

## **RECORD OF DECISION**

### **Review of Completed Project, Kansas Citys Levees, Missouri and Kansas**

The Interim Feasibility Report and Environmental Impact Statement (EIS), dated August 2006 with Addendum dated December 2006 addresses opportunities for flood risk reduction for the Argentine, East Bottoms, Fairfax-Jersey Creek, Birmingham and North Kansas City levee units of the Kansas Citys Local Flood Damage Reduction Project. Based on the report, the reviews of other Federal, State, and local agencies, input from the public, and the review by my staff, I find the plan recommended by the Chief of Engineers to be engineeringly sound, economically justified, in accordance with environmental statutes, and in the public interest.

This report is the first of two study phases being conducted by the U.S. Army Corps of Engineers, Kansas City District, at the request and with the cooperation of four non-Federal sponsors. The purpose of the study was to improve the performance of the Kansas Citys Local Flood Damage Reduction Project. It covers five of the existing project's seven levee units that act as a system to reduce the risk of flooding to commercial, industrial and residential areas within the Kansas City metropolitan area. This feasibility study was conducted under the authority provided by Section 216 of the 1970 Flood Control Act (Public Law 91-611).

The recommended plan is the combination of the preferred alternatives for each levee unit. The preferred alternatives are considered to have the highest net economic benefits and formulated to minimize land disturbance, tree removal, and maximize cost-effectiveness. The recommended plan for the Kansas River Argentine levee unit consists of an average five foot levee raise and associated pump station, floodwall, and line of protection reliability improvements. The recommended plan for the Missouri River levee units (Fairfax-Jersey Creek, North Kansas City, and East Bottoms) includes the installation of relief wells and a pump station, installation of a buried collector system, strengthening of an existing floodwall, and sheet pile wall reconstruction to improve the reliability of flood damage reduction.

The recommended plan has relatively minor impacts to the natural environment with overall positive benefits to the socio-economic environment. Impacts to the natural environment are minor because the project is located within a previously disturbed environment that is highly industrial and urbanized. The main impacts to the natural environment include the loss of three small wetlands measuring a total of 0.2 acres. To compensate for the loss of these three small wetlands, one 0.21 acre wetland will be created and planted with native wetland species. In addition, any woody vegetation lost as a result of the project will be replaced as appropriate. All practicable means to avoid and/or minimize adverse environmental effects have been incorporated into the recommended plan. Therefore, the recommended plan is the environmentally preferable alternative. The Corps will implement the wetland mitigation construction concurrently with the overall project construction.

The feasibility report presents an array of alternative plans for improved flood damage reduction for the existing levee system. These alternatives were formulated based on an examination of the existing levels of flood risk reduction and the project authorizations. The alternatives were analyzed and compared in consideration of completeness, efficiency, effectiveness, acceptability, and risk and uncertainty; as well as for maximizing net benefits to the national economy and impact on the environment. The alternatives for each of the five levee units are discussed below.

The Argentine levee alternatives are river foreshore tree removal and channel modification, a series of levee raises, and no-action. The alternative of removing all trees within the foreshore throughout the Kansas City reach of the Kansas River and/or channel modification was considered for the improvement of conveyance along the Kansas River. Modeling results indicated these alternatives would provide a limited conveyance improvement and would cause adverse impacts to the riparian habitat along the Kansas River. The 500-year+3 levee raise alternative consists of an approximate 5-foot raise along the earthen levee within the existing levee footprint. It also includes reliability improvements to three levee pump stations. The levee raise alternative would provide for overtopping reliability, stability and underseepage control improvements and would result in less land disturbance than the other levee raise alternatives. Therefore, the 500-year+3 levee raise is the most cost-effective and preferred alternative for the Argentine levee unit.

For the East Bottoms levee unit the alternatives are flood fighting, a sheet pile wall, a slurry cut-off wall, pressure relief wells, and no-action. The flood fight alternative consists of placing sand bags in areas prone to have a high underseepage risk. This would not prevent underseepage failure. The sheet pile wall alternative is relatively expensive and less effective for underseepage control than pressure relief wells. The slurry cut-off wall alternative would construct a three-foot wide slurry wall along the levee and is relatively expensive. The pressure relief wells alternative consists of installing a series of relief wells along Station 403+00 to Station 420+00. A header system will serve to transfer seep-water from the wells to the proximity of the Hawthorne pump plant. Relief wells are highly effective in controlling underseepage, and though more expensive than the buried collector system, have proven to be reliable under flood conditions that could occur at this site. The pressure relief well alternative is the preferred alternative for the East Bottoms Levee unit.

There are six alternatives for the Fairfax-Jersey Creek Unit, Fairfax-Board of Public Utilities Floodwall: flood fighting, a new floodwall, foundation soil modification with jet grouting, temporary earthen fill, new earthen levee, and no-action. The flood fighting alternative would place sand bags on sections of the floodwall displaced by floodwaters; however, the alternative does not provide adequate reliability against floodwall failure. The new floodwall alternative consists of constructing a higher capacity pile system floodwall with stronger structural elements along the existing floodwall. Limited space for placement of a new floodwall and a high cost of construction eliminated this alternative. The soil modification alternative would apply jet

grouting to modify soil properties. Jet grouting is not considered a long-term, viable solution for floodwall strengthening. The temporary earthen fill alternative consists of placing fill behind the existing floodwall as water rises and removing it once the high water recedes. Temporary earthen fill is not considered a viable alternative because the weight of the fill needed would unduly stress the structural components of the wall. The new earthen levee alternative consists of a permanent earthen levee placed adjacent to and in contact with the existing floodwall. A new earthen levee at this location would require additional real estate acquisitions and other associated costs; and would have limited to no public acceptability. Therefore, this alternative is not considered feasible due to insufficient space available for levee construction. The floodwall modification alternative would provide for strengthening modifications to the pile foundation and constructing buttress supports for the main stem wall. It would be the most cost-effective alternative and better adapted to the limited construction space as compared to the new wall alternative. Therefore, the floodwall modification alternative is preferred.

Alternatives for the Fairfax-Jersey Creek Unit Sheet Pile Wall are flood fighting, closed or open cell design sheet pile wall, a new sheet pile wall with auger cast piles and tiebacks, and no-action. The flood fighting alternative would place sand bags on site and is not a reliable solution for flood damage reduction. The closed or open cell sheet pile wall alternative consists of placing a new sheet pile wall along the existing wall by crane and then removing the existing sheet pile wall. Closed cell wall construction is considered more reliable but is more expensive than the open cell wall design. The open cell design provides the reliability required at a lower cost. The sheet pile wall with auger cast piles and tiebacks consists of placing piles along the landside of the existing sheet pile wall, placing a concrete cap on top of the piles, and then grouting the tiebacks into the soil. This alternative would be more expensive than the open cell wall design. The open cell wall design provides adequate flood reduction reliability at the lowest cost. Therefore, the open cell design is the preferred alternative for the Fairfax-Jersey Creek levee unit.

For the North Kansas City-Harlem unit the alternatives are flood fighting, a landside seepage berm, pressure relief wells, and no-action. The flood fight alternative consists of placing sand bags on site and is not a reliable solution for flood damage reduction. The landside seepage berm alternative consists of the construction of two seepage berms to control underseepage during a flood event. Pressure relief wells consist of installing stainless steel relief wells along the levee toe. This alternative is effective for preventing seepage but is more expensive than installing a buried collector system. The buried collector system is constructed using perforated pipe and placed within an excavated trench providing gravity flow to collection vaults. Underseepage water is pumped manually from these vaults to prevent interior flooding. The buried collector system is the preferred alternative because it provides underseepage control and flood damage reduction reliability at the lowest cost.

The alternatives for the North Kansas City-National Starch unit are flood fighting, a landside seepage berm, buried collector system, and no-action. The flood-fighting

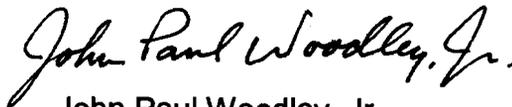
alternative consists of placing sand bags on site to decrease underseepage and is not a reliable solution for flood damage reduction. The landside seepage berm alternative consists of the construction of two seepage berms to control underseepage during a flood event. A landside seepage berm is not as effective as pressure relief wells, is very expensive, and would disturb 23 acres of land. The buried collector system was deemed technically inadequate for this site because of the magnitude of underseepage pressures at the site. The relief wells and pump station alternative consists of installing a series of relief wells along the levee toe. Relief wells would collect the seepage and route it through a header system to a new pump station located nearby. The pump station provides active draw-down of underseepage pressures at this site controlling underseepage and interior flooding. The relief well alternative provides underseepage control and flood reduction reliability at a low cost and while minimizing disturbance of local habitat. Therefore, the pressure relief wells and pump station alternative is the preferred alternative.

The no-action alternative is proposed for the Birmingham levee unit, since it currently provides adequate overtopping, geotechnical and structural reliability at the design level.

The public involvement process consisted of public meetings, public notices, and circulating the draft feasibility report and draft EIS to the public and resource agencies. The final comment period on the interim feasibility report and final EIS ended on October 30, 2006. The Corps has reviewed and evaluated the documents concerning the proposed action, considered the views of other agencies and the public, responded to comments containing those views, and examined the various practicable means to avoid and/or minimize environmental harm from construction of this project. Those means were adopted into my decision. In addition, the public interest will best be served by implementing the improvements identified and described in the interim feasibility report and the Final Environmental Impact Statement.

Technical and economic criteria used in the formulation of alternative plans were those specified in the Water Resource Council's Principles and Guidelines. All applicable laws, executive orders, regulations and local government plans were considered in the evaluation of alternatives. Based on review of these evaluations, I find that the benefits outweigh the costs and any adverse effects. This Record of Decision completes the National Environmental Policy Act process.

21 November 2007  
Date

  
John Paul Woodley, Jr.  
Assistant Secretary of the Army  
(Civil Works)