



DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
ROBERT A. YOUNG BUILDING - 1222 SPRUCE ST.
ST. LOUIS, MISSOURI 63103-2833

July 16, 2008

Planning, Programs, and Project Management
Environmental Branch

To whom it may concern:

A copy of the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the "*Levee Repair P.L. 84-99: Clear Creek Drainage & Levee District, Alexander and Union Counties, Illinois*" are enclosed for your review. Please note that the Draft Finding of No Significant Impact is unsigned. This document will be signed into effect only after having carefully considered comments received as a result of this public review. We invite your comments related to the technical content of the attached documents. Please address your comments or questions to Francis Walton, of the Environmental Branch (CEMVS-PM-E), at telephone number (314) 331-8487, facsimile number (314) 331-8806, or e-mail at <francis.j.walton@usace.army.mil>, by close of business on August 15, 2008.

Sincerely,

A handwritten signature in cursive script that reads "Thomas Keevin".

Thomas M. Keevin
Chief, Environmental Branch

**ENVIRONMENTAL ASSESSMENT
WITH DRAFT FINDING OF NO SIGNIFICANT IMPACT**

**LEVEE REPAIR (PL 84-99)
CLEAR CREEK DRAINAGE AND LEVEE DISTRICT
UNION AND ALEXANDER COUNTIES, ILLINOIS**

I. PURPOSE AND NEED FOR ACTION

A. Purpose and Need for Action:

The Clear Creek Drainage and Levee District (DLD) was damaged at 6 slides and two gravity drains as a result of a March 2008 flood event. This damage has compromised the level of protection provided by the levee, making the DLD vulnerable to flooding at more frequent intervals. If the slides are not repaired to the Federal standard, future economic losses could be extensive.

The Clear Creek Drainage and Levee District (DLD) is a Federal levee located in Union and Alexander Counties, Illinois, on the left bank of the Mississippi River. The levee extends along the left descending bank of the Mississippi River from river mile 57 to 66 and is 21 miles in length and protects 18,000 acres (Attachment 5). The levee, constructed under authority of the Flood Control Act of 22 June 1936, affords protection against a flood stage of 46 feet.

Heavy rains throughout south central Missouri and southern Illinois during March 2008 caused flooding along the Mississippi River drainage system within the USACE, St. Louis District, in Missouri and Illinois. Two day rainfall totals for March 17-19 ranged from 3 to 11 inches. This pattern continued through April exceeding the normal rainfall for that time period. Runoff was high during the event due to lack of ground cover and foliage. This resulted in major flooding on small tributaries and filled Corps reservoirs to their flood control pools. The Mississippi River at Cape Girardeau reached 9 feet over flood stage. Flooding in the Meramec basin resulted in a peak discharge of 53,600 cubic feet per second (cfs) at Eureka. This flow resulted in a peak stage 13 feet over flood stage at Valley Park. The Big Muddy River at Murphysboro recorded a flow of over 28,000 cfs, with a stage 15 ft over flood stage.

B. Project Objective: The project objective is to restore the Clear Creek Drainage and Levee District levee to the 50-year Federal standard which existed prior to the flood event to protect the DLD's economic value with minimal environmental impacts.

C. Relevant Law and Regulations

1. PUBLIC LAW 84-99

Repair of eligible Federal and non-Federal levees has been authorized by Congress through PL 84-99. This law authorizes emergency funds to be expended in preparation for, or in the repair or restoration of, any flood control work threatened or destroyed by flood, including strengthening or other modifications that may be necessary for adequate flood control. Under the memorandum of agreement between the Federal Emergency Management Agency (FEMA)

and the Department of the Army, the USACE is tasked to provide engineering, design, construction, and construction contract management in support of the emergency operation.

2. EXECUTIVE ORDER 11988 (FLOODPLAIN MANAGEMENT)

Under this Executive Order, Federal agencies are to "provide leadership and shall take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains."

3. EXECUTIVE ORDER 11990 (PROTECTION OF WETLANDS)

Under this Executive Order, Federal agencies shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities."

II. ALTERNATIVES

The following section describes the alternatives for repair of the slides in the Clear Creek DLD.

A. No Action Alternative: Under this alternative, the Federal government would not assist the DLD in repairing the six slide areas and two gravity drains and the DLD would not undertake repairs on their own.

Under the No Action Alternative, the federal government would not repair the flood damages of the DLD. It is possible that the Drainage and Levee District would make repairs without Federal assistance. Environmental impacts of the Drainage and Levee District repairs would be similar to the recommended alternative; except that the time period required for repairs may be increased and the environmental protections may be reduced. However, because of the uncertainty of the Drainage and Levee District making repairs, this potential alternative was not addressed further.

Instead, the environmental impacts of allowing the slides to remain unrepaired are evaluated as the No Action Alternative. This would presumably perpetuate a state of reduced levee structural integrity. The levee would be susceptible to further erosion at the damage sites. It is estimated that in its damaged condition, the DLD would provide a 10 year level of protection instead of the 50 year level it was designed to provide. This reduced level of protection would increase the flood risk, threatening the livelihood of local landowners.

B. Preferred Alternative: Under this alternative, at the request of the DLD, the Federal government would repair the six slide areas to pre-flood elevations on the original levee alignment and repair the gravity drains. The repair costs would be 100 percent federal.

Project Description: A survey of the Clear Creek levee revealed that there were six areas where slides occurred and two gravity drains with damage. Pictures of typical slide damage are shown in Attachment 1. Attachment 2 is a list of the slides with the GPS coordinates in State Plane Illinois West, NAD 83, the number of the slide, measured length of the slide, and measured scarf of the slide. Most of the slides have occurred in the upper one-fourth of the slope

and cover a large section of the slope. Several of the slides are into the roadway at the crown of the levee. Lime treatment of the slide material is the recommended repair. Attachment 3 is the basic scope for the lime treatment used in the recommended repair for this type of slide. Attachment 4 is the cross-section showing the recommended repair for this type of slide. Attachments 5 and 5a show the locations of the slides.

The gravity drain, at WP 162; N286947, E2509362, shows signs of material loss from around the pipe due to the high volume of water flow caused by the spring high water event. There is a 4' depression 50' upstream and the entire area is soft and low. The recommended repair is to slip line the pipe with HDPE (High Density Polyethylene Pipe) and fill the annular space with grout. The gate and stem on the gravity drain at WP 166; N251061, E2529378, were damaged during the high water event and need to be replaced. Pictures of the damage are shown in Attachment 1. Attachment 5 includes maps with the gravity drain location.

Under this alternative, which is the preferred alternative or recommended plan, all the slides would be repaired using the lime treatment method as described in Attachment 3. Both gravity drains would be repaired as well. The levee would be repaired to the pre-2008 flood condition and the repair costs would be born by the Federal government since this is a Federal levee. All material would come from the levee slide and no borrow sites would be needed. A 50 ft contractor work area on the levee berm adjacent to the slide area is designated to perform the necessary work (Attachment 4). If trees occur and impair the contractor's ability to use this space, the contractor would not remove these trees. The contractor would relocate to the closest area with no trees along the same side of the levee.

The slides involve minor repairs which the Corps contractor would perform; and are considered to be repair and rehabilitation activities associated with previously authorized structures. The DLD would be responsible for acquiring all the necessary permits and rights-of-way to make repairs.

C. Non-structural Alternative: Section 73 of the WRDA of 1974 (PL93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage. Nonstructural measures reduce flood damages without significantly altering the nature or extent of flooding. Damage reduction from nonstructural measures is accomplished by changing the use made of the floodplains, or by accommodating existing uses to the flood hazard. Examples are flood proofing, relocation of structures, flood warning and preparedness systems, and regulation of floodplain uses. A flood warning system would do little to reduce structural and agricultural damages. Flood proofing or relocation is not desirable to the DLD, would have large costs, and result in loss of numerous acres of prime farmland. Therefore, the nonstructural alternative was eliminated from further consideration.

D. Comparison of Alternatives

Under the action alternative damaged levees and drains would be repaired to the pre-flood Federal standard. Table 1 contains a summarized comparison of the impacts between the Action and the No Action alternatives. This table is based on the supporting data in Sections 3 and 4 of this document.

Table 1 – Comparison of Project Alternatives		
Resources	Alternatives	
	No Action	Federal Repair
Physical Resources	Flooding may occur if slides are not repaired and the levee’s integrity is compromised during a flood. Estimated that protection is reduced to 10 year flood level with current damages.	Levees and gate repairs would meet the Federal standard. The area inside levees would be flooded only when flood stages exceed levee designs.
	Water turbidity may be temporarily increased if slides continue to erode during flood events.	Temporary minor impacts to water and air quality during construction.
	Does not meet project objective of repairs to Federal standard.	Meets project objective.
Biological Resources	Potential for beneficial impacts to fish and wildlife, if levee is compromised.	Construction would be confined to the levee and may result in minor temporary impacts.
	Federal T&E species would not be adversely impacted	There would be no tree clearing; therefore, proposed action should have no adverse affect on Federally listed species.
	Meets project objective of minimal environmental impacts.	Meets project objective.
Socioeconomic Resources	Potential negative impacts to cultural resources if levee fails and historic properties or significant sites flood.	Unlikely cultural impacts; however, a process is in place to address if encountered.
	Approximately 18,000 acres of a variety of land areas may be susceptible to future floods. Potential negative impacts to regional economy if levee fails due to slide and drain damages.	Final repair of levee would result in the protection of croplands and structures from floods up to the design (50 year frequency) of the levee system.
	Recreation would be curtailed during flood events if levee is compromised.	Recreation would be possible up to 50 year flood event.
	Does not meet project objective of protecting the socioeconomic value of the DLD.	Meets project of objective.

III. AFFECTED ENVIRONMENT

The Clear Creek DLD protects approximately 18,000 acres of prime agricultural land, residences, small businesses, outbuildings, agricultural lands and the villages of McClure and Reynoldsville. Soybeans and corn are the principle crops produced.

A. Physical Resources

The topography of the project site is low and located on the floodplain of the Mississippi. Because of the fertility of the soil and moisture, the lands are prized for their agricultural productivity. Levees have been constructed to the Federal standard to keep out flood waters up to a 50-year level flood and provide a reasonable amount of certainty of yearly crop production. Much of the area within the levee is considered prime farmland.

B. Biological Resources

a. Fish and Wildlife: Riparian zones adjacent to the Mississippi River support bottomland hardwood tree species such as cottonwood, ash, box elder, maples, sycamore, and oaks. This bottomland hardwood habitat and the adjacent aquatic habitats support a great variety of insects, crustaceans, mollusks, reptiles, amphibians, fish, birds, and mammals. Typical terrestrial species that use this habitat include turkey, white-tailed deer, beaver, raccoon, opossum, wood duck, and many songbirds. Aquatic species include catfish, crappie, freshwater drum, gar, shad, paddlefish, buffalo, carp, largemouth bass, other sunfish, and a variety of bivalves. The levees themselves are mowed grass areas that are managed to prevent shrub and tree growth and animals from making burrows. Federally listed species which may be found in the Clear Creek DLD project area include the gray bat, Indiana bat, pallid sturgeon, least tern and sheepsnose mussel.

b. Federal Threatened or Endangered Species: In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District Corps of Engineers requested the U.S. Fish and Wildlife Service (USFWS) provide a listing of Federally threatened or endangered species, currently classified or proposed for classification, that may occur in the vicinity of the Clear Creek DLD. The USFWS provided species lists for Alexander and Union Counties, Illinois as shown in Table 2:

<u>Classification</u>	<u>Common Name (Scientific Name)</u>	<u>Habitat</u>
Endangered	Gray bat (<i>Myotis grisescens</i>)	Caves; feeding-rivers/ reservoirs adjacent to forests
Endangered	Indiana bat (<i>Myotis sodalis</i>)	Caves, mines; small stream corridors with well developed riparian woods; upland and bottomland forests
Endangered	Least tern (<i>Sterna antillarum</i>)	Bare alluvial dredge spoil islands
Endangered	Pallid sturgeon (<i>Scaphirhynchus albus</i>)	Rivers
Candidate	Sheepsnose (<i>Plethobasus cyphus</i>)	Rivers

The **gray bat** (*Myotis grisecens*) is listed as endangered and occurs in several Illinois and Missouri counties where it inhabits caves both during summer and winter. This species forages

over rivers and reservoirs adjacent to forests. Caves may be located in the bluffs to the east of the DLD.

The endangered **Indiana bat** (*Myotis sodalis*) has been noted as occurring in several Illinois and Missouri counties. Indiana bats are considered to potentially occur in any area with forested habitat. Indiana bats migrate seasonally between winter hibernacula and summer roosting habitats. Winter hibernacula include caves and abandoned mines. Females emerge from hibernation in late March or early April to migrate to summer roosts. Females form nursery colonies under the loose bark of trees (dead or alive) and/or in cavities, where each female gives birth to a single young in June or early July. A maternity colony may include from one to 100 individuals. A single colony may utilize a number of roost trees during the summer, typically a primary roost tree and several alternates. Some males remain in the area near the winter hibernacula during the summer months, but others disperse throughout the range of the species and roost individually or in small numbers in the same types of trees as females. The species or size of tree does not appear to influence whether Indiana bats utilize a tree for roosting provided the appropriate bark structure is present. However, the use of a particular tree does appear to be influenced by weather conditions, such as temperature and precipitation.

During the summer, Indiana bats frequent the corridors of small streams with well-developed riparian woods, as well as mature bottomland and upland forests. They forage for insects along stream corridors, within the canopy of floodplain and upland forests, over clearings with early successional vegetation (old fields), along the borders of crop lands, along wooded fence rows, and over farm ponds and in pastures. It has been shown that the foraging range for the bats varies by season, age and sex and ranges up to 81 acres (33 ha). Suitable Indiana bat habitat maybe located within the DLD and in the forested areas to the east.

The Federal endangered **pallid sturgeon** (*Scaphirynchus albus*) is present in the Mississippi River adjacent to the project locations. Pallid sturgeons require large, turbid, free-flowing riverine habitat with rocky or sandy substrate (Federal Register 1989). Pallid sturgeon are adapted to large rivers with extensive micro-habitat diversity, turbid water, braided channels, irregular flows and flood cycles. Little is known of its micro-habitat preferences; however, it is suspected that sand/gravel bars and the mouths of major tributaries may be utilized for spawning. This species feeds on aquatic invertebrates and small fish.

The **least tern** (*Sterna antillarum*) is listed as endangered and occurs in several Illinois counties along the Mississippi and Ohio Rivers. It nests on bare alluvial or dredge spoil islands and sand/gravel bars in or adjacent to rivers, lakes, gravel pits and power plant cooling ponds. It nests in colonies with other least terns and sometimes with the piping plover. This species forages in shallow water areas along the river and in backwater areas, such as side channels and sloughs. Foraging habitat must be located in close proximity to nesting habitat.

The **sheepnose** (*Plethobasus cyphus*) is listed as a candidate species and occurs in rivers. This species inhabits gravel or mixed sand and gravel habitats in medium to large rivers.

C. Socioeconomic Description

Economic: The main occupation in the DLD is farming. The DLD includes a railroad and road, utility infrastructure and businesses. No schools are located within the DLD. Levees are of regional economic importance to maintain the agricultural productivity occurring in the floodplain. Other than farming and the railroad, no other businesses are located in the DLD.

Recreation: The Union County State Conservation Area is located in this area and some recreation occurs in this area. No recreational facilities are located in the proposed repair or staging areas of the DLD.

Cultural: The project repair sites and staging areas are composed of recently deposited material and are not expected to include any culturally significant materials.

IV. ENVIRONMENTAL IMPACTS OF PROPOSED ALTERNATIVES

A. No Federal Action Alternative:

1. **Physical Resources:** If the Clear Creek DLD levees were not repaired to the Federal standard there would be an increased flood risk and more physical damages would occur within the DLD such as erosion, sedimentation and hazardous pollutants associated with agriculture. Air quality and noise pollution would not be affected by this alternative.

2. **Biological Resources:** Due to the possibility of more frequent flooding of the DLD under this alternative, some vegetation would be destroyed and some wildlife would be more frequently displaced. There would also be some beneficial impacts if agriculture use diminished and a more diverse environment developed especially for aquatic oriented wildlife.

3. Socioeconomic Description:

a. **Cultural Resources:** Erosion of the levee would expose any cultural material, and any material exposed by flooding in the DLD could potentially be adversely impacted.

b. **Recreational Resources:** Recreational resources would experience greater flood risk and reduced availability.

c. The flood protection is reduced under this alternative to the 10-year protection level. A more frequent flood interval (every 10 years) would greatly diminish agriculture with negative regional economic impacts.

B. Preferred Alternative: Federal Assist with Levee Repairs

1. Physical Resources

a. **Air Quality:** Construction activities could cause a slight increase in suspended particulates (i.e., dust). Emissions from construction equipment would increase the carbon monoxide and carbon dioxide levels in the vicinity of the construction site. The expected increases would be very negligible relative to local agricultural activities and cease after construction.

b. Water Quality: Construction activities would only occur on the mowed grass levee berms and are not expected to adversely impact the water quality of the adjacent Mississippi River. Levee repairs could cause a short-term increase in suspended solids in waterways at the immediate construction site if flooding or heavy rains occurred during construction. All disturbed areas would be reseeded following construction to reduce the potential for erosion.

c. Noise: Construction activities would cause an increase in local noise levels. The expected increase would be short-term and negligible relative to normal agricultural activities.

d. Prime Farmland: All construction activities would occur on the levees, no prime farmland would be impacted.

2. Biological Resources

a. Fish and Wildlife: If heavy rain occurs during construction washing soil into the rivers, there would be a short-term increase in turbidity in the immediate area, temporarily displacing fish and other mobile organisms. Following construction, aquatic species would be expected to return. Only limited impacts to fish and wildlife resources are expected.

b. Wetlands/404 Permit Requirements: No wetlands would be impacted by the project.

c. Federal Threatened or Endangered Species: Federally listed species which may be found in the Clear Creek DLD project area include the gray bat, Indiana bat, pallid sturgeon, least tern and sheepsnose mussel.

There is no designated critical habitat in the project area at this time.

The **gray bat** is listed as endangered and occurs in several Illinois and Missouri counties where it inhabits caves both during summer and winter. No cave areas would be impacted; therefore, no adverse impacts to this species are expected.

The endangered **Indiana bat** has been noted as occurring in several Illinois and Missouri counties. The repair would take place within the footprint of the existing levee and no suitable Indiana bat trees would be impacted. In addition, because construction would occur in the fall, the proposed project is not likely to adversely affect the Indiana bat.

The Federal endangered **pallid sturgeon**, the **least tern**, and the **sheepsnose** are associated with the habitats of medium to large rivers. No habitat appropriate for these species is located in the vicinity of the proposed repair areas.

3. Socioeconomic Description

a. Economic Resources: Local agricultural and agri-businesses would benefit from levee repair and subsequent flood protection. The proposed initial levee repairs would not require residential displacement. No impacts to life, health, or safety would result from levee repair. There would be a temporary increase in noise levels associated with construction of levee repairs.

b. Recreation Resources: Recreation, such as hunting and fishing, occur at the Union County State Conservation Area, but no adverse impacts are anticipated on the recreational resources within the Clear Creek DLD. Continued access to the Conservation Area would be maintained by the project.

c. Cultural Resources: It is very unlikely that adverse impacts to cultural resources would occur. The project area is recently deposited material that is regularly maintained. However, in the unlikely event that potentially significant archeological/historic remains are discovered during construction activities, all earthmoving actions in the immediate vicinity of the remains would be held in abeyance until the potential significance of the remains is determined. The precise nature of such investigations would be developed by the SLD in concert with the State Historic Preservation Officer's representatives in the Illinois Historic Preservation Agency.

V. CUMULATIVE IMPACTS

Although system-wide repairs to levees are currently underway, final repairs would involve repairs within the footprint of the levee. Projects that would require borrow may impact more habitat, but it is likely that most of it would be agricultural land. Projects that are infeasible to repair on the original alignment (Vandalia) would be realigned with a new levee, again on farm ground. Some acreage at Vandalia would be removed from agricultural use causing a minor loss to overall farm production. However overall, no adverse cumulative impacts from these levee repair projects are expected.

VI. COORDINATION WITH OTHER STATE AND FEDERAL AGENCIES

The proposed initial repairs will be coordinated with respective State and Federal agencies:

U.S. Fish and Wildlife Service	U.S. Environmental Protection Agency
Federal Emergency Management Agency	Illinois State Historic Preservation Agency
Illinois Department of Natural Resources	

To assure compliance with the National Environmental Policy Act, Endangered Species Act and other applicable environmental laws and regulations, coordination with these agencies will continue as required throughout the planning and construction phases of the proposed levee repairs.

VII. RELATIONSHIP OF RECOMMENDED PLAN TO ENVIRONMENTAL REQUIREMENTS

Table 3 - RELATIONSHIP OF RECOMMENDED PLAN TO ENVIRONMENTAL REQUIREMENTS	Compliance
Bald Eagle Protection Act, 42 USC 4151-4157	Full
VIII.	
Clean Air Act, 42 USC 7401-7542	Full
Clean Water Act, 33 USC 1251-1375	Full
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	Full
Endangered Species Act, 16 USC 1531-1543	Full
Farmland Protection Policy Act, 7 USC 4201-4208	Not applicable
Fish and Wildlife Coordination Act, 16 USC 661-666c	Full
Food Security Act of 1985, 7 USC varies	Full
Land and Water Conservation Fund Act, 16 USC 460d-4601	Full
National Environmental Policy Act, 42 USC 4321- 4347	Partial ¹
National Historic Preservation Act, 16 USC 470 <i>et seq.</i>	Partial ²
Noise Pollution and Abatement Act, 42 USC 7691-7642	Full
Resource, Conservation, and Rehabilitation Act, 42 USC 6901-6987	Full
Rivers and Harbors Appropriation Act, 33 USC 401-413	Full
Water Resources Development Acts of 1986 and 1990	Full
Floodplain Management (EO 11988 as amended by EO 12148)	Full
Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities (EO 11282 as amended by EO's 11288 and 11507)	Full
Protection and Enhancement of Environmental Quality (EO 11991)	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Protection of Wetlands (EO 11990 as amended by EO 12608)	Full

Full compliance: having met all requirements of the statute for the current stage of planning

Not applicable: compliance with the statute not required

1 Full compliance to be achieved with the District Engineer's signing of the Finding of No Significant Impact

2 Full compliance to be achieved with the State Historic Preservation Officer's concurrence in the District's EA conclusions.

Source: U.S. Army Corps of Engineers, St. Louis District.

Environmental Regulatory Constraints

The Preferred Alternative was subject to compliance review with all applicable environmental regulations and guidelines. The Preferred Alternative was determined to be in full compliance with all applicable acts and legislation (Table 3).

According to EO 11988, The St. Louis District, Corps of Engineers has evaluated the levee repairs at the slides which occurred in the Clear Creek DLD during the spring flood of 2008. Based on the extent of property damage (roads, crops, and utilities) that currently exists, it is prudent to restore the levee by utilizing existing agricultural lands for improvements to afford a level of flood protection that existed prior to the flood event. By reducing the future risk of flood loss, minimizing the impacts on existing vegetation in the floodplain, and minimizing structural development in the floodplain, this proposed project is in full compliance with this Executive Order.

No environmental justice issues exist for any of the alternatives. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Federal Register 7629 (1994), directs federal agencies to incorporate environmental justice in their decision making process. Federal agencies are directed to identify and address as appropriate, any disproportionately high and adverse environmental effects of their programs, policies, and activities on minority or low-income populations. No minority or low-income populations would be displaced or negatively affected in any way by the alternatives.

The St. Louis District, Corps of Engineers has evaluated the levee repairs at the levee slides which occurred in the Clear Creek DLD during the spring flooding of 2008. The proposed project involves the repair of the slide areas according to Attachment 3. The proposed levee repairs are in full compliance with Executive Order 11990 by not requiring impacts to any wetlands.

VIII. LIST OF PREPARERS

Mr. Bruce Douglas, Civil Engineer	Role: Project Manager
Mr. Chuck Frerker, Regulatory Specialist	Role: Regulatory Permits
Dr. Terry Norris, District Archaeologist	Role: Archeological Compliance
Mr. Francis Walton, Biologist	Role: Environmental Assessment

IX. REFERENCES

U.S. Fish and Wildlife Service. Official Correspondence 25 June 2008.

ATTACHMENT 1



Slide #71- Crack in Crown



Slide #73



Slide # 74



Slide # 74



Slide # 75



Slide # 75

Gravity Drains



WP #162



**WP #162- 4" depression over pipe
(entire area soft and low)**



WP #166 - Broken gate and stem

ATTACHMENT 2

Clear Creek Slides

Start	End	Slide Number	Length (ft)	Depth (in)		
2527180	248001	2526940	247757	70	345	20
2526714	247518	2526714	247518	71	265	54
2526461	247115	2526423	247024	72	96	30
2526384	246969	2526303	246799	73	539	48
2524002	243296	2523949	243204	74	114	48
2523710	242796	2523643	242668	75	142	60

Total Linear Feet 1501

ATTACHMENT 3

Lime Stabilization Process for Slide Repair

Identify slide area and remove 8" of topsoil. This material will not get treated with hydrated lime. Stockpile this topsoil.

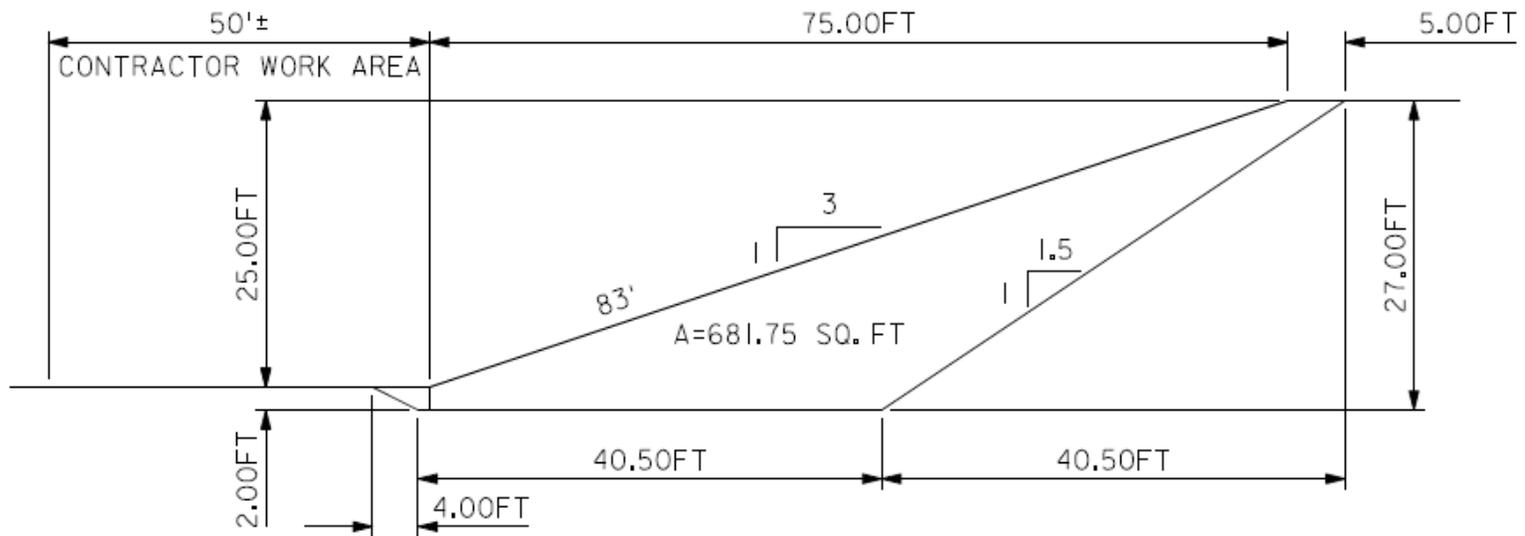
Dig an inspection trench to determine failure surface at each slide. Each slide will be excavated to a depth beyond the failure surface. Excavation will start at the top and proceed to the bottom of the slide.

Place excavated material in stockpiles within the right-of-way on berm. Material will be placed and spread in 10" lifts in the stockpile. Each lift shall receive the initial (first of two) lime treatments. Hydrated lime shall be applied to achieve 16 pounds per square yard over the entire stockpile for each lift. The lime shall be mixed with a pulverizer thoroughly to a depth of 10". The pulverizer shall be equipped with rotor and cutting teeth designed to blend additives with cohesive soils. It shall be capable of mixing to a minimum depth of 16" and have a minimum cutting speed of 170 rpm. The top layer in the stockpile shall "cure" for a minimum of 24 hours before receiving the final (second of two) lime treatments.

Prepare the bottom of the slide area with the same 16 pounds per square yard of hydrated lime and mix with foundation soils to a depth of 10". Compact this layer in place.

After the final lime treatment, remove the soil from the stockpile in 10" lifts and place and compact the material within 8 hours of treatment. The treated embankment material shall be placed and spread in lifts that are 6" thick after compaction. The material will be compacted to 95% of max dry density.

ATTACHMENT 4

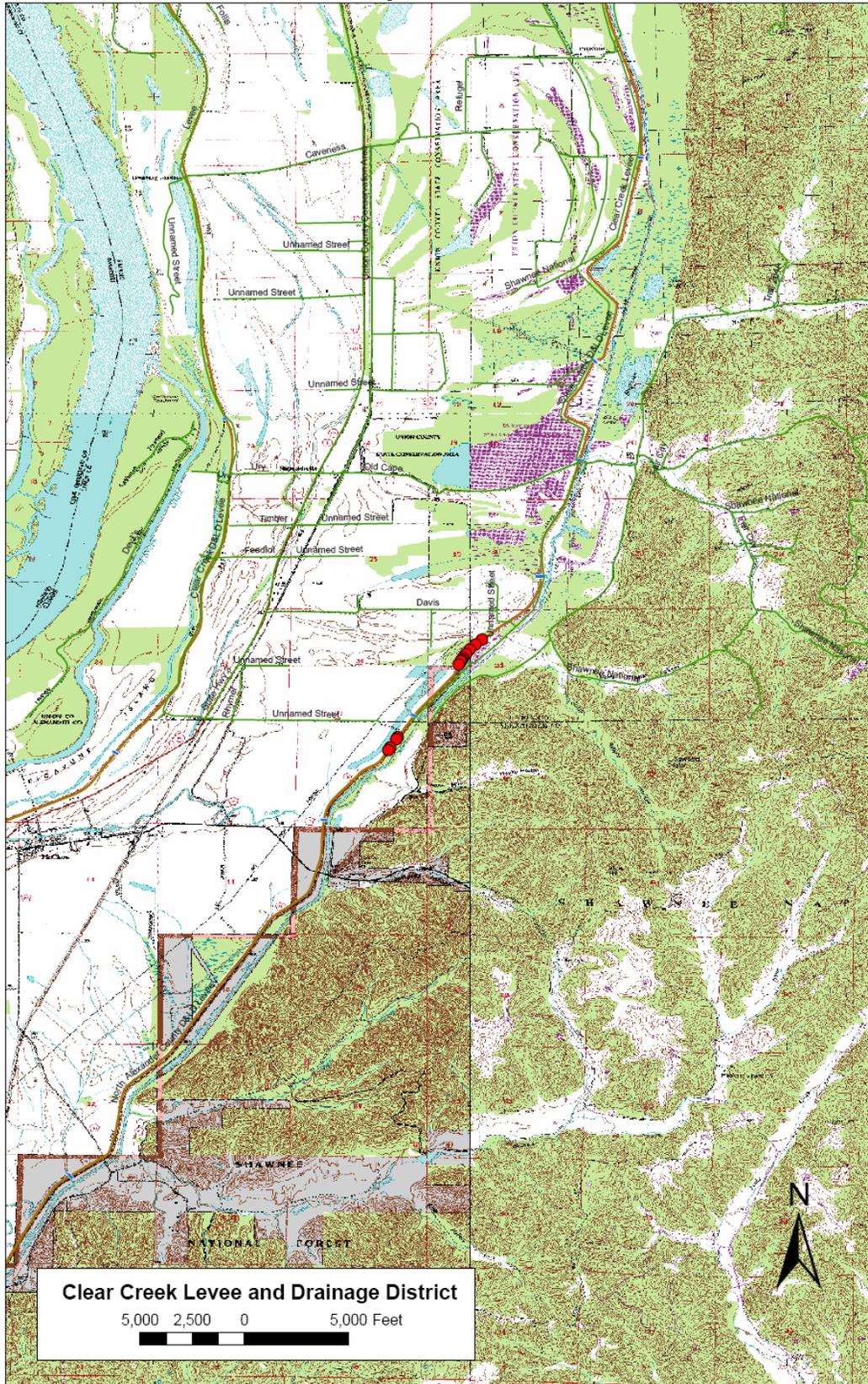


TYPICAL SECTION

NO SCALE

TYPICAL SETBACK
SCOUR REPAIR

Attachment 5 – Slides indicated by red dots.



Attachment 5a - Slides



DRAFT FINDING OF NO SIGNIFICANT IMPACT

LEVEE REPAIR (PL 84-99) CLEAR CREEK DRAINAGE AND LEVEE DISTRICT ALEXANDER AND UNION COUNTIES, ILLINOIS

1. I have reviewed and evaluated the documents concerning the proposed repair of six slide areas and two gravity drains in the Clear Creek Drainage and Levee District, Alexander and Union Counties, Illinois. The damaged areas reduce the ability of the system to provide the authorized level of flood protection. The St. Louis District proposes work that involves excavation of the slide area to 1 – 2 feet deeper than the failure surface. Excavated material would then be mixed with hydrated lime (approximately 6% by dry weight) on the levee berm. The material would then be placed back in the levee section and compacted in place. All work would be performed within the footprint of the existing levee and the levee restored to pre-flood levee grades, cross sections, and alignments. The repair for the gravity drain is to slip line the pipe with HDPE (High Density Polyethylene Pipe) and fill the annular space with grout.

2. I have also evaluated other pertinent data and information on these repairs. As part of this evaluation, I have considered the following project alternatives.

- a. Providing Federal assistance with repairs to the levee system (Recommended Alternative).
- b. No Action
- c. The Non-Structural Alternative

3. The nonstructural alternative was eliminated during preliminary planning because it is not desirable to the sponsor, would have large costs, and result in loss of numerous acres of prime farmland. The possible consequences of the remaining two alternatives have been studied for physical, biological, and socioeconomic effects, as well as engineering feasibility. Significant factors evaluated as part of my review include:

a. If no repairs are accomplished, the levee system could deteriorate to the point that protection would be jeopardized during the next significant flood event. The Clear Creek Levee would remain in its damaged state and provide an estimated 10 year level of protection instead of the 50 year level it was designed to provide. This reduced level of protection would increase flood risk and threaten the livelihood of local landowners.

b. Repair activities would cause temporary erosion, noise, and air pollution. Proper construction and soil management techniques would minimize this effect. Upon completion, all construction equipment would be removed and exposed areas would be stabilized by compaction and seeding. Impacts would be short term and minor.

c. Levee vegetation would be lost and wildlife disturbed during repair. These impacts would be both minimal and temporary. Seeding would restore vegetation and wildlife disturbance would end after construction completion.

d. No Federally endangered, threatened, or candidate species would be adversely impacted by the levee repairs.

e. The aesthetic and recreational quality of the area would be temporarily reduced by construction equipment and associated noise. Shortly after construction completion, aesthetic and recreational quality would return to pre-flood conditions.

f. Construction/repair activities associated with this project would have no effect upon significant archaeological remains or historic properties. As presently designed, earthmoving would be confined to areas previously disturbed during original levee construction.

g. No adverse socioeconomic impacts from the proposed levee repairs were identified.

h. The repair work would not require the permanent placement of additional fill material below ordinary high water. As such, the public would not be notified of the action by Public Notice under Section 404 or 401 of the Clean Water Act.

4. Based on my analysis and evaluation of the alternative courses of action presented in the Environmental Assessment, I have determined that the implementation of the recommended plan would not have significant effects on the quality of the environment. Therefore, an Environmental Impact Statement would not be prepared prior to proceeding with this action.

Date

Thomas E. O'Hara, Jr.
Colonel, U.S. Army
District Engineer