US Army Corps
of Engineers
Louisville District

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE
INDIANAPOLIS NORTH
FLOOD DAMAGE REDUCTION PROJECT,
INDIANAPOLIS, INDIANA

Prepared by
U.S. Army Corps of Engineers
Louisville District

JUNE 2013

Final Supplemental Environmental Impact Statement for the Indianapolis North Flood Damage Reduction Project in Indianapolis, Indiana

U.S. Army Corps of Engineers, Louisville District

Abstract: The United States (US) Army Corps of Engineers, Louisville District (Corps) has completed a Final Supplemental Environmental Impact Statement (FSEIS) for the Phase 3B/South Warfleigh Section, also known as the Phase 3B Alignment, of the Indianapolis North Flood Damage Reduction Project in Indianapolis, Indiana. This study presents the various alternatives being proposed by the Corps to complete the Phase 3B Alignment. Additional tree and vegetation clearing to the riverside of the Phases 3A/Warfleigh and 3C/Monon-Broad Ripple Sections of the project are also provided in this document.

The Corps examined three alternatives to complete the Phase 3B Alignment: the Rocky Ripple Alternative, the 56th Street Alternative, and the Westfield Boulevard Alternative. Additionally, two engineering variations of the Westfield Boulevard Alternative (the Canal Gated Structure Relocation and the Full Height Removable Wall) and one engineering variation of the 56th Street Alternative (Illinois Street) were examined. As a result of public input from the Draft Supplemental Environmental Impact Statement (DSEIS), and in cooperation with the local sponsor, the City of Indianapolis, the Corps is recommending two Proposed Actions for the Phase 3B Alignment: the Westfield Boulevard Alternative and the 56th Street Alternative-Illinois Street variation. They are described herein.

A tree clearing variance was considered for the Phase 3A/Warfleigh and 3C/Monon-Broad Ripple Sections of the project to a distance measuring approximately 20 ft from levee crown to the toe of the levee. However, the Proposed Action for the vegetation clearing on Phases 3A and 3C is an additional 15 ft riverward and landward from toe of the earthen levee, for a total distance measuring approximately 35 to 40 ft from the levee crown, and 15 ft riverward and landward from the floodwall. The DSEIS also discussed mitigation needs for project's impacts, which have been updated in the FSEIS.

Public Comment: The public is invited to review and provide comments on the contents of the FSEIS. The FSEIS may be viewed at Indianapolis Public Library, Central Library, 40 E. St. Clair St., or downloaded at http://bit.ly/indynorth. Comments and questions on the FSEIS by mail and/or email should be directed to:

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The period for public comment on the FSEIS will end with the close of business on **the 30th day following its publication in the Federal Register**.

Table of Contents

1.0 SUMMARY 1
2.0 PURPOSE AND NEED FOR ACTION 8
3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTIONS 9
3.1 Phase 3B Alternatives 9
3.1.1 No Action 11
3.1.2 Rocky Ripple Alternative 11
3.1.3 56th Street Alternative 15
3.1.3.1 Illinois Street Variation (Proposed Action) 18
3.1.4 Westfield Boulevard Alternative (Proposed Action) 22
3.1.4.1 Canal Gated Structure Relocation Variation 28
3.1.4.2. Full Height Removable Wall Variation 28
3.2 Phase 3A and 3C Vegetation Clearing Alternatives 30
3.2.1 No Action 30
3.2.2 20 Feet Vegetation Variance 30
3.2.3 15 Feet Vegetation Clearing (Proposed Action) 32
4.0 ENVIRONMENTAL MITIGATION 34
5.0 AFFECTED ENVIRONMENT 36
5.1 Physiography, Topography, Geology, Soils, and Climate 36
5.2 Floodplains 36
5.3 Water Quality 39
5.4 Aquatic Resources 40
5.4.1 Fish 40
5.4.2 Benthic Invertebrates 41
5.5 Wetlands 41
5.6 Terrestrial Resources 41
5.7 Threatened and Endangered Species 42
5.8 Recreation 43
5.9 Cultural Resources 43
5.10 Hazardous, Toxic, and Radiological Waste 45
5.11 Socioeconomic 46
5.12 Land-use/Aesthetics 47
5.13 Transportation 47
5.14 Air Quality 47
6.0 ENVIRONMENTAL CONSEQUENCES 48
6.1 Physiography, Topography, Geology, Soil Types, and Climate 48
6.1.1 No Action (Phase 3B Alignment) 48
6.1.2 Rocky Ripple Alternative 48
6.1.3 56th Street Alternative – including Variation (Proposed Action) 48
6.1.4 Westfield Boulevard Alternative - Including Variations (Proposed Action) 49
6.1.5 No Action (Phase 3A and 3C Vegetation Clearing) 49
6.1.6 Vegetation Variance 20 Feet from Levee Crown 49
6.1.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) 49
6.2 Floodplains 49
6.3 Water Quality 50

6.3.1 No Action (Phase 3B Alignment) 50
6.3.2 Rocky Ripple Alternative 50
6.3.3 56th Street Alternative – Including Variation (Proposed Action) 51
6.3.4 Westfield Boulevard Alternative – Including Variations (Proposed Action) 51
6.3.5 No Action (Phase 3A and 3C Vegetation Clearing) 52
6.3.6 Vegetation Variance 20 Feet from Levee Crown 52
6.3.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) 52
6.4 Aquatic Resources 52
6.4.1 No Action (Phase 3B Alignment) 52
6.4.2 Rocky Ripple Alternative 52
6.4.3 56th Street Alternative – Including Variation (Proposed Action) 53
6.4.4 Westfield Boulevard Alternative – Including Variations (Proposed Action) 53
6.4.5 No Action (Phase 3A and 3C Vegetation Clearing) 54
6.4.6 Vegetation Variance 20 Feet from Levee Crown 54
6.4.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) 54
6.5 Wetlands 55
6.6 Terrestrial Resources 55
6.6.1 No Action (Phase 3B Alignment) 55
6.6.2 Rocky Ripple Alternative 55
6.6.3 56th Street Alternative– Including Variation (Proposed Action) 56
6.6.4 Westfield Boulevard Alternative– Including Variations (Proposed Action) 56
6.6.5 No Action (Phase 3A and 3C Vegetation Clearing) 57
6.6.6 Vegetation Variance 20 feet from Levee Crown 57
6.6.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) 57
6.7 Threatened and Endangered Species 57
6.7.1 No Action (Phase 3B Alignment) 57
6.7.2 Rocky Ripple Alternative 58
6.7.3 56th Street Alternative – Including Variation (Proposed Action) 58
6.7.4 Westfield Boulevard Alternative – Including Variations (Proposed Action) 59
6.7.5 No Action (Phase 3A and 3C Vegetation Clearing) 59
6.7.6 Vegetation Variance 20 Feet from Levee Crown 59
6.7.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) 60
6. 8 Recreation 60
6.8.1 No Action (Phase 3B Alignment) 60
6.8.2 Rocky Ripple Alternative 60
6.8.3 56th Street Alternative-Including Variation (Proposed Action) 60
6.8.4 Westfield Boulevard Alternative – Including Variations (Proposed Action) 61
6.8.5 No Action (Phase 3A and 3C Vegetation Clearing) 61
6.8.6 Vegetation Variance 20 Feet from Levee Crown 61
6.8.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) 61
6.9 Cultural Resources 62
6.9.1 No Action (Phase 3B Alignment) 62

6.9.2 Rocky Ripple Alternative ... 62
6.9.3 56th Street Alternative – Including Variation (Proposed Action) ... 63
6.9.4 Westfield Boulevard Alternative – Including Variations (Proposed Action) ... 63
6.9.5 No Action (Phase 3A and 3C Vegetation Clearing) ... 64
6.9.6 Vegetation Variance 20 Feet from Levee Crown ... 64
6.9.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) ... 65
6.10 Hazardous, Toxic, and Radiological Waste ... 65
6.11 Socioeconomic ... 65
6.11.1 No Action (Phase 3B Alignment) ... 65
6.11.2 Rocky Ripple Alternative ... 65
6.11.3 56th Street Alternative – Including Variation (Proposed Action) ... 66
6.11.4 Westfield Boulevard Alternative – Including Variations (Proposed Actions) ... 66
6.11.5 No Action (Phase 3A and 3C Vegetation Clearing) ... 67
6.11.6 Vegetation Variance 20 Feet from Levee Crown ... 67
6.11.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) ... 67
6.12 Land-use/Aesthetics ... 67
6.12.1 No Action (Phase 3B Alignment) ... 67
6.12.2 Rocky Ripple Alternative ... 68
6.12.3 56th Street Alternative – Including Variation (Proposed Action) ... 68
6.12.4 Westfield Boulevard Alternatives – Including Variations (Proposed Action) ... 68
6.12.5 No Action (Phase 3A and 3C Vegetation Clearing) ... 68
6.12.6 Vegetation Variance 20 Feet from Levee Crown ... 69
6.12.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) ... 69
6.13 Transportation ... 69
6.13.1 No Action (Phase 3B Alignment) ... 69
6.13.2 Rocky Ripple Alternative ... 69
6.13.3 56th Street Alternative– Including Variation (Proposed Action) ... 69
6.13.4 Westfield Boulevard Alternative – Including Variations (Proposed Action) ... 69
6.13.5 No Action (Phase 3A and 3C Vegetation Clearing) ... 70
6.13.6 Vegetation Variance 20 Feet from Levee Crown ... 70
6.13.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) ... 70
6.14 Air Quality ... 70
6.14.1 No Action (Phase 3B Alignment) ... 70
6.14.2 Rocky Ripple Alternative ... 70
6.14.3 56th Street Alternative – Including Variation (Proposed Action) ... 70
6.14.4 Westfield Boulevard Alternative – Including Variations (Proposed Action) ... 71
6.14.5 No Action (Phase 3A and 3C Vegetation Clearing) ... 71
6.14.6 Vegetation Variance 20 Feet from Levee Crown ... 71
6.14.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action) ... 71
7.0 CUMULATIVE IMPACTS ... 72
7.1 Past and Present Actions ... 72
7.2 Reasonably Foreseeable Future Actions ... 73

7.3 Cumulative Effects on Resources 74
7.3.1 Flooding 74
7.3.2 Land Use Changes 74
7.3.3 Terrestrial Resources 74
7.3.4 Aquatic Resources and Water Quality 75
7.3.5 Recreation 75
7.3.6 Cultural Resources 75
7.3.7 Socioeconomics 75
7.3.8 Summary 76
8.0 MITIGATION 76
9.0 AGENCY COORDINATION AND ENVIRONMENTAL COMPLIANCE 77
9.1 Clean Water Act 77
9.1.1 Section 404 77
9.1.2 Section 401 Water Quality Certification 78
9.1.3 National Pollutant Discharge Elimination System (NPDES) 78
9.2 Floodplain Management 78
9.3 Fish and Wildlife Coordination Act 78
9.4 Endangered Species Act 78
9.5 National Historic Preservation Act 79
9.6 Environmental Justice 79
9.7 Clean Air Act 80
9.8 Other State Approvals 80
9.9 Summary 80
10.0 REFERENCES 82
11.0 LIST OF PREPARERS 85
12.0 INDEX 86
Appendix A: Vegetation Clearing 88
Indy 3A 89
Indy 3B 98
Indy 3C 102
Appendix B: Project Best Management Practices 108
Appendix C: 404 (B) (1) Alternatives Analysis 111
Appendix D: DSEIS Public Hearing Transcripts, 23 August 2012 116
Appendix E: DSEIS Report Comments 231

LIST OF TABLES

Table 1 Concept Level Costs Estimates 9
Table 2 Total Acreage of Forest Impacted by the Indianapolis North Flood Damage Reduction Project. 35
Table 3 State Water Quality Data for Citizens Water Canal 1991-2008 40
Table 4 Population Data for the Project Area 46
Table 5 Economic Data for the Project Area 47
Table 6 Federal Act/Executive Order Compliance 80

LIST OF FIGURES

Figure 1. The 1946 Authorized Project for the Indianapolis North Flood Damage Reduction Study..... 2
Figure 2. General Location of the Authorized Project for the Indianapolis North Flood Damage Reduction Study..... 3
Figure 3 Phases of the Indianapolis North Flood Damage Reduction Project..... 5
Figure 4 Friedman Park and the Phase 3B Levee Alignment..... 6
Figure 5 All Alternatives and Engineering Variations for the Phase 3B Alignment..... 10
Figure 6 The Rocky Ripple Alternative..... 13
Figure 7 The Rocky Ripple Levee and White River..... 15
Figure 8 The 56th Street Alternative..... 16
Figure 9 Location of the Canal Gate Structure for the 56th Street Alternative..... 17
Figure 10 Location of the 56th Street Alternative east of the Citizens Water Canal..... 17
Figure 11 The 56th Street Alternative-Illinois Street Variation..... 19
Figure 12 Path of the Illinois Street Variation near White River and Riviera Club..... 21
Figure 13 Location of Canal Gate Structure for Illinois Street Variation..... 21
Figure 14 The Westfield Boulevard Alternative..... 23
Figure 15 Location of the south end of Westfield Boulevard Alternative at Butler University 24
Figure 16 Location of the Westfield Boulevard Alternative, view to northeast..... 24
Figure 17 Rendering of the Canal Gate Structure for the Westfield Boulevard Alternative.. 25
Figure 18 Rendering of the Westfield Boulevard Alternative Canal Gate Structure without Removable Wall..... 27
Figure 19 Rendering of the Westfield Boulevard Alternative Canal Gate Structure with Removable Wall..... 27
Figure 20 The Westfield Boulevard Alternative - Canal Gated Structure Relocation Variation..... 29
Figure 21 Levee and I-wall along the Phase 3A/South Warfleigh Section..... 31
Figure 22 Levee, Minimum Vegetation Free Zone..... 33
Figure 23 I-Wall, Minimum Vegetation Free Zone..... 34
Figure 24 Eco-Regions of Indiana..... 37
Figure 25 The West Fork of White River..... 38
Figure 26. The Citizens Water Canal (a. k. a. Indianapolis Central Canal)..... 45

FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE INDIANAPOLIS NORTH FLOOD DAMAGE REDUCTION PROJECT IN INDIANAPOLIS, INDIANA

1.0 SUMMARY

The US Army Corps of Engineers, Louisville District (Corps), was authorized by the Flood Control Act (FCA) of 1936, as amended by the FCA of 1946, to construct a flood protection project in the Warfleigh area of Indianapolis, Indiana, as part of the "plan of improvement for flood control in the Wabash River Basin, Illinois and Indiana, substantially in accordance with the recommendations of the Chief of Engineers in his report dated April 9, 1946….". **Figure 1** shows the limits of the authorized project as defined in that report. The project is located along the west bank of the Wabash River, beginning at high ground just upstream of the Broad Ripple intake structure of the Citizens Water Canal (also known as the Indianapolis Central Canal) and terminating on the downstream end at high ground at Michigan Road. **Figure 2** is a more current map of the general project area. Implementation was delayed for several years, until interest in the project revived in the early 1990's. At the time, the Corps conducted a General Reevaluation study to verify that the project still met Federal interest criteria for implementation. In September of 1996 the study results were documented in a General Reevaluation Report (GRR) and Final Environmental Impact Statement (EIS) entitled Indianapolis North Flood Damage Reduction Feasibility Study. A Record of Decision (ROD) on the project was subsequently signed on 8 September 1997. A Project Cooperation Agreement was executed between the City of Indianapolis, the cost sharing sponsor, and Department of the Army on 7 December 2000.

The Indianapolis North Flood Damage Reduction Study examined environmental resources within the project and its impacts to those resources. It also evaluated the feasibility of constructing flood damage reduction measures along seven different stream reaches of the White River. They included Rocky Ripple, South Warfleigh, Warfleigh, Monon-Broad Ripple, Ravenswood, RWR-10, and 79th and Haverstick. Environmental mitigation for the project was proposed at two locations. The first was located along the west bank of the White River in downtown Indianapolis and the second was at Lake Sullivan.

Through the study process it was determined that flood damage reduction measures were not feasible for the Ravenswood, RWR-10, and 79th and Haverstick reaches. In addition, the Town of Rocky Ripple, Indiana did not support the design and scope of the proposed flood protection around their community because of its impacts to local real estate and the environment; and thus they withdrew from the project. As a result, the study recommended, and ultimately approved for implementation, a plan to construct a combination of earthen levees and floodwalls to protect the communities of Monon-Broad Ripple, Warfleigh and South

Figure 1. The 1946 Authorized Project for the Indianapolis North Flood Damage Reduction Study.

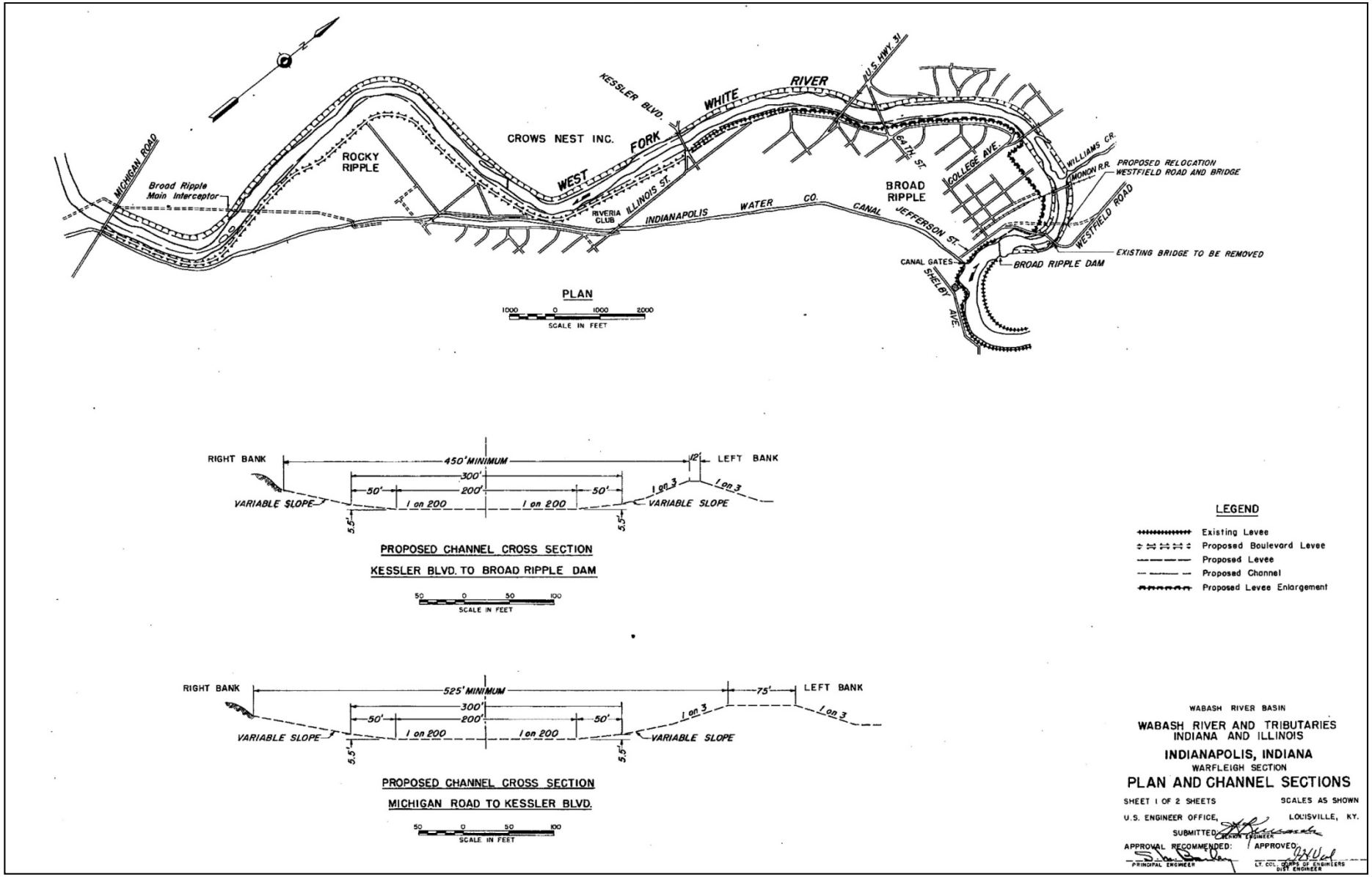


Figure 2. General Location of the Authorized Project for the Indianapolis North Flood Damage Reduction Study.

Warfleigh. Implementation of these changes from the original project authorization was within the discretionary authority of the Corps and did not require additional action on the part of Congress.

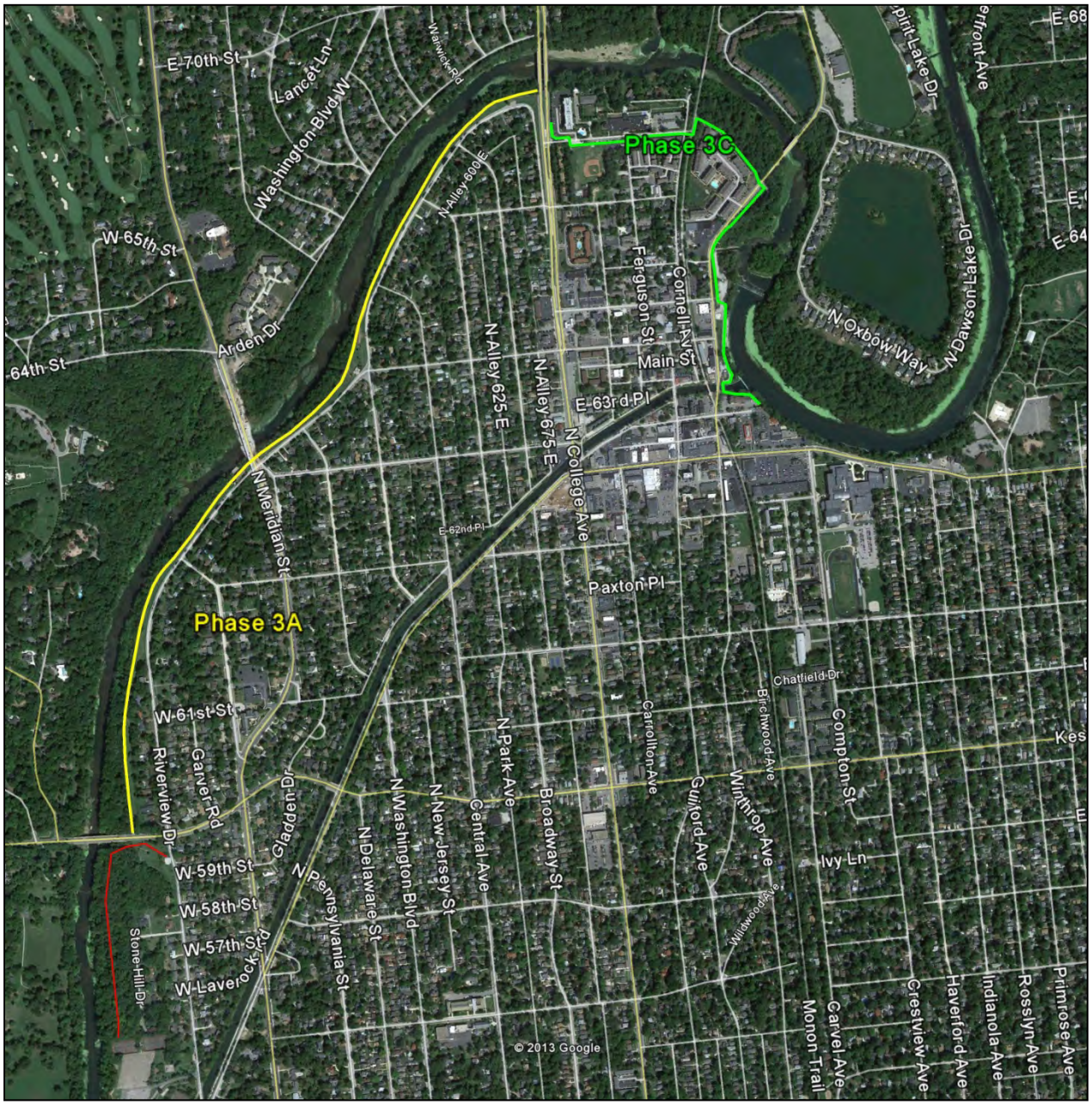
The recommended plan in the 1996 GRR and EIS included construction of 2,315 linear feet (LF) (0.44 miles) of levee and 13,172 LF (2.5 miles) of floodwall, and would provide protection to approximately 1,500 properties, 83% of which are residential, along a four mile stretch of the White River. When completed, the project would provide a minimum level of flood protection to an annual 0.35 percent chance of exceedance (300-year level of flood protection). The plan included approximately 29 acres of reforestation and/or wetland plantings to mitigate for ten acres of impacts to the environment due to the project's construction. The recommended plan also called for acquisition of hardware, software, and precipitation gauges for the City's Flood Warning Preparedness Plan.

The entire project was subsequently divided into three sections or phases (Phase 3A, 3B & 3C) due to funding constraints and real estate acquisition concerns (**Figure 3**). Phase 3A, the Warfleigh Section, consisted of 7,600 LF of modified sheet pile I-wall or floodwall and 500 LF of earthen levee on the existing Warfleigh levee. This phase was constructed between September 2002 and July 2004. Phase 3C, the Monon-Broad Ripple Section, included construction of approximately 4200 LF of floodwall and 700 LF of earthen levee from N. College Avenue to high ground just upstream of the Broad Ripple intake structure of the Citizens Water Canal. The Broad Ripple portion of this phase extended approximately 1,700 ft from College Avenue, along the south side of 67th Street, to the existing Monon East Levee. The Monon portion of this phase extended approximately 700 LF across the existing levee and tied into the road embankment of Westfield Boulevard. From the southeast side of Westfield Boulevard, the project then paralleled Westfield Boulevard and White River for a distance of approximately 2500 LF to high ground. This phase was completed in 2009. Phase 3B, known as the South Warfleigh Section, involved construction of floodwall and earthen levee, along the east bank of the White River, from Kessler Boulevard to termination on high ground at the downstream end of the project. However, the specific point of termination for the project was never defined in the 1996 GRR and EIS.

The Phase 3B/South Warfleigh Section, as defined in the 1996 GRR and EIS and ultimately adopted under the ROD, extended from Kessler Boulevard and Friedman Park through private property belonging to "the Riviera Club" (**Figure 4**). From herein referred to in this report as the "Phase 3B Levee Alignment," this section involved the construction of an earthen levee across its length and ended at Citizens Water Canal. However, the downstream end of the project needed to be extended beyond the southern limits of the Riviera Club property, because the termination point was at a lower ground elevation than what was required for a 300-year level of flood protection.

The Corps examined different courses to provide for a 300-year level flood protection. An initial plan to extend the Phase 3B/South Warfleigh Section, herein referred to in this report as the "Phase 3B Alignment", included a 6-inch to 24-inch high floodwall, adjacent to the canal towpath and terminating along the towpath embankment in the vicinity of the Butler University

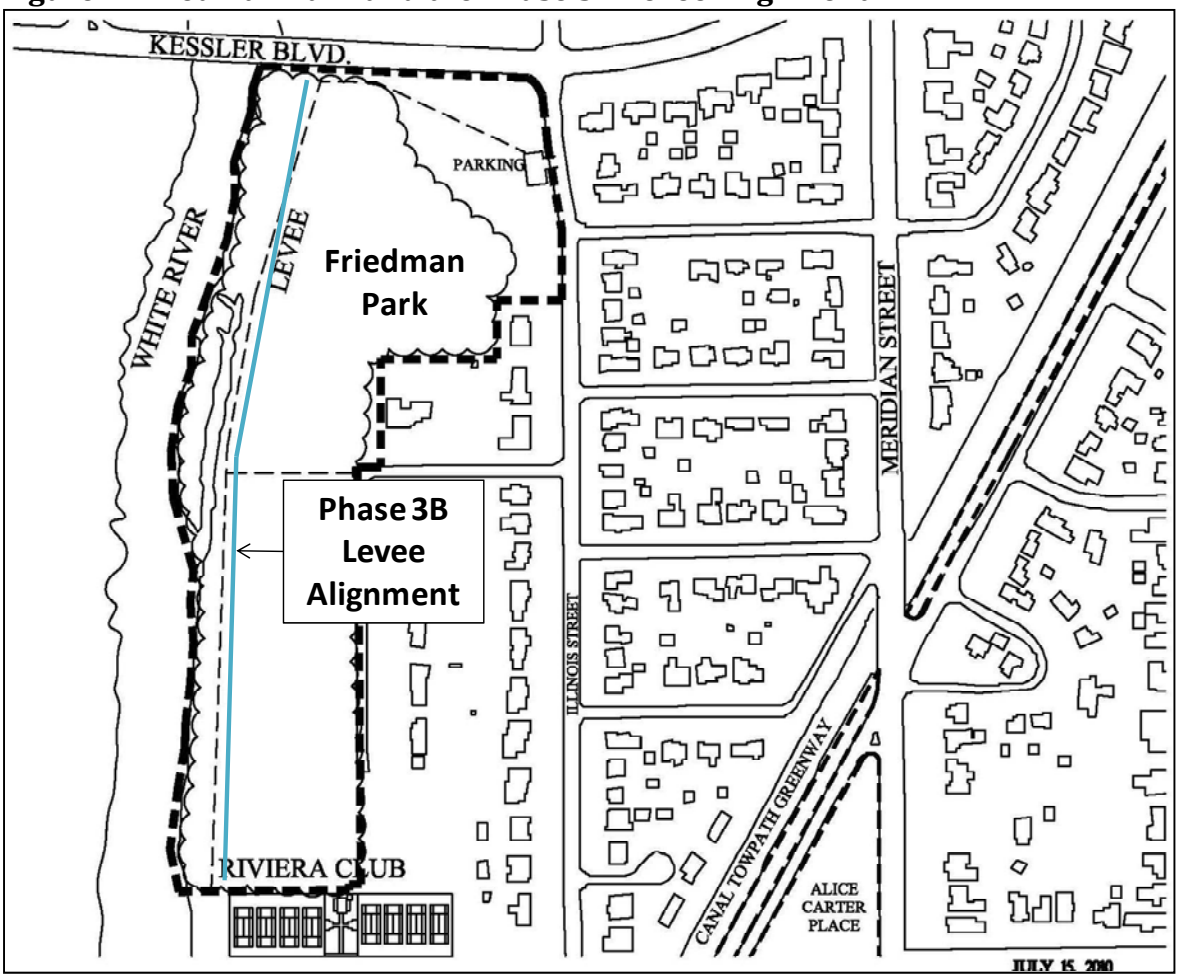
Figure 3. Phases of the Indianapolis North Flood Damage Reduction Project.



athletic fields. However this course was determined to be technically and economically infeasible. Thus, a second course to a higher ground was examined crossing the Citizens Water Canal from the Riviera Club property, running parallel to Westfield Boulevard in a southwestwardly direction, and terminating at Butler University.

In January of 2011 an Environmental Assessment (EA) was prepared to evaluate the new course of the Phase 3B Alignment and its impacts to the environment. The new course was designated as the "Proposed Action" and the EA was circulated for agency and public review between 1 February and 4 April 2011. The Corps received numerous comments regarding the EA

Figure 4. Friedman Park and the Phase 3B Levee Alignment.



and Proposed Action including concerns about the aesthetics of the proposed floodwall, public safety, threats to the City's public water supply, the effects on aquatic species and vegetation, accessibility to the Citizens Water Canal, and the exclusion of the Town of Rocky Ripple from the flood protection project. As a result, the Corps prepared a Draft Supplemental Environmental Impact Statement (DSEIS).

The DSEIS was completed and circulated for comment on 21 June 2012. It included a full re-examination of the 1996 Rocky Ripple Alternative; two variations of the Proposed Action, designated as the "Westfield Boulevard Alternative"; presentation of a new alternative to the Phase 3B Alignment, designated as the "56th Street Alternative"; and additional environmental mitigation requirements resulting from the aforementioned changes. The Proposed Action, approved for implementation under the existing cost sharing agreement with the City of Indianapolis, has a downstream termination point on Butler University Property in the vicinity of Holcomb Gardens. This termination point is based on the National Economic Development (NED) plan, which is the plan that provides the maximum net benefits of all plans studied, and is within the discretionary authority of the Corps to implement. This location is further downstream than what was originally anticipated in the 1996 GRR and EIS, but still well within the originally authorized project limits.

The Corps also proposed in the 2012 DSEIS was a more extensive tree clearing program for the Phase 3A/Warfleigh and 3C/Monon-Broad Ripple Sections of the project to comply with current engineering requirements in Engineering Technical Letter (ETL) 1110-2-571 (USACE 2009).

A public meeting on DSEIS and project was held on Thursday, 23 August 2012 at the Meridian Street United Methodist Church in Indianapolis, Indiana. Over 200 individuals attended the meeting, many of whom provided written and oral comments. Written responses to the DSEIS through regular mail and electronic mail were also received. The official comment period ended on 28 September 2012 resulting in nearly 300 individual comments. They are provided in the **Appendix E** of this report.

This Final Supplemental Environmental Impact Statement (FSEIS) evaluates subjects presented in the 2012 DSEIS; additional information acquired since the preparation of DSEIS; and comments received from the public, government agencies, and the local sponsor: the City of Indianapolis.

As a result of the above, the FSEIS maintains the Proposed Action from the 2012 DSEIS, the Westfield Boulevard Alternative, for the remaining section of the Phase 3B Alignment. However, the Corps has presented a second Proposed Action in this document, designated as the 56th Street Alternative-Illinois Street Variation. The Proposed Action for the vegetation clearing on the Phase 3A/Warfleigh and Phase 3C/Monon-Broad Ripple sections of the project is 15 ft from the toe of the levee and/or face of the floodwall. Mitigation for the Phase 3B Alignment and the vegetation clearance ranges from 68.33 to 80.51 acres of hardwood bottomland forest with riparian habitat, which includes the 29 acres previously designated in the 1996 GRR and EIS. If any mitigation for affects to cultural resources is needed, it will be fully coordinated with the appropriate agencies and consulting parties.

The Phase 3B Levee Alignment was addressed in the 1996 GRR, was fully vetted through the NEPA process resulting in an EIS, and was ultimately adopted under the 1997 ROD. Therefore, the construction of the Phase 3B Levee Alignment does not preclude implementation of the alternatives provided in this FSEIS. Decision making and action on the remaining portions of the Phase 3B Alignment will occur after public and agency review of the FSEIS and the signing of another, separate ROD; and construction will occur after the receipt of additional project funds from Congress. Final decisions and any action on the tree and vegetation clearing of the Phase 3A/Warfleigh and 3C/Monon-Broad Ripple Sections of the project will not begin before public and agency review of the FSEIS and the signing of the new ROD. Each of the Proposed Actions for this project are within the discretionary authority of the Corps to implement. No additional pre-authorized investigations or evaluations are required.

This FSEIS was prepared pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 C.F.R. §§ 1500-1517), and the Corps implementing regulation, Procedures for Implementing NEPA (33 C.F.R. §§ 230.1-230.26) and Engineering Regulation (ER) 200-2-2 (USACE 1988). Much of the information used to prepare this

document is available in the 1996 GRR and EIS; therefore, those documents and all exhibits, appendices, and other supporting materials are hereby incorporated by reference.

2.0 PURPOSE AND NEED FOR ACTION

The purpose of this FSEIS is to present the Corps' determination of impacts to the human environment resulting from completion of the Indianapolis North Flood Damage Reduction Project to provide the congressionally authorized level of flood risk management and changes to the Phase 3A and 3C vegetation clearing. Completion of the project is needed in order to fully protect neighborhoods constructed within the West Fork of the White River floodplain, even those that receive some protection from the already completed phases. New environmental mitigation measures related to the project are also evaluated.

Flooding problems on the White River in North Indianapolis have been studied at various stages since the flood of record in 1913. Other significant flood events occurred in 1937, 1943, 1957, and 1958 (USACE 1996). Numerous sections of levees were constructed by the government and private entities, and have provided varying levels of protection for the surrounding area. Therefore, the purpose of the Indianapolis North Flood Damage Reduction Project is to provide the affected communities of Monon-Broad Ripple, Warfleigh, and South Warfleigh with flood protection at a minimum level of an annual 0.35 percent chance of being exceeded; commonly referred to as the 300-year flood protection level.

As another matter, there are existing trees and vegetation along the previously-constructed Phases 3A and 3C Sections of the project which do not meet the levee safety standards outlined in ETL 1110-2-571 (USACE 2009). The Corps is proposing a tree and vegetation clearing action of these Phases to meet the above standards and receive certification from the Louisville District Levee Safety Officer (LSO) enabling the preparation of a Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA) to modify Flood Insurance Rate Maps (FIRM) through the National Flood Insurance Program (NFIP). The map revision could result in reduction and/or elimination of flood insurance cost for property owners protected by the project.

Environmental mitigation of the project's impacts remains to be completed. The current project described herein is expected to require a greater mitigation area than that already agreed upon in the 1996 GRR and EIS. Additional requirements will be determined in coordination and/or consultation with the appropriate state and federal agencies. All mitigation and/or related activities will take place within the White River Basin and/or as close to the area of impact as possible.

3.0 ALTERNATIVES INCLUDING THE PROPOSED ACTIONS

3.1 Phase 3B Alternatives

This section presents the various alternatives developed by the Corps to complete the Phase 3B Alignment (**Figure 5**). Two of these alternatives, Westfield Boulevard and 56th Street, possess engineering "variations" that differ from their base in terms of design and scope.

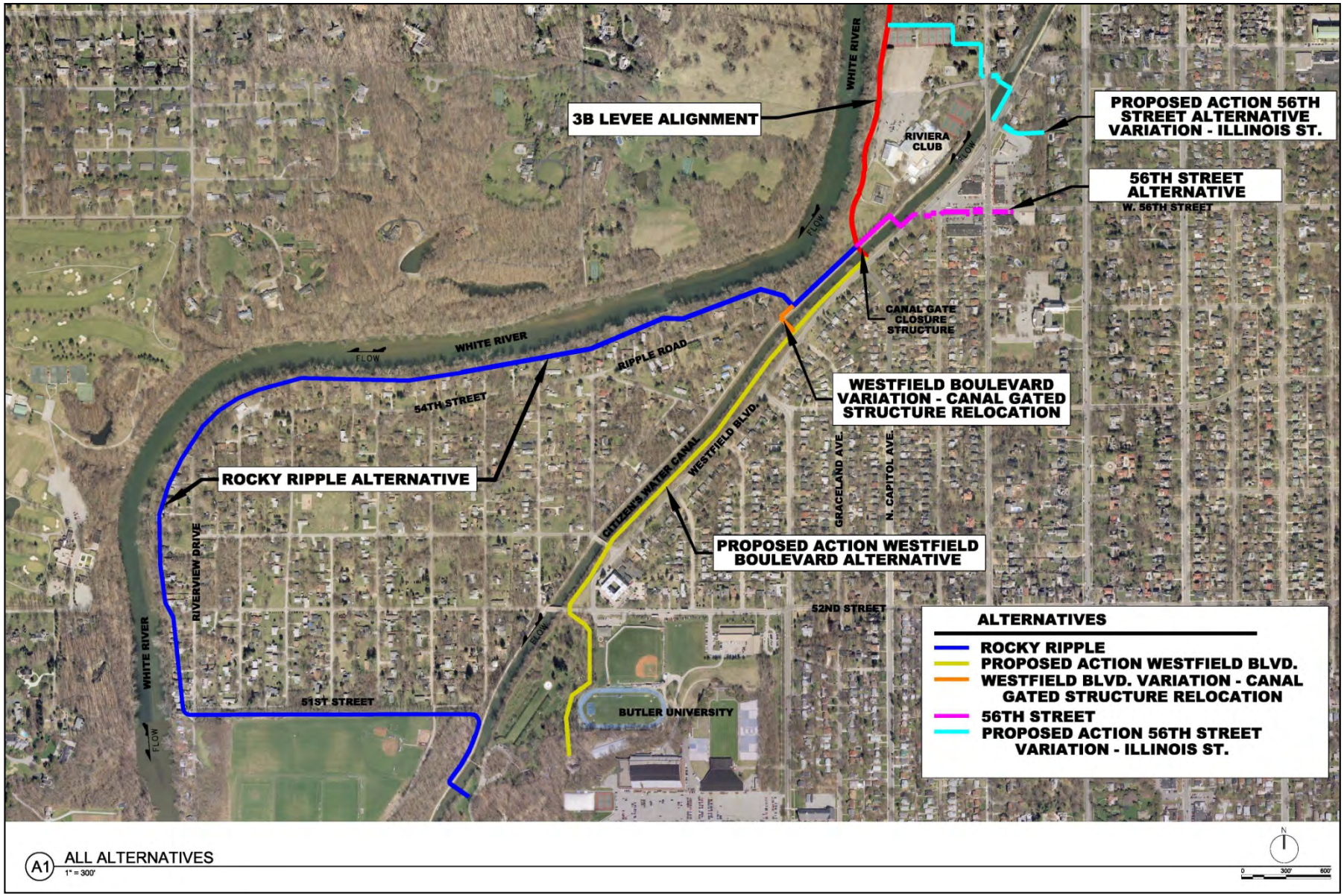
Concept-level costs for the alternatives, as well as the variations of the alternatives, are listed in **Table 1**. Two Proposed Actions for completion of the Phase 3B Alignment are presented in this section, but only one of these will be signed in the ROD. They include the Westfield Boulevard Alternative, as presented in the 2012 DSEIS, and the 56th Street Alternative-Illinois Street Variation. Minor changes to the design of the Proposed Action selected for the ROD may occur, but not the level of flood protection.

As part of its planning process for conducting studies of new projects, the Corps must determine if a plan meets Federal interest and policy guidance, is economically supportable, and meets the Corps's environmental planning objectives. In the 2012 DSEIS, another GRR was thought to be required if the Rocky Ripple Alternative or 56th Street Alternative were pursued. The Corps confirmed that the Rocky Ripple Alternative was not a viable alternative due to its cost above the NED plan. However, implementation of the 56th Street Alternative would be within the existing discretionary authority of the Corps on this project due to its lower cost, the level of protection (300-year), and the positive benefit to cost (b/c) ratio. Thus, preparation of a new or supplemental GRR is not required for the 56th Street Alternative or the Illinois Street Variation.

Table 1. Concept Level Cost Estimates, by Alternative and Variation.

White River, Indianapolis North Flood Damage Reduction Project Phase 3B Alignment: Project Costs			
Alternatives	**Alternative Costs**	**Phase 3B Alignment Levee Costs**	**Total Project Completion Costs**
Westfield Boulevard Alternative	$11,612,000	$3,986,000	**$15,598,000**
Westfield Boulevard Alternative Variation - Canal Gate Structure Relocation	$14,578,000	$3,986,000	**$18,564,000**
Westfield Boulevard Alternative Variation - Removable Wall	$13,868,000	$3,986,000	**$17,854,000**
56th Street Alternative	$11,158,000	$3,986,000	**$15,252,000**
56 Street Alternative Variation - Illinois Street	$13,774,000	$0	**$13,774,000**
Rocky Ripple Alternative	$45,093,000	$3,986,000	**$49,079,000**

Figure 5. All Alternatives and Engineering Variations for the Phase 3B Alignment.



3.1.1 No Action

The basic alternative to any project reviewed under NEPA is the "No Action" Alternative. Adoption of this alternative essentially continues the original Phase 3B Alignment presented in the 1996 GRR and EIS and adopted under the 1997 ROD, which terminates this section of the project south of the Riviera Club property. As previously mentioned, the existing ground elevation at this location is lower than the elevation needed for a 300-year level of protection. As a result, the downstream end of the project, as shown in the 1996 GRR and EIS, would not provide the full flood risk management benefits to the communities of Broad Ripple, Warfleigh, and South Warfleigh. Therefore, the No Action Alternative was eliminated from further consideration.

The completion of Phase 3B Levee Alignment, as presented in the 1996 GRR and EIS and adopted under the 1997 ROD, will require removal of approximately 5.05 acres of hardwood bottomland forest within Freidman Park, and an additional 1.79 acres across the Riviera Club, totaling approximately 6.84 acres. The area also falls within the interface between the White River and floodplain known as a riparian zone. The Phase 3B Levee Alignment has no vegetation variance considerations, as it will be built to current standards.

3.1.2 Rocky Ripple Alternative

The Rocky Ripple Alternative was originally studied during the 1996 GRR and EIS. Its reach or course followed the White River from the Riviera Club property, going around the Town of Rocky Ripple and the athletic fields of Butler University, and terminating at the Citizens Water Canal. The original alternative involved a combination of floodwalls and levees across its length.

A majority of the comments received from the 2011 EA and 2012 DSEIS centered on the inclusion of the Town of Rocky Ripple within the project's flood protection. Thus, a re-examination the 1996 Rocky Ripple Alternative was conducted and concluded that the original alternative would not meet the Corps' current standards for constructing floodwalls and levees, and could not be cost-shared as a federal project. Detailed explanations of the Corps' floodwall and levee standards are presented in Engineering Manual (EM) 1110-2-1913, EM 1110-2-2502, and ETL 1110-2-569(USACE 1989, 2000, and 2005).

Plans were evaluated as a part of the 2012 DSEIS and the FSEIS to provide flood protection for the Town of Rocky Ripple. Further study would be required to develop an optimum design. For this study, the Corps developed an alternative for the Town of Rocky Ripple that would minimize the footprint of real estate acquisition and the demolition of structures for the construction. As designed, the new Rocky Ripple Alternative would require the following features:

- Approximately 9,335 total LF of floodwall and earthen levee (I-wall - 560 LF, T-wall - 5,575 LF and levee - 3,200 LF)

- A gated-structure across Citizens Water Canal
- 5 gatewell structures (4 storm sewer and one sanitary)
- 5 closure gates (2 roadway and 3 pedestrian)
- 3 pumping station

If the Town of Rocky Ripple was added to the current project, then its section of floodwall and levee would become an integral part of the entire system As a result, it would expand the area of protection for the overall project. However, the new Rocky Ripple Alternative would also have to provide flood protection for a 300-year flood event, and could not be treated as a separable flood protection area. In order to achieve this level of protection, engineering and hydrological data indicate that the proposed floodwall and levee must reach an elevational mark ranging from 720 ft National Geodetic Vertical Datum (NGVD) at Riviera Club to approximately 717 ft. NGVD at Butler University. The height of the wall above the ground surface will vary based on the existing ground surface.

As shown in **Figure 6**, the new Rocky Ripple Alternative would begin at the southern end of the Riviera Club property and then parallel the northwest side of the Citizens Water Canal adjacent to the towpath for a distance of 470 LF. This section would be constructed with 310 LF of concrete T-wall, 160 LF of steel sheet pile I-wall, and topped with decorative concrete cap. The T- and I-walls would average 9’-6” and 6’-0” high, respectively.

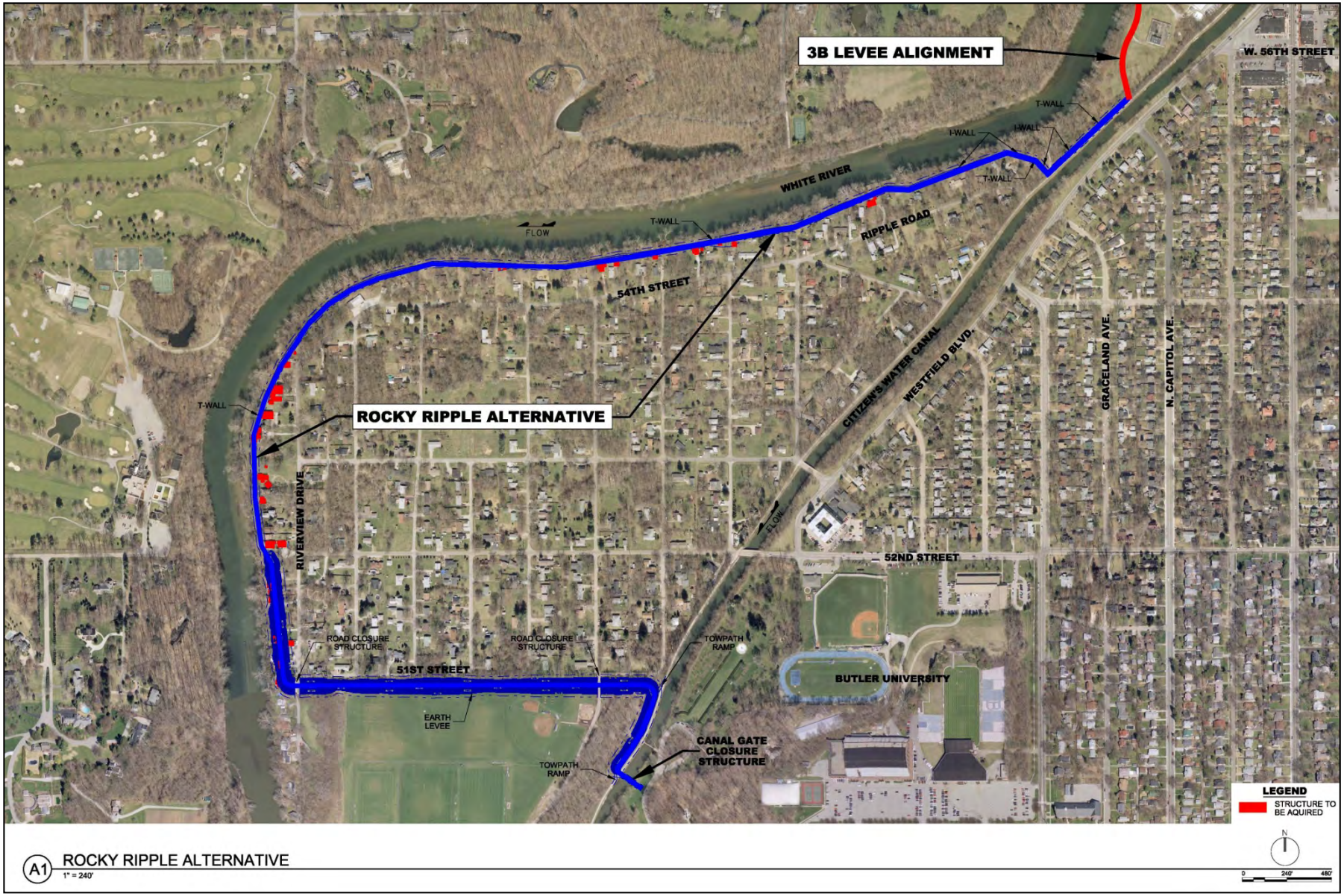
An underground 72” reinforced concrete pipe runs generally parallel to the canal in this area. The distance between the pipe and earthen mound of the towpath is about 50 LF. Due to the close proximity of this pipe to the canal, it would be necessary to install temporary shoring to construct the T-wall section between the pipe and canal towpath.

Poor soils and areas of previously deposited construction debris along the 470 LF section could also affect design and construction of T-wall and I-wall. Therefore, it may be necessary to drive steel H-piles to support the base of the T-wall and increase the embedment length of the steel sheet piling for the I-wall.

In order to control underseepage during a flood event, a perforated "toe drain" would be installed along the base of the floodwall, away from the White River and towards its landward side. The toe drain would likely be installed at an elevation lower than the water surface of the Canal. As a result, the toe drain could cause water to seep from the canal. Thus, it would be necessary to drive approximately 500 LF of steel piling to cut-off the potential flow-path of water between the canal and the toe-drain.

Following the 470 LF section that parallels the canal, the floodwall turns west and south following a path along the White River and around the Town of Rocky Ripple. It then turns eastward running along the north side of the Butler University ball fields, crossing the Citizens Water Canal and tying into high ground at Butler University campus.

Figure 6. The Rocky Ripple Alternative.



This section around Rocky Ripple to high ground on Butler University contains 400 LF of I-wall at an average height of 6'0", 5,265 LF of T-wall at an average height of 12'-0", and 3,200 LF of earthen levee at an average height of 12'-0". Areas in close proximity to the White River would require rip-rap protection for the stream bank of the wall and levee, and toe drains on the landward side. Soils for the earthen levee would be obtained from an off-site borrow area.

The U.S. Army Corps of Engineers' design criteria in ETL 1110-2-571 (USACE 2009), requires the removal of all structures, trees and other deep-rooted vegetation within 15 ft of a floodwall or toe of an earthen levee. Thus, these guidelines would require the acquisition and demolition of 43 structures (shown in red on **Figure 6**), including 22 residences to construct the alternative with the least, overall real estate "footprint." (**Figure 7**) The Rocky Ripple Alternative would provide much greater flood risk management for the remaining 300 households. However, the loss of residential properties would reduce tax revenues and likely change the social makeup of the town.

The footprint for construction of the Rocky Ripple Alternative would require the clearing and grubbing of trees and other deep-rooted vegetation to a distance of 15 ft from both sides of the floodwall, as necessary to attain a positive Levee System Evaluation (LSE) by a LSO per Corps' regulation. This alternative would measure approximately 14.5 acres. Upon certification of all levee and floodwall construction, FEMA could issue a LOMR to modify the FIRM through the NFIP for properties protected by the White River, Indianapolis North Flood Damage Reduction Project.

There is no sanitary sewer system within the Town of Rocky Ripple. Its residents therefore rely upon septic systems. Construction would require partial or complete removal of approximately 50 residential lateral fields. Sanitary sewer would need to be provided to properties where space is insufficient for the relocation of lateral fields. The sewer system would entail installation of a package sewer treatment plant and approximately 5,600 LF of 8-inch sewer pipe.

For evaluation of the Rocky Ripple Alternative, the Corps developed a concept-level cost analysis to determine if that plan was economically supportable. The total estimated cost is $49,079,000. This estimate contains construction and real estate costs, relocation assistance for residents, the demolition of structures, utility relocations, removal and disposal of existing Rocky Ripple Levee, borrow material for new levee, additional engineering and design, and construction management.

The incremental cost of the Rocky Ripple Alternative is $33,481,000 more than Westfield Boulevard Alternative and $35,305,000 more than the 56th Street Alternative-Illinois Street Variation. A comparison of the total alternative costs (i.e. $49,079,000) to its overall benefits indicate a negative annual net benefit to the Rocky Ripple Alternative. A preliminary analysis showed the b/c ratio of this alternative to be less than 1.0. Thus it is ineligible for consideration as a Federal project under existing Corps policy.

Figure 7. The Rocky Ripple Levee and White River.

3.1.3 56th Street Alternative

As presented in the 2012 DSEIS, this alternative would consist of approximately 944 LF of floodwall between the southern end of the Riviera Club property and high ground along W. 56th Street (**Figure 8**). It would require the construction of a gated structure across the Citizens Water Canal at a location approximately 312 ft northeast of the intersection of W. Westfield Boulevard and N. Capitol Avenue. From the canal gate structure, the proposed floodwall would go in a northeastwardly direction along the Citizens Water Canal, before turning eastward across W. Westfield Boulevard, N. Kenwood Avenue, and N. Illinois Street along the south side of W. 56th Street (**Figures 9** and **10**). The alternative terminates at high ground approximately 150 ft east of N. Illinois Street. This concept would require construction of the following features:

- Approximately 392 LF of concrete T-wall
- Approximately 482 LF of steel sheet pile I-wall with decorative concrete facing
- Approximately 70 LF of removable floodwall
- Gated-structure across Citizens Water Canal

Figure 8. The 56th Street Alternative.

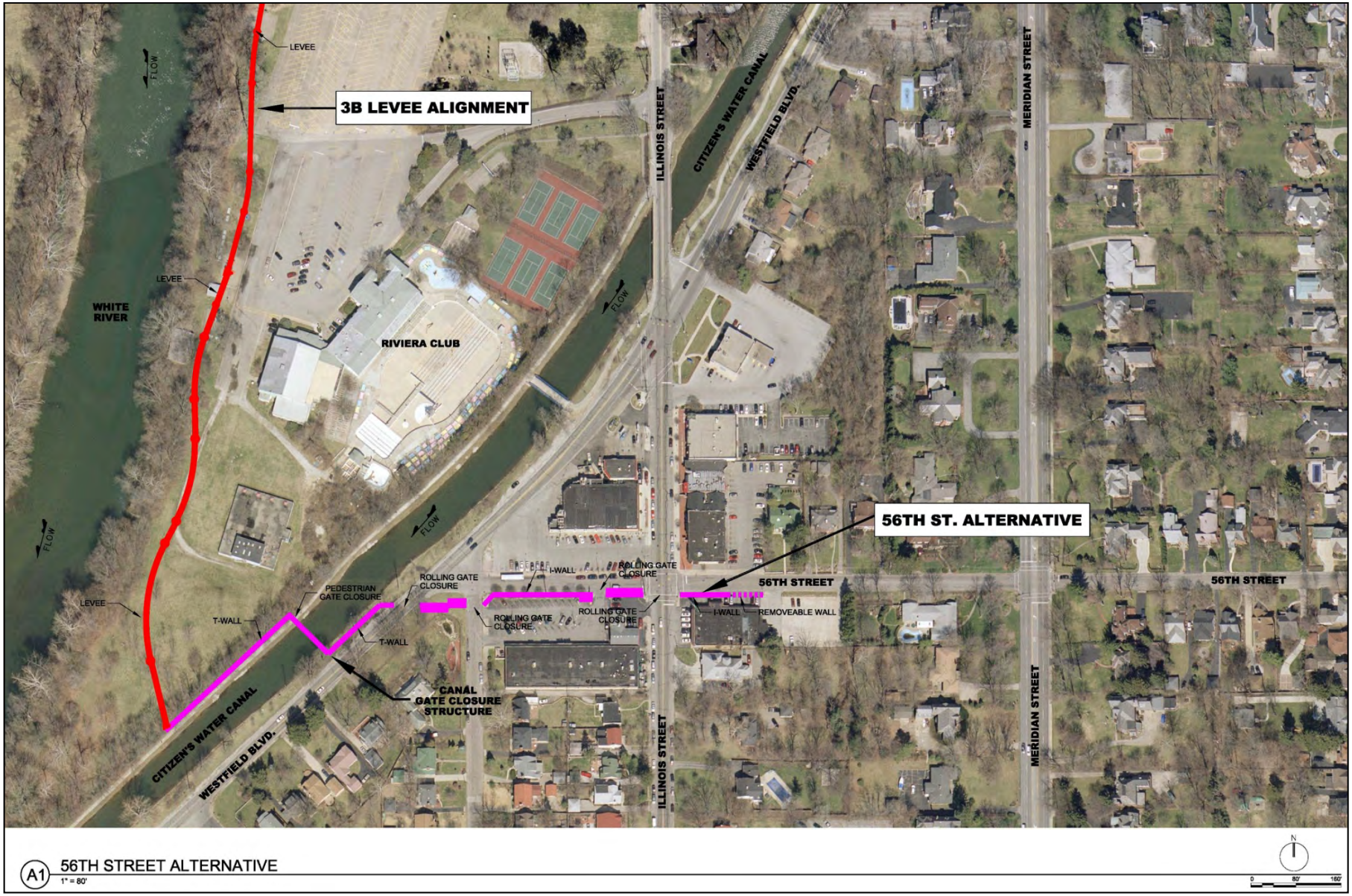


Figure 9. Location of the Canal Gate Structure for the 56th Street Alternative.

Figure 10. Location of the 56th Street Alternative east of the Citizens Water Canal.

- 3 gatewell structures
- 5 closure gates (3 roadway, 1 parking lot and 1 pedestrian)
- 2 pumping station
- Utility relocations

As previously indicated for the Rocky Ripple Alternative, the earthen mound of the canal towpath was constructed with poor soil materials. As a result, it is expected that it will be necessary to drive steel H-piles to support the base of the T-wall along that section of the 56th Street Alternative. In addition, it would likely be necessary to drive approximately 350 LF of steel sheet piling to cut-off the flow path, through the earthen mound, between the canal and toe drain of the floodwall.

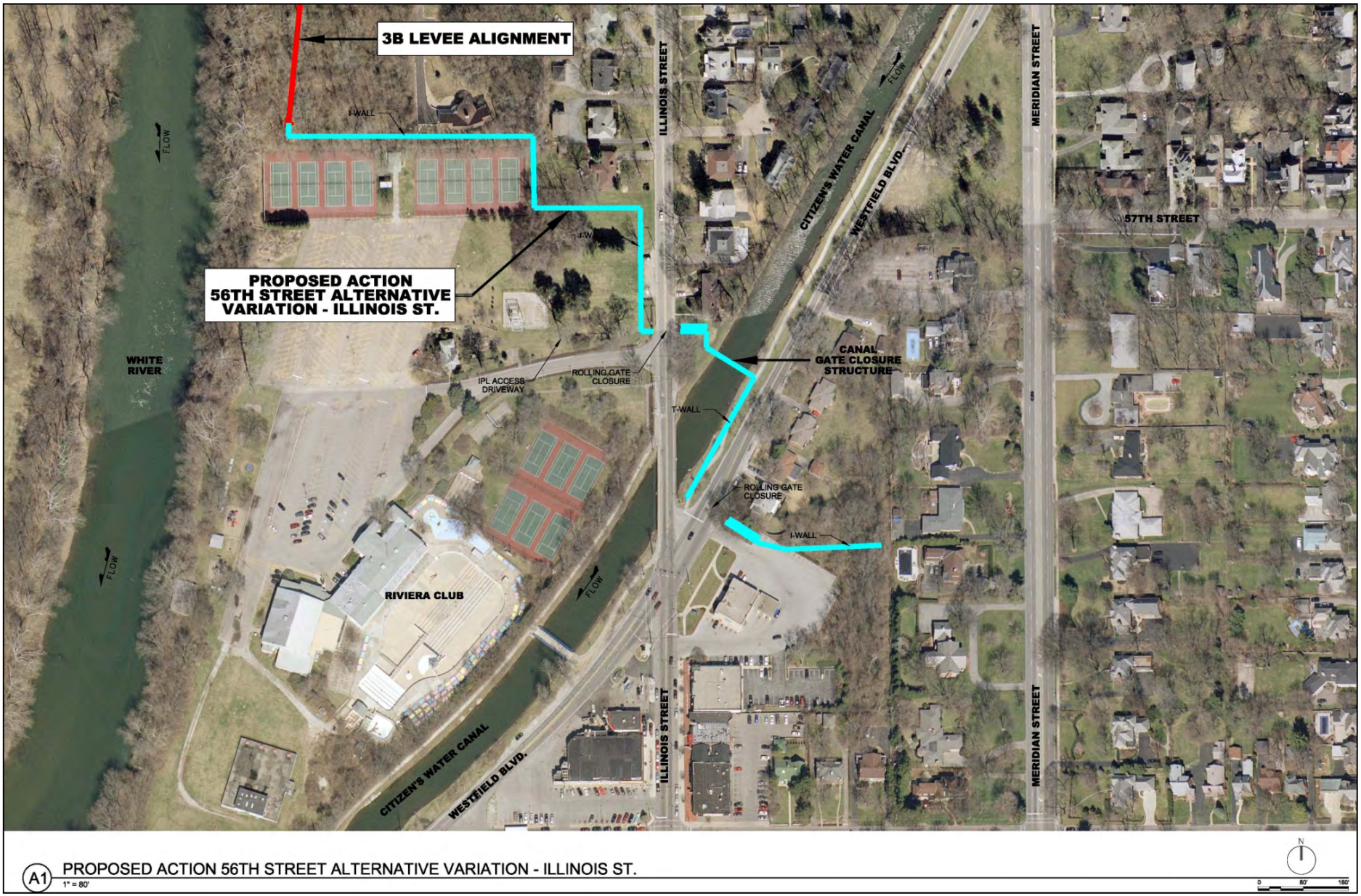
In order to achieve the necessary level of protection for a 300 year flood event, engineering and hydrological data indicate that the floodwall must reach an elevation mark of 720 ft. NGVD. Subsequently the height of the floodwall above the surface will vary across its length from 5 to 8 ft depending on the ground elevation. However, the 56th Street Alternative would not provide flood risk management for structures to the southeast of W. Westfield Boulevard and N. Capitol Avenue as are included in the Westfield Boulevard Alternative, the Proposed Action in the 2011 EA and 2012 DSEIS.

3.1.3.1 Illinois Street Variation (Proposed Action)

In evaluating impacts of the alternatives for the Phase 3B Alignment, the Corps and the City of Indianapolis identified another path for the 56th Street Alternative that would provide a similar level protection as the original 56th Street Alternative (**Figure 11**). Designated as the Illinois Street Variation, this new path would end the Phase 3B Alignment to the north of the Riviera Club property, head eastward across N. Illinois Street, the Citizens Water Canal and W. Westfield Boulevard, and terminate on high ground just east of Chase Bank. This concept would require construction of the following features:

- Approximately 1080 LF of steel sheet pile I-wall with decorative concrete facing between the White River and Citizens Water Canal.
- Approximately 392 LF of concrete T-wall between the Citizens Water Canal and Westfield Boulevard.
- Approximately 285 LF of steel sheet pile I-wall with decorative concrete facing from Westfield Boulevard to high ground near Chase Bank.
- Gated-structure across Citizens Water Canal
- 2 closure gates (Illinois Street and Westfield Boulevard)

Figure 11. The 56th Street Alternative-Illinois Street Variation.



- 2 Pump Stations
- Utility relocations

In order to achieve the necessary level of protection for a 300-year flood event, engineering and hydrological data indicate that the floodwall must reach an elevation mark of 720 ft. NGVD. Subsequently the height of the floodwall above the surface will vary across its length from 10 ft near the White River and Riviera Club property to 5 ft near Chase Bank, depending on the ground elevation (**Figures 12** and **13**).

The Illinois Street Variation is the northern most plan being considered in this study and would not provide flood risk management for structures to the southeast of W. Westfield Boulevard and N. Illinois Street, as are included in the 56th Street Alternative. Specifically these include structures for the Riviera Club, a lift station, and five structures east of the Citizens Water Canal.

The footprint for construction of the Illinois Street Variation would require the clearing and grubbing of trees and other deep-rooted vegetation to a distance of 15 ft from both sides of the floodwall, as necessary to attain a positive Levee System Evaluation (LSE) by a LSO per Corps' regulation. This alternative would measure approximately 0.54 acres each. Upon certification of all levee and floodwall construction, FEMA could issue a LOMR to modify the FIRM through the NFIP for properties protected by the White River, Indianapolis North Flood Damage Reduction Project.

Based upon a concept-level estimate, the cost of the 56th Street Alternative and its Illinois Street Variation would be $15,252,000 and $13,774,000, respectively (see **Table 1**). Although shorter in length, the 56th Street Alternative and the Illinois Street Variation would require construction of the large closure gates, H-piles for T-wall foundation and sheet pile cut-off wall, and relocation of multiple existing utilities.

The incremental cost of the 56th Street Alternative and the Illinois Street Variation is under the cost of the Westfield Boulevard Alternative, the Proposed Action in the 2011 EA and 2012 DSEIS, by $346,000 and $1,824,000 respectively.

A preliminary analysis showed the b/c ratio of the 56th Street Alternative and Illinois Street Variation to be greater than 1.0. Because of the reduced cost and annual benefits, the alternative and variation can be a recommended plan for the project and is considered as a Proposed Action for this FSEIS. Relative to the Illinois Street Variation, the 56th Street Alternative provides protection for eight additional structures, at an additional cost of $1,478,000. This incremental cost exceeds the incremental probability-weighted value of damages prevented to these structures, thus the Illinois Street Variation, though it has provides somewhat lower benefits, provides greater net benefits than the 56th Street Alternative.

Figure 12. Path of the Illinois Street Variation near White River and Riviera Club.

Figure 13. Location of Canal Gate Structure for Illinois Street Variation.

3.1.4 Westfield Boulevard Alternative (Proposed Action)

The Westfield Boulevard Alternative is one of the Proposed Actions for the Phase 3B Alignment. As presented in the 2011 EA and 2012 DSEIS, the alternative would consist of a steel sheet pile I-wall with a decorative concrete cap measuring approximately 4,220 LF (**Figure 14**). The wall would begin at the south end of the Riviera Club property, cross the Citizens Water Canal with a gated structure near the intersection of W. Westfield Boulevard and N. Capitol Avenue, extend southward running between the Canal and Westfield Boulevard, and terminate on high ground at Butler University (**Figures 15**, **16** and **17**). The alternative would cross property belonging to the City of Indianapolis, the Riviera Club and Butler University. As designed, the Westfield Boulevard Alternative would provide greater flood risk management benefits for residents of the Warfleigh, Monon-Broad Ripple, and South Warfleigh neighborhoods.

In order to achieve the necessary level of protection for a 300-year flood event, engineering and hydrological data indicate that the floodwall must reach an elevation mark of 720 ft. NGVD at the canal gate structure and approximately 717 ft NGVD at Butler University. Subsequently the height of the floodwall above the surface will vary across its length from zero to 6.5 ft depending on the ground elevation. The height of the floodwall above the surface will be greatest for the first 300 LF immediately southwest of the canal gated-structure between the Citizens Water Canal and Westfield Boulevard.

The Corps received numerous comments to the 2011 EA and 2012 DSEIS regarding the aesthetics of the proposed floodwall and public accessibility to the Citizens Water Canal. Thus, the Westfield Boulevard Alternative was modified in the DSEIS to address these concerns while providing the necessary level of flood protection to Warfleigh, Monon-Broad Ripple, and South Warfleigh. The modifications presented in the DSEIS are presented again below and address the comments received.

In order to limit the aesthetic impact of the project, the Corps would construct a partial height wall with removable panels that can be installed prior to significant flood events along the White River. This concept would require a foundation and partial height permanent I wall along a 700 LF section of the flood protection immediately southwest of the canal gate structure. The partial height permanent I wall would be constructed to a minimum 100-year flood event. It would measure approximately four feet above ground surface and be constructed with commercial form liners to create a simulated stone wall or other decorative appearance. This will allow certification by the Levee Safety Officer (LSO) and a revision of FEMA flood mapping for the protected area.

Figure 14. The Westfield Boulevard Alternative.

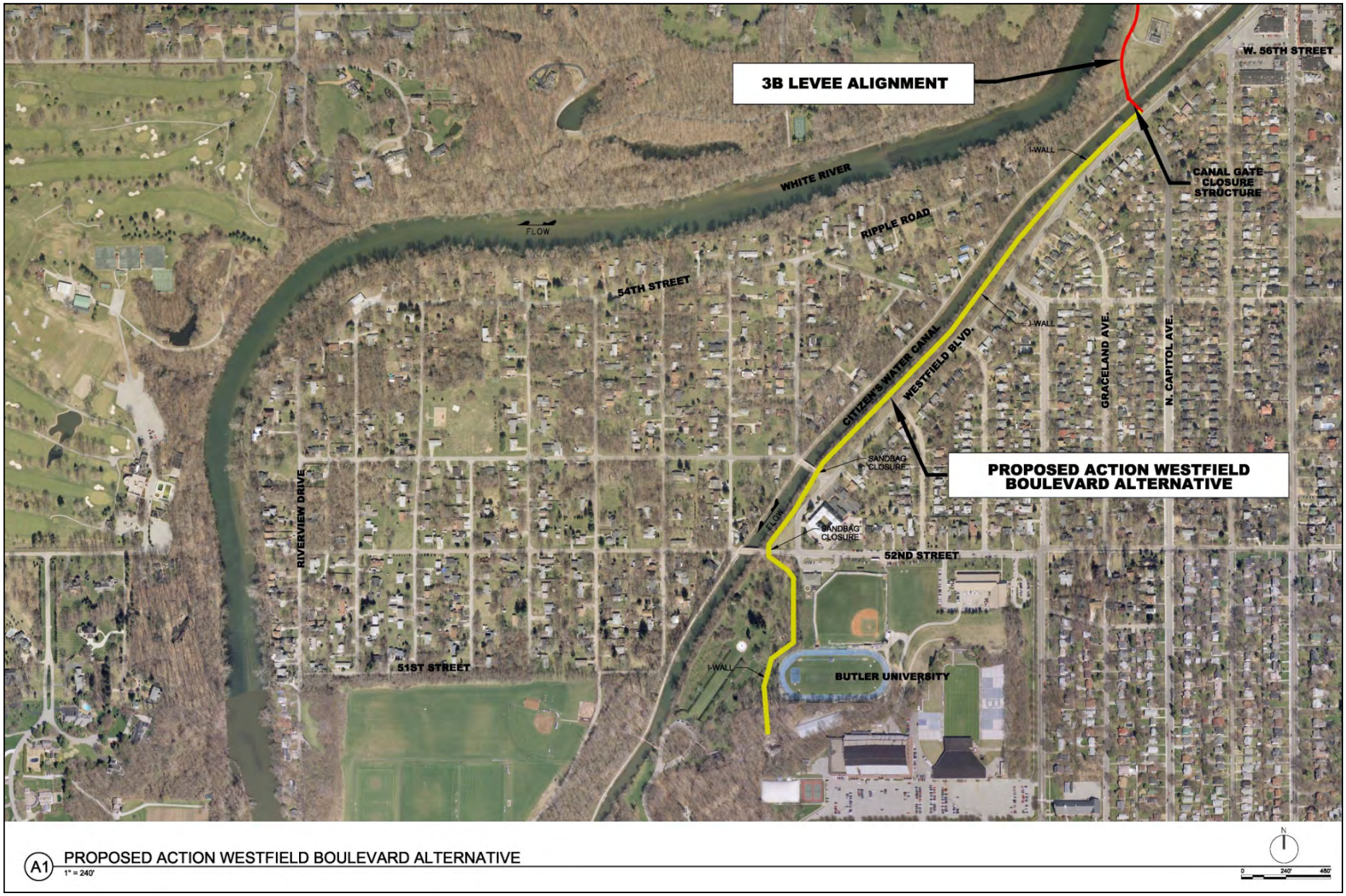


Figure 15. Location of the south end of Westfield Boulevard Alternative at Butler University.

Figure 16. Location of the Westfield Boulevard Alternative, view to northeast.

Figure 17. Rendering of the Canal Gate Structure for the Westfield Boulevard Alternative.

During significant flood events, the upper section would be installed with lightweight, removable columns (posts) and panels to the 300-year flood event elevation (**Figures 18** and **19**), as required by predicted flood events. During low-water periods when the removable floodwall was not installed, the recesses of the posts would be covered with securely attached aluminum plates to prevent the accumulation of debris and other materials, and vandalism.

The City of Indianapolis would be responsible for the storage, installation and maintenance of the removable wall, just as it is responsible for all operation and maintenance of the project. However, failure to install the removable sections properly or in a timely manner would add a risk factor to the project not found for the previously recommended wall along Westfield Boulevard and presented in the 2011 EA.

A "removable wall" concept and design was presented by the Corps in the 1996 GRR and EIS for the original Rocky Ripple Alternative. Briefly, the original Rocky Ripple Alternative proposed an option for a "full height removable wall" across the entire length of the alternative, similar to the "full height removable wall" variation of the Westfield Boulevard Alternative presented below. The option, however, was ultimately ruled out due to its overall costs and liability (USACE 1996: IV-31, 32).

The "partial removable wall" for the Westfield Boulevard Alternative differs from the Rocky Ripple Alternative's "full removable wall" option in that it is much shorter in length (i.e 700 LF versus the entire length) and provides minimum flood risk management for a 100-year flood event with a four foot high wall. Therefore the Corps LSO can certify the Proposed Action, but the additional cost for the 700 foot partial removable wall must be incurred by the local sponsor as this is considered a "betterment" under the existing Project Cooperation Agreement (PCA).

To prevent back flow through existing sewers during significant flooding events, the Corps would construct gatewell structures that contain sluice gates. One structure would be located along the floodwall at a distance of approximately 80 ft to the northeast of the intersection of Graceland Avenue and Westfield Boulevard. The other structure would be constructed along W. 52nd Street, approximately 100 ft east of the Citizens Water Canal.

The footprint for construction of the Westfield Boulevard Alternative would require the clearing and grubbing of trees and other deep-rooted vegetation to a distance of 15 ft from both sides of the floodwall, as necessary to attain a positive Levee System Evaluation (LSE) by a LSO per Corps' regulation. This distance would measure approximately 2.81 acres. Upon certification of all levee and floodwall construction, FEMA could issue a LOMR to modify the FIRM through the NFIP for properties protected by the White River, Indianapolis North Flood Damage Reduction Project.

The incremental cost of the Westfield Boulevard Alternative is $1,824,000 more than the other Proposed Action for the Phase 3B Alignment: the 56th Street Alternative-Illinois Street Variation. However, this alternative provides the greatest annual net benefits to the project of any of the alternatives and variations presented in this study. A preliminary analysis

Figure 18. Rendering of the Westfield Boulevard Alternative Canal Gate Structure without Removable Wall.

Figure 19. Rendering of the Westfield Boulevard Alternative Canal Gate Structure with Removable Wall.

showed the b/c ratio of this alternative to be greater than 1.0. Because of the increased benefits and modest increase in cost, the Westfield Boulevard Alternative can be a recommended plan for the project and is considered as a Proposed Action for this study.

Two engineering variations of this Alternative were evaluated as part of the 2012 DSEIS and FSEIS: They would not entail any irreversible and irretrievable commitments of resources.

3.1.4.1 Canal Gated Structure Relocation Variation

This variation is similar to the Proposed Action, but would include a gated structure crossing the canal near the intersection of W. Westfield Boulevard and Graceland Avenue (**Figure 20**). This variation was developed in response to comments received from the 2011 EA regarding aesthetic impacts. It would require the construction of approximately 340 LF of steel sheet pile I-wall with a concrete facing and 430 LF of concrete T-wall along the canal towpath. From the gated structure at Graceland Avenue, the variation follows the remaining portion of the Westfield Boulevard Alternative terminating on high ground at Butler University.

The soils that form the mound of the canal towpath are poorly compacted and unsuitable for levee and floodwall construction. Design and construction of the T-wall adjacent to the canal towpath would be challenging and costly primarily due to its proximity to the canal and need to avoid possibility of breeches.

The estimated incremental cost of this variation is $2,966,000 and $4,790,000 more than the estimate for two Proposed Actions for the Phase 3B Alignment: the Westfield Boulevard Alternative and the 56th Street-Illinois Street Variation. This additional cost would not be in the Federal interest and would be ineligible for cost sharing as a Federal Project.

3.1.4.2. Full Height Removable Wall Variation

This variation follows the same path as the Westfield Boulevard Alternative, but consists of a fully removable wall along the entire 3,100-foot section that begins southwest of the canal gated structure (see **Figure 14**). The foundation of the removable wall would be at the same elevation as the existing ground surface. Minor grading would be required to transition the ground to the design elevation of the wall's foundation. The upper section would be erected by installing lightweight, removable columns (posts) and panels to the 300-year flood event, or lower elevation, as required by predicted flood levels. The vertical posts would be installed within recesses in the wall foundation. When not in use, the recesses would be covered with securely attached aluminum plates to prevent accumulation of debris and other materials.

A similar concept and design was proposed in the 1996 GRR and EIS for the original Rocky Ripple Alternative, but was ultimately ruled out for several reasons (USACE 1996: IV-31, 32). Firstly, if selected, the additional costs would have to be paid by the City of Indianapolis. Secondly, there are risk factors for the City to ensure the proper placement of all of the removable panels during a flood event. The process of installing the panels would be labor

Figure 20. The Westfield Boulevard Alternative - Canal Gated Structure Relocation Variation.

intensive due to the long length of the Alternative, and the ongoing operation and maintenance costs for the project would be magnified by false flood alarms. Finally, for risk and uncertainty reasons, the Corps LSO will not a certify a removable wall whose top of wall elevation is less than the 100-year flood event. Therefore, this variation was eliminated from further consideration.

Moreover, the estimated incremental cost of this variation is $2,256,000 and $4,080,000 more than the estimate for the two Proposed Actions for Phase 3B Alignment; the Westfield Boulevard Alternative and the 56th Street-Illinois Street Variation. The additional cost would not be in the Federal interest and would be ineligible for cost-sharing as a Federal project.

3.2 Phase 3A and 3C Vegetation Clearing Alternatives

3.2.1 No Action

The "No Action" Alternative would leave conditions as they currently are for the Phase 3A/Warfleigh and Phase 3C/Monon-Broad Ripple Sections of the project. However, this alternative would place the entire length of Phase 3A (7600 ft) and isolated stretches along the floodwall of Phase 3C out of compliance with the Corps' vegetation clearance guidance provided in ETL 1110-2-571 (USACE 2009).

Moreover, even with the completion of the Phase 3B alignment, the project as a whole would not be given a positive LSE by the Corps' LSO. Property owners behind the Phase 3A and 3C sections would not be shown as a reduced flood risk area on the FIRM, would not be included in the NFIP, and be required to pay flood insurance.

Finally, if there is no vegetation clearing for Phases 3A and 3C, the project would be ineligible for the Corps' Rehabilitation and Inspection Program (RIP). In accordance with Public Law (PL) 84-99 (33 U.S.C 701n) (69 Stat. 186), Flood Control and Coastal Emergency Act, and provisions of ER 500-1-1 (USACE 2001), projects that are not part of this program are ineligible to receive federal funding assistance for damage sustained during a flood event. Therefore, the No Action Alternative for the Phase 3A and 3C vegetation clearing was eliminated from further consideration.

3.2.2 20 Feet Vegetation Variance

A vegetation variance request, as provided for in ETL 1110-2-571(USACE 2009), was considered for the entire length of the Phase 3A/Warfleigh Section, approximately 7600 LF. This section of the project is an earthen levee, topped in some areas with a low lying I-wall (**Figure 21**). Currently, vegetation has been cleared for Phase 3A to a distance measuring 5 ft from the face of the I-wall. Under this alternative, vegetation would be cleared to a distance measuring 20 ft from I-wall face. The requested variance would allow existing vegetation to

Figure 21. Levee and I-wall along the Phase 3A/South Warfleigh Section.

remain outside to a distance of 20 ft measured horizontally in the direction of the river from the riverside face of the I-wall, or measured from the riverside edge of the levee crown (for portions of the phase which consist of levee only). Approximately 2.63 acres for the Phase 3A/ Warfleigh Section would require clearing under the 20 ft vegetation variance. Conversely, approximately 4.27 acres of trees and vegetation would be saved if the vegetation variance for Phase 3A was adopted.

A vegetation variance request was also considered for the Phase 3C/Monon-Broad Ripple Section, specifically the areas adjacent to the Reserve at Broad Ripple condominiums. Currently, vegetation has been cleared to an average distance of ten ft riverward of the edge of the levee crown. Under this alternative, vegetation would be cleared to a distance of 20 ft from the edge of the levee crown. The variance would allow existing vegetation to remain outside a distance of 20 ft measured horizontally in the direction of the river from the riverside edge of the levee crown. Approximately 0.44 acres for the Phase 3C/Monon-Broad Ripple Section would require clearing under the 20 ft vegetation variance. Conversely, approximately 0.17 acres of trees and vegetation would be saved if the vegetation variance for Phase 3C was adopted.

To establish the limits of tree removal, the Corps performed stability analyses of the floodwall and earthen levee embankments, assuming a large hole were to develop by an uprooted tree. The modeling of the uprooting of a tree during or after a flood event required an estimate of the root ball that was displaced. Reconnaissance of the project area during and after significant flow events indicated trees that uprooted in the riverbank or levee toe primarily removed soil no more than five feet from the trunk, and no deeper than four feet beneath the ground surface. It was also noted that the resulting hole quickly filled in with depositing sands and sediments. To maintain the integrity of the levee, the sponsor would be required to access these areas and make repairs to the loss of the tree(s) by benching and backfilling the areas where fallen trees have removed portions of the levee material.

On January 30, 2012, District staff met with Corps headquarters staff to conduct an on-site inspection and review of the two phases where vegetation is in question. As per the previously referenced ETL, a vegetation variance can be considered if one of the following applies:

a. Comply with applicable law concerning the environment, cultural or historic preservation;
b. Protect the right of Tribal Nations, pursuant to treaty, statute, or Executive Order;
c. Address a unique environmental consideration; and/or
d. Prior vegetation agreement in place.

Even if one of the above criteria is met, life safety is still paramount and the vegetation variance must assure that the structural integrity and functionality of the levee are retained. The levee must still be accessible for maintenance, periodic inspection, monitoring during flood events, and access to perform flood-fighting if required.

Through careful review of the Corps Vegetation Policy Guidance and the meeting and discussions with Corps Headquarters staff, Phases 3A and 3C do not meet the first three criteria. The fourth, though a reason, is a highly unlikely justification for this project. The Corps has not granted vegetation variance to date based on the preliminary plans in a Feasibility Report (i.e., GRR). The application process, analysis and review time will be both lengthy and costly. The analysis, reports, meetings, and reviews are estimated to cost at least $100,000 to $150,000. All costs associated with the vegetation variance would be cost shared by the City of Indianapolis. The Corps can apply under the fourth item for a variance but, based on discussion and meetings with Corps Headquarters staff it is highly unlikely to be granted. Therefore the vegetation variance was eliminated as it will not meet the requirements of the ETL or PL 84-99 (33 U.S.C. 701n) (69 Stat.186).

3.2.3 15 Feet Vegetation Clearing (Proposed Action)

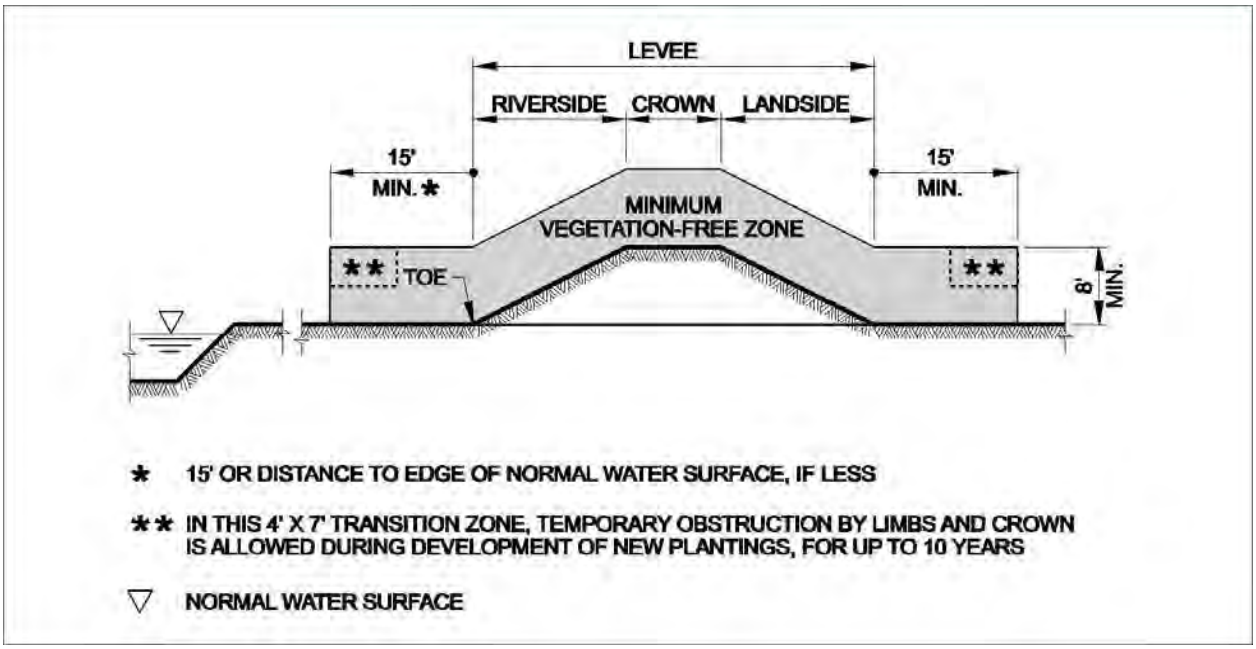
A 15 ft vegetation clearance is the Proposed Action for the Phase 3A/Warfleigh and 3C/Monon-Broad Ripple Sections of the project. Vegetation will be removed to a distance measuring 15 ft from either the toe of the levee or face of the floodwall. The limits of the clearing for Phase 3A and 3C is provided in **Appendix A**. **Figures 22** and **23** provide an

illustration of the necessary clearing limits for compliance with ETL 1110-2-571 (USACE 2009). In three locations along Phase 3A, for a distance measuring approximately 1,140 lf (or 15% of its total length), the vegetation clearing will go to the edge of the White River. These areas will be protected with erosion control blankets and the ends of the blankets will be anchored in trenches in the riverbank. An undetermined number of trees will also be removed along various locations for Phase 3C, as some are located too close to the floodwall and levee.

Approximately 6.9 acres for Phase 3A and 0.62 acres for Phase 3C will require clearing for the project. Generally these areas are described as a mature bottomland hardwood forest. Phase 3A also falls within a riparian zone along the White River. The ETL also recommends the removal of all roots 0.5 in or greater in diameter. This will be accomplished for vegetation within 15 ft of the toe of the levee or face of the floodwall.

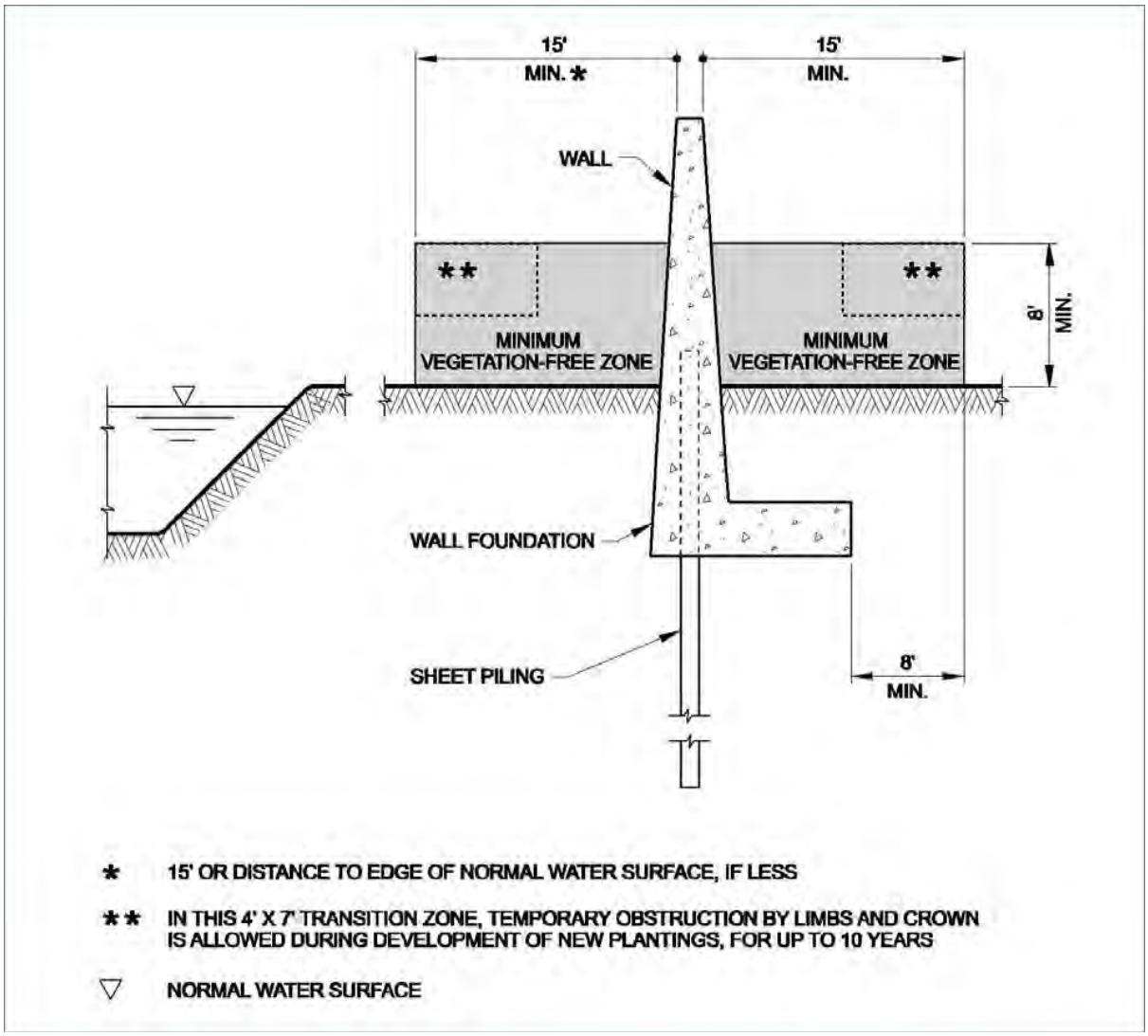
As described above, this alternative and Proposed Action would meet all of the requirements stated in ETL 1110-2-571 (USACE 2009) and allow for the project's inclusion into the Corps' RIP program. It would also meet all of the technical requirements for issuance of a LOMR by FEMA.

Figure 22. Levee, Minimum Vegetation Free Zone.



Note: Illustration from Chapter 6, ETL 1110-2-571 (USACE 2009).

Figure 23. I-Wall, Minimum Vegetation Free Zone.



Note: Illustration from Chapter 6, ETL 1110-2-571 (USACE 2009).

4.0 ENVIRONMENTAL MITIGATION

The recommended plan of the 1996 GRR and EIS indicated that the Corps and the City of Indianapolis would implement environmental mitigation for the entire project at two locations. One mitigation area involved the planting of 14 acres of trees on an existing open grass field along the west bank of the White River in downtown Indianapolis between the Indianapolis Zoo and Riley Park. The other mitigation site entailed the planting of aquatic wetland species in a 15-acre shallow lake named Lake Sullivan. This site was located along N. White River Parkway W. Drive, south of U.S. Interstate 65.

Unfortunately, circumstances forced the elimination of both mitigation sites from the project. Since preparation of the 1996 GRR and EIS, Indy Parks Greenways, now known as the Greenways Foundation, prepared a Master Plan which included future development of the west

bank of the White River. This development involved the construction of a trail from the Indianapolis Zoo to 10th Street with riverbank and bridge improvements along the way. The trail crossed property originally designated for the downtown mitigation site of the project.

The Greenways Foundation intended the site to be planted with ornamental trees and shrubs allowing a view of the river and downtown area from the Greenways trail. Since mitigation on the project required a forested area for wildlife habitat, the Corps agreed to cancel use of the downtown site for environmental mitigation.

Years of siltation at Lake Sullivan, the second environmental mitigation site, greatly reduced its size and depth. The City of Indianapolis decided to drain Lake Sullivan and allow for the natural flow of the creek to enter the property. Because of the changed site conditions, the Corps was unable to plant the intended aquatic species for mitigation purposes.

Corps' regulations permit the acquisition and management of lands, such as bottomland hardwood forests, to mitigate for the loss of biological productivity resulting from its projects. The local sponsor, the City of Indianapolis, is required to provide all real estate associated with a project including mitigation lands. They will acquire suitable property, in agreement with the Corps and, most desirably near the project, within the White River basin to fully compensate for the loss of habitat associated with construction of the project. The fair market value and related cost of any property acquisition would be credited towards the City's cost share of the project. The property would be purchased in fee and contain deed restrictions to designate its use for wildlife habitat and mitigation. Indianapolis Parks and Recreation would manage and maintain the property for such use. The recommended mitigation for this project is presented in Section 8.0. **Table 2** shows the acreage of bottomland hardwood forest impacted by the project for each Proposed Action.

Table 2. Total Acreage of Forest Impacted by the Indianapolis North Flood Damage Reduction Project.

Phase 3A Vegetation Clearing (Proposed Action)	6.9 acres	6.9 acres
Phase 3C Vegetation Clearing (Proposed Action)	0.62 acres	0.62 acres
Phase 3B Levee Alignment Vegetation Clearing	6.84 acres (Kessler Blvd to Citizens Water Canal)	5.05 acres (Kessler Blvd to Riviera Club)
Phase 3B Alignment (Proposed Actions)	2.81 acres (Westfield Boulevard Alternative)	0.54 acres (56th Street Alternative-Illinois Street Variation)
Total:	**17.17 acres**	**13.11 acres**

5.0 AFFECTED ENVIRONMENT

5.1 Physiography, Topography, Geology, Soils, and Climate

The White River basin cuts across various topographic and physiographic regions in Indiana ranging from broad, flat uplands in the upstream portion of the basin, to high hills with uneven ridges and canyon-like gorges, to flat-bottom valleys in the central section, and finally to wide meandering floodplain bottomlands in the lower section (USGS 1998). Elevations across this distance vary between 500 and 1500 ft NGVD.

Specifically, the project is located within the Eastern Corn Belt Plains Eco-region (**Figure 24**), a generally flat and featureless plain with low gradient streams that were laid down during the Wisconsian glaciation (USGS 1998). In particular, the project lies on materials of the Cartersburg Till Member of the Trafalgar Formation. These materials, including outwash sand and gravels, and end moraines such as the Crawfordsville and Knightsville Moraines, were laid down by glaciers from the northeast and south-central Indiana around 20,000 to 21,000 years ago. The thickness of the glacial deposits in the study area range from 10 to 200 ft. They overlay various bedrock deposits of limestone, dolomites, shale from the Devonian, Silurian and Mississippian ages (Gutschick 1966).

Soils within the various alternatives of Phase 3B Alignment and Phase 3A and 3C vegetation clearing belong to the Genesee-Sloan association, and are characterized as deep well drained and very poorly-drained, nearly level soils formed in loamy alluvium. Along the floodplains of the White River, the Genesee series are well-drained soils (Sturm and Gilbert 1978; USACE 1996). Outside of the metropolitan area, the soils are suited for beech, oak-sugar maple, and elm-ash swamp forests; much of the land base is used for corn, soybean, and livestock production. This region receives between 36 and 43 inches of annual rainfall. Temperatures range from lows in the 20° Fahrenheit (F) during January to highs near 90° F in July (USGS 1998).

5.2 Floodplains

The project is located within the floodplain of the White River (**Figure 25**). The left descending bank is almost completely developed for commercial, residential and municipal use, save for a band of bottomland hardwoods along the river and the small wooded or grassy areas in the vicinity of the Freidman Park, Riviera Club and Butler University. It is fairly level with small hills and stream terraces that offer some topographic variation. The right descending bank of the White River is much more wooded and contains fewer residences, but is at higher elevation and is not within the area of protection for the project.

Figure 24. The Eco-Regions of Indiana.

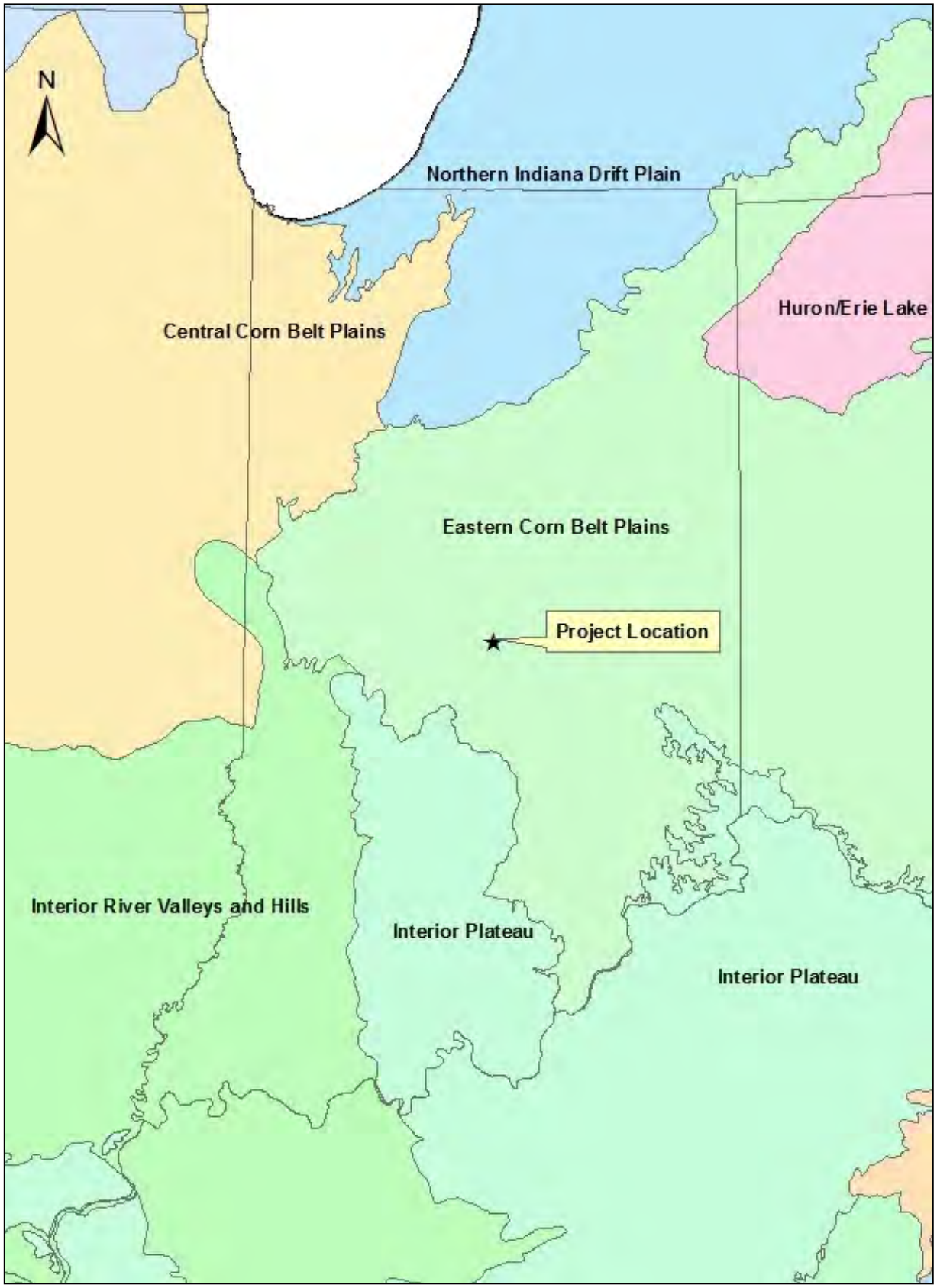
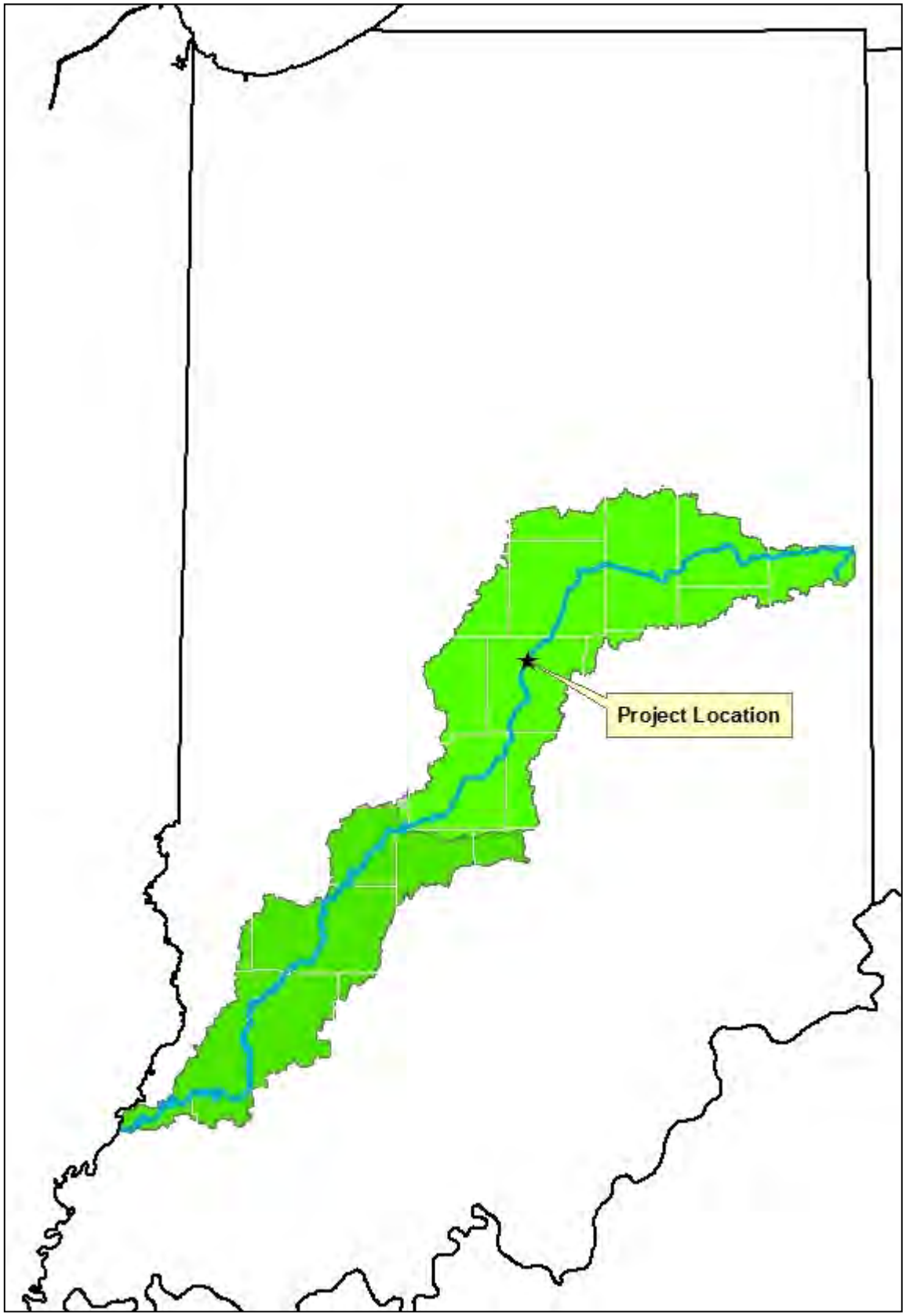


Figure 25. The West Fork of White River.



5.3 Water Quality

The White River is a tributary of the Wabash River. It extends upstream from the project in a general northeastwardly direction to its headwaters along the Ohio border, and confluences downstream from the project with the Wabash River in southwestern Indiana near the city of Mt. Carmel, Illinois. In all, the White River basin encompasses approximately 13,249 square miles (see **Figure 25**).

The various alternatives of Phase 3B Alignment and Phase 3A and 3C vegetation clearing follow the White River from Kessler Boulevard at river mile 240.8 downstream to Butler University near river mile 239.3. The drainage area of the White River at this site is about 1265 square miles. Other tributary sub-basins of the White River in Marion County, and their respective drainage areas, include Williams Creek (22.2 square miles); Crooked Creek (20.1 square miles); Fall Creek (318 square miles); Eagle Creek (210 square miles); Pogues Run (9 square miles); Pleasant Run (21 square miles); Lick Creek(26 square miles); and Little Buck Creek (17 square miles). There are no impoundments on the White River itself, but they do exist on some of its tributaries, namely Eagle Creek (Eagle Creek Reservoir), Fall Creek (Geist Reservoir), and Cicero Creek (Morse Reservoir). None of these streams enter the White River within the project.

In the 2008 303(d) Report published by the Indiana Department of Environmental Management (IDEM), the White River within Marion County is reported as impaired due to mercury and polychlorinated biphenyl (PCB) contamination in fish tissue. This listing continued in the 2010 IDEM 303(d) listing of impaired waters.

The Citizens Water Canal, is also located within and/or near the project. The canal, which is fed by the White River at Broad Ripple intake structure and flows back into the White River in downtown Indianapolis, is used by the City as a source for municipal water supply. The average depth of the canal is three feet in the upper section near the Broad Ripple intake structure and may reach a depth of four feet with concrete-lined sections further downstream and within downtown Indianapolis (Hagan 2008). Citizens Water has dredged the canal in the past to maintain water depths and remove siltation.

IDEM has historical water quality data for the canal dating back to 1991. Dissolved oxygen (DO) levels have ranged from 16.6 milligrams per liter (mg/l) in January 1992 to a minimum of 5.5 mg/l in August 2002. **Table 3** shows additional trend data for other water quality parameters measured in the canal. During the period of collection between March 1991 and December 2008, DO levels remained above the state minimum 4.0 mg/l requirement. Measured solvency of hydrogen ions, or pH levels, has also stayed within the accepted range of 6 to 9. None of the recorded water temperatures exceeded allowable state levels for that month (Bell 2009; Indiana Administrative Code 2009).

Table 3. State Water Quality Data for Citizens Water Canal, 1991-2008. (Source: Bell 2009)

Parameter	Average	Maximum	Minimum	Mode
Dissolved Oxygen (mg/l)	9.8	16.6 (1/1992)	5.5 (8/2002)	9.9
Water Temp (^{0}C)	14.1	30.02 (7/1991)	0.1 (2/2007)	23.5
pH Levels	7.99	8.6 (3/2001)	6.98(4/1992)	8.1
Specific Conductivity (us/centimeter)	731.73	1240 (11/1999)	305 (6/2002)	527

5.4 Aquatic Resources

5.4.1 Fish

The White River varies in width through the project between 150 to 200 ft and has a diverse fishery. Common game fish include largemouth (*Micropterus salmoides*), smallmouth (*M. dolomieu*) and spotted bass *(M. punctulatus*), white and black crappie (*Pomoxis annularis, P. nigromaculatus*), rock bass (*Ambloplites rupestris*), and a variety of sunfish (*Lepomis* spp). Other common fish species include yellow and black bullhead (*Ameiurus natalis, A. melas*), channel catfish (*Ictalurus punctatus*), stonerollers (*Campostoma* spp), shiners (*Notropis* spp), gizzard shad (*Dorosoma cepedianum*) silverjaw minnow (*Ericymba buccata*), grass pickerel (*Esox americanus*), and carp (*Cyprinus carpio*) (USACE 1996). As reported in historic documentation (USFWS 1992, 1995) and previous correspondence with US Fish and Wildlife Service (USFWS), the river provides a diversity of habitat to enhance the fishery—a forested riparian corridor, primarily intact though narrow in some locations; detritus and temperature regulation within the stream; undercut banks; and pool-riffle sequences. Thus USFWS has described the White River as a "high quality fishery."

Fish community assessments completed in September 1996 by IDEM in the Rocky Ripple area of the White River show the total Index of Biological Integrity (IBI) score to be 48. This would classify the fish assemblage as "good", meaning there is decreased species richness, specifically of intolerant species; however, sensitive species are present in the assemblage. Twenty-one different species were represented in the assessment; sunfish represented sixty percent of the total catch. The Qualitative Habitat Evaluation Index (QHEI), which determines the available habitat for potential biological community structure rated this site 84 out of a possible 100. Thus the higher the score, the more diversity and better quality of habitat is available. IDEM has determined through years of data collection that a rating below 51 represents poor habitat, which could have a negative effect on biological communities (Sobat 2009).

The Citizens Water Canal is approximately 50 ft wide through the project. Algae and other aquatic vegetation are prevalent in the canal waters. However, limited shading, shallow water depth, and a lack of diverse aquatic vegetation inhibit its use for various fish and macroinvertebrates. There are no fish consumption advisories for the Citizens Water Canal (Stahl 2009).

5.4.2 Benthic Invertebrates

Benthic invertebrates are bottom dwelling organisms that are relatively sedentary and reflect the physical and chemical characteristics of their environment. The invertebrates thus reflect the overall ecological integrity and are indicative of environmental conditions of the waters. They serve as an important forage base for fish and other fauna.

The 2008 303(d) IDEM Report listed the White River's biotic community as impaired (IDEM 2008). However, there appears to be a sufficient benthic community to support the river's fishery. There are no impairments listed for the Citizens Water Canal.

5.5 Wetlands

The 1996 GRR and EIS reported one potentially jurisdictional wetland within the project. The site was located near the south end of the Rocky Ripple Alternative and outside of the project limits. However, a telephone conversation on 11 August 2011 with the USFWS, Bloomington, Field Office reported no known wetlands at this location.

National Wetland Inventory (NWI) maps depict a linear wetland area on the east side of the White River and near the Phase 3B Levee Alignment. This wetland is reported to be just north of Kessler Boulevard extending downstream to the Riviera Club property, where the river meanders to the west around the Town of Rocky Ripple and away from the canal. While shown as a NWI wetland, site conditions did not indicate it was jurisdictional per existing Corps guidance. No other wetlands have been identified or reported within any of the other alternatives of the Phase 3B Alignment.

5.6 Terrestrial Resources

Although the proposed project is located in an urban area, forested habitat remains in proximity to the White River. All of the bottomland hardwood forest between the levee and the river for Phases 3A and 3C is mature with many trees ranging from 60 ft to 80 ft in height or more and from 12 inches to greater than 36 inches dbh (diameter @ breast height) depending upon the species. The entire length of Phase 3A falls within a riparian zone of the White River. Much of the Phase 3B Alignment from Kessler Boulevard to the Citizens Water Canal is also covered in mature bottomland hardwood forest with a riparian habitat while the Proposed Actions and alternatives are more fragmented with large trees and shrubs separated by buildings, roads and landscaped yards.

Common tree species in the area include cottonwood (*Populus deltoides*), black willow (*Salix nigra*), sycamore (*Plantanus occidentalis*), silver maple (*Acer saccharinum*), oaks (*Quercus* spp), box elder (*Acer negundo*), black locust (*Robinia pseudoacacia*), black walnut (*Juglans nigra*), buckeye (*Aesculus* spp.) and ash (*Fraxinus* spp). Two non-natives, bush honeysuckle (*Lonicera* spp.) and wintercreeper (*Euonymus fortunei*) dominate the densely vegetated shrub and groundcover layers respectively while another invasive non-native, Tree of Heaven (*Ailanthus* altissima), is common along the edges of wooded areas. Sumac (*Rhus* spp.) and poison ivy (*Toxicodendron radicans*) are the two most common native species in the shrub layer. Poison ivy may occur as a shrub, vine or groundcover which helps it survive even with the dominance of non-native species in these vegetative layers.

Common wildlife species include opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), fox and gray squirrels (*Sciurus niger, S. carolinensis*), white-tailed deer (*Odocoileus virginianus*), bats and various other small mammals, reptiles, and amphibians. The relatively intact tree canopy within the riparian zone, though narrow, provides suitable habitat for a variety of bats and songbirds especially neotropical migrants or songbirds. Great blue herons and migratory waterfowl are frequently seen in and along the river.

However, limited studies of the animal biomass within the Citizen Water Canal suggest a diverse number of turtles within the Phase 3B Alignment, particularly along the Westfield Boulevard Alternative (Ryan et al. 2008).

5.7 Threatened and Endangered Species

The U.S. Fish and Wildlife Service reports one endangered species, the Indiana bat (*Myotis sodalis*), as occurring in Marion County and likely to occur within the proposed project area. Indiana bats hibernate in caves in winter, and then disperse to reproduce and forage in spring and summer, in relatively undisturbed forested areas usually associated with water resources. Recent research has shown that they will inhabit fragmented landscapes with adequate forest for roosting and foraging. Their young are raised in nursery colony roosts in trees, typically near drainage ways in undeveloped areas.

The USFWS Indiana Bat Recovery Plan (2007) provides a summary of the characteristics of typical habitat for a summer maternity colony den tree or primary roost. Individual Indiana bats have been found roosting in many types of trees and situations, but it is possible to summarize the essential characteristics of a typical primary roost. A typical primary roost is located under exfoliating bark of a dead ash, elm, hickory, maple, oak, or poplar, although any tree that retains large, thick slabs of peeling bark probably is suitable. Average diameter of maternity roost trees is 18 inches and average diameter of roosts used by adult males is 13 inches. The height of the trees (snags) is greater than 10 ft, but the height of the roosting tree is not as important as height relative to surrounding trees and the position of the snag relative to other trees, because relative height and position affect the amount of solar exposure. Primary roosts usually receive direct sunlight for more than half the day. Access to the roost site is unimpeded by vines or small branches. The tree is typically within canopy gaps in a forest, in a fence line, or along a wooded edge. Primary roosts usually are not found in the middle of

extensive open fields but often are within 50 ft of a forest edge. Primary roosts usually are in trees that are in early-to-mid stages of decay.

There are numerous trees fitting the characteristics for primary roost sites for the Indiana bat along the White River and within the project. In addition, there are current records of the Indiana bat within a few miles of the project. Therefore it is very likely that the Indiana bat uses the riparian forests within the area covered by the three phases of the Project as summer habitat.

5.8 Recreation

The White River and Citizens Water Canal provide a variety of recreational activities within the project. A towpath trail adjacent to the canal provides walking, jogging, and biking opportunities for local residents. The Riviera Club property, which includes a section of the Phase 3B Alignment, also provides organized recreational opportunities with a paid membership. The club's amenities include tennis courts, swimming pool, picnic shelters and tables, playgrounds, horseshoe pits, outdoor basketball courts, a fitness center, a gymnasium, and a ballroom. In the most downstream portion of the project lies Butler University which has athletic ball fields, a jogging track and landscaped gardens (Holcomb Garden) for university staff, students and visitors.

5.9 Cultural Resources

The project has a long history of consultation under Section 106 of the National Historic Preservation Act (NHPA), and significant cultural resources are located near or within its limits. The following is a summary of this consultation and the resources identified within its limits.

An assessment of archaeological resources affected by the entire Indianapolis North Flood Damage Reduction Project was conducted in 1994 by Dr. Bob Jeske and Mr. Larry Stillwell of Indiana University-Purdue University at Fort Wayne (Jeske and Stillwell 1995). A total of 179 acres were surveyed along the length of the project using a variety of field techniques such as a walkover inspection, shovel probes, bucket augering, and backhoe trenching. Nine archaeological sites were identified during the investigation, predominately in the Phase 3B/South Warfleigh section of the project between the Riviera Club and the Town of Rocky Ripple. They included archaeological sites 12Ma: 628, 629, 630, 631, 632, 633, 634, 635 and 636. Six of these (12Ma: 630, 631, 632, 633, 634, and 635) were recommended for a Phase II Archaeological Testing of Significance, while the remainder (12 Ma: 628, 629 and 636) were considered ineligible for listing to the National Register of Historic Place (NRHP). A meeting in June of 1995 between representatives of the Corps and Indiana State Historic Preservation Office (IN SHPO) identified an additional archaeological site, referred to as the "Formal Garden Site". It was also recommended for additional investigations. However due to the withdrawal of the Town of Rocky Ripple, and changes to the Phase 3B Alignment, the affects to these archaeological resources were completely avoided.

Consultation for a new alternative to complete the Phase 3B Alignment was initiated on October 24, 2008 prior to the submittal of the EA. This alternative was subsequently identified in the 2012 DSEIS, and this FSEIS, as the Westfield Boulevard Alternative. The Corps identified no cultural resources within the alternative based on a review of existing documentation. However, in a response letter dated 20 November 2008, the IN SHPO recommended a reconnaissance level archaeological survey to determine its effects to previously unidentified archaeological resources. They also asked for information on the alternative's design and scope to establish the area of potential effect beyond its construction limits.

A visual site reconnaissance of Westfield Boulevard Alternative was undertaken by the Corps on 4 March 2009 to access the potential effects to above-ground historic properties. Several historic properties were noted at this time, including a National Historic Landmark (Hinkle Fieldhouse at Butler University, Site #: 097-296-11140), a historic property listed on the NRHP (Butler University Historic District, Site #: 097-296-18001-042) and another considered eligible for the NRHP by the National Park Service's Keeper of Register on 24 April 1985 (the Citizens Water Canal, also known as "Indianapolis Central Canal") (**Figure 26**), and some private residences in the Town of Rocky Ripple (the Karstadt House-341 Ripple Avenue, Site #: 097-296-05977 and a single family dwelling- 337 Ripple Avenue, Site #: 097-296-05976). Consultation on the affects to these historic properties is ongoing.

A Phase I archaeological survey of the Westfield Boulevard Alternative was conducted by the Corps in April of 2009. Approximately 4300 ft were examined as a part of the investigation resulting in the discovery of two previously unrecorded archaeological sites, designated as 12Ma947 and 12Ma948. Significant soil disturbance was also noted within the project along the Citizens Water Canal and towpath, likely related to its construction and maintenance over the years. Neither were considered eligible for listing the NRHP, and thus no further work was recommended (Snell and Snyder 2009).

Several comments were received from the public, local communities, individual property owners and businesses, and government agencies in regards to the cultural resources and the various alternatives of the Phase 3B Alignment presented in 2012 DSEIS. Much of these centered on the historical significance and value of Citizens Water Canal and the Holcomb Gardens, a 1950 garden designed by Indianapolis Landscape Architect A.W. Brayton and considered a contributing resource to the Butler University Historic District.

The IN SHPO presented comments on the 2012 DSEIS and Proposed Actions in a letter dated 13 August 2012. In addition to providing detailed comments on the above cultural resources and historic properties (the Indianapolis Central Canal, Hinkle Fieldhouse, etc.), they noted that there may be an effect on the Holcomb Garden, the potential extension of previously identified Butler-Fairview Historic District to the Westfield Boulevard Alternative, and two potential historic districts in the Warfleigh area opposite the completed Phase Clearing on Phases 3A and 3C, the IN SHPO only asked for the age of the current levee along Riverview Drive. They concurred with our conclusions that the two archaeological resources 3A/Warfleigh Section of the project. In regards to the Proposed Action for the Vegetation

Figure 26. The Citizens Water Canal (a. k. a. Indianapolis Central Canal).

identified within the Westfield Boulevard Alternative as being ineligible for listing to the NRHP. However, six archaeological sites affected by the Rock Ripple Alternative will either need to be avoided or require additional investigations to determine their eligibility for listing to the NRHP. The IN SHPO further stated that it is looking forward to further consultation.

A full assessment of the Illinois Street Variation and its affects to the cultural resource and historic properties will be performed prior to the construction of the Proposed Action for the Phase 3B Alignment, including a field survey, analysis, and report of findings. All information will be provided to and coordinated with the City of Indianapolis, the IN SHPO, ACHP, and other consulting parties. No construction of the Phase 3B Alignment will commence until the after the conclusion of the consultation under Section 106 of the NHPA with either the signing of a MOA or a determination of 'no adverse affect" to historic properties.

5.10 Hazardous, Toxic, and Radiological Waste

No hazardous substance concerns were identified by the Corps during site investigations of the project and its various alternatives. These investigations did not reveal evidence of metal container drums, lagoons, or buried waste, including underground storage tanks. Further, Corps

staff did not identify any soil disturbances or stressed vegetation. Finally, Corps staff did not identify any electrical equipment that may contain polychlorinated biphenyls (PCBs) during the field reviews.

The Environmental Protection Agency (EPA) Envirofacts database was examined by the Corps to identify and evaluate, to the extent possible, whether current and/or past activities on or near the study area represent any concern. Query results for the Proposed Actions showed no facilities reported.

5.11 Socioeconomic

Ninety one percent of the population of Marion County, Indiana lives within the Indianapolis metropolitan area. Both the county and city experienced a population growth between 2000 and 2006; however, the rate of growth (0.5/0.6% respectively) has not been as high as the 3.8% for the state (US Census Bureau 2008). Population statistics are shown in **Table 4**. Economic figures for city, county, and state residents are shown in **Table 5**. Both Marion County and Indianapolis median income ranks less than the state average. The percent below poverty level for Indianapolis is slightly higher than the state average; Marion County is 3% higher. The most prominent industry in both Indianapolis and Marion County for employment is education, healthcare, and social assistance services; manufacturing ranks second for both areas. For Marion County, the third leading employment industry is wholesale trade; for Indianapolis this supplier is professional, scientific, and management and administrative and waste management services. This variance is likely due to city government and universities/higher learning institutions.

Table 4. Population Data for the Project Area

	2006 Population Est. (% change from 2000)	Persons per sq mi (2000)
Indiana	6,313,520 (+3.8)	169.5
Marion County	865,504 (+0.6)	2172.9
Indianapolis	785,597 (+0.5)	2163.0
Data obtained from US Census Bureau website		

Table 5. Economic Data for the Project Area

	2004 Median Household Income	Persons Below Poverty Level (%)
Indiana	$43,217	11.1 (2004)
Marion County	$42,702	14.1 (2004)
Indianapolis	$40,051	11.9 (1999)
Data obtained from US Census Bureau website		

5.12 Land-use/Aesthetics

The surrounding area is primarily used for residential purposes with segments of commercial activities along major streets and thoroughfares. Utilities (overhead power lines and underground water, gas and sanitary sewer pipes) are located primarily along road right-of–ways and criss-cross the various residential communities and businesses. Public areas -including parks, schools, Butler University, the Citizens Water Canal and several trails related to the Greenways Foundation - are also within or near the project. Mature bottomland hardwoods such as silver maple, cottonwood, and sycamore line the White River and provide shade for the pathways, bridges, gardens, accesses and park-like green spaces scattered throughout the area. Thus the area covered by the Proposed Actions are a popular location for recreational activities such as hiking, biking, boating and watching wildlife.

5.13 Transportation

Primary roads within the project include Riverview Drive, Illinois Street, College Avenue and Kessler Boulevard (which provides access across the White River and Citizens Water Canal), 52nd Street, 53rd Street, 56th Street, and Westfield Boulevard (which parallels the Citizens Water Canal). There are also numerous residential streets and corridors within the project.

5.14 Air Quality

In compliance with Clean Air Act (CAA), as amended, the US Environmental Protection Agency (EPA) has promulgated ambient air quality standards and regulations. National Ambient Air Quality Standards (NAAQS) were enacted for protection of public health and welfare. To date, EPA has issued NAAQS for the following criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO2), particulate matter 10 micron (PM10), particulate matter 2.5 micron (Fine Particles), ozone (O3), nitrogen dioxide (NO2), and lead (Pb). Areas below standards are "attainment," while those that equal or exceed standards are "non-attainment."

Air quality standards are set at levels to protect public health. Monitoring is conducted to assure compliance of those standards. The City of Indianapolis measures gaseous pollutants (CO, O3, SO2) 24 hours a day, 7 days a week. Particulate type of pollutants (Fine Particles, PM10, Pb) are collected over a 24 hour period and measured once every day (Fine Particles) to every 6th day (PM10 and Pb) (Indianapolis Department of Public Works [IDPW] 2009).

Air Quality Index (AQI) is a national standard for reporting air quality. Air quality is determined by measuring 4 pollutants: carbon monoxide, sulfur dioxide, fine particulates and ozone. AQI translates each pollutant measurement to a common index, where a score of 100 equals the Federally established limit. An AQI score from 1 to 50 is good quality; 51 to 100 is moderate quality; and 101 to 150 are unhealthy for sensitive groups (IDPW 2009).

According to Indiana Ozone Nonattainment Design, as of 8 May 2008, Marion County was an attainment area, meaning that concentrations of one or more criteria pollutants did not exceed Federal air quality standards, and had a maintenance plan in place. (IDEM 2008).

However, in 2008, EPA revised the criteria for ozone by lowering the threshold. With this change, Marion County is now a nonattainment area. Monitored ozone concentrations have trended downward in Marion County since 2002 and the state expects this trend to continue with the adoption of new Federal and state regulations. Based on its historical monitoring, Indiana has requested that EPA re-designate Marion County as an attainment area and classify it as a maintenance area for the revised ozone standard, meaning a maintenance plan will be implemented (IDEM 2008).

Currently, Marion County has a Lead (Pb) Maintenance Plan for implementation upon approval. The County's Fine Particles rating is non attainment based on 2005-2007 data; however the rating is within attainment limits for 2006-2008 data (IDEM 2008).

6.0 ENVIRONMENTAL CONSEQUENCES

The environmental consequences for the Alternatives and Variations of the Phase 3B Alignment and the Phase 3A and 3C Vegetation Clearing are discussed below.

6.1 Physiography, Topography, Geology, Soil Types, and Climate

6.1.1 No Action (Phase 3B Alignment)

Adoption of this alternative continues the original plan evaluated and approved in the 1996 GRR and EIS. Soil necessary to build up the existing ground surface would be brought on-site from a previously approved borrow location, and sloped to grade as necessary. There could be some sediment erosion resulting from this action, but such would be limited in time and extent. However, there would be no significant impacts to the physiography, topography, geology, soil types, or climate with selection of a No Action Alternative for the Phase 3B Alignment.

6.1.2 Rocky Ripple Alternative

While there would be need for additional cubic yards of suitable soil for construction of this alternative and the need to remediate areas of poor soils, there will be no significant impacts to the physiography, topography, geology, soils types, and/or climate resulting from the alternative.

6.1.3 56th Street Alternative – including Variation (Proposed Action)

There would be no significant impacts to the physiography, topography, geology, soil types, and/or climate resulting from the variations and Proposed Action. Prior to its construction, soil tests would be conducted across the length of the Proposed Action to ensure it is suitable for erecting the project. The sheet piling would then be driven into the ground to a depth adequate for stability, typically a minimum ratio of 2:1 below ground to above ground height. If additional soil is necessary to build up the existing ground line, material would be

brought onsite from a previously approved borrow location, and sloped to grade as necessary. Any ongoing erosion or deposition of soils due to the White River exceeding its banks would continue.

6.1.4 Westfield Boulevard Alternative - Including Variations (Proposed Action)

There would be no significant impacts to the physiography, topography, geology, soil types, and/or climate resulting from the variations or Proposed Actions. Prior to its construction, soil tests would be conducted across the length of the Proposed Actions to ensure it is suitable for erecting the project. The sheet piling would then be driven into the ground to a depth adequate for stability, typically a minimum ratio of 2:1 below ground to above ground height. If additional soil is necessary to build up the existing ground line, material would be brought onsite from a previously approved borrow location, and sloped to grade as necessary. Any ongoing erosion or deposition of soils due to the White River exceeding its banks would continue.

6.1.5 No Action (Phase 3A and 3C Vegetation Clearing)

There would be no significant impacts to physiography, topography, geology, soil types, or climate with selection of a No Action Alternative for the Phase 3A and 3C vegetation clearing. The existing trees would remain and additional tree clearing would not take place.

6.1.6 Vegetation Variance 20 Feet from Levee Crown

The proposed vegetation clearing variance would result in the conversion of approximately 2.63 acres along Phase 3A and 0.44 acres along Phase 3C from mature bottomland hardwood forest with a riparian habitat to an open short grass landscape. Tree and vegetation removal from this alternative would result in no significant changes to physiography, topography, geology, soil types, or climate.

6.1.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

The Proposed Action would clear trees and other vegetation from the levee's slopes and to a distance measuring approximately 15 ft from toe of the levee and/or the face of the floodwall. Approximately 1,140 LF of the 7,600 ft length of the Phase 3A/Warfleigh Section (or 15% of its total length) would be cleared and grubbed to the White River's edge, totaling 6.9 acres. The cleared areas along Phase 3A would be replaced with grasses. An undetermined number of trees will also be removed for Phase 3C, as some are located too close to the floodwall, totaling 0.62 acres. In any case, this clearing would not change the topography, geology, soil types, or climate of the area.

6.2 Floodplains

Completion of the project under any of the alternatives for the Phase 3B Alignment would reduce the floodplain area available for flood storage. Construction of the Rocky Ripple

Alternative would have the greatest impact in reducing the floodplain among those alternatives considered in the FSEIS, while construction of the 56th Street Alternative-Illinois Street Variation would have the least. The No Action Alternative for the Phase 3B Alignment would allow a portion of the City of Indianapolis to remain in the floodplain and provide flood storage, albeit in a heavily developed area.

The presence of trees and other vegetation within the outer portion of the vegetation free zone for Phase 3A and 3C of the project would decrease the flow of the White River during any potential high water event, based on the assumptions of Manning's Equation, an empirical formula used for calculating open channel flows driven by gravity. Reducing river velocities near the current levee and I-Wall would ease the potential effects of scour and wave-wash. The proposed tree removal for either alternative would not otherwise impact the floodplain. The No Action Alternative for the Phase 3A and 3C vegetation clearing would simply allow the existing trees to remain in place.

6.3 Water Quality

6.3.1 No Action (Phase 3B Alignment)

Adoption of this alternative continues the original plan evaluated and approved in the 1996 GRR and EIS with construction of the Phase 3B Alignment to the south of the Riviera Club property. The same water bodies would be impacted as those of the Proposed Actions. Impacts possible from sedimentation and erosion would be limited in time and extent. The water quality of the White River and the Citizens Water Canal would not be permanently impacted and remain within acceptable state levels for DO, pH and temperature. It is not anticipated that Section 401 Water Quality Certification from IDEM would be required. Compliance with Section 404 of the Clean Water Act is also required for the project.

6.3.2 Rocky Ripple Alternative

Temporary impacts to water quality could occur during the construction of the alternative. Installation of the canal gate structure near Butler University would require a dewatering of the crossing site, and a diversion of water flowing into the canal. Upon the project's completion, the canal gate structure would remain open and only be used during flood events. Additional temporary impacts to water quality could occur from the construction of the floodwall around the Town of Rocky Ripple. This could include sedimentation and erosion associated with land clearing activities and structural razing. Removed vegetation would be replaced with grasses adjacent to the floodwall while deep-rooted vegetation would be permitted only between the limits of the easement and canal and/or in accordance with the ETL 1110-2-571 (USACE 2009).

The water quality of the Citizens Water Canal and White River is not likely to be impacted and is expected to remain within acceptable state levels for DO, pH and temperature. Impacts possible from run-off sedimentation and erosion would be limited in time and extent. Implementation of Best Management Practices (BMPs) would further reduce any impacts to

water quality. A list of BMPS that would be implemented for the alternative is included in the **Appendix B**.

Compliance with Sections 401 and 404 of the Clean Water Act would be required and obtained if this alternative were implemented.

6.3.3 56th Street Alternative – Including Variation (Proposed Action)

Temporary impacts to water quality could occur during the construction of the alternative and Proposed Action. Installation of the canal gate structure directly across from the Riviera Club would require a dewatering of the crossing site, and a diversion of water flowing into the canal. Upon the project's completion, the canal gate structure would remain open and only be used during flood events. Additional temporary impacts to water quality could occur from the construction of the floodwall between the canal and Westfield Boulevard. This could include sedimentation and erosion associated with land clearing activities and a loss of shade from the canal. Removed vegetation would be replaced with grasses adjacent to the floodwall while deep-rooted vegetation would be permitted only between the limits of the easement and canal and/or in accordance with the ETL 1110-2-571 (USACE 2009).

The water quality of the canal is not likely to be impacted and is expected to remain within acceptable state levels for DO, pH and temperature. Impacts possible from run-off sedimentation and erosion would be limited in time and extent. Implementation of BMP would further reduce any impacts to water quality. A list of BMP's is included in **Appendix B**. An application for Indiana State Water Quality Certification pursuant to Section 401 of the Clean Water Act will be sought prior to, but no earlier than one year before, the initiation of the project's construction. Compliance with Section 404 of the Clean Water Act is also required for the project.

6.3.4 Westfield Boulevard Alternative – Including Variations (Proposed Action)

Temporary impacts to water quality could occur during the construction of the variations and Proposed Action. Installation of the canal gate structure directly across from the Riviera Club would require a dewatering of the crossing site, and a diversion of water flowing into the canal. Upon the project's completion, the canal gate structure would remain open and only be used during flood events. Additional temporary impacts to water quality could occur from the construction of the floodwall between the canal and Westfield Boulevard. This could include sedimentation and erosion associated with land clearing activities and a loss of shade from the canal. Removed vegetation would be replaced with grasses adjacent to the floodwall while deep-rooted vegetation would be permitted only between the limits of the easement and canal and/or in accordance with the ETL 1110-2-571 (USACE 2009).

The water quality of the canal is not likely to be impacted and is expected to remain within acceptable state levels for DO, pH and temperature. Impacts possible from run-off sedimentation and erosion would be limited in time and extent. Implementation of BMP would further reduce any impacts to water quality. A list of BMP's is included in **Appendix B**. An

application for Indiana State Water Quality Certification pursuant to Section 401 of the Clean Water Act will be sought prior to, but no earlier than one year before, the initiation of the project's construction. Compliance with Section 404 of the Clean Water Act is also required for the project.

6.3.5 No Action (Phase 3A and 3C Vegetation Clearing)

There would be no significant impacts to water quality with the selection of a No Action Alternative for the Phase 3A and 3C vegetation clearing. The existing trees would remain and additional tree clearing would not take place.

6.3.6 Vegetation Variance 20 Feet from Levee Crown

Tree and vegetation removal from this alternative would not impact water quality. Impacts from sediment and erosion would be limited in time and extent. The cleared area would then be replaced with grasses.

6.3.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

Tree and vegetation removal from this Proposed Action would not permanently impact water quality. To meet necessary requirements for levee certification, vegetation clearing of trees and shrubs would be replaced with grasses. Impacts possible from sediment and erosion would be limited in time and extent.

Compliance with Sections 401 and 404 of the Clean Water Act is also required for the Proposed Action. This Proposed Action will require placement of rip-rap along a short section of the White River riverbank. This will result in fill below the ordinary high water mark, and require certification under Section 401 of the Clean Water Act. Because this Proposed Action discharges fill material into the navigable waters of the United States, an updated analysis under Section 404 (b) (1) of the Clean Water Act is provided in **Appendix C**.

6.4 Aquatic Resources

6.4.1 No Action (Phase 3B Alignment)

Adoption of this alternative continues the acceptance of the plan evaluated and approved in the 1996 GRR and EIS with construction of the Phase 3B Alignment to the southern portion of the Riviera Club property. The primary concern would be erosion and sedimentation during construction, but as previously stated these impacts would be temporary. The same water bodies would be impacted as those of the Proposed Actions. Once construction is complete, preconstruction conditions would return.

6.4.2 Rocky Ripple Alternative

The primary impact to aquatic resources of the White River from this alternative would be the temporary erosion and sedimentation resulting from its construction. Habitation of the

canal by fish and other aquatic species is limited due to the abundance of algae and other aquatic vegetation, and the uniformly shallow depth of the waterway from previous dredging activities by the City of Indianapolis.

Any aquatic fauna encountered during the construction of the alternative would be removed from the project limits, particularly within the location of canal gate structure crossing. Potential impacts to aquatic fauna are expected to be minimal, however, since the canal is relatively low in the number of individuals and species represented. Re-colonization of affected aquatic species within the dewatered areas of the alternative would occur soon after the temporary dewatering structures were removed and the canal gate structure was completed. Therefore, the alternative would not significantly impact the aquatic resources.

6.4.3 56th Street Alternative – Including Variation (Proposed Action)

The primary impact to aquatic resources from this alternative and Proposed Action would be the temporary erosion and sedimentation resulting from its construction. Habitation of the canal by fish and other aquatic species is limited due to the abundance of algae and other aquatic vegetation, and the uniformly shallow depth of the waterway from previous dredging activities by the City of Indianapolis.

Any aquatic fauna encountered during the construction of the alternative and Proposed Action would be removed from the project limits, particularly within the location of canal gate structure crossing. Potential impacts to aquatic fauna are expected to be minimal, however, since the canal is relatively low in the number of individuals and species represented. Re-colonization of affected aquatic species within the dewatered areas of the alternative would occur soon after the temporary dewatering structures were removed and the canal gate structure was completed. Therefore, the alternative and Proposed Action would not significantly impact the aquatic resources.

6.4.4 Westfield Boulevard Alternative – Including Variations (Proposed Action)

The primary impact to aquatic resources from the alternative and Proposed Action would be the temporary erosion and sedimentation resulting from its construction. Habitation of the canal by fish and other aquatic species is already limited due to the abundance of algae and other aquatic vegetation, and the uniformly shallow depth of the waterway from previous dredging activities by the City of Indianapolis.

Any aquatic fauna encountered during the construction of the alternative would be removed from the project limits, particularly within the location of canal gate structure crossing. Potential impacts to aquatic fauna are expected to be minimal, however, since the canal is relatively low in the number of individuals and species represented. Re-colonization of affected aquatic species within the dewatered areas of the alternative would occur soon after the temporary dewatering structures were removed and the canal gate structure was completed. Therefore, the alternative and Proposed Action would not significantly impact the aquatic resources.

Access to the canal from aquatic resources would be impeded by the erection of a floodwall. However the existing Westfield Boulevard already serves as an impediment for these species. The floodwall could prevent some reptile and amphibian losses due to road kill by preventing them from moving across Westfield Boulevard.

6.4.5 No Action (Phase 3A and 3C Vegetation Clearing)

There would be no significant impacts to aquatic resources with the selection of a No Action Alternative for the Phase 3A and 3C vegetation clearing. The existing trees would remain and additional tree clearing would not take place.

6.4.6 Vegetation Variance 20 Feet from Levee Crown

The proposed vegetation clearing variance would result in the conversion of approximately 2.63 acres along Phase 3A and 0.44 acres along Phase 3C from a bottomland hardwood forest with a riparian habitat to an open short grass landscape.

While some loss of these woodlands was included in the development of the previously identified mitigation requirements (29 acres), the sixteen years that have passed since the 1996 GRR and EIS have allowed for further growth of trees and increased habitat value for wildlife. which will be considered in determining final mitigation requirements. Also the clearing and grubbing of trees and other woody vegetation would reduce the riparian forest contribution of detritus to the aquatic ecosystem; however the acreage is so small relative to the contributions of detritus materials from elsewhere in the drainage basin as to have no measurable effect on aquatic resources.

6.4.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

The Proposed Action will result in the conversion of an additional 6.9 acres along Phase 3A and 0.62 acres along Phase 3C from a bottomland hardwood forest with a riparian habitat to an open short grass landscape.

While the loss of these woodlands were included in the development of the previous mitigation requirements (29 acres), the sixteen years that have passed since the first EIS have allowed for further growth of the trees and increased habitat value for wildlife which will be considered in determining final mitigation requirements. Also clearing and grubbing of trees and other woody vegetation would reduce the riparian forest contribution of detritus to the aquatic ecosystem; however the acreage is so small relative to the contributions of detritus materials from elsewhere in the drainage basin as to have no measurable effect on aquatic resources.

6.5 Wetlands

No regulated wetlands and/or navigable waters of the United States would be impacted by the alternatives or Proposed Actions of the Phase 3B Alignment. NWI maps examined during the project indicate a wetland area designated along the east side of the White River, north of Kessler Boulevard and within the Phase 3B Alignment. This area was examined as part of the 1996 GRR and EIS and was determined to have no impact on wetlands or navigable waters of the United States .

In addition, the clearing and grubbing of trees, shrubs and other woody vegetation for Phase 3A and 3C would have no impact to regulated wetlands or navigable waters of the U.S. An analysis under Section 404 (b) (1) of the Clean Water Act is provided in **Appendix C**.

6.6 Terrestrial Resources

6.6.1 No Action (Phase 3B Alignment)

Adoption of this alternative continues the original plan evaluated and approved in the 1996 GRR and EIS with construction of the Phase 3B Alignment to the south of the Riviera Club property. A mature bottomland hardwood forest with a riparian habitat along the White River dominates the kinds of terrestrial resources impacted by this alternative, particularly between Kessler Boulevard and the Riviera Club. To meet the Corps' clearing requirements for levees and floodwalls (i.e. ETL 1110-2-571) (USACE 2009), this alternative would require the removal of approximately 5.05 acres of trees and other vegetation to the Riviera Club-Friedman Park property line, or 6.84 acres if continued onto the Citizens Water Canal. Such would have a significant impact on terrestrial species.

The loss of riparian forest was included in development of previous mitigation requirements for the 1996 GRR and EIS. In addition to increased clearing required to meet vegetation standards for the current design, the sixteen years that have passed since the 1996 EIS have allowed for further growth of trees and increased habitat values for wildlife which will also be considered in determining final mitigation requirements.

6.6.2 Rocky Ripple Alternative

Mature bottomland hardwood forest and related animal species along the White River dominate the terrestrial resources within this alternative, particularly around the Town of Rocky Ripple and Butler University property. In all, this alternative would require the clearing of approximately 14.5 acres of trees and other vegetation to meet the Corps' clearing requirements for levees and floodwalls (i.e. ETL 1110-2-571 (USACE 2009)). Such would have a significant effect on terrestrial species. Mitigation of the loss of this habitat would be required for alternative.

6.6.3 56th Street Alternative– Including Variation (Proposed Action)

Affected terrestrial resources along the 56th Street Alternative and its Illinois Street Variation range from a mature bottomland hardwood forest with a riparian habitat along the White River to sparse trees and vegetation in an urbanized setting. The 56th Street Alternative extends northeastward from the Phase 3B Alignment along the canal towpath for a short distance, until it crosses the Citizens Water Canal and Westfield Boulevard and follows the right-of-way of W. 56th Street. This alternative will require the removal of a few trees in residential and commercial areas to the east and along the northwest side of the Citizens Water Canal. This loss of terrestrial wildlife habitat will be considered in the determination of mitigation for the entire project.

The Illinois Street Variation of the alternative, which is one of the Proposed Actions for Phase 3B Alignment, extends from the White River north of the Riviera Club eastward, across Illinois Street, the Citizens Water Canal and Westfield Boulevard, terminating on high ground east of Chase Bank. As such, a mature bottomland hardwood forest and related animal species along the White River characterizes the western third of the variation, while sparse trees and other vegetation related to landscaping activities characterize the remaining two-thirds.

The total estimated area to be cleared of vegetation for the alternative and Proposed Action is approximately 0.54 acres. This loss of terrestrial wildlife habitat will be considered in the determination of mitigation for the entire project.

6.6.4 Westfield Boulevard Alternative– Including Variations (Proposed Action)

Much of the area containing the variations and Proposed Action is a maintained road right-of-way and green space between Westfield Boulevard and the Citizens Water Canal. The northernmost end of the proposed floodwall, in the vicinity of Capitol Avenue, is a narrow, open area measuring approximately 30-35 ft wide, maintained in grasses and containing very few trees. Moving downstream along the canal, or southward from Capitol Avenue to 52nd Street, the road right-of-way and green space is slightly wider and more heavily vegetated with Bush honeysuckle and Tree-of-Heaven: two non-native invasive species. At the downstream end, between 52nd Street and its termination on Butler University property, the proposed floodwall crosses another open area maintained in grasses and borders Butler University's Holcomb Gardens. The final 200 to 400 ft of the proposed floodwall ties into high ground and requires the removal of some trees and shrubs from the construction.

The largest expanse of affected trees and shrubs within the variations and Proposed Action is on Butler University property. The proposed floodwall route through this area skirts the edge of a tree line related to the University's Holcomb Gardens and then follows an existing path to high ground. But none of the trees related to Holcomb Gardens will be affected. With the exception of common species of semi-aquatic turtles and other urban wildlife, such as squirrels, the remaining areas along Westfield Boulevard and the Citizens Water Canal to the north are unsuitable for significant terrestrial resources due to the dominance of invasive non-native species, its setting and limited area between Westfield Boulevard and the canal.

The total estimated area to be cleared of vegetation for the variations and Proposed Action is approximately 2.81 acres. Although disturbance would be minimized to the greatest extent possible, it is anticipated that some wildlife will be lost due to construction activities or movement of wildlife, such as opossums and raccoons, across highways and roads. This loss of terrestrial wildlife habitat will be considered in the determination of mitigation for the entire project.

6.6.5 No Action (Phase 3A and 3C Vegetation Clearing)

No clearing and grubbing of trees, shrubs and other woody vegetation along the Phase 3A and 3C sections of the project would have no impact on terrestrial resources. This alternative would preserve about 7.52 acres of mature bottomland hardwood forest along the White River for Phases 3A and 3C.

6.6.6 Vegetation Variance 20 feet from Levee Crown

A vegetation variance for the project would result in the conversion of an additional 2.63 acres along the Phase 3A/Warfleigh Section and 0.44 acres along Phase 3C Monon-Broad Ripple Section from a mature bottomland hardwood forest to an open short grass landscape, thereby preserving 4.45 acres of vegetation from the Proposed Action. Any loss of terrestrial wildlife habitat resulting from this alternative will be considered in the determination of mitigation for the entire project.

6.6.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

The Proposed Action will result in the conversion of an additional 6.9 acres along the Phase 3A/Warfleigh Section and 0.62 acres along Phase 3C Monon-Broad Ripple Sections from a mature bottomland hardwood forest to an open short grass landscape. Such would have a significant effect on terrestrial species. Any loss of terrestrial wildlife habitat resulting from this alternative will be considered in the determination of mitigation for the entire project.

6.7 Threatened and Endangered Species

6.7.1 No Action (Phase 3B Alignment)

Adoption of this No Action Alternative continues the original plan as evaluated and approved in the 1996 GRR and EIS. Under this alternative, there would be potential loss of some summer habitat for the Indiana bat. Clearing and grubbing for the Phase 3B Levee Alignment is necessary to construct the flood protection to current standards and encompasses an area no greater than 6.84 acres (Kessler Boulevard to the southern portion of the Riviera Club). However, the destruction of larger, mature trees that could serve as roosting habitat is unavoidable.

The potential loss of habitat was included in development of previous mitigation requirements for the 1996 GRR and EIS. In addition to increased clearing required to meet vegetation standards for the current design, the sixteen years that have passed since the 1996 EIS have allowed for further growth of trees and increased habitat values for wildlife which will also be considered in determining final mitigation requirements.

The clearing will result in the loss of mature bottomland hardwood forest with multiple possible den trees suitable for maternity colonies of Indiana bats and their young. While no field surveys have been conducted in this area, the forest exhibits significant potential to provide summer habitat for the endangered Indiana bat.

The loss of such mature hardwood bottomland forest does not benefit the Indiana bat, especially at a local level, but the potential loss is insignificant when considered at a landscape scale. Summer habitat exists across all or portions of as many as 27 states in the eastern U.S. Other threats, especially White Nose Syndrome, are decimating bat populations. The loss of habitat associated with construction of the Proposed Action is unlikely to jeopardize the continued existence of the Indiana bat.

The USFWS commented in previous correspondence (USACE 1996) that the agency would not expect significant impacts to endangered species if the felling of trees greater than 3 inches dbh was avoided from 1 April through 30 September. The Corps will abide by this restriction. Further, mitigation lands would provide suitable replacement habitat to minimize impacts to the Indiana bat. Details on the project's mitigation are in Section 8.0 of this report.

The project's 30 May 2001, "Certificate of Approval, Construction in a Floodway" permit number FW-19540 from the Indiana Department of Natural Resources (IDNR), contains a Special Condition that any trees suitable for Indiana bat roosting (greater than 14 inches in dbh, living or dead, with loose or hanging bark) not be cut from 1 April through 30 September. The Corps will abide by the more restrictive of the two conditions, i.e. greater than 3 inches dbh unless otherwise permitted by the agencies involved.

6.7.2 Rocky Ripple Alternative

The Rocky Ripple Alternative would eliminate approximately 14.5 additional acres of trees. The loss of mature trees that could serve as roosting habitat for the Indiana bat is unavoidable, but is unlikely to jeopardize its continued existence. Any felling of trees >3" dbh would be avoided from 1 April through 30 September. Further details on lands considered for the project's mitigation is provided in Section 8.0 of this report. These lands will be permanently protected for use by the Indiana bat and other wildlife species.

6.7.3 56th Street Alternative – Including Variation (Proposed Action)

The 56th Street Alternative area is primarily a maintained right-of-way along the south side of W. 56th Street and southeast of Westfield Boulevard. This alternative crosses the canal and runs down the northwest side of the canal for a few hundred feet. The area near the gated

structure will require moving a few trees in a residential area. The portion of the floodwall that runs along the northwest side of the canal will require some tree removal as well. The few scattered trees will be removed from the area impacted by this alternative do not offer much potential habitat for the Indiana bat. Further any tree clearing will be conducted from 1 October through 30 March when the bats are unlikely to be present. There will be minimal impacts to the Indiana bat from this alternative.

The Illinois Street Variation of the alternative, which is one of the Proposed Actions for Phase 3B Alignment, extends from the White River eastward, just north of the Riviera Club, across Illinois Street, the Citizens Water Canal and Westfield Boulevard, terminating on high ground east of Chase Bank. As such, a mature bottomland hardwood forest with a riparian habitat along the White River characterizes the western third of this variation, while sparse trees, bushes and cut-grass lawns characterize the remaining two-thirds.

The Illinois Street variation would eliminate approximately 0.54 acre of trees. The loss of mature trees that could serve as roosting habitat for the Indiana bat is unavoidable, but it is unlikely to jeopardize its continued existence. Any felling of trees >3" dbh would be avoided from 1 April through 30 September. Further details on lands considered for the project's mitigation is provided in Section 8.0 of this report. The Corps will abide by this restriction to avoid and/or reduce impacts to endangered species. These lands will be permanently protected for use by the Indiana bat and other wildlife species.

6.7.4 Westfield Boulevard Alternative – Including Variations (Proposed Action)

With the variations or Proposed Action, there would be a potential loss of summer habitat for the Indiana bat, measuring approximately 2.81 acres. Destruction of larger, mature trees that could serve as roosting habitat is unavoidable due to the limited area between the river and the developed areas to be protected. The USFWS commented in previous correspondence that the agency would not expect significant impacts to endangered species if the felling of trees >3" dbh was avoided from 1 April through 30 September (USACE 1996). The Corps will abide by this restriction to avoid and/or reduce impacts to endangered species. There will be minimal impacts to the Indiana bat from this alternative. Further details on lands considered for the project's mitigation is provided in Section 8.0 of this report. These lands will be permanently protected for use by the Indiana bat and other wildlife species.

6.7.5 No Action (Phase 3A and 3C Vegetation Clearing)

The No Action Alternative for the Vegetation Clearing along Phase 3A and 3C would have no impact on endangered species. In addition, this alternative would preserve about 7.52 acres in all of mature bottomland hardwood forest along Phases 3A and 3C.

6.7.6 Vegetation Variance 20 Feet from Levee Crown

A vegetation variance for the completed Phases 3A and 3C sections would preserve about 4.45 acres of mature bottomland hardwood forest, i.e., an area with significant potential to provide summer habitat for the endangered Indiana bat, while 3.07 acres would be lost. Any

loss of terrestrial wildlife habitat resulting from this alternative will be considered in the determination of mitigation for the entire project, provided in Section 8.0.

6.7.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

The Proposed Action will result in the conversion of an additional 6.9 acres along Phase 3A and 0.62 acres along Phase 3C from a mature bottomland hardwood forest to an open short grass landscape. This clearing will result in the loss of at least 7.52 acres in potential Indiana bat habitat. While no field surveys have been conducted in this area, the forest exhibits significant potential to provide summer habitat for the endangered Indiana bat.

While the loss of such riparian forest does not benefit the Indiana bat, especially at a local level, the potential loss is insignificant when considered at a landscape scale. The loss of habitat associated with construction of the Proposed Action is unlikely to jeopardize the continued existence of the Indiana bat.

6. 8 Recreation

6.8.1 No Action (Phase 3B Alignment)

Adoption of this alternative continues the acceptance of the plan evaluated and approved in the 1996 GRR and EIS with construction of the Phase 3B Alignment to the southern portion of the Riviera Club property. As with the other alternatives, the No Action Alternative would temporarily interrupt, but not permanently impact, public recreational activities in the area and/or access to the Citizens Water Canal and White River. A section of the canal towpath, which is part of the overall Greenways Project for Indianapolis, would be temporarily closed or rerouted while the canal gate structure crossing was being constructed, but its use would be restored upon completion of the work.

6.8.2 Rocky Ripple Alternative

This alternative would temporarily interrupt, but not permanently impact, public recreational activities in the area and/or access to the Citizens Water Canal and White River. A section of the greenway along the canal, and access to Butler University's athletic fields, would be temporarily closed or rerouted while the canal gate structure crossing was being constructed, but its use would be restored upon completion of the work.

The proposed project would interrupt, but would not permanently impact, access to the White River or the greenway in the area. A section of the canal towpath, which is part of the overall Greenways Project for Indianapolis, would be temporarily closed or rerouted while the canal gate structure crossing was being constructed, but its use would be restored upon completion of the work.

6.8.3 56th Street Alternative-Including Variation (Proposed Action)

This alternative and Proposed Action would temporarily interrupt, but not permanently impact, public recreational activities in the area and/or access to the Citizens Water Canal and White River. A section of the canal towpath, which is part of the overall Greenways Project for Indianapolis, would be temporarily closed or rerouted while the canal gate structure crossing was being constructed, but its use would be restored upon completion of the work.

6.8.4 Westfield Boulevard Alternative – Including Variations (Proposed Action)

The variations and Proposed Action would temporarily interrupt, but not permanently impact, public recreational activities in the area and/or access to the Citizens Water Canal and White River. A section of the canal towpath, which is part of the overall Greenways Project for Indianapolis, would be temporarily closed or rerouted while the canal gate structure crossing was being constructed, but its use would be restored upon completion of the work.

Impacts to the Riviera Club are expected to be temporary and minimal. The western end of some tennis courts, parking spots along the White River, and some walking trails in the southern portion of the property will be impacted by the construction.

These activities would also affect use of Butler University's running track and Holcomb Gardens. However, this impact would also be temporary and minimal as this area is located on the downstream terminus of the alternative and construction will be ending at this point.

6.8.5 No Action (Phase 3A and 3C Vegetation Clearing)

There would be no significant impacts to recreation with selection of a No Action Alternative for the Phase 3A and 3C vegetation clearing. This alternative would preserve about 7.52 acres of mature riparian forest along the river side of the completed sections that provide shade and wind protection for pedestrians walking along the levee.

6.8.6 Vegetation Variance 20 Feet from Levee Crown

This alternative would have little impact on recreation activities in the area other than loss of shade along the existing trails and possibly their temporary closure during vegetation removal activities.

6.8.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

This Proposed Action would have little impact on recreation activities in the area other than loss of shade along the existing trails and possibly their temporary closure during vegetation removal activities.

6.9 Cultural Resources

6.9.1 No Action (Phase 3B Alignment)

Adoption of this alternative continues the acceptance of the plan evaluated and approved in the 1996 GRR and EIS with construction of the Phase 3B Alignment to the southern portion of the Riviera Club property. The area was previously examined for cultural resources by Robert Jeske and Larry Stillwell (1995). The No Action Alternative would primarily impact the Riviera Club property. No other cultural resources or historic properties will be affected.

The Corps and the City of Indianapolis in consultation with the IN SHPO and other consulting parties will work toward avoiding any affects to the historic properties. Those determined to have an unavoidable adverse affect by the proposed undertaking will be resolved through the signing a Memorandum of Agreement. All documentation would be submitted to the IN SHPO, the ACHP and other consulting parties for review and comment.

Inadvertent discoveries during construction would be addressed in accordance with project's plans and specifications. This would include ceasing all work in the area of discovery and appropriate notification, assessment, and consultation.

6.9.2 Rocky Ripple Alternative

Several cultural resources would be affected by this alternative. Eight archaeological sites are located within its limits, six of which were recommended for a Phase II Archaeological Testing of Significance. Approximately 43 standing structures, including 22 residences, will also be demolished by this alternative. Two other historic structures are recorded adjacent to the alternative: a 1925 dormer-front bungalow at 337 Ripple Avenue (ISSI #: 05976) and a 1911 Spanish Colonial Craftsmen at 341 Ripple Avenue (The Karstadt House, ISSI #: 05977). Both structures were evaluated as "Notable" and additional research may reveal them to be eligible for listing to the NRHP. A historic structures inventory and assessment would be required of these properties to determine their eligibility to the NRHP.

Other significant historic properties that would be affected by this alternative include the Citizens Water Canal, and the Butler University Historic District. The Riviera Club, located between the White River and the Citizens Water Canal, is a cultural resource within this Alternative and was considered, at one time, for listing in the NRHP. A formal nomination was never completed or approved by the IN SHPO.

The Corps and the City of Indianapolis in consultation with the IN SHPO and other consulting parties will work toward avoiding any affects to the historic properties. Those determined to have an unavoidable adverse affect by the proposed undertaking will be resolved through the signing of a Section 106 Memorandum of Agreement. All documentation would be submitted to the IN SHPO, the National Park Service, the ACHP and other consulting parties for review, comment and execution, as applicable. No construction of the Rocky Ripple Alternative would commence until the after the conclusion of the consultation under Section 106 of the NHPA.

Inadvertent discoveries during construction would be addressed in accordance with project's plans and specifications. This would include ceasing all work in the area of discovery and appropriate notification, assessment, and consultation.

6.9.3 56th Street Alternative – Including Variation (Proposed Action)

The primary cultural resource affected by this alternative and Proposed Action is the Citizens Water Canal, also known as the Indianapolis Central Canal. The canal extends five miles in length from the Broad Ripple intake structure, through the project to its south terminus at 30th Street. This historic property was determined eligible on 24 April 1985 for the National Register of Historic Places (NRHP) by the Keeper of the Register and is part of the overall Greenways Project for Indianapolis.

The Riviera Club, located between the White River and Indianapolis Citizens Water Canal, is a cultural resource within the Phase 3B Alignment and was considered eligible for listing in the NRHP but a formal nomination was never completed.

The Corps and the City of Indianapolis in consultation with the IN SHPO and other consulting parties will work toward avoiding any affects to the historic properties. Those determined to have an unavoidable adverse affect by the proposed undertaking will be resolve through the signing of a Section 106 Memorandum of Agreement. All documentation would be submitted to the IN SHPO, the National Park Service, the ACHP and other consulting parties for review, comment and execution, as applicable.

Inadvertent discoveries during construction would be addressed in accordance with project's plans and specifications. This would include ceasing all work in the area of discovery and appropriate notification, assessment, and consultation.

A full assessment of the Illinois Street Variation and its affects to the cultural resource and historic properties will be performed prior to construction, including a field survey, analysis, and report of findings. All information will be provided to and coordinated with the City of Indianapolis, the IN SHPO, ACHP, and other consulting parties. No construction of either the 56th Street Alternative or the Illinois Street Variation would commence until the after the conclusion of the consultation under Section 106 of the NHPA.

6.9.4 Westfield Boulevard Alternative – Including Variations (Proposed Action)

The primary cultural resource affected by this alternative and Proposed Action is the Citizens Water Canal. The canal extends five miles in length from the Broad Ripple intake structure, through the project to its south terminus at 30th Street. This historic property was determined eligible on 24 April 1985 for the National Register of Historic Places (NRHP) by the Keeper of the Register and is part of the overall Greenways Project for Indianapolis.

Two archaeological sites are also located within this alternative and Proposed Action, identified as Sites 12Ma947 and 12Ma948. Site 12Ma947 is a prehistoric isolated find dating to the Late Woodland period. The only artifact recovered from the site was a prehistoric ceramic rim sherd, located in a disturbed soil stratum. Site 12Ma948 is a historic wall feature made of cut limestone, concrete and wood. It is located on the eastern cut bank of the Citizens Water Canal and likely dates to the early twentieth century. The wall may be a remnant park feature (walkway, landing, or overlook) related to either the canal or Fairview Park. Neither site meets the criteria of significance set forth by the National Park Service and Secretary of Interior (36 CFR part 60) and thus are not eligible for listing on the NRHP.

Additional historic properties affected by the variations or Proposed Action are the Hinkle Field House at Butler University and the Butler University Historic District. The Riviera Club, located between the White River and Indianapolis Citizens Water Canal, is a cultural resource within the Phase 3B Alignment and was considered eligible for listing in the NRHP but a formal nomination was never completed or approved. The IN SHPO also noted in their August 13, 2012 letter the proximity of the Butler-Fairview Historic District to the variations and Proposed Action.

The Corps and the City of Indianapolis in consultation with the IN SHPO and other consulting parties will work toward avoiding any affects to the historic properties. Those determined to have an unavoidable adverse affect by the proposed undertaking will be resolved through the signing of a Section 106 Memorandum of Agreement. All documentation would be submitted to the IN SHPO, the National Park Service, the ACHP and other consulting parties for review, comment and execution, as applicable. No construction of the Westfield Boulevard Alternative or its variations would commence until the after the conclusion of the consultation under Section 106 of the NHPA.

Inadvertent discoveries during construction would be addressed in accordance with project's plans and specifications. This would include ceasing all work in the area of discovery and appropriate notification, assessment, and consultation.

6.9.5 No Action (Phase 3A and 3C Vegetation Clearing)

Adoption of this alternative continues the acceptance of the plan evaluated and approved in the 1996 EIS and GRR with no further vegetation clearing conducted. If selected, this alternative for the Phase 3A and 3C vegetation clearing would not affect cultural resources.

6.9.6 Vegetation Variance 20 Feet from Levee Crown

Tree and vegetation removal from this alternative would not impact cultural resources. No cultural resources were identified within the Phase 3A and 3C sections of the project as part of the 1996 GRR and EIS, and the proposed vegetation clearing does not represent a significant change to its original design and scope. The exact age of the levee is unknown. Therefore, the Corps will determine whether there will be an affect to historic properties eligible for, or listed on the NRHP.

6.9.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

Tree and vegetation removal from this Proposed Action would not impact cultural resources. No cultural resources were identified within the Phase 3A and 3C sections of the project as part of the 1996 GRR and EIS, and the proposed vegetation clearing does not represent a significant change to its original design and scope. The exact age of the levee is unknown. Therefore, the Corps will determine whether there will be an affect to historic properties eligible for, or listed on the NRHP by the proposed undertaking.

6.10 Hazardous, Toxic, and Radiological Waste

The Corps conducted a visual site inspection, and an EPA Envirofacts Facility database search of all known hazardous, toxic, and radiological waste locations on all alternatives for the Phase 3B Alignment and Phase 3A and 3C vegetation clearing. The result determined no environmental concerns regarding these materials within the project, including all of its alternatives. No impact involving hazardous, toxic, and/or radiological waste is expected. Any inadvertent discovery or release of such materials during construction of any kind would be handled in accordance with applicable local, state and federal laws and regulations.

6.11 Socioeconomic

6.11.1 No Action (Phase 3B Alignment)

Adoption of this No Action Alternative continues the acceptance of the plan evaluated and approved in the 1996 GRR and EIS with construction of the Phase 3B Alignment to the southern portion of the Riviera Club property. Local businesses and residents would not be protected from flood damage reoccurrence along the White River. Property owners would need to continue the purchase of flood insurance.

6.11.2 Rocky Ripple Alternative

There would be a negative socioeconomic affect to the Town of Rocky Ripple resulting from the selection of this alternative because of the loss of population and property. Even with a “minimum real estate footprint” design, the alternative would require the acquisition and removal of 43 structures in order to construct, including 22 single family dwellings. Available census data suggests that the population of the Town of Rocky Ripple declined from 712 residents in the 2000 to 606 residents within 322 households in the 2010. A loss of 22 households would result in the loss of an estimated 42 residents from the Town of Rocky Ripple.

Construction of this alternative would greatly reduce the quantity and frequency of property damage and loss due to flooding for the remaining 300 households. However, the loss of these properties and their residents would greatly reduce tax revenues and likely change the social makeup of the town. Furthermore, the Rocky Ripple Alternative would cost an estimated

$33,481,000 to $35,305,000 more than the Proposed Actions of Phase 3B Alignment or the equivalent of almost $112,000 to $118,000 per household.

6.11.3 56th Street Alternative – Including Variation (Proposed Action)

There would be positive and negative socioeconomic impacts to local businesses and residents resulting from the alternative and Proposed Action. The reoccurrence of damages from flooding would be relieved through the implementation of the project, providing a tremendous savings to the City of Indianapolis, local businesses, and individual home owners north of the Riviera Club. Property owners and residents, in general, would no longer be required to pay flood insurance. Similarly, the city would realize benefits from an increased tax base. However, property south of the Riviera Club and southeast of the Citizens Water Canal would not be protected from flood damage reoccurrence. Property owners in this area would continue to purchase flood insurance. Finally, construction activities would provide a source of jobs to local residents, thereby providing some temporary benefits to the local economy.

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, was signed on 11 February 1994. The order requires Federal agencies to promote "nondiscrimination in Federal programs substantially affecting human health and the environment." In response to this EO, Federal agencies must identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The final step is an evaluation of impacts on the affected populations by a project to ascertain whether target populations are effected more adversely than are other residents.

The conclusion of this evaluation is that low-income or minority populations would not be disproportionately impacted by the alternative and Proposed Action. With completion of the project, the property of all businesses and residents would receive protection regardless of their minority or low income status.

6.11.4 Westfield Boulevard Alternative – Including Variations (Proposed Actions)

There would be no negative socioeconomic impact to local businesses and residents resulting from the variations or Proposed Action. The reoccurrence of damages from flooding would be relieved through the implementation of the project, providing a tremendous savings to the City of Indianapolis, local businesses, and individual home owners. Construction activities would provide a source of jobs, thereby providing some temporary benefits to the local economy.

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, was signed on 11 February 1994. The order requires Federal agencies to promote "nondiscrimination in Federal programs substantially affecting human health and the environment." In response to this EO, Federal agencies must identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The

final step is an evaluation of impacts on the affected populations by a project to ascertain whether target populations are effected more adversely than are other residents.

The conclusion of this evaluation is that low-income or minority populations would not be disproportionately impacted by the alternative and Proposed Action. With completion of the project, the property of all businesses and residents would receive protection regardless of their minority or low income status.

6.11.5 No Action (Phase 3A and 3C Vegetation Clearing)

Adoption of this alternative continues the acceptance of the plan evaluated and approved in the 1996 EIS and GRR with no further vegetation clearing conducted. Failure to clear trees, shrubs and woody vegetation, including roots, from the prescribed area on and adjacent to the flood protection project would have the result of being a negative LSE by the LSO, exclusion from the NFIP, and ineligibility for inclusion in the Corps' RIP.

6.11.6 Vegetation Variance 20 Feet from Levee Crown

There will need to be clearing along the entire length of Phase 3A (approximately 7600 ft) and portions of Phase 3C where the existing conditions do not comply with Corps vegetation clearance limits per ETL 1110-2-571 (USACE 2009), All sections not yet built will be constructed in accordance with the vegetation clearing requirements in the ETL. If there is no vegetation clearance on this project, it will not be given a positive LSE by a LSO per Corps regulation. Therefore, the property behind the levee area would not be shown as a flood protected area on the FIRM and would not be included in the NFIP, subjecting property owners to flood insurance requirements. Also, if there is no clearing, then this project would not be eligible for inclusion in the Corps' RIP. In accordance with PL 84-99 (33 U.S.C. 701n) (69 Stat.186) and provisions of ER 500-1-1 (USACE 2001), projects that are not a part of this program are not eligible to receive federal funding assistance for damage sustained during a flood event. Therefore the vegetation variance was eliminated as it will not meet the requirements of the ETL or PL 84-99 (33 U.S.C. 701n) (69 Stat.186).

6.11.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

This Proposed Action would meet all Corps requirements for clearing limits for levee projects and therefore allow project to receive a positive LSE by the LSO and inclusion into NFIP and the Corps' RIP program. It would also meet all technical requirements for issuance of a LOMR by FEMA. Implementation of this alternative would be expected to result in some change in insurance cost, i.e., a decrease, for effected property owners.

6.12 Land-use/Aesthetics

6.12.1 No Action (Phase 3B Alignment)

Adoption of this No Action Alternative continues the acceptance of the plan evaluated and approved in the 1996 GRR and EIS with construction of the Phase 3B Alignment to the

southern portion of the Riviera Club property. The Phase 3B Levee Alignment would change the aesthetics of the surrounding area through the removal of 6.84 acres of trees and other vegetation The amount of vegetation to be removed as a part of the alternative would be limited to the greatest extent possible.

6.12.2 Rocky Ripple Alternative

The alternative would change the aesthetics and land-use of the surrounding area through the removal of 14.5 acres of trees and other vegetation, the placement of a gate structure within the Citizens Water Canal, and the installation of a concrete wall structure and earthen levee around the Town of Rocky Ripple. The amount of vegetation removed would be limited to the greatest extent possible. However, the demolition of 43 structures (90 parcels with 22 residences) would be required to implement this alternative and have severe impact to the aesthetics of the community. The heavily wooded Town of Rocky Ripple would be replaced with a grass-covered earthen levee and floodwall, surrounding it and cutting off most views of the White River.

6.12.3 56th Street Alternative – Including Variation (Proposed Action)

The alternative and Proposed Action would change the aesthetics and land-use of the surrounding area through the placement of a gate structure within the Citizens Water Canal and the installation of a concrete floodwall across Westfield Boulevard to the east along either W. 56th Street or Illinois Street. The amount of vegetation to be removed as a part of this alternative would be limited to the greatest extent possible. The cap and facing of the floodwall would be designed to minimize the negative aesthetic impacts.

6.12.4 Westfield Boulevard Alternatives – Including Variations (Proposed Action)

The variations or Proposed Action would change the aesthetics and land-use of the surrounding area through the removal of some trees and other vegetation, the placement of a gate structure within the Citizens Water Canal, and the installation of a concrete floodwall between Westfield Boulevard and the Canal. The amount of vegetation to be removed would be limited to the greatest extent possible. The cap and facing of the floodwall would be designed to minimize the negative aesthetic impacts. Portions of the floodwall along Westfield Boulevard would be removable allowing for continued viewing of the Canal, except during extreme flooding conditions and periodic inspections.

6.12.5 No Action (Phase 3A and 3C Vegetation Clearing)

The No Action Alternative would leave the existing conditions as they are – no additional tree clearing. There would be no impact to either land use or aesthetics.

6.12.6 Vegetation Variance 20 Feet from Levee Crown

This alternative of the Phase 3A and 3C vegetation clearing would impact land use through the loss of riparian forest along the White River. It would also have some impact on aesthetics through loss of shading along project.

6.12.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

This Proposed Action would impact land use through the conversion of bottomland hardwood forest with a riparian habitat along the White River to mowed grasslands. It would have some impact on aesthetics through loss of shading along the project.

6.13 Transportation

6.13.1 No Action (Phase 3B Alignment)

No Action Alternative continues acceptance of the plan as evaluated and approved in the 1996 GRR and EIS. This alternative's impact would be similar to that of the Proposed Actions.

6.13.2 Rocky Ripple Alternative

Activities associated with this alternative would require temporary alterations to traffic patterns, particularly within the Town of Rocky Ripple. Upon completion, traffic patterns would return to previous conditions. All traffic and road alterations would be coordinated with local officials. Local media sources would also be informed of necessary alterations to further minimize impacts.

6.13.3 56th Street Alternative– Including Variation (Proposed Action)

Activities associated with this alternative or proposed action would require temporary alterations to traffic patterns in the immediate vicinity. Upon completion, traffic patterns would return to previous conditions. All traffic and road alterations would be coordinated with local officials. Local media sources would also be informed of necessary alterations.

6.13.4 Westfield Boulevard Alternative – Including Variations (Proposed Action)

Activities associated with the variations and Proposed Action would require temporary alterations to traffic patterns. Upon its completion, traffic patterns would return to previous conditions. As the majority of the construction activities would take place in a high traffic urban area, necessary precautions would be taken to limit interference with automobiles and pedestrians. All traffic and road alterations would be coordinated with local officials. Local media sources would also be informed of necessary alterations to further minimize impacts.

6.13.5 No Action (Phase 3A and 3C Vegetation Clearing)

The No Action Alternative of the Phase 3A and 3C vegetation clearing would leave the existing conditions as they are – no additional tree clearing. There would be no impact to transportation.

6.13.6 Vegetation Variance 20 Feet from Levee Crown

This alternative would have almost no impact to transportation. There would be a small temporary increase in local traffic generated by workers and equipment needed to conduct any clearing.

6.13.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

This Proposed Action would have almost no impact to transportation. There would be a small temporary increase in local traffic generated by workers and equipment needed to conduct any clearing.

6.14 Air Quality

6.14.1 No Action (Phase 3B Alignment)

Adoption of the No Action Alternative continues the acceptance of the plan as evaluated and approved in the 1996 EIS and GRR. Its impacts would be similar to that of the Proposed Actions.

6.14.2 Rocky Ripple Alternative

Air quality impacts associated with this alternative would be from the operation of construction equipment and associated construction vehicles. Emissions from gasoline and diesel-operated machines are expected to be minimal. Fugitive dust emissions resulting from excavation, grading and other construction activities are also expected to be minor. Potential construction air impacts are considered insignificant because of the relatively small magnitude of the expected impacts and the temporary nature of the construction activities. Construction would be conducted in accordance with state and/or local regulations to minimize fugitive dust emissions and to remove mud and soil tracked onto adjacent roadways. Construction activities would not significantly impact air quality indices for Marion County. Air quality impacts would be minor and temporary. Implementation of BMP would further reduce any impacts to air quality. A list of BMPS to be implemented for the alternative is included in the **Appendix B**.

6.14.3 56th Street Alternative – Including Variation (Proposed Action)

Air quality impacts associated with the alternative and the Proposed Action would be from the operation of construction equipment and associated construction vehicles. Emissions from gasoline and diesel-operated machines are expected to be minimal. Fugitive dust emissions resulting from excavation, grading and other construction activities are also expected to be minor. Potential construction air impacts are considered insignificant because of the

relatively small magnitude of the expected impacts and the temporary nature of the construction activities. Construction would be conducted in accordance with state and/or local regulations to minimize fugitive dust emissions and to remove mud and soil tracked onto adjacent roadways. Construction activities would not significantly impact air quality indices for Marion County. Air quality impacts would be minor and temporary. Implementation of BMP would further reduce any impacts to air quality. A list of BMPS to be implemented for the variations and Proposed Action is included in the **Appendix B**.

6.14.4 Westfield Boulevard Alternative – Including Variations (Proposed Action)

Air quality impacts associated with the variations or the Proposed Action would be from the operation of construction equipment and associated construction vehicles. Emissions from gasoline and diesel-operated machines are expected to be minimal. Fugitive dust emissions resulting from excavation, grading and other construction activities are also expected to be minor. Potential construction air impacts are considered insignificant because of the relatively small magnitude of the expected impacts and the temporary nature of the construction activities. Construction would be conducted in accordance with state and/or local regulations to minimize fugitive dust emissions and to remove mud and soil tracked onto adjacent roadways. Construction activities would not significantly impact air quality indices for Marion County. Air quality impacts would be minor and temporary. Implementation of BMP would further reduce any impacts to air quality. A list of BMP's to be implemented for the variations or Proposed Action is included in the **Appendix B**.

6.14.5 No Action (Phase 3A and 3C Vegetation Clearing)

The No Action Alternative for the Phase 3A and 3C vegetation clearing would leave the existing conditions as they are – no additional tree clearing. Thus there would be no impact to air quality.

6.14.6 Vegetation Variance 20 Feet from Levee Crown

Air quality impacts from this alternative would be minor and temporary. Operation of trucks, chain saws and other needed equipment would be the primary sources of additional pollutants.

6.14.7 Vegetation Clearing 15 Feet from Toe of Levee/Face of the Floodwall (Proposed Action)

Air quality impacts from this Proposed Action would be minor and temporary. Operation of trucks, chain saws and other needed equipment would be the primary sources of additional pollutants.

7.0 CUMULATIVE IMPACTS

Cumulative impacts result from incremental impact of the Proposed Actions when added to those of other past, present and reasonably foreseeable future actions. Geographical boundaries for this discussion of cumulative impacts are the White River basin. The temporal boundaries span from the early 19th century, when the Citizens Water Canal was first built, to fifty years future projection. Previous subject headings, e.g., Air Quality, Transportation or Wetlands, not discussed herein were considered to have very little or no cumulative impacts.

7.1 Past and Present Actions

Although the sandy, shallow conditions of the White River prevented its use as a major navigable waterway, Indianapolis served as a transportation hub for the region with railroad connections to Chicago, Louisville, Cincinnati, Detroit, Cleveland, and St. Louis. The city's population began to grow rapidly throughout the first half of the 20th century and remains the state's largest city as well as its capital. Urbanization followed during the second half of the century with Indianapolis, Muncie, and Anderson being the primary cities of development (USGS 2001).

Three-fourths of the White River Basin's population is concentrated in the northern section. Outside Indianapolis, land use continues to be primarily for agricultural purposes, corn and soybean accounting for seventy-eight percent of all the crop production in the state (USGS 2001).

Significant flooding events, such as those experienced in 1913, 1937, 1943, 1957, and 1958, caused severe economic losses for the City of Indianapolis and the surrounding area in terms of agricultural production and damage to property, homes and businesses. Agricultural lands may have continued to be used, but it is likely that the damages discouraged growth in the surrounding region.

Revitalization of the downtown area of Indianapolis began in the 1990s after years of urban decay. Today, numerous improvement projects are developing the city's future including a new international airport terminal, upgraded interstates and roads, a new convention center and supporting businesses such as hotels and restaurants.

One outcome of this revitalization effort was the development of multi-use recreational trails throughout the City of Indianapolis. Led by Indianapolis Parks Department and the Greenways Foundation, the effort has focused on working with local groups, acquiring grant funding, and promoting the BMP for linear parks within the city. Several of the trails are located within or near the Indianapolis North Flood Damage Reduction Project including the canal towpath of the Citizens Water Canal and Monon Trail (Greenways 2008).

In addition to the revitalization of downtown Indianapolis, the water quality of the White River has improved through upgraded and expanded wastewater treatment and control facilities. The result has been an increased awareness and use of the White River and other water

resources, such as the Citizens Water Canal by the public. Immediate and future concerns for the water and the White River basin include non-point source pollution (NPS) and their effect to aquatic resources.

Flood damage reduction projects such as levees and floodwalls reduce the negative impacts to agriculture and residential properties and commercial facilities and encourage the use and expansion of development into previously flood prone areas.

The Citizens Water Canal, as previously mentioned, is located within the project and has a long history in the area. Also known as the Indianapolis Central Canal, it was part of an overall effort by the state of Indiana in the early nineteenth century to provide reliable transportation for land-locked areas in the state. Before the advent of railroads, and given the successes of the Erie Canal between Hudson and Niagara Rivers, canals were seen as the best method to provide this transportation. Construction of the Citizens Water Canal began in 1837 with the intention of connecting the Wabash and Erie Canal to the Ohio River, but stopped in 1839 due to financial difficulties and was eventually abandoned. In the end, only eight miles of the Indianapolis section were completed and twenty-four miles partially were built (Huppert 1996).

Use of the Citizens Water Canal has changed through the years. In the last half of the 19th Century, various water companies used the canal to power water systems. In 1904 the Indiana Department of Waterworks used the canal as a purification system. In 1976 the Company sold the land to the City of Indianapolis. In 1971 the canal was designated by the American Water Association as an American Water Landmark.

A section of the Citizens Water Canal, outside the project and located in downtown Indianapolis, runs through White River State Park, an urban cultural state park. Restoration of this area was undertaken in the 1980s and centered on the canal. This section has undergone major renovations to improve aesthetics and is now the focal point of many downtown area events. The canal has been historically dredged to maintain depths for water withdrawal for water supply (Hagan 2008).

7.2 Reasonably Foreseeable Future Actions

Population centers within the White River basin are not expected to change significantly. Similarly the major land use, outside of Indianapolis and the other population centers, is expected to continue for agricultural production. Urban sprawl will result in the loss of agricultural lands. Erosion from residential developments and pesticide residue from residential and agricultural use are likely to continue as major contributors of NPS pollution, and will likely continue as one of the leading impacts to water quality.

Growth and revitalization of downtown Indianapolis are expected to continue as interest in the redevelopment of these areas for residential, commercial, and recreational purposes continues to grow. Redevelopment and revitalization is reflected in the Greenways Foundation's Master Plan that includes continued improvements to the canal towpath trail and

tying these improvements to community access plans as well as linking the Greenways Project to museums, universities, and other public facilities (Greenways 2008). Finally, temporary impacts from dredging of Citizens Water Canal are expected to continue in order for the canal to provide a source for the city's municipal water supply.

7.3 Cumulative Effects on Resources

7.3.1 Flooding

A direct result of implementation of the Proposed Actions is that the quantity and frequency of property damage and loss due to flooding would be greatly reduced. From a cumulative effects perspective, there would be fewer instances of flood damage throughout northern Indianapolis resulting in monetary savings to residents, businesses and governments. In addition, the vegetation clearing from the constructed levees and floodwalls within the overall project would insure their long-term stability and integrity. Improvements in the "quality of life" factors related to reduced flood induced disruptions would be seen, such as pride in property ownership and community development, increased property value, and reduced fear of flood damage.

7.3.2 Land Use Changes

As mentioned earlier (Section 6.12), only minor land use changes are anticipated for the Proposed Actions. Urban encroachment into agricultural areas would likely be the greatest change to the region. Downtown areas are already developed, but could include rezoning of existing areas. With measures to protect lands from flooding, more pressure to develop floodplain lands could happen outside of the project. However, it would be the responsibility of the City of Indianapolis to ensure that any future development complied with appropriate FEMA regulations and guidance. Therefore, future development is most likely to be in the form of redevelopment of previously used properties and land.

7.3.3 Terrestrial Resources

Implementation of the Proposed Actions, when added to previous development, would have a minimal cumulative impact to terrestrial resources as the habitat directly impacted by the overall project is limited to a narrow band along the White River. The proposed vegetation clearing will be 6.9 acres for the Phase3A/Warfleigh Section, 0.62 acres for the Phase 3C/Monon-Broad Ripple Section, and 6.84 acres for the Phase 3B Levee Alignment. These impacts, however, can and will be mitigated. If changes to use of floodplain areas increases due to the reduced flooding from construction of the project, loss of terrestrial resources could occur. Floodplains provide terrestrial and riparian habitat for a variety of wildlife. Development of these areas could further limit habitat availability within a metropolitan area. The loss of large tracts or pockets of vegetated floodplain would cause the greatest impact. Finally, continued dredging of the canal by the City of Indianapolis and the Citizens Water Group could cause temporary impacts to identified terrestrial resources.

7.3.4 Aquatic Resources and Water Quality

Positive cumulative effects to aquatic resources and water quality from the Proposed Actions would largely be the reduction of pollutants returning to the canal and river from nearby neighborhoods and commercial areas following a flood event. As with the terrestrial resources, continued dredging of the canal by the City of Indianapolis and the Citizens Water Group could cause temporary impacts to aquatic resources and overall water quality. NPS pollution, however, will continue to be a water quality concern regardless of the implementation of the Proposed Actions.

7.3.5 Recreation

The cumulative effects of the Proposed Actions may include the loss of some recreational opportunities. Selection of the Westfield Boulevard Alternative, in particular, will impact two tennis courts, two shelters and associated picnic tables, and several areas of playground equipment. Members and patrons of the Riviera Club may lose opportunities for recreation activities, if these facilities are not replaced. None of these facilities will be impacted with the selection the 56th Alternative-Illinois Street Variance. The opportunity for walking along the crown of the levee, even if officially discouraged, will present itself to those who desire to do so regardless of the Proposed Action selected for the Phase 3B Alignment. The completed Phase 3A/Warfleigh Section of the project is frequently used by walkers and joggers and provides access along the wooded edge of the White River. The Phase 3C/Monon-Broad Ripple Section of the project adjoins existing developmental areas providing better pathways for recreational activities, and thus is not used as much as the Phase 3A.

7.3.6 Cultural Resources

The Proposed Actions for the Phase 3B Alignment will have an adverse affect to a historic property determined eligible for the NRHP by the National Park Service's Keeper of the Register: the Citizens Water Canal. Additional historic properties listed to the NRHP and identified within the area of potential effect for the Westfield Boulevard Alternative include a Hinkle Fieldhouse (a National Historic Landmark) and the Butler University Historic District, which includes Holcomb Gardens. Consultation under Section 106 of the NHPA on the affects of the Phase 3B Alignment to these historic properties is ongoing, and may conclude with the signing of a Section 106 MOA. Conversely no historic properties listed to, or eligible for, the NRHP have been identified within the Proposed Action of the Vegetation Clearing for Phase 3A and 3C of the project. As such, the impact of the project, when added to the other past, present and reasonably foreseeable future actions, is insignificant.

7.3.7 Socioeconomics

Relieved incidents of flooding by the Proposed Actions would mean a monetary savings to residences, businesses and governments within the project. Positive cumulative impacts would result in revitalization of the area and provide for economic and social benefits.

7.3.8 Summary

Based on a review of the information presented above, and previous data collected within the Basin, the Proposed Actions for the Phase 3B Alignment and vegetation clearing for Phases 3A and 3C, if conducted in accordance with applicable state and Federal regulations, should not contribute to or result in a significant adverse impacts on the environment. Rather, the cumulative effects of implementing the Proposed Actions would have a benefit to the region, primarily from significant reduction in potential flooding as presented section 7.3.1 and accompanying expected socioeconomic benefits as described in section 7.3.7. Similarly, with proper maintenance and regulation, the effects of these benefits would be visible both now and into the foreseeable future for northern Indianapolis and the White River watershed.

8.0 MITIGATION

Mitigation for environmental impacts includes three phases: avoidance, minimization, and compensatory mitigation. For the project, environmental impacts have been avoided and/or minimized to the greatest extent possible. The remaining unavoidable impacts will be mitigated at a site or sites to be determined, or handled through additional consultation (i.e. cultural resources). The primary purpose of mitigation will be the preservation and/or restoration of bottomland hardwood forest with riparian habitat and their benefits to wildlife resources and to off-set impacts to cultural resources (i.e. the Citizens Water Canal)

The non-federal sponsor of any Corps civil works project is required to supply all necessary real estate. As such, the City of Indianapolis will have to provide the needed mitigation lands and implement any natural resource management practices on them as may be required after completion of coordination with the state and federal resource agencies. Mitigation lands are normally acquired as near the project as possible, preferably within the same drainage basin.

The project, as approved in the 1997 ROD, required 29 acres of mitigation for impacts to fish and wildlife habitat. Additional tree clearing to meet levee certification standards, as well as the construction of the Phase 3B Alignment, will result in a greater loss of bottomland hardwood forest with riparian habitat than what was previously considered in 1997. Therefore an increase in mitigation lands from the project will be necessary.

The total number of acres of bottomland hardwood forest impacted is presented in **Table 2.** Briefly, construction of the Westfield Boulevard Alternative will impact an additional 9.65 acres of bottomland hardwood forest, while the 56th Street Alternative-Illinois Street Variation will impact 5.59 acres. The Proposed Action for the Phase 3A and 3C vegetation clearing will impact 7.52 acres of bottomland hardwood forest.

Coordination with the IDNR through permitting activities, and both IDNR and the U.S. Fish and Wildlife Service through review of the 2012 DSEIS, enabled the determination of additional mitigation requirements. The total bottomland hardwood forest impacted by the Proposed Action for the Phase 3A and 3C Vegetation Clearing and Westfield Boulevard

Alternative is 17.17 acres., Based on coordination with IDNR and U.S. Fish and Wildlife this Proposed Action will require a total of approximately 51.51 acres of mitigation land.

The total bottomland hardwood forest impacted by the Proposed Action for the Phase 3A and 3C Vegetation Clearing and 56th Street Alternative-Illinois Street Variation is 13.11 acres. Based on coordination with IDNR and U.S. Fish and Wildlife this Proposed Action will require approximately 39.33 acres of mitigation land.

With the addition of the 29 acres of mitigation land required by the 1997 ROD, the total number acres for mitigation on the project is projected to be 80.51 acres for the Westfield Boulevard Alternative and 68.33 acres for the 56th Street Alternative-Illinois Street Variation. Areas to be cleared for all three phases of the project are presented in **Appendix A**.

9.0 AGENCY COORDINATION AND ENVIRONMENTAL COMPLIANCE

Preparation of the FSEIS includes a public notification in the Federal Register and the opportunity for governmental agencies and the public to review and comment on the document and project prior to the Corps' decision-making.

This FSEIS will be circulated to members of the public, elected officials and local, state, and Federal governmental agencies with jurisdiction by law or special expertise. A 30 day review period will follow the public release of the FSEIS offering all reviewers an opportunity to comment on the FSEIS and/or the Proposed Actions. The Corps will consider all of these comments and issue a ROD explaining its final decision as to the Proposed Action. The signing of the ROD will complete the Corps compliance with the National Environmental Policy Act.

The present state of compliance with environmental laws and regulations required for the Proposed Action is described below and summarized in **Table 6**.

9.1 Clean Water Act

9.1.1 Section 404

Compliance with Section 404 of the Clean Water Act is required for discharges of dredged or fill material into the waters of the United States, including adjacent wetlands. A 404(b)(1) evaluation was completed for the Phases 3A and 3C vegetation clearing. **Appendix C** provides an analysis of these impacts.

A separate 404(b)(1) evaluation was previously prepared for the levee portion of Phase 3B with the 1996 GRR and EIS. The Proposed Actions for the Phase 3B Alignment will require a canal gate structure. Thus another 404 (b)(1) evaluation will be prepared specific to the selected Proposed Action.

9.1.2 Section 401 Water Quality Certification

State Water Quality Certification or waiver, pursuant to Section 401 of the Clean Water Act, is required from IDEM for any activity that may result in a discharge into waters of the State. This certification will be sought prior to but no earlier than one year before the initiation of the Proposed Actions.

9.1.3 National Pollutant Discharge Elimination System (NPDES)

A National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge is required when construction or land disturbance exceeds one acre. This permit will be sought prior to but no earlier than one year before the initiation of Proposed Actions.

9.2 Floodplain Management

Executive Order (EO) 11988 (24 May 1977) outlines the responsibilities of Federal agencies in the role of floodplain management. In accordance with this EO, the Corps is required to evaluate the potential effects of actions on floodplains, and does not undertake actions that directly induce growth in the floodplain, unless no practical alternative exists. Construction of structures and facilities on floodplains must incorporate flood proofing and other accepted flood protection measures. Agencies must attach appropriate use restrictions to property proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties.

The Proposed Actions would serve to reduce the damaging effects of flooding; they would not be directly encouraging growth within the floodplain especially as the surrounding area is already fully developed. The City of Indianapolis participates in the FEMA program and therefore regulates development within the floodplains. Any necessary local or state permits would be acquired prior to starting construction.

9.3 Fish and Wildlife Coordination Act

The Corps is required to coordinate water resource project proposals with the USFWS and IDNR, Division of Fish and Wildlife under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). Coordination was initiated at the onset of the project and continues with a request for their review and comment on the FSEIS.

9.4 Endangered Species Act

The Endangered Species Act (ESA) requires the determination of possible effects on or degradation of habitat critical to federally listed endangered or threatened species. Based on information available from the state and Federal agencies and their comments to the 1996 GRR and EIS, the 2011 EA, and the 2012 DSEIS, there is one listed species within the project, the Indiana bat. Due to the unavoidable removal of trees within the footprint of the project, potential habitat for the endangered Indiana bat will be lost. The Corps will work with the non-Federal sponsor to identify mitigation lands and plantings that will preserve current habitat and

provide future habitat for the Indiana bat and other species. Therefore, while the Proposed Actions are likely to impact the Indiana bat, they are not likely to jeopardize the continued existence of this species.

9.5 National Historic Preservation Act

Section 106 of National Historic Preservation Act of 1966 requires that Federal agencies take into account the effects of its undertakings on historic properties eligible to, or listed on, the NRHP. This process, implemented and guided by regulations set forth in 36 CFR part 800, requires Federal agencies to establish the undertaking, initiate consultation, identify consulting parties, notify the public, define an area of potential effect, identify historic properties and/or cultural resources within the Area of Potential Effect, assess the potential for adverse effects and resolve them through either consultation or the signing a MOA. Within this process, the ACHP will be given a reasonable opportunity to comment on the undertaking.

The Corps is working with consulting parties - namely the Indiana State Historic Preservation Office, the City of Indianapolis, local preservation groups and communities, the ACHP and affected property owners - to assess affects and resolve adverse affects to historic properties by the proposed undertaking. Currently, the Proposed Actions of the Phase 3B Alignment will adversely affect one historic property determined eligible for listing to the NRHP, the Citizens Water Canal (a.k.a. the Indianapolis Central Canal). Additional NRHP historic properties and cultural resources have been identified within the Proposed Actions of the Phase 3B Alignment while none have been identified with Proposed Actions of the Phase 3A and 3C vegetation clearing. Continued consultation under Section 106 of the NHPA for the Phase 3B Alignment will center on avenues to avoid minimize or off-set any adverse affects to the Citizens Water Canal through a MOA and determine affects to other historic properties.

9.6 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, was signed on 11 February 1994. The order requires Federal agencies to promote "nondiscrimination in Federal programs substantially impacting human health and the environment." In response to this direction, Federal Agencies must identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

The final step in the environmental justice evaluation process is to evaluate the impact of the Proposed Actions on the population and to ascertain whether target populations are impacted more adversely than are other residents. An assessment of these impacts, presented in Section 6.11 of this FSEIS, concluded that low-income or minority populations would not be disproportionately impacted by the project. Upon its completion, all properties and individuals within the project limits would receive flood protection. Similarly, Proposed Actions would not disproportionately or adversely impact minority or low income populations.

9.7 Clean Air Act

The EPA defines ambient air in 40 CFR, Part 50, as "that portion of the atmosphere, external to buildings, to which the general public has access." The CAA and the Clean Air Act Amendments of 1990 require the Corps to comply with all applicable parts of these acts and applicable standards. The proposed project area is currently in non-attainment for ozone; however IDEM has petitioned EPA for a reconsideration of Marion County to attainment with a maintenance plan classification. The Corps' Proposed Actions would not cause additional impacts to the status of this area and would comply with the CAA Conformity Rule.

9.8 Other State Approvals

An IDNR Construction in a Floodway Permit (FW-19540) was first issued on May 30, 2001. This permit is still valid and covers the current construction activities. The permit will be amended as necessary for future construction. In addition, the Corps will obtain National Pollutant Discharge Elimination System (NPDES) permits, as required by the Clean Water Act, for any construction disturbing more than one acre. A Section 401 Water Quality Certification or waiver will be obtained as needed when the engineering details are sufficient to complete an evaluation of impacts to the Waters of the U.S.

9.9 Summary

Compliance status with the previously described laws and other laws that are commonly considered prior to the construction of projects by the Corps is documented in **Table 6** as follows.

Table 6: Federal Act/Executive Order Compliance

Act/Executive Order	Status	Compliance
Wetlands (EO 11990)	N/A	C
Prime/Unique Farmlands	N/A	C
Floodplain Management (EO 11988)	No impact	C
Clean Water Act		
Section 404	No impact	C
Section 401	To Be Sought	C
NPDES	To Be Sought	C
Fish and Wildlife Coordination Act	In Progress	
Endangered Species Act	In Progress	
National Historic Preservation Act	In Progress	
Environmental Justice (EO 12898)	Completed	C
Clean Air Act	No impact	C
Comprehensive Environmental Response Compensation and Liability Act (CERCLA)		N/A
Resource Conservation and Recovery Act (RCRA)		N/A

Wild and Scenic Rivers Act		N/A
Other:		
State approval for work within floodway	Permit No. FW-19540	C- amended As Necessary
N/A—not applicable C--Compliant		

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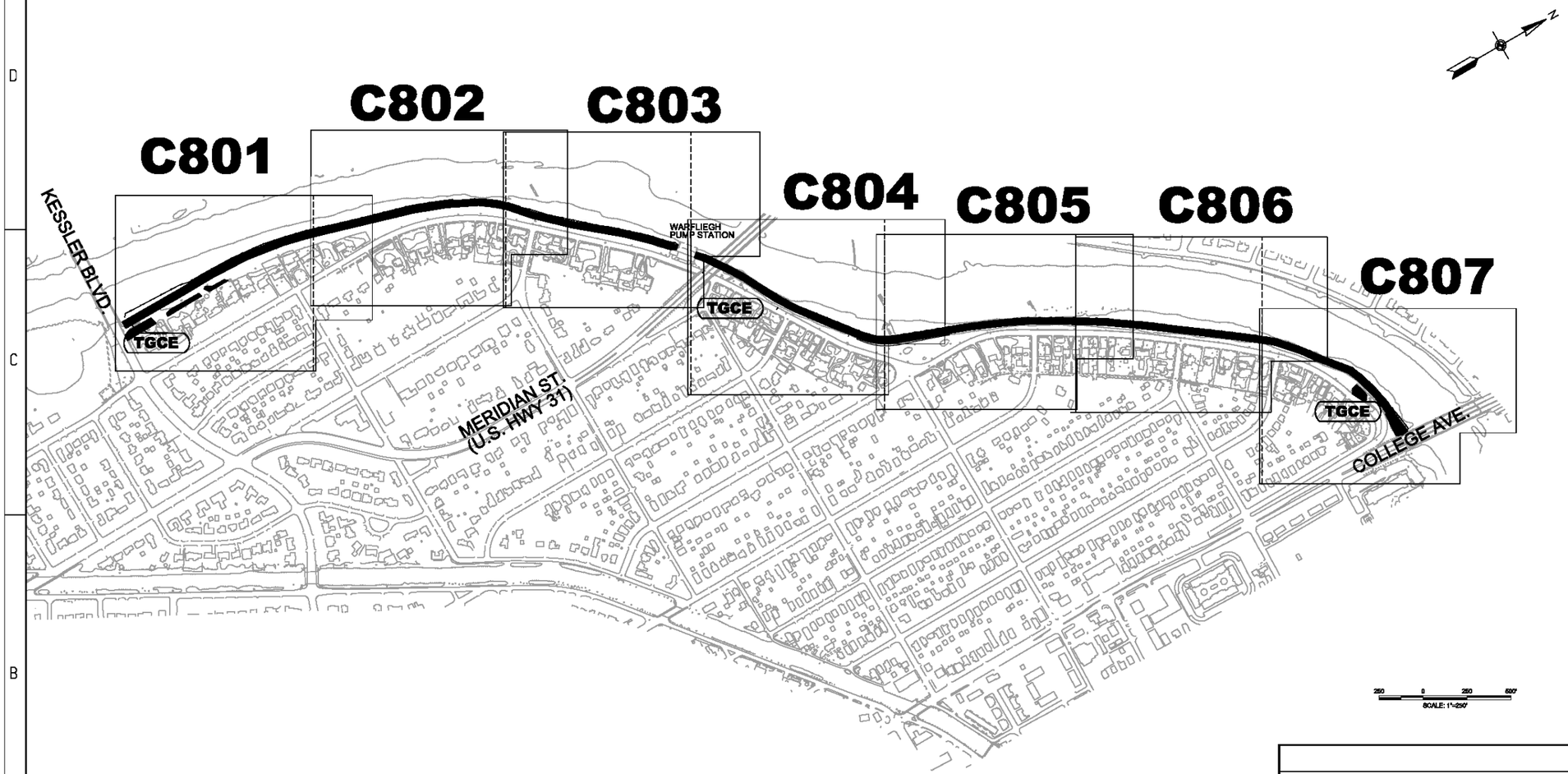
12.0 INDEX

1996 GRR and EIS 4, 6, 7, 8, 11, 26, 28, 34, 41, 48, 50, 52, 54, 55, 57, 58, 60, 62, 64, 65, 67, 69, 77, 78
2011 EA 11, 18, 20, 22, 26, 28, 78
56th Street Alternative .6, 7, 9, 14, 15, 16, 17, 18, 19, 20, 26, 48, 50, 51, 53, 56, 58, 60, 63, 66, 68, 69, 70, 76, 77
Aesthetics 6, 22, 68, 69, 73
Best Management Practices (BMP) 50, 51, 70, 71, 72
Butler University.....4, 5, 6, 11, 12, 14, 22, 24, 28, 36, 39, 43, 44, 47, 50, 55, 56, 60, 61, 62, 64, 75
Canal Gated Structure Relocation 28, 29
Citizens Water Canal (also Indianapolis Central Canal). 1, 4, 5, 6, 11, 12, 15, 17, 18, 20, 22, 26, 39, 40, 41, 43, 44, 45, 47, 50, 55, 56, 59, 60, 61, 62, 63, 64, 66, 68, 72, 73, 74, 75, 76, 79
City of Indianapolis .1, 6, 7, 18, 22, 26, 28, 32, 34, 35, 45, 47, 50, 53, 62, 63, 64, 66, 72, 73, 74, 75, 76, 78, 79
Draft Supplemental Environmental Impact Statement (DSEIS)7,8, 9, 11, 13, 14, 19, 24, 29, 35, 38, 54, 58, 59, 93, 95
Environmental Justice..... 66, 79, 80
Engineering Technical Letter (ETL) 1110-2-571..... 8, 14, 30, 33, 34, 50, 51, 55, 67
Federal Emergency Management Agency (FEMA)..... 8, 14, 20, 22, 26, 33, 67, 74, 78
Flood Insurance Rate Map (FIRM) 8, 14, 20, 26, 30, 67
Freidman Park 11, 36
Greenways 34, 35, 47, 60, 61, 63, 72, 73
Hinkle Fieldhouse 44, 75
Holcomb Gardens..... 6, 44, 56, 61, 75
Indian Department of Environmental Management (IDEM) 39, 40, 41, 47, 48, 50, 78, 80
Indiana Department of Natural Resources (IDNR) 58, 76, 77, 78, 80
Illinois Street Variation 7, 9, 14, 18, 19, 20, 21, 26, 28, 30, 45, 50, 56, 59, 63, 76, 77
Indiana State Historic Preservation Act (IN SHPO)..... 43, 44, 45, 62, 63, 64
Indiana bat 42, 43, 57, 58, 59, 60, 78
Kessler Boulevard 4, 39, 41, 47, 55, 57
Letter of Map Revision (LOMR) 8, 14, 20, 26, 33, 67
Levee Safety Evaluation(LSE)..... 14, 20, 26, 30, 67
National Environmental Policy Act (NEPA) 7, 11
National Flood Insurance Program (NFIP) 8, 14, 20, 26, 30, 67
National Historic Preservation Act (NHPA)..... 43, 45, 62, 63, 64, 75, 79
Phase 3A/Warfleigh Section (also Phase 3A) .. 4, 7, 8, 30, 31, 32, 33, 36, 39, 41, 44, 48, 49, 50, 52, 54, 55, 57, 59, 60, 61, 64, 65, 67, 68, 69, 70, 71, 75, 76, 77, 79
Phase 3B Alignment (also Phase 3B/South Warfleigh Section) 4, 5, 6, 7, 9, 10, 11, 18, 22, 26, 28, 30, 36, 39, 41, 42, 43, 44, 45, 48, 49, 50, 52, 55, 56, 57, 59, 60, 62, 63, 64, 65, 66, 67, 69, 70, 75, 76, 77, 79
Phase 3B Levee Alignment 4, 6, 7, 11, 41, 57, 68, 74
Phase 3C/Monon-Broad Ripple Section (also Phase 3C) .. 4, 7, 8, 30, 31, 32, 33, 36, 39, 41, 44, 48, 49, 50, 52, 54, 55, 57, 59, 60, 61, 64, 65, 67, 68, 69, 70, 71, 74, 75, 76, 77, 79

Removable wall 26, 28, 30
Rehabilitation amd Inspection Program (RIP) 30, 33, 67
Riparian 7, 11, 33, 40, 41, 42, 43, 49, 54, 55, 56, 59, 60, 61, 69, 74, 76
Riviera Club 4, 5, 11, 12, 15, 18, 20, 21, 22, 36, 41, 43, 50, 51, 52, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 68, 75
Rocky Ripple Alternative...6, 9, 11, 12, 13, 14, 18, 26, 28, 41, 48, 50, 52, 55, 58, 60, 62, 65, 68, 69, 70
Record of Decision (ROD) 1, 4, 7, 9, 11, 76, 77
Town of Rocky Ripple 1, 6, 11, 12, 14, 41, 43, 44, 50, 55, 65, 68, 69
Turtles 42, 56
Westfield Boulevard Alternative ... 6, 7, 9, 14, 18, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 42, 44, 45, 49, 51, 53, 56, 59, 61, 63, 64, 66, 69, 71, 75, 76, 77
White River 4, 8, 11, 12, 14, 15, 18, 20, 21, 22, 26, 33, 34, 35, 36, 38, 39, 40, 41, 43, 47, 49, 50, 52, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 68, 69, 72, 73, 74, 75, 76

Appendix A: Vegetation Clearing

Indy 3A



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Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3A
PLAN KEY MAP

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C800
Sheet 103 of 132

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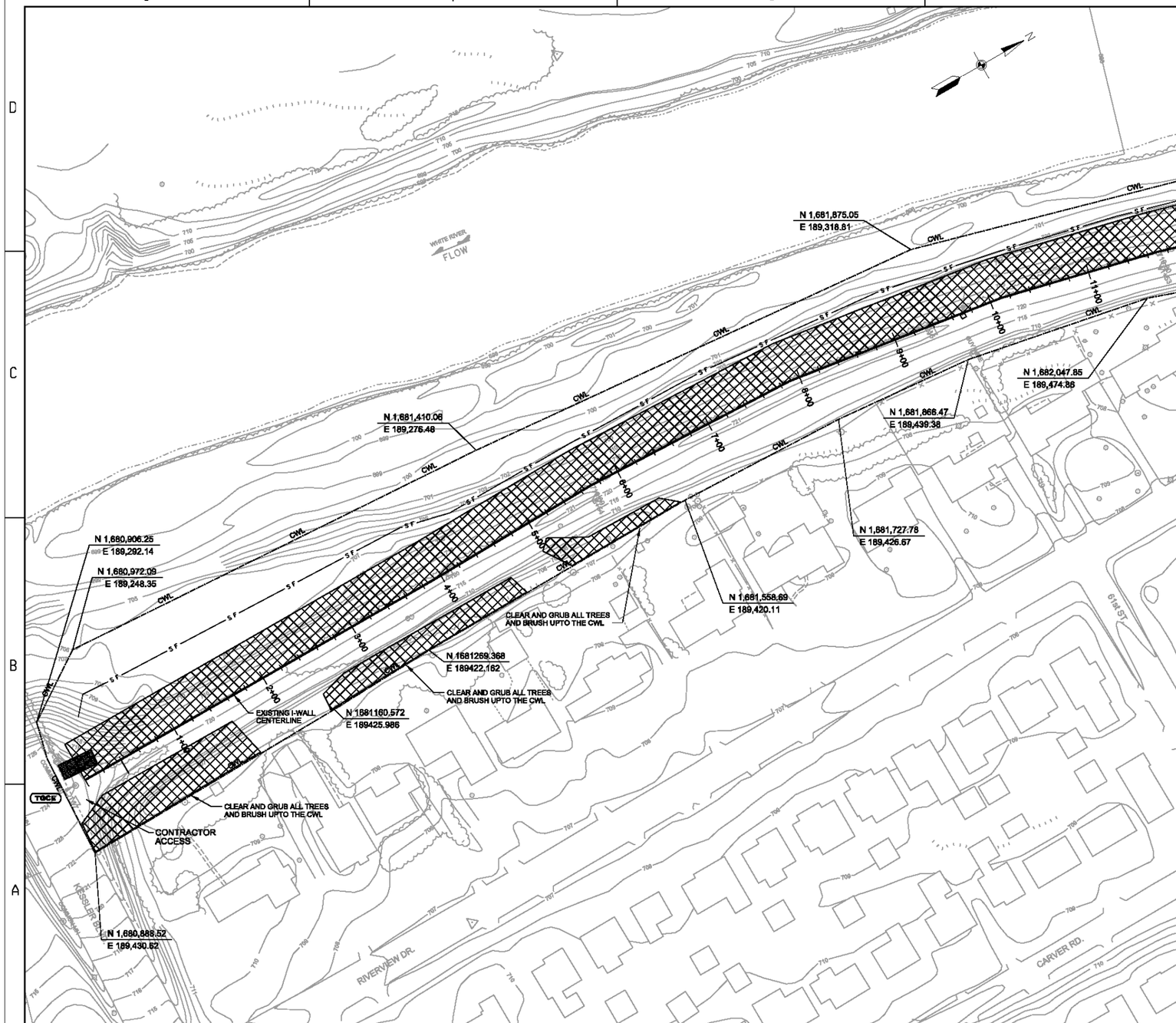

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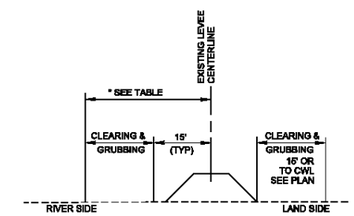

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NOT TO SCALE

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2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00.06, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

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SCALE: 1"=40'

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LOUISVILLE,KENTUCKY

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Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3A PLAN

(SHEET 1 OF 7)

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Sheet 104 of 132

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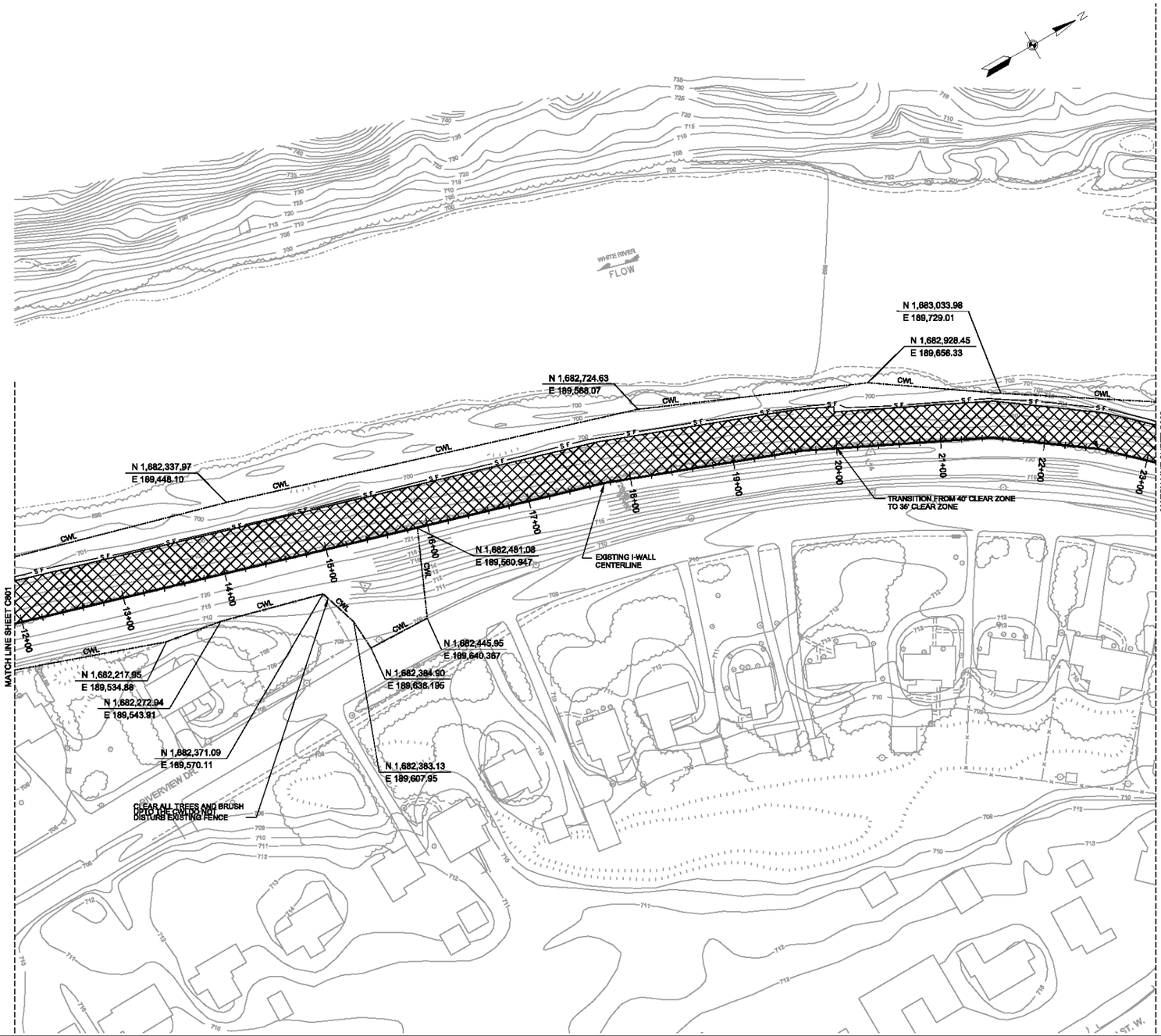

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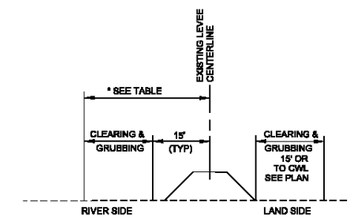

TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CONTRACTOR WORK LIMITS SHALL BE AS SHOWN ON THE DRAWINGS. IF CWL IS NOT SHOW ON THE LAND SIDE OF THE IWALL THEN THE IWALL WILL BE THE CWL.
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5. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 0 40 80'
SCALE: 1"=40'

Revisions

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U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
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US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3A PLAN

(SHEET 2 OF 7)

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Sheet 105 of 132

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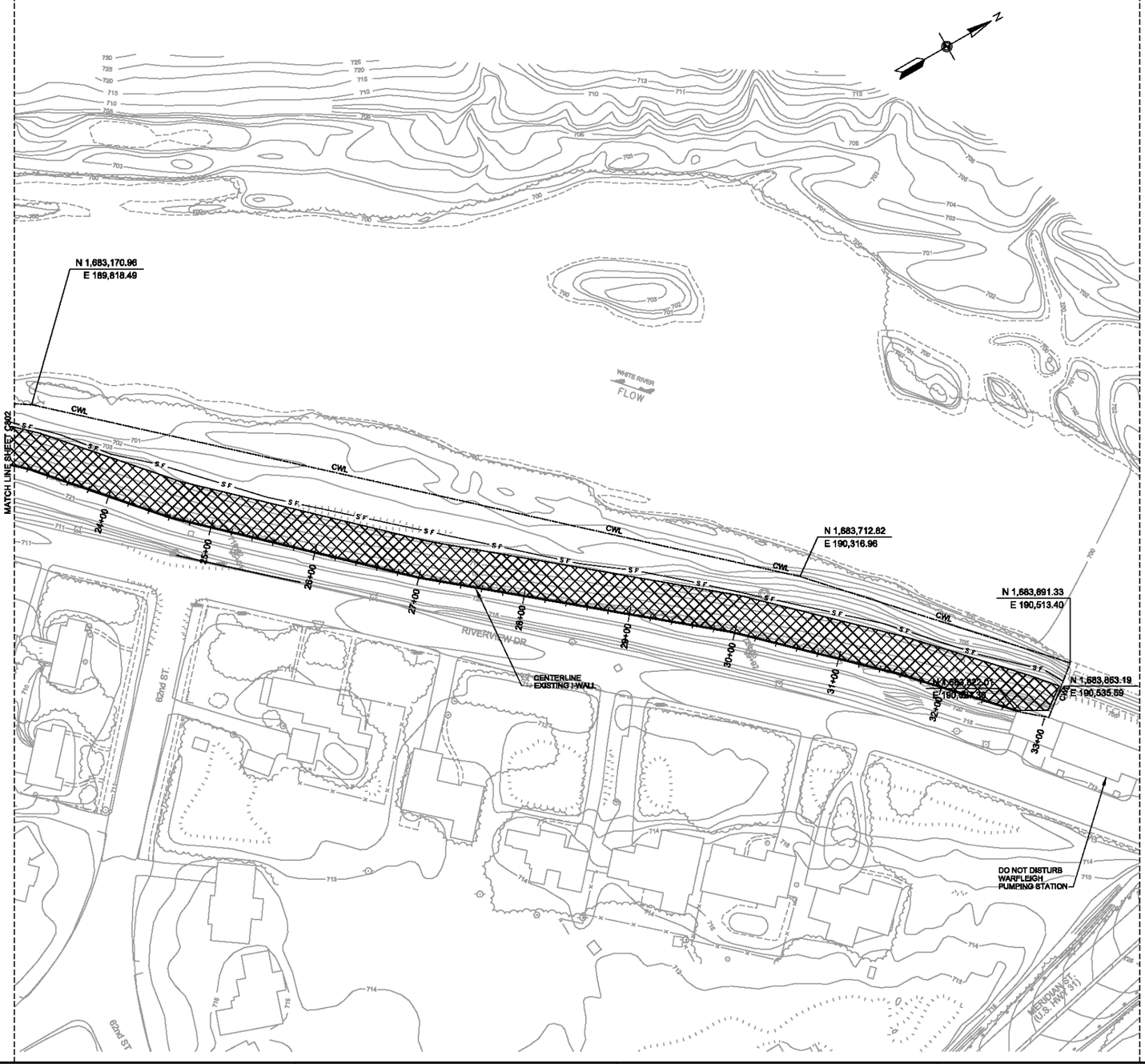
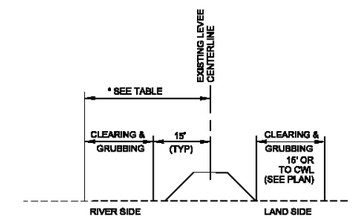


CLEARING AND GRUBBING

STATION	OFFSET (FT.)
0+00 TO 20+00	40
20+00 TO END	35



TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CONTRACTOR WORK LIMITS SHALL BE AS SHOWN ON THE DRAWINGS. IF CWL IS NOT SHOW ON THE LAND SIDE OF THE IWALL THEN THE IWALL WILL BE THE CWL.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 06, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR ACCESS FOR PHASE 3A WEST OF THE WARFLEIGH PUMP STATION SHALL BE FROM KESSLER BLVD.
6. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 0 40 80
SCALE: 1"=40'

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

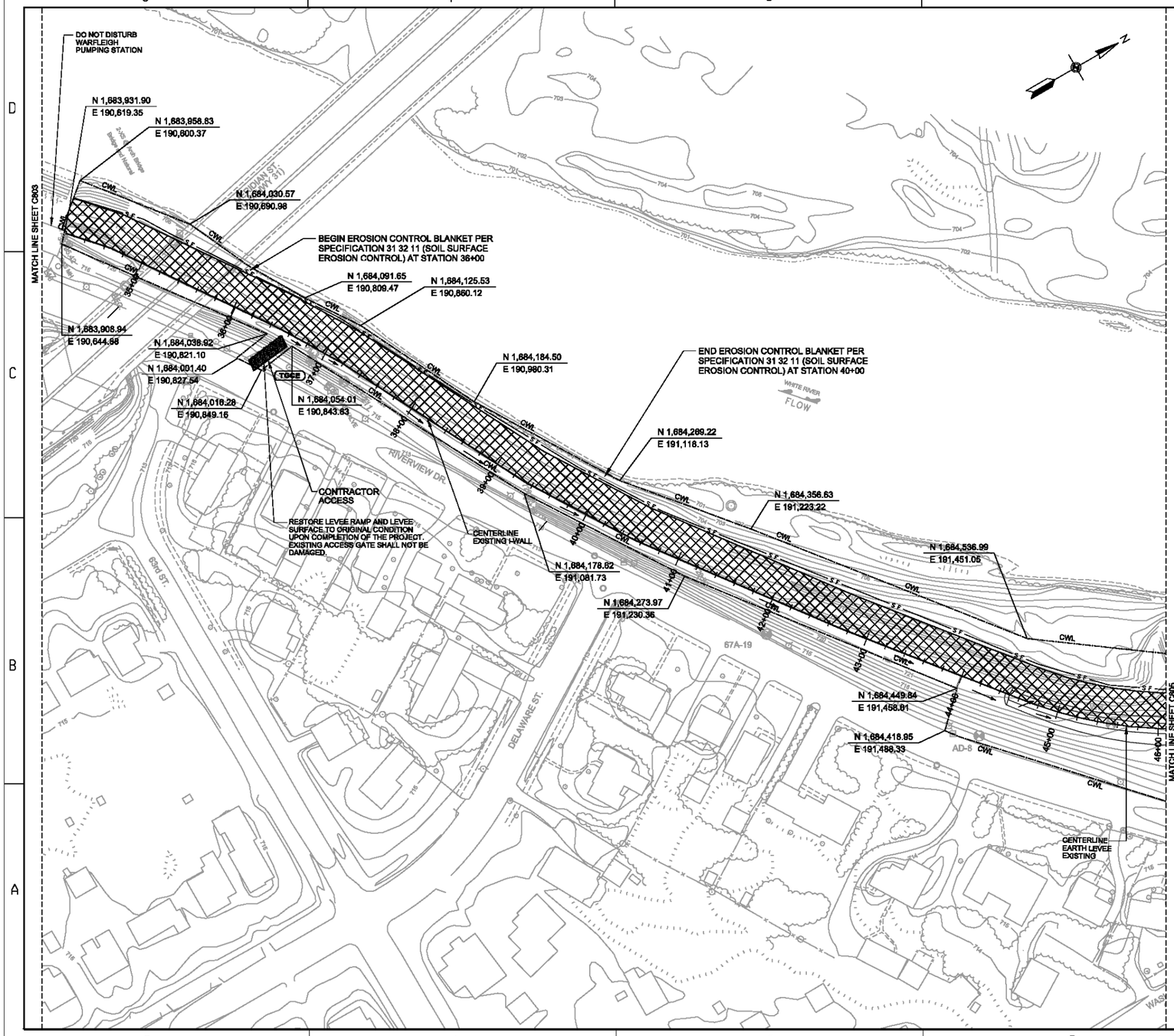
PHASE 3A PLAN

(SHEET 3 OF 7)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date
Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C803
Sheet 106 of 132

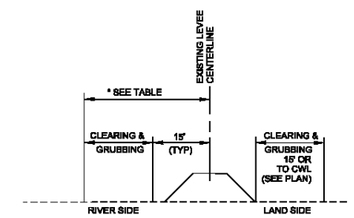
DATE: 14-AUG-2012 10:16
FILE: \\rl-fs01\ou\Org\ED\Public\CAD\Civil\112689-INB9\CADD 3B\rb3c803.dgn

CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059



CLEARING AND GRUBBING

STATION	OFFSET (FT.)
0+00 TO 20+00	40
20+00 TO END	35



TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CONTRACTOR WORK LIMITS SHALL BE AS SHOWN ON THE DRAWINGS. IF CWL IS NOT SHOW ON THE LAND SIDE OF THE IWALL THEN THE IWALL WILL BE THE CWL.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 06, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR ACCESS FOR PHASE 3A EAST OF THE WARFLEIGH PUMP STATION SHALL BE FROM ACCESS POINTS SHOWN NEAR MERIDIAN ST. AND COLLEGE AVE.
6. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 0 40 80'
SCALE: 1"=40'

Revisions

Symbol	Descriptions	Date	Approved
		9-13-11	BFJ

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3A PLAN

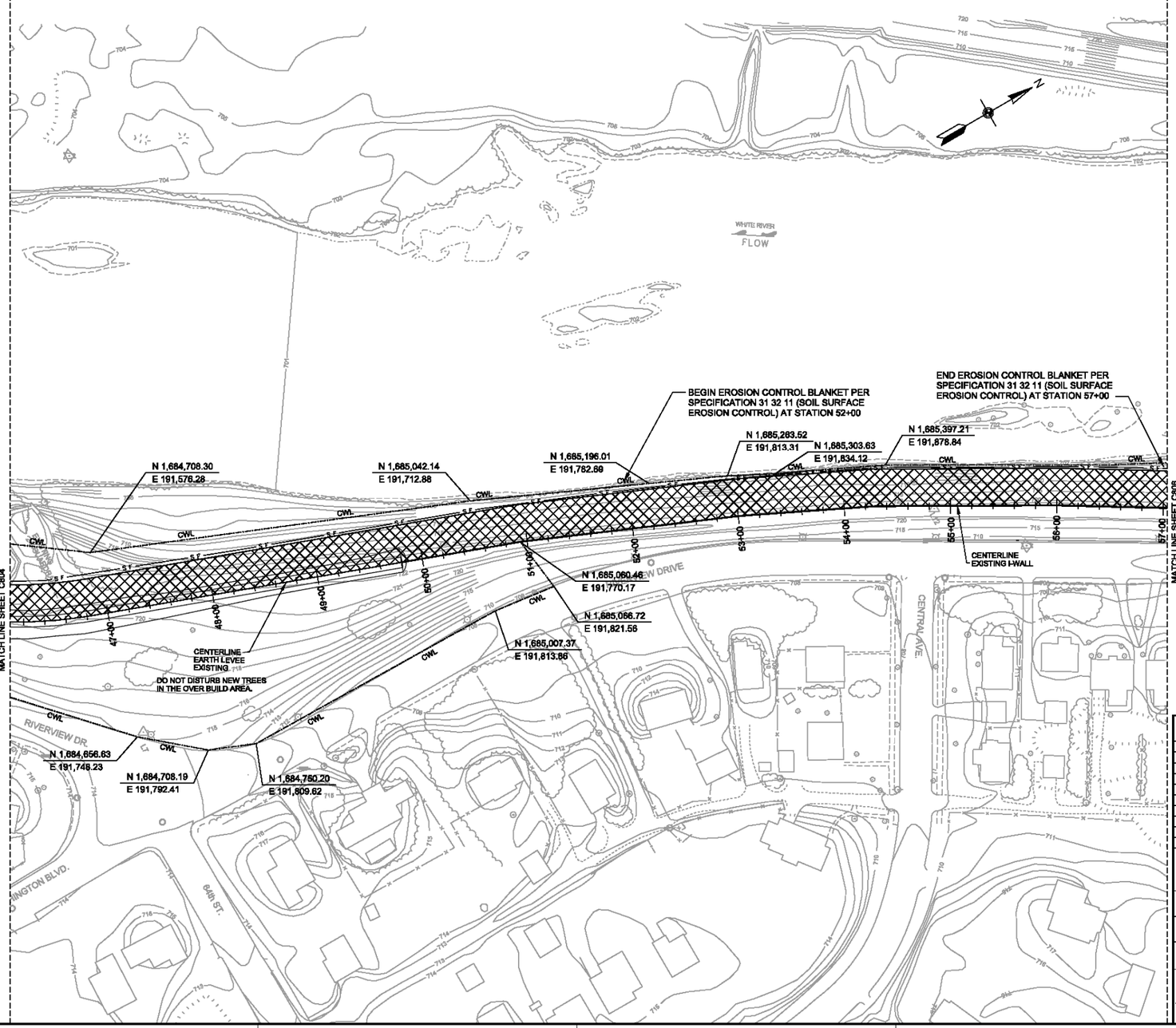
(SHEET 4 OF 7)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C804
Sheet 107 of 132

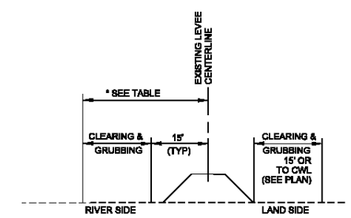
DATE: 14-AUG-2012 10:16
FILE: \\irl-fs01lou\Org\ED\Public\CAD\Civil\112886-INB3\CADD 3B\nb3c804.dgn

CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059



CLEARING AND GRUBBING

STATION	OFFSET (FT.)
0+00 TO 20+00	40
20+00 TO END	35



TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CONTRACTOR WORK LIMITS SHALL BE AS SHOWN ON THE DRAWINGS. IF CWL IS NOT SHOW ON THE LAND SIDE OF THE IWALL THEN THE IWALL WILL BE THE CWL.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 06, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 0 40 80'
SCALE: 1"=40'

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3A PLAN

(SHEET 5 OF 7)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C805
Sheet 108 of 132

DATE: 14-AUG-2012 10:16
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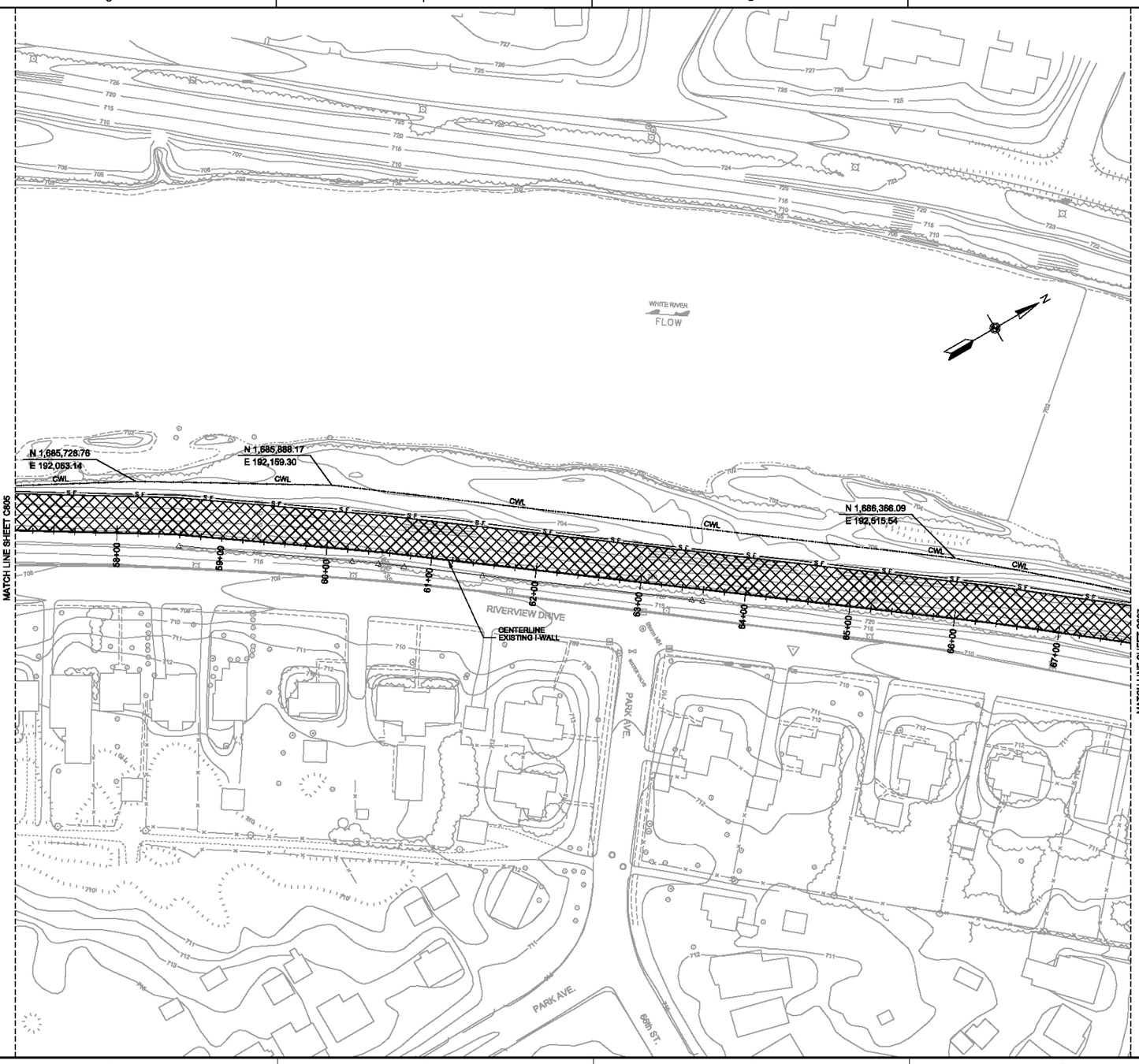
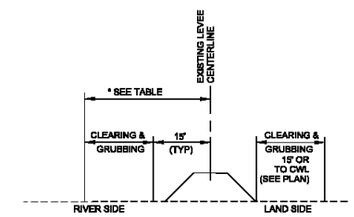
CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059



CLEARING AND GRUBBING

STATION	OFFSET (FT.)
0+00 TO 20+00	40
20+00 TO END	35



TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CONTRACTOR WORK LIMITS SHALL BE AS SHOWN ON THE DRAWINGS. IF CWL IS NOT SHOW ON THE LAND SIDE OF THE IWALL THEN THE IWALL WILL BE THE CWL.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 06, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 0 40 80
SCALE: 1"=40'

Revisions

Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

US Army Corps of Engineers

PHASE 3A PLAN

(SHEET 8 OF 7)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date
Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C806
Sheet 109 of 132

CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059

DATE: 14-AUG-2012 10:16
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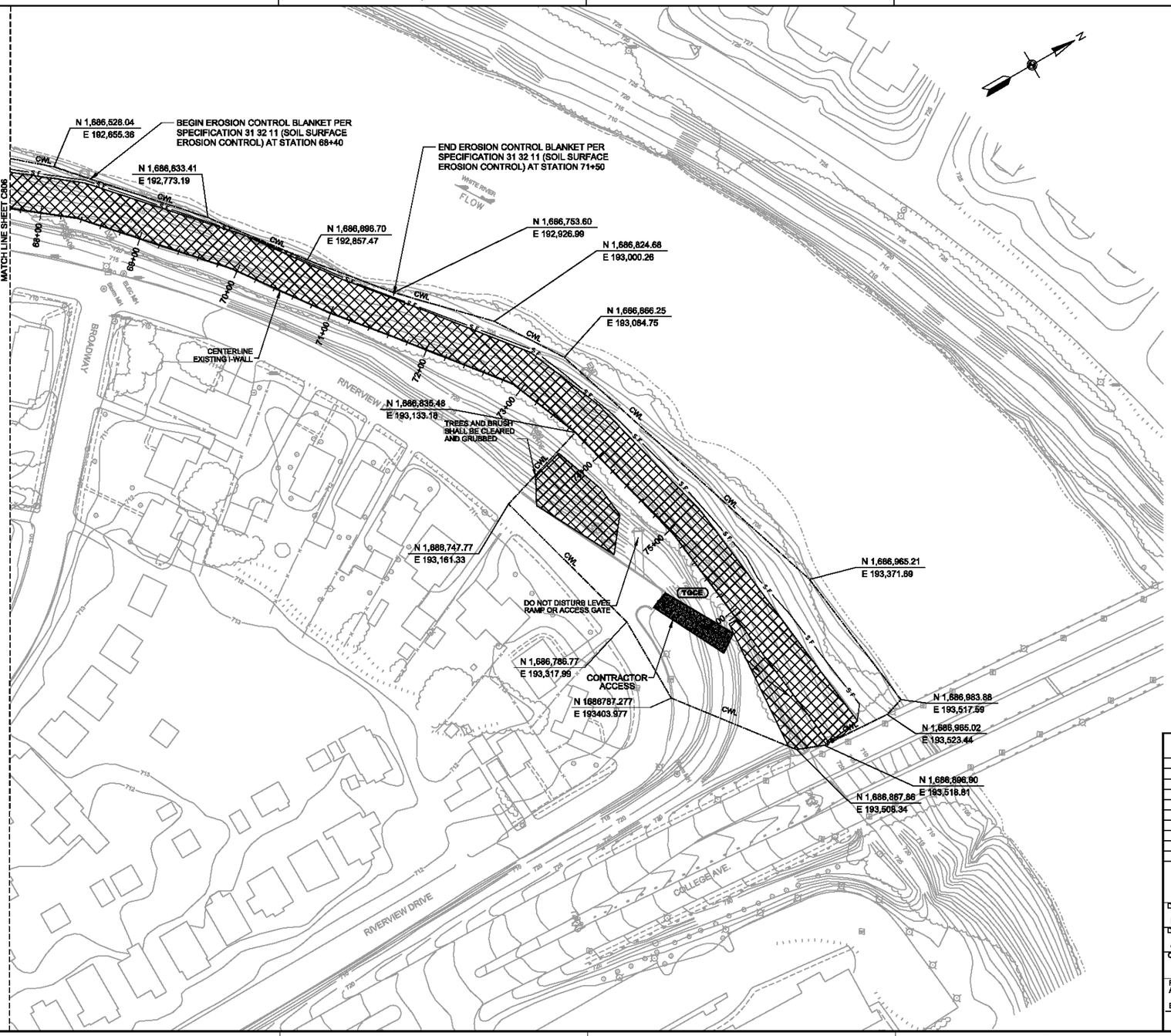
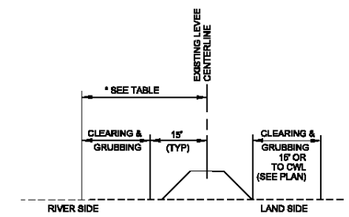


CLEARING AND GRUBBING

STATION	OFFSET (FT.)
0+00 TO 20+00	40
20+00 TO END	35



TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CONTRACTOR WORK LIMITS SHALL BE AS SHOWN ON THE DRAWINGS. IF CWL IS NOT SHOW ON THE LAND SIDE OF THE IWALL THEN THE IWALL WILL BE THE CWL.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 08, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 0 40 80
SCALE: 1"=40'

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3A PLAN

(SHEET 7 OF 7)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C807
Sheet 110 of 132

CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059

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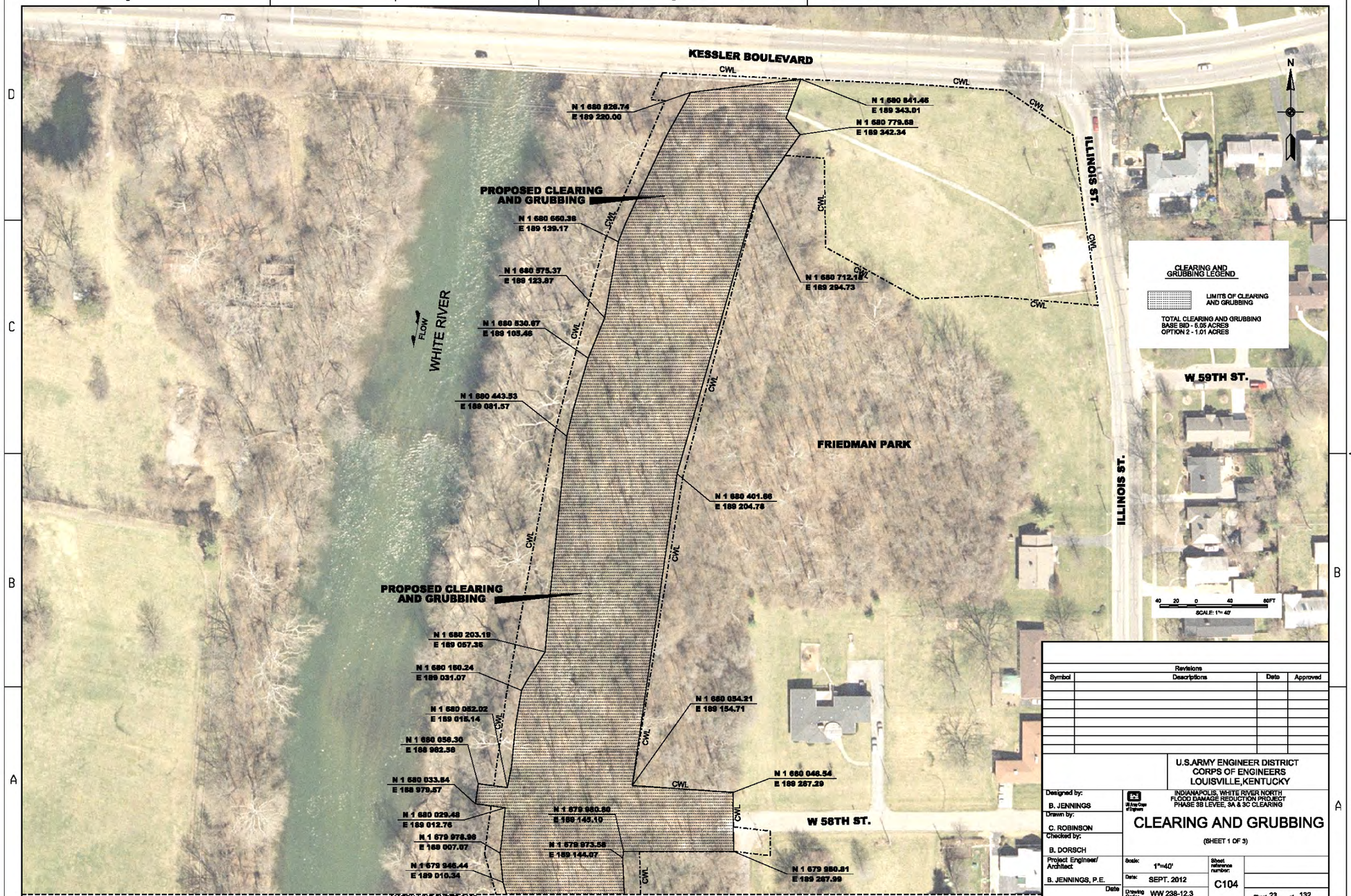
Indy 3B



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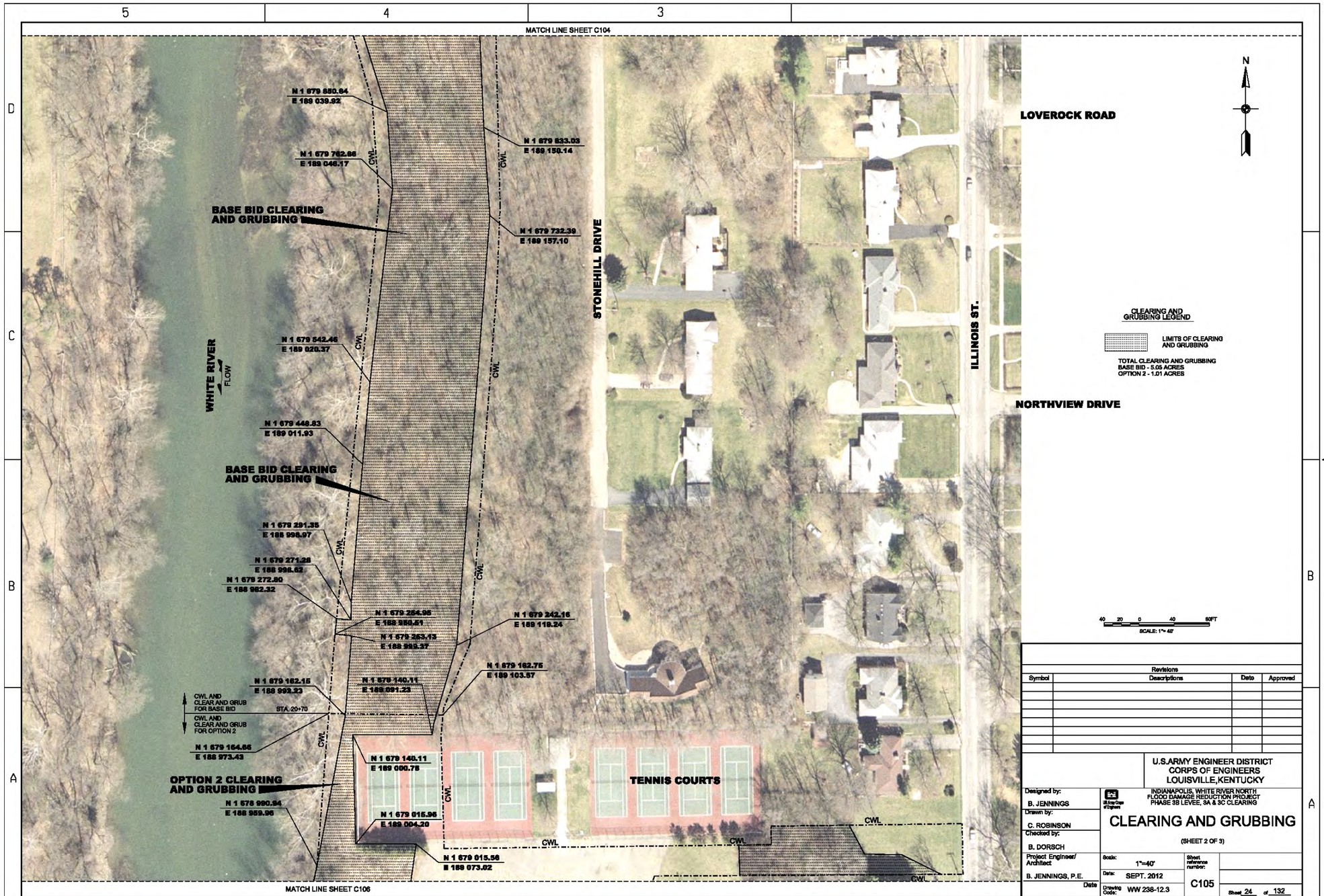

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

CLEARING AND GRUBBING

(SHEET 2 OF 3)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: 1"=40'
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C105
Sheet 24 of 132

DATE: 14-AUG-2012 10:03
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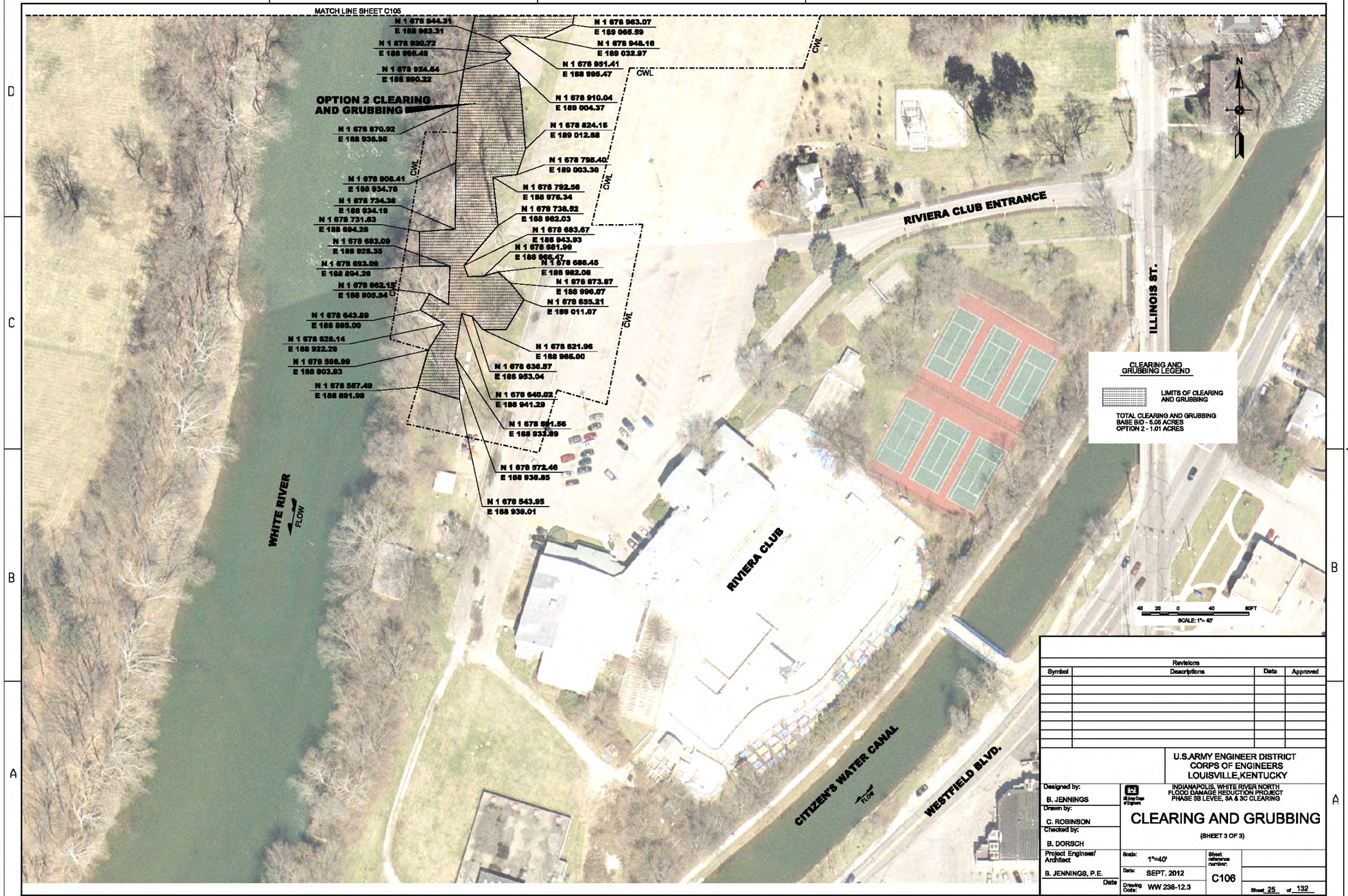
CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059



Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

CLEARING AND GRUBBING

(SHEET 3 OF 3)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: 1"=40'
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C106
Sheet 25 of 132

DATE: 14-AUG-2012 10:04
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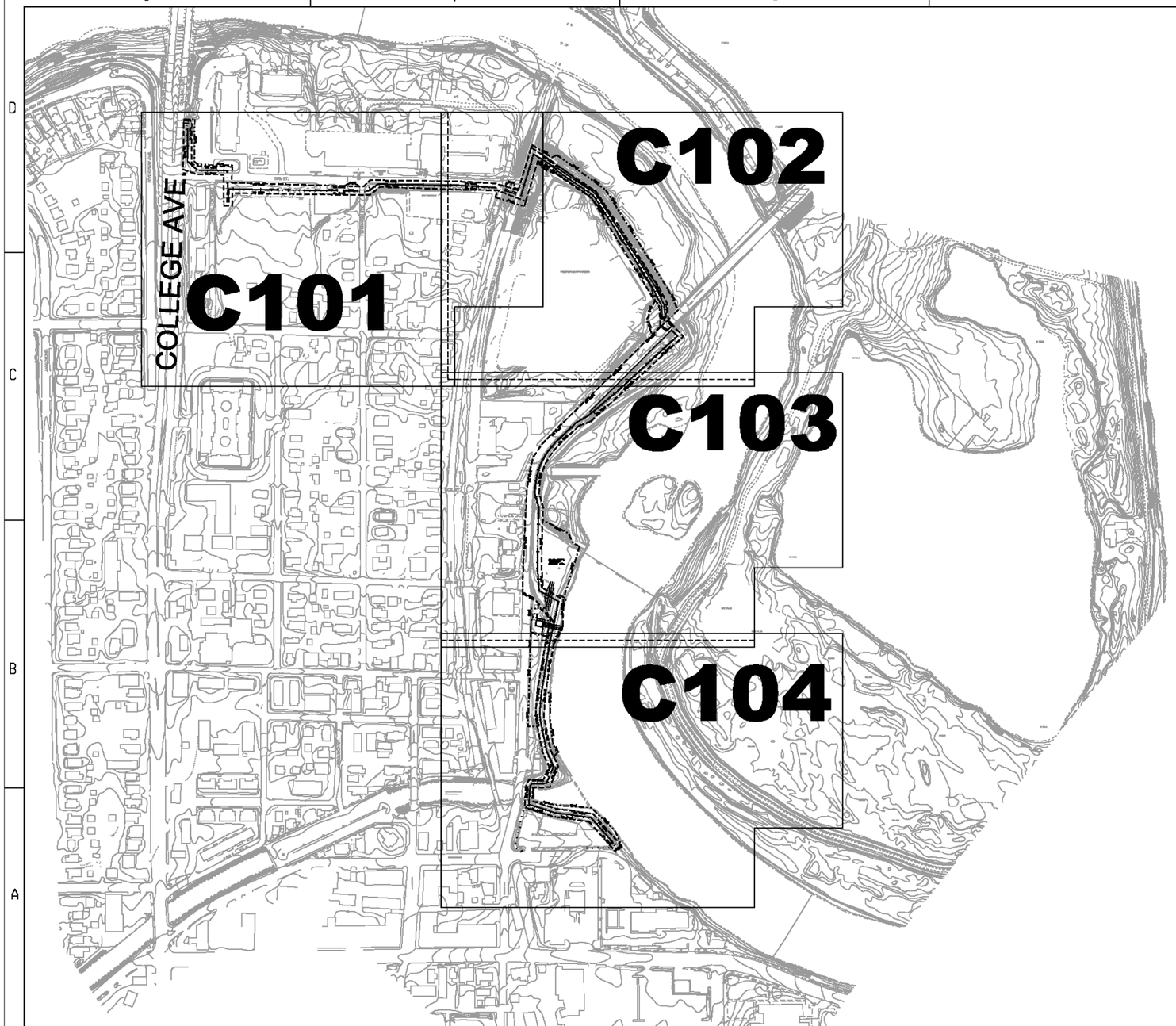
CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059

Indy 3C



Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3C PLAN KEY MAP

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C900
Sheet 11 of 132

DATE: 14-AUG-2012 10:17 File: S:\proj\inb0\CADD\inb0c100.dgn
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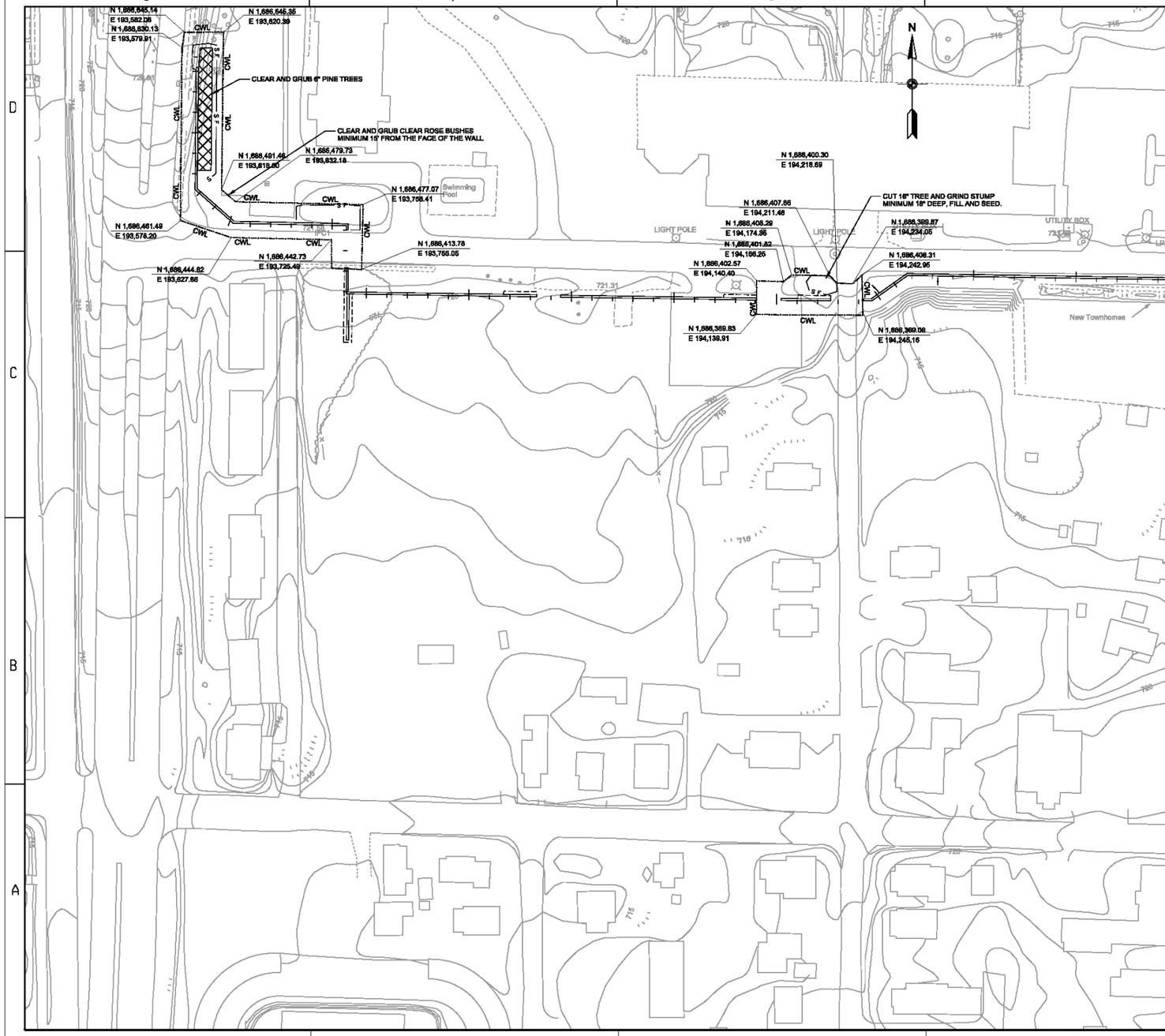
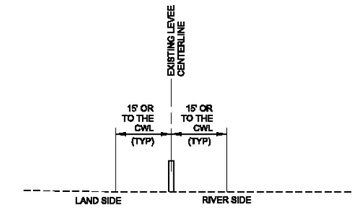
CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059





TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CLEARING AND GRUBBING
   LEVEE: LIMITS ARE OFFSET 33' RIGHT OF LEVEE CENTERLINE.
   IWALL: 15' RIVER SIDE AND 15' LANDSIDE OR TO THE CONTRACTOR WORK LIMITS.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 06, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR ACCESS FOR PHASE 3C LEVEE SECTION OF CLEARING AND GRUBBING SHALL BE FROM WESTFEILD BLVD AS SHOWN
6. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 20 0 40 80FT
SCALE: 1"= 40'

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3C - PLAN
(SHEET 1 OF 1)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C901
Sheet 114 of 132

CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059

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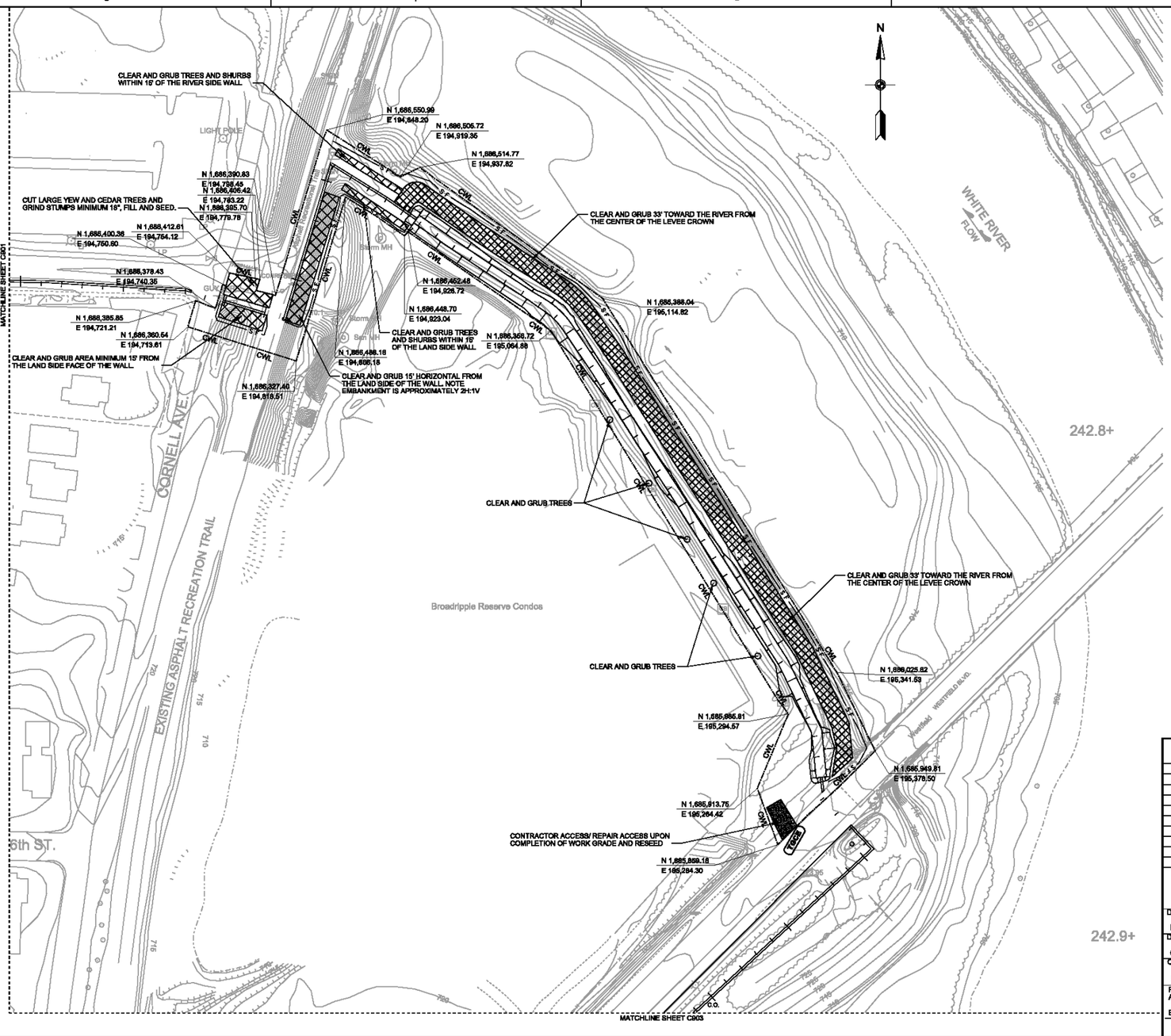

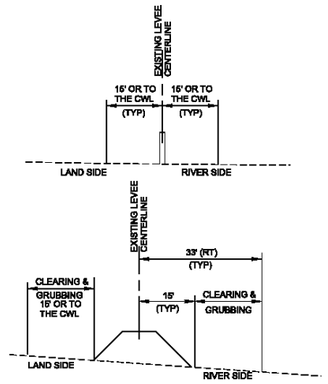

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CLEARING AND GRUBBING
   LEVEE: LIMITS ARE OFFSET 33' RIGHT OF LEVEE CENTERLINE.
   IWALL: 15' RIVER SIDE AND 15' LANDSIDE OR TO THE CONTRACTOR WORK LIMITS.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 06, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR ACCESS FOR PHASE 3C LEVEE SECTION OF CLEARING AND GRUBBING SHALL BE FROM WESTFEILD BLVD AS SHOWN
6. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 20 0 40 80FT
SCALE: 1"= 40'

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3C - PLAN

(SHEET 2 OF 4)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C902
Sheet 109 of 132

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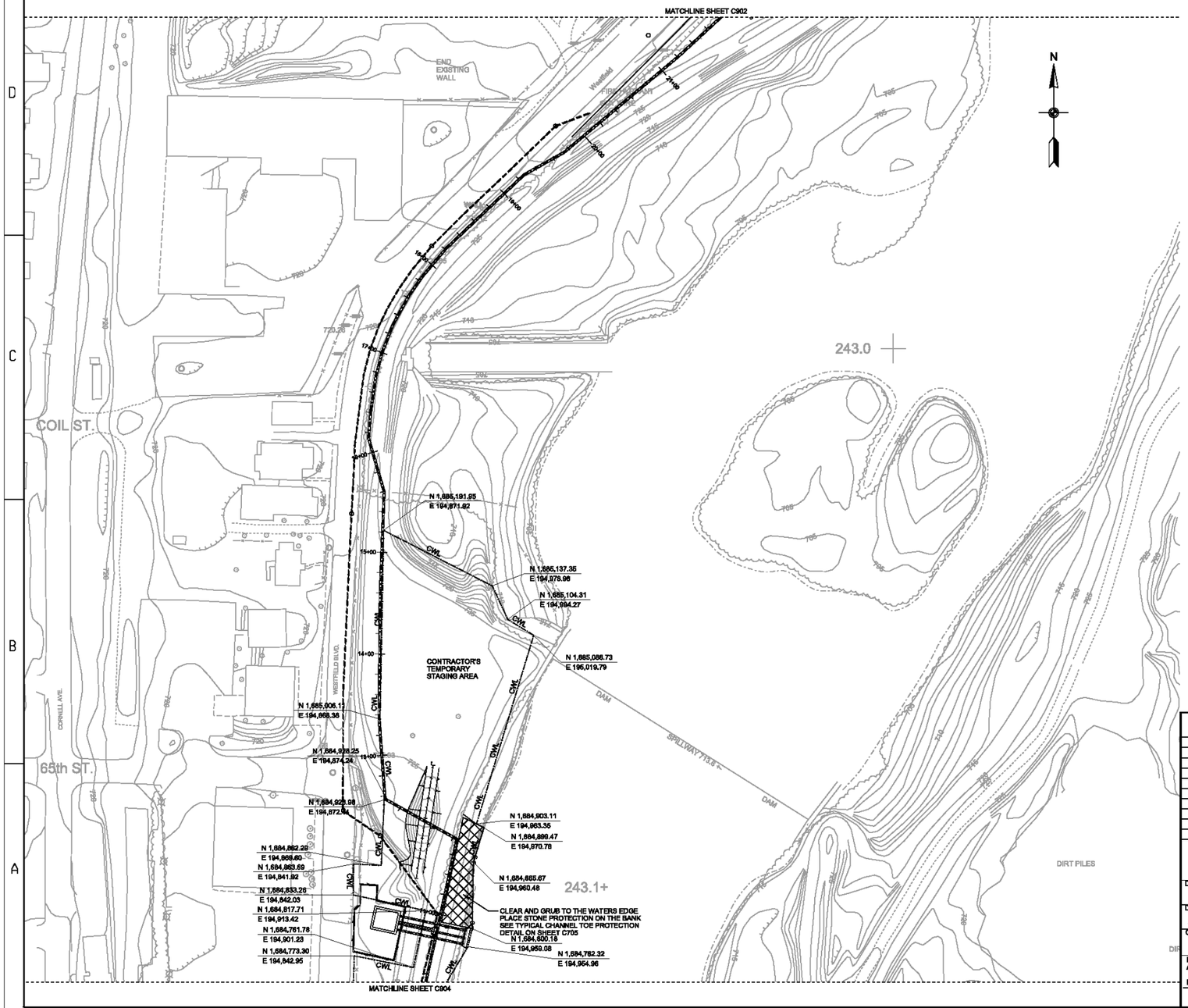

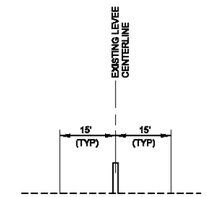

TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CLEARING AND GRUBBING
   LEVEE: LIMITS ARE OFFSET 33' RIGHT OF LEVEE CENTERLINE.
   IWALL: 15' RIVER SIDE AND 15' LANDSIDE OR TO THE CONTRACTOR WORK LIMITS.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 08, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 92 19.
4. UTILITY LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL UTILITY LOCATIONS AND THEIR DEPTHS. THE CONTRACTOR SHALL CALL INDIANA'S "CALL BEFORE YOU DIG" (811 OR 1-800-382-5544) AT LEAST TWO BUSINESS DAYS PRIOR TO INITIATING WORK.
5. CONTRACTOR ACCESS FOR PHASE 3C LEVEE SECTION OF CLEARING AND GRUBBING SHALL BE FROM WESTFEILD BLVD AS SHOWN
6. CONTRACTOR SHALL STAKE ALL CWL BEFORE ANY WORK BEGINS.

LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 20 0 40 80FT
SCALE: 1"= 40'

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3C - PLAN

(SHEET 3 OF 4)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date
Scale:
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C903
Sheet 109 of 132

CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059

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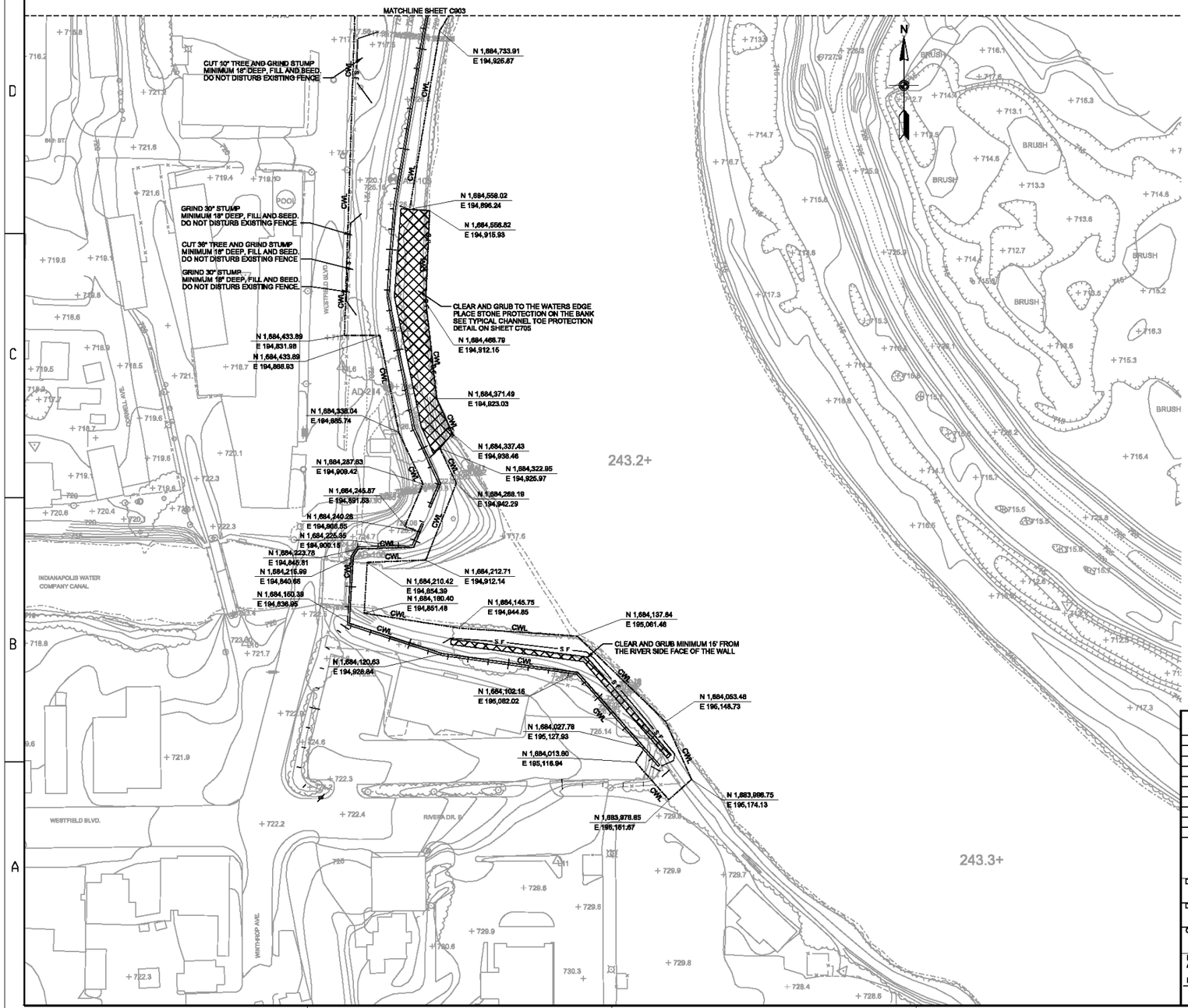

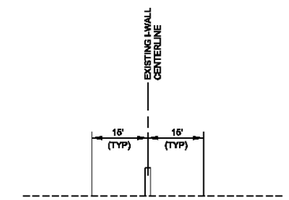

TYPICAL SECTION

CLEARING AND GRUBBING
NOT TO SCALE

NOTES:

1. CLEARING AND GRUBBING
   LEVEE: LIMITS ARE OFFSET 33' RIGHT OF LEVEE CENTERLINE.
   IWALL: 16' RIVER SIDE AND 15' LANDSIDE OR TO THE CONTRACTOR WORK LIMITS.
2. LEVEE CLEARING AND GRUBBING SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 31 11 00.
3. FOR ALL AREAS OF CLEARING AND GRUBBING, THE LEVEE SLOPE SHALL BE RESTORED IN ACCORDANCE WITH SPECIFICATION SECTION 31 00 00.00 08, AND SHALL BE SEEDED IN ACCORDANCE WITH SPECIFICATION SECTION 32 82 19.
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LEGEND

CWL — CONTRACTOR WORK LIMITS

CLEARING AND GRUBBING

40 20 0 40 80FT
SCALE: 1"= 40'

Revisions			
Symbol	Descriptions	Date	Approved

U.S.ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE,KENTUCKY

US Army Corps of Engineers

INDIANAPOLIS, WHITE RIVER NORTH
FLOOD DAMAGE REDUCTION PROJECT
PHASE 3B LEVEE, 3A & 3C CLEARING

PHASE 3C - PLAN

(SHEET 4 OF 4)

Designed by: B. JENNINGS
Drawn by: C. ROBINSON
Checked by: B. DORSCH
Project Engineer/ Architect: B. JENNINGS, P.E.
Date

Scale: AS SHOWN
Date: SEPT. 2012
Drawing Code: WW 238-12.3
Sheet reference number: C904
Sheet 109 of 132

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CERTIFIED FINAL DOCUMENTS W912QR-12-R-0059

Appendix B: Project Best Management Practices

BEST MANAGEMENT PRACTICES (BMP)

The following specific BMPs are examples that would be incorporated for implementing the proposed action:

1. Vegetative Practices.
   a) Straw, mulch or other suitable material placed on disturbed areas to reduce runoff and erosion.
   b) Temporary vegetation established to reduce stormwater runoff velocity and sheet flow.
   c) Permanent vegetation such as trees, shrubs, grasses planted on exposed areas for final permanent stabilization where possible.
   d) A protective blanket or soil stabilization mat used to assist in establishment of temporary or permanent vegetation.

2. Structural Practices.
   a) Check dams installed to minimize erosion rates by reducing the velocity of storm water in areas of concentrated flow, and to capture larger soil particles.
   b) A stone-stabilized pad located at any point where traffic leaves a construction site to a public roadway.
   c) Silt fence used as a temporary sediment barrier to prevent sediment from leaving construction site and entering natural drainage ways.

IMPLEMENTATION MEASURES

The following commitments are made regarding the proposed project implementation measures:

1. Contaminated soils and waste, if encountered, would be disposed of at an approved landfill in accordance with State of Indiana regulations and specific landfill requirements.

2. Disturbed soil would be stabilized as quickly as practicable.

3. During construction, housekeeping steps would be implemented to minimize fugitive dust emissions, to remove mud and soil tracked onto adjacent roadways, and to control runoff contamination.

4. A Sediment and Erosion Control Plan would be prepared and implemented in accordance with State of Indiana regulations.
5. Necessary permits and approvals would be received and implemented in accordance with regulations.

6. Mature trees would be preserved to the greatest extent possible within the project footprint for protection of potential Indiana bat habitat. All felling of timber will occur when bats are not present unless otherwise approved by the US Fish and Wildlife Service.
7. If construction plans and specifications result in significant changes from those outlined in the Environmental Impact Statement, the NEPA process would be revisited.

DISPOSAL AREAS

The following commitments for the Disposal Area are made:

1. Excavated materials and debris would be properly disposed of in accordance with state and local law, regulations, and permit requirements.

2. Housekeeping steps would be implemented to minimize fugitive dust emissions and to remove mud and soil tracked onto adjacent roadways.

EQUIPMENT STAGING AREAS

Equipment Staging Areas would most likely be previously disturbed areas such as gravel or asphalt lots or vacant residential lots; such sites would be the preferred locations.

The following commitments for the Equipment Staging Areas are made:

1. A BMP Plan for activities at the Equipment Staging Areas would be prepared and implemented.

2. The areas would be kept clean and any hazardous materials used to support the proposed project would be contained.

3. Housekeeping steps would be implemented to minimize fugitive dust emissions and to remove mud and soil tracked onto adjacent roadways.

MITIGATION

Mitigation for environmental impacts includes three phases: avoidance, minimization, and compensatory mitigation. For the proposed project, environmental impacts have been avoided and minimized to the greatest extent possible along the entire route. The remaining unavoidable impacts will be mitigated at a site or sites to be determined. The primary purpose of mitigation will be the preservation and/or restoration of bottomland hardwood forest with riparian habitat and associated wildlife.

Appendix C: 404 (B) (1) Alternatives Analysis
For the
Indianapolis North Flood Damage Reduction Project

Section 404(b)(I) Evaluation
Indianapolis North Flood Damage
Reduction Project Vegetation
Clearing Phases 3A & 3C
Indianapolis, Indiana

1. PROJECT DESCRIPTION

A. Location. The proposed project is a 15 ft vegetation clearance for the Phase 3A/Warfleigh and Phase 3C/Monon-Broad Ripple Sections of the project. Vegetation will be removed 15 ft from the toe of the levee or face of the floodwall.

B. General Description. The proposed action consists of removal of trees, shrubs and vines and their roots within 15 ft of either side of the floodwall and/or toe of the levee. The cleared areas will be maintained as mowed grasses. This clearing will require stone protection of the riverbank where clearing extends to the edge of the stream.

C. Authority and Purpose. The US Army Corps of Engineers, Louisville District (Corps), under authority of the Flood Control Act (FCA) of 1936, as amended by the FCA of 1946, prepared a General Reevaluation Report (GRR) and Final Environmental Impact Statement (EIS) in September of 1996, entitled Indianapolis North Flood Damage Reduction Feasibility Study to address flooding problems along the White River in northern Indianapolis, Marion County, Indiana.

D. General Description of the Dredged or Fill Material. The material which will be placed below ordinary high water in the White River consists of approximately 50 CYs of bedding stone (INDOT #2) and 150 CYS of (INDOT Revetment) Riprap.

E. Description of the Proposed Discharge Site. Stone placement will take place along the toe of the cleared riverbank in Phase 3C. This stone will all be placed along approximately 250 lineal feet along the left descending bank just downstream of the upper end of the canal and White River intersection.

F. Description of Disposal Method. Sound engineering practices will be followed during all phases of project construction. The fill material will be placed by mechanical means so as to produce a well-constructed and stable structure. Bedding stone will be placed first then riprap all on a 2.5:1 slope.

2. FACTUAL DETERMINATIONS

"Factual Determination" as required by Section 230.11 of the Environmental Protection Agency's Final Revised Guidelines of March 14, 1997 includes the following:

A. Physical Substrate Determinations. Minor changes to physical substrate will occur because of the construction. Sediments, primarily sand, silt and gravel, will be removed along the 250 ft of riprap to construct a trench to key in the slope protection.

B. Water Circulation, Fluctuation, and Salinity Determinations. Water chemistry, odor, taste, dissolved oxygen levels, and nutrients will not be significantly affected by the fill operations. Current patterns, stream flow and velocity, and hydrologic regime will not be adversely affected by the fill operations. Salinity is not a consideration.

C. Suspended Particulate and Turbidity Determinations. Turbidity levels will be elevated locally during construction. Following construction activities, turbidity levels will return to preconstruction levels. Fill materials will be obtained from clean commercial site sources. There will be no effect on the chemical and physical properties of the White River. Primary production in the river will not be 'affected due to suspended particulates and turbidity. The project will have no post-construction suspended particulates or turbidity that will affect fisheries.

D. Contaminant Determination. The fill material will be obtained from commercial, pollution-free sources. There is no reason to believe that the considered fill material is a carrier of contaminants. This meets the testing exclusion criteria.

E. Aquatic Ecosystem and Organism Determination. As insignificant amount of substrate will be disturbed, the aquatic system will not be significantly affected. The considered fill area does not provide significant wildlife habitat. Spaces between the riprap will provide some habitat for smaller fishes.

F. Proposed Fill Site Determinations. The placement of the fill is determined by engineering requirements. Placement of fill materials will not violate Indiana water quality standards. There will be no effect on municipal water supplies; no recreational fishery will be affected.

G. Determination of Cumulative Effects on the Aquatic Ecosystem. No cumulative effects to the aquatic ecosystem of the stream can be attributed to disposal of fill materials associated with construction of the project.

H. Determinations of Secondary Effects on the Aquatic Ecosystem. No significant adverse secondary effects to the aquatic ecosystem can be identified from the proposed placement of the fill materials.

3. FINDING OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

A. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem. The proposed construction fulfills the economic, engineering, and environmental requirements associated with project development under the applied authority. No practicable alternatives to the proposed discharge site which will have less adverse impact on the aquatic ecosystem exist.

B. Compliance with Applicable State Water Quality Standards. As required by Section 401 of the Clean Water Act, Water Quality Certification will be requested from the State of Indiana.

C. Compliance with Applicable Toxic Effluent Standard or Prohibition under Section 307 of the Clean Water Act. The fill placement operations will not violate Section 307 of the Clean Water Act.

D. Compliance with Endangered Species Act of 1973, as Amended. Based on available information, it has been determined that no species, or the critical habitat thereof, will be affected by the considered work.

E. Evaluation of Extent of Degradation of the Waters of the United States. The considered placement of fill will result in no significant adverse impact on health and welfare, including municipal and private water supplies, recreational and commercial fishing, wildlife, and endangered species. Life stages of aquatic and terrestrial species will not be adversely affected. No significant adverse effects on aquatic ecosystem diversity, productivity, and stability will occur.

F. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem. Appropriate steps to minimize potential adverse impacts of the discharge on the aquatic ecosystem of the affected streams include sound engineering design and careful placement of fill material. In addition, the contractor(s) placing of fill material will be governed by detailed contract specifications to prevent pollution and damage to the aquatic system as a result of construction activities and fill placement. The provision of a riprap substrate will improve habitat variety.

4. EVALUATION RESPONSIBILITY

On the basis of the guidelines, the considered disposal site for the fill material is specified as complying with the requirements of CFR 40 Part 230 Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material.

Appendix D: DSEIS Public Hearing Transcripts, 23 August 2012.

U.S. ARMY CORPS OF ENGINEERS

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DRAFT SUPPLEMENTAL ENVIRONMENTAL
IMPACT STATEMENT

+ + + + +

PUBLIC HEARING

+ + + + +

THURSDAY
AUGUST 23, 2012

+ + + + +

The Public Hearing was held at the Meridian Street United Methodist Church, 5500 North Meridian Street, Indianapolis, Indiana, at 7:05 p.m., Colonel Luke Leonard, U.S. Army Corps of Engineers, Louisville District Commander and SEIS Decisionmaker , presiding.

P-R-O-C-E-E-D-I-N-G-S

(7:02 p.m.)

MS. ROSEBROCK: Good evening and welcome. My name is Anne Rosebrock, I'm the Senior Pastor at Meridian Street United Methodist Church, and this church has a long history of welcoming the community to come and discuss various issues. So, we are honored to serve you this evening. We welcome you and ask that you will remember that you are in this sacred place where we come to worship each and every week. And so we would invite you, knowing that this is a discussion where many people have certainly deep interests, that you will discuss it with a sense and attitude of respect. We would invite your patience with one another as you listen to opposing views, and just remember that you're in this beautiful sanctuary.

This is a church that serves the community in many, many ways, and we are

happy to have you here this evening and hope the conversation is one that is open and inviting to all. So, if you are a person who prays I would invite you to join me as we begin this evening and offer our prayer.

Gracious God, move in our midst this evening. Help us to be open as we listen to one another. Give us wisdom and vision and clarity as we explore the issues that are before us. And for this day and every day we give you thanks, amen.

It is my privilege to introduce you to Colonel Luke Leonard, Army Corps of Engineers, Louisville District Commander. And he will lead us from this point.

COL LEONARD: Thank you, Reverend. Thank you very much, and thank you for opening the doors for your beautiful church to our meeting today. Ladies and gentleman, I also want to thank before I get started, the City of Indianapolis Public Works Department, especially Director Lori

Miser, who is here in our presence today, and who serves as your sponsor for the City of Indianapolis for the North Levee project.

My name is Colonel Luke Leonard, Army Corps of Engineers, I am the Louisville District Commander and District Engineer. I'm assisted tonight by people from my staff, including Ms. Sharon Bond, Civil Projects, and my chief economist; Mr. Steve Durrett, my Chief of Engineering Division; Ms. Bonnie Jennings, who is the project manager; and Mr. Mike Turner, Environmental Resources, all of whom have spent a lot of time working on this project.

We have a transcriber recording these proceedings so that we'll have a complete formal transcript of the public comments. As a kindly reminder, smoking is prohibited, if you must smoke, please step outside. As a precaution, in case of emergency, exits are located behind you and to my right through the set of doors. As you

came in this evening you had the opportunity to stop by our registration tables and sign a card that looks kind of like this. We ask that you fill out one of these cards if you would like to make a statement tonight, most of you have already done so. You may also fill out a card to help us update our mailing lists for the Supplemental Environmental Impact Statement. If you have not yet completed one, and would like to, just raise your hand and we'll get one. There's some hands back there, Todd, right behind you.

The Indianapolis North White River Flood Risk Reduction Project involved construction of flood walls and earthen levees along the east bank of the White River in the Broad Ripple, Warfleigh and South Warfleigh neighborhoods, which will reduce the flood risk. The project helps preserve lives and livelihoods. Our overall project is designed to remove an estimated 1,500 businesses and homes from the 300 year

floodplain. Approximately 1,300 of these structures are located within the 100 year floodplain and the Broad Ripple, Warfleigh and South Warfleigh neighborhoods. We are two thirds of the way complete with realizing the benefit of this project. Two of the three levee sections are finished.

After completion of the entire project, homeowners and businesses behind the levee system will likely experience cost savings in flood insurance, pending levee certification and FEMA remapping of your town. The Corps of Engineers is poised to begin construction of the third and final phase of the levee, but the construction will only start presently at the northern end. This area is the upstream section of the levee segment, you'll know it at Kessler Boulevard up to Friedman Park. This will start this fall, and this is progress. Let me clarify, this initial stretch of levee is not the alignment to be discussed this

evening at this public meeting, but we will have an open house to discuss it before construction sometime this fall.

Tonight we are here to take public comments on the Army Corps of Engineers' draft Supplemental Environmental Impact Statement, referred to as the draft SEIS. This product has been prepared to evaluate alternatives and impacts from those proposed modifications to project features, including realigning the South Warfleigh section and the proposed additional tree clearing along the already completed levee work in the Broad Ripple and Warfleigh neighborhoods. To complete the project the Corps recommends the Westfield Boulevard alternative among the three alternatives. This plan describes construction that would begin at the south end of the Riviera Club property, cross the canal at the intersection of Westfield Boulevard and North Capitol Avenue, and end in the vicinity of Butler

University.

Additionally, some trees and shrubs will need to be removed on completed parts of the levee in Broad Ripple and Warfleigh. This vegetation removal is required to meet current engineering levee safety standards, render the levee structurally sound for certification and FEMA remapping, and most importantly, ensure public safety.

The draft Supplemental Environmental Impact Statement does not recommend the Rocky Ripple alternative. However, when you read the draft SEIS you'll see that we did examine this alternative in detail. The Corps of Engineers evaluated assimilating Rocky Ripple into the three phase project. We conducted significant engineering and cost analysis to explore the city's request. The analysis determined that adding a flood wall component that would meet current engineering standards to include

Rocky Ripple was not economically viable. The cost of adding Rocky Ripple to the project would substantially exceed the economic benefits. The cost of the Rocky Ripple alignment outweighs those benefits. With the Rocky Ripple included the entire project in the federal's eyes would no longer be economically viable. That said, by law no selected alternative may increase flood risk levels in any community, including Rocky Ripple by law.

I'll now move into the purpose of this hearing. I will cover the public hearing guidelines and ground rules to accept your oral statements, so this is the comment guidelines. The purpose of this hearing is to accept all oral and written and public comments in response to the SEIS, which I will consider when the final SEIS is prepared and signed. I will consider a wide range of public interest factors relating to the impacts of the specific proposal. The draft

impact statement is intended to disclose environmental impacts associated with the proposed project, as well as reasonable alternatives to the proposal and their environmental impacts.

The factors which will be considered include, but are not limited to, economics, aesthetics, fish and wildlife values, flooding, land use, recreation, historic properties, water supply, water quality, and safety. This information will inform me as the decision maker regarding the impact on the human environment. Then the final SEIS will be circulated to agencies and to the public for a minimum of a 30-day review period, after which the Corps will make a final decision on the future direction of the project and sign the record of decision. This record of decision completes the review process for that environmental impact statement.

If you would like to discuss this

proposed action in further detail you may consult with members of my staff that I brought with me who are available in the parlor next door, and most of you have already talked with them, but they'll remain out there while we're going through the public comment period. Please understand though that any statements that you make to them will not be included in the public record. So, if you think of something and want to include, you have to come back in here and read it into the record, or submit it in written form at a later date.

When you make any comments on the proposal tonight I ask that you direct your comments to me. Everyone will have an opportunity to speak. If you indicated so on your registration card, please raise your hand if you have the intent just so I can gauge just how much time we're going to need. Please raise your hand if you have intentions of making a comment. Okay, thank you.

So, we had anticipated that we could give everybody about three minutes, but I don't think we need to be too strict because I only saw 30 perhaps hands go up. But, get to your points quickly so that everybody gets a chance, we only have until 11:00 p.m. before we need to get out of the church. During your remarks you will be cued with a yellow card when you have a minute remaining, and then with a red card signifying the end of your three minutes or so. Carol will be judicious with her card use.

Your oral comments will be included in the record. In addition, you may submit more written comments to our staff tonight, or you may mail them into the address on your comment card, even if you made an oral statement. The format will be to first ask for statements from elected officials and government agency representatives. Following these comments

I'll open the floor to anyone else wishing to make a statement. And as a final reminder, we'll accept written statements tonight, or you can mail them to us, again both written and oral will be included in the hearing record.

The hearing record will now remain open, and this is new information, until close of business 28 September 2012. This second extension was brought at the request of the city, which will bring the total public comment period for this impact statement to three months. Okay, so now I will ask for statements from elected officials. I have Senator Schneider, sir are you in the audience still? Okay, did he go? Okay, and Representative Delaney, Liz Pelloso from EPA Region Five. Oh, I'm sorry, sure, right into the microphone, please, sir.

MR. DELANEY: I got out of the Navy a long time ago, Colonel, so I'm not used to paying attention to the audience. I

just have a few remarks. I've been studying this for several months.

COL LEONARD: Let's hang on a second.

MR. DELANEY: I can lift this up, does that help?

COL LEONARD: Sir, state your name for the audience.

MR. DELANEY: My name is Ed Delaney, I'm the State Representative, I currently represent Rocky Ripple. Come November I hope to be representing the East Bank. They've changed my district, but I'll be on one side or the other, so this canal project will go through, this wall project will go through my district either way.

I wanted to clarify a couple things that concern me up front. First of all, the display is helpful, I think the visual of the wall going across the canal is attractive, it looks a lot more like a canal lock than an ugly wall, so the Corps has to

be congratulated on that. I have a deep concern about what I want to call the urban legend that our problem with Rocky Ripple is that they said no 20 years ago. I'm hopeful that the Corps is ignoring that no and looking at what people feel today. I think people know a lot more, people have changed in the neighborhood, they've learned more, a lot of them have moved out, others have moved in. So, I hope that there's no, hangover, let's call it, from this past attitude of rejection. I don't hear that.

I participated in the demonstration the other day and I saw, I was interested, the chant was that they want protection, not that they don't want the government, not that they don't want the wall, they want protection. That was the chant of hundreds of people. So, that is the core concern, is that the people of Rocky Ripple are going to be excluded.

The negative, the biggest

negative that I see is the apparent decision, and I'm happy to be corrected, that there will be electric walls on the bridges at 52nd and 53rd Street that will close on or at those bridges. Is that right Colonel, is that the way that's set up?

COL LEONARD: I don't think that's accurate.

MR. DELANEY: It is accurate?

COL LEONARD: Sandbags.

MR. DELANEY: Sandbags will go up?

COL LEONARD: Correct.

MR. DELANEY: At the time someone declares an event, the sandbags will go up, okay.

COL LEONARD: Yes, sir.

MR. DELANEY: That will isolate the people in Rocky Ripple, that is I think the ultimate concern. If they haven't gotten out, if they haven't gotten their goods out that will be literally a visual

representation of the isolation that this wall represents. That concerns me the most. Next, it seems to me that the most important thing we can do is send a good message to the people of Rocky Ripple, which is that we do care about them and we want to protect them. That's the most important message. I'm not sure the current design provides for that, in fact it sends the opposite message.

Lastly, there's a lot more to learn. I, for example, am very interested in the flood insurance aspect. I have no idea what can happen to the people on the other side of this wall. I can't think that it's good for their flood insurance or its availability or its price. I'm also concerned about whether the overall structure of the wall actually increases the risk to the people of Rocky Ripple.

As long as you're putting this wall to the north, areas that once would have perhaps drained off some of the water in the

flood event, that water will be concentrated on Rocky Ripple. So, those are my main concerns. I will work with the city, I'm a state legislator I'm not a city official, I will work with the people from the city to see what we can do to do something that's fair to these people and sends a right message.

I do have a concern that others do about the visuals. I use that path all the time, I'm concerned about turning it into a treeless plain. That bothers me, but it's the people of Rocky Ripple that I'm most concerned about, and I thank you for your attention and I hope you'll keep your eyes on this currently as we move forward. Thank you very much.

COL LEONARD: Thank you, sir.

(Applause.)

I got you loud and clear. Senator Taylor.

MR. TAYLOR: I'm going to turn

around and speak to the Colonel in a second, but I want to introduce myself. My name is Greg Taylor, I'm the State Senator for District 33. District 33 happens to include portions of Butler-Tarkington area, and it includes the entire Rocky Ripple area. So, I'm here to speak for my constituents who live in, hopefully for my constituents who live in Rocky Ripple.

Thanks, first of all, Colonel, for being here and opening up the dialogue for conversation in regards to the flood wall, and what you have to do. And respectfully I want to thank you for your service to this country and what you do as a Colonel.

First off, I don't know how they do it in Kentucky or any other areas in your region, but typically in public hearings is a question and answer situation, and I don't know if there's any questions that are going to be answered here today. But I hope that

we will leave open the idea of getting together to answer some additional questions that may come up as a result of this meeting.

Third, Rocky Ripple is an area that I've come to know and grow and love as a representative of my district. And one of the things that compels me to stand up here before you today, I wasn't even going to speak until you asked for comments from elected officials, was that Rocky Ripple is a neighborhood that is very prideful about what they have and who they are. They have a little community center there, they have, you know, whenever I go over there I can always go over to the community building and there would be some people there and we just sit around and talk.

If I look at this map and I look at the proposed wall that you're talking about putting up, I think you're going to cause the property value in that area to go down. Because this is going, this could put

Rocky Ripple in a floodplain.

Now, I didn't say it would, but it could. And just to bring you a little history, in Indiana we have a thing called property tax caps, and if you lower the property value you're going to lower the taxes that the city uses to provide public service to the people.

The flood insurance is an issue that my colleague brought up earlier, and I'm very concerned about that as well. I think that when you go out and you look for alternatives, I think one of the things you need to understand is what are the far reaching ramifications of what you do. I don't know if the Corps understands this, but if this is a 300 year floodplain and there hasn't been a flood, instead of causing an issue, why don't you just leave it alone?

(Applause.)

I live by the motto of "Do no harm," and hopefully I say that to you

respectfully Colonel, not to do any harm. If the wall is going to cause harm, and you're predicting what you have to do with the wall based on what could possibly happen in the case of a 300 year flood, hopefully you would err on the side of doing no harm at all. And I ask that you consider that in your proposal. I know that funding still needs to come through, there's a lot of things, red tape, in government, so I understand how that works. But I ask that you really consider the net effect and maybe the way you evaluated the situation and your group as to whether or not this is going to cause more harm than benefit.

Maybe you need to hear about what some of the people who live in Rocky Ripple, what the harm would do to them. And maybe we need to have one of them on the team that decides where this wall finally goes. That's how we do it here in Indiana, we put people who have interest in it, even though their

interest may be adverse from ours, we still put them at the table so they can have a voice. And I ask that you do that on this proposal, and before you make the final decision, at least consult with some people who live in Rocky Ripple. Thank you.

(Applause.)

COL LEONARD: Thank you, sir. Is John Barth here, please? John Barth, please, from the city council.

MR. BARTH: Good evening, I'm John Barth. I'm an at-large member of the Indianapolis City County Council. I am a lifelong resident of this neighborhood. I am former President and current board member of the Butler Tarkington Neighborhood Association. I'm here to say this, I support, as does Counselor Monroe Grey, the position of the Butler Tarkington Neighborhood Association, the position of Rocky Ripple, the position of Butler University, and that is that we need to

listen carefully to the priorities of the neighbors.

I don't know, I came in late to hear Senator Taylor's comments, but I believe he said, "That's how we do it in Indiana." That is how we do it, we listen carefully to what neighbors want, we listen carefully to neighbor priorities, and we go forward with that approach. The thing I would also like to say, that concerns me greatly, is that there is no money for this project is my understanding, am I correct about that?

COL LEONARD: You are not correct.

MR. BARTH: There is money allocated for this?

COL LEONARD: Yes.

MR. BARTH: For this money, for the project as described?

COL LEONARD: Well, in order to apply for the money which, we have to have this impact statement complete.

MR. BARTH: It's 100 percent allocated?

COL LEONARD: We're getting ready to start a section, it's incrementally funded. So, annually we get increments. We have an increment for 2012.

MR. BARTH: So the section --

COL LEONARD: Correct.

MR. BARTH: Okay.

COL LEONARD: The section that we have enough money to build on this year we're going to start building on.

MR. BARTH: Right, that section.

COL LEONARD: That's right.

MR. BARTH: So, going forward is yet to be funded, so my point is this. Since it's not funded to date I think there's a huge opportunity for us to sit down and work together, prioritize neighborhood issues, and really think through how it could work for the long term for the city, not for the short term for decisions that, to me, seem more

appropriately made for engineers rather than priorities of neighborhoods.

(Applause.)

And I will leave it at that, with just restating Senator Taylor's plea, how we do it in Indiana is we listen to neighbors and we build on that and we go from there. We are your partners, let’s do this thing together.

(Applause.)

COL LEONARD: Thank you, sir. Is Liz Pelloso here? Liz Pelloso, EPA Region 5? How about Dave Daugherty, Rocky Ripple Emergency Management? Carla Gaff-Clark?

MR. DAUGHERTY: I'm not very good at public speaking, but Colonel, I think the first thing said was something about this was for protecting lives and property, and the decision has been based on property. Can't hear me? Can you hear me now? I said, when he first started talking he said the decision was based on lives and property, and then the

final decision right now is based on property value. And as head of the Rocky Ripple Emergency Management we devised a system kind of like Homeland Security of Yellow, river warning, Orange, river watch, or something like that, and Red, river alerts, which we have had one voluntary evacuation of Rocky Ripple since we formed this group in '98.

So, looking at the river in '91, I was sitting on the top watching it, about two feet from the top, and it was in January, freezing cold and the water was freezing cold. Since then we've had some near flood stages in summer time, but I've sat on the road to Rocky Ripple and watched the river up here. If the river should suddenly burst in the winter time I worry about hypothermic death and that type of thing on the river in Rocky Ripple. Because we tried to get our people out, but maybe they not all can or won't. So, that's all I got to say about that. And if anybody wants to join the Rocky

Ripple Emergency Management, contact me by e-mail dockguitar@yahoo.com, or Carla. And we're having a benefit concert Sunday for a little gal that lost both her parents this year, from 2:00 to 7:00 at Holcomb Park, so come on out. Thanks a lot.

COL LEONARD: Carla, Carla Clark.

MS. GAFF-CLARK: I'm Carla Gaff-Clark, and I am a senior board member in Rocky Ripple. I have been on the board for approximately 18 years. And I guess with that said, you know that I was here when we went through this before in '94 and '96. And the interesting things that I think are still here today is in '94 and '96 when Rocky Ripple decided they didn't want in, things were different with this whole landscape and the development up on the north side.

Since that time, the water gets very high, very quickly. And other things that have happened, of course, have been almost 20 years of decay to our levee. At no

time did the residents of Rocky Ripple say no to flood protection. We have always asked for flood protection. That particular plan that the Army Corps had at that time is what Rocky Ripple said no to.

But I kind of see this when I look at it historically, I kind of look at this as a figure eight. Like if my children, if I lived in a house where the middle of the figure eight is, and they can get on the school bus at 7:15, or I could let them sleep and they could get on at 8:20. The reality of it, this is kind of how Rocky Ripple is. We opted out, the town opted out and a few years later we said, whoa, too much changing going on in our river, we want back in. And the project wasn't to us yet, it wasn't even to us yet.

At the point in '94 and '96 when we opted out the project was a $10 million dollar project. Now, before you've even gotten to us, we haven't been left out, it's

not like you'd have to band aid us in, you haven't gotten to us yet, and now suddenly the project is $50 million. It's gone from $10 million to $50 million. We don't really understand why that could be.

One thing that has been said over and over by those who have stood up here in front of me is above all else, "Do no harm." And this project looks like, not only is it something that was totally surprising to the residents of Rocky Ripple, at the time things were said like what the wall would look like. So, when the wall was built, to me it looks like what you told me it was going to. Things were said like, this is it or nothing. People said later, even in the last year, we didn't know it was all or nothing. Well, people hear what they want to hear, and you said that to us, I heard that. But what was never said to us is if you don't get in we'll build a wall along the canal. In fact, we'd asked that question many, many times. If you

stop at river then is it high enough, could you stop the project there, and the answer was yes.

So, imagine the surprise of Rocky Ripple residents about 18 months later when they started talking about a wall. At first it was a little tiny wall about 18 inches tall on one side of the canal, with the condition of the canal not being able to support that wall. Then it was changed a few years later to what you're looking at today. And this is an alarming type of thing to those of us in Rocky Ripple. We don't know how you can do no harm with this project. And so with that I guess I'm asking you to re-include us in some way and let us work. As the council folks have said in front of us, let us work with you on this. Thank you.

(Applause.)

COL LEONARD: Thank you, ma'am. Brad Barcum, please.

MR. BARCUM: Hi, my name is Brad

Barcum, and I'm a member of the Rocky Ripple Town Council, and I second what Carla just said. And mine is a question for you, Colonel. I read the DSEIS, all 109 pages or so of it, and am I correct, the decision, or the proposal that was put forward in the DSEIS was put forward for financial concerns, it was going to be too expensive to include Rocky Ripple. Is that correct, my understanding?

COL LEONARD: Of the three alternatives?

MR. BARCUM: Yes.

COL LEONARD: That's correct.

MR. BARCUM: Rocky Ripple was left out for financial reasons?

COL LEONARD: Not financial, economic.

MR. BARCUM: And by economic, what does that mean?

COL LEONARD: I'm not parsing words, as I stated in my intro, "We must

maintain a positive benefit to cost ratio," or it doesn't, it's no longer a legal federal project and I can't do any work.

MR. BARCUM: Understood. My comment is that's how I took it, see, when I read the DSEIS. If it's going to cost $54 million dollars to include Rocky Ripple and $14 million dollars to go down Westfield, and that's the crux of the argument, I would have thought it would have been itemized, we would have been told why it's going to be $54 million versus $14 million, you would have given us some substance behind those numbers. And without substance, you could have said a trillion, because there is not substance behind them.

COL LEONARD: Well, you know, while that's not in the EIS you can ask my staff members. They may be able to give you more detail.

MR. BARCUM: We have.

COL LEONARD: Okay.

MR. BARCUM: And we still have no definition of why it's going to be $54 million versus the $14 million. And some people, and I am one of them, believe that the $14 million may be underestimated and the $54 million may be overestimated.

(Applause.)

And I'd like to let you know that we've got 700 signatures in the last two weeks supporting, these are signatures from Butler Tarkington and Rocky Ripple, supporting or asking the Army Corps of Engineers and the City of Indianapolis to include Rocky Ripple in the levee project. And I'd like to reiterate one of the things you said in your introduction, you said the top priority is the preservation of life, and I don't see it. Do we not live -- there are 700 homes, or there are 330 homes in Rocky Ripple, and there are over 700 of us and we all live there, and our lives are at stake, and we're asking to be included like everyone

else is in this project.

(Applause.)

I'd like to give you our resolution from Rocky Ripple. There is a resolution from Butler Tarkington Neighborhood Association asking for the inclusion of Rocky Ripple in the levee project, and here's our formal resolution.

COL LEONARD: Robert Tomey.

MR. TOMEY: I'm Robert Tomey, I'm Rocky Ripple's Town Board President. Throughout our conversations with the Corps and the City of Indianapolis, they keep speaking to one Rocky Ripple as we are some kind of a second class citizen behind the wall. Our point is Rocky Ripple is a community, but our communities do not stop at the bridge. All of our communities are Butler, Butler Tarkington, Warfleigh area, we're all one community. But you keep speaking of not being economically viable. Well, the one point of that is if you pick

any 330 homes at any one point of this project, are they economically viable for just those? But if you add everybody into the whole project, which we should in your preservation of life, that if you include our 330 homes along with the 1,500 other homes that are involved, it is economically viable for us to be there. And also, Congress can allocate that money to get this done if the Corps goes after the money for this project. I believe that the Corps can do this, and it can do it right.

We do not want to split up one -- put a wall down you're splitting communities. And I was appalled to see, at 5:00 o'clock, Channel 59 news, when you said that if Rocky Ripple tries to be included that this project will stop and it will never get finished. That, sir, right now, is trying to divide communities before we ever get started, and I am appalled at that.

COL LEONARD: Michael Bergitoff?

Peg Sharpes?

MS. SHARPLES: My name is Peg Sharples. I didn't just get off the boat, I've lived here for 51 years. I live on Capitol Avenue. I've written down my statements here. If a flood wall along the river was successful for the first two phases, why change? We want all our neighborhood protected. None of us are more privileged than others. Let's do the best job to protect all of us. A lesson learned from New Orleans can't be forgotten so quickly.

COL LEONARD: Sue Moge.

MS. MOGLE: I'm Sue Mogle, I live in Rocky Ripple. I've got a few things prepared, and I'm going to kind of abbreviate most of them because most of them have already been said. First do no harm I think is very significant. Bonnie Jennings, the Army Corps of Engineers project manager is quoted in one of the articles as saying

public safety is our number one concern, when the levee is complete homeowners and businesses can rest assured that the levees and flood walls, the complete system, will reduce risk that flooding causes. If this is true, then why is any other alignment other than the Rocky Ripple alignment even being considered?

The Army Corps of Engineers own documents, the PDF that's on the website, states the Rocky Ripple alignment is the best alignment for flood protection in Indianapolis. An alignment along the Central Canal would wall off an entire community of Rocky Ripple into the flood way, deliberately exposing roughly 300 homes and almost 1,000 people to the risks that flooding causes. And the emergency plan, in writing, in the proposal, is to sandbag the two bridges to Rocky Ripple, cutting off all access and escape routes, including emergency vehicles. The current proposal allowed hugely increases

the immediate danger of a flood to a significant population to provide a flood 300 years in the future for few.

(Applause.)

COL LEONARD: Dennis Faulkenberg.

MR. FAULKENBERG: My name is Dennis Faulkenberg, I live at 177 West Westfield Boulevard, in the Butler Tarkington neighborhood. My wife, Jill, and I, have lived here since 2004 after 28 years in the suburbs. We were drawn into this neighborhood for the very feature that you're out to destroy, the Indianapolis Central Water Canal. The incredible beauty, nature and history of this area and this neighborhood that we were drawn to are all under attack by this plan that you've proposed. The crossing of the canal right in front of my house, with an industrial-like gate that will come across, this flood wall, four foot, six foot, whatever you, whichever you want to call it, four feet and then you

add two feet on of removable wall, whichever it is, will become a graffiti magnet, weeds will grow up behind it.

I would challenge the water company folks here who own that canal to tell us how they're going to maintain it. The weeds will grow up behind it, folks like us will be behind it with weed eaters trying to keep the weeds and the brush down. Trash will gather up by it. Graffiti magnet, we know this mile long wall will become when it doesn't need to be that way. You don't need to breach this incredible, historic feature. That canal was built in the 1830's. That canal is probably the oldest manmade feature in all of Central Indiana.

(Applause.)

When you issued your environmental assessment document 18 months ago, when you weren't even going to have a public hearing then because of this minor change moving it across the canal, you didn't

even address the historic features of that canal. And my comments, and many comments of the 300 people who gathered at the Riviera Club pointed out the history of this canal. I don't think you folks even realize that. Come to our neighborhood, talk to us, that's what these people are here tonight to tell you, about what a unique, incredible feature this canal, Rocky Ripple, and our neighborhood is. Your taking the cheap route out. The cheap route of $14 million dollars versus $50, I think $14 is understated, I think $50 is overstated.

You've given no detail, we've asked repeatedly for the detail of your cost benefit, of how you came up with the $50 million dollars cost, and the cost benefit. You've not included the benefit of saving the canal in the cost-benefit ratio. This is 60 percent of Indianapolis' water supply, it's supplied by that canal. And if you go along the river, protect Rocky Ripple, and go on

to, around the Butler fields, for some reason you arbitrarily cut down 53rd Street in Rocky Ripple, rather than protecting the entire area north of the canal, including the Butler fields. The cost benefit seems like it would be amazing if you would include the canal along with the Rocky Ripple homes you would save.

What does it take to get you to include the value, the benefit of that, saving the Indianapolis water canal and 60 percent of our water supply, as well as it being this incredible historic feature? What does it take to get you to include the benefit of that in your cost-benefit ratio?

(Applause.)

COL LEONARD: Will Carlson.

MR. CARLSON: My name is Will Carlson, I am the President of the Warfleigh Neighborhood Association. We're a relatively fledgling, young neighborhood association. We don't have a full board, we just have four

officers. But, it's been put to us for the last year or so, where does Warfleigh stand.

So, we had a meeting, we planned on July 23rd and had a meeting, asked everybody in the neighborhood, 650 homes, to show up. And 52 people showed up, 34 voted to go with the fastest way to get the wall done, because we were concerned about a flood coming between the time now and when you might finish it. So, our concern was get it done fast, and if it's got to be cheap, let's go cheap.

But, at the time there was some facts we didn't have, which have been brought to my attention by the president of the Butler Tarkington Association, Neil Bode, John Barth, that there's some discrepancies that we need to consider. Our position is officially, I have to represent how we voted, and that is we support the Westfield alignment. But in my heart, I can't go that way for my own personal opinion.

(Applause.)

I know my neighbor geologist is going to disagree with me, but we'll talk about that later, Kevin. But my feeling is we are a city, we are a community, we are Rocky Ripplians, Warfleighans, Broadville Village Association, we can't be, say, okay, ours is done, we're safe, get it done. We have to support the entire community. Without that, the city would not be what it is, and it wouldn't stand for what we think it stands for. And that is we sit down and we talk with each other and we get the right thing done for the right reasons. Thank you.

(Applause.)

COL LEONARD: Mr. Zach Cattell.

MR. CATTELL: Good evening, my name is Zach Cattell, I live at 706 West 54th Street, Indianapolis, Indiana, in the neighborhood of Rocky Ripple. The draft Supplemental Impact Statement, in my estimation, is flawed for a number of

reasons. As was stated earlier, and stated again, the preface that the DSEIS was designed to preserve lives and livelihoods is patently false. It leaves out 350 homes, 700 and plus people in the town of Rocky Ripple. Irreparable harm is being planned, and we must stop it via political solutions or legal action.

The DSEIS does not adequately measure the cost-benefit of including Rocky Ripple in an alignment. The design footprint includes too many homes, artificially increasing cost via acquisition. The total area of the project, including Rocky Ripple, must be evaluated, and not just an incremental add-on through the DSEIS language. Further, the design includes sewer installation for impacted septic fields that could not be replaced. Rocky Ripple, evidently, I recently learned, is seventh on a list of communities in Indianapolis to receive septic tank elimination. That cost

should be taken out of the DSEIS because it will no longer be a problem once the Corps comes through.

The $35 million dollar incremental cost at Rocky Ripple, even if accurate, roughly equals the replacement cost of 350 homes at a low $100,000 estimate per home. This in and of itself is a one-to-one cost-benefit analysis.

(Applause.)

The project, as a federal and city, or local sponsorship project, should go forward only with the cooperation of everyone here, the city and its communities. The city, as project sponsor, should not participate in any way in any project that permanently places life and property in harm's way.

The proposed alignment must be rejected. The Corps must conduct a general reevaluation review to re-include Rocky Ripple, and future design must preserve life

and property. Thank you.

(Applause.)

COL LEONARD: Thank you. Clarke Kahlo.

MR. KAHLO: Good evening, Clarke Kahlo. I'll just take a brief moment to speak in favor of tree protection. I'm pretty concerned about the impact of the tree take that's been shown on your diagrams, and concerned also about the revision of the standards that apparently your engineers have come up with post-Katrina. And I just want to urge you to take a real close look at the tree take and whether you actually need as much take as your indicating that you do.

The riparian zone of White River is just threatened almost on a daily basis. It's kind of like death by a thousand cuts. For one reason or another people are opening up the canopy to get a view of the water, normal development and so forth, and we're losing our riparian zone. That, of course,

is where the critters are afforded a habitat. So, I just urge you to take a look at it for the entire length of the levee, starting at Broad Ripple on south, including the portions that have already been constructed. Thank you very much.

(Applause.)

COL LEONARD: Thank you, sir. Susan Appel.

MS. APPEL: My name is Susan Appel, and I'm a member of the Butler Tarkington. I read through the entire 120-page document, and it's clear that this is a difficult problem without a clear solution. But, it's clear that the Butler Tarkington and Rocky Ripple neighborhood associations are against it, the Mayor of Indianapolis has come out against it, Citizens Energy, that operates the canal, has spoken out against it because it compromises the canal which supplies 60 percent of the drinking water for the city. Also, the removal of seven acres

of mature trees is a huge concern in a place where this is one of the few neighborhoods that nature and urban exist together, and people have chosen to live there for that reason.

(Applause.)

I'm a mother of two young children, and we spend lots of time in Holcomb Gardens, and walking up the canal, and putting this in place will remove it. When I told my four year old daughter about the tree removal, she suggested a petition. So, please add her name to the petition, and hopefully we can tell her that all our work will be a benefit to save our trees and nature in our communities. Thank you.

(Applause.)

COL LEONARD: Thank you. Kevin Strunk.

MR. STRUNK: I'm Kevin Strunk, I'm a Warfleigh homeowner. I've been involved with this project since January 1st

of 1991 when the big flood of record, most recent record, happened. And I have to hand it to these guys, they've duplicated the effort politically that we did in the early 90's on this project. I have lots of friends in Rocky Ripple, so whatever I say I'll probably get lynched by somebody. I've got friends that live on the river and friends that live in the interior, so I'm going to let those guys work that out themselves.

What I'm most concerned about is living on the Warfleigh levee in my backyard is something that we discussed at length, Colonel, in the early 90's, was the tree situation on the levee. And the backside of the levee clearly is heavily treed, and we had extensive, I should tell you I'm an engineering geologist, and we had extensive conversations of a technical nature at the time about tree clearing. Because then the engineers, the Corps wanted to clear down to at least the tow, the backside slope on the

levee. And we, at the time the design of the levee, is my recollection, was with the height of the wall on top of the levee, the sheet pile, and the tow drain, was designed specifically to accommodate continued trees on the backside of the levee.

The current plan, which I haven't heard anybody talk about, other than Clark just got it, was a shock to me to see that. Not only would the backside of the levee be cleared, but as much as another additional 15 feet of trees, huge trees, would be cleared. Now then, that's not just the Warfleigh levee, that's the levee that's going to be built over here in Friedman Park, 15 feet on either side out from the tow slope. And then were there to be a levee built in Rocky Ripple, 15 feet there, resulting overall in, what is it, eleven acres of trees, or some number like that.

This has been justified to me by Corps staff, and also DPW, as being what is

informally referred to as post-Katrina standards, although I know you guys don't like to say that. But I'm yet to be convinced that a probability analysis can show that that tree loss is justified down to, when you get into the equivalent of what a 300-year flood probability is. That is a smaller number than what you guys are actually designing for.

And I think it's just a travesty that you guys would come in here and clear out those trees on the existing Warfleigh levee or up in Broad Ripple, let alone what would happen here in Friedman Park, or I don't know if people understand what's going to happen at Rivey, which is going to be completely denuded down to the river's edge, and then on down into Rocky Ripple should that portion be built, and that the tree loss is significant and will alter this neighborhood.

So, I think that's something I'd

like to have you guys go back and look at that. I understand there's a variance procedure, I've been told that it was kicked back from the D.C. Corps office. And I'd like to see the documentation on what submittal you guys made from Louisville to the D.C. office, and then what their justification for denying that vegetation waiver, which I think is an important part of whatever final solution comes out here. But it's just awful to do that.

Now, the justification for the tree loss is that, unless you guys certify it, FEMA won't drop the flood insurance. I understand that. But, that's something I think is really important, to do that. As a Warfleigh resident, and somebody who's been involved since the very first day on this project, you know, the thing that Warfleigh and Broad Ripple want to see happen is whatever project it is, let's get it finished. Because, you know, we've been

waiting since 1996 for something to happen, and for better or worse, it's time to finish something up and move on. So, I'm going to also submit some more detailed comments later. Thank you.

(Applause.)

COL LEONARD: Thank you. Mary Walker, please.

MS. WALKER: My name is Mary Walker. I'm a 40 year resident of the Butler Tarkington neighborhood association, Butler Tarkington neighborhood. I'm a former president of the neighborhood association. I'm here tonight representing the Marion County Alliance of Neighborhood Associations.

We stand with the neighbors, the neighborhoods, and the City of Indianapolis, but we would stand alone if absolutely necessary. We're very disappointed that the Corps is determined not to change their decision. Communities should not be penalized today for a decision made 16 years

ago.

(Applause.)

Placing a levee anywhere near the canal is the wrong place for a levee. The canal never floods, Butler Tarkington need not be protected from the canal. The river is what floods. Any levee should be placed where a flood could occur: at the river.

(Applause.)

In the interest of protecting the homes in Butler Tarkington neighborhood, why would you sacrifice our neighbors in Rocky Ripple? Why would you send flood debris into the Butler playing fields and their prairie and endanger their transmission tower? We suffered one fall of a transmission tower; we don't need another one.

Why would you compromise the beautiful Holcomb Gardens and the Carillon? The operation is down there in the gardens, although the Carillon is up the hill. Why would you destroy the unique tow path, a

walking, biking trail connecting Broad Ripple with downtown, long before the green ways trail system was even dreamed of? I am a trail monitor, as the people behind me can see on my shirt, and the tow path is my trail. I have been protecting that and monitoring that for 40 years.

Why would you design a levee system that would deliberately destroy the primary source of the water supply for central Marion County?

(Applause.)

The canal is a fragile waterway; it could not withstand the onslaught of flood debris. I was president of the neighborhood association when one tree came down and it took out the west bank of the canal, and it cost hundreds of thousands of dollars to repair one small breach. They had to build a road down from Butler University, down the bluff, in order to repair that, and it was weeks before the water supply could be

maintained in downtown Indianapolis.

It doesn't matter which side of the canal is strong enough to support a levee, either side of the canal is the wrong place to build a levee.

(Applause.)

Your plan has not factored in the effects, has not factored in the function of that canal. In your cost-benefit there is nothing in there about the water supply to downtown Indianapolis, has nothing to do with the greenways trail system, and if you think that it's cheaper to put a wall at the canal, just do it and see what it's going to cost when you have to replace the canal, find another way to get water to the water treatment plant, replace all those houses, or pay back those people who've lost their homes, or their lives, in Rocky Ripple. It's just not a cost-benefit ratio that we want to live with. You don't have to live with it because you're in Louisville. One more

minute.

(Applause.)

Please listen to the people who live here and have invested in this area. We may not be engineers, but we know this land. We chose to live here, in this place. We appear to value elements of the community differently than you do. I realize that you have a legal obligation. Please design a system that protects what we think needs to be protected, what we hold dear. Thank you very much.

(Applause.)

COL. LEONARD: Thank you, ma'am. Glenn Pratt. I'm sorry, Glenn Pratt.

MR. PRATT: Thank you. My name is Glenn Pratt. My background is the federal public health service, the federal environmental agency, and I came down to Indiana to help form the state environmental agency. My background is in public health and environmental engineering at the federal

and state level. My concern, and it's been stated but I'll repeat it, is we need a safe water supply.

As a couple of previous speakers had mentioned, is that 60 percent of our water comes from the canal. And some people say we'll put in pumps. If you look at the electrical cost, as well as installation of pumps in eliminating a canal, it's prohibitive. There are two places where the canal is extremely vulnerable, and your design has done nothing to protect them. You must stop moving ahead until you can harden the situation to protect our water supply.

It's a major economic impact. If all of a sudden Indianapolis loses 60 percent of their water, what does it do to industry, what does it do to, oh we have a big convention in town but you can only flush your toilet once every three days. So, we need to address protecting the canal. There's all the other issues, but I'm just

saying you should not move ahead until you can assure the hardening of the canal. There's two very vulnerable places where what you're doing is directing water into the, undercutting the canal, and this is critical.

And I would add another point, it's interesting where the Corps of Engineers says, oh, we don't really treat everybody equal, screw the poor, we only protect the wealthy, we base it on the value of the homes not on the value of the people. And so I would say to the Corps, number one, protect our water supply. Number two, treat all people as humans. Thank you.

MR. LEONARD: Thank you. Ben Herriman, Mr. Herriman.

MR. HERRIMAN: Good evening, my name is Bart Herriman, I'm at 5340 Riverview Drive, in Rocky Ripple. I want to basically just kind of clarify a few things about the whole idea of Rocky Ripple opting out at one point. I think it's important that everybody

understands it. This was a very, very close vote, this was a straw vote, it ended up being about a few votes apart. And at that point the town did, in fact, say that they did want to be out of that specific project, but not out of flood protection.

At that time the city granted a letter, issued a letter to Rocky Ripple saying if you want to come back in you can come back in, we'll let you in so long as we have the money to do this. Well, the fact is we don't have the money to finish this project anyway, so there's really no harm in letting Rocky Ripple back in at this point. All it does take is a general reevaluation review at the congressional level, which we could very easily have done from our congressman, who is here today but I don't see him, and I think it's very important that that get done to re-include Rocky Ripple.

Secondly, there's a legal issue, I'm a lawyer so I'm going to talk about legal

jargon here. There's something called detrimental reliance, and detrimental reliance is when somebody basically tells you something and you rely on it to your detriment. That's what happened here with the city. The city said we could get back in, turns around four times now Rocky Ripple has approached the city and they said you can't get back in. So, we relied to our detriment on what the city had told us, and I think that is patently unfair and it is going to cause irreparable damage to our communities.

In addition to detrimental reliance there is something called inverse condemnation. And that's not when somebody, when the government comes and tries to buy your house and just take it from you, this is where the government does something that is so drastic that it reduces all the property values in your area. I guarantee by walling off Rocky Ripple, as is proposed in this

plan, you're putting up a sign on Rocky Ripple saying they're not open for business. Our property values are going to drop precipitously, and we would ask you please do not do that to our community. We deserve the same amount of flood protection as everybody else, and we do not need our property values reduced in that regard.

Thinking about other government decisions that have been very bad over the years, I think of Plessy vs. Ferguson, our Supreme Court decision that decided that separate but equal was okay. Luckily that's been overturned over the years, but this plan basically treats us separately but unequally. We are basically on our own in Rocky Ripple, high water comes up we're sealed off, and it's a horrible decision. But unlike Plessy vs. Ferguson, which was overruled with ink and paper, in this case we're going to have a wall. We're going to have millions of dollars worth of construction of a wall

that's going to be very permanent, it's not going to be a temporary type thing like a court's opinion, and it's going to be a permanent wall.

The fact of the matter is the Berlin Wall was up for almost 40 years before it came down. In 40 years I don't think Rocky Ripple will be here if the Corps doesn't provide us a little bit of protection. So, I would once again encourage you to work with the neighborhoods, and we're here for you, we're here to try to make this thing right. I think that reasonable minds can do a good job on this, and we look forward to working with you.

COL. LEONARD: Thank you, sir. Is Robert Falco here?

MR. FALCO: Hi, my name is Robert Falco, I live on Thornycroft Drive in the Butler Tarkington area, and I've heard a lot of comments from everybody and I just want to say what I have to say. I think the Corps of

Engineers had it right the first time, but you backed off, you didn't let, when Rocky Ripple wanted to back out of it for some reason or other the door was slammed behind them. From seeing what I could with your drawing and your, the information in here, because I brought this up at another meeting as why aren't you building a, I called it a match steel pile driven wall, which is very narrow, and that's what you were going to do. You had an I-wall planned, and from what I've seen in here that was the best plan.

Some houses are going to be lost, that's just the way it goes, you know. Better to sacrifice 20 or 30 than 300. I believe that the Corps of Engineers had a good plan, but has now somehow backed off of it in light of a cost benefit ratio. I just want to say one thing, you as a military person, you know what happens when you fight a war on the cheap. And you should fight your war at the river's edge because that is

the enemy, not the canal, not the people behind it. Put the wall where it's supposed to be, on the river, and we all will support you.

COL. LEONARD: Sylvia Scott? Okay, Margaret Drew? How about Larry and Amy KOENFMAN, am I saying that wrong? Okay, sir, Jeremy Stewart.

MR. STEWART: My name is Jeremy Stewart, I am current President of the Butler Tarkington Neighborhood Association. I just wanted to briefly state what we passed on August 13th. We had 65 people in attendance, we had a unanimous vote to support a plan that includes Rocky Ripple, protects historic Holcomb Gardens, and also includes the properties that Butler University owns, which has not been mentioned much in the cost benefit analysis.

As well, we request that we get, we know we got an extension to the September 28th date, but we would request a 90 day

extension for public comment. That's all I have.

COL. LEONARD: Thank you. Alice Poulsen? Alice Poulgen, sorry, how about George Fleetwood?

MR. FLEETWOOD: Yeah, I'm George Fleetwood, I live at 5530 North Capitol, that's the intersection of where the gate and the wall will come together. I've lived in the neighborhood for 27 years. I used to live at 54th and Kenwood and chose to move to the canal thirteen years ago, because of it's aesthetic qualities. I thank you today, Colonel, for having this opportunity. This is the first time in my 27 years in the neighborhood being invited to a meeting to the Corps to discuss this project. I appreciate the opportunity.

I have a number of concerns, as does my wife, Jenny, and my son Hank. First off is the aesthetics, what it's going to do to the neighborhood. I think it's going to

devalue the property, putting up a wall that I believe will attract graffiti and protect very few people, actually, in Rocky Ripple, or in Broad Ripple. I mean, up in Broad Ripple they'll be protected, but not in my neighborhood, in Butler Tarkington. I think there's only like 20 effected homes that have flood insurance today.

Our concern is protecting everybody. I think we live in a classless society in the United States, I didn't realize there were two classes in the neighborhood that I live in. Those with a wall and those behind the wall, who will lose everything, I fear. The recreational value, I mean I live right on the canal, I'm on it every day that I'm in town as a walker. My son and I occasionally go over and fish in the canal. The fishing is not particularly good, but the experience is tremendous.

I share the concerns of the water supply, and I've also been told, I'm a

business man, but I've also been told by engineers that there could be sewage backup to over 5,000 homes. So, in the event of a flood I would be protected, I might not have water, and I might have excrement in my basement. This is not an attractive thought to me. But I appreciate the opportunity to be here today. COL. LEONARD: Thank you, George. I have one with no last name, Carolyn from Canal Boulevard. Okay, Anne Traynor? Ron McNew, okay.

MR. MCNEW: My name is Ron McNew, and my wife and I have been residents of Butler Tarkington for about 36 years. And we live about four houses from the canal, and so if there is a flood our house would be at risk unless this current wall were built. But we are against the flood wall as it's proposed because we care very much about our neighbors and the environment.

I want to say that I am very, very proud of the Butler Tarkington

Neighborhood Association, the Rocky Ripple town board, and Butler University, for taking what I think is a very responsible and principled stand in terms of protecting our environment and protecting Rocky Ripple. It seems to me that the role of government, one of the most important roles of government, is to protect it's citizens and citizens property. And that's not just the citizens of Broad Ripple or the citizens of Warfleigh. It includes all of us, it includes Rocky Ripple. And I think that the people here, I'm very proud of you, I think we are setting a good example for the Corps, and I think we're setting a good example for the city, and I hope that the city and the Corps will follow our lead. Thank you.

COL. LEONARD: Thank you, sir. Will Carlson? How about Donna Floyd?

MS. FLOYD: Thank you, Colonel, for hearing us. Can everyone hear me back there? Good. I didn't write anything down

because I came up here to speak to you from our hearts. People in Rocky Ripple aren't just a community, we're family. We get together, we have gardens, we do everything just like it used to be in the 50's. It's a wonderful place to live, it's a safe place to live. I've heard a lot of technical information and it's all good and I've learned a lot listening to all these people. I want to thank all of you that don't live in Rocky Ripple, thank you for coming out and supporting us. My heart is just filled with so much love, I appreciate it.

My concerns are this, first of all, if you build the wall as you are proposing it, and I've been told, if we flood -- everyone in Rocky Ripple has septics, we don't have sewers because no one has gotten around to put them in yet. This is going to be an environmental nightmare when all of our sewers, septics, back up into the canal. Now, as he said he didn't want to find any

stuff in his basement, that's the least of our worries. If 60 percent of Indianapolis' water comes from that canal, do you want to drink it? I don't, I don't even now.

The other thing I'm concerned about is FEMA. FEMA will drop us like a hot potato. I know the government, I've worked in it long enough, we will not have flood insurance provided by them which means our mortgage company, those of us that have mortgages still, will insist that we have flood insurance. But I don't know any insurance company in their right mind who would even offer it to us unless it was three or four times what we're already paying. Now, half the people in the United States are losing their homes over unemployment, over losing their homes because they're underwater, sorry, the pun, with their mortgages, and now our insurance on flood insurance is probably going to cost as much as our mortgage payments. We're going to

lose our homes. And can we sell our homes in Rocky Ripple, I don't think so.

So, I'm asking you today, please take these things into heart. Don't just look at, they're going to say, well we have enough money to do the -- if the septics back up into the canal we have enough money to clean that water. I say, today, to you, take that money that you were going to clean that water up with, we're all environmentally concerned, and put it in to put the wall along the river where it belongs, not against the canal. Thank you for your time.

COL. LEONARD: Thank you, ma'am. Tim Maloney, please.

MR. MALONEY: Thanks, Colonel. I'm Tim Maloney with the Hoosier Environmental Council, and we would like to express some comments and concerns and questions about the project and the environmental impact statement. The Hoosier Environmental Council has long been involved

and commented on the Corps' flood control projects for the White River through Indianapolis, and as recently as submitting comments on the environmental assessment.

First, comments about the quality of the EIS document, it really contains a surprising lack of information and analysis. Beginning with the lack of a detailed benefit cost analysis for the various alternatives, quantitative comparisons between the alternatives in a user friendly and meaningful form, such as comparing acreage effected, homes effected, value of flood reductions by each of the proposed alternatives, so people can make meaningful judgments about the benefits or drawbacks of each of the alternatives. There is a lack of details on the mitigation plans. It was known as far back as a year ago, as described in the environmental assessment, that the original proposed mitigation was not going to work out. And it seems like the details for

new mitigation in terms of the type and acreage of mitigation, is it preservation, restoration or enhancement, could have been included in this draft environmental impact statement.

I would like to point out an apparent discrepancy. In the environmental assessment the document indicates that the level of flood protection that would be provided would be to the 100 year level, yet the new draft environmental impact statement says the level of protection is the 300 year level. And I think that discrepancy needs to be explained.

Furthermore, we didn't find any response to public comments that were made on the environmental assessment included in the environmental impact statement, and that would be a very helpful feature in the environmental impact statement.

Finally, just to express some substantive concerns. As an environmental

organization, clearly we're concerned about the project's impacts on natural resources, including the high quality riparian forest that lines the White River through this part of the city. We are very concerned that not all efforts have been made to mitigate the loss of forests, from the new part of the project as well as going back and removing more forest from the completed parts of the project. And as other commenters have said, we think more needs to be done to evaluate and reconsider a variance process and make sure that that extremely valuable environmental resource is protected. Thank you.

COL. LEONARD: Thank you, sir. Is Jonathan Elrod here?

MR. ELROD: My name is Jonathan Elrod, I'm the attorney for the Town of Rocky Ripple. I think a lot has already been said. And I think, particularly the comments by our last speaker, Mr. Maloney, really speak to

our biggest concerns, it's just the lack of transparency. We're told that the economic analysis says that it doesn't make sense for us to go around there. Not only does it not make sense to go around there, but under federal law we can't go around Rocky Ripple because of that. There's an old saying that there's lies, there's darn lies and there's statistics, but maybe we should add economic analysis to it as well.

I think everyone here would like to have e-mailed to them the numbers. How did you weigh what this would cost, how did you weigh the concerns that we have about Rocky Ripple being put in the bottom of the bathtub, about us being walled in after the flood comes in, about having our drinking water on the wrong side of the flood. And I think if all of us could see with transparency where you guys are coming from we could have a much more constructive conversation about, well, why did you weigh

this this way, and what do we not understand about this that your expertise might help us.

With that, I think it's wonderful that all these other organizations have come out for Rocky Ripple, and the board is truly grateful.

COL. LEONARD: Thank you, sir. Is Duane Etienne here?

MR. ETIENNE: Thank you, Colonel. My wife and I have been residents of Butler Tarkington neighborhood for 33 years. We do not live in the floodplain, but I'm here to be a good neighbor to my good neighbors, and to support them. I don't have to repeat the very fine comments that have already been made, but I'd like to make two observations. And one is that in the face of the relative cost, which seems to be a major factor in the decision, there's an awful lot of cynicism out there already about government. And my feeling is that Rocky Ripple and Butler Tarkington at large we're pretty positive

people, but I would imagine if this decision as I understand it goes forward there's going to be a lot more cynics about government in our community. And I think that's really sad, that's kind of an emotional statement, but I don't hate government, I think there's a good role for government. But this kind of thing, I hope you're listening, I hope the Corps is listening.

And then, finally, it kind of makes me wonder, there's about, what 200, 300 people here tonight. I think there probably should be three or 400,000 here tonight when you consider that's how many people would be effected if that canal gets flooded. Thank you.

COL. LEONARD: Thank you, sir. Is Mike Mooney here, Mike Mooney?

MR. MOONEY: Thank you, Colonel. My name is Mike Mooney and I live in Rocky Ripple, I have for the last 20 years. It strikes me, or one thing I want to thank you

for, this public hearing that we're at. It seems to me it's the only public hearing that we have on this particular topic. And I think it's very significant to me as I come in and listen to this hearing where we talk about our problem, this is not just a hearing for angry people to vent, this is a time when the community comes together to give you some feedback. We think you're doing a great job, and we think you can do it better here or something, this is the purpose of this public meeting.

Now, I have been here tonight, I am aware, I read the papers like everybody else, I'm aware that the Indianapolis paper is against this plan in the Westfield area. I'm aware that the Butler Tarkington area is against it. Rocky Ripple, of course has always been against it. Butler University is against it. That every person that has stood up here tonight has told you, at this public hearing, your plan does not work, sir.

They're saying to you, as I understood it, that the plan as it's laid out is a much greater danger to our life and to our community than the possibility of a flood.

And I respect you and your job. I realize that you, I don't know whether you personally are an engineer, but I understand the engineers. Engineers do what their slide rules, and I don't mean it in a denigrating way, what their slide rules tell them. And I appreciate you're up here and in many ways saying this is professionally what we can do. This may be as far as our conversation can go with you, I did get educated by an awful lot of people that seem to question even the information from the Corps of Engineers, I'm not in a position where I can do that.

But one thing I'm sure of is the City of Indianapolis is also here tonight at this public hearing. They have heard not just angry people, but the people of this community expressing to you the idea that the

plan is just not viable, that we need another plan and the City of Indianapolis may be the ones that has to say, God bless you, you tried hard, now we want you to go back and try harder. But please listen, this is what we've said tonight. I'll quit while I'm winning, but please.

COL. LEONARD: Thank you, Mike. Jay Barbus? How about Mark Chatten?

MR. CHATTEN: Good evening, my name is Mark Chatten. I got off the boat a few years ago, but I happen to live in 5509 North Capitol, and I'm strongly opposed to the current alignment along the canal. My family's preferred alignment is to protect Rocky Ripple, even though where we live our family home is protected by the current proposal by yourselves. And we think that flood protection should be to not just where we live, but also our neighbors in Rocky Ripple.

In particular, I have objections

to the draft EIS. I think the proposal must be acceptable to everyone in the community, and I think that point is clearly missed in the EIS, it's not reported there. It's not acceptable for the locals at all, and there is widespread support for an alternative in the plan and this is not mentioned. This needs to be addressed in the next version of the EIS so it reaches the right conclusion.

Also, the draft EIS is not transparent and neither is it objective. It doesn't fully account for or emphasize non-monetary considerations. Also, when we look at the economic considerations in the report, the benefit to cost ratio is not appropriate. It talks about the incremental cost and the incremental benefit. But if we look at the wall today the wall protects nobody. Because if the flood was to rise tomorrow, Rocky Ripple, Warfleigh, Butler Tarkington and Broad Ripple homes would be unprotected because the current wall doesn't work as it

currently stands.

So, when you look at, if we finish the wall we need to consider the benefit of the work going forward, the remaining benefit and the remaining cost. But if we look at the benefit cost ratio in that way we come to the different conclusion. I'm quite convinced that we've reached the conclusion that it does make good sense to go around Rocky Ripple. Also, that the replacement value of Holcomb Gardens and the canal is not considered, sir.

Also, when we look at the benefit it's not even mentioned in the report at all of the different options, you know, of all of these areas. And that should be in today's dollars, not back in 1996 when this was first delivered. So, I'm quite convinced that if we did the report, did this analysis correctly, we'd realize that the remaining costs and the remaining benefits would determine that the benefits far outweigh any

costs of even the sensible option. Also, there's things which are not economic and that needs to be properly emphasized, sir. There's life safety of 600 residents at risk in Rocky Ripple. We know that the White River rises rapidly when there's heavy rainfall. In fact, I talked to the P.E. this evening, he's a levee safety officer, and he says he's not personally willing to sign off on a fully demountable wall that runs along for 700 feet because he's concerned that if there was a flood there wouldn't be adequate time to put up the flood defense. And I think we need to realize that evacuations don't run smoothly. We all can think of recent incidents in New Orleans which prove that, and we need to consider life safety. And that needs to be emphasized so you come to the right conclusions.

Also, I'd like to mention the canal and Holcomb Gardens, their cultural and historical assets. And this is not protected

by the current plan, it's not mentioned, and their replacement value is significant. But more than that, even if we replace them and rebuild them they would not be the same again.

And then finally, this is the reason I chose to live where I do, is the fact the canal is a beautiful thing. It's actually park land, it's more than just a canal, it's more than just a water supply. And the aesthetics of this is not considered at all. So, I would like to ask you, please, to build a flood wall, I think we need a flood wall. But this is not reason to panic, this is a very extreme event, it happens once 100 years or 100 to 300 years.

We don't need to rush to build the cheapest option, we need to build the sensible option. We need to even potentially consider reopening the project, if necessary, and resubmitting to consider Rocky Ripple if that's the best way politically to get the

funding that we need. And I'd just like you and your team to do maybe a bit of a sharper job in the next version so we can come up with a report that allows our politicians and officials in the local government and the federal government to support a plan that provides protection to Rocky Ripple as well as where I live, and the other neighborhoods here in this room. Thank you.

COL. LEONARD: Thank you, Mark. Are Julie and John Bleakley here? How about Peter Boeger?

MR. BOEGER: Thank you, my name is Peter BOEGER, I live in Butler Tarkington. I've lived here for 19 years, and not in the floodplain or in sight of the canal. To me there's two things that I wanted to talk about tonight. One is the recreational and the beauty value of the canal. I really consider that canal to be a jewel, not only for our neighborhood but for the whole city. And I think it's incumbent on us here today

to protect it, because that wall is permanent, and it will be a permanent scar on the beauty of that canal. And every time we go past it we're going to be reminded of what we did or did not do to protect the beauty of that canal. I don't believe that the recreational beauty and historical value of the canal is adequately represented in your draft SEIS.

The second reason that I'm here tonight is because of my concern about Rocky Ripple. Rocky Ripple is our neighbors in Butler Tarkington, I'm not directly effected by it. I do believe there are two reasons that we need to protect Rocky Ripple, one of which is a pure moral reason. The reason that I'm out here tonight is that I cannot picture myself watching a news program in five or ten or 20 years where Rocky Ripple is flooded out and there's the helicopters, and we're all going to ask ourselves at that time, what did we do to protect Rocky Ripple.

And I hope, Colonel, that you ask yourself now, and envision that same picture, and ask what did you and what did your staff do to uncover all of the relevant details to make sure that Rocky Ripple got a fair shake in this flood control plan.

I am concerned that they haven't gotten a fair shake so far in your draft SEIS, just based on what I've seen. Other people have mentioned that there is a lack of detail regarding the cost benefit analysis. Clearly you state in the report that the cost benefit analysis does not pass your test. But I don't believe there's enough detail in that report for me, who is well versed in cost benefit analysis, or anyone else who is interested to be able to look at that and judge whether or not it truly does pass the test or not.

The other aspect is simply the basis for that 50 plus million dollar cost. I cannot look at what you've written there

and determine whether or not it looks reasonable. I can't bring it to an expert and ask them whether they think your analysis is reasonable because there isn't sufficient detail in there as to the cost of protecting Rocky Ripple.

So, on those two basis, both the recreational beauty, historical value of the canal, and on providing us with enough detail that we can adequately comment on your cost benefit analysis, I would ask you to please think seriously about revising your draft SEIS.

COL. LEONARD: Thank you, sir. Travis Ryan.

MR. RYAN: Good evening. My name is Travis Ryan, I'm with the Department of Biological Sciences at Butler University, and one of the founding members of the Center for Urban Ecology. And I would like to talk about the thoroughness of the environmental assessment. When the Environmental

Assessment report came out in early 2011 it focused almost exclusively on the White River, mentioning the fishes and benthic invertebrate. As it pertained to the central canal, the environmental assessment only states that algae and other aquatic vegetation are prevalent in the canal waters, however, with the limited shading and depth, the aquatic vegetation is likely a limiting factor for fish and macro-invertebrates use of the waters.

I responded to this Environmental Assessment in April of 2011, and I pointed out that my students and I studied the turtle assemblage of the central canal intensively between October of 2001 and August 2009. During that time we caught, marked and returned more than 3,000 individual turtles, representing all six aquatic turtle species native to Marion County. It is likely that the number of turtles actually inhabiting the canal is several times higher than what we

were able to mark and return.

My letter either went unread or ignored, because section 4.3 of the DSEIS, made available June 2012 is essentially identical to the original environmental assessment. There is no mention of turtles among the aquatic resources in the central canal, nor an acknowledgment of the flawed assumptions that the physical characteristics of the canal, such as it's width, depth, shading, or the amount of aquatic vegetation, significantly limits animal biomass.

More troubling is that in my letter in 2011 I detailed the fact that the portion of the canal that will be most heavily effected by the proposed alignment will most certainly have a direct impact on the resident turtle assemblage. Both basking turtles, such as the commonly seen map turtles and red ear sliders, and less obvious species like snapping turtles, preferentially inhabit the regions of the canal that are

bordered by wood lots. This is certainly true during the active period, but the habitat is even more important in the three to four months of inactivity during the coldest part of the year.

Additionally, turtles preferentially reside in the specific area that will be cleared of trees by the Corps proposed alignment, along Westfield Boulevard between Capitol Avenue and Holcomb Gardens on the campus of Butler University. We have noted a greater density of turtles in this stretch as compared to anywhere else within the central canal. Given the number of turtles per unit surface area it is no exaggeration to say that this stretch of the canal likely hosts the greatest density of turtles in Marion County.

Yet, the only potential impact to turtles mentioned in the 2011 environmental assessment was that the flood wall could prevent some reptiles and amphibian losses

due to road kill, by preventing them from moving across the road. This section also says that the aquatic fauna is low and in both the number of individuals and species, therefore potential impacts are expected to be minimal. Despite specific information in the form of data that have appeared in national and international peer reviewed scientific journals that contradict the assumptions that appear in the environmental assessment, the language in the DSEIS is essentially unchanged.

I hope that prior to making a final decision the United States Army Corps of Engineers, and the mayor's office, will at least recognize the true threat to wildlife that the proposed alignment actually represents, even if they do not value that wildlife in the same manner as many of the residents of Indianapolis, who I have had the opportunity to talk with in the course of my field work over the past decade. Thank you.

COL. LEONARD: Thank you. Do we have Mr. Spiegel here? Okay, Sam Carpenter? Cathy Hamaker?

Mary Weber? Doesn't matter what order you come up.

MS. HAMAKER: My name is Cathy Hamaker, and I live at 5340 Canal Boulevard. So I live right on the canal, and pretty much everything that I was going to say has kind of already been said. I love my house, I love where I live, I love what I can see when I look out my front door. It seems to me that the primary concerns here are all easily grouped into about four categories. There is the life and property loss. If we do have a major flood event everybody in Rocky Ripple is looking at pretty much the loss of everything.

But, even if we don't have a flood event, there are the categories that everyone else has also brought up about the fact that we will lose the riparian area

along the canal, which is of course of primary concern to me. But we'll also lose the canal itself, and it boggles my mind that the City of Indianapolis would not consider that as a major, major issue in the cost benefit analysis that somebody is going to have to pay to get all the junk that's in my garage and my septic tank, and all of my neighbors garages and septic tanks, out of that canal once an event occurs. So, it seems to me a very obvious choice that this plan, as it currently stands, is not acceptable to anybody. Not just Rocky Ripple, but everyone in Indianapolis who relies on that canal. Thank you very much for the opportunity.

COL. LEONARD: Thanks, Kathy. Mary Weber?

MS. WEBER: My name is Mary Weber, I live at 5112 Riverview Drive. I've only lived in Rocky Ripple for a year. I just thought the river was so incredible, and

even though the house was a money pit I thought, man, this is cool, this is where I want to live. And I'm, you know, and our home is one of the red dots, so it's slated for demolition should the flood wall be placed along the river. But, when you think about the entire neighborhood, I mean it's an absolute, I mean if that's what has to be, that's what has to be. I mean, it's an absolute no brainer that, you know, you would want to protect the entire neighborhood.

But, having said that, feel like there are options out there if the Corps and the city were willing to think outside of the box. Even if the flood wall is placed along the river it doesn't, it seems like there should be options available to look at, such as the effect that, of looking at the 16th Street dam, for instance. I don't know if the Army Corps of Engineers addressed that, an inoperable dam downstream, and the effect that that would have on river levels, or the

effect of the type of wall that would be constructed should that option be looked at.

So, I'm all for Rocky Ripple for flood protection, but I'm also for more brainstorming and looking at other, you know, other alternatives should the flood wall be placed along the river. Thank you.

COL. LEONARD: Thank you. Linda McLeaish?

MS. MCLEAISH: Thank you for taking our comments. I wasn't going to say anything, and everything that I wanted to say has pretty much been said. But we are a community, and I'm just part of Butler Tarkington, but I'm a citizen of Indianapolis, I'm a citizen of Indiana, and we need to protect this whole area. It is a beautiful area and people come from all over the state to see it. So, I don't know where our mayor is, I don't know where our governor is to help protect all of us. And I do like that we're all, you know, we're supportive of

each other.

I have a garden spot in Rocky Ripple. They've been nice enough to let me come and garden there, and we just need, we need to save them, we can't drown them. Thank you.

COL. LEONARD: Thank you. Craig Pinkus, is Craig Pinkus here? Okay, I have called all the cards they have handed to me, so if anybody else hasn't had the opportunity to talk, now is the time.

MS. AGINATIS: I submitted a card, and I said I wouldn't speak. But, I submitted my comments in the form of a letter, but I wanted to --

MR. LEONARD: What's your name, ma'am?

MS. AGINATIS: My name is Ellen Aginatis, I live in Meridian Kessler, and I am involved in community associations. But I am speaking here now as a 25 year experienced chemical engineer. So, fluid dynamics,

thermodynamics were among my specialties, and I worked in the chemical industry for quite a few years, and now I work for a pharmaceutical company. The last ten years most of it I'd had, one of my responsibilities has been on purification water systems. So I have the happy joy of seeing the city's water data on a bi-weekly basis.

The city barely passes the national drinking water standard. Any shocks to that system would cause loss of supply to the communities. It would probably cause equipment damage, because I don't know how good their systems are as far as shutting it down before they overload all their pumps, sifters, you name it. And I think that that cost estimate, the impact of Veolia, who now owns the city water and sewerage systems, that's not included in the cost benefit estimate. I think Veolia should have spoken up on that. And I think because they just

took over the system, I don't think they're fully aware of what the damage is. You know, they need to do failure mode and effect analysis on their systems, other things have to be considered. But that could be in the tens of millions right there, just on our water system.

And as other people have said, 60 percent of our water system comes from the canal, we have to protect the canal. It would require rebuilding of the canal, the system. It is the cleanest water we have supplying the city water system. The whole system of wells and other river supplies, streams, that is part of this grid network is much dirtier water. So, that's another concern, even without flooding, just the canal being down by itself without a flood would cause problems.

Also, we have a problem with our storm sewers empty into the canal. When we had May 1st the great downpour of water that

flooded the downtown Broad Ripple area, all the sewer caps popped and started flooding the businesses. That was just with a hard downfall of one day, it wasn't even a 50 year flood and it already caused backup. So, we have to protect the canal all the way down.

The other thing is that the base was depicted in these diagrams, and it's possibly the diagrams are oversimplified, there are no footing on this, on the wall base, it's up in dirt and clay. You know, usually, I've been involved in a number of building projects where I was not the structural soil engineer, but I've seen the work they've done, and they considered a strata of clay, and there's different types of clay, before putting significant weight on it. So, what you built for a wall depends on the soil structure. I would say we have pretty lousy soil structure, when it gets wet it's very slippery, it's almost like graphite so I wouldn't expect that to be a very tight

soil like it is in some areas. So, I think you really need to look at that again.

The other thing is, again, and I'm not going to berate this again, I read something recently that the canal was on the National Register of Historic Places. So, if it's on the national register it's supposed to be protected. I did not read that in too many places, but the point is, seeing that, I think that should raise that question right there.

Also, you have, if you include Rocky Ripple you have a cohesive line of defense against a major flood. Also, when doing these wall calculations, I have some concerns that, did they break it into it's components significantly to say that you've got both lateral thrusts and the forward thrust at the curves in the canal and the curves in the wall, whatever they would build. Even in the best or worse case, you know, consider those things. When you have

turbulent flow, normally a lot of people say, well, that's forward throw. Well, actually when you do vector analysis on it, what they're talking about is an average, which is downstream, there are side velocities going on. So, that's an additional pressure on the wall.

So, I think all these things have to be considered. It would take a lot of time, but I think that would impact the kind of wall you have and where you place the wall. But definitely, structurally the canal wall is terrible. Thank you.

COL. LEONARD: Thank you, ma'am. Tamara Carr.

MS. CARR: Hi, thank you for having us, having this meeting tonight, can everyone hear me, and for all the neighborhoods that have been supporting Rocky Ripple. I have been a lifelong resident of Rocky Ripple. My family has been at the corner of 53rd and Lester for nearly 70

years, and most of my family members were from Rocky Ripple. And for me, this is such a sad time, to think that someone is planning on changing the way our town has been for all these years, and I just wanted to say that I am extremely sad about the possibility of seeing a wall along the canal. I support having a wall along the river, and that would protect our town from flooding.

I hope that you will take our message back and reevaluate old plans and maybe come up with a better solution, because it would be heartbreaking for all of us to lose everything that we have in our town, and what we have to offer the communities around us. I know that people ride bikes out there, we didn't have to build cement riding ways, we didn't have to ask for funds for that, and they enjoy riding along the canal path, walking through the community, enjoying nature. I remember as a child my mom would tell us about the horse drawn barges that

used to go down the canal to deliver goods through Indianapolis, and we could visualize that as children. And I've told my grandchildren and my great grandchildren about that. And I grew up in the river, and walking along it, playing in it, and I just think that there has to be a solution, some way to protect that levee and to protect our town.

There seems to be a lot of money for a lot of other things in the city, parking garages for example, that are very close to the canal, that I think is going to cause the canal to rise when it rains. But, everything has been said, I just wanted to voice how I felt, and ask that you reconsider and include us.

MR. SMITH: Thank you, sir. I also submitted a card, apparently it got lost. But my name is Vic Smith, my wife and I have lived in Butler Tarkington for 26 years, and we love it here. And I want to

add my voice to those who oppose this plan. As I analyze this program as a citizen I use three words that start with E to start my analysis. Environment, ethics and economics.

As for environment, the environment along the canal is just amazing, adds tremendous value to our lives, it's one reason we stayed here for a quarter century. It's about a half block from where I live. But we're on the side of the proposed wall that would protect our property.

Still, I move to ethics. Under ethics can you really, seriously ask me to support a plan that will protect my property but not the people of Rocky Ripple. And that doesn't make any sense to me ethically.

And thirdly, economics. If the cost is $15 million dollars, and it's $15 million dollars for a plan that the community and no one wants, it seems to me that's wasting $15 million dollars. And we should save our money until we have $50 million

dollars to do it right and put the wall along the river. Thank you.

MS. SCOTT: My name is Sylvia Scott, and I turned in a card earlier, just hoping to have that ready if I wanted to speak, and I have three questions. I spent over an hour talking with your representatives in the room over there, and looking at the pictures. And I will say that I often stood behind people and listened, so there is the distinct possibility that I did not hear it correctly. Therefore, I'm asking that people who are here who were in front listening to your representatives, if someone could clarify. I heard someone talking about the drinking water issue in the canals and I believe I heard one of your representatives saying, well that's just sewer water already. Now, if it was the kind of sewer water that we're not supposed to drink then I don't think we should be fishing in it.

The next thing, I could be

mistaken, I'm saying that, but I thought I heard that said more than once that, well it is part of the sewer company right now, it's sewer water right now. Another thing I did have told to me that when Rocky Ripple sort of reconsidered and they asked to be included in the project, that they were asked to participate, to match funds for a feasibility study, and I was told by one of your representatives that they weren't able to raise the funds.

I hope that person is still here, but I know there's someone here who could speak to it, who was here earlier, Mr. Harriman, but I understand that our representative Julia Carson did raise the $150,000 for the feasibility study, but it was taken away when Katrina happened, and they have petitioned to have that again, the money restored for the feasibility, and it has been denied. If I have heard wrong or if I've been misinformed, I would like to know

that.

And the third one, one of your representatives said that the Butler playing fields, for instance, that they do not want to raise these flood walls for development, to bring in a lot of heavy buildings. But, in one of your pictures there where it shows the before and after picture of the flood wall, in Broad Ripple I believe, it shows an empty place, you know, with I think sort of a levee of a little thing originally. And now with the wall it shows three story condos behind it, which doesn't seem consistent with the fact that they are discouraging development. Thank you very much.

COL. LEONARD: Anybody else? Okay, well look, this is your faceless bureaucrat that is going to make a decision. I came here to gather lots of information, and I did get some. Do you want to say something, sir?

MR. REDMOND: Thank you, my name

is Paul Redmond and I live in Rocky Ripple, and I've been in Rocky Ripple for close to 28 years and I live along the canal. And you know, I'm in bewilderment of why you would want to build a wall into Rocky Ripple to hold the river into us. I don't understand that. You're the U.S. Army, it's like you're supposed to be watching out for our democracy.

All these people, with all these communities around, all negative against the wall being built on the canal, I don't understand why you haven't taken a different approach. I mean, there is Butler Tarkington, there's Butler University, there's Rocky Ripple, and all the other associations around us, don't want it. We want flood protection, but we don't want to be walled into the river. And I think that it's your responsibility, as part of this organization, to protect us from that. And with you protecting democracy we're not

getting it. I don't understand.

COL. LEONARD: Okay, so let me tell you, anybody else? No?

MR. BAILER: I have a comment. My name is Bill Bailey, and I live at 340 Ripple Road, which is on the river, and I'm about 30 feet above the river. And what I'm sad about is, I believe that Rocky Ripple should be protected. Yes, there should be a levee, the canal should be protected, yes. But, you know, everybody isn't thinking about the 20 folks who will lose their homes, you know. If the levee goes around Rocky Ripple 20 folks will lose their homes. Think about that, okay. My back yard will be severely effected by probably at least 20 or 25 feet. I wont have a back yard, I won't see the river.

Those folks who say that they live on Westfield Boulevard, that's great, you could only see the canal seven months out of the year because of the foliage. I love

the canal, I use it a lot, but what I'm saying is you've got to think about the folks who are going to be losing their homes in Rocky Ripple when that wall comes by. And I hope that Rocky Ripple supports those 20 households when they say goodbye to Rocky Ripple. Thank you, and thank you for being here.

COL. LEONARD: Thank you. Okay, so here's what I heard in a nutshell. Is there more? Okay, I've got quite a book of notes here.

Clearly you are all a well informed bunch, and you're passionate, and you should be, and you don't believe my economists and my costs estimates, and that I need to be more transparent with those documents, either in order to check my peoples' work or to show it to you in black and white. And you've got my commitment that we'll do that, and I want to make sure that, to remind you that you have until the 28th of

September to make any other comments, and those will all come to my office. Ma'am, do you have anything for the group here? I don't want to put you on the spot. So, this is Lisa Miser, our partner in this with the Indianapolis DPW, and who we work closely with.

MS. MISER: Thank you, thank you all for coming, thank you all for your passion. We've said it before and I'll just say it again, the city is committed to looking at this further, making sure that we protect all of our residents, and we'll be working closely with the Corps to do that.

COL. LEONARD: Okay, that's it for tonight folks. I'm going to stick around in the map room here for 20 minutes or so if you want to chat. Thanks.

(Whereupon, the above-entitled matter went off the record at 9:11 p.m.)

Appendix E: DSEIS Report Comments