified mitigation needs are tentative and that revised recommendations will be submitted to the Louisville District, which will be incorporated in the final Feasibility Report. This does not appear to have been done, resulting in some uncertainty as to the recommended mitigation features and costs. In addition, page 262 states that the final CAR will indicate whether or not the requirements of the Endangered Species Act have been met. The District needs to obtain a final Coordination Act Report or indicate the reasons why it does not, or will not, have one prior to release of the final Feasibility Report/EA/FONSI for State and Agency review. Information should be provided regarding the certainty of mitigation requirements and costs for the selected plan and the compliance with the Endangered Species Act.

Action Taken: Concur. The Final CAR was issued 02 March 2006 by the USFWS, indicating that the mitigation needs referenced above have been resolved and that the requirements of the Endangered Species Act have been met. Additional field surveys will be conducted during the PED phase to determine whether or not the project as finally designed would have an impact on Running Buffalo Clover plants, Indiana bats, and/or mussels, if any, that might exist on project sites. The surveys and any relocation of affected species will be completed within the current estimated cost of the project. Pages 12 and 262 of the Main Report, and pages 13, 14, 19, 21, and 22 of the EA, have been modified to reflect receipt of the final CAR. A copy of the final CAR has been attached to Appendix K. These revisions have been provided as corrected pages.

HQUSACE Analysis: The concerns are resolved by the actions taken. Appendix K includes the final CAR letter dated 28 February 2006.

2. Editorial and Miscellaneous. There are a few locations in the report where minor editorial corrections should be made with errata changes or an addendum to improve clarity in the report presentation.

- The first paragraph on page 13 of the EA ends with incomplete statements (broken paragraph), and should be corrected.
- The text at the bottom of page 231 should be revised to avoid confusion, since the values of financial contributions expected from the Commonwealth of Kentucky and Harrison County are reversed.
- Table 45 on page 208, the Total Investment Cost should be shown as \$18,453,000 rather than \$18,458,000.
- Page 8 of the Economic Appendix wrongly states that EGM 04-01 assumes a 100% content to structure value. The depth damage functions in EGM 04-01 calculate content damages as a function of structure value and make no estimate of structure to content ratio. In order to use these functions in the FDA program you must state the content to structure ratio as 100% so that the program will calculate content damage based on structure value. Currently, the model uses the content value to calculate content damages. Also, pages 13 and 14 state the wrong interest rate.

Action Taken: Concur. Corrected pages have been provided for circulation of the report for state and agency review.

- The referenced paragraph on page 13 of the EA has been corrected by deleting the incomplete sentence.
- The values of financial contributions from Harrison County and the Commonwealth of Kentucky at the bottom of page 231 have been reversed to reflect the correct amounts.
- The referenced error on Table 45, page 208, has been corrected.
- Pages 13 and 14 of the Economics Appendix (B) referred to the Federal interest rate used during the screening process, which at that time was 6 1/8%. For the NED Plan the FY2005 interest rate of 5 3/8% was used for final computations in the report. Wording to this effect was added to paragraphs 10 and 11 on page 14 of the economics appendix.

HQUSACE Analysis: The concerns are resolved by the actions taken.

PART II. RESOLUTION OF REVIEW COMMENTS ON THE FINAL FEASIBILITY REPORT AND EA DATED SEPTEMBER 2005.

All concerns resulting from review of the Final Feasibility Report and EA have been resolved.

A. SUMMARY OF REVIEW.

CELRL submitted the Final Feasibility Report and EA on 21 September 2005. The materials included the PGM Compliance Memorandum. Review of the final report and EA was completed when the final policy review assessment was provided on 22 December 2005. Policy review identified one new significant concern in regard to the receipt of the final U.S. Fish and Wildlife Coordination Act (2.b.) Report. The review also identified the likely need for an economic update and provided editorial concerns. **The concerns, which arose during review of the final report and EA, have been resolved** by revised report pages provided in March 2006. The resolution of each concern is discussed below in Section II. B. The documentation of review for the draft report and AFB materials are furnished as Sections III. and IV. of this document. **All concerns resulting from review of the draft report and AFB materials have also been resolved** to the degree possible at this phase of study. CELRL provided updated responses to the policy review comments on 21 March 2006, including revised report pages. The documentation of the policy compliance review for the final report follows.

B. COMMENTS

1. POLICY COMPLIANCE REVIEW OF THE FINAL FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT. One new policy compliance concern was identified during review of the final report related to the need for a final Fish and Wildlife Coordination Act Report (CAR) as discussed below. Several editorial items were also noted which could be addressed to improve clarity in the presentation. It was noted that the report was submitted at the end of the fiscal year and an economic update would be required for preparation of a Chief's Report and the Project Summary. The project costs were to be updated consistent with other WRDA candidate projects to an October 2005 price level and the current FY06 discount rate of 5-1/8% used consistent with the Economic Guidance Memo for FY06. This information was to be provided as a separate update or in an addendum, if prepared.

Action Taken: Concur. Coordination with the USFWS and the KYDFWR was completed and comments by these agencies resolved without significant changes to the Feasibility Report/EA/FONSI or project cost. A final Coordination Act Report dated 02 March 2006 was received by the District and has been made an attachment to Appendix K. Project cost updated to FY 2006 levels is \$17,791,000.

HQUSACE Analysis: The concerns are resolved by the actions taken, as discussed in the items below. The final CAR is dated 28 February 2006. Updated economic information needs to be provided for the FY 2006 price level and 5-1/8%.

a. Fish and Wildlife Coordination Act Report. It appears that the District has not obtained a final Coordination Act Report (CAR) or recent letter from the FWS pursuant to the Fish & Wildlife Coordination Act. The Feasibility Report/EA references a draft Coordination Act letter (dated 09/27//01), which is included in Appendix K. Pages 261 and 262 indicate that the identified mitigation needs are tentative and that revised recommendations will be submitted to the Louisville District, which will be incorporated in the final Feasibility Report. This does not appear to have been done, resulting in some uncertainty as to the recommended mitigation features and costs. In addition, page 262 states that the final CAR will indicate whether or not the requirements of the Endangered Species Act have been met. The District needs to obtain a final Coordination Act Report or indicate the reasons why it does not, or will not, have one prior to release of the final Feasibility Report/EA/FONSI for State and Agency review. Information should be provided regarding the certainty of mitigation requirements and costs for the selected plan and the compliance with the Endangered Species Act.

Action Taken: Concur. The Final CAR was issued 02 March 2006 by the USFWS, indicating that the mitigation needs referenced above have been resolved and that the requirements of the Endangered Species Act have been met. Additional field surveys will be conducted during the PED phase to determine whether or not the project as finally designed would have an impact on Running Buffalo Clover plants, Indiana bats, and/or mussels, if any, that might exist on project sites. The surveys and any relocation of affected species will be completed within the current estimated cost of the project. Pages 12 and 262 of the Main Report, and pages 13, 14, 19, 21, and 22 of the EA, have been modified to reflect receipt of the final CAR. A copy of the final CAR has been attached to Appendix K. These revisions have been provided as corrected pages.

HQUSACE Analysis: The concerns are resolved by the actions taken. Appendix K includes the final CAR letter dated 28 February 2006.

b. Editorial and Miscellaneous. There are a few locations in the report where minor editorial corrections should be made with errata changes or an addendum to improve clarity in the report presentation.

- The first paragraph on page 13 of the EA ends with incomplete statements (broken paragraph), and should be corrected.
- The text at the bottom of page 231 should be revised to avoid confusion, since the values of financial contributions expected from the Commonwealth of Kentucky and Harrison County are reversed.
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Action Taken: Concur. Corrected pages have been provided for circulation of the report for state and agency review.

- The referenced paragraph on page 13 of the EA has been corrected by deleting the incomplete sentence.
- The values of financial contributions from Harrison County and the Commonwealth of Kentucky at the bottom of page 231 have been reversed to reflect the correct amounts.
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- Pages 13 and 14 of the Economics Appendix (B) referred to the Federal interest rate used during the screening process, which at that time was 6 1/8%. For the NED Plan the FY2005 interest rate of 5 3/8% was used for final computations in the report. Wording to this effect was added to paragraphs 10 and 11 on page 14 of the economics appendix.

HQUSACE Analysis: The concerns are resolved by the actions taken.

PART III. RESOLUTION OF POLICY COMPLIANCE REVIEW CONCERNS ON THE DRAFT REPORT. The HQ policy compliance review on the draft report was completed in September 2005 and identified a few new concerns. The following paragraphs document the resolution of those concerns.

A. Plan Formulation.

(1) Additional Benefits. After the NED plan has been identified in the text, additional benefit categories are added to the NED alternative analysis. These include FEMA administrative cost savings and non-physical damages. Although it may be helpful to show the comparison of alternatives without the non-physical damages, adding them after the identification of the NED plan causes concern as to how other plans would accrue additional benefits and whether there is potential to affect the designation of the NED Plan. Either a discussion should be added to explain why these additional benefits would not affect the selection of the NED Plan or the additional benefit information should be included for all final plans to demonstrate that the NED plan has been identified.

District Response: Had the referenced “additional benefits” been distributed on all the final plans that consisted of detention basins, by using the flood damage reduction benefits for these plans as an order of magnitude, the result would have been that these benefits increased uniformly for each plan, thus not affecting the NED Plan selection. The 30 considered plans had to be screened without these “additional benefits” or mitigation costs because the District was still seeking approval during the AFB process for how the “additional benefits” should be estimated (para 3.A.(1)). Meanwhile, the mitigation costs for 11 of the thirty plans considered were not estimated. Plans involving a cut-through component were determined to be unreasonable alternatives as these impacted the sites of two civil war battles. Other historic and

prehistoric features are also within the vicinity of the cut-throughs. Local and state opposition to such alternatives was clear. It is likely that national opposition would have developed had these alternatives been developed further. The remaining plans involved only detention basins. Applying the “additional benefits” to all these plans would not have affected NED plan selection

HQUSACE Assessment: The concern is partially resolved by the information in the response. However, it does not appear that any text changes were made in the final report to explain that the additional benefit categories would not impact plan selection. The abbreviation of steps in the evaluation analyses and procedures is provided for in the guidance in paragraph 2-4.d.(6) of ER 1105-2-100, however, the report must provide some explanation and documentation.

Action Required: The information in the response should be included in the report, as noted in the comment. This can be accomplished by providing errata or addendum pages.

Action Taken: Concur. The information contained in the District response has been provided in revisions to pages 180 and 203 of the Main Report.

HQUSACE Analysis: The concerns are resolved by the actions taken.

(2) Mitigation.

(a) Consideration for Alternatives. It is not clear how mitigation requirements and costs have been considered during the formulation of the alternatives and whether a mitigation cost was included only in the tentatively selected plan. Mitigation requirements can vary considerably between the alternatives and should be considered during detailed formulation, since they can affect the formulation results. According to ER 1105-2-100, Economic and Environmental Principles for Water and Related Land Resources Implementation Studies, Item 5, page 1-2, “Appropriate mitigation of adverse effects is to be an integral part of each alternative plan.” Clarification is needed on how the mitigation requirements and costs were addressed during the plan formulation.

District Response: The citation from ER 1105-2-100 is given correctly; however it is taken out of sequential context and therefore is not fully applicable. The referenced item 5 first states that “Various alternative plans are to formulate in a systematic manner to ensure that all reasonable alternatives are evaluated.” It is the District's determination that the eleven plans involving a cut-through are not reasonable alternatives as these plans impacted the sites of two civil war battles. Other historic and prehistoric features including National Register eligible structures and prehistoric settlements are also within the vicinity of the cut-throughs. Local citizenry and State Historic Preservation Office opposition to such alternatives was made very clear at various meetings. It was expected that national opposition, especially from Civil War battlefield preservation groups and reenactors, would have developed had these alternatives been pursued further. All the remaining plans consisted of detention basins (DBs). Mitigation for these plans is in the form of acreage for tree planting, which was not required for plans involving cut-throughs. If the mitigation cost of tree planting was applied only to all these DB plans, mitigation costs would have been uniform across the plan components and would not have influenced the NED Plan selection. Therefore, a detailed mitigation cost was estimated for the Recommended Plan only.

HQUSACE Assessment: The concern is partially resolved by the response. HQ acknowledges that the analysis of mitigation requirements and costs can vary in detail for various alternatives. This is provided for in the guidance in paragraph 2-4.d.(6) of the regulation. However, abbreviating the steps in evaluation procedures by reducing the extent of the analyses need to be explained and documented in planning reports. The report does not present iterative cycles of alternative formulation leading to plan selection; Table 43 presents thirty plans as a screening of the final array of alternatives. With no explanation regarding the consideration given to mitigation in these alternatives, it is not clear that the formulation of detailed alternatives is based on complete cost information and the NED plan has been identified.

Action Required: The explanation provided in the response must be included in the text, so that it is clear which of the alternatives are being considered in detail and how mitigation considerations are being treated in the formulation of detailed alternatives leading to plan selection.

Action Taken: Concur. Text has been added to pages 182 - 184 of the Main Report explaining that mitigation requirements were essentially uniform in their impacts across plan alternatives and would not affect identification of the NED plan. Revised pages are provided. Incremental justification of the mitigation was covered on pages 250A through 250C of the original submission of the final Main Report.

HQUSACE Analysis: The concerns are resolved by the actions taken.

(b) Basis and Justification. The discussion of mitigation requirements on page 256 of the feasibility report states that the PDT estimated mitigation requirements for the project to be approximately 90 acres. Also, pages 13 and 18 of the EA refer to the mitigation need identified in the Coordination Act Report. It is not clear from these documents whether the project mitigation need is based upon USFWS mitigation recommendations found in the Coordination Act Report, or if the District conducted an independent mitigation needs determination as outlined in section C-3 (e), pages C-15 to C-21 of ER 1105-2-100. There is no evidence that a CE/ICA was conducted to develop and justify the mitigation plan. Further, page 248 notes that the detention basins require no significant removal or inundation of trees or wetlands. Page 244 notes that the PDT considers the mitigation an opportunity for environmental improvement. These statements raise questions regarding the significance of impacts and whether the proposed measures would represent enhancement.

District Response: The District evaluated the findings of the USFWS Coordination Act Report including mitigation requirements. The bulk of the 90 acres is to mitigate for wildlife habitat reduction in the riparian areas upstream of the dams with nominal compensation for project lands required for construction and operation. There is no significant tree removal associated with the project; however changes in floral and faunal components of the riparian community over the 50 year life of the project are expected due to the periodic and extended inundation of the stream valleys at times and levels other than would occur naturally. Such long-term impacts were realized during the District's independent fieldwork and environmental analyses. Results of the District's investigations were substantially similar to the findings of the work conducted by the USFWS with regard to mitigation needs. Therefore, the 90 acres are based on both the district assessment and the recommendations of the Federal and State resource agencies. The statement regarding the opinion of the PDT has been removed.

HQUSACE Assessment: The concern is resolved by the District response and the text change noted.

(b) Basis and Justification. (cont'd)

The Corps has the responsibility to make independent determinations of mitigation need, and develop appropriate mitigation measures. In accordance with the cited guidance, a Corps mitigation plan must describe and evaluate the current environmental conditions, identify and characterize the likely adverse environmental effects of the project, make a determination of the significance of the identified impacts, and using this information, develop an appropriate mitigation plan incorporating a cost-effectiveness/incremental cost analysis. The Fish and Wildlife Coordination Act requires the Federal action agency (in this case, the Corps) to solicit input from the appropriate Federal and State resource agencies, to fully consider the recommendations of these agencies in the planning process, and to describe the response to Coordination Act recommendations, as required by ER 1105-2-100, C-3.c.(1). The details of the mitigation planning process used by the District should be incorporated into the final feasibility report, and referenced into the EA.

District Response: Concur. See pages 250A through 250C of the main report for the detailed incremental analysis. In order to identify and characterize the adverse environmental effects of the proposed project, the District solicited inputs from Federal and State resource agencies and compared its own independent work with those of these agencies with regard to estimating mitigation needs. USFWS, supported by Kentucky Department of Fish and Wildlife Resources, originally estimated a need for 225 acres of mitigation based on a much larger project consisting of maximized components of three large DBs impacting over 51 miles of stream corridor, instead of the two downsized ones of the Recommended Plan that impact approximately 19 miles of stream corridor. The resource agencies agreed that their estimate of mitigation could be prorated with the downsized plans, but that the “final mitigation needs should be based on the impacts specifically associated with the alternative to higher authorities for authorization.” Using similar assumptions as USFWS, the District estimates that the Recommended Plan will impact to some extent the habitat values of approximately 90 acres of riparian corridor. The District also estimates that the habitat values of these 90 acres would decrease in the range of 25%. On this basis 90 acres of new hardwood plantings would be a 4 to 1 mitigation ratio, 45 acres would be 2 to 1 mitigation, 135 acres would be 6 to 1 mitigation, and so on. Given that new plantings will require years in which to mature, a four to one replacement (90 acres of new plantings) was selected by the District as appropriate compensation for reduced habitat value of existing riparian and bottomland hardwoods and the slowly increasing habitat value of the compensatory plantings. These plantings would be done on land already required for the project. The acreage used for mitigation plantings would be purchased in fee as opposed to a simple flowage easement.

HQUSACE Assessment: This particular concern is resolved by the district response. However, there is still some uncertainty regarding the mitigation requirements based on the need for a final Coordination Act Report as noted in item 2.a. above.

Action Taken: Concur. The final CAR was issued by the USFWS and mitigation requirements clarified with no expected change in the total project cost. See response to comment 2(a) above.

HQUSACE Analysis: The concerns are resolved by the actions taken.

B. Cultural Resources. See cultural resources investigations, pages 10, 11, 14 and 15; feasibility draft pages 245-247. HQUSACE has evaluated the proposed plan of action with regard to cultural resources, and questions whether the information gathered to date is sufficiently detailed to qualify as feasibility-level analysis. In the case of the Hinkston Creek basin, the nature of the resources that could potentially be impacted by project has not been identified, but would be investigated during PED. In the case of the Strode Creek basin, preliminary investigations have revealed possible intact subsurface deposits and features, and the report and EA state further investigations would be pursued during PED to further characterize the site. Typically, feasibility-level documents identify and characterize all factors that are likely to require consideration during the planning process. Given the degree of uncertainty associated with these known archeological deposits, HQUSACE recommends that the needed investigations should be completed as soon as possible so that likely avoidance measures and mitigation measures may be evaluated during the remainder of the study. Should the known archeological sites turn up significant historic resources, the avoidance and mitigation factors could have substantial impact on project schedules and costs, especially if any of the sites meet the criteria for inclusion on the National Register of Historic Places. Also, it is unclear whether appropriate contingency costs and schedules have been incorporated into the feasibility report. HQUSACE recommends that the feasibility report incorporate an analysis concerning whether the standard one percent of project costs allotted to data recovery for historic resources would be adequate to cover the anticipated costs of the known archeological sites. Detailed guidance concerning historic resources is found on pages C-24 through C-37 of ER 1105-2-100.

District Response: Concur, the needed additional archaeological investigations will be conducted as soon as possible, once funds become available to conduct the work during PED. There were neither funds nor time to conduct all the additional archaeological work during the feasibility study phase. Sampling of the project universe and coordination with Kentucky State Historic Preservation Officer (KY-SHPO) has resulted in KY-SHPO concurrence with shifting the remaining cultural resource work to PED. The local sponsor is aware that the needed investigations could result in increased costs. Appropriate costs have been estimated for the anticipated work and are included in the project's cost estimate in Volume 2, Appendix F. As regards data recovery costs, there is currently no confident factual basis to anticipate exceeding the standard 1%. Guidance is provided (ER 1105-2-100, pg. C-32) for addressing this issue in PED, if it becomes necessary.

HQUSACE Assessment: The concern is resolved to the extent possible at this time. Further cultural investigations will be conducted in PED. This approach is acceptable to the SHPO.

B. Cultural Resources. (cont'd)

On a related matter, the letter from the Kentucky State Historic Preservation Officer focuses on the proposed Battlefield Cut-Through, but has little to say concerning the other known historic resources at the Hinkston and Strode sites. HQUSACE concerns about the historic resources at the Hinkston and Strode sites would be greatly allayed should the District be able to obtain concurrence from the SHPO on the process that has been outlined in the feasibility study for these sites.

District Response: Concur, a new letter from the KY-SHPO, dated August 20, 2005, indicated that the SHPO concurs with the District on the process that has been outlined in the Feasibility Report for these sites and that this work will be conducted during PED in coordination with that agency. See Appendix J.

HQUSACE Assessment: The concern is resolved by the inclusion of the recent SHPO letter in the report.

C. Preliminary Financing Plan. Appendix N Financial Capability Analysis does a good job explaining the Federal and non-federal costs and how those costs would be apportioned among the various non-federal participants. However, several items should be included in the financial analysis. Because other public entities will be providing funding for portions of the project, a letter from each entity indicating their financial support is required. The method of finance for all non-Federal outlays should be explained in the financing plan. Where the non-Federal sponsor's capability is clear, as in the instances where the sponsor has sufficient funds currently available or has a large revenue base and a good bond rating, the statement of financial capability need only provide evidence of such. Otherwise, the financial analysis should include a discussion on the sponsor's ability to cover the non-Federal stream of costs. The district's assessment of the sponsor's financial capability could include prior performance by the sponsor, certainty of revenue sources, and the overall financial position of the sponsor. The above information should be provided at the level of detail necessary to demonstrate the sponsor's capability to meet the financial demands of the project. These components of the financing plan are described in Appendix D-5 of ER1105-2-100. This information is necessary to establish implementability and should be included in the appendix.

District Response: Cynthiana has recently indicated that it is prepared to be the sponsor for the project and to proceed with project implementation and provide 100% of the local cost share, until construction is completed, whether other local jurisdictions or community sources wish to contribute to local cost share financing or not. Cynthiana, with anticipated assistance from Harrison County, intends to issue a municipal bond for the amount that would come from their coffers (\$2,138,500 for 100% financing without contributions from other jurisdictions), with the remainder of \$3,971,500 coming from Commonwealth of Kentucky. If other jurisdictions wish to contribute funds, this would be subject to a third party agreement before the PCA is executed. At this time the only local sponsor known for certain is Cynthiana. However, Cynthiana and possibly Harrison County would have the primary responsibility for local support of the project, because the maximum funding that other jurisdictions could provide would only be a nominal amount of little more than 1% of total project costs.

A local sponsor's Financial Capability Assessment (FCA) is not required during the Feasibility Study. The District Resource Management Office (RMO) that will be responsible for conducting the required audit and documentation of the sponsor's FCA with regard to their bond rating, prior performance, certainty of revenues, overall financial position, stream of local appropriation, budget cycles, status of State and other assistance, etc. Already senior leaders of the District RMO visited with the Mayor of Cynthiana and the County Judge Executive of Harrison County and provided them with full information as to the forthcoming documentation of their financial responsibilities and gave them a tentative schedule on how and when the documentation of the required FCA will be conducted and informed that this would occur after the feasibility study

phase but prior to the PED and PCA agreements. In order for the District to be consistent, neither the PDT nor the RMO should start an untimely assessment of the sponsor's FCA at this time, because the time and tentative schedule for this FCA have been agreed upon between the local sponsor and the District RMO, and this assessment is not due now. Only a financial capability analysis Letter of Intent (LOI) is required during the feasibility phase and this LOI has been received (Appendix N).

HQUSACE Assessment: The concern is not resolved. The development of a preliminary financial analysis is needed to accomplish two key elements of the planning process, first to establish implementability of the recommended plan and second to ensure that the non-Federal sponsor has a reasonable plan for meeting its financial commitment. Establishing implementability is a requirement of a feasibility study and must be completed to recommend a plan. The fact that a detailed financial analysis is required as part of the PCA, does not preclude its preliminary development as part of the feasibility study to establish implementability. The feasibility requirements go beyond receipt of a sponsor's Letter of Intent to include a preliminary financial analysis and district's assessment, as described below.

ER 1105-2-100, paragraph G-9.a. states: "The purpose of the feasibility study is to identify, evaluate and recommend to decision makers an appropriate, coordinated, **implementable** solution to the identified water resources problems and opportunities. The resulting report should be a complete decision document, referred to as a feasibility report."

ER 1105-2-100, paragraph D-5 d.(2)(b) further states: "The feasibility report should be accompanied by supporting Financial information consisting of a preliminary financing plan and a statement of financial capability as described in this section of this Appendix. It is recommended that this information be included in an appendix on local cooperation. **This information is necessary to establish implementability.**"

Ultimately, the purpose of the financial analysis is to ensure that the non-Federal sponsor will be able to meet their financial obligations, which would be contractually entered into after the Feasibility phase. ER 1105-2-100, paragraph D-5.c. states:

"General Financial Analysis Philosophy. Financial analysis is required for any plan being **considered** for Corps of Engineers implementation that involves non-Federal cost sharing. The ultimate purpose of the financial analysis is to ensure that the non-Federal sponsor has a reasonable plan for meeting its financial commitment. The financial analysis should include:

- (1) The non-Federal sponsor's statement of financial capability;
- (2) The non-Federal sponsor's financing plan; and
- (3) The district's assessment of the non-Federal sponsor's financial capability. Financial considerations can be expected to affect project scale as well as construction scheduling and phasing and OMRR&R expenses."

The level of detail of the financial analysis will vary depending on its purpose and uncertainty. The feasibility study would only require sufficient detail to demonstrate implementability, while the PCA agreement would require greater detail to fully assess the non-Federal sponsors capability to meet future contractual obligations both in amount and timing of outlays.

Action Required: The district must provide a preliminary financial analysis and assessment as described above. Several items would be helpful to resolve the concerns. These include letters of support from Harrison County and the Commonwealth of Kentucky, the district's assessment of the sponsor's capability to obtain the required county and the state funding based on past performance, and discussion of the city's bond rating and past performance on using municipal bonds to finance capital projects.

Action Taken: Concur: A letter from the Kentucky Department for Local Government (KYDLG) was obtained, indicating that this agency intends to recommend to the state legislature that state financial assistance equal to 65 percent of the fully funded local cost share for project implementation be considered in the legislative session following Federal project authorization. The Commonwealth of Kentucky provides assistance to cities/counties for projects such as this one through KYDLG. The role of KYDLG is to recommend to the state legislature that the Commonwealth provide financial assistance to the local sponsor. Only an appropriation bill enacted by the state legislature can commit further assistance to the local sponsor for this project. Over the last few decades, the Commonwealth of Kentucky has provided financial assistance to cities and counties for water resource and other projects and is expected to do so for this project. KYDLG is the agency that recommended Commonwealth assistance to the local sponsor for the Feasibility Study phase. A letter of support was also obtained from the executive arm of Harrison County. Once the project is authorized for Federal construction funding, the County Judge Executive will recommend that the Harrison County Fiscal Court provide up to 50 percent of the remaining requirement (above the commitment from the Commonwealth of Kentucky) for local cost share funds. The balance is to be provided by the local sponsor, the City of Cynthiana. Harrison County provided similar assistance to Cynthiana for the Feasibility Study, and is expected to continue to support Cynthiana in future phases of project implementation. These letters have been attached to Appendix N and provided for circulation of the report.

The past performance of the City of Cynthiana includes several bond issues. There is no information on record indicating that this local sponsor has ever failed to fulfill its obligations with regard to any of its bonds issued to date. Previously, the local sponsor met its financial obligations by providing the local cost share for the Feasibility Study in full and on time. Currently, the local sponsor has a bond rating of "BBB-". With the expected financial assistance from Harrison County and from the State, the District is confident that this local sponsor is capable of financing the remaining portion of the fully funded project cost share. The local cost share portion to be borne by Cynthiana from their coffers over the next 7 years would not be beyond the financial capability of this local sponsor in view of their successful past performance and good bond rating.

HQUSACE Analysis: The concerns are resolved by the response and actions taken.

D. Cost Estimates.

(1) Fully Funded Cost Estimate. Cost estimates should represent as complete and as accurate a picture as is practicable. This is necessary for Federal and non-Federal sponsor planning and budgeting processes. The presentation of the project cost estimate is of particular importance in the feasibility study as it forms the basis for local decisions on project commitment and financing. Two project cost estimates should be displayed in the feasibility report. The first is the economic cost of the project based on constant dollars (which will include interest during construction). The second shows the financial costs (this not include IDC, but will show current and inflated costs) based on projected inflation rates. (see ER 1105-2-100 4-3.b.(2)). Local financing plans should be based on the fully funded cost estimate. Chapter XI, section h should be updated to reflect fully funded costs.

District Responses: Concur, the base year cost is estimated at \$17,458,000 in current constant dollars. The fully funded project cost is estimated at \$20,600,000 based on projected inflation rates. This was added to Table 50 in the Main Report on page 236.

HQUSACE Assessment: The concern is resolved by the district response and text changes noted.

(2) MCACES Estimate. The MCACES estimate stated “Adjusting pricing of 1.25% to all construction features to account for cost growth from the original estimate effective pricing date (September 2004) to the current effective pricing date (April 2005).” This adjustment rate appears to be excessive and not justified. The total project costs could be overstated due to this high adjustment factor. Provide rationale and justification describing the basis and assumptions for using this high adjustment factor. Guidance for updating cost estimates is described in ER 1110-2-1302.

District Response: The cost escalation calculated and applied by Adjust Pricing relates to the escalation value computed from the Civil Works Cost Index System Quarterly Indexes for an end date of Apr 2005 (early 3Q05). The specific escalation value calculated was determined by analysis of the impacts of various project components on the total construction cost and represents a blend of all these components. The overall end date for the escalation index determined was established as April 2005 as stated in the report. Cost engineering judgment was applied to establish the 1.25% cost escalation factor applied to all construction features. This complies with the guidance found in paragraph 13 a. of ER1110-2-1302.

HQUSACE Assessment: The concern is resolved by the district response.

(3) Contingency Factors. The application of high contingency factors to construction features exceeds guidelines described in ER 1110-2-1302. The use of high contingency factors in the estimate should be verified to insure project costs are not overstated. Provide justification and rationale describing the basis and assumptions used in the development of high contingency factors.

District Response: Concur, normal contingencies for a project of this size are 20% at the feasibility level. The contingency percentages assigned (25%) were based on PDT discussions relating to the level of uncertainty and cost risk associated with each design element reflecting the design development to date. This complies with the guidance found in ER 1110-2-1302. Cost Risk software was not employed in the analysis. The percentages used reflect the best

judgment of the PDT members. A number of design development activities were deferred to PED leading to higher than normal contingency percentages at feasibility. The notes supporting the basis for the assigned contingencies were developed for the project components and are maintained as part of the project working files. Some notes were included as part of the full MCACES estimate, but do not show up in the MCACES summary report in the draft report. Detailed estimate is included in the final report.

HQUSACE Assessment: The concern is resolved by the district response and text changes noted.

F. Real Estate Plan.

(1) Gross Appraisal. The REP is generally good. However, values in the REP are over a year old. The gross appraisal will need to be updated for the final feasibility study.

District Response: Concur, the Chief, Louisville District Appraisal Branch has advised that there is no change in the land values for Cynthiana. No changes are required to the report or the REP. An Admin update will be forwarded through appraisal channels.

HQUSACE Assessment: The concern is resolved by the district response.

(2) Mapping. The REP also needs to include some preliminary mapping depicting the project area and tracts required to support the project (including mitigation lands).

District Response: Do not concur, All mapping was included in Volume 3, Engineering Drawings in the draft Feasibility Report and is stated in paragraph 3 of the REP. After execution of a PCA, the local sponsor will be provided right of way drawings. The local sponsor will have the property surveyed and prepare the legal descriptions for acquisition.

HQUSACE Assessment: The concern is resolved by the district response.

(3) Permanent Flowage Easements. Paragraph 4 states that permanent flowage easements will be acquired over all areas within a one-year flood event. Permanent flowage easements are reserved for areas that are permanently inundated by the project. Generally, occasional flowage easements are acquired in areas that will not be permanently inundated. The REP needs to provide justification for acquiring the greater estate.

District Response: Concur, Louisville District, Office of Counsel has provided a Taking Analysis. The conclusion of the Taking Analysis states “the flooding caused by the 1, 2, and 5-year events would be compensable as a taking. ... The 1-year event would equate to a permanent taking because of the frequency and the amount of water placed on the land.” Office of Counsel has advised that this is tantamount to a permanent taking based on the frequency and duration. Paragraph 6 of the REP will be modified to add additional rationale.

HQUSACE Assessment: The concern is resolved by the district response and text change noted.

(4) Occasional Flowage Easements. Paragraph 4 states that occasional flowage easements will be acquired over all property within the two to five year event and paragraph 6 implies that greater than a five year event is not compensable. HQ does not see any justification for this position. The REP should elaborate. The extent of flowage easement acquisition in a project like this should be based on project contours and hydrology information. Flowage easements are normally acquired to a contour that is the height of spillway plus a free board (as determined by engineering). The contour is at least the height of the spillway because that is the height that will cause flooding beyond a natural event. It is possible that a taking will occur beyond that contour during a flood event by wave action. The district may want to look at the acquisition policies established on the later lakes constructed in the district. It is likely that occasional flowage easements were acquired up tributaries far beyond a 5-year flood event and were based on a contour line plus a freeboard.

District Response: Concur, Louisville District Office of Counsel prepared a Taking Analysis based on information provided by Hydraulics. The Taking Analysis was prepared in accordance with ER 405-1-12, Para 12-16, c, (9). The analysis incorporated the facts provided by Hydraulics relating to depth, frequency, duration, and extent of the expected induced flooding. Relevant Kentucky case law was referenced. Paragraph 6 of the REP will be modified to add additional rationale.

HQUSACE Assessment: The concern is resolved by the district response and text change noted.

(5) Paragraph 13. This paragraph should also address NEPA and NHPA compliance.

District Response: Concur, REP has been revised to include a new Para 14, Cultural Resources and addressed NEPA and NHPA.

HQUSACE Assessment: The concern is resolved by the district response and text changes noted.

(6) Sponsor Capability. A sponsor capability assessment must be provided as an exhibit to the REP for each sponsor. The district notes this requirement in REP paragraph 15.

District Response: Concur, a QCP for the City of Cynthiana has been completed and attached as an Exhibit to the REP.

HQUSACE Assessment: The concern is resolved by the district response and text change noted.

G. Editorial.

(1) The main report should not include ITR and policy review comments. The main report should be an outcome of the ITR. The review process can be incorporated into an appendix as a process. Further, this is a Corps of Engineers report- the names of individuals or offices should not be singled out in the report or the review process. All explicit review comments and names should be removed from the main report.

District Response: Concur, this has been done throughout the Report.

HQUSACE Assessment: **The concern is resolved** by the district response and text changes noted.

(2) Page 223 and 224. The attempt in these paragraphs to describe flowage easement requirements differs from the description in the REP. They need to be reconciled.

District Response: Concur, has been corrected in final report.

HQUSACE Assessment: **The concern is resolved** by the district response and text changes noted.

(3) Page 224 indicates a takings analysis is attached to the REP as an exhibit. It is not.

District Response: Page 224 will be corrected to indicate that a taking analysis was performed as the basis for the real estate. Indications that the taking analysis is in the REP have been removed.

HQUSACE Assessment: **The concern is resolved** by the district response and text changes noted.

(4) Table 50 on page 235 should have the first entry corrected to show the LERRD costs as 29.4%, rather than 31.4%, similar to the information in parentheses for the total.

District Response: Concur, table corrected in final report.

HQUSACE Assessment: **The concern is resolved** by the text change noted in the response.

PART IV. RESOLUTION OF PRIOR CONCERNS ON THE AFB PACKAGE. The items below discuss the resolution of specific policy review concerns based on the information provided in the Alternative Formulation Briefing materials. The number of each concern below corresponds to the paragraph number in the AFB PGM.

A. Economic Analysis.

(1) **Non-Physical Damages:** See page 42. While the extensive effort that went into developing the non-physical damages estimates for the Frankfort, Kentucky project do not need to be

replicated for this study, it is recommended that the district verify that the types, sources and magnitudes of damages included in the Frankfort analysis are in fact still relevant to this particular project and geographic location.

District Response: The Frankfort analysis included estimates of non-physical damages pertaining in part to administrative costs of emergency and disaster relief efforts incurred by a multitude of public agencies and private charitable organizations in response to major disaster declarations by both Federal and State governments. The Frankfort analysis also included estimates of a variety of non-physical costs incurred by flood victims themselves consisting of increased expenses while living away from home in temporary housing and/or while their homes or businesses or major parts thereof were closed and being repaired. With regard to the non-physical damages that would be alleviated by the prospective Cynthiana project, the type, sources, and magnitude of non-physical damages included in the Frankfort analysis, are still applicable to this project and geographic location for the following reasons: One, the same type of Federal and State declarations of a major disaster were issued for both geographic locations; Two, almost identical public agencies and private charitable organizations provided their services in a typical manner in response to the disaster declarations in both geographic locations; Three, approximately the same number of federally provided temporary housing units that was provided in Frankfort during the 1978 disaster was provided in Cynthiana during the 1997 disaster; Four, because federally provided temporary housing was used as a measure of magnitude to assess the size of the Frankfort disaster and its administrative costs within the larger disaster throughout the State of Kentucky, and because the temporary housing units were similar in both Frankfort and Cynthiana, the magnitude of disaster and its emergency administrative costs for the Frankfort project are still applicable to the Cynthiana project; Five, because the size of disaster relief activities in both locations was similar, it is reasonable to assume that the increased expenses incurred by flood victims were also similar. On this basis, the methodology used in the Frankfort analysis for incorporating non-physical damages into project benefits will be used by the District to derive non-physical damages (benefits) for the Cynthiana project. This will be reflected in the draft Feasibility Report.

Discussion: HQ thinks the Frankfort analysis is useful, but is concerned about the application of it to the Cynthiana project due to the age of the data used for Frankfort (1978). The District explained that the flood of 1997 that struck Cynthiana was very similar in magnitude, response and geography to the 1978 flood in Frankfort

Action Required: The District needs to verify and document that the Frankfort analysis, which was formulated in 1978, can be appropriately applied to Cynthiana, i.e. that all of the responding agencies and data are similar and that no new organizations are involved in the non-physical responses to disasters in Kentucky. The draft report needs to address, the specifics of the analysis, including the verification process used for this study.

Action Taken: District concurs. See draft Feasibility Report under 2) *SIGNIFICANT BENEFIT INCREASES OVER THE PRELIMINARY NED PLAN BENEFITS*, pages 199-205. The District conducted what is believed to be very reliable, yet conservative, extrapolation of non-physical damages from well-documented research on non-physical damage for the Frankfort Project. In the event that the reviewers in HQ and LRD do not concur with the proposed District execution of this item, the item could be eliminated from the final Feasibility Report. In this case, the BCR for the project would slightly decrease from 3.1 to about 2.7.

HQUSACE Analysis: The concern is partially resolved. The report does a good job of explaining how the non-physical damages from the South Frankfort Feasibility Study was used and incorporated into this analysis. However, more information should be included to describe how benefits were calculated in the Frankfort study. This concern could be addressed by including the economic methodology from the Frankfort study as an appendix.

Action Required: Provide additional information on the economic methodology from the Frankfort study in the final report.

District Action: Concur, the methodology for estimating non-physical damages in the Frankfort study is included in Appendix B.

HQUSACE Assessment: The concern is partially resolved. One issue remains with the annualization of the non-physical damages. The non-physical damages are based on one large event. How that event is used to determine average annual damages is critical. The Frankfort, Kentucky analysis does not indicate how the single event damages were related to smaller infrequent events. A comparison of damages by frequency for both studies could show that the type of flooding is similar for all frequencies.

Action Required: Provide information in the report that explains how the non-physical damages were estimated over a range of frequency flooding events based on the information available from the Frankfort study.

Action Taken: Concur in that information will be added to the main report clarifying how the non-physical damages were estimated for Cynthiana. The non-physical damages under discussion consist primarily of administrative costs of emergency response incurred by public agencies and private charitable organization mobilized as a result of Federal and State Declarations of Major Disaster. This level of mobilization will typically occur only as the result of large, infrequent flood events. The annualized numbers calculated in the Frankfort study (and extrapolated to this study of the Cynthiana region) represent the risk of a single large event spread over the period of analysis. In the absence of a field survey and economic analysis conducted immediately subsequent to the 1997 flood of record in the Cynthiana study region, the District extrapolated an estimate of these specific damage categories from the previously surveyed, annualized and approved estimates for the Frankfort flood. The extrapolation took into account the physical and economic differences between the Frankfort and Cynthiana communities. The Frankfort flood event was selected for comparison purposes because it occurred in the adjacent Kentucky River watershed, was of similar magnitude, and had similar disaster declarations and flooding conditions as along the Licking River. This benefit category item does not significantly alter the economic viability of this project or the NED Plan selection. Additional clarifying wording has been added to pages 180 and 203 of the Main Report.

HQUSACE Analysis: The concerns are resolved by the actions taken.

(2) Residual Damages: See page 87. There appears to be no residual damages of any kind associated with the proposed flood protection project in Millersburg. The district should consult ER 1105-2-100 in paragraph 3-3.b. (2) (c) and ER 1110-2-1150 in Appendix C. paragraph C-2.2 concerning residual flood damages for events exceeding the level of protection.

District Response: The size and potential performance of the detention basin (DB) component of the NED plan at Hinkston Creek were planned to be sizable enough to effectively reduce the existing massive damages in Cynthiana which is located some 28 stream miles downstream from the DB site. The size and performance of this DB would eliminate over 99 percent of the relatively tiny existing average annual damages in the small rural town of Millersburg, which is located almost immediately downstream from the prospective DB site. Based on ER 1105-2-100, the higher the level of performance for Corps projects, the lower the residual risk, and conversely. Further, because the dam structure of this DB would be constructed in RCC, residual risk connected with the unlikely event of dam failure would be very small. Insofar as the flood protection of the potential project in Millersburg is concerned, no significant residual risk is expected.

Discussion: HQ is concerned about the perception the report gives that there will be 100 percent protection for the city of Millersburg. The Division stated that Millersburg is close to the dam site and would get a fraction of 1 percent of flood damages. The District needs to address the potential expectations of the local stakeholders regarding residual damages due to very low frequency events.

Action Required: The wording in the draft report should be changed to reflect a more realistic level of protection, i.e. something less than 100 percent.

Action Taken: District concurs. See draft feasibility report, pages 114 and 164. The residual risk has been re-estimated at about 4%.

HQUSACE Analysis: The concern is resolved by the text changes noted in the response.

B. Plan Formulation. The last paragraph on page 136 indicates that although the stand-alone plans for Battlefield Cut- Through and the Railroad Cut- Through are economical, they do not have sufficient benefits to be included in the NED plan. This sounds a bit contradictory at first, and the text clarifies that when the cut-through channels were investigated in combination with detention basins, the net NED benefits of the combinations decreased. Review of the data in Table 33 indicated that when the costs of combination plans were developed, the costs of component plans were simply added. It may be worthwhile to consider the effect of any economies of scale (savings in mobilization /demobilization, for example), which may result from the combination plans as the selected plan is finalized, since this might have potential to affect the NED cost of combinations and the sponsor has expressed some interest in the larger combinations.

District Response: With regard to any economies of scale pertaining to savings in mobilization / demobilization (mob/demob), for example, the significant distance between the location of a cut-through and the location of the NED plan components (Strodes Creek and Hinkston Creek Dps), in view of the relatively narrow and winding, rural roads in between, would render any claim of savings as such impractical. With regard to developing the Battlefield cut-through (CT) on this historic landmark site; even if this CT were eligible for being a component of the NED plan, there would be formidable opposition by the State Heritage Council and by community interest groups that would threaten community cohesion. As to developing the Railroad CT, even if it

were eligible for being a component of the NED plan, the cost of the larger project would be beyond the financial capability of the local sponsor.

Discussion: HQ questioned the reasons for not looking at the Cut-Through plans. The concern is that the wording in the report makes it seem as though cost was the only reason for not accepting either plan. The District explained that both cut-throughs involve the Battlefield. The Battlefield area is a sensitive cultural resource area. Any project that significantly impacted the Battlefield would face strong resistance from the Cultural Resources agencies and local historical groups. The District stated that the last added increment for either of the Cut-Through plans is not economically justified.

Action Required: The draft report needs to include a more robust explanation for the elimination of both cut-through plans from further consideration. The explanation needs to include information addressing the cost of the plans, as well as the physical locations of the respective cut-throughs in order to fully document the validity of the NED formulation process. The maps in the report need to be modified to more clearly show the potential locations for the cut-throughs. The draft report also needs to clearly show that due to the physical locations of the various project elements, there would be no cost savings due to combining the mob/demob for the various components.

Action Taken: District concurs. See draft Feasibility Report as follows:

- For consideration of the cut-throughs, see Section IX, Paragraph N, 3) *ISSUE CONCERNING POSSIBLE IMPACT OF DISTURBING CUT-THROUGH SITES ON COMMUNITY COHESION*, pages 176-180. All the plans involving a cut-through, be they stand alone or combination plans, actually received the same thorough consideration that all the other plans received. However, none of the plans involving a cut-through passed the screening test of becoming the NED Plan. Further consideration of plans involving a cut-through would have been limited to assessing the potential mitigation costs which were assumed to be excessive, with a potential retarding effect on the competitiveness of these plans in the screening process, and this additional work would have been justified only if the local sponsor was in favor of: providing additional local funds for conducting an inevitable environmental impact statement (EIS); extending the schedule for completion of the study for up to 20 months awaiting work on the EIS; and supporting a locally preferred plan involving a cut-through instead of the NED Plan. The facts that the local sponsor had already supported the NED Plan, made it necessary not continue work for assessing the potential mitigation requirements for the cut-throughs.
- For physical location of the cut-throughs, see Plate 2, Site Location Map, page 100.
- For modification of maps in the Report, see Plate 1, page 14, Plate 2, page 100, Plate 3, page 189, Plate 4, page 193, and Plate 5, page 197.
- For lack of cost savings from combining the mob/demob, see under paragraph 1) *WITH PROJECT DAMAGES AND BENEFITS*, pages 182-184 and under paragraph 4) *INTERRUPTION OF RCC CONSTRUCTION*, pages 218-219. In addition to the safety concerns and physical constraints discussed in the draft Feasibility Report, savings in mob and demob that could have particularly enhanced the competitiveness of stand alone cut-through plans or combination plans involving a cut-through component were not possible. First, savings in mob and demob are not claimed for

plans with a stand-alone feature. Second, none of the combination plans included more than one cut-through component and, even if there were savings in mob and demob for combination plans consisting of one or more detention basin(s) plus one cut-through, the savings advantage for a cut-through component would be cancelled out by those of the detention basin component(s) of the combination plan.

HQUSACE Analysis: The concern is resolved by the text changes noted in the response.

C. Cost Sharing. The AFB material does not present the proposed cost sharing for the tentatively recommended plan. The MCACES estimate is not yet available and it is not clear whether the sponsor will be buying up to a locally preferred plan. However, in the event that a locally preferred plan is recommended, the text on Policy Issues on page 130 indicates that the sponsor has been informed that Federal participation will be limited to the cost share for the NED plan, unless a waiver is granted by ASA (CW). Any such waiver request should be submitted at the earliest possible time.

District Response: The local sponsor has been apprised of the prospective local cost sharing on several occasions as part of ongoing coordination. Based on new information, the local sponsor will not be buying into a locally preferred plan and will submit a letter during the forthcoming AFB conference for supporting the tentative NED plan only. The cost sharing requirements will be reflected in the draft Feasibility Report. Work on the MCACES estimate is in progress. The financial capability of the local sponsor appears to be limited to financing, with major assistance from the Commonwealth of Kentucky, the local cost share of the NED plan solution. The Commonwealth of Kentucky is expected to contribute 65 percent of the local cost share of this project on behalf of the local sponsor. The local sponsor would be interested in greater protection only if the entire cost above that of the NED plan would come from Federal sources or State sources or both. There is no indication that this is attainable.

Discussion: Cost sharing for the project was discussed. The 35 percent Federal/65 percent non-Federal plus 5 percent cash cost split was explained to the Local Sponsor. One option that the Local Sponsor has is to select a non-NED plan where the local sponsor would pay costs above the NED plan. The Local Sponsor said that the funding would be through the Department of Local Government funds (this is similar to a block grant). It was also noted that the signatory on the PCA would be the Local Sponsor only and all other agreements for funding would be third-party agreements.

Action Required: Tables and discussion of the project's cost sharing should be included in the draft report. Also, the report should include a section on responsibilities of the Local Sponsor.

Action Taken: District concurs. See draft Feasibility Report as follows: Pages 233-235 under 4) *LOCAL COST SHARING RESPONSIBILITIES*; page 226 under 8) *LOCAL SPONSOR RESPONSIBILITIES WITH REGARD TO LERRD*; and pages 236-241 under paragraph *J. ASSESSMENT OF LOCAL SPONSOR FINANCIAL CAPABILITY*. Total project costs are \$17,458,000, with \$11,348,000 (65%) Federal and \$6,110,000 (35%) non-Federal.

HQUSACE Analysis: The concern is resolved by the text changes noted in the response.

D. Completeness. See Page 21. Has the cost for the additional structure needed to block debris from entering the basin been included in the estimated costs for the project? As per ER- 1 105-2-1 00, all reasonable costs should be included in the feasibility cost estimates.

District Response: The structure referred to is actually intended to be a simple debris deflector to prevent large pieces of wood and similar material from blocking the culvert. Its cost is estimated to be in the range of \$5,000, which will be accounted for in the MCASES estimate.

Discussion: The terminology used in the AFB materials makes the deflector sound like a concrete structure that would be rather expensive. The District explained that the deflector is actually a steel grate placed in front of the culvert.

Action Required: The draft report should include a more detailed, or at least clearer, description of the debris deflector.

Action Taken: District concurs. See draft Feasibility Report, under 2) HYDROLOGY AND HYDRAULICS/ ECONOMICS, pages 216-217. The term “structure” was replaced by the terms ‘simple deflector’ and “steal grate”.

HQUSACE Analysis: The concern is resolved by the text changes noted in the response.

E. Real Estate- Sponsor's Jurisdiction: On page 66 of the Report, a comment is made that areas outside Cynthiana's jurisdiction or other possible sponsors' jurisdiction may need to be acquired for the project and that a binding agreement between the parties would be needed to address potential condemnation matters. As the non-Federal sponsor is responsible for providing all land required for the project and operating and maintaining the project, all jurisdictions involved need to be a party to the PCA whether it is individual cities or counties or a larger political entity.

District Response: This comment has been made known to the local sponsor and will be reflected in the Draft Feasibility Report. Further, the local sponsor already has an understanding with all jurisdictions involved that they would be a party to the PCA.

Discussion: HQ asked for information on jurisdiction of local sponsor. Cynthiana would be the local sponsor with sub-agreements between Cynthiana and two other cities and three counties.

Action Required: Information about the division of plan responsibilities should be included in the draft report.

Action Taken: District concurs See draft Feasibility Report, Section XI, G, 9) DIVISION OF ACQUISITION PLAN RESPONSIBILITIES, pages 227-229.

HQUSACE Analysis: The concern is partially resolved. Sponsorship of this project needs to be settled. The main report indicates that there may be as many as six sponsors. This is not acceptable. Sponsorship should be limited to one or possibly two sponsors. Obligations of other entities should be handled by sub-agreements with the sponsor.

Action Required: The discussion of sponsorship information in the final report should be revised to address the above concern.

District Action: Cynthiana has indicated that it is prepared to proceed with the project and provide 100% of the local cost share, until construction is completed, whether other local jurisdictions or community sources wish to provide some funding or not (Appendix N). Cynthiana would be open to accept contributions to the project from local community sources or other jurisdictions preferably if provided as donations to the project without strings attached. Otherwise, at the appropriate time before execution of the PED agreement and the PCA, a third party agreement could be negotiated and executed with other local jurisdiction wishing to contribute small amounts of funds, if any, for financing the local cost share. Cynthiana, with possible assistance from Harrison County, intends to issue a municipal bond for the amount that would come from their coffers (\$2,138,500 for 100% local cost share financing) with the remainder of \$3,971,500 coming from the Commonwealth of Kentucky. Possible contributions from other jurisdictions to the local cost share financing would be a little more than 1% of the total project cost, if any.

HQUSACE Assessment: The concern is partially resolved by the district response. However, this response seems to contradict the report text on pages 231 and 232 regarding the role of Harrison County in providing financial assistance. The report indicates the city expects to issue a bond for its expected share of \$1,059,250 versus the \$2,138,500 above.

Action Required: Further clarification is needed so that consistent information is presented on the division of responsibilities and the financial plans.

Action Taken: Concur. The referenced inconsistency has been corrected on revised Page 231 of the Main Report. Cynthiana and Harrison County will each contribute \$1, 069,250 and the Commonwealth of Kentucky \$3,971,500.

HQUSACE Analysis: The concerns are resolved by the actions taken.

F. Editorial Comments.

(1) Text Organization. Sections III through VIII of the report, which discuss the results of the initial public involvement, environmental scoping, and real estate, contain some general information as well as specific information on alternatives and the NED plan that seems premature, since the plan formulation is discussed in Section IX. Consideration should be given to relocating some of that material in the draft report so it is presented in the context of public views and coordination during the plan formulation and evaluation process.

District Response: As advised, the general information in Sections III through VIII of the AFB report will be relocated and presented in the draft Feasibility Report in the context of plan formulation.

Discussion: No discussion needed.

Action Required: Draft report to be corrected.

Action Taken: District concurs. The general information in Sections III through VIII of the AFB report was relocated and presented in the draft Feasibility Report in the context of plan formulation.

HQUSACE Analysis: The concern is resolved by the text changes incorporated in the draft report.

(2) FY 2003 Discount Rate: See page 134. The District needs to be cognizant of updating the feasibility costs for the selected plan to the current discount rate before submitting the draft report in accordance with Economic Guidance Memo #03-02.

District Response: The feasibility costs for the selected plan will be updated to the current discount rate, as soon as work on the MCACES estimate is completed.

Discussion: No discussion needed.

Action Required: Draft report to be corrected.

Action Taken: District concurs. See draft Feasibility Report, pages 206 – 207. The District has updated the costs and benefits of the selected plan to the FY 2005 discount rate of 5.375%. In reevaluating / updating annual benefits and costs of the Recommended Plan, the FY 2005 price level, the FY 2005 Federal interest rate of 5.375%, and the standard 50-year period of analysis were used. A summary of annual costs and benefits of the Recommended Plan is presented in Table 207.

HQUSACE Analysis: The concern is resolved by the changes incorporated in the draft report.

Action Required: No action is required at this time. Note, however, that the applicable guidance on interest rate changes each fiscal year and new guidance would be applicable to reports submitted in FY06. A change in discount rate could be addressed in an addendum or errata sheets, if necessary.

Action Taken: Concur. The update for FY06 change in the discount rate was performed. The project cost adjusted to FY06 levels is \$17,791,000.

HQUSACE Analysis: The concerns are resolved by the actions taken. An economic update was provided on 19 May 2006.

(3) Schedule: The district needs to reconsider the implementation schedule included on page 139 of the AFB package, as it was already obsolete by the date of submittal.

District Response: The schedule on page 139 of the report will be adjusted after the forthcoming AFB conference to reflect HQ guidance and District workload capabilities.

Discussion: No discussion needed

Action Required: Draft report to be corrected.

Action Taken: District concurs. Schedule has been updated as shown in the draft Feasibility Report, Page 266.

HQUSACE Analysis: The concern is resolved by the changes incorporated in the draft report.

/s/
C. Lee Ware, P.E.
Review Manager

Attachment 2
Supplemental Review-Final Feasibility Report and EA
Licking River Cynthiana, KY

The following supplemental comments are provided for reference during PED based on an engineering review of the report from a dam safety perspective by the HQ Review Team.

Hydraulics.

1. Resolution of the remaining ITR comments.
 - a. The FFR refers to two outstanding comments associated with the Hydraulics ITR. The first comment refers to the need for additional routing of the standard project flood and the probable maximum flood through the detention basin structure and on the stilling basin design. The second comment requests a more detailed failure analysis for the RCC.

Both issues will need to be resolved during PED. However, based on the hydraulic analyses already completed, refinements to the selected plan resulting from the additional review will likely be minor.

2. Dam Safety Analysis.
 - a. The feasibility report states that the detention basins are classified as “Standard 3” structures. The evidence required to support this determination is outlined in ER 1110-8-2(FR) (ER2) and should be provided in the design report. The hazard classification, which has design implications, should also be included in the report. These determinations should be coordinated with the dam safety officer.
 - b. As required, the FFR includes analyses for a wide range of flood events. However, the PMF is not specifically discussed. Since ER2 specifies one-half of the PMF as the minimum acceptable inflow design flood for a Standard 3 dam, the PMF and one-half PMF should be identified and included in the analysis.
 - c. A significant hazard dam requires a minimum acceptable freeboard of 3 feet. Wind and wave run-up calculations and a seismic analysis should also be completed to determine the appropriate freeboard. Please describe how the freeboard was determined for the detention basins.
 - d. The FFR states that the antecedent conditions were not considered due to the short duration of storage in the detention basins and low probability of the occurrence of two or more events. ER2 does specify that antecedent conditions must be considered in the determination of the Inflow Design Flood. The decision not to include antecedent conditions needs to be further explained. What were the conditions in the basin during previous high water events? A cursory review may be required to determine the potential impact to the design of the structure.

The hydraulic analysis already completed indicates that any refinements to the selected plan, as a result of this additional analysis, will be minor. A possible exception could be a final determination on the inclusion of antecedent conditions.

Geotechnical.

3. Potential Impacts to Cost.

The bulk of the geotechnical analysis will take place during PED. The list of future work provided in the Geotechnical Appendix adequately summarizes the required geotechnical analysis. The comments provided below address areas that could potentially impact project costs.

- a. Usually bedrock contains weathering, jointing and fracturing due to environmental aspects and due to unloading during valley formation. Flow through limestone (LS) can occur in these joints and fractures and depending on the LS, can cause solutioning (karst type situation). Concerns regarding flow in the foundation may require dental or foundation grouting. The high water level may make this a problem.
- b. Additionally, due to the high water level, borrow may be limited unless it is cost effective to dry it.
- c. The presence of shale, formed of clay materials, is often a stability red flag. (The designers have noted some stability concerns that will be addressed during PED.)
- d. Seepage through the embankments, abutments, and/or foundation is also a design concern. Additional borings will be necessary to accurately characterize the geologic stratification in all of these areas. The presence of weak soils can lead to additional excavation and fill, which will increase project costs.

The designers have outlined most of these concerns in the FFR. Due to the potential for major changes to project costs, Division and HQ should be updated if any of these issues are realized during PED.