DOCUMENTATION OF REVIEW FINDINGS

TOPEKA, KANSAS
FLOOD RISK MANAGEMENT PROJECT

FEASIBILITY REPORT
AND
ENVIRONMENTAL ASSESSMENT

June 2009

Table of Contents

A. GENERAL. ____ *4*

1. Policy Compliance Review Findings ____ 4
2. Project Location ____ 4
3. Authority. ____ 5
4. Non-Federal Sponsors. ____ 5
5. Problems, Needs And Opportunities. ____ 5
6. Plan Formulation ____ 6
7. Selected Plan. ____ 7
8. Project Costs. ____ 8
9. Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R). ____ 8
10. Project Benefits. ____ 8
11. Cost Sharing. ____ 8
12. Environmental Compliance ____ 9

B. COMMENTS FROM REVIEW OF THE FEBRUARY 2007 ALTERNATIVE FORMULATION BRIEFING DOCUMENTATION. ____ *9*

1. Project Location and Description (Section 1.0). ____ 9
2. Description of the Existing Problem (Section 2.0). ____ 10
3. Design vs. Existing ____ 14
4. Description of Problem. ____ 15
5. Alternative Development. ____ 17
6. Base and Future Conditions. ____ 18
7. OMRR&R. ____ 19
8. Zero Damage Elevation. ____ 19
9. Stage Damage Curves. ____ 20
10. EA Level of Detail. ____ 21
11. Public Meeting (Section 5.0). ____ 22
12. Non-government land. ____ 23
13. Borrow Areas (Sections 7.0, line 259). ____ 23
14. Disposal (Section 8.0). ____ 24

15. Forest/Vegetation. 25
16. Jurisdictional Wetlands. 26
17. Endangered or Threatened Species (Section 10.6). 26
18. Cultural Resources (Section 10.7). 27
19. Recreational Resources (Section 10.8). 27
20. Visual Quality (Section 10.9). 28
21. Noise (Section 10.10). 28
22. Air Quality (Section 10). 29
23. Demography (Section 10.12.1). 29
24. Environmental Justice (Section 10.12.4). 30
25. HTRW. 31
26. Mitigation (Section 13.0). 32
28. Minimum List of Statutes (Page 46). 33
C. COMMENTS ON THE APRIL 2008 DRAFT FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT RECEIVED 20 AUGUST 2008. 34
1. North Topeka Unit NED Analysis. 34
2. South Topeka Benefits. 34
3. South Topeka Unit's Commercial Structures 35
4. Riparian Habitat South Topeka Floodwall Construction. 36
5. Fairchild Pump Station. 37
6. Lost Production. 38
7. Oakland Unit Construction Features. 39
8. Real Estate Impacts Oakland Sewage Disposal Plant. 40
9. Real Estate Costs. 40
10. Value Engineering Study. 41
11. Economic Update. 42
D. REVIEW COMMENTS ON THE DECEMBER 2008 FINAL REPORT AND EA. 42
1. The review of the final report generated no additional comments. 42

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June 2009

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FEASIBILITY REPORT
AND
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DECEMBER 2008

A. GENERAL.

1. Policy Compliance Review Findings. The following summarizes the final HQUSACE policy compliance review findings for the feasibility report and Environmental Assessment (EA) on the proposed flood risk management project. This summary includes the concerns and the related resolutions of those concerns for the HQUSACE reviews of the Alternative Formulation Briefing Documentation received in February 2007, Draft Report and EA dated August 2008, and the December 2008 Final Feasibility Report and EA.

The AFB materials for the Topeka, Kansas, Flood Damage Reduction Project were submitted for review on 6 February 2007 and led the policy compliance review comments, which were issued on 23 April 2007. CENWD forwarded responses to the comments on 27 April 2007. The AFB was held on 30 April 2007 to further resolve the review concerns and resulted in a PGM, which was issued on 15 June 2007. The PGM required further coordination for two issues before HQUSACE could endorse the tentatively selected plan. The first issue required additional information categorizing the proposed work as design or construction deficiencies. The second issue required a revised, simplified mitigation plan and cost analysis to address the quality of the habitat and why it is worth mitigating.

The Draft Feasibility Report package was submitted to HQUSACE in August 2008. HQUSACE provided an assessment of the degree to which the actions taken by CENWK had addressed the comments. Additional comments were also provided at that time.
The final report review information was documented in the CECW-PC Final Project Assessment Memorandum dated 19 December 2007. The documentation that follows comprises the HQUSACE policy compliance review record.

2. Project Location. The study area includes those portions of the Kansas River, Soldier Creek, and Shunganunga Creek drainage basins that are located within the City of Topeka. Soldier Creek basin is 331 square miles located to the north of the Kansas River. Shunganunga Creek flows through southeast Topeka to the Kansas River just downstream of

the airport. The drainage basin of Shunganunga Creek is about 75 square miles of which 22.5 square miles lay within the city limits of Topeka.

The Topeka, Kansas, local Flood Protection Project was authorized by the 1936 Flood Control Act. The authorized plan provided for the construction of flood damage reduction works for South Topeka, North Topeka, and the municipal water works. Several modifications to the original plan were authorized. Portions of the South Topeka plan and the municipal water works were completed in 1939. However, the final modification and construction of all project units were not completed until 1973.

3. Authority. The Topeka, Kansas, Flood Risk Management Feasibility Study (the Study) was authorized under Section 216 of the 1970 Flood Control Act, which reads as follows:

> *The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects, the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to the significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying structures or their operation, and for improving the quality of the environment in the overall public interest.*

4. Non-Federal Sponsors. The City of Topeka, Kansas, and the North Topeka Drainage District are the designated non-Federal Sponsors for ownership, operation and maintenance of the existing levee system. The City of Topeka represents both entities as the cost-share sponsor for the Study.

5. Problems, Needs And Opportunities The existing levee system does not reliably provide the intended level of flood risk management benefit. This is supported by the research of previous design and authorizing documents, engineering analysis performed using current criteria, and mathematical modeling. Each of the units in the existing system was systematically analyzed and critical reaches for geotechnical and structural concerns were identified. For those reaches that did not meet current factor of safety criteria, an additional reliability analysis was conducted to calculate the probability of failure. Table 1 presents the current estimates of the probability of passing the 1-percent annual chance event for each unit and the specific areas of concern.

Table 1
Existing Conditions Reliability and Areas of Concern in Kansas River Units

Levee Unit	Reliability Against the 1% Event	Key Problem Area
Waterworks	92.8%	Low factors of safety for floodwall sliding stability.
South Topeka	84.2%	High probability of underseepage failure in earthen levee section. Low factors of safety for pump station strength and manhole uplift. Unacceptable probability of axial capacity failure in floodwall timber pile foundation.
Oakland	2.9%	High probability of underseepage failure in earthen levee section. Low factors of safety for pump station and manhole uplift. Low factors of safety for floodwall sliding stability.
North Topeka	14.1%	High probability of underseepage failure in two reaches of earthen levee section. Low factors of safety for pump station uplift.
Auburndale	96.8%	No problem areas detected.

6. Plan Formulation The levee system was evaluated in a systematic fashion in order to assess reliability and likely future performance, including the identification of critical areas or cross sections. The results of the existing conditions analysis, and observations and effects from historic and recent flood events, were used to formulate potential engineered solutions aimed at lowering the risk of flooding for units under study. An initial set of management measures was developed using experience from other levee system studies and application of current engineering standards and practices. These measures were screened and refined for their application at each critical Area of Interest (AOI). As the process continued, additional measures surfaced and were examined. All measures were examined and compared considering the Federal criteria of completeness, efficiency, effectiveness, acceptability, and constructability, as well as for their potential to impact the environment. As the measures passed through this evaluation and screening process, a preliminary economic analysis of each measure's cost was used as a ranking factor in the final selection. Measures passing the evaluation criteria were carried forward for more detailed analysis.

Screening-level costs were prepared in 2006 by cost engineering staff for each of seven alternatives. Screening costs were based on October 2005 prices as updating would not have changed the screening process, and only the identified NED plan elements were subsequently updated. Annual costs for operations and maintenance (O&M) are included only for the alternatives that produce additional O&M costs over and above current without-project levels. The three alternatives with net additional O&M costs are the alternatives that include

relief wells. For these alternatives, the life-cycle cost analysis for each alternative assumes that each pump will require servicing every four years and complete replacement after 40 years at a cost equal to the current construction cost plus 17 percent to account for E&D and S&A.

In addition to the relief wells, the North Topeka alternative also includes an underground collector system and a temporary pumping component. The O&M costs for the collector systems assume that flushing and cleaning would be required every 25 years. The temporary pumping plan would be needed when the water surface elevation comes within three feet of top of levee, which would require an event of about a 0.5 percent magnitude. It is assumed that the pumping capability will be needed three times over the 50-year period of analysis, requiring one week of pump rental per instance.

The results of the risk-based screening were:

Waterworks – Only one alternative was carried forward from initial screening. This alternative maximizes the net benefits over the No Action alternative and is recommended as the NED Plan.

South Topeka – Two alternatives were carried forward from the initial screening. Alternative 1 maximizes the net benefits and is recommended as the NED Plan.

Oakland – Two alternatives were carried forward from the initial screening. Alternative 1 maximizes the net benefits and is recommended as the NED Plan.

North Topeka – Two alternative were carried forward from the initial screening. Alternative 1 maximizes the net benefits and is recommended as the NED Plan.

7. Selected Plan. The selected plan includes recommendations for modifications to four existing levee units within the Topeka Flood Risk Management Project: the South Topeka Unit, the Oakland Unit, the North Topeka Unit, and the Waterworks Unit.

a. South Topeka Unit. Levee under-seepage concerns will be addressed by installation of a control berm. Structural strength and uplift concerns will be improved by modifications of the Kansas Avenue Pump Station and three manholes. Approximately 2,000 linear feet of existing concrete floodwall on timber-pile foundations will be removed and replaced with a new floodwall on concrete piles following the same alignment and to the same height as the existing floodwall. The work in this unit will result in the removal of 7.5 acres of woodland habitat and appropriate mitigation measures are included in the Recommended Plan.

b. Oakland Unit. An area of under-seepage concern will be controlled with a berm and a stability berm will be installed to improve the stability factor of safety of the existing floodwall. Structural modification of the East Oakland Pump Station will be implemented to address uplift failure concerns.

c. North Topeka Unit: Two areas of low under-seepage reliability will be improved by installation of an under-seepage control berm and a series of pumped relief wells, respectively. One pump station that is no longer required, and currently poses an uplift failure risk, will be removed.

d. Waterworks Unit: Landside stability berms will be installed to increase the reliability of an existing concrete floodwall protecting the primary water source for the City of Topeka and surrounding communities.

8. Project Costs. Based on a 4.625 percent discount rate and a 50-year period of analysis, the total equivalent average annual costs of the project, including operation, maintenance, repair, replacement, and rehabilitation (OMRR&R), are estimated to be $1,168,100.

9. Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R). Future OMRR&R practices would remain the same as current operations for inspection and monitoring, levee mowing, vegetation control, outfall cleaning, maintenance of wells, etc. Additional cost will be added by the project with respect to maintenance of six new relief wells and temporary pumping of the well header during high flood events. The appropriate Operation and Maintenance manuals will be updated accordingly at the conclusion of the project design and construction period. The total estimated annual cost of operation, maintenance, repair, rehabilitation, and replacement for the recommended plan is $13,000.

10. Project Benefits. The selected plan would reduce average annual flood damages by about 67 percent and would leave average annual residual damages estimated at $7,438,000. Annual average economic benefits are estimated to be $15,427,600; net average annual benefits are $14,259,500. The system wide benefit-to-cost ratio is 13.2 to 1.

11. Cost Sharing. Project costs are allocated to the Flood Risk Management purpose. Based on the October 2008 price levels, the estimated first cost to the plan is $21,157,000. In accordance with the cost sharing provisions of Section 103 of the Water Resources Development Act (WRDA) of 1986, as amended by Section 202 of WRDA 1996, the Federal share of the total project cost would be $13,752,000 (65 percent) and the non-Federal share would be $7,405,000. The non-Federal costs include the costs of lands, easements, rights-of-way, relocations, and dredged (LERRD) or excavated material disposal areas, estimated at $1,279,000. Table 2 shows the breakout of Federal and non-Federal cost.

TABLE 2
Topeka, Kansas, Local Protection Project - Cost Sharing
(October 2008 Price Level, $1,000s)

Item	Federal Cost	Non-Federal Cost	Total
Flood Damage Reduction (FDR)			
PED	$ 1,191 (65)	$ 641 (35)	$ 1,832
LERRD	$ 0	$ 1,279	$ 1,279
Flood Damage Reduction	$ 11,730	$ 6,316	$ 18,046
Total Project	$ 13,752 (65)	$ 7,405 (35)	$ 21,157

12. Environmental Compliance. The Topeka Feasibility Report consists of a main report, with a stand alone Environmental Assessment (EA), and appropriate appendices to both the main report and EA. There are no anticipated significant environmental, cultural or social impacts from construction of the Selected (NED) Plan. The project has responded to all resource agency and interested party comments, and compensatory mitigation for environmental losses are included in the plan. The mitigation plan has undergone an appropriate incremental analysis commensurate with the small impacted area. Construction of the South Topeka Levee underseepage control berm will result in removal of 7.5 acres of floodplain habitat in the form of shrubs and secondary trees. The report has justified compensation, consisting of the planting of 15 acres of floodplain habitat in the North Topeka Unit. Temporary impacts due to construction and hauling of waste materials have been satisfactorily addressed in the plan. The plan has received Section 106 Clearance from the Kansas State Historic Preservation Office (SHPO) on August 25, 2006. The final U.S. Fish & Wildlife Service Coordination Act Report was received on March 16, 2007, and the Selected Plan will result in no significant impacts on endangered species. It was determined that there are no features or activities that will necessitate a Clean Water Act Section 404(b)(1) or Section 401 permit. The Clean Water Act Section 402 NPDES permit will be obtained from the Kansas Department of Health and Environment (KDHE) during design phase

B. COMMENTS FROM REVIEW OF THE FEBRUARY 2007 ALTERNATIVE FORMULATION BRIEFING DOCUMENTATION.

1. Project Location and Description (Section 1.0). A physical description of the existing authorized plan is needed. This summary description should provide information such as the authorized levee height and a description of the flood-frequency and/flows for which the project is supposed to provide protection. The description should also include information on pumping stations and drainage structures. This information is important to determine the most efficient level of protection. Nothing provided establishes a measurable standard as a minimum formulation target. This is a critical constraint. A summary of the authorized plan for the existing project must be provided.

NWK Response: The existing project was authorized to pass a design flood flow of 314,000 cfs; the authorization did not designate a flood frequency. As constructed, the existing system includes approximately 40 miles of river levees, 4,120 linear feet of concrete floodwall, 17.3 miles of improved river and stream channel, 121 gated drainage structures, 76 relief wells, 12 pumping plants, 7 stoplog gaps, and 4 sandbag gaps. Existing conditions analysis has determined that there are areas of reliability less than 90% due to potential underseepage, structural uplift, or structural stability failures under flood conditions. See summary included in response to next comment.

Discussion: Frequency of overtopping flows should be discussed.

Required Action: Kansas City District will add this discussion to the Draft Report.

Action Taken: Flow frequencies and discussion of overtopping flows is included in Section VII of the Feasibility Report on page 24.

HQUSACE Assessment: The concern is partially resolved by the response and revised text included in the report. Existing Projects (page 5 of the main report) provides an overview, where maps indicating the upstream reservoirs and complete watershed should also be provided. However, the existing project condition must be thoroughly described. Project performance is dependant on proper functioning of the entire system—closure structures, stop log gaps, etc. The system features described in the AFB comment response should also be identified and described in the feasibility report.

NWK Response: Concur

Discussion/Required Action: Add a new map and expand existing system description.

Action Taken: A new figure (Figure 2) has been added to the report showing the location of Corps of Engineers levee and reservoir projects within the Kansas River watershed. The existing system features are described in the descriptions of each unit found in Section VI.A.2.0 "Description of Overall Project". The introductory paragraph of this section, found on page 7 of the report, has been expanded to provide a more general description consistent with the AFB comment response and to emphasize the importance of overall system performance.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

2. Description of the Existing Problem (Section 2.0). Nothing in these discussions explain why the existing project is unstable or unlikely to pass a 1% event. It does discuss that the design level of protection was approximately a 300-year event. What has changed that would indicate that a project designed to pass a 300-year event cannot now reliably pass a 100-year event. The EA indicates the problem is under the levee/wall, but this is not presented in this discussion. The district must present the exact nature of the problem in this discussion. Is it a result of a design deficiency, changed conditions, lack of maintenance or related to the useful life of the project.

The report includes identifies areas of interest in section three. These areas of interest need to be fully explained in the problem identification section. Are these areas of interest separable elements? How do they relate to each other? How do they contribute to the reliability of the levee unit? What are the specific problems in these areas? The problems have to be fully described before discussing alternative formulation.

NWK Response: The following summary was prepared of the existing conditions including the potential weaknesses and failure modes for each unit:

Geotechnical uncertainty analysis calculated the conditional probability of failure as a function of floodwater elevation by combining the probability of failure functions for two failure modes; underseepage piping and slope instability. Geotechnical failure modes are excessive seepage leading to a piping condition and slope instability. Possible results of such a failure include loss of the levee toe and slope failure, leading to possible loss of the entire levee.

The structural analysis involved an assessment of the existing stability and strength condition of the individual structures. The assessment was based on visual observation, dated construction plans, historical data, discussions with Corps of Engineers and Levee District personnel (those familiar with and involved in the inspection, operation, and maintenance of the levee units), detailed engineering analysis, and engineering judgment.

North Topeka Unit. The natural blanket for the entire levee unit, consisting predominantly of silt, varies in thickness from 1 to 23 feet, with an average thickness of 12 feet. Underseepage is controlled by landside underseepage berms between stations 83+00 and 220+00. Cut-off trenches are present between stations 205+00 and 462+50 at locations where the blanket is overlain by a sand layer or by existing pervious fill. Three (3) relief wells were placed at station 392+05 where the natural impervious blanket had been excavated for the basement of a warehouse building. Underseepage analyses evaluating the existing conditions identified the areas between stations 165+00 and 180+00 and stations 246+00 to 250+00 as having piping safety factors less than 1.0 and were considered critical for reliability evaluation. The existing underseepage berm between 165+00 and 180+00 is inadequate and the reach from 246+00 to 250+00 does not have any existing underseepage control measures. The critical water stage for 85 percent probability of failure for the reach between stations 165+00 and 180+00 is elevation 891 feet, and 892 feet for the reach between stations 246+00 and 250+00. The levee crest elevation varies within this reach between elevations 895.6 and 896.0 feet.

North Topeka structures considered included fourteen gatewell closure structures, two reinforced concrete box structures, one sandbag closure gap, one floodwall section with stoplog gap, and three pump stations. Little information has been located for the Fairchild pump station. Pump station uplift calculations are based on field measurements of exterior footprint dimensions, interior sump dimensions, and assumptions for floor member thickness. Using these dimensions and varying hydraulic gradelines (based on possible variations in blanket thickness, blanket permeability, and foundation permeability) the uplift factor of safety was determined to be 0.72. The required minimum is 1.1.

Waterworks Levee Unit. Waterworks structures considered for this study included one gatewell closure, one sandbag closure gap, four stoplog closure gaps, and fifteen different floodwall cross sections making up the floodwall.

The 1600 linear foot spread-footing floodwall has an average exposed wall height of between 8 and 12 feet. A sheetpile cutoff wall is embedded in the heel of the floodwall along with a relief well system. Six analyzed floodwall cross sections failed to meet sliding stability.

Sliding factors of safety calculated vary from 0.78 to 1.15; the minimum requirement is 1.3. Four stoplog closure structures within the Waterworks floodwall were analyzed with water to top of wall. Each closure showed a factor of safety of less than 1.3 for sliding stability (values ranged from 0.75 to 1.04). Sliding failure of the wall could lead to separation of the wall sections, water infiltration through opened wall joints, scour around the openings, and rapid wall failure.

South Topeka Levee Unit. This unit is founded on an impervious blanket varying in thickness between 5 and 24 feet, with an average of 15.5 feet. The blanket consisting of silty clays and silty sands overlays a sand deposit more than 80 feet thick. Fill placed on the top of the natural blanket between station 50+00 and 74+30 contains debris, rock, rubble, and sand requiring the construction of riverside cut-off trenches to reduce seepage. Between station 74+30 and 93+90, a 6 to 7 foot thick layer of debris required construction of 27 relief wells for underseepage control. The blanket beneath this fill averages only a few feet in thickness and appears to be entirely missing between stations 77+50 and 80+50. A seepage interceptor drain and relief wells were placed between stations 74+05 and 93+25. The critical geotechnical reach was identified between stations 50+00 and 73+00 where no wells currently exist and the existing underseepage control fill is inadequate. The 85 percent probability of failure for this reach occurs at a flood stage of elevation 893 feet corresponding to the elevation of the levee crest.

South Topeka structures considered for this study included eight gatewell closure structures, six riverside closure gates, forty-six manhole and drop inlet structures, two reinforced concrete box structures, four pump stations, one pile founded floodwall, and two stoplog closure gaps, and associated spread footing transition walls.

An elaborate system of some forty-six manholes, drop inlets, and relief wells form an underseepage relief system along the South Topeka levee unit. Uplift calculations are based on fifty percent relief well efficiency as supplied by geotechnical engineers. It is assumed that up to three feet of water will be allowed in the collector system to meet uplift requirements. Four manhole boxes fail to meet uplift criteria with three foot of standing water (Sta. 16+07, 84+10, 84+10a, and 85+57). Existing factors of safety range from 0.84 to 0.96; 1.1 is the required uplift factor of safety.

At the Kansas Avenue pump station, the exterior foundation wall vertical steel exhibits a factor of safety of 0.97, failing to meet the required 1.5 factor. A failure of the steel within the wall will lead to cracking of the wall, water infiltration, scour around the openings, and possible loss of the foundation of the pump station.

Drawings for the floodwall extending from approximately station 74+41 to 93+86 are not available. Incomplete records of construction, memoranda related to modifications to the walls and drainage systems, and information collected during recent site visits was used for stability and strength analysis of the wall. From the information that was obtained, timber piles supporting the wall were found deficient to resist axial bending. A potential timber pile

axial/flexure failure could result in excessive floodwall deflections, water infiltration through opened wall joints, scour around the openings, and rapid wall failure.

Oakland Levee Unit. The critical geotechnical section was identified between stations 64+00 and 80+00. The 85 percent probability of failure for this reach occurs at a flood stage of elevation 880 feet. The levee crest elevation varies within this reach between 886 and 887 feet. Oakland unit structures considered included thirty-four gatewell closure structures, twenty-six manhole and drop inlet structures, one sandbag closure gap, one floodwall section, one landside toe retaining wall, and one pump stations.

The 5.5'x 4.5' drop inlet buried to a 6.5 ft depth at station 75+50 fails to meet uplift criteria. The existing structure shows a factor of safety of 0.93. Almost 4ft of water would be necessary to meet the minimum required 1.1 uplift factor of safety. An uplift failure of the manhole would provide a path of floodwaters to enter the protected area.

The East Oakland Pump station exhibits an uplift factor of safety of 0.76, failing to meet the minimum of 1.1. An uplift failure would create a path for floodwaters to enter the protected area. Additional, a pump station failure prevents interior drainage from being evacuated to the river.

A floodwall exists from station 485+86 to 491+01. Exposed wall heights vary from 7ft to 9ft. Both wall sections failed to meet sliding stability, exhibiting factors of safety of 0.76 and 0.85, compared to the minimum requirement of 1.3. Sliding failure can lead to separation of the floodwall sections, infiltration of water, scour around the openings, and possible rapid loss of the wall.

Summary. Because of the low reliabilities at each area of interest, all of the identified deficiencies are required to be corrected in order to restore the reliability of each unit. Furthermore, each unit must be made reliable to constitute a complete plan to restore the overall reliability of the Topeka Levee System.

The local sponsor has performed an exemplary job of maintaining the levee system to Corps standards as evidenced by the historical maintenance records. There is no indication that a significant changed condition has caused the identified weaknesses, nor that the deficiencies are directly related to the age of the system.

Discussion: Response focuses on not meeting design criteria. Need to discuss how or why the District was led to perform the analysis. Discuss that the reliability issues may have always existed, but there has been a change in our knowledge brought about by the questioning of the overtopping issues by the State highway department, there has not been a physical change in the levee.

Required Action: Kansas City will provide detailed information in the Draft Report.

Action Taken: Details of existing conditions are included in Section VI.A, beginning on page 6, and future without-project condition descriptions are included in Section VI.B.1, beginning on page 15.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

3. Design vs. Existing. This discussion in Section 2.0 appears to conflict with Table 4. E.g., if the Oakland section will begin overtopping at 305k cfs it does not appear too likely that there is only 3% reliability of protection against the 1% event that has a flow of 217k cfs. The North Topeka and South Topeka data also appear to conflict with the text. Explain why these reliability numbers are so low relative to the design level of protection. More detail is needed to fully describe the future without project condition. The district needs to describe what is happening to the levee that is causing the extreme unreliability of performance. Will this condition worsen? If Oakland and North Topeka only has a 3 to 14 percent chance of passing the 100-year event, what is the reliability to pass more frequent events? The section on Structural Alternatives includes descriptions of problems that should be included in a problem section and in the discussion of future without project conditions.

NWK Response: The discussion of overtopping flows was provided as an illustration that the existing height of the levee is sufficient when overtopping reliability is considered separately. However, with the additional consideration of the geotechnical and structural weaknesses (underseepage, uplift, sliding failure, foundation deficiency) the existing levee units will fail at much lower flows, long before overtopping begins. The failure modes described begin to evidence themselves at water surface elevations as much as six feet below top of levee, thus causing the low reliabilities. Reliabilities to pass the 10, 25, and 50 year events were calculated and were provided in the Draft Economics Appendix. The discussion in the *Description of Problem* and *Future Conditions* sections will be expanded in the draft report.

Discussion: Comment and responses related to previous comment. Need to cleanup and clarify the wording of this section. Editorial comment: Need to use consistent language, i.e. 1%-event versus 100-yr flood. Should include reliabilities of higher events in the discussion, may be appealing to non-Federal sponsor to spend a little more for greater protection.

Required Action: Kansas City will include revised language in Draft Report The District will include an initial explanation of the risk and uncertainty based characterization of performance that is required, and will relate that to formerly used conventions such as "100-year level of protection". This will be done early in the report, as we have done in previous feasibility reports.

Action Taken: Discussion of 1% vs 100-yr is included in Section I of the Feasibility Report, on page 2.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

4. Description of Problem. Section 2.0 needs to fully describe and justify the problems as either a design deficiency or reconstruction and show that the non-Federal sponsor has adequately maintained the project or separable element. Some of this information is currently in Section 6.0 of the report. Although additional information is required similar to that which was required for the Argentine, East Bottoms, Fairfax-Jersey Creek and North Kansas City Levee Units, Missouri River and Tributaries at Kansas Cities, Missouri and Kansas Chief of Engineers Report dated 19 December 2006. Most elements of the project may require Congressional authorization. Two elements, the underseepage control in the South Topeka Unit and the replacement of the South Topeka Floodwall, have been identified as possibly qualifying for construction under the original project authorization due to design or construction deficiencies. If this strategy is pursued, the project proponent will have to carefully justify that these elements qualify for modification as design deficiencies.

If elements of the project are going to be pursued as "a design or construction deficiency," the use of the existing project authority will have to be carefully justified in accordance with ER 1165-2-119. In order to qualify as a design deficiency, there must be a flaw in the Federal design or construction of a project that significantly interferes with the project's authorized purposes or full usefulness as intended by Congress at the time of original project development. ER 1165-2-119. The fact that the project does not satisfy contemporary needs is not sufficient to find a design or construction deficiency. The ER requires that for a project to proceed under the original project authority as a design deficiency, the following conditions must be met:

> (a) It is required to make the project function as initially intended by the designer in a safe, viable and reliable manner; e.g., pass the original design flow without failure. This does not mean that the project must meet present-day design standards. However, if current engineering analysis or actual physical distress indicates the project will fail, corrections may be considered a design or construction deficiency if the other criteria are met.
> (b) It is not required because of changed conditions.
> (c) It is generally limited to the existing project features. Remedial measures which require land acquisitions or new project structures must not change the scope or function of the authorized project.
> (d) It is justified by safety or economic considerations.
> (e) It is not required because of inadequate local maintenance.

It would appear that the two project elements that have been identified as potentially correcting design deficiencies may satisfy all of these conditions. However, in order to use the original project authorization, the satisfaction of these conditions should be carefully documented.

Because most elements of this project must secure Congressional authorization to be completed, and because it is indicated that the entire project is needed in order to provide any enhanced flood protection, it may be easier to secure Congressional authorization for the

entire project – including those elements that may qualify for design deficiency – than to try to justify the use of design deficiency for some elements.

NWK Response: Section 2 will be expanded with more complete discussion, including information found in Section 6 and elsewhere. Design data for the earliest parts of the existing system no longer exists or cannot be located. However, information in the record indicates that the areas discussed as potential design deficiencies were known problems during the later phases of project modification and construction. With respect to the conditions of ER 1165-2-119:

(a) The proposed reliability improvements are required to make the project function as initially intended by the designer in a safe, viable and reliable manner. The system will not currently pass the original design flow without failure.

(b) The proposed reliability improvements are not required as a result of changed conditions.

(c) The proposed reliability improvements are limited to the existing project features. Minimal land acquisitions are required as easements and rights-of-way but will not change the scope or function of the existing authorized project.

(d) The proposed reliability improvements are required to ensure the safety of the residential and commercial infrastructure in the study area and they are economically justified.

All of the criteria of ER 1165-2-119 are met and current engineering analysis indicates that the project will fail. The proposed reliability improvements meet the criteria for implementation within the exiting project authority.

Discussion: The proposed work does initially appear to be within the existing authorization based on ER 1165-2-119. Determination of a design deficiency for the entire proposed project will remove the need for a Civil Works Review Board and Congressional authorization. If the design deficiency path is followed now, it may cause problems if authorization is determined to be required later. A parallel path can be followed to prepare the Draft Report and investigate design deficiency at the same time. Documented support from the engineering community needs to be included with design deficiency discussion.

Required Action: Kansas City will investigate design deficiency further and will prepare and submit, through Northwest Division, a decision paper detailing their recommendation for vertical team review and concurrence.

Action Taken: Design Deficiency was investigated by Kansas City District and a decision paper submitted separately. The Draft Feasibility Report as submitted does not include a request for Design Deficiency approval.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

5. Alternative Development. Section 3.0 does not provide information on how alternatives developed, cost effectiveness, or incremental cost analyses. This section should begin with general alternatives such as Floodfighting, Floodproofing Structures, Evacuation of the Interior, Replace Defective Sections, Add New Landward Of Defective Sections, Landside Underseepage Berms, Modify/Repair Existing Foundation, etc. After elimination of the obviously unacceptable alternatives such as Floodfighting, Floodproofing Structures, and Evacuation of the Interior by discussion the remaining measures should be refined, combined into various alternatives that are evaluated and eliminated until a recommended alternative is determined. The district must provide a formulation development, and evaluation process consistent with ER 1105-2-100 and the P&G.

NWK Response: The discussion in Section 3 will be expanded for the Feasibility Report to better present the formulation development process and evaluations that were conducted.

Discussion: None.

Required Action: Kansas City will include expanded detail in the Draft Report.

Action Taken: Plan Formulation section expended, see Section IX of Feasibility Report, beginning on page 30.

HQUSACE Assessment: The concern is partially resolved by the response and revised text included in the report. The plan formulation section appears to have been adequately expanded, except for North Topeka. The plan formulation section for North Topeka should be expanded in like manner as the other units.

NWK Response: Additional discussion requested to clarify assessment.

Discussion: Discussion with reviewer indicated there was some misunderstanding of the relationship between the impacts of proposed measures in North Topeka, the proposed mitigation area, and the proposed borrow sites. The proposed North Topeka measures do not cause environmental impacts. The mitigation area in the North Topeka Unit is for the purpose of offsetting impacts occurring in the South Topeka Unit. The source for borrow for the North Topeka underseepage berm measure is the South Topeka borrow site.

Required Action: Clarify purpose of North Topeka mitigation area and sources of borrow in the report.

Action Taken: The discussion of North Topeka alternatives, found in Section IX.E "Screening of Measures", starting on pages 39, has been edited to state that the proposed project measures do not create impacts to the environment. The discussion of South Topeka measures, beginning on page 42, has been clarified to indicate the specific measures that will cause environmental loss. Sources of borrow material for each proposed measure are

indicated in Section IX.F "Borrow Areas" found on page 45. Section X.A. "Recommended Plan – Work Components" now includes a paragraph describing the mitigation area designated in the North Topeka Unit and its purpose, and references Plate 13.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

6. Base and Future Conditions. Section 4.0 states that "conditions were evaluated in terms of a base year of 2013 when the project would be operational and a further without-project conditions year of 2038". However the report states that the base year and future conditions are the same. ER 1105-2-100 paragraph 2-3 a(5)b states "Exiting conditions are those at the time the study is conducted. The forecast of the future without-project condition reflects the conditions expected during the period of analysis. The future without-project condition provides the basis from which alternative plans are formulated and impacts are assessed." Be clear that the model uses the existing condition throughout the period of analysis and that future conditions will not likely differ from the existing condition.

NWK Response: Concur. Since economic development plans potentially affecting the future without-project condition tend to be fluid and speculative, we establish our assumptions in this area as late in the study as possible. At present (i.e., the pre-AFB documentation of April 2006), we assume no differences between existing, base year, and future without-project condition economic data. It is quite possible that the final iteration of the economic analysis prepared for the draft final report will include a future condition (and possibly a base year condition) with economic development assumptions that diverge from the existing condition and require separate modeling. It is not expected that NED plan selection will be affected by potential revisions of the future without-project condition, however. Benefits are identical for both North Topeka alternatives, both South Topeka alternatives, and both Oakland alternatives. Future development would not differentiate any of the alternatives within a given area but would affect only the future without-project condition. We will revise and add text in the main report and the socioeconomics appendix as necessary to reflect our final assumptions concerning the base and future without-project conditions and their effects on damages, benefits and plan selection.

Discussion: The economics appendix should be better annotated and all suppositions concerning the future condition should be documented.

Required Action: Kansas City will expand the discussion in the economics appendix.

Action Taken: Discussion of Future Conditions are found in Section VI.B.2 (page 19) of the Feasibility Report, and Section 5.3 (page 63) of Appendix D.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

7. OMRR&R. Section 4.0 states that "OMRR&R costs were included in this analysis for those features that will incur a cost over and above present levels". OMRR&R should be estimated for the new project and reported and then compared to the without project condition OM&R. The total OMRR&R needs to be explicitly stated. ER 1105-2-100, Appendix D, D-3, e (9) OMRR&R costs represent the current value of materials, equipment, services, and facilities needed to operate the project and make repairs, rehabilitate, and make replacements necessary to maintain project measures in sound operating condition during the period of analysis. Provide the with and without project OMRR&R to support the net change during the period of analysis.

NWK Response: Most of the proposed project features, including the berms, floodwalls, and pumping station modifications, will not add components requiring additional OMRR&R activities or costs. Thus the difference between future and existing OMRR&R is zero. Alternative measures involving the addition of relief wells will require additional OMRR&R and the future costs were estimated and the expected increase over existing levels was presented in Table 11 of the AFB document.

Discussion: The discussion of OMRR&R should be expanded and clarified. Future OMRR&R for the with and without project condition should be included.

Required Action: Kansas City will include the existing condition O&M costs in comparison to the Future With-Project O&M costs in the Draft Report.

Action Taken: Annual O&M Costs are discussed in Section 6.4 (page 69) of Appendix D of the Feasibility Report.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

8. Zero Damage Elevation. Section 4.3.1 of the Economic Appendix states that damages do not begin until the water reaches the first floor. Does this imply that there are no basements and that the typical house is slab on grade? If not explain why damages do not begin sooner. ER 1105-2-100, Appendix E, Section III, E-19, f(1)(a) Describe the flooding situation including the characteristics of the flooding. The proper determination of the zero damage point can impact the selection of the NED plan.

NWK Response: Concur. The socioeconomics appendix text will be revised to indicate that damages actually begin at the elevation of the lowest opening, although it is true that the great majority of study area homes with basements do not have openings below first floor.

Discussion: None.

Required Action: Kansas City will include change in the Draft Report.

Action Taken: Reference to lowest opening elevation added to Section 4.3 (page 29) of Appendix D.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

9. Stage Damage Curves. The economic appendix indicates the stage damage curves for non residential structures are curves developed by New Orleans District. The district needs to describe the development of the curves, explain why they apply to Topeka and indicate if the curves been through an ITR from the appropriate center of expertise. ER 1105-2-100, Appendix E, Section III, E-19, q(2) states that depth-damage relationships should be developed on site specific data or from comparable floodplain data, at a minimum, qualitative rationale will be provided to demonstrate the reasonableness of the use of the depth-damage relationship in the study area. Districts may request deviation from this guidance if they can reasonably demonstrate lack of site-specific depth-damage relationships will not affect plan formulation.

NWK Response: Concur. Sections 4.3.2.6 (p. 24) and 4.3.3.2 (p. 27) of the socioeconomics appendix describe the development and background of the New Orleans depth-damage and valuation data. No non-residential depth-damage functions in existence are known to have been formally approved by any Corps of Engineers flood damage reduction center of expertise; the first official release of such data for national use is planned by IWR in the near future. It is not known whether the New Orleans District submitted the data to independent review, but it is important to note that their published reports are based on a wide range of expertise, including panels made up of experienced subject experts on construction and post-flood cleanup, owner/operators of businesses, and FEMA post-flood depth-damage functions for the same region. The New Orleans owner/operator estimates used for Topeka were based on post-flood surveys conducted in the aftermath of an urban, freshwater, mainstem (long duration) flooding event in Louisiana. The owner/operators interviewed represented many of the same types of businesses and facilities as those included in the Topeka structure inventory. These are the factors making the data relevant for Topeka. National experts involved in the ITR process for the Kansas Cities. Missouri and Kansas, levee study (a parallel CENWK study of existing urban levee systems) recommended use of the New Orleans functions as the best available data. The data have been used in many Corps studies and have been approved by the independent review team for this study. More explanation on their applicability to Topeka will be added to the text. It should also be noted that the great majority of non-residential damages in the analysis are based on first-hand information from larger companies and facilities rather than generic depth-damage relationships. In addition, the use of any set of depth-damage relationships rather than another could affect economic justification but would not affect alternatives ranking in this study since the alternatives within each unit have identical benefits.

Discussion: Report should include more discussion to support the applicability of the stage-damage curves to Topeka.

Required Action: Kansas City will expand discussion in the Draft Report.

Action Taken: Discussion of New Orleans stage curves included in Section 4.4.4 (page 33) of Appendix D.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

10. EA Level of Detail. This EA is about double the length it needs to be and it fails to focus on some key points. Corps regulation (33 CFR 233.10) says the approximate length of an EA should be 15 pages. This may be achieved by recognizing that this is a major rehab of an existing Corps constructed project. Most of the project area is highly disturbed from the original construction, and much of the remaining area of the current project footprint is highly disturbed by other development. A series of maps showing the present land use and vegetative cover type would be very useful to show this point. An overlay showing ownership would add more value (do not get into individual private owners, just label as private land, city owned, county owned, state owned, etc.). This analysis would show how small the new impact area is and what types of land uses would be affected.

Most of the discussions in the EA are about the general vicinity of the project site but never focuses on the impacts at the site. For example: how much and what quality of forest will actually be impacted by each alternative is never presented and certainly never presented comparing an action condition relative to the No Action Future Condition. The E&T Species discussion (Section 10.6) is another example of unfocused discussions. Section 10.6 presents a list of Federally list species and the state listed species that may occur in the county, but it does not indicate which species are found in the impact areas. Farmlands are discussed but there is still determination of which acres are covered under FPPA or of what the future will most likely be for these acres. 10.3.4 attempts to address the Future No Action Condition but it is unclear saying the farmlands would be developed as the demand for farmland increases.

NWK Response: In order to shorten the EA, sections that can be incorporated in the appendix such as HTRW and T&E species will be. Due to the size and complexity of the project, it is necessary to go beyond the suggested page limit to support the decision that an EIS is not required. The impacts of the alternatives to the forest resource are discussed in sections 10.5.3-10.5.5. The EA does state the quantity of impacts to occur from each alternative. The EA describes this vegetation as secondary growth trees or woodland. We agree the importance of this woodland is not well defined in the EA, but is discussed in the mitigation plan. We agree the EA does not discuss the impacts of levee failure in the No-Action alternative. This will be added. In reference to T & E species, suitable habitat within the project area exists for three Federally-listed species (bald eagle, piping plover, and least tern). Currently, no known nesting sites are within the study area for terns and plovers. Suitable nesting habitat for bald eagle (woodland along the river) would not be impacted by the project.

Discussion: The EA should make clear that proposed improvements and borrow areas do not extend outside of previously disturbed areas and should concentrate on the impacts within the existing footprint. EA should focus on what is impacted. If a resource was considered but is not impacted, the EA should so state without further discussion.

Required Action: Kansas City will revise the Draft EA accordingly.

Action Taken: Edits made throughout EA to adjust document length. EA as submitted is still 33 pages long. Length considered necessary due to multiple project components.

HQUSACE Assessment: The concern is resolved by the response and revisions incorporated in the text of the EA.

11. Public Meeting (Section 5.0). The last public meeting was 10 years ago. This means the public input and particularly the Environmental Justice process is dated and not credible. The district must provide current/ongoing opportunities for the public to provide input and show recent evidence of measures to comply with E.O. 12898. In recent years there has been an increasing number of successful challenges against projects for failure to comply with E.O. 12898. Consequently, compliance with E.O. 12898 is a significant concern of nearly all Federal agencies, and failure to document reasonable effort to comply leaves the project vulnerable to litigation.

NWK Response: Initial scoping was conducted in 1996 to address the project and formulate alternatives. Public involvement will include a 30-day public review period of the EA/FR report. The report will be mailed to state and federal agencies, local libraries, local sponsors, city officials, etc. and will be made available online. A list of environmental justice contacts within the project area provided by USEPA would be used to ensure that project components will be communicated to residents who might not otherwise become aware of the project and draft EA availability through the standard methods. A public meeting will be held during the NEPA public review period. The full understanding of problems with the system has only recently been realized. Thus, development of alternatives has only recently been completed. Because the nature of the problems is reliability of an existing levee and corrective alternatives have relatively low impacts, we anticipate broad public support. Coordination with other agencies has been on-going and successful.

Discussion: All activities to keep the public involved should be documented including coordination with the sponsors and resource agencies.

Required Action: Kansas City will fully document coordination activities in the Draft EA.

Action Taken: A public meeting will be held during the 30-day Public Review period. A record of the meeting, including comments and responses, will be included in Appendix B "Public Involvement" of the Final Feasibility document.

HQUSACE Assessment: The concern is not resolved, however the action proposed in the response will help to address the concern. Appendix B of the draft report indicates that the district has had regular discussions with state and local agencies in regard to the project. The appendix should include summaries of that coordination including any significant views that were expressed and how those have been incorporated in the planning activities. The draft EA contains documentation on recent coordination with Federal resource agencies such as

the USDOI Fish and Wildlife Service and USDA Natural Resources Conservation Service, and state agencies involved with threatened and endangered species (KDWP) and historic preservation (SHPO).

NWK Response: Appendix B, "public Involvement" will be updated at the conclusion of the 30-day Draft Report public review period.

Discussion/Required Action: Update Appendix B.

Action Taken: Appendix B of the main report has been expanded to discuss the Public Meeting held in October 2008 and the comments received during the 30-day public comment period. References to the agency coordination detailed in the EA have also been included.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

12. Non-government land. Sections 6.0 and 7.0 -- These discussions should indicate how much non-government land will be required relative to the total footprint. First this presentation should serve to emphasize this project is not going to take much additional land from the private sector. Minimal mitigation should result from impacts to areas previously disturbed and maintained as part of the levee.

NWK Response: The total project needs are 217 acres. Of this, 191 acres are for temporary construction easements, and 26 acres of sponsor-owned land used in perpetuity for the mitigation site. This information will be added to the EA.

Discussion: None.

Required Action: Kansas City will include this information in the Draft EA.

Action Taken: Non-government land discussion added to Section 7 of the EA, page 5.

HQUSACE Assessment: The concern is resolved by the response and text revisions in the EA.

13. Borrow Areas (Sections 7.0, line 259). The discussion of the distance from the edge of the cells to the tree line needs additional information. The primary root zone of trees approximates the diameter of the crown. Based on a crown radius of 40 ft from the trunk, a 50 ft buffer should be sufficient in an already cultivated area to eliminate any significant adverse effects to the vegetation. ASA(CW) has repeatedly reminded the Corps that terrestrial restoration is not a Corps focus (ASA(CW) letter to DCW dated 29 JUL 05). Reduction of the buffer would significantly reduce the area taken from production and the total real estate requirements. The district needs to justify a 200 ft buffer or reduce it to a justifiable width.

NWK Response: We concur. A minimum buffer of 50 feet is sufficient. A 200 foot buffer was used because space was available and to increase the factor of safety.

Discussion: The EA should include justification of the buffer width no matter what the distance.

Required Action: Kansas City will include this discussion in the Draft EA.

Action Taken: Borrow Area discussion in Section 7 (page 4) of the EA edited to refer to minimum 50 foot buffer between borrow areas and tree line.

HQUSACE Assessment: The concern is resolved by the response and text revisions in the EA.

14. Disposal (Section 8.0). Projects that require modifications of levees and floodwalls frequently generate waste materials that require disposal, but this is not discussed. If there are wastes to dispose the disposal areas must be addressed. If there are no wastes the EA should so state so it does not appear they have been overlooked. If wastes are minimal and going to a commercial site this should be stated, if new sites are required they should be discussed similar to the borrow areas. 40 CFR 1502.16, 1508.8n and 1508.25 are all clear that all effects of a project must be identified and considered in the NEPA process and those considerations appropriately documented. The project can not be in compliance with NEPA without a discussion of these reasonably foreseeable effects.

NWK Response: We concur. The project construction will generate wastes from the removal of the floodwall and pump station. Anticipated wastes are concrete and steel materials that will be disposed at an existing commercial-land fill in the project area. This information will be added to the EA and Feasibility report.

Discussion: Discussion of disposal areas should also include impacts along haul routes between project site and disposal site.

Required Action: Kansas City will add this discussion to the Draft EA.

Action Taken: Waste disposal discussion added to Section 7 of the EA. See page 5.

HQUSACE Assessment: The concern is partially resolved by the discussion included in the text section on waste disposal. However, impacts associated with hauling of waste are not explicitly addressed as discussed during the AFB. The text should clarify whether the impacts of hauling waste are covered by discussions of construction equipment in the paragraphs on “Future Conditions with the Recommended Plan” under the appropriate sections. If impacts from hauling waste go beyond those discussed, text may be needed similar to that included under “Future Conditions with the Use of Commercial Fill.”

NWK Response: Final EA will be updated.

Discussion/Required Action: Update EA

Action Taken: Impacts are more fully described in the Final EA including the proposed location of final waste disposal.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

15. Forest/Vegetation. Section 10.5.3 describes the 7.5 ac of woodlands to be cleared as secondary-growth at the South Topeka unit. At the top of the page this area is described as a thin strip of trees between the levee and the railroad and the species listed are almost all old-field species. Given the location and the species present, the functional value of this area is questionable. It is highly probable that the incidental benefits of a good revegetation plan for the disturbed areas would more than offset the losses described A discussion of the quality of the subject area is needed to justify any compensatory mitigation. A habitat-based evaluation commensurate with the size, quality, and regional importance of the subject area is required.

NWK Response: We concur. A mitigation plan has been developed and is included in the EA appendix. The mitigation plan includes a description of the impacted habitat, quality, and size, significance of habitat, mitigation site justification, cost, planting list, and scope of work.

Discussion: Mitigation plan needs to be simple and discuss what is the quality of habitat and why is it worth mitigating for.

Required Action: Kansas City will submit the current Mitigation Plan and cost analysis for review and approval by HQ.

Action Taken: Mitigation Plan included as Appendix F of the EA. Community Habitat Model included as Appendix G of the EA.

HQUSACE Assessment: The concern is partially resolved by the additional analyses and text provided in Appendices F and G. However, there is no CE/ICA analysis which is required by C-2.e.(8) of ER 1105-2-100. This should be included to support the recommended mitigation.

NWK Response: Additional discussion and clarification requested.

Discussion/Required Action: Per telephone discussion with the review team on 12 Nov 2008, the written discussion of the mitigation plan and cost analysis should be edited to clarify that the different planting plans reviewed all produce the same level of habitat output (cost-effectiveness analysis). This level of habitat output was previously determined through coordination with state and Federal resource agencies as the required amount to compensate for the loss incurred by the project. Detailed incremental cost analysis will not be required.

The report should be revised to more clearly describe the process taken in the mitigation analysis and correlate the process to the steps required by ER 100.

Action Taken: Mitigation Cost Analysis revised and included in the Final EA as Appendix H.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

16. Jurisdictional Wetlands. In section 10.5 -- Forest/Vegetation, there is no mention of jurisdictional wetlands in the project impact area. To document compliance with the Clean Water Act, this section should describe wetlands present or state there are none. Unavoidable impacts to wetlands must be described along with any mitigation.

NWK Response: Wetlands are addressed in sections 10.2 – 10.2.5 and states that the National Wetland Inventory database maps for the project area were consulted to determine wetland classifications within the project area. In addition, Corps staff conducted a wetland delineation on 13 October 2006. No wetlands were found within the proposed borrow areas on the riverward side of the levee or any other areas within the project footprint.

Discussion/Required Action/Action Taken: None.

HQUSACE Assessment: The concern is resolved by the response.

17. Endangered or Threatened Species (Section 10.6). ER 200-2-2 says an EA should focus on effects of the proposed alternatives. The extent to which an EA must focus is emphasized by the 15-page limit established in 33 CFR 230.10.c. It is excessive to include a list of all ESA and state listed species that may be found in the county. Inclusion of so many species that may be in the area overstates the apparent ecological importance of these areas. This EA should mention the number of such species in the county, but restrict discussion to those species actually expected to be found in the project's impact area. If there are no affected species or protected habitats the EA should so state with minimal elaboration.

NWK Response: We concur. This section will be revised to discuss only those three Federally-listed species that are dependent on the Kansas River and its floodplain within the study area. State-listed species not likely to occur in the project area will be listed in the appendix as supporting information.

Discussion/Required Action: None.

Action Taken: Threatened & Endangered species discussion found in Section 10.5 of EA, page 14. Species lists included as Appendix D of the EA.

HQUSACE Assessment: The concern is resolved by the response and the text revisions in the EA.

18. Cultural Resources (Section 10.7). There is no reason to describe the requirements of the applicable statutes in an EA. Simply state that the District has conducted literature and field surveys and has determined there are no protected resources are likely to be significantly impacted by the proposed action. Continue by saying the Kansas SHPO has concurred with District's findings and there is no need for further consultation unless additional ground disturbances are required (this relates back to the Non-government land comment above). In addition to the requirements of the Archeological Resources Protection Act, the Native American Graves Protection and Repatriation Act also require coordination with potentially affected Federally recognized Native American Tribes. The FONSI may not be signed until coordination with federally recognized Native American Tribes that may be affected is completed.

NWK Response: We concur. We will be sending the tribes copies of the EA during the public review period.

Discussion/Required Action: None.

Action Taken: Cultural Resources discussed in Section 10.6 of the EA, page 16. Agency Coordination letters included in Appendix B of the EA.

HQUSACE Assessment: The concern is partially resolved by the text changes included in the EA. The proposed coordination with the tribes during public review appears appropriate to address the remaining concerns. Documentation of the coordination should be included in the final report.

NWK Response: Appendix B, "public Involvement" will be updated at the conclusion of the 30-day Draft Report public review period.

Discussion/Required Action: Update Appendix B.

Action Taken: Thirty Indian Tribes were notified and no comments were received. Appendix B of the Feasibility Report has been expanded to discuss efforts during the public comment period, including a list of the Indian Tribes that were notified and invited to attend the public meeting and/or provide comment.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

19. Recreational Resources (Section 10.8). If there are no recreation resources in the affected area there are no significant impacts to recreation resources as stated in 10.8.2, 10.8.3, and 10.8.5; there is no reason for this section to be in the EA.

NWK Response: We concur. We will simply state there are no recreational resources in the project area and remove this section from the EA.

Discussion/Required Action: None.

Action Taken: Recreational resources section removed.

HQUSACE Assessment: The concern is resolved by the response and text revisions in the EA.

20. Visual Quality (Section 10.9). Areas that flood or are at risk of flooding are not usually maintained as well as housing in protected areas. Although Section 122(2) of the R&HA of 1970 identifies effects to aesthetic values as a significant consideration, improvement of this resource is not likely to be included in the EA. Unless impacts to this resource were specifically identified as a significant issue during public scoping the district should drop this discussion from the EA. As explained before, 40 CFR 1508.9 says an EA should concisely provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact, in this case Visual Quality is not likely to be a pivotal issue. If the district retains the discussion it should be correctly presented that the With Project Condition (WPC) is better than the Future No Action Condition (FNAC).

NWK Response: We will retain discussion of this resource to disclose the short-term construction related impacts. The FNAC section would be revised to address conditions if levee failed.

Discussion: The EA should document that any impacts are short-term, in a controlled situation, and that the With-Project condition is better than the Future No Action Condition.

Required Action: Kansas City will include this discussion in the Draft EA.

Action Taken: Visual Quality discussed in Section 10.7, page 17. Statement that impacts are temporary and minor included in Recommended Plan discussion.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the EA.

21. Noise (Section 10.10). As with Visual, the WPC should reflect an improvement compared to the FNAC. If the levee fails in the noise from clean-up and the associated noise will be widespread generally unregulated and possibly occur repeatedly. During project construction noise level increases will be localized, the time of day for the disturbance will be regulated and should occur only once. The report should indicate an insignificant, short-term impact with the project. This impact has little significance in the decision to modify the project and should not be included in the EA unless there was an earlier suspicion that noise may be significant problem. However, if the district retains the discussion it should be correctly presented that the With Project Condition (WPC) is better than the Future No Action Condition (FNAC).

NWK Response: We will retain discussion of this resource to disclose the short-term construction related impacts. The FNAC section would be revised to address conditions if levee failed.

Discussion: The EA should document that any impacts are short-term, in a controlled situation, and that the With-Project condition is better than the Future No Action Condition.

Required Action: Kansas City will include this discussion in the Draft EA.

Action Taken: Noise impacts discussed in Section 10.8 of the EA, page 18.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the EA.

22. Air Quality (Section 10). Cite the source of this information. It would be good to add that the surrounding counties are all full-attainment areas. This is another situation where the FNAC should describe the general situation if the levee fails relative to the effects of the construction impacts. If the levee fails in the future no action scenario, dust and other contaminants from clean-up activities will be widespread and generally uncontrolled. With the project air pollution increases will be localized and controlled by monitoring. The report should indicate an insignificant, short-term impact with the project. This impact has little significance in the decision to modify the project and should not be included in the EA unless there was an earlier suspicion that air quality impacts may be significant problem. However, if the district retains the discussion it should be correctly presented that the With Project Condition (WPC) is better than the Future No Action Condition (FNAC).

NWK Response: We concur. The suggested language will be added.

Discussion: The EA should document that any impacts are short-term, in a controlled situation, and that the With-Project condition is better than the Future No Action Condition. Coordination with local air quality agency, in this case the Kansas Department of Health & Environment., should be documented.

Required Action: Kansas City will include this discussion in the Draft EA.

Action Taken: Air Quality impacts discussed Section 10.9 of the EA, page 19.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the EA.

23. Demography (Section 10.12.1). These data are the basis for compliance with Section 122 of RHA 1970 and EO 12898 which will be discussed in a later comment. Any demographic presentation should focus on address the resources described in these Section 122 and EO 12898. The information presented in subsequent subsections is generally good but should be, as discussed above, included only if the level of impact expected would significantly influence the decision to modify the project or the decision to do an EIS,

otherwise these discussions should not be included in the EA. Discussions should present the With Project Condition (WPC) relative to the Future No Action Condition (FNAC).

NWK Response: We concur. Census data will be removed from this section. Subsequent sections will be revised and reduced to discussion of impacts.

Discussion/Required Action: None.

Action Taken: Census data removed and demographics discussion edited in Section 10.10, page 20, of the EA.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the EA.

24. Environmental Justice (Section 10.12.4). Environmental Justice is not a resource, it a specific enhancement of the scoping and public involvement process. EJ requires a Federal action agency to make proactive effort to determine the presence of low-income and/or minority populations in the area affected by proposed projects, to specifically engage with these populations to determine their special project related needs & mitigate unavoidable adverse effects as practical, and to determine if there is any disparity in the impacts to these groups relative other affected population groups. Demographic data at the census block-level (or the smallest census unit available for the impact area) should be used as a tool to determine the presence of any clusters of minority and low income populations. Census data at the city or county level are not sufficient to help locate small population clusters that may occur in the impact area. The process to find and work with identified groups should be summarized in the Public Involvement sections of the NEPA document and more fully discussed in the main planning report. Any significant impacts and mitigation would be described under such resource headings as employment effects, property values, infrastructure & services, community cohesion, etc. (see Section 122). The process to determine if EJ covered populations are effected must be presented, if no EJ populations are found in the impact area the report should so state and very briefly describe efforts to determine their presence. If EJ populations are found the EA should concisely document efforts to involve them, the specific impacts involved and the outcome of the coordination must be documented. Detailed discussion of this aspect of public involvement should be covered in the main planning document.

NWK Response: We concur. This section will be revised and coordinated with EPA. A list of environmental justice contacts within the project area provided by USEPA would be used to ensure that project components will be communicated to residents who might not otherwise become aware of the project and draft EA availability through the standard methods.

Discussion: The EA must include documentation of all efforts to identify and include potentially impacted EJ population.

Required Action: Kansas City will consult with the sponsor and with EPA for available information, and outreach will be conducted as required. We will document these efforts in the Draft EA.

Action Taken: Environmental Justice contacts obtained from EPA and added to the mailing list to be used for public distribution of the Draft Feasibility Report and EA. Full list of contacts is included in the Public Involvement appendix (Appendix B) of the Final Feasibility Report.

HQUSACE Assessment: The concern is not resolved, however the action proposed will help to address the concern. The report should also document any significant views expressed during the coordination and how they were given consideration.

NWK Response: Appendix B, "Public Involvement" will be updated at the conclusion of the 30-day Draft Report public review period.

Discussion/Required Action: Update Appendix B.

Action Taken: Appendix B has been expanded to discuss all public coordination efforts and how comments received were incorporated into the report. The notification mailing list has been added to the Appendix, including all community contacts provided by the EPA for compliance with EJ requirements.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

25. HTRW. This level of information is excessive for an EA. The level of detail provided here should be in an appendix to the main report, the project files, and available for public review, but the EA needs only to incorporate the detailed discussions by reference. If no sites are found in or adjacent the alignment, so state. If sites were found outside of but immediately adjacent to the alignment area; list them and provide a conclusion whether any of them effect the project alignment. According to 11.1.2 and 11.2.0, there is still some uncertainty about contamination in some areas, but it is unclear if additional detailed surveys will be conducted near the railroad. Location of HTRW contamination would have a significant bearing on project decisions and may require an EIS. The District should not sign a FONSI until the results of additional testing are available. Move detailed discussions to other documents, and leave summarized plans for additional site testing, the findings in this section.

NWK Response: The HTRW portion of the EA will be summarized and the details of the information included by reference. In terms of the railroad, no additional investigations are recommended at this time. There is no specific information available to suggest any contamination exists at this location. The statement in the HTRW portion of the EA that contamination is not uncommon near railroads was made to emphasize the need to sample

and analyze any material that would be removed from this site. This prevents the inadvertent transfer of contamination from one location to another.

Discussion/Required Action: None.

Action Taken: HTRW information summarized in Section 11.0, page 24, of the EA. Other information provided in Appendix H of the EA.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the EA.

26. Mitigation (Section 13.0). Justification for compensatory mitigation is not found. First, the district must determine and present the most likely future condition of the 7.5 ac woodlot then base mitigation on the difference. When the incidental benefits of basic contouring and use of mixes of native woody and herbaceous species to revegetate compensatory mitigation should not be required. Use of a simple ratio is not sufficient to determine mitigation; mitigation determinations must include a site-specific habitat-based analysis (see ER 1105-2-100, C-3.d.(5) and C-3.e.). The EA must present justification for mitigation based on at least a simple habitat-based analysis of the area and quality of the impacted resource, e.g. a HEP-like analysis.

NWK Response: A detailed mitigation plan has been added to the appendix of the EA. The analysis that was done was appropriate for the size/quality of this habitat and cost of this project. The cost of the project and impact to the project schedule do not warrant an incremental habitat analysis.

Discussion/Required Action/Action Taken: See Comment 4b(6) above.

HQUSACE Assessment: The concern is partially resolved. Although the mitigation plan is not large or costly, C-2.e.(8) of ER 1105-2-100 requires that an incremental analysis be performed for all recommended mitigation plans at a commensurate level of detail, and that analytical steps similar to those described in the regulation be documented. Further information is needed to support the conclusion that the recommended mitigation represents the least cost means of compensating for the loss of habitat.

NWK Response: Discussion with reviewer requested for additional clarification of assessment.

Discussion/Required Action: Per telephone discussion with the review team on 12 Nov 2008, the written discussion of the mitigation plan and cost analysis should be edited to clarify that the different planting plans reviewed all produce the same level of habitat output (cost-effectiveness analysis). This level of habitat output was previously determined through coordination with state and Federal resource agencies as the required amount to compensate for the loss incurred by the project. Detailed incremental cost analysis will not be required, because the mitigation target can be achieved based on the first level of investment. The

report should be revised to more clearly describe the process taken in the mitigation analysis and correlate the process with the steps required by ER 100.

Action Taken: Updated Mitigation Plan included in Final EA (Appendix F).

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

27. Conclusion (Section 14.0). This section misses a number very key points: 1) The impacts of this project are localized short-term effects that are not significant, 2) Most impacts of the project will be in areas previously disturbed by the original project or other development, 3) There is no widespread opposition to the project, and 4) Compared to the social and economic effects of even a partial levee failure the effects of implementing and operating this project are not significant.

NWK Response: We concur. The suggested language will be added.

Discussion/Required Action: None.

Action Taken: Conclusion (Section 15, page 29) edited accordingly.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the EA.

28. Minimum List of Statutes (Page 46). First, this table should be included within the EA or the Main Report: as it is, it just appears. Second, the table is incomplete. The Principles and Guidelines provides a minimum list of statutes that should considered, if one is not applicable that should be stated. The P&G list aside, this table misses statutes applicable to this project, e.g., CERCLA, RCRA, TOSCA, Noise Control Act, and EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds. Laws with direct bearing on this project (e.g., NEPA, ESA, NHPA, CWA, FWCA, CAA, CERCLA, RCRA, etc.) should be discussed in the EA or Main Report with the EA referencing the MR discussion. The discussion should address what has been done specific to compliance with the statute; if/how this compliance has influenced project formulation, and what remains to be done.

NWK Response: We concur. The table will be revised.

Discussion/Required Action: None.

Action Taken: Compliance table included as Section 17, page 31, of the EA.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the EA.

C. COMMENTS ON THE APRIL 2008 DRAFT FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT RECEIVED 20 AUGUST 2008.

1. North Topeka Unit NED Analysis. The report (Table 12, Screening Cost Summary) has not demonstrated that Alternative 1 is the NED alternative--least cost protection. Initial plan comparison did not include mitigation costs for Alternative 1 (See also Plate 13, North Topeka Unit Mitigation Area). If these mitigation costs are included, then Alternative 1 would not be the NED alternative. Providing the same benefits, Alternative 1 is levee berm construction, whereas Alternative 2 includes relief wells. Total first costs are $2,479,300 and $1,852,800, respectively, and annual costs are $151,600 and $162,200. Alternative 2's total first costs are $626,500 less, but annual costs are $11,000 more due to higher O&M. LERRD costs for both alternatives 1 and 2 must be presented. And mitigation costs including LERRDS must be identified and added to Alternative 1, (See Plates 2 and 13).

NWK Response: Mitigation activities, while proposed to be located in the North Topeka Unit area, are necessary as a result of project construction in the South Topeka Unit. Mitigation costs are therefore not included in the analysis of North Topeka alternatives but are included in the South Topeka alternative analysis.

Discussion/Required Action: The sections describing the North and South Topeka alternatives should be expanded to clarify which proposed project features cause environmental impacts and where offsetting habitat will be created. Discussion should also include an indication of borrow material sources for each proposed project feature.

Action Taken: The discussion of North Topeka alternatives, found in Section IX.E "Screening of Measures", starting on pages 39, has been edited to state that the proposed project measures do not create impacts to the environment. The discussion of South Topeka measures, beginning on page 42, has been clarified to indicate the specific measures that will cause environmental loss. Sources of borrow material for each proposed measure are indicated in Section IX.F "Borrow Areas" found on page 45. Section X.A. "Recommended Plan – Work Components" now includes a paragraph describing the mitigation area designated in the North Topeka Unit and its purpose, and references Plate 13.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

2. South Topeka Benefits. The report (See Draft Feasibility Report, Section VIII.A., page 26) notes: "A complicating factor in the economic analysis for the Oakland and South Topeka units is presented by the issue of hydraulic independence. Despite the longstanding practice in older reports of treating the two units as separate and independent, further inspection determined that they are instead 'partially dependent." Flows entering South Topeka flood the Oakland Unit, but not vice versa. So, some of the benefits shown from the Oakland Unit should be included with the South Topeka Unit's benefits, as flows from South Topeka will cause damages in Oakland, if South Topeka isn't improved.

NWK Response: Benefits for the South Topeka unit as presented in the report do in fact include benefits based on prevention of damages in Oakland; see especially sections 4.7.3 and 7.4.3 of the socioeconomics appendix. (Note also that an update of the benefits to FY 2009 prices is pending. Costs in the analysis were updated to FY 2009 prices immediately before submission of the report, but benefits have not yet been updated from FY 2008 prices.)

Discussion: The discussions involving NWK, NWD and HQUSACE reached a consensus that a combined consideration of the South Topeka/Oakland areas would be more accurate than the separate incremental analyses contained in the draft report. It is believed that the analytical methods used in the separate analyses of these units minimize or eliminate any double-counting of damage reduction in Oakland.

Required Action: NWK will edit both the main report and the socioeconomics appendix to add a combined consideration of benefits for the South Topeka and Oakland units. The incrementally-determined benefits and the costs for the two units will be added and a combined benefit-cost ratio will be presented for South Topeka/Oakland (approximately 3.7 for the combined units), and the combined BCR will receive the main emphasis in the appendix and the main report. Following discussion of the combined reach in the appendix, NWK will include discussions of each of the units separately, using the analysis that already has been completed for the draft report, and demonstrate economic feasibility for each unit's fix.

Action Taken: Section VI.A.2 "Description of Existing Overall Project", beginning on page 7, has been edited to include the following paragraph: "*The six flood risk management units, although authorized and constructed as separate units, were designed in coordination with the others as a complete levee system. While some of these separate units are operationally independent, a direct risk dependency exists between the South Topeka and Oakland units, i.e. if the South Topeka Unit were to flood; the Oakland Unit immediately downstream would also flood. This dependency will be then taken into consideration in the economic and future performance analyses presented later in this report. However, the convention of separate units, as constructed, will be maintained for clarity and accuracy in the discussion of existing conditions, problem locations, and proposed corrective alternatives.*" Accordingly, the economic comparisons and tables found in the main report have been edited to present the combined South Topeka/Oakland unit instead of two separate units (see Section IX.I "Economic Analysis and Screening of Plans", page 48, and Section X.B "Economic Performance of the Selected Plan", page 56.) Additionally, he Socioeconomic Appendix (Appendix D) has been edited throughout.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

<u>3. South Topeka Unit's Commercial Structures</u>. There are more commercial structures vis-à-vis residential structures in the South Topeka Unit compared to other units. So the BCR for the South Topeka Unit is more sensitive to the commercial structure without-project assumptions. The report (see Appendix D, page 33) states that "this analysis primarily

utilizes CSVRs developed by the New Orleans District Corps of Engineers." The report also states, "The availability of flood avoidance measures such as evacuation, raising, or flood proofing was taken into consideration in formulating depth-damage relationships where appropriate." (see Economic Appendix 4.5.2 Commercial and Public Depth Damage.) Flooding would be from levee or floodwall structural failure, so avoidance measures—evacuation, raising and flood proofing--would be ineffective. Thus, the South Topeka Unit's commercial building depth damage functions should not take these factors into consideration.

NWK Response: Concur. The intended meaning of the referenced portion of the appendix is that we gave due consideration to such factors as floodproofing in selecting and/or formulating the depth-damage functions used in the analysis. It is not intended to imply that any degree of damage potential was ultimately deducted from the functions based on assumptions concerning flood avoidance measures.

Discussion/Required Action: None.

Action Taken: None.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

4. Riparian Habitat South Topeka Floodwall Construction. The report (page 53) states, "Construct riverside construction and haul road to serve as working platform." However, a cursory examination of this area on GOOGLE MAPS@ indicates that there is riparian habitat. Potential environmental impacts from the floodwall construction must be identified and resource agency coordination ensured.

NWK Response: Vegetation in the area between the South Topeka Floodwall and the Kansas River consists primarily of weeds and scrub grasses growing among the riprap on the slope. This area is a fairly steep slope and does not provide any significant habitat. Natural revegetation is expected to occur after construction along the same pattern as currently existing. Pictures of the area are included below.

Discussion/Required Action: None.

Action Taken: None.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

<u>5. Fairchild Pump Station.</u> The report (Section IX E (1), page 39) states, "The Fairchild Pump Station is no longer used or maintained as an active part of the levee system," and page 52 states, "Recommended plan provides for controlling uplift at the Fairchild Pump Station by proper in-place abandonment of the structure." Since the pump station has been abandoned, appropriate disposal is an existing project O&M requirement. Therefore, Fairchild Pump Station abandonment costs are not an appropriate cost-shared project feature.

NWK Response: The Fairchild Pump Station is a part of the Federally authorized levee project and the recommendation of NWK under Section 216 authority is to remove the station. Review of project authority, operational guidance, levee safety program guidance, and discussion with those NWK program managers, and other project precedents, indicates that this work is a legitimate cost shared feature. The uplift risk identified constitutes an

unacceptable probability of failure in the levee system. It is important to note that even if the pump station remained in active status, it would still have to be modified to address the uplift issue. The current inactive status of the station allows for consideration of pump station abandonment and removal as the lowest cost alternative to restore acceptable reliability and maintain flood risk management benefits. There are other possible remedies, as discussed in the feasibility report, to address uplift concerns that would result in greater project costs with no increase in project benefits.

The local sponsor has consistently received high marks on annual inspection reports and the Fairchild Pump Station has never been noted as a deficiency. Correction of the uplift risk is required for continued satisfactory performance of the system and is beyond the normal scope of non-Federal operation and maintenance activities. To not include this proposed work would make the Recommended Plan incomplete and violate the stated purposes and objectives of the Feasibility Study.

Discussion/Required Action: None.

Action Taken: None.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

6. Lost Production. The report notes "Lost production - Business shutdowns can last for weeks in large floods, causing sizable and even ruinous production losses. Usually, production can be replaced by other locations of the company or companies in the same industry, so costs of business interruptions are generally considered economic transfers rather than losses to total output." Flooding would occur from structural failure during rare events, so flooding would be sudden and catastrophic. There probably is some lost production having national implications. Thus, lost production, particularly for the South Topeka Unit, should be reconsidered and included in the BCR.

NWK Response: Concur. A certain amount of data on this subject was collected during our discussions with the larger companies in the study area. The proposed methodology is as follows: (1) review the company-specific data for information on shutdown losses; (2) delineate NED vs. non-NED losses (this was specifically discussed during our discussions with the companies); (3) estimate shutdown time in a range of single flood events; (4) use the assumed shutdown durations to estimate losses for each event; (5) develop a depth-damage function based on the single event loss estimates; (6) input the function and the dollar losses to the HEC-FDA analysis to produce annualized benefits. It should be noted that confidentiality is an extremely important consideration for most companies in regard to this type of data, and therefore the information in the report will need to be presented somewhat generically. With HQUSACE approval, we propose presenting the data in breakouts by 2-digit North American Industry Classification System (NAICS) classifications.

Discussion/Required Action: Proceed with determination of lost production benefits and include in the Report.

Action Taken: Lost production valuation is discussed in Section 4.4.8 of Appendix D, Socioeconomics.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

7. Oakland Unit Construction Features. The report (page 54) indicates "Recommended Plan provides for increasing the stability factor of safety by installation of a stability berm two feet high extending from the wall five feet and then tapering at a one on three slope to the existing ground surface." However, GOOGLE MAPS@ shows that the floodwall is *not* where Plate 7 indicates. Furthermore the area directly behind the floodwall where the berm would be constructed appears to be occupied. The plate must be corrected and the construction area appropriately identified. Furthermore, construction easements and possibly some LERRD might also be required.

NWK Response: The location of the Oakland Unit floodwall will be corrected on Plate 7 and the appropriate real estate map. Sufficient area is available to construct a stability berm extending as much as nine feet out from the wall without affecting existing structures. Equipment and materials stored on the site by the adjacent business will be moved during the construction period. Permanent levee easement held by the City of Topeka already exists in this location. Additional temporary construction easement is required and has been included the LERRD cost determination. The photos below show the area behind the floodwall.

Photo #1 – Looking west from east end of wall.

Photo #2 - :Looking northeast from west end of wall.

Discussion/Action Required: None.

Action Taken: None.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

8. Real Estate Impacts Oakland Sewage Disposal Plant. Plate 6 indicates that berm construction will impact structures on the plant premises. If so, this potential taking must be identified in the real estate plan and appropriate costs included.

NWK Response: The limits of the proposed underseepage berm location do overlap with the location of buildings at the treatment plant. However, the buildings are a sufficient distance from the levee toe that the berm thickness will have tapered significantly before reaching the building location. During the PED phase, the berm design will be further refined to extend around existing building locations and will not require a permanent real estate taking. Temporary easements for construction have been included in the LEERD cost determination.

Discussion/Action Required: None.

Action Taken: None.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

9. Real Estate Costs. The report (page 62, paragraph G) references Appendix G for real estate considerations and that they will be refined during PED. It appears that Real Estate is

now Appendix C, where Table 10.3 costs don't appear consistent with Table 16. The real estate figures in the main text and appendix should be consistent. Pertinent real estate costs must be identified for each "fix," and appear in the main report's tables.

NWK Response: Concur.

Discussion/Action Required: Correct references and ensure proper consistency of figures between report and appendices.

Action Taken: The Real Estate Appendix reference has been corrected. Table 10.3 has been edited to allow for easier comparison to costs in other sections. The real estate cost values presented in 10.3 were originally prepared at an Oct 2007 price level and correspond to the first column (1 Oct 07 price level) of the Total Project Cost Summary Sheet (TPCS) in Appendix E. The only exception is the Waterworks unit, in which there are $5,000 in construction related relocations listed in the 02 account of the TPCS that were determined not eligible for credit, and so are not shown in Table 10.3. The total LERRD values for each unit were updated to Oct 2008 prices during the cost estimate update process and are shown in the second column (1 Oct 08 price level) of the TPCS. These Oct 2008 values were used in the preparation of Table 16 of the main report.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

10. Value Engineering Study. ER 11-1-132, 7d. (1) states: "All feasibility reports, post authorization change reports, general reevaluation reports, reauthorization letter reports and the equivalent will contain a review and approval statement from the PM indicating that required VE action has been completed, as appropriate, for that phase of the project." An appropriate VE approach must accompany the final report, since project performance is so dependant on the geotechnical assumptions.

NWK Response: A meeting was held in the District on 14 OCT 2008 between the project manager, the District VE Officer, and a structural engineer not previously involved in the project. This team chose to review the alternatives that had been considered in the Feasibility Study to address the identified areas of concern at the South Topeka floodwall and the East Oakland Pump Station. Two additional alternatives were discussed for the floodwall and one additional alternative for the pump station. After the meeting of 14 October, the proposed additional alternatives were separately discussed with representatives of the civil and geotechnical engineering disciplines. The additional floodwall alternatives, while providing increased short-term stabilization to the wall itself, were dismissed as not providing a long-term solution to the problem of foundation stability.

The possibility of employing drilled anchors instead of a heel extension for the control of the East Oakland Pump Station uplift concern was considered and is recommended for further review during the PED phase. Drilled anchors have recently been proposed for use in the Kansas City levee system to address pump station uplift concern. In Kansas City, the uplift

concern was of a greater magnitude, making a heel extension too large of an undertaking. The Topeka pump station concern is smaller resulting in the preliminary indication that the costs for a heel extension versus drilled anchors in Topeka are very similar. Additional comparison using updated design information to be collected during the PED phase is needed to make a final determination.

It was determined that this review satisfied the requirements of the Value Engineering ER. A report stating such is being prepared by the NWK Value Engineering Officer.

Discussion/Required Action: Add discussion of VE activities to the final report.

Action Taken: Section X., Item I. "Value Engineering" has been added to the report.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

11. Economic Update. Reference ER 1105-2-100, paragraph D-4, b. "(3) Plan for Economic Updates. Feasibility reports, General Reevaluation reports and other project decision (formulation) documents shall include a plan for updating project benefits for future reporting and decision making." The update plan should be described in the economics appendix and resources included in the PED cost estimate. The plan must include tasks for budget submissions including updating residential structures and, if appropriate, agricultural valuations (see Economic Appendix Paragraph 4.4.1. Residential Structures Valuation and 4.4.6 Agricultural Valuation).

NWK Response: Concur.

Discussion/Required Action: Develop a brief plan for the 3-year economic updates and add to the final draft of the socioeconomics appendix.

Action Taken: Economic update plan discussed in Section 8 of Appendix D – Socioeconomics.

HQUSACE Assessment: The concern is resolved by the response and revised text included in the report.

D. REVIEW COMMENTS ON THE DECEMBER 2008 FINAL REPORT AND EA.

1. The review of the final report generated no additional comments.

Thomas Hughes

Policy Compliance Review Manager