APPENDIX A

CORRESPONDENCE

ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX A
CORRESPONDENCE

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DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

December 21, 2001

Planning, Programs, and
Project Management Division.

SEE DISTRIBUTION LIST

The Rock Island District of the U.S. Army Corps of Engineers (Corps) is currently investigating restoration activities along Waubonsie Creek, which runs through Kendall, Kane, and Du Page Counties in northeastern Illinois. This site-specific evaluation is being conducted as a component of the Illinois River Ecosystem Restoration Study, which is a General Investigation study authorized by Section 216 of the Flood Control Act of 1970 with supplemental authority from Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000. Several alternatives have been identified, with the goal of creating instream habitat and providing fish passage at several low-head dam locations. This study is being conducted with our cost-share sponsor, the Illinois Department of Natural Resources (DNR).

The Illinois River Ecosystem Restoration Feasibility Study has been initiated to identify sources of degradation within the Illinois River Basin through a Restoration Needs Assessment (RNA). The RNA will identify basin-wide restoration opportunities to address key resource problems, and locate pilot projects in an attempt to remedy these issues. Specifically, the Waubonsie Creek pilot project will help address connectivity of aquatic habitats and restoration of degraded habitats, including instream and wetland habitats, within the Illinois River Basin.

An Environmental Assessment (EA) for the following actions is currently in progress. The EA is expected to be distributed later this year. This letter is to provide a brief description of the proposed project and to ask for your agency's early comments within your area of expertise.

River Mile (RM) 0.1 through RM 1.1

Stonegate Dams

- Modify and/or improve existing rock ramps, riffle structures, and dam modifications at the Lower Stonegate Dam (approximate RM 0.4).
- Stabilize splitting channel within the Stonegate reach of Waubonsie Creek. This would be accomplished through the use of riffle structures or some type of diversion structure near the upper end (approximate RM 0.5).

Pfund Dams

- Stabilize Lower Pfund Dam site through dam debris removal and/or riffle structures (approximate RM 0.75).
- Restore fish passage at the Upper Pfund Dam. Fish passage would be gained through dam replacement and/or rock ramping of existing dam (approximate RM 0.9).

Fox Bend Dam

- Restore fish passage at the Fox Bend golf course dam with some form of rock ramping (approximate RM 1.1).

RM 2.0 through RM 3.1

- Construct series of lateral wetlands (3-5) to provide fish refuge during high flows and floods.
- Install riffle and/or instream structures to enhance fish community habitats.
- Establish native vegetation with plantings and/or seedbeds.

RM 5.0

- Enhance wetland area within the Parkview Estates flood detention reservoir.
- Construct wetland scrapes to provide areas of permanent water.

RM 6.0 through 7.0

- Install riffle and/or instream structures to enhance fish community habitats.

The Corps' Rock Island District is working closely with the Illinois DNR, as well as with the Waubonsie Creek Technical Committee and Upper Illinois River Steering Committee to formulate viable alternatives.

According to a fish survey conducted on Waubonsie Creek during the summer of 2001, the Illinois DNR found several individuals of the state listed slippershell mussel (*Alasmidonta viridis*). Recognizing that there could potentially be some impact to mussels in the vicinity, it is unlikely that the construction of any of the previously mentioned features would jeopardize the continued existence of any species or the critical habitat of any fish, wildlife, or plant that is designated as endangered or threatened. Any impacts on the sites of construction would be relatively small, and other impacts due to construction activities in the vicinity of the site would be temporary, with the surrounding area expected to recover quickly after project completion.

The information provided should allow you to make preliminary comments on the proposed project. A timely review of this information and a written response for inclusion into the EA would be greatly appreciated. Please provide your written recommendations, comments, and concerns relative to resources in your area of expertise no later than 30 days from the date of this letter.

If you have any questions, please call Mr. Kraig McPeek of our Economic and Environmental Analysis Branch, telephone 309/794-5547, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Kraig McPeek).

Sincerely,

Dorine A. Bellman

for: Kenneth A. Barr
Chief, Economic and Environmental
Analysis Branch

DISTRIBUTION LIST

Mr. Rick Nelson
Field Supervisor
U.S. Fish and Wildlife Service
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Rock Island, IL 61201

U.S. Fish and Wildlife Service
Barrington Field Office
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Barrington, IL 60010

Mr. Francis Lyons
Regional Administrator
U.S. Environmental Protection Agency
Region 5
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Chicago, IL 60604-3590

Mr. G. Brent Manning
Director
Illinois Department of Natural Resources
Lincoln Tower Plaza
524 South Second Street
Springfield, IL 62701-1787

Mr. Dennis Kennedy
Senior Water Resources Engineer
Office of Water Resources
Illinois Department of Natural Resources
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Natural Heritage Division
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Mr. Thomas Ryterske
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St. Charles IL 60174

Mr. Robert Jankowski
Natural Resources Conservation Service
1201 South Gougar Road
New Lenox IL 60451

Ms. Jill Keeton
Kendall County Soil and Water
Conservation District
7775A Route 47
Yorkville IL 60560

Mr. William Donnel
Fox Valley Park District
712 South River Street
P.O. Box 818
Aurora IL 60507

Mr. Grant Caselton
Oswegoland Park District
313 East Washington Street
Oswego IL 60543

Mr. Ronald L. Thomas
Northeastern Illinois Planning Commission
222 South Riverside Plaza, Suite 1800
Chicago, IL 60606

ATTN: CELRC-ED (Paul Mohrhardt)
Commander
U.S. Army Engineer District, Chicago
111 North Canal Street, Suite 600
Chicago, IL 60606-7206

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources

524 South Second Street, Springfield 62701-1787 George H. Ryan, Governor ● Brent Manning, Director

December 27, 2001

SUBJECT: Waubonsie Creek Restoration Project
Kane, Kendall and DuPage Counties

U.S. Army Corps of Engineers
Rock Island District
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204-2004

ATTN: Planning, Programs, and Project Management Division (Kraig McPeek)

Gentlemen:

Thank you for coordinating with us concerning this proposed project. The information you provided with your December 21, 2001 letter indicates that portions of the project are 1) within the floodways of waterways that have either a drainage area greater than 1 square mile in an urban area or greater than 10 square miles in a rural area at the project site or 2) may impact a dam. Therefore, a permit would be required from this office. When the designs and plans are prepared, an application for a permit in accordance with the rules entitled "Construction in Floodways of Rivers, Lakes and Streams", "Floodway Construction in Northeastern Illinois" and/or "Rules for Construction and Maintenance of Dams" should be submitted. If you don't already have a copy of these rules, please contact us or you may access them on the internet at the address, http://dnr.state.il.us/waterresources/index.htm.

If you have any further questions, please feel free to contact Rob Giesing of my staff at 217/782-3863.

Sincerely,

Robert H. Dalton

Robert H. Dalton, P.E.
Chief, Downstate Regulatory Programs

RHD:emm
cc: Gary Jereb

OSWEGOLAND PARK DISTRICT

Prairie Point Center
313 E. Washington St.
Oswego, IL 60543

Phone (630) 554-1010
FAX (630) 554-1577

January 28, 2002

Department of the Army
Rock Island District Corps of Engineers
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004

Attn: Planning, Programs, and Project Management Division

Re: Waubonsie Creek Restoration

Dear Mr. Barr:

I have reviewed your letter of December 21, 2001 describing the proposed improvements to Waubonsie Creek. The Oswegoland Park District is in agreement with the conceptual scope of the project as it pertains to Oswegoland Park District property.

On January 14th, I met with staff from your agency and we discussed the following additions to the project between Pearce's Ford Drive and Barnaby Drive:

- The regrading of the steep and eroded slopes of Waubonsie Creek through the project area which would help prevent continued erosion and provide the opportunity for more wildlife habitat.
- The improvement of the floodplain between the areas of wetland construction with native grasses and forbs which will also improve wildlife habitat.

All areas outside the limits of the project including ingress and egress that are disturbed by construction should be repaired as part of the project.

The Park District will want to be involved in every phase of the project as it pertains to our section of the project including design, engineering, meetings and correspondence. It is our understanding that this project is being funded through USACOE and IDNR and that no park district funds will be required.

Thank you for the opportunity to comment. We look forward to working with you on this project.

Sincerely,

Grant A. Casleton

Grant A. Casleton, R.L.A.
Director of Planning & Development

GAC/nh
cc: Bert Gray, Oswegoland Park District

Illinois
Department of
Natural Resources

http://dnr.state.il.us

524 South Second Street, Springfield, Illinois 62701-1787

George H. Ryan, Governor • Brent Manning, Director

January 31, 2002

Mr. Kenneth A. Barr
Chief, Economic and Environmental Analysis Branch
Rock Island District, Corps of Engineers
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

ATTN: Kraig McPeek

Dear Mr. Barr:

Reference is made to your letter of December 21, 2001 concerning the Rock Island District's proposed preparation of an Environmental Assessment (EA) for restoration activities along Waubonsie Creek in Kendall, Kane and DuPage counties, Illinois. The general goal of the project is to create instream habitat and provide fish passage at several low-head dams on the stream. The Illinois Department of Natural Resources is a cost-share sponsor of the project.

In 1998 a live slippershell mussel (*Alasmidonta viridis*), a state threatened species, was collected from Waubonsie Creek in Township 38 North, Range 8 East, Section 36, Kane County, and a recent dead slippershell was collected in Township 37 North, Range 8 East, Section 9, Kendall County. Both specimens were found in association with live ellipse mussels (*Venustaconcha ellipsiformis*), a species which appears to be declining in Illinois and may someday merit threatened or endangered status. As is noted in your letter, additional slippershells were reportedly collected from Waubonsie Creek during a summer, 2001 fish survey.

The Department fully supports the proposed restoration activities and anticipates they will have a significant beneficial effect on Waubonsie Creek and its aquatic biota. However, we recommend that all instream construction be preceded by a thorough search for freshwater mussels, and that any mussels collected be moved to sites with comparable substrates outside the areas of disturbance.

Also, please note that, as a cost-share sponsor, the Department reserves the right to review and approve the project to ensure that it does not diminish the flood control benefits resulting from existing facilities constructed by this Department.

We look forward to reviewing the forthcoming Environmental Assessment and to working closely with your involved staff as the project enters the implementation phase. Please contact me at 217-785-4863 if we can be of further assistance.

Sincerely,

Robert W. Schanzle
Permit Program Manager
Office of Realty and Environmental Planning

RWS:rs

cc: IDNR/ORC (Cole, Langbein), IDNR/OWR (Culli, Jereb), IEPA (Yurdin), USFWS (Nelson)

OSWEGOLAND PARK DISTRICT

Prairie Point Center
313 E. Washington St.
Oswego, IL 60543

Phone (630) 554-1010
FAX (630) 554-1577

March 19, 2002

Department of the Army
Rock Island District Corps of Engineers
Clock Tower Building
P.O. Box 2004
Rock Island, IL 61204-2004

Attn: Planning, Programs, and Project Management Division (Kraig McPeek)

Re: Waubonsie Creek Restoration

Dear Mr. McPeek:

I have reviewed all the information in regard to the Habitat Evaluation Procedure (HEP) and have the following comments and suggestions.

In general, I agree with the information that you have listed for the seed mixes and emergent root stock. I have enclosed the Oswegoland Park District's plant list, seed mixes and installation specifications for this work. I have also included seed mixes from LaFayette Home Nursery. A seed mix such as the "Low Profile Prairie Seed Mix" that we have included should be used for all the areas of the floodplain between the wetland construction areas.

The second and third components relate to areas in which I have little expertise or experience. As I told you over the phone, I'm not sure that I would be able to complete the work with any accuracy because I am not a wildlife biologist, and I could only guess at the information you are requesting.

I have reviewed the fourth component of the package which is the preliminary design plans with contour drawings that appear to be a refinement of what we have discussed for those areas. I have sent these plans and contour drawings to the park district's consulting engineer for their comments also. I will forward their comments to you as soon as I get them.

What are the future steps and time table for the planning process? Please provide a timeline if one is available.

Thank you for the opportunity to review and comment on the information.

Sincerely,

Grant A. Casleton

Grant A. Casleton, R.L.A.
Director of Planning & Development

GAC/nh
encs.
cc: Pete Wallers, Engineering Enterprises
Bert Gray, Oswegoland Park District

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

March 19, 2002

REPLY TO
ATTENTION OF
Planning, Programs, and
Project Management Division (11.2.240a)

Ms. Anne Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62704

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources (DNR) are presently conducting a site-specific evaluation of Waubonsie Creek (Project) for the purposes of implementing the Illinois River Ecosystem Restoration (IRER) Feasibility Study, authorized by Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000.

The basin has a total area of 29.6 square miles (approximately 18,950 acres) located in Kane, DuPage, Kendall, and Will Counties. The watershed drains portions of the municipalities of Naperville, eastern Aurora, Montgomery, and Oswego. Several tributaries enter Waubonsie Creek, which flows into the Fox River at the Village of Oswego. The principal goal of the Project is to enhance aquatic habitat and reduce sediment delivery/ deposition. In addition, degraded tributary streams have resulted in habitat losses in the watershed and are delivering high levels of sediment to the Illinois Waterway. Ecosystem restoration opportunities will address these conditions as they relate to the Waubonsie Creek watershed (see enclosed Fact Sheet, Enclosure 1).

The Corps conducted an archival search for historic properties following the **Policy and Procedures for the Conduct of Underwater Historic Resource Surveys for Maintenance Dredging and Corps Activities** (DGL-89-01, March 1989). The Corps queried the most updated Illinois Geographic Information Systems (GIS) site file database for historic properties potentially affected by the Project (see enclosed Waubonsie Creek Project Sites map, Enclosure 2). No previously reported or recorded historic properties are documented within the areas of proposed watershed restoration measures for the Waubonsie Creek Project, although the proposed stream restoration, retention/wetland ponds, and terrestrial upland placement have potential for containing undocumented archeological historic properties, due to the proximity of previously reported and recorded sites.

Due to the potential for undocumented archeological historic properties in the floodplain and upland areas of the proposed Upper and Lower Stonegate, Upper and Lower Pfund, Fox Bend Golf Course, and Fox Valley Greenway Project sites, the Corps plans to conduct a Phase I Intensive Archaeological Survey in the area of potential effects, excluding areas previously surveyed or disturbed by construction. The Phase I archeological survey of the floodplain will include hand methods of deep testing to search for deeply buried historic properties. The 16.5-acre Parkview Estates Reservoir was proposed in the 1975 *Strategic Planning Study Waubonsee Creek*, prepared by the Division of Water Resources, presented by the State of Illinois Department of Transportation and was constructed between 1976 and 1978. These previously disturbance by construction results in the Corps determination of ***No Historic Properties Affected***, as defined in 36 CFR Part 800.3(a)(1) for the Parkview Estates Reservoir.

Pursuant to Section 800.3 of the Council's regulations and to meet the responsibilities under the National Environmental Policy Act of 1969, the Corps and the Illinois DNR developed a preliminary Consulting Parties List. All consulting parties were notified of the IRER program and were asked to respond to remain on the enclosed final Consulting Parties List (Enclosure 3). The request to remain on the final Consulting Parties List allows for agencies, tribes, individuals, organizations, and other interested parties an opportunity to provide views on any effects of this undertaking on historic properties resulting from the IRER and to participate in the review of the site-specific documents and will be provided with study newsletters, public meeting announcements, special releases, and notifications of the availability of report(s), including all draft agreement documentation, as stipulated by 36 CFR Part 800.14(b)(ii) of the National Historic Preservation Act. Any request for site locations will require the comment of the Illinois Historic Preservation Agency.

By copy of this letter, those on the final Consulting Parties List are asked to review the Project within 30 days, as accorded by CFR Part 800.5(a)(3)(c). Please feel free to notify the Corps of any other interested parties for inclusion in future coordination of the Waubonsie Creek Project.

Please comment or concur with our opinion, recommendations, and determination within 30 days, or the Corps will assume that you concur and will proceed as proposed. If you have questions concerning the proposed Project, please call Mr. Ron Deiss of our Economic and Environmental Analysis Branch, telephone 309/794-5185, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY
RICHARD FRISTIK
for Kenneth A. Barr
Chief, Economic and Environmental
Analysis Branch

Enclosures

Copies Furnished:

Dr. Harold Hassen
Illinois Department of Natural Resources
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787 (with enclosures)

MFR: Standard letter to the Illinois Historic Preservation Agency and consulting parties as promulgated under Section 106 of the National Historic Preservation Act for the Waubonsie Creek Project, Illinois River Ecosystem Restoration Feasibility Study.

Consulting Parties (see List) (with Enclosures 1 and 3)

Waubonsie Creek Project Fact Sheet
Illinois River Ecosystem Restoration Feasibility Study

The Rock Island District of the U.S. Army Corps of Engineers and the State of Illinois Department of Natural Resources are presently conducting a site-specific evaluation of Waubonsie Creek (Project) for the purposes of implementing the Illinois River Ecosystem Restoration Feasibility Study. This site-specific evaluation is being conducted as a component of the Illinois River Ecosystem Restoration Study, which is a General Investigation study, authorized by Section 216 of the Flood Control Act of 1970 with supplemental authority from Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000. The study was initiated pursuant to the provision of funds in the Energy and Water Development Appropriations Act, 1998. The Feasibility Study was initiated in October 2000 with completion scheduled for December 2003.

Waubonsie Creek is located in the northeastern portion of Illinois and is a tributary of the Fox River. The basin has a total area of approximately 29.6 square miles (18,950 acres) located in Kane, DuPage, Kendall, and Will Counties. The watershed drains portions of the municipalities of Naperville, eastern Aurora, Montgomery, and Oswego. Several tributaries enter Waubonsie Creek, which flows into the Fox River at the Village of Oswego.

The principal focus of feasibility of the Waubonsie Creek Project is to identify opportunities for restoring degraded ecosystem structures and functions, including the ecosystem's hydrology, plant, fish, and wildlife communities, to a less degraded condition. Restoration of connectivity of aquatic habitats in the Illinois River and its tributary streams is important in (1) maintaining distribution and abundance of vertebrates and invertebrates, (2) maintaining spatial structure of habitat, and (3) maintaining interspersion and connectivity.

The Waubonsie Creek Project feasibility restoration activities could include the following:

a. Installation of a riffle structure downstream of Lower Stonegate Dam; modification of the Lower Stonegate Dam; extending existing riffle structures across the floodway; and installation of a diversion structure just downstream of Upper Stonegate Dam along the existing left descending bank line. All riffle structures would be keyed into the bank line. Maximum potential area of impact is 3 acres.

b. The Lower Pfund Dam failed in 1996 and the Upper Pfund Dam is near failure. Restoration activities in the area of the Pfund Dam could include removal of the Lower Pfund Dam debris, installation of a rock ramp at the location of the Lower Pfund Dam, and modification or removal of the Upper Pfund Dam and replacement with riffle structures. Maximum potential area of impact is 4 acres.

c. Restoration activities at the Fox Bend Golf Course Dam could include placement of rock down stream of the dam to create a rock ramp and riffles. Maximum potential area of impact is 0.75 acre.

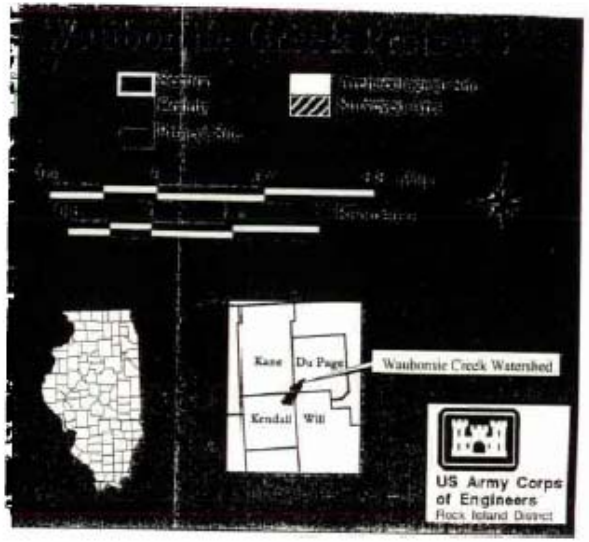
d. The Oswegoland Greenway is an urban stream setback. Restoration activities could include riffles, wetland construction wetlands adjacent and connected to the creek, and introduction of native vegetation. Maximum potential area of impact includes 28 acres.

e. The Parkview Estates Reservoir is a water retention basin for the Parkview Estates subdivision. Restoration activities could include canalization of the interior drainage ditch, wetland construction or enhancement, and introduction of native vegetation. Maximum potential area of impact includes 17 acres.

f. The Fox Valley Greenway is another urban stream setback. Restoration activities could include installation of riffles or other in aquatic structures. Maximum potential area of impact is 9 acres. This restoration construction effort may produce terrestrial and aquatic disturbances.

END

ENCLOSURE 1



The specific locations of historic and archaeological properties are subject to protection through nondisclosure under Section 304 of the National Historic Preservation Act. All maps subject to public review/access shall not contain any information on archeological sites. This information is not to be released in order to protect the resources at the sites.

Consulting Parties List
Illinois River Ecosystem Restoration (IRER)
Waubonsie Creek Project
Kane, DuPage, Kendall, and Will Counties

Mr. William Poore
Secretary
Palos Historical Society
c/o Palos Public Library
12330 Forest Glen Boulevard
Palos Park, Illinois 60464

Ms. Phyllis M. Ellin
Executive Director
United States Department of the Interior
Illinois & Michigan Canal
National Heritage Corridor Commission
201 West Tenth Street, #1-SE
Lockport, Illinois 60441

Mr. David J. Grignon
Tribal Historic Preservation Officer
Menominee Indian Tribe of Wisconsin
P.O. Box 910
Keshena, Wisconsin 54135-0910

Ms. Carol Anske
Chairperson
Kickapoo of Kansas Tribal Council
P.O. Box 271
Horton, Kansas 66349

Mr. Richard Salazar
Chairman
Kickapoo of Oklahoma Business Council
P.O. Box 70
McCloud, Oklahoma 74851

Ms. Lisa A. Kraft
Cultural Resources Management Consultant
Citizen Potawatomi Nation
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Shawnee, Oklahoma 74801

Mr. Johnathan Buffalo
Sac and Fox Tribe of the Mississippi
in Iowa
349 Meskwaki Road
Tama, Iowa 52339-9629

Mr. Talbert Davenport
Sac and Fox Tribe of the Mississippi in Iowa
349 Meskwaki Road
Tama, Iowa 52339-9629

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Director
Canal and Regional History Collection
Lewis University
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Romeoville, Illinois 60446-2298

Ms. Liz Safanda
Preservation Partners
P.O. Box 903
St. Charles, Illinois 60174

Mr. John F. Anderson
Ford Country Historical Society
201 West State Street
P.O. Box 115
Paxton, Illinois 60957-0115

Mr. John Hoffman
University of Illinois at Urbana-Champaign
University Library
Illinois Historical Survey
346 Main Library
1408 West Gregory Drive
Urbana, Illinois 61801

ENCLOSURE 3

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

RECEIVED
MAR 25 2002
Preservation Services

IHPA REVIEW
N/A NHPA 4/8/02
AC
AR
File

March 19, 2002

Planning, Programs, and
Project Management Division

Ms. Anne Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62704

Eric
concur survey is necessary

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources (DNR) are presently conducting a site-specific evaluation of Waubonsie Creek (Project) for the purposes of implementing the Illinois River Ecosystem Restoration (IRER) Feasibility Study, authorized by Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000.

The basin has a total area of 29.6 square miles (approximately 18,950 acres) located in Kane, DuPage, Kendall, and Will Counties. The watershed drains portions of the municipalities of Naperville, eastern Aurora, Montgomery, and Oswego. Several tributaries enter Waubonsie Creek, which flows into the Fox River at the Village of Oswego. The principal goal of the Project is to enhance aquatic habitat and reduce sediment delivery/ deposition. In addition, degraded tributary streams have resulted in habitat losses in the watershed and are delivering high levels of sediment to the Illinois Waterway. Ecosystem restoration opportunities will address these conditions as they relate to the Waubonsie Creek watershed (see enclosed Fact Sheet, Enclosure 1).

The Corps conducted an archival search for historic properties following the **Policy and Procedures for the Conduct of Underwater Historic Resource Surveys for Maintenance Dredging and Corps Activities** (DGL-89-01, March 1989). The Corps queried the most updated Illinois Geographic Information Systems (GIS) site file database for historic properties potentially affected by the Project (see enclosed Waubonsie Creek Project Sites map, Enclosure 2). No previously reported or recorded historic properties are documented within the areas of proposed watershed restoration measures for the Waubonsie Creek Project, although the proposed stream restoration, retention/wetland ponds, and terrestrial upland placement have potential for containing undocumented archeological historic properties, due to the proximity of previously reported and recorded sites.

Due to the potential for undocumented archeological historic properties in the floodplain and upland areas of the proposed Upper and Lower Stonegate, Upper and Lower Pfund, Fox Bend Golf Course, and Fox Valley Greenway Project sites, the Corps plans to conduct a Phase I Intensive Archaeological Survey in the area of potential effects, excluding areas previously surveyed or disturbed by construction. The Phase I archeological survey of the floodplain will include hand methods of deep testing to search for deeply buried historic properties. The 16.5-acre Parkview Estates Reservoir was proposed in the 1975 *Strategic Planning Study Waubonsee Creek*, prepared by the Division of Water Resources, presented by the State of Illinois Department of Transportation and was constructed between 1976 and 1978. These previously disturbance by construction results in the Corps determination of ***No Historic Properties Affected***, as defined in 36 CFR Part 800.3(a)(1) for the Parkview Estates Reservoir.

Pursuant to Section 800.3 of the Council's regulations and to meet the responsibilities under the National Environmental Policy Act of 1969, the Corps and the Illinois DNR developed a preliminary Consulting Parties List. All consulting parties were notified of the IRER program and were asked to respond to remain on the enclosed final Consulting Parties List (Enclosure 3). The request to remain on the final Consulting Parties List allows for agencies, tribes, individuals, organizations, and other interested parties an opportunity to provide views on any effects of this undertaking on historic properties resulting from the IRER and to participate in the review of the site-specific documents and will be provided with study newsletters, public meeting announcements, special releases, and notifications of the availability of report(s), including all draft agreement documentation, as stipulated by 36 CFR Part 800.14(b)(ii) of the National Historic Preservation Act. Any request for site locations will require the comment of the Illinois Historic Preservation Agency.

By copy of this letter, those on the final Consulting Parties List are asked to review the Project within 30 days, as accorded by CFR Part 800.5(a)(3)(c). Please feel free to notify the Corps of any other interested parties for inclusion in future coordination of the Waubonsie Creek Project.

Please comment or concur with our opinion, recommendations, and determination within 30 days, or the Corps will assume that you concur and will proceed as proposed. If you have questions concerning the proposed Project, please call Mr. Ron Deiss of our Economic and Environmental Analysis Branch, telephone 309/794-5185, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Ron Deiss).

CONCUR

By: Anne E. Haaker for
State Historic Preservation Officer

Date: 4-6-02 EGH

Enclosures

Sincerely,

Richard Fristik

Kenneth A. Barr
Chief, Economic and Environmental
Analysis Branch

Waubonsie Creek Project Fact Sheet
Illinois River Ecosystem Restoration Feasibility Study

The Rock Island District of the U.S. Army Corps of Engineers and the State of Illinois Department of Natural Resources are presently conducting a site-specific evaluation of Waubonsie Creek (Project) for the purposes of implementing the Illinois River Ecosystem Restoration Feasibility Study. This site-specific evaluation is being conducted as a component of the Illinois River Ecosystem Restoration Study, which is a General Investigation study, authorized by Section 216 of the Flood Control Act of 1970 with supplemental authority from Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000. The study was initiated pursuant to the provision of funds in the Energy and Water Development Appropriations Act, 1998. The Feasibility Study was initiated in October 2000 with completion scheduled for December 2003.

Waubonsie Creek is located in the northeastern portion of Illinois and is a tributary of the Fox River. The basin has a total area of approximately 29.6 square miles (18,950 acres) located in Kane, DuPage, Kendall, and Will Counties. The watershed drains portions of the municipalities of Naperville, eastern Aurora, Montgomery, and Oswego. Several tributaries enter Waubonsie Creek, which flows into the Fox River at the Village of Oswego.

The principal focus of feasibility of the Waubonsie Creek Project is to identify opportunities for restoring degraded ecosystem structures and functions, including the ecosystem's hydrology, plant, fish, and wildlife communities, to a less degraded condition. Restoration of connectivity of aquatic habitats in the Illinois River and its tributary streams is important in (1) maintaining distribution and abundance of vertebrates and invertebrates, (2) maintaining spatial structure of habitat, and (3) maintaining interspersion and connectivity.

The Waubonsie Creek Project feasibility restoration activities could include the following:

a. Installation of a riffle structure downstream of Lower Stonegate Dam; modification of the Lower Stonegate Dam; extending existing riffle structures across the floodway; and installation of a diversion structure just downstream of Upper Stonegate Dam along the existing left descending bank line. All riffle structures would be keyed into the bank line. Maximum potential area of impact is 3 acres.

b. The Lower Pfund Dam failed in 1996 and the Upper Pfund Dam is near failure. Restoration activities in the area of the Pfund Dam could include removal of the Lower Pfund Dam debris, installation of a rock ramp at the location of the Lower Pfund Dam, and modification or removal of the Upper Pfund Dam and replacement with riffle structures. Maximum potential area of impact is 4 acres.

c. Restoration activities at the Fox Bend Golf Course Dam could include placement of rock down stream of the dam to create a rock ramp and riffles. Maximum potential area of impact is 0.75 acre.

d. The Oswegoland Greenway is an urban stream setback. Restoration activities could include riffles, wetland construction wetlands adjacent and connected to the creek, and introduction of native vegetation. Maximum potential area of impact includes 28 acres.

e. The Parkview Estates Reservoir is a water retention basin for the Parkview Estates subdivision. Restoration activities could include canalization of the interior drainage ditch, wetland construction or enhancement, and introduction of native vegetation. Maximum potential area of impact includes 17 acres.

f. The Fox Valley Greenway is another urban stream setback. Restoration activities could include installation of riffles or other in aquatic structures. Maximum potential area of impact is 9 acres. This restoration construction effort may produce terrestrial and aquatic disturbances.

END

ENCLOSURE 1

Consulting Parties List
Illinois River Ecosystem Restoration (IRER)
Waubonsie Creek Project
Kane, DuPage, Kendall, and Will Counties

Mr. William Poore
Secretary
Palos Historical Society
c/o Palos Public Library
12330 Forest Glen Boulevard
Palos Park, Illinois 60464

Ms. Phyllis M. Ellin
Executive Director
United States Department of the Interior
Illinois & Michigan Canal
National Heritage Corridor Commission
201 West Tenth Street, #1-SE
Lockport, Illinois 60441

Mr. David J. Grignon
Tribal Historic Preservation Officer
Menominee Indian Tribe of Wisconsin
P.O. Box 910
Keshena, Wisconsin 54135-0910

Ms. Carol Anske
Chairperson
Kickapoo of Kansas Tribal Council
P.O. Box 271
Horton, Kansas 66349

Mr. Richard Salazar
Chairman
Kickapoo of Oklahoma Business Council
P.O. Box 70
McCloud, Oklahoma 74851

Ms. Lisa A. Kraft
Cultural Resources Management Consultant
Citizen Potawatomi Nation
1601 South Gordon Cooper Drive
Shawnee, Oklahoma 74801

Mr. Johnathan Buffalo
Sac and Fox Tribe of the Mississippi
in Iowa
349 Meskwaki Road
Tama, Iowa 52339-9629

Mr. Talbert Davenport
Sac and Fox Tribe of the Mississippi in Iowa
349 Meskwaki Road
Tama, Iowa 52339-9629

Mr. John Lamb
Director
Canal and Regional History Collection
Lewis University
One University Parkway
Romeoville, Illinois 60446-2298

Ms. Liz Safanda
Preservation Partners
P.O. Box 903
St. Charles, Illinois 60174

Mr. John F. Anderson
Ford Country Historical Society
201 West State Street
P.O. Box 115
Paxton, Illinois 60957-0115

Mr. John Hoffman
University of Illinois at Urbana-Champaign
University Library
Illinois Historical Survey
346 Main Library
1408 West Gregory Drive
Urbana, Illinois 61801

ENCLOSURE 3

CHAIRMAN
John "Rocky" Barrett

SECRETARY-TREASURER
Gene Bruno

CITIZEN POTAWATOMI NATION

March 28, 2002

Ron Deiss
Economic and Environmental Analysis Br.
Dept. of the Army
Rock Island Dist. Corps of Eng.

Re: Waubonsie Creek Project

My name is Charles Clark and I am the new Director of NAGPRA for the Citizen Potawatomi Nation located in Shawnee, Oklahoma. I received a letter concerning the Illinois River Ecosystem Restoration Feasibility Study. A preliminary search revealed that there is no previously reported or recorded historic properties documented within the area, but there is a potential for undiscovered archaeological properties due to the proximity of previous sites. It is my understanding that a Phase I Archaeology Survey will be conducted of the area.

I would appreciate a survey report of the area after it is completed. If at all possible, I would like a copy of the area marked with the previous archaeological sites.

You can e-mail me at cclark@potawatomi.org or mail a response. Thank you. I appreciate your assistance and time on this matter

Sincerely

Charles Clark
Director of NAGPRA

(405) 275-3121 • Fax (405) 275-0198 • 1601 S. Gordon Cooper Dr. • Shawnee, OK 74801

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

May 2, 2002

REPLY TO
ATTENTION OF

Planning, Programs, and
Project Management Division

Mr. Grant Casleton
Director of Planning and Development
Oswegoland Park District
313 East Washington Street
Oswego, Illinois 60543

Dear Mr. Casleton:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) is studying the feasibility of ecosystem restoration of Waubonsie Creek. The purpose of this letter is to describe the proposed restoration project; describe the steps toward project implementation; describe the responsibilities of the project sponsors; and outline potential scenarios for project sponsorship. This study is a component of the Illinois River Ecosystem Restoration Study, which is a General Investigation study authorized by Section 216 of the Flood Control Act of 1970. Supplemental authority is provided by Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000. The Illinois Department of Natural Resources (DNR) is the non-Federal sponsor for this study.

An interagency team has built upon efforts of the Waubonsie Creek Planning and Advisory Committees to identify restoration alternatives at four major areas along Waubonsie Creek. Modification of the Upper and Lower Stonegate, Upper and Lower Pfund and Fox Bend Golf Course Dams has been proposed to provide fish passage over the dams. The team has proposed construction of wetlands adjacent to and connected to Waubonsie Creek and construction of stream riffles within Waubonsie Creek between Pearce's Ford Road and Barnaby Drive to create wetlands and provide fish refuge. Wetland scrapes and establishment of diverse wetland vegetation has been proposed for the Parkview Estates Detention Facility to increase the amount of shallow water wetlands and increase wetland diversity. The team has also proposed construction of riffles in Waubonsie Creek between Waterford Drive and Montgomery Road. Plates showing the recommended restoration plan are enclosed (Enclosure 1).

The following steps must occur prior to implementation of the above restoration features: A feasibility report presenting the evaluation and recommended plan for restoration of Waubonsie Creek will be finalized and must be approved by Corps higher authority. The Corps and non-Federal sponsor will then sign a Project Cooperation Agreement (PCA), which describes the financial and other responsibilities for construction, operation, and maintenance of the project. The sponsor must provide 35 percent of the project costs, including all lands required for the project. The Corps will then advertise and award a construction contract and the project will be implemented.

The non-Federal sponsor is responsible for the following items: (1) thirty-five percent (35 %) of total project costs (construction, lands, etc.), (2) acquisition of all necessary lands, easements, rights-of-way and disposal areas and perform any necessary relocations (credit applied to Item 1), and(3) 100 percent of operation, maintenance, repair, replacement, and rehabilitation costs.

While we anticipate further discussion among all parties, following are three options for project sponsorship:

Option 1. The Oswegoland Park District, Fox Valley Park District, and Village of Montgomery could be the sole project sponsor for project components on lands they own. The Park Districts and Village would be responsible for 35 percent of project costs and receive credit for the lands they provide for the project. The Park Districts and Village would be responsible for operations, maintenance, repair, replacement and rehabilitation of the restoration project.

Option 2. The Oswegoland Park District, Fox Valley Park District and Village of Montgomery may become project sponsors along with the Illinois DNR, as the majority of the lands needed for the restoration project are owned by one of the three public entities. For example, the Oswegoland Park District and the Illinois DNR could jointly sign a PCA for the sites owned by the Park District (Upper and Lower Stonegate, Lower Pfund, Fox Bend Golf Course, and the greenway between Pearce's Ford Road and Barnaby Drive). The Oswegoland Park District would provide lands needed for the project and would maintain full ownership of the lands. The value of the lands would be applied toward the 35-percent cost share. The Illinois DNR has expressed interest in providing the cash for the remainder of the 35-percent cost share. The responsibility for operations, maintenance, repair, replacement and rehabilitation could be divided between the Park District and Illinois DNR.

Option 3. The Illinois DNR could be the sole project sponsor. The Oswegoland Park District, Fox Valley Park District, and Village of Montgomery would need to grant the Illinois DNR a permanent easement to construct, operate, and maintain the restoration features. The Illinois DNR would be solely responsible for the 35-percent cost share, but would receive credit for the value of the easements provided. Either the Illinois DNR or the Park District could be the sponsor for operation and maintenance of the restoration project.

A sample PCA is enclosed for your review and consideration (Enclosure 2). This PCA is used for the Upper Mississippi River System – Environmental Management Program, but is similar to what would be required for the Illinois River Basin Restoration Program. The PCA would be modified, as appropriate, to accommodate one of the sponsorship options described above.

We look for to your continued involvement in the Waubonsie Creek Restoration Project. We anticipate further discussions among all parties to resolve the specifics of these issues in the coming months. If you have any questions, please call Ms. Jodi Staebell of our Project Management Branch at 309/794-5448.

Sincerely,

ORIGINAL SIGNED BY

Brad Thompson
Project Manager

Enclosures

DISTRIBUTION LIST

Mr. Grant Casleton
Director of Planning and Development
Oswegoland Park District
313 East Washington Street
Oswego, Illinois 60543

Mr. Bill Donnell
Fox Valley Park District
712 South River Street
Aurora, Illinois 60506

Mr. Peter Wallers
Senior Vice President
Engineering Enterprises, Inc.
52 Wheeler Road
Sugar Grove, Illinois 60554

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

May 14, 2002

REPLY TO
ATTENTION OF
Planning, Programs, and
Project Management Division

Mr. Michael Pubentz
Director of Public Works
Village of Montgomery
891 Knell Road
Montgomery, Illinois 60538

Dear Mr. Pubentz:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) is studying the feasibility of ecosystem restoration of Waubonsie Creek. The purpose of this letter is to describe the proposed restoration project; describe the steps toward project implementation; describe the responsibilities of the project sponsors; and outline potential scenarios for project sponsorship. This study is a component of the Illinois River Ecosystem Restoration Study, which is a General Investigation study authorized by Section 216 of the Flood Control Act of 1970. Supplemental authority is provided by Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000. The Illinois Department of Natural Resources (DNR) is the non-Federal sponsor for this study.

An interagency team has built upon efforts of the Waubonsie Creek Planning and Advisory Committees to identify restoration alternatives at four major areas along Waubonsie Creek. Modification of the Upper and Lower Stonegate, Upper and Lower Pfund and Fox Bend Golf Course Dams has been proposed to provide fish passage over the dams. The team has proposed construction of wetlands adjacent to and connected to Waubonsie Creek and construction of stream riffles within Waubonsie Creek between Pearce's Ford Road and Barnaby Drive to create wetlands and provide fish refuge. Wetland scrapes and establishment of diverse wetland vegetation has been proposed for the Parkview Estates Detention Facility to increase the amount of shallow water wetlands and increase wetland diversity. The team has also proposed construction of riffles in Waubonsie Creek between Waterford Drive and Montgomery Road. Plates showing the recommended restoration plan are enclosed (Enclosure 1).

The following steps must occur prior to implementation of the above restoration features: A feasibility report presenting the evaluation and recommended plan for restoration of Waubonsie Creek will be finalized and must be approved by Corps higher authority. The Corps and non-Federal sponsor will then sign a Project Cooperation Agreement (PCA), which describes the financial and other responsibilities for construction, operation, and maintenance of the project. The sponsor must provide 35 percent of the project costs, including all lands required for the project. The Corps will then advertise and award a construction contract and the project will be implemented.

The non-Federal sponsor is responsible for the following items: (1) 35 percent of total project costs (construction, lands, etc.), (2) acquisition of all necessary lands, easements, rights-of-way and disposal areas and perform any necessary relocations (credit applied to Item 1), and (3) 100 percent of operation, maintenance, repair, replacement, and rehabilitation costs.

While we anticipate further discussion among all parties, following are three options for project sponsorship:

Option 1. The Oswegoland Park District, Fox Valley Park District, and Village of Montgomery could be the sole project sponsor for project components on lands they own. The Park Districts and Village would be responsible for 35 percent of project costs and receive credit for the lands they provide for the project. The Park Districts and Village would be responsible for operations, maintenance, repair, replacement and rehabilitation of the restoration project.

Option 2. The Oswegoland Park District, Fox Valley Park District and Village of Montgomery may become project sponsors along with the Illinois DNR, as the majority of the lands needed for the restoration project are owned by one of the three public entities. For example, the Oswegoland Park District and the Illinois DNR could jointly sign a PCA for the sites owned by the Park District (Upper and Lower Stonegate, Lower Pfund, Fox Bend Golf Course, and the greenway between Pearce's Ford Road and Barnaby Drive). The Oswegoland Park District would provide lands needed for the project and would maintain full ownership of the lands. The value of the lands would be applied toward the 35-percent cost share. The Illinois DNR has expressed interest in providing the cash for the remainder of the 35-percent cost share. The responsibility for operations, maintenance, repair, replacement and rehabilitation could be divided between the Park District and Illinois DNR.

Option 3. The Illinois DNR could be the sole project sponsor. The Oswegoland Park District, Fox Valley Park District, and Village of Montgomery would need to grant the Illinois DNR a permanent easement to construct, operate, and maintain the restoration features. The Illinois DNR would be solely responsible for the 35-percent cost share, but would receive credit for the value of the easements provided. Either the Illinois DNR or the Park District could be the sponsor for operation and maintenance of the restoration project.

A sample PCA is enclosed for your review and consideration (Enclosure 2). This PCA is used for the Upper Mississippi River System – Environmental Management Program, but is similar to what would be required for the Illinois River Basin Restoration Program. The PCA would be modified, as appropriate, to accommodate one of the sponsorship options described above.

We look for to your continued involvement in the Waubonsie Creek Restoration Project. We anticipate further discussions among all parties to resolve the specifics of these issues in the coming months. If you have any questions, please call Ms. Jodi Staebell of our Project Management Branch at 309/794-5448.

Sincerely,

ORIGINAL SIGNED BY

Brad Thompson
Project Manager

Enclosures

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Ecological Services Field Office
1250 South Grove Avenue, Suite 103
Barrington, Illinois 60010
Phone: (847) 381-2253 Fax: (847) 381-2285

IN REPLY REFER TO:
FWS/AES-CIFO/T181

November 7, 2002

Mr. Ken Barr
Chief, Economic and Environmental Analysis Branch
U.S. Army Corps of Engineers, Rock Island District
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204

Attn: Kraig McPeek - Project Manager - A Branch

Dear Mr. Barr:

This responds to a request from Mr. Kraig McPeek of your staff to provide a coordination letter on the Waubonsee Creek Restoration Project. The COE proposes to modify or remove five dams to restore opportunities for fish passage, and to enhance wetland areas adjacent to Waubonsee Creek. The Service generally supports restoring fish passage, and wetland enhancement along Waubonsee Creek. We offer the following comments on various aspects of the project.

Stonegate dams -- The COE proposes to convert these dams to riffle structures to allow fish passage by adding rock. The engineering design of these riffle structures should permit fish passage during average flow conditions. We recommend that construction not take place between March 15 and June 15 when fish may be spawning.

Pfund Dams -- The upper dam is in disrepair, however the land owner wishes to maintain the pool above the dam. The COE proposes to restore fish passage by removing the dam and installing a large riffle structure in its place. A second riffle structure would be placed downstream of the current dam site. The Service recommends that the design of the riffle structures permits fish passage during average flow conditions. We recommend that construction not take place between March 15 and June 15 when fish may be spawning.

The Lower Pfund dam has already failed and a large piece of concrete weighing several tons lies downstream of the original structure. The stream splits into two segments as a result of this dam failure. The COE proposes to remove this failed dam to reduce the stream's diversion away from the original channel. The Service is concerned that this action may not be necessary from a fish and wildlife perspective. During the site visit, it looked as though fish passage already exists at the site, even though the stream was clearly at a low flow condition. Gaining access to the site and removing the large piece of concrete could disrupt the stream bottom, and cause downstream siltation. The Service recommends that the COE consider leaving this dam as is rather than trying to remove it.

Fox Bend Golf Course Dam -- The COE proposes to use rock to construct a ramp on the downstream end of the dam to provide fish passage. That should enable fish to pass over the dam during high flows. We recommend that construction not take place between March 15 and June 15 when fish may be spawning.

Oswego land green way -- The COE would excavate wetland areas adjacent to the stream and would plant these areas with native vegetation. In addition, riffle structures and a grade protector would be installed along the creek. The proximity of urban areas to this green way may present on going management problems (e.g., reed canary grass control), however overall the addition of wetland areas would enhance the area for wildlife. The COE proposes to dispose of the excavated material at Saw-Wee-Kee Park. This area contains a well developed riparian forest used by migratory birds. In the past, the area was used to dispose of fill material containing dirt and rock, placed to a depth of several feet. Some trees died as a result of this past activity. The Service recommends against using this flood plain forest as an area to dispose of material excavated from the green way. We recommend sculpting the excavated material into the green way to create upland areas. These upland areas could be planted with prairie, further enhancing the area for wildlife.

Montgomery Detention basin -- This is a large flat dry bottomed detention basin that captures stormwater from a nearby subdivision. The COE proposes to excavate portions of the basin to create areas of open water and areas where native wetland vegetation could become established. The basin is currently dominated by reed canary grass, and the excavated wetlands would likely have enough standing water that the reed canary grass would not persist. However, it is likely that there will always be a seed source of reed canary grass, and that during dry periods the wetlands would become infested with this invasive plant. During wetter periods the wetlands may become dominated by cattails. Thus this project may increase wildlife habitat values, but only to a limited degree. The basin is separated from Waubonsee Creek, and therefore this aspect of the project would not contribute to restoration of fish passage. Therefore, though we do not oppose this project, we recommend that it be given lower funding priority than other components of the Waubonsee Restoration Project. The COE proposes to

dispose of the dredged material at Saw-Wee-Kee Park. For the reasons discussed above we recommend against using Saw-Wee-Kee Park as the disposal site.

Thank you for your interest in restoring Waubonsee Creek. If you have any questions regarding these comments, please call Karla Kramer at (847) 381-2253 ext. 230.

Sincerely,

Karla A. Kramer

John D. Rogner
Field Supervisor

Acting

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Ecological Services Field Office
1250 South Grove Avenue, Suite 103
Barrington, Illinois 60010
Phone: (847) 381-2253 Fax: (847) 381-2285

IN REPLY REFER TO:
FWS/AES-CIFO

November 19, 2002

Mr. Kenneth A. Barr
Chief, Economic and Environmental Analysis Branch
U.S. Army Corps of Engineers, Rock Island District
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204

Attn: Kraig McPeek - Program Manager - A Branch

Dear Mr. Barr:

This responds to your letter dated December 21, 2001, received by our office on November 8, 2002, and to a request from Mr. Kraig McPeek of your staff asking for our concurrence that the proposed Waubonsee Creek Restoration Project is not likely to adversely affect federally listed species. Mr. McPeek also asked that we review a few draft paragraphs from the Environmental Assessment (EA) addressing endangered species.

The following federally listed species have actual or likely historical records within the general vicinity of the project area: Bald Eagle (*Halieeatus lecocephalus*), Indiana bat (*Myotis sodalis*), Hine's emerald dragonfly (*Somatochlora hineana*), eastern prairie white fringed orchid (*Platanthera leucophaea*), lakeside daisy (*Hymenopsis herbacea*), Mead's milkweed (*Asclepias meadii*), prairie bush clover (*Lespedeza leptostachya*), and leafy prairie clover (*Dalea foliosa*).

None of the restoration sites on Waubonsee Creek contain suitable habitat for any of these listed species, and therefore the proposed restoration activities are not likely to adversely affect these species. The proposed site to dispose of excavated material (Saw-Wee-Kee Park) supports a relatively open riparian forest. The site has been used for strip mining and previous dumping and is therefore somewhat degraded. The site is immediately adjacent to the Fox River, and as such may occasionally be used by Bald eagles, though the site is not known to be

a winter roost. The site contains some dead trees, and sometimes dead trees are used by Indiana bats. Dan Kirk (2002, IDNR, pers. comm.) indicated that he did not believe that the site was suitable for Indiana bats.

For these reasons the Service concludes that the project as proposed is not likely to adversely affect federally listed species. If you have any questions, please contact Karla Kramer at (847) 381-2253 ext. 230.

Sincerely,

Christie Deloria-Sheffield

John D. Rogner
Acting Field Supervisor

PROGRAMMATIC AGREEMENT

Among the
Chicago, Rock Island, and St. Louis Districts of the U.S. Army Corps of Engineers,
the State of Illinois Department of Natural Resources,
the Illinois State Historic Preservation Officer,
and the Advisory Council on Historic Preservation,
Regarding Implementation of the
Illinois River Ecosystem Restoration

WHEREAS, the Chicago, Rock Island, and St. Louis Districts of the U.S. Army Corps of Engineers (hereafter, Corps) and the State of Illinois Department of Natural Resources (hereafter DNR) determined that the Illinois River watershed exhibits loss of aquatic habitat and have entered into a partnership for the purpose of implementing the Illinois River Ecosystem Restoration (IRER) authorized by Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000; and

WHEREAS, the Corps and the DNR have determined that the implementation of the IRER may have an effect upon properties listed on, or eligible for listing on, the National Register of Historic Places (National Register), and have consulted with the Advisory Council on Historic Preservation (Council) and the Illinois State Historic Preservation Officer (SHPO) pursuant to Section 800.14(b) of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470[f]), and Section 110(f) of the same Act (16 U.S.C. 470h-2[f]); and

WHEREAS, the IRER study area encompasses the entire Illinois River watershed located in Illinois (54 counties) with two types of efforts: (1) system evaluations focused on assessing the overall watershed needs and general locations for restoration and (2) site-specific evaluations focused on developing detailed restoration options for possible implementation at specific sites by project planning, engineering, construction, and monitoring with interdisciplinary and collaborative planning for habitat restoration, protection, preservation, and enhancement. The Corps and the DNR will manage the IRER throughout all stages of individual habitat project development, restoration, and management. Several other Federal agencies, as well as non-government entities and individual citizens, also will regularly participate in the development of projects within the IRER; and

WHEREAS, the study area includes four IRER areas identified as (1) watershed stabilization, (2) side channel and backwater modification, (3) water level management, and (4) floodplain restoration and protection. The focus areas will be implemented by habitat creation (islands, ponds, wetlands, potholes, channels, backwaters, etc.), flow control structures (grade

controls, dams, dikes, detention basins, weirs, riffles, fish passage, levees, etc.), habitat enhancements (anchor trees, stumps, plantings, management of timber and forest stands, regulation of water levels, etc.), and structure removals/modifications (snagging, clearing, dikes, borrowing, trenching, dredging, etc.); and

WHEREAS, pursuant to Section 800.3 of the Council's regulations, and to meet the Corps' and DNR's responsibilities under the National Environmental Policy Act of 1969, the Corps has developed a **Consulting Parties List** which was developed in consultation with the SHPO/Tribal Historic Preservation Officers (THPOs), Tribes, and other parties that may have an interest in the effects of this undertaking on historic properties. Those on the **Consulting Parties List**, comprised of 325 parties, including 47 federally recognized Tribes, were asked to comment on earlier drafts of this Programmatic Agreement or be provided with study newsletters, public meeting announcements, special releases, and notifications of the availability of report(s), including all draft agreement documentation, as stipulated by 36 CFR Part 800.14(b)(ii) of the National Historic Preservation Act. Comments received by the Corps were taken under consideration in developing this Programmatic Agreement; and

WHEREAS, the Corps has provided scholarly evidence of stewardship in the recordation, protection, and management of historic properties along the Illinois Waterway System through systemic research and studies which have been finalized and approved, then placed in the permanent files of the Corps and SHPO as evidence of compliance promulgated under Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36 CFR Part 800: "Protection of Historic Properties." [These studies included: (1) archeological studies (management of documented and undocumented historic properties), (2) architectural and engineering studies (buildings, structures, and objects associated with Multiple Property National Register Districts), (3) erosion studies, (4) land form sediment assemblage studies (geomorphology) and (5) submerged historic property study (historic shipwrecks and other underwater or previously inundated historic properties)]; and

NOW, THEREFORE, the Corps, the DNR, the SHPO, and the Council agree that the undertakings authorized under Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000 shall be implemented in accordance with the following stipulations:

I. IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES

The Corps will ensure that the following measures are implemented:

A. The Corps will take all measures necessary to discover, preserve, and avoid significant historic properties listed on, or eligible for listing on, the National Register, burials, cemeteries, or sites likely to contain human skeletal remains/artifacts and objects associated with interments or religious activities, and provide this information, studies, and/or reports to the SHPO/THPO.

Under consultation with the SHPO/THPO(s) and the other consulting parties, the Corps will describe and define the Area of Potential Effect (hereafter referred to as the APE) in accordance with the definition contained in 36 CFR Part 800.16(d). The APE may be modified upon consultation with the appropriate SHPO(s)/THPO(s) through avoidance documented through the implementation of historic property surveys and testing, documentary research, recordation, and other investigation data.

B. Unless recent and modern ground surface disturbances and/or historic use can be documented and a determination made by the Corps, in consultation with the SHPO/THPO(s) and the other consulting parties, that there is little likelihood that historic properties will be adversely affected, the Corps will then conduct a historic property (reconnaissance) survey in (1) areas with the potential for containing submerged or deeply buried historic properties and (2) areas indirectly and directly affected by construction, use, maintenance, and operation during the implementation of the IRER program.

C. The Corps will ensure that all reconnaissance surveys and subsurface testing are conducted in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Identification and Evaluation (48 FR 44720-23) and take into account the National Park Service publication The Archaeological Survey: Methods and Uses (1978) and any extant or most recent version of appropriate SHPO(s)/THPO(s) guidelines for historic properties reconnaissance surveys/reports, related guidance, etc. The reconnaissance surveys and subsurface testing will be implemented by the Corps and monitored by the SHPO/THPO(s).

D. In consultation with the SHPO, the appropriate THPO(s), and the other consulting parties, the Corps will evaluate for eligibility all significant historic properties by applying the National Register criteria (36 CFR Part 60.4). The Corps will use its archival documentation as a context in which to make National Register evaluations of historic properties.

1. For those properties that the Corps, the SHPO/THPO(s), and the other consulting parties agree are not eligible for inclusion on the National Register, no further historic properties investigations will be required, and the project may proceed in those areas.

2. If the survey results in the identification of properties that the Corps, the SHPO/THPO(s), and the other consulting parties agree are eligible for inclusion on the National Register, the Corps shall treat such properties in accordance with Part II below.

3. If the Corps, the SHPO/THPO(s), and the other consulting parties do not agree on National Register eligibility, or if the Council or the National Park Service so request, the Corps will request a formal determination of eligibility from the Keeper of the National Register, National Park Service, whose determination shall be final.

4. Relative to the treatment of historic properties and the identification of traditional cultural properties, the Corps will continue to provide the appropriate Tribe(s), the THPO(s), and the other consulting parties information related to treatment measures proposed by the Corps. Consideration of comments received by the Corps can be considered by the signatories to be measures to assist the Corps in meeting its responsibilities under the National Historic Preservation Act of 1966, as amended (Public Law 89-665), and the regulations of the Advisory Council on Historic Preservation, "Regulations for the Protection of Historic and Cultural Properties" (36 CFR, Part 800).

II. TREATMENT OF HISTORIC PROPERTIES

Those individual historic properties and multiple property districts that the Corps, the SHPO/ THPO(s), and the other consulting parties agree are eligible for nomination to, or that the Keeper has determined eligible for inclusion on, the National Register, will be treated by the Corps in the following manner:

A. Archival Documentation of the Construction and Operation of the Historic Locks and Dams and Management of Historic Properties: The Corps has provided scholarly evidence of stewardship in the recordation, protection, and management of historic properties along the Illinois Waterway System through systemic research and studies which have been finalized and approved, then placed in the permanent files of the Corps and SHPO. These studies included: (1) archeological studies (management of documented and undocumented historic properties), (2) architectural and engineering studies (buildings, structures, and objects associated with Multiple Property National Register-eligible **Illinois Waterway Navigation System Facilities**, (3) land form sediment assemblage studies (geomorphology), and (4) submerged historic property study (historic shipwrecks and other underwater or previously inundated historic properties).

B. Treatment of Archaeological Historic Properties:

1. If the Corps determines, in consultation with the SHPO/THPO(s) and the other consulting parties, that no other actions are feasible to avoid and minimize effects to archaeological historic properties, then the Corps will develop a treatment plan, which may include various levels of data recovery, recordation, documentation, and active protection measures. The Corps will implement the treatment plan in consultation with the SHPO/THPO(s) and the other consulting parties.

2. If data recovery is the agreed upon treatment, the data recovery plan will address substantive research questions developed in consultation with the SHPO/ THPO(s) and the other consulting parties. The treatment plan shall be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into

account the Council's publication, Treatment of Archaeological Properties (Advisory Council on Historic Preservation, 1980) and SHPO/THPO(s) guidance. It will specify, at a minimum, the following:

a. The property, properties, or portions of properties where the treatment plan is to be carried out;

b. The research questions to be addressed, with an explanation of research relevance and importance;

c. The methods to be used, with an explanation of methodological relevance to the research questions;

d. Proposed methods of disseminating results of the work to the interested public; and,

e. A proposed schedule for the submission of progress reports to the SHPO/THPO(s).

3. The Corps will submit the treatment plan to the SHPO/THPO(s) and the other consulting parties for 30 days' review and comment. The Corps will take into account SHPO/THPO(s) and the other consulting parties' comment(s), and will ensure that the data recovery plan is implemented. The SHPO/THPO(s) and the other consulting parties may monitor this implementation.

4. The Corps will ensure that the treatment plan is carried out by or under the direct supervision of an archaeologist(s), architectural historian(s) and/or other appropriate cultural resource specialist that meets, at minimum, the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-9).

5. The Corps will ensure that adequate provisions, including personnel, time, and laboratory space are available for the analysis and curation of recovered materials from historic properties.

6. The Corps will develop and implement an adequate program in consultation with the SHPO/THPO(s) and the other consulting parties to secure archaeological historic properties from vandalism during data recovery.

III. TREATMENT OF HUMAN REMAINS, FUNERARY OBJECTS, SACRED OBJECTS, OR OBJECTS OF CULTURAL PATRIMONY, AND CURATED ITEMS

A. When human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered or collected, the Corps will comply with all provisions outlined in the appropriate state acts, statutes, guidance, provisions, etc., and any decisions regarding the treatment of human remains will be made recognizing the rights of lineal descendants, Tribes, and other Native American Indians and under consultation with the SHPO/THPO(s) and the other consulting parties, designated Tribal Coordinator, and/or other appropriate legal authority for future and expedient disposition or curation. When finds of human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered or collected from Federal lands or federally recognized tribal lands, the Corps will coordinate with the appropriate federally recognized Native American Tribes, pursuant to the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. § 3001 *et seq.*) and its implementing regulations (43 CFR Part 10).

B. Cemeteries.

1. Any project activities that affect burials shall comply with state and local burial and cemetery laws. The county coroner shall be notified of the discovery of any human remains within 48 hours (5ILCS 5/2 and 20 ILCS 3440). The City shall notify the SHPO in order to obtain the proper permit prior to removal of remains. Burials, grave markers, and burial artifacts will not be disturbed or removed without this authorization.

2. Burials in cemeteries registered with the State Comptroller's Office are subject to the Cemetery Care Act (760 ILCS 100). A number of state laws may apply to burials that are less than 100 years old but that are not in registered cemeteries. These laws include, but are not limited to, the Cemetery Protection Act (765 ILCS 835), the Public Graveyards Act (50 ILCS 610), and several laws applying to municipalities (see 65 ILCS 5/11-49 through 65 ILCS 5/11-52.2). Authorization for removal of burials shall be as required under the applicable statute.

3. Burials over 100 years old that are not in registered cemeteries are subject to the Human Skeletal Remains Protection Act (HSRPA) (20 ILCS 3440 and its rule 17 Ill.Adm.Code 4170). This agreement constitutes authorization under Section 16 of HSRPA for removal of any burials that will be affected by the project at locations the SHPO agrees cannot be easily avoided. However, review and approval of specific data recovery plans are still required under 17 Ill.Adm.Code 4170.300(d)(3).

4. Disposition of any discovered human skeletal remains, burial markers, burial artifacts, and documentation of the removal project shall be completed as required by the applicable statute and shall be fully coordinated with the SHPO pursuant to 17 IAC 4147.

C. Collected artifacts, samples, and other physical objects shall be returned to the land-owner as real estate upon request. Owners can donate or transfer their ownership rights to the Corps. In consultation with the SHPO/THPO(s), the Corps will ensure that all donated artifacts, samples, and other physical objects with related and associated research materials and records resulting from the historic properties studies are curated at repositories within the State of Illinois in accordance with 36 CFR Part 79.

IV. REPORTS

The Corps will ensure that all final historic property reports resulting from the actions pursuant to this Agreement will be provided in a format acceptable to the appropriate SHPO(s)/THPO(s). The Corps will ensure that all such reports are responsive to contemporary standards, and to the Department of the Interior's Format Standards for Final Reports of Data Recovery (42 FR 5377-79). Precise locations of significant historic properties may be provided only in a separate appendix if it appears that the release of this data could jeopardize historic properties. Locations of traditional cultural properties or sacred sites, consisting of architectural, landscapes, objects, or surface or buried archaeological sites, identified in coordination with Tribes and THPO(s), will be considered to be sensitive information and, pursuant to Section 304 of the National Historic Preservation Act, the Corps will not make this information available for public disclosure. The Corps will make available for publication and public dissemination the reports and associated data, minus precise aforementioned locations and sensitive information.

V. PROVISION FOR POST-REVIEW DISCOVERIES

In accordance with 36 CFR Section 800.13, if previously undetected or undocumented historic properties are discovered during project activities, the Corps will cease, or cause to stop, any activity having an effect and consult with the SHPO/THPO(s) to determine if additional investigation is required. If further archaeological investigations are warranted or required, the Corps will perform any treatment plan in accordance with Part II - TREATMENT OF HISTORIC PROPERTIES, Part III - TREATMENT OF HUMAN REMAINS, FUNERARY OBJECTS, SACRED OBJECTS, OR OBJECTS OF CULTURAL PATRIMONY, AND CURATED ITEMS, Part IV - REPORTS, and Part V - PROVISION FOR POST-REVIEW DISCOVERIES, all of this Agreement. If the Corps and the SHPO/THPO(s) determine that further investigation is not necessary or warranted, activities may resume with no further action required. Any disagreement between the Corps and the SHPO/THPO(s) concerning the need for further investigations will be handled pursuant to Part VI - DISPUTE RESOLUTION of this Agreement.

VI. DISPUTE RESOLUTION

Should the SHPO/THPO(s) or the Council object within 30 days to any plans or actions provided for review pursuant to this Agreement, the Corps will consult with the objecting party to resolve the objection. If the Corps determines that the disagreement cannot be resolved, the Corps will request further comment from the Council in accordance with the applicable provisions of 36 CFR Part 800.7. The Corps, in accordance with 36 CFR Part 800.7(c)(4), will take any Council comment provided in response into account, with reference only to the subject of the dispute. The Corps' responsibility to carry out all actions under this Agreement that are not the subjects of the dispute will remain unchanged.

VII. TERMINATION

Any of the signatories to this Agreement may request a reconsideration of its terms or revoke the relevant portions of this Agreement upon written notification to the other signatories, by providing 30 days' notice to the other signatories, provided that these signatories will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the advent of termination, the Corps will comply with 36 CFR Parts 800.3 through 800.7 with regard to individual undertakings covered by this Agreement.

VIII. AMENDMENTS

Any signatories to this Agreement may request that it be amended, whereupon the other signatories will consult in accordance with 36 CFR, Parts 800.6(c)(7) and 800.14(b)(3), to consider such amendment.

IX. REPORTING AND PERIODIC REVIEW

The Corps will provide the SHPO/THPO(s) with evidence of compliance with this Agreement by letter on January 30, 2003, and once every 2 years thereafter said date. This documentation shall contain the name of the project, title of the documents that contained the Agreement, historic properties identified, determinations of effect, avoidance procedures, level of investigation(s) and/or mitigation(s) conducted with titles of all project reports related to such investigation(s) and/or mitigation(s) which have been completed. Every 5 years starting from the date of January 30, 2003, the Corps will provide the SHPO/THPO(s) a review report of the overall IRER to determine this Agreement's effectiveness, accuracy, and economy. Based upon this review, the Corps, the SHPO/THPO(s), and the Council will determine whether the Agreement shall continue in force, be amended, or be terminated.

X. EXECUTION AND IMPLEMENTATION

A. Nothing in this Agreement is intended to prevent the Corps from consulting more frequently with the SHPO/THPO(s) or the Council concerning any questions that may arise or on the progress of any actions falling under or executed by this Agreement.

B. The undersigned concur that the Corps has satisfied its Section 106 responsibilities for all individual undertakings through this Agreement regarding the implementation of IRER.

C. The stipulations of this Agreement are limited solely to undertakings authorized under Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000.

XI. SIGNATORIES TO THIS AGREEMENT

A. **CHICAGO DISTRICT, U.S. ARMY CORPS OF ENGINEERS:**

BY: _____ Date: 4 SEP 02

Colonel Mark A. Roncoli
District Engineer
U. S. Army Corps of Engineers
Chicago District

B. **ROCK ISLAND DISTRICT, U.S. ARMY CORPS OF ENGINEERS:**

BY: _____ Date: 30 Aug 2002

Colonel William J. Bayles
District Engineer
U. S. Army Corps of Engineers
Rock Island District

C. **ST. LOUIS DISTRICT, U.S. ARMY CORPS OF ENGINEERS:**

BY: _____ Date: 2 OCT 02

Colonel C. Kevin Williams
District Engineer
U. S. Army Corps of Engineers
St. Louis District

XI. SIGNATORIES TO THIS AGREEMENT (Continued)

D. **ILLINOIS DEPARTMENT OF NATURAL RESOURCES:**

BY: _____ Date: 11-12-02

Brent Manning
Director
Illinois Department of Natural Resources

E. **ILLINOIS STATE HISTORIC PRESERVATION OFFICER:**

BY: _____ Date: 11-14-02

Anne E. Haaker
Illinois Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency

F. **ADVISORY COUNCIL ON HISTORIC PRESERVATION:**

BY: _____ Date: 4/21/03

John M. Fowler
Executive Director
Advisory Council on Historic Preservation

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

http://www.mvr.usace.army.mil

December 9, 2002

Planning, Programs, and
Project Management Division (11.2.240a)

Mr. Charles Clark
Director of NAGPRA
Citizen Potawatomi Nation
1601 Gordon Cooper Drive
Shawnee, Oklahoma 74801

Dear Mr. Clark:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources (DNR) have been consulting with the Citizen Potawatomi Nation concerning the site-specific evaluation of Waubonsie Creek (Project) for the purposes of implementing the Illinois River Ecosystem Restoration (IRER) Feasibility Study, authorized by Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000.

To meet our requirements promulgated under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and the implementing regulations, 36 CFR Part 800: "Protection of Historic Properties," the Corps will conduct research and investigations to search for reported and unreported historic properties within the project area and associated ancillary undertakings. This research and investigation will be conducted to determine effects to sites eligible for, or listed on, the National Register of Historic Places. The Phase I Intensive Archeological Survey will include acceptable archeological and geomorphological methods of testing for deeply buried archeology sites, meeting all State and Federal guidance and regulations.

The Waubonsie Creek Restoration Project was coordination by letter with the Illinois Historic Preservation Agency (IHPA) in Springfield, Illinois, and 12 other consulting parties by letter dated March 19, 2002. This letter proposed a Phase I Intensive Archeological Survey in the area of potential effects, excluding areas previously surveyed or disturbed by construction. Allowing for tribal and other consulting parties review and comment on the project and proposal contributes to fulfilling Corps obligations as set forth in the NHPA (Public Law [PL] 89-665), as amended; the National Environmental Policy Act of 1969 (PL 91-190); Executive Order (EO) 11593 for the "Protection and Enhancement of the Cultural Environment" (Federal Register, May 13, 1971); the Archaeological and Historical Preservation Act of 1974 (PL 93-291); the ACHP "Regulations for the Protection of Historic and Cultural Properties" (36 CFR, Part 800); and the applicable National Park Service and Corps regulations.

In response to the Corps consultation, correspondence dated March 28, 2002, was received from the Citizen Potawatomi Nation (Enclosure 1), requesting site locational data and a copy of the proposed Phase I Archeological report.

The Corps is providing the locational information, depicted as archeological sites and surveyed areas (Enclosure 2), as requested in your letter of March 28, 2002. This locational information was obtained using the Corps' Illinois Geographic Information Systems site file database which revealed a high density of architectural and buried (archeological) historic properties surrounding the project area, although no previously recorded or reported historic properties are located within the project area. The high density of historic properties in the vicinity may be associated with the long-term human occupation of this area near the confluence of Waubonsie Creek and Fox River and location of the village of Oswego. The Fox River and the village of Oswego are significant highly urbanized, hydrological, topographical, and geomorphological regions unique to the Illinois River Valley.

All consulting parties must be aware that the specific locations of historic and archaeological properties are subject to protection through nondisclosure under Section 304 of the National Historic Preservation Act. All maps subject to public review/access shall not contain any information on archeological sites. This information is not to be released in order to protect the resources at the sites.

The Corps will provide the Citizen Potawatomi Nation with a copy of the Intensive Archeological Survey draft and final report copies for your review and permanent files. The Citizen Potawatomi Nation will also be provided with an opportunity to provide views on any effects of this undertaking on historic properties resulting from the IRER and to participate in the review of the site-specific documents and will be provided with study newsletters, public meeting announcements, special releases, and notifications of the availability of report(s), including all draft agreement documentation, as stipulated by 36 CFR Part 800.14(b)(ii) of the NHPA.

We thank you for consulting on the Waubonsie Creek Project for the purposes of implementing the Illinois IRER Feasibility Study. We also look forward to any comments on the draft and final report, which will be taken under consideration, as promulgated under the NHPA and its implementing regulations.

If you have questions concerning the proposed Waubonsie Creek Project, please call Mr. Ron Deiss of our Economic and Environmental Analysis Branch, telephone 309/794-5185, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY

Dorene A. Bollman
Acting Chief, Economic and
Environmental Analysis Branch

CHAIRMAN
John "Rocky" Barrett

SECRETARY-TREASURER
Gene Bruno

CITIZEN POTAWATOMI NATION

March 28, 2002

Ron Deiss
Economic and Environmental Analysis Br.
Dept. of the Army
Rock Island Dist. Corps of Eng.

Re: Waubonsie Creek Project

My name is Charles Clark and I am the new Director of NAGPRA for the Citizen Potawatomi Nation located in Shawnee, Oklahoma. I received a letter concerning the Illinois River Ecosystem Restoration Feasibility Study. A preliminary search revealed that there is no previously reported or recorded historic properties documented within the area, but there is a potential for undiscovered archaeological properties due to the proximity of previous sites. It is my understanding that a Phase I Archaeology Survey will be conducted of the area.

I would appreciate a survey report of the area after it is completed. If at all possible, I would like a copy of the area marked with the previous archaeological sites.

You can e-mail me at cclark@potawatomi.org or mail a response. Thank you. I appreciate your assistance and time on this matter

Sincerely

Charles Clark
Director of NAGPRA

(405) 275-3121 • Fax (405) 275-0198 • 1601 S. Gordon Cooper Dr. • Shawnee, OK 74801

ENCLOSURE 1

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

http://www.mvr.usace.army.mil

August 5, 2003

Planning, Programs, and
Project Management Division (11.2.240a)

Ms. Anne Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62704

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources (DNR) is providing the enclosed draft Archaeological Short Survey Report (ASSR) in compliance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulation, 36 CFR Part 800, "Protection of Historic Properties" (Enclosure 1).

This ASSR and documentation within this letter is provided for review and comment pursuant to determinations of ***No Historic Properties Affected*** and ***No Adverse Effect*** for the proposed recommended plan for the Waubonsie Creek (Project, including the Saw-Wee-Kee Park soil disposal area) for the purposes of implementing the Illinois River Ecosystem Restoration (IRER) Feasibility Study, authorized by Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000.

The Corps formally coordinated the Project information by letter dated March 19, 2003 with your agency, requesting concurrence with a determination of ***No Historic Properties Affected***, as defined in 36 CFR Part 800.3(a)(1) for the existing Parkview Estates Reservoir and other areas of previous disturbance. The Corps also requested comment from your agency and other consulting parties concerning our intent to search for undocumented archeological historic properties in the flood plain and upland areas of the proposed Upper and Lower Stonegate, Upper and Lower Pfund, Fox Bend Golf Course, and Fox Valley Greenway Project site-specific Project areas. The Phase I Intensive Archaeological Survey would be conducted in the area of potential effects, excluding areas previously surveyed or disturbed by construction. The Illinois Historic Preservation Agency (IHPA) returned the Corps letter of March 8, 2002, which was stamped "**concur,**" by the State Historic Preservation Officer (ASSR Attachment A, Scope of Work, Exhibit 12.5).

The Phase I survey is documented in the enclosed draft ASSR entitled Phase I Archaeological, Architectural, and Geomorphological Survey for Historic Properties within the Waubonsie Creek Site Specific Projects, Illinois River Ecosystem Restoration Program, Kendall and Kane Counties, Illinois, dated June 2003 (Enclosure 1, as Archaeological Survey Report No. 2003-1586-7). The Illinois State Museum Society, Springfield, Illinois, prepared the report under Corps Indefinite Deliveries Contract Number DACW25-98-D-0017, Delivery Order No. 0026.

According to the ASSR, five historic properties were reported and determined to be water-retaining dams or dam remains from the early-to-late 20th centuries, constructed for ice harvesting and/or potential recreational and landscaping purposes. The reported sites are 11KE479 (Fox Bend Dam), 11KE480 (Upper Pfund Dam), 11KE481 (Lower Pfund Dam), 11KE482 (Upper Stonegate Dam), and 11KE483 (Lower Stonegate Dam). All of these dams have been determined not to be of historic significance, except for the 11KE481 (ASSR Attachment B). Although portions of the Lower Pfund Dam were partially destroyed by a flood in 1996, the intact portion of the dam does provide information concerning the technology of ice harvesting during the early 20th century (ASSR Attachment B, page 8). Therefore, the intact portions of the Lower Pfund Dam may potentially be eligible to the National Register of Historic Places (NRHP) under criteria considerations C and D of 36 CFR Part 60.

The Corps concurs with the findings and recommendation of the ASSR, that one potentially NRHP site was discovered within the Waubonsie Creek Project area of potential effect, identified as 11KE483 (Lower Pfund Dam). The Project site-specific restoration proposed within the reach of the Lower Pfund Dam consists of removal of dam debris within the Waubonsie Creek channel that originated from the severe damage by the 1996 flood. This debris was reported, described, and determined in the ASSR to be no longer architecturally or archeologically contributing to the Lower Pfund Dam site (ASSR, page 8, Attachment D, page 8). No proposed Waubonsie Creek site-specific measures will affect the potentially NRHP eligible intact portions of the Lower Pfund Dam.

The Corps requests concurrence with the determination of ***No Historic Properties Affected***, as defined in 36 CFR Part 800.3(a)(1) for all reaches of the Waubonsie Creek, except that reach which encompasses the Lower Pfund Dam (Enclosure 2, Plates 1-24). The determination of the Corps and the Illinois DNR is that the proposed Project within the reach which encompasses the Lower Pfund Dam does not meet the adverse effect criteria of CFR Part 800.5(a)(1), being consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines. The Corps determination of ***No Adverse Effect*** for 11KE483 is based upon complete avoidance of those intact architectural remains of Lower Pfund Dam by confining the restoration to the main channel (Enclosure 2, Plate 5), which adheres to 36 CFR Part 800.4(d). Agency concurrence with the draft report and the Corps determinations and findings will meet, in part, our requirements promulgated under the NHPA.

By copy of this letter, consulting parties (see Consulting Parties Distribution List) are given the opportunity to review and comment on the Corps determination within 30 days. Consulting parties are not being provided with the draft ASSR because the specific locations of historic and archaeological properties are subject to protection through nondisclosure under Section 304 of the National Historic Preservation Act. All maps subject to public review/access shall not contain any information on archeological or architectural sites, and any reports prepared or coordinated in compliance with the NHPA shall not be provided for public review or release in order to protect the resources at the sites. Any request for site locations will require the comment of the IHPA, State Historic Preservation Officer.

Please comment or concur with our opinion, recommendations, and determination within 30 days. If no reply is received from your agency within 30 days of receipt of this correspondence, the Corps will assume that the draft report is acceptable, and two copies of the final report will be forwarded to your agency, and the Corps and Illinois DNR will proceed with the Project as proposed.

If you have questions concerning the proposed Project, please call Mr. Ron Deiss of our Economic and Environmental Analysis Branch, telephone 309/794-5185, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY
MARK A. CORNISH
FOR
Kenneth A. Barr
Chief, Economic and Environmental
Analysis Branch

Enclosures

Copies Furnished:

Dr. Harold Hassen
Illinois Department of Natural Resources
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787 (with enclosures)

Dr. Michael Sheehan
Illinois State Museum--RCC
1011 East Ash Street
Springfield, Illinois 62703 (without enclosures)

Consulting Parties (see List) (with Enclosure 2)

MFR: Standard letter to the IHPA and consulting parties as promulgated under Section 106 of the NHPA for the Waubonsie Creek Project, IL River Ecosystem Restoration Feasibility Study, forwarding the draft Phase I archaeological report.

Consulting Parties List

Illinois River Ecosystem Restoration
and
Illinois River Basin Restoration

Mr. William Poore
Secretary
Palos Historical Society
c/o Palos Public Library
12330 Forest Glen Boulevard
Palos Park, Illinois 60464

Ms. Phyllis M. Ellin
Executive Director
United States Department of the Interior
Illinois & Michigan Canal
National Heritage Corridor Commission
201 West Tenth Street, #1-SE
Lockport, Illinois 60441

Mr. Johnathan Buffalo
Sac and Fox Tribe of the Mississippi
in Iowa
349 Meskwaki Road
Tama, Iowa 52339-9629

Mr. John Lamb
Director
Canal and Regional History Collection
Lewis University
One University Parkway
Romeoville, Illinois 60446-2298

Ms. Liz Safanda
Preservation Partners
P.O. Box 903
St. Charles, Illinois 60174

Mr. John F. Anderson
Ford Country Historical Society
201 West State Street
P.O. Box 115
Paxton, Illinois 60957-0115

Mr. Charles Clark
Director of NAGPRA
Citizen Potawatomi Nation
1601 Gordon Cooper Drive
Shawnee, Oklahoma 74801

Waubonsie Creek Restoration

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DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF

http://www.mvr.usace.army.mil

October 27, 2003

Planning, Programs, and
Project Management Division (11.2.240a)

Ms. Anne Haaker
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62704

Dear Ms. Haaker:

The Rock Island District of the U.S. Army Corps of Engineers (Corps) and the State of Illinois Department of Natural Resources (DNR) encloses the final Archaeological Survey Short Report in compliance with Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulation, 36 CFR Part 800, "Protection of Historic Properties."

Enclosed for your permanent files are two copies of the final report entitled Final Report, Phase I Archaeological, Architectural, and Geomorphological Survey for Historic Properties within the Waubonsie Creek Site Specific Projects, Illinois River Ecosystem Restoration Program, Kendall and Kane Counties, Illinois, dated October 2003 (Enclosure 1, as Archaeological Survey Report No. 2003-1586-7). The Illinois State Museum Society, Springfield, Illinois, prepared the report under Corps Indefinite Deliveries Contract Number DACW25-98-D-0017, Delivery Order No. 0026.

This report documents investigations in support of the Waubonsie Creek Project (including the Saw-Wee-Kee Park soil disposal area) for the purposes of implementing the Illinois River Ecosystem Restoration (IRER) Feasibility Study, authorized by Section 216 of the 1970 Flood Control Act and Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000. Please keep these reports in your permanent files as evidence of our compliance with Section 106 of the NHPA of 1966, as amended. Your agency was provided an opportunity to comment on the Corps determinations and findings of the draft version of this report, as forwarded by Corps letter. No comment or response was received from your agency during the 30-day review period.

Pursuant to Section 800.3 of the Council's regulations and to meet the responsibilities under the National Environmental Policy Act (NEPA) of 1969, the Corps and the Illinois DNR developed a preliminary Consulting Parties List. All consulting parties were notified of the IRER program and were asked to respond to remain on the attached final Consulting Parties List.

The request to remain on the final Consulting Parties List allows for agencies, tribes, individuals, organizations, and other interested parties an opportunity to provide views on any effects of this undertaking on historic properties resulting from the IRER, to participate in the review of the site-specific documents, and to be provided with study newsletters, public meeting announcements, special releases, and notifications of the availability of report(s), including all draft agreement documentation, as stipulated by 36 CFR Part 800.14(b)(ii) of the NHPA.

The specific locations of historic and archeological properties are subject to protection through nondisclosure under Section 304 of the NHPA. The reports are not made available to those on the Consulting Parties List by this correspondence. All maps subject to public review and access of archeological sites will be scaled so that specific sites cannot be found easily and the resources are protected. Any specific request for site locations and/or redistribution and disclosure of the final reports will require the comment of the Illinois Historic Preservation Agency, State Historic Preservation Officer.

If you have questions concerning the final report, please call Mr. Ron Deiss of our Economic and Environmental Analysis Branch, telephone 309/794-5185, or write to our address above, ATTN: Planning, Programs, and Project Management Division (Ron Deiss).

Sincerely,

ORIGINAL SIGNED BY

Kenneth A. Barr
Chief, Economic and Environmental
Analysis Branch

Enclosure

Copies Furnished:

Dr. Harold Hassen
Illinois Department of Natural Resources
Lincoln Tower Plaza, Room 310
524 South Second Street
Springfield, Illinois 62701-1787 (with enclosure, 3 copies)

MFR: Standard letter to the IL Historic Preservation Agency and consulting parties as promulgated under Section 106 of the National Historic Preservation Act for the Waubonsie Creek Project, Illinois River Ecosystem Restoration Feasibility Study forwarding the final Phase I archeological report.

Copies Furnished (Continued):

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Illinois State Museum--RCC
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ATTN: CELRC-PM-PS (Mr. Keith G. Ryder)
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Waubonsie Creek Project
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APPENDIX B

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX B
CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

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ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
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FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX B
CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

I. PROJECT DESCRIPTION

A. Location. The proposed project is located along Waubonsie Creek in Kane and Kendall Counties, Illinois. Sites for modification of dams and riffles are located in Sections 16 and 17, Township 37 North, Range 8 East. Placement of riffles and wetland construction is proposed in Section 9, Township 37 North, Range 8 East. Wetland construction is proposed for Section 35, Township 38 North, Range 8 East. Riffle construction is proposed in Section 36, Township 38 North, Range 8 East. This document specifically addresses the alteration, or removal, of four dams and two artificial riffles on Waubonsie Creek. The document also specifies two areas that are being considered for the construction of off-channel wetlands, and several locations for riffle placement in Waubonsie Creek.

B. General Description. The recommended plan provides for:

1. Restoring aquatic connectivity through modification or removal of four dams and two artificial riffles on Waubonsie Creek. Dams and riffles would be modified by constructing a rock ramp or lengthening the existing rock ramp.

2. Construction of three off-channel wetland areas that would not exceed 3 acres in size (each) and the planting of these areas with emergent rootstock and native wetland seed mixes.

3. Construction of a wetland area within the Parkview Estates retention reservoir and planting of emergent rootstock and wetland seed mixes.

4. Seeding of riparian areas along Waubonsie Creek that are directly related to the areas of wetland construction.

5. Introduction of three riffle structures within Waubonsie Creek to create habitat diversity, protect from habitat loss, and maintain water elevations within backfilling wetlands.

C. Authority and Purpose. The site-specific evaluation was initiated as a component of the Illinois River Ecosystem Restoration Study, which is a General Investigation study authorized by Section 216 of the Flood Control Act of 1970. The evaluation was completed under authority provided by Illinois River Basin Restoration, Section 519 of the Water Resources Development Act of 2000. Illinois River Basin Restoration authorizes implementation of critical restoration projects that produce independent, immediate, and substantial restoration, preservation, and protection benefits.

D. <u>Description of Proposed Placement Site</u>. Riffle placements sites will be located in areas that currently do not have natural riffle habitat. Rock ramps will be located on the downstream sides of all dam sites to produce a 20:1 gradient leading up to the dam crest. In both the Oswegoland Greenway and Fox Valley Greenway riffle construction components, effort was taken to identify areas with little habitat value for riffle construction. However, at the Oswegoland Greenway sites the riffles are also tied into the water level management of the off-channel wetlands, and placement opportunities were relatively limited.

E. <u>Description of Placement Method</u>. Rock materials will be placed in the stream for three purposes: riffles, ramps, and bank protection. Placement method will generally be the same for all three types. Rock will be placed by loader or backhoe from the bank and from within the stream. Due to limited access, intermediate transport by loader from the staging area is anticipated. Some excavation of the bank will be required to tie the rock into the bank. Where bank protection is proposed, the bank will first be excavated before bedding stone is placed. Rock will then be placed as described above.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations. The substrate of Waubonsie is predominantly alluvial sands and gravels with some fines. Given the size of Class "B" riprap, downstream movement of fill material is anticipated to be negligible. Past experience with this riprap for bank stabilization further substantiates this claim.

Actions Taken To Minimize Impacts. The minimum amount of materials necessary for project purposes will be used.

B. Water Circulation, Fluctuation, and Salinity Determinations.

1. Water Chemistry. Waubonsie Creek is a freshwater lotic system. The proposed riprap to be placed along its bankline and used to create in-stream riffle habitat is basically an inert material that will have little effect on water chemistry. Water clarity, odor, taste, and dissolved gas levels will not be appreciably changed. Because the wetland areas along the Oswegoland Greenway are to be constructed to drain the majority of the wetland area, it is unlikely that water chemistry would be affected in these areas as well.

2. Current Patterns and Circulation. In the Stonegate area, riprap would be placed parallel to and along the bankline. A limited amount of the streambed would be filled by the riprap; however, current patterns, velocity, and circulation should not be noticeably affected.

In areas where artificial riffle structures would be constructed, the hydrology would change slightly to create a more natural pool riffle combination that is seen in natural undisturbed streams. The pool area behind the riffles acts as a resident area for aquatic organisms, while the riffle habitat creates ideal invertebrate habitat. These two habitats together create natural stream habitat that is important for a healthy aquatic ecosystem.

3. Salinity Gradients. The proposed actions take place in and around a freshwater stream system. Therefore, no consideration of salinity gradients is warranted for these actions.

4. Actions Taken to Minimize Impacts. The use of chemically stable materials and physical stabilization of materials by design are actions intended to reduce impacts to the stream system. Also, construction would take place during the fall season when water levels are likely to be low and unlikely subject to higher fluctuations. This will allow riffles, ramps, and stream protection measures to take hold before the spring high flows.

C. Suspended Particulate/Turbidity Determinations. There will be minor increases in turbidity during construction. However, these increases will be temporary, and turbidity levels will return to normal upon completion of the project.

Contaminant Determinations. Riprap will be chemically stable and non-contaminating rock obtained from an approved commercial source. No known contaminated substrate will be disturbed.

D. Aquatic Ecosystem and Organism Determinations. Fish passage at several locations along Waubonsie Creek is a project goal. Although resident fish within the project areas may temporarily disperse during construction, the overall benefit to the Waubonsie Creek fish community offsets any temporary impacts. Currently, no unique fishery exists within the project area. However, there are many fish species of the Fox River, which historically used Waubonsie

Creek as a spawning source (including the State endangered *Moxostoma carinatum,* or river redhorse). Access of Fox River fish to Waubonsie Creek could potentially increase the resident fishery in Waubonsie Creek, as well as serve to increase Fox River populations.

Fish, in aquatic systems, also serve as a mode of transportation for several stream organisms. For example, the glochidia of fresh water mussels attach themselves to the gills of freshwater fish as parasites, and upon maturation drop off to live their independent lives in the system. For this reason, fish passage is not only important for fish populations, but is essential to maintain a healthy system.

There will be no noticeable effect on special aquatic sites. No sanctuaries, refuges, wetlands, mudflats, or vegetated shallows will be affected.

An evaluation of Federal and State endangered species is given earlier in the Environmental Assessment portion of this document.

Actions Taken to Minimize Impacts. Before any in-stream construction takes place, biologists from the Rock Island District, U.S. Army Corps of Engineers and the Illinois Department of Natural Resources (IDNR) will conduct an informal mussel search. Any specimens found will be removed and relocated upstream to an area with similar flow and sediment conditions.

E. Proposed Placement Site Determinations. No violations to water quality standards should occur. An application for State certification under Section 401 of the Clean Water Act has been submitted.

The proposed project should have no effect on municipal or private water supplies. Recreational or commercial fisheries are expected to benefit from the proposed action. Water-related recreation will not be affected. Aesthetics are generally negatively affected by this type of construction activity; however, the post-project aesthetics are expected to form a more natural and more aesthetically pleasing environment.

F. Determination of Cumulative and Secondary Effects on the Aquatic Ecosystem. Placement of rocks within Waubonsie Creek will have limited short-term impacts to the surrounding aquatic and terrestrial organisms. Directly, any bottom-dwelling organism within the area of impact would most likely be killed by the placement of material. Other organisms would be disoriented during construction and placement of material within the stream. However, these impacts would be extremely short term and the positive benefits that they would yield strongly outweigh any negative benefits to the areas of riffle construction. To ensure limited impact to the State listed slipper shell mussel, an informal survey will be carried out prior to construction. All individuals found will be taken to another area within the stream with similar substrates and flow conditions.

In addition to the negative impacts, these areas will provide better stream conditions for fish and invertebrates to fulfill vital life cycle requirements. The pools created upstream of the constructed riffle habitats will provide additional depth to a stream that is lacking such habitat. The actual rocks will serve as cover and foraging habitat to a variety of darter, minnow, and madtoms within the stream, as well as aquatic insects of a wide variety of species.

III. FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

A. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.

B. Evaluation of Practicable Alternatives. Refer to Section 2 - Project Formulation of the main feasibility report.

1. **No Federal Action.** This alternative was not selected because the existing fish barriers create a disconnected system in Waubonsie Creek from the Fox River. These barriers would continue to create an isolated system throughout the life of this project and this alternative was deemed unacceptable to the restoration of Waubonsie Creek.

2. **Proposed Action.** The proposed action is considered environmentally and economically acceptable and operationally feasible as planned.

C. Section 401 certification of the Clean Water Act will be obtained prior to project implementation. The project will be in compliance with water quality requirements of the State of Illinois.

D. The project is not anticipated to introduce toxic substances into nearby waters or result in an appreciable increase in existing levels of toxic materials.

E. No adverse impact to Federal or State-listed endangered species would result from the proposed actions. No marine sanctuaries would be impacted.

F. No municipal or private water supplies would be affected by the proposed actions and no degradation of waters of the United States is anticipated.

G. Removal of sediments to construct off-channel wetlands and backfilling channels as well as shallow water areas would provide improved water quality and habitat diversity to the Waubonsie Creek watershed and is deemed beneficial for the environment.

H. No other practical alternatives have been identified. The proposed actions are in compliance with Section 404(b)(1) of the Clean Water Act, as amended. The proposed actions would not adversely impact water quality and would improve habitat diversity throughout the Waubonsie Creek watershed.

_____

Date

William J. Bayles
Colonel, U.S. Army
District Engineer

APPENDIX C

HABITAT EVALUATION AND QUANTIFICATION

ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX C
HABITAT EVALUATION AND QUANTIFICATION

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ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX C
HABITAT EVALUATION AND QUANTIFICATION

1. INTRODUCTION

As mandated by planning guidance in Engineering Regulation 1105-2-100, the Corps of Engineers is required to quantify benefits of environmental restoration projects. The quantification of these benefits is not restricted to any one method or rationale, and therefore biologists involved in habitat restoration, including the Corps of Engineers, are constantly searching for more innovative and accurate ways to quantify ecosystem benefits of environmental restoration projects. This appendix provides an overview of the methods, assumptions, and rationale used to quantify both aquatic and wetland benefits of restoration along Waubonsie Creek located in Kane and Kendall Counties, Illinois.

2. PROJECT GOALS AND OBJECTIVES

Waubonsie Creek is 10.8 miles long and has a 29.6-square-mile watershed. Several dams block stream connectivity between Waubonsie Creek and the Fox River. Fox River fish have limited access to tributary habitat as dams also block many other Fox River tributaries. Drainage for agricultural production, channelization, and urbanization have reduced in-stream habitat diversity and riparian wetland habitat. Fish refuge habitat within Waubonsie Creek is limited.

The project goal is to restore aquatic habitat and riparian habitat. The project objectives are to restore connectivity at the dams, increase in-stream habitat, and restore/create riparian wetlands. Potential project features include the following: remove dam(s), install fish passage structures, meander channelized stream sections, install streambank structures, install riffles, create off-channel fish refuge, and restore riparian wetlands.

There is the opportunity to restore stream connectivity by modifying or removing the dams. While much of the riparian corridor is in private ownership, some portions of the riparian corridor are owned by public agencies including the Oswegoland Park District, Village of Montgomery, and Fox Valley Park District. These publicly owned areas offer an opportunity to increase in-stream diversity and restore riparian wetlands.

3. POTENTIAL ENVIRONMENTAL BENEFITS

The restoration project could restore stream connectivity between Waubonsie Creek and the Fox River, allowing downstream aquatic organisms access to historic upstream habitats that have generally become isolated since construction of the dams. Removing or modifying the Lower Stonegate, Upper Stonegate, Lower Pfund, Upper Pfund, and Fox Bend Golf Course Dams would allow fish from the Fox River to access approximately 7.5 miles of tributary stream habitat.

In general, riverine fishery resources have evolved to utilize a variety of habitats throughout their life cycle. Various life stages of fish utilize different habitat s for spawning, feeding, resting, and overwintering and as refuge during floods and droughts. Moreover, fish frequently move long distances to meet certain desired habitat conditions, thus maximizing their fitness and ability to reproduce and pass on genetic material. Fish species anticipated to utilize habitat in the creek for different life stages include smallmouth bass, shorthead redhorse, and channel catfish. Providing fish passage would also benefit organisms such as freshwater mussels. Mussels utilized fish as parasitic hosts for their larvae. Allowing upstream fish passage would allow for mussel resources to re-colonize upstream habitats that have become isolated since dam construction.

The project could provide refuge habitat which is limited in Waubonsie Creek. During high flows in Waubonsie Creek, fish could seek refuge in areas with lower velocity to avoid being flushed downstream toward the Fox River. By providing fish passage at the dams, any fish flushed downstream would be able to return to upstream areas.

The project could restore wetlands in the riparian corridor of Waubonsie Creek. Discouraging monocultures of invasive reed canarygrass and planting a variety of native grassland and wetland plants could increase the diversity of plants in the riparian corridor at the Oswegoland Greenway and Parkview Estates Detention Area. The project could provide higher quality wetland and riparian habitat for songbirds, raccoons, opossums, egrets, and muskrats within the riparian corridor.

Much of Waubonsie Creek has been channelized and has little in-stream habitat diversity. By creating pools and riffles, the restoration project could provide a diversity of in-stream habitats. The riffles will provide rock substrate, as well as oxygenate the water. The rocks provide structure for aquatic macroinvertebrates and refuge for small fish.

4. GENERAL METHODOLOGY

The purpose of this analysis is to quantify, to the extent possible, environmental benefits resulting from the various project alternatives. Project alternatives will be compared based on the relative quantity of environmental benefits and relative costs. Participants for this analysis included biologists from the Rock Island District of the U.S. Army Corps of Engineers, Illinois Department of Natural Resources (IDNR), and U.S. Fish and Wildlife Service (USFWS). Habitat analyses were conducted to evaluate potential benefits of fish passage, fish refuge, wetland creation, and in-stream habitat improvements. Project benefits are expressed in terms of Habitat Units (HUs) which are a measure of both habitat quantity and habitat quality. Habitat quantity can be measured in acres or stream miles. Habitat quality can be measured with Habitat Suitability Indices (HSIs) for key indicator species or with community-based indices such as the Qualitative Habitat Evaluation Index.

The analysis utilized four different methodologies to quantify project benefits. Fish passage benefits were quantified based on the value of the stream habitat that would be connected through dam modification alternatives. The Qualitative Habitat Evaluation Index (QHEI) (Rankin 1989) was used to assess the quality of stream habitat, and stream miles connected were used as the quantity of habitat.

A model was developed by the Corps Rock Island District to quantify the benefits of providing fish refuge in the Oswegoland Greenway reach. The model assesses the quantity and quality of refuge

habitat in the stream reach. Point values were assigned to each refuge type. Refuge types that offer lower water velocities provide higher quality refuge habitat and were assigned higher point values. Ancillary riparian benefits are described below.

Published species-specific habitat models were used to quantify the benefits of riparian restoration at the Oswegoland Greenway and Parkview Estates areas. The marsh wren and muskrat were used as indicator species for emergent and palustrine wetlands. The eastern meadowlark was used as an indicator species for grassland. The models were used to estimate habitat quality. The areas of wetland and grassland cover types were used for the habitat quantity.

The QHEI was also used to quantify ecosystem restoration benefits for restoring in-stream habitat at the Fox Valley Greenway reach. The QHEI was used to assess the quality of stream habitat, and stream miles affected were used as the quantity of habitat.

5. FISH PASSAGE BENEFIT QUANTIFICATION

The quality of the stream habitat in Waubonsie Creek was assessed using the Qualitative Habitat Evaluation Index (QHEI). The QHEI is a rapid environmental assessment tool used to estimate habitat quality for stream ecosystems. The QHEI provides a measure of habitat quality corresponding to the physical features that affect fish and invertebrate communities. Physical features evaluated include substrate, channel morphology, riparian zone, gradient, and pool/riffle characteristics. *Qualitative Habitat Evaluation Index (QHEI): Rationale, Methods, and Application* (Rankin 1989) provides a full description of the QHEI model. The QHEI scale of 0-100 was used as the habitat quality measurement. The Ohio EPA uses QHEI scores as a guide to designate aquatic life uses in headwater streams (Rankin 1989). Stream reaches with a QHEI score greater than 60 are designated as Exceptional Warmwater Habitat or Warmwater Habitat without limitations. Stream reaches with QHEI scores between 45 and 60 are designated as Warmwater Habitat or Modified Warmwater Habitat.

Corps and IDNR staff conducted a QHEI evaluation for existing conditions at eight sites on Waubonsie Creek on November 9, 2001. A ninth site was evaluated in May 2002. Table C-1 shows the results of the evaluation. Waubonsie Creek was broken into three reaches based on stream morphology. QHEI scores were averaged for each stream reach (Table C-2). Reach 1 has the steepest gradient (18.5 feet/mile) and has an average QHEI score of 64.8. Based on Ohio EPA use designations, this score indicates that Reach 1 is considered exceptional warmwater habitat or warmwater habitat without impairment. Reach 2 has the lowest gradient (3.3 feet/mile) and has an average QHEI score of 32.4. Reach 2 meets modified warmwater use designations. Reach 3 has a slightly higher gradient at 5 feet/mile and has an average QHEI score of 55.3. Reach 3 meets warmwater use designations.

Table C-1. Results of QHEI evaluation.

Site ID	Stream Mile	Qualitative Habitat Evaluation Index (QHEI)	Reach
Site 1	0.1	78.3	1
Site 2	0.4	52.6	1
Site 3	0.9	70.6	1
Site 4	2.3	57.6	1
Site 5	3.3	36.9	2
Site 6	4.6	33.8	2
Site 7	5.6	26.6	2
Site 8	6.7	54.6	3
Site 9	7.2	56.0	3

Table C-2. Average QHEI scores by stream reach.

Reach Designation	Stream Mile	Qualitative Habitat Evaluation Index (QHEI)
Reach 1	0-2.0	64.8
Reach 2	2.1 - 6.5	32.4
Reach 3	6.5 – 7.1	55.3

Table C-3 shows the location of the dams and distance between dams. Alternatives varied in the number of dams modified and the method of fish passage. Because the dams are not very high, the study team felt that all proposed methods of fish passage would successfully pass fish and that alternative methods would not vary in passage efficiency. Methods only varied in cost.

Table C-3. Dam locations.

Dam Name	Distance from the Fox River (stream miles)	Distance from Downstream Dam (stream miles)	Reach
Lower Stonegate Dam	0.32		1
Upper Stonegate Dam	0.47	0.15	1
Lower Pfund Dam	0.83	0.36	1
Upper Pfund Dam	0.96	0.13	1
Fox Bend Golf Course Dam	1.22	0.26	1
Waubonsie Lake Dam	7.37	6.15	3

Under existing conditions, only 0.32 stream mile of Waubonsie Creek is connected to the Fox River and accessible to fish in the Fox River. Under some flow conditions, fish can pass the ramp at the Lower Stonegate Dam and Stonegate Riffles, but are blocked from further upstream

movement by the Upper Stonegate Dam. While there may be fish passage under some flows, the Lower Stonegate Dam and Stonegate Riffles were not considered passable under the without-project condition. The evaluation team assumed that under the no action plan no additional stream miles would be connected and the quality of habitat in the Reach 1 would remain constant.

The benefit of providing fish passage at a given dam was dependent upon having fish passage at the downstream dam. The first set of with-project alternative plans would provide fish passage at the Lower Stonegate Dam, Stonegate Riffles, and Upper Stonegate Dam ("S" measures) and would connect an additional 0.64 stream mile (Table C-4). The second set of alternative plans would provide fish passage at the Stonegate Dams and the Lower and Upper Pfund Dams ("F" measures) and would connect 0.90 stream mile. The third set of alternatives would provide fish passage at the Stonegate Dams, Pfund Dams, and the Fox Bend Golf Course Dam and would connect 7.05 stream miles.

Table C-4. Alternative plans, stream miles connected.

Alternative Plans	Measure	Total Miles Connected	Net Gain in Miles	Incremental Gain in Miles
No Action		0.32		
Stonegate	S	0.96	0.64	0.64
Stonegate and Pfund	S, F	1.22	0.90	0.26
Stonegate, Pfund and Fox Bend Golf Course	S, F, B	7.37	7.05	6.15

Data from Tables C-2 and C-4 were used to calculate the habitat benefit of different project alternatives in Table C-5. Under existing conditions, there is 0.32 stream mile connected to the Fox River with an average QHEI score of 64.8 for a total of 21 HUs. The first set of alternative plans would provide fish passage at the Upper and Lower Stonegate Dams and Stonegate riffles for a total of 62 HUs. The second set of alternatives would also provide fish passage at the Lower and Upper Pfund Dams for a total of 79 HUs. The final set of alternatives would also provide fish passage at the Fox Bend Golf Course Dam up to the Waubonsie Lake Dam and would provide a total of 292 HUs.

Table C-5. Fish passage habitat units.

Alternative Plans	Measure	Habitat Quality (QHEI)	Habitat Quantity (stream miles connected)	Habitat Units	Net Habitat Units
No Action		64.8	.32	21	
Stonegate	S	64.8	.96	62	41
Stonegate and Pfund	S, F	64.8	1.22	79	58
Stonegate, Pfund and Fox Bend Golf Course	S, F, B	64.8 32.4 55.3	1.22 5.5 0.6	292	271

6. FISH REFUGE BENEFIT QUANTIFICATION

A model to quantify the benefits of providing fish refuge habitat in the Oswegoland Greenway area was developed in coordination with fisheries biologists and hydraulic engineers at the U.S. Army Corps of Engineers, Rock Island District. The group listed different types of refuge habitat found in small streams: off-channel, boulder/riffle, large woody debris, and meander eddies (including bridges). The group assumed that the different refuge habitats provided different quality of refuge based on the velocity of flow. Refuge types that offer lower velocities provide higher quality refuge habitat. Off-channel areas such as oxbows, lateral arms, and backwaters provide refuge habitat with the lowest velocities. Under flow regimes less than bank full, these areas typically have no current, and even when overtopped by floodwaters, the flow energy is dissipated over a greater surface area, allowing it to slow as it flows through the floodway. Boulder/riffle and large woody debris provide in-stream refuge but have higher velocities than off-channel refugia. In-stream structures create "refuge pockets" behind structural elements in the stream and in a thin hydraulic boundary layer around the objects. The meander refuge habitat had the highest velocities (i.e., lowest refuge value) because of the lack of structure. Meanders provide refuge in hydraulic eddies that form on the inner portion of a river bend as flow is shunted to the outer bend of the curve. The group assigned quality scores to each type of refuge habitat as shown in Table C-6.

Table C-6. Refuge quality.

Refuge Type	Quality Score
Off-channel	15
Boulder/riffle	8
Large woody debris	8
Meander/eddy (incl. bridges)	6

The area of impact was identified as a reach of Waubonsie Creek from immediately downstream of the Oswegoland Greenway area (approximate SM 2.75) upstream 2.5 miles (approximate SM 5.25). The group assumed that fish from areas upstream would utilize the refuge habitat as they were being swept downstream. The group estimated the frequency of each type of refuge habitat in the 2.5-mile reach using aerial photos and visual observations from previous site visits.

Habitat Units (HUs) were calculated by multiplying the quality score for a given refuge type by the quantity (number of occurrences) of that refuge type in the 2.5-mile reach. Scores for all the refuge types were summed to produce total HUs. HUs were calculated for the no action and each with-project alternative.

$$\text{Habitat Units} = \sum \text{Quality}_{\text{refuge type}} * \text{Quantity}_{\text{refuge type}}$$

Table C-7 shows the benefit quantification for each alternative. The alternatives varied in the number of off-channel refuge areas and boulder riffle/riffle refuge areas. Table C-8 summarizes the fish refuge HUs. Based on the habitat evaluation, Alternative O1 will almost double the amount of refuge habitat in the 2.5-mile stream reach. Alternative O2 will provide over 2 times as much refuge habitat as exists currently. Alternatives O3 and O4 will triple the amount of refuge habitat.

Table C-7. Fish refuge habitat units, calculation.

	O0 No Action	O1 1 Riffle; 1 Refuge	O2 1 Riffle; 2 Refuge	O3 2 Riffle; 3 Refuge	O4 2 Riffle; 3 Refuge; No Plantings
Quantity					
Off-channel	0	1	2	3	3
Boulder/riffle	0	1	1	2	2
Large woody debris	0	0	0	0	0
Meander/eddy	5	5	5	5	5
Quality					
Off-channel	15	15	15	15	15
Boulder/riffle	8	8	8	8	8
Large woody debris	8	8	8	8	8
Meander/eddy	6	6	6	6	6
Refuge Benefit Units					
Off-channel	0	15	30	45	45
Boulder/riffle	0	8	8	16	16
Large woody debris	0	0	0	0	0
Meander/eddy	30	30	30	30	30
Total	**30**	**53**	**68**	**91**	**91**

Table C-8. Fish refuge habitat units, summary.

Alternative Plans	Measure	Habitat Units	Net Habitat Units
No Action	O0	30	-
1 Riffle; 1 Refuge	O1	53	23
1 Riffle; 2 Refuge	O2	68	38
2 Riffle; 3 Refuge	O3	91	61
2 Riffle; 3 Refuge; no plantings	O4	91	61

7. RIPARIAN BENEFIT QUANTIFICATION

The objectives of restoration at the Oswegoland Greenway and Parkview Estates Detention Area include increasing the value of wetland and grassland habitat by discouraging monocultures of reed canarygrass and increasing vegetation diversity. Published habitat models were selected to evaluate wetland and grassland benefits.

The marsh wren and muskrat were selected to evaluate wetland habitat benefits. The marsh wren model (Gutzwiller and Anderson, 1987) characterizes the suitability of wetland habitat for supplying cover and reproductive needs of marsh wrens using four habitat variables—growth form of emergent hydrophytes, percent canopy cover of emergent herbaceous vegetation, mean water

depth, and percent canopy cover of woody vegetation. The muskrat model (Allen and Hoffman 1984) characterizes the suitability of freshwater wetlands for providing food and cover needs using three habitat variables—percent canopy cover of emergent herbaceous vegetation, percent of year with surface water present, and percent emergent herbaceous vegetation consisting of Olney bulrush, common three-square bulrush, or cattail.

The Eastern meadowlark was selected to evaluate benefits of improving riparian grassland habitat. The Eastern meadowlark model (Schroeder and Sousa 1982) evaluates the suitability of grasslands for supplying food and reproduction needs of the Eastern meadowlark using five habitat variables—percent herbaceous canopy cover, proportion herbaceous canopy cover in grass, average height of herbaceous canopy, distance to perch sites, and percent shrub crown cover.

Application of these models required a number of assumptions. Reed canarygrass was not assessed as emergent vegetation. It was assumed that under without-project conditions, the Oswegoland Greenway and Parkview Estates Detention Area would continue to be dominated by monocultures of reed canarygrass, providing little habitat for the marsh wren, muskrat, and meadowlark. However, the existing 3.5-acre wetland area within the Parkview Estates Detention Area was anticipated to continue to support emergent vegetation under without-project conditions. It was assumed that implementation of the 5-year establishment period would successfully discourage reed canarygrass and establish a diverse native plant community. It was assumed that there would be continued management to control populations of reed canarygrass. It was assumed that a wetland consisting of a diverse plant community would create higher quality habitat than a wetland dominated by reed canarygrass or some other monoculture. With-project alternatives would have wetland and grassland cover types with some open water and a diversity of emergent and herbaceous vegetation. The diversity of the existing 3.5-acre wetland would increase with-project conditions. The quality of habitat would be the same for all with-project alternatives. Alternatives vary in the amount of wetland and grassland cover types (Table C-9).

Table C-9. Cover types for Oswegoland Greenway and Parkview Estates alternatives.

Alternative	Wetland Acres	Grassland Acres
O0	0	22.8
O1	2.9	19.9
O2	3.4	19.3
O3	4.0	18.8
O4	3.3	18.8
P0	3.5	14.9
P1	5.6	12.8
P2	6.7	11.7
P3	8.8	9.6

Marsh wren and muskrat benefits would increase with an increase in the diversity of the existing wetland and restoration/creation of additional wetlands with diverse vegetation. Eastern meadowlark benefits would increase as diverse herbaceous vegetation is established and reed canarygrass is controlled. There is a tradeoff between wetland and grassland benefits—as wetland habitat increases, grassland habitat is reduced.

Table C-10 shows the benefit quantification for wetland HUs. Habitat is reported as Average Annual Habitat Units (AAHUs).

Under the no action alternative, the Oswegoland Greenway provides no habitat for the indicator species as there is no wetland cover type and the grassland cover type is dominated by reed canarygrass, thus providing no habitat value. With Alternative O1, the wetland vegetation in and around the fish refuge area provides a total of 3.51 AAHUs for the marsh wren and muskrat; the 19.9 acres of diverse grassland provide 7.49 AAHUs of meadowlark habitat. With Alternative O2, the wetland vegetation in and around the two fish refuge areas provides a total 4.24 AAHUs for the marsh wren and muskrat; the 19.3 acres of diverse grassland provide 7.27 AAHUs of meadowlark habitat. With Alternative O3, the wetland vegetation in and around the three fish refuge areas provides a total of 4.84 AAHUs for the marsh wren and muskrat; the 18.8 acres of diverse grassland provide 7.08 AAHUs of meadowlark habitat. Alternative O4 provides the same wetland benefits as Alternative O3; however, the 18.8 acres of grassland would be dominated by reed canarygrass resulting in no meadowlark habitat.

Under the no action alternative, the existing 3.5-acre wetland in the Parkview Estates Detention Area provides limited habitat value, 1.15 AAHUs, for marsh wren and muskrat. The 14.9 acres of grassland cover type is dominated by reed canarygrass, thus providing no habitat value. With Alternative P1, the 2.1-acre constructed wetland and the 3.5-acre restored wetland provide a total of 7.86 AAHUs for the marsh wren and muskrat; the 12.8 acres of diverse grassland provide 5.67 AAHUs of meadowlark habitat. With Alternative P2, the 3.2-acre constructed wetland and the 3.5-acre restored wetland provide a total of 9.4 AAHUs for the marsh wren and muskrat; the 11.7 acres if diverse grassland provide 5.19 AAHUs of meadowlark habitat. With Alternative P3, the 2.1-acre and 3.2-acre constructed wetlands and the 3.5-acre restored wetland provide a total of 11.29 AAHUs for the marsh wren and muskrat; the 9.6 acres of diverse grassland provide 3.95 AAHUs of meadowlark habitat.

Table C-10. Riparian wetland and grassland habitat units.

		Average Annual Habitat Units			Total AAHUs	Net AAHUs
Alternative Plans	**Measure**	**Marsh Wren**	**Muskrat**	**Meadowlark**		
No action	O0	0.00	0.00	0.00	0	-
1 riffle; 1 refuge	O1	2.23	1.28	7.49	11.00	11.00
1 riffle; 2 refuge	O2	2.70	1.54	7.27	11.51	11.51
2 riffles; 3 refuge	O3	3.08	1.76	7.08	11.92	11.92
2 riffles; 3 refuge, no grassland planting	O4	3.08	1.76	0.00	4.84	4.84
No action (3.5-acre existing wetland)	P0	0.50	0.65	0.00	1.15	-
2.1-acre wetland (3.5-acre restored wetland)	P1	4.32	3.54	5.67	13.53	12.4
3.2-acre wetland (3.5-acre restored wetland)	P2	5.17	4.23	5.19	14.58	13.4
2.1- and 3.2-acre wetlands (3.5-acre restored wetland)	P3	6.78	4.51	3.95	15.24	14.1

8. IN-STREAM BENEFIT QUANTIFICATION

In-stream benefits for the Fox Valley Greenway were also quantified using the QHEI. The QHEI scale of 0-100 was used as the habitat quality measurement. Stream miles affected were used as the habitat quantity measurement. The evaluation included 1 mile of stream habitat immediately downstream of the Waubonsie Lake Dam from SM 6.4 to 7.4. The quality of existing habitat was 56 based on QHEI Site 9 at SM 7.0 (Table C-1). The proposed project would increase in-stream habitat diversity by constructing a riffle. A with-project QHEI score of 65.5 was estimated assuming an increase in riffle-pool habitat and rock substrate.

Table C-11 shows the benefit quantification for in-stream habitat at the Fox Valley Greenway.

Table C-11. In-stream habitat units.

Alternative Plan	Measure	Habitat Quality (QHEI)	Habitat Quantity (stream miles)	Habitat Units	Net Habitat Units
No action	V0	55	1	56.0	-
1 riffle	V1	65	1	66.5	10.5

9. SUMMARY

The proposed restoration alternatives would restore stream connectivity, provide fish refuge during high flows, restore riparian wetland habitat, and increase in-stream diversity. HUs were rounded to the nearest whole number. Table C-12 summarizes the benefits of restoring stream connectivity by providing fish passage at the Upper and Lower Stonegate, Upper and Lower Pfund, and Fox Valley Golf Course dams. Net benefits range from 41 to 271 fish passage HUs. Table C-13 summarizes the fish refuge and wetland benefits of restoration at the Oswegoland Greenway and Parkview Estates Detention Area. Fish refuge HUs and wetland HUs for these areas were summed. Combined net benefits range from 12 to 73 HUs. Table C-14 summarizes the benefits of increasing in-stream habitat at the Fox Valley Greenway. There were 11 net in-stream HUs for the Fox Valley Greenway.

Table C-12. Net benefits for fish passage.

Alternative Plan	Fish Passage Habitat Units
S	41
S F	58
S F G	271

Table C-13. Combined net benefits, fish refuge and wetland restoration.

Alternative Plan	Fish Refuge Habitat Units	Wetland Habitat Units	Combined Habitat Units
O1	23	11	34
O2	38	12	40
O3	61	12	73
O4	61	5	66
P1	-	12	12
P2	-	13	13
P3	-	14	14

Table C-14. Net benefits for in-stream restoration.

Alternative Plan	In-Stream Habitat Units
V1	11

References

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APPENDIX D

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE DOCUMENTATION REPORT

ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX D
HAZARDOUS, TOXIC, AND RADIOLOGICAL WASTE (HTRW) ASSESSMENT

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APPENDIX D
HAZARDOUS, TOXIC, AND RADIOLOGICAL WASTE (HTRW) ASSESSMENT

1. PHASE I INVESTIGATION

A Hazardous Toxic and Radioactive Waste (HTRW) Documentation Report was completed in October of 2002 by Missman, Stanley & Associates, P.C. (MSA) and documents the Phase IA and IB HTRW Environmental Site Assessment (ESA) for the Waubonsie Creek Section 519 Project Plan in accordance with Engineering Regulation (ER) 1165-2-132 - HTRW Guidance for Civil Works Projects, Illinois Statute 415 ILCS 5/22.2(j)(6)(E)(v), and ER 405-1-12, Real Estate Handbook. The Phase IA and IB Environmental Site Assessment was performed in general conformance with the scope and limitations of the American Society for Testing and Materials Standards E 1527-00 and E 1528-00. The information was obtained through site reconnaissance, informal interviews, a review of maps, and aerial photographs, U.S. Army Corps of Engineers records, and a search of Federal and State environmental databases. These screening methods were selected based on the particular nature of the restoration project. The HTRW Documentation Report by Missman, Stanley & Associates, P.C. is on file at the Rock Island District office.

The Waubonsie Creek Project Plan involves four particular restoration sites along Waubonsie Creek located in Illinois. The four sites included the Dam Sites, the Oswegoland Greenway, the Parkview Estates Reservoir, and the Fox Valley Greenway. These four sites are shown on Plate 2 of the main report. In accordance with performing the Phase IA and IB site assessments, several database types were reviewed with a search radii suggested by ASTM. The database types, ASTM radii, and number of occurrences for the particular database type are shown in Table D-1. Of the database types searched, the most number of occurrences were from LUST (Leaking Underground Storage Tanks), UST (Underground Storage Tanks), and RCRA generators (Hazardous Wastes).

Other environmental record sources reviewed included fire department information, USGS topographic maps, aerial photography reviews, city directories, Sanborn fire insurance maps, chains of title, and Illinois Department of Natural Resources (IDNR) coal mine searches. It is also believed that all four sites were along or near agricultural fields at one time or another. The site reconnaissance revealed no evidence of recognized environmental conditions concerning the chosen properties, including unidentified substance containers, storage tanks, and indications of solid waste disposal along Waubonsie Creek.

MSA evaluated the findings of the Phase IA and IB Environmental Site Assessment using applicable information relative to the subject property. Regarding former agricultural use of the property, research and interviews conducted during the assessment did not present evidence that chemical mixing or spills occurred on the property, and that pesticides and herbicides were applied in order to control pests and weeds in a manner consistent with normal agricultural activities, per manufacturer's recommendations. No pesticide or herbicide mixing or cleaning platforms were observed at these sites. Pesticides and herbicides applied to lands during the course of normal

agricultural activities are exempt from the CERCLA or RCRA regulations and are not considered to be an HTRW concern. Regarding the environmental database sites that were identified adjacent to the project sites, it is MSA's opinion that these sites do not present a Recognized Environmental Concern (REC). The Illinois EPA has documentation that the LUST sites are still active, however, these sites are located a significant distance from the property and have low probability of impacting the subject property via migration of contaminants through groundwater. Also, the information provided on the environmental database did not present information or evidence that the subject sites have been impacted by the adjacent environmental database sites.

Therefore, it is MSA's conclusion that this assessment has revealed no evidence of recognized environmental conditions in connection with the properties assessed, with no need for a Phase II Environmental Site Assessment.

Table D-1. Waubonsie Creek database search types.

Database Type	ASTM Miles (miles)	Number of Occurrences
NPL	1.25	---
CORRACTS	1.25	---
SPL	1.25	---
CERCLIS/NFRAP	0.75	---
TSD	0.75	---
LUST	0.75	---
SWLF	0.75	---
UST	0.50	---
ERNS	0.25	---
RCRA LG GEN	0.50	---
RCRA SM GEN	0.50	---

2. HTRW REFERENCES AND ABSTRACTS

a. Missman, Stanley & Associates, P.C., *Phase IA and IB Environmental Site Assessment, Waubonsie Creek Section 519 Target Properties*, Oswego, Montgomery, and Aurora, Illinois, October 2002.

b. Illinois Administrative Code, Title 35, Section 742.

c. U.S. Army Corps of Engineers, Lower Mississippi Valley Division, ER 1165-2-9, *Hazardous, Toxic, and Radioactive Waste Policy for Civil Works Projects*, 14 June 1996.

d. U.S. Army Corps of Engineers, Rock Island District, ER 1165-2-132, *Hazardous, Toxic, and Radioactive Waste Guidance for Civil Works Projects*, 26 June 1992.

e. U.S. Army Corps of Engineers, Policy Guidance Letter ER 1105-2-100 No. 34, CECW-PA, *Non-CERCLA Regulated Contaminated Materials at Civil Works Projects*, 5 May 1992.

f. U.S. Army Corps of Engineers, ER 385-1-92, *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities*, 18 March 1994.

g. U.S. Army Corps of Engineers, ER 405-1-12, *Real Estate Handbook, Chapter 8*.

h. U.S. Army Corps of Engineers, ER 500-1-1, *Natural Disaster Procedures*.

i. ASTM E 1527-97, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*.

j. ASTM E 1528-98, *Standard Practice for Environmental Site Assessments: Transaction Screen Process*.

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APPENDIX E

GEOTECHNICAL CONSIDERATIONS

ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

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APPENDIX E
GEOTECHNICAL CONSIDERATIONS

1. PURPOSE

The purpose of this report is to describe and discuss the geotechnical issues associated with the proposed stream restoration project on Waubonsie Creek in northeastern Illinois. The main features of the project will create and enhance aquatic and wetland habitat and improve aquatic connectivity to the Fox River.

2. BACKGROUND

The Waubonsie Creek watershed is approximately 29.6 square miles and drains portions of Kendall, Kane, DuPage, and Will Counties in Illinois. The creek flows through the towns of Naperville, Aurora, Montgomery, and Oswego before emptying into the Fox River at Oswego. During the late-19th century and early to mid-20th century, the creek was straightened and wetlands drained to maximize agricultural production. A series of five low-head dams was installed in the lower reach to harvest ice from the creek and create recreational ponds. Recent years have seen rapid urbanization and development of the watershed.

A 1996 flood event caused widespread damage to property, including failure of two of the five dams. Three of the five dams are still present and essentially prevent upstream passage by fish from the Fox River. Potential projects are located at each of these sites. There are also excavated wetlands proposed at two sites upstream, as well as in-stream rock riffle structures.

3. SITE GEOLOGY

3.1 Location

The project area is located in the extreme northeastern part of Illinois. The Waubonsie Creek watershed drains portions of Naperville, eastern Aurora, Montgomery, and Oswego as well as unincorporated areas of the four surrounding counties—Kane, Kendall, DuPage, and Will. The watershed covers approximately 29.6 square miles (18,950 acres). Waubonsie Creek is 10.8 miles long and the average channel slope is 0.2 percent. The watershed flows from northeast to southwest, with several tributaries entering the creek, which flows into the Fox River at the Village of Oswego.

3.2 Physiography

The glaciers that covered this area have influenced the present day soils. The continental glaciers that reached this area brought with them ground up soil and rock material from Canada, Wisconsin, and the basin of Lake Michigan. The material was then deposited, either by the ice itself, or by the melt waters as the ice retreated. This area is covered in glacial drift except where moving water has exposed carbonate bedrock.

The project area lies in the Kankakee plain of the Central Lowland Province. The relief is mainly level to gently sloping but is rolling to steep along the river and stream valleys.

Waubonsie Creek in the 1800's contained large wetlands. Early surveys denoted one of these areas "Great Wabausia Swamp," located along present day U.S. Highway 30. The swamp was drained in the 1880's. The Waubonsie Creek was a meandering stream until it was straightened in the late 1890's and early 1900's. The current creek flows in a channelized stream course.

3.3 Stratigraphy

The Waubonsie Creek watershed lies in the Wedron Till Formation. The formation consists of deposits of glacial till and outwash. Although largely till, they contain beds of outwash, including gravels, sand, and silt. The Formation is extremely variable in thickness, but averages about 100 feet thick. The five tills exposed in this area include, from youngest to oldest, Haeger Till Member, Yorkville Till Member, Malden Till Member, Gilbert Till, and Tiskilwa Till Member. All of these tills are included in the Woodfordian Substage of the Wisconsinan Stage Glaciation.

Underlying these tills is the Silurian bedrock and sand and gravel. As with the tills, the bedrock has been greatly modified by glaciation. The bedrock is 20 to 130 feet below the glacial drift except areas located in the Fox River Valley where it forms the bottom of the stream bed. The Silurian rocks in these areas are the Niagara Limestone Series with the Racine Formation, the uppermost formation in this area. The Racine reef rock is exceptionally pure dolomite, largely vesicular to coarsely vuggy, medium grained, and light gray to white. The Waubonsie Creek runs across the top of this rock for about a mile up from its confluence with the Fox River.

4. EXPLORATION METHODS AND LABORATORY TESTING

4.1 Field Exploration

The subsurface exploration program was conducted in general accordance with U.S. Army Corps of Engineers (USACE) and the American Society of Testing and Materials (ASTM) standards as follows:

1. EM 1110-1-1804, "Geotechnical Investigation"
2. EM 1110-2-1907, "Soil Sampling"
3. ASTM D-1586, "Penetration Test and Split-Barrel Sampling of Soils"

The borings were advanced using an all-terrain vehicle (ATV) mounted rotary drilling rig, Central Mine Equipment (CME) Model 550. The borings were advanced using 4-inch-diameter flight augers. The borings were drilled to depths varying from 5 to 15 feet below the ground surface, within the areas of the proposed wetlands. Borings were backfilled with cuttings after completion. Boring locations are shown on Plates E-1 and E-2.

Borings were sampled selectively by standard penetration method using an automatic hammer and from the augers. Representative samples obtained were sealed in 16-ounce jars and returned to the lab for testing.

Water levels within the boreholes were measured immediately after boring completion, prior to backfilling. Only Boring WC-02-11 was left open and a water level was taken the following day. Groundwater levels do fluctuate seasonally, and it can take time for water levels within a borehole to stabilize and reflect the actual groundwater surface. This is especially true in low permeability, clayey soils.

Areas within the stream were probed by hand since use of the rig would have resulted in significant impacts to the stream and banks. The result of this exploration is detailed in the narrative within the "Subsurface Condition" section of this report.

4.2 Laboratory Testing

Laboratory testing included visual classification and moisture content testing for all samples. Complete graphical boring logs incorporating laboratory test data are shown on Plates E-3 and E-4.

5. PROJECT FEATURES

The general proposed project features are shown on Plates 10 to 15 of the main report. The Dam Area Sites include the Stonegate, Pfund, and Golf Course Areas. The Stonegate Area involves notching and rock placement at two dam locations, additional rock placement at two existing riffles, and bank protection between two of these structures. The Pfund Area involves debris removal at one dam location, and modification by rock placement at another. The Golf Course Area involves modification by rock placement at one dam location.

The Oswegoland Greenway Area involves both proposed in-stream structures and wetland excavations. There will be three in-stream structures keyed into the streambed and bank. There will be three large (1.0-, 2.4-, and 2.7-acre) excavated wetland areas with a channel connection to the creek. These wetland excavations, maximum depth about 6 to 7 feet, will extend below anticipated ground water and surface water elevations.

The Parkview Estates Area involves excavated wetland areas but will not have a connection to the creek. There will be two large (2.1- and 3.2-acre) excavated wetland areas with maximum depths of about 3 feet. These excavations are anticipated to extend below the groundwater elevation.

The Fox Valley Greenway Area involves one proposed in-stream structure. Like the Oswegoland Greenway structures, this structure will be keyed into the streambed and the bank.

6. SUBSURFACE CONDITIONS

6.1 Stonegate Area

The streambed below the Lower Stonegate Dam is limestone bedrock with minor (1 foot or less) sand and gravel deposits. The areas between the Upper and Lower Dams near the riffles are predominantly gravel substrate with a few areas of soft fine-grained sediments.

6.2 Pfund Area

The streambed downstream of the Lower Pfund Dam is mostly boulder/cobble substrate. Between the Upper and Lower Dams, the streambed is exposed limestone bedrock with a few areas of minor sand and gravel deposition near the Upper Dam. Upstream of the Upper Pfund the streambed is about 6 inches of sand and gravel overlying firm fine-grained sediments.

6.3 Golf Course Area

The streambed below the Golf Course Dam consists of exposed limestone bedrock with minor sand and gravel deposition. Upstream of the dam, the streambed consists of about 6 inches of sand and gravel overlying firm fine-grained sediments.

6.4 Oswegoland Greenway Area

The soils in this area are derived from glacial deposits. The general profile, based on the borings, appears to be about 2 to 4 feet of surficial clay, with varying inclusions of sand, gravel, cobbles, and organics. Some of the borings encountered a very dark, highly organic topsoil at the surface, but others did not. This may indicate prior earthwork during the development of this area. Below the clay, the borings encountered sand and gravel to depths of about 8 to 10 feet. Beneath this, the borings encountered either finer sand deposits or silt. The streambed in this reach, averaging about 6 feet below the adjacent ground elevation, is composed of gravel substrate with occasional cobbles overlying the sand and gravel deposits.

Water levels were observed consistently at depths between about 4 to 5 feet. This would place the apparent groundwater elevation near, but slightly above, the stream elevation.

6.5 Parkview Estates Area

The soils in this area are derived from glacial deposits. This entire area was excavated by several feet or more during the construction of the dry reservoir. It appears that a small amount of topsoil was redistributed after this construction, as a few inches of topsoil was encountered at the surface. Below this, however, the borings encountered inorganic lean and medium clay to depths of 4 or more feet. Some of the borings terminated in this material. The upper two feet of this material was mottled gray and brown, possibly indicating a zone of fluctuating water table. Below about 2 feet, the material was predominantly gray in color. Several of the borings encountered a sand layer beneath the clay.

On the date of exploration, only one boring (WC-02-12) encountered water in the hole after completion, at about 2.5 feet. Boring WC-02-11 was left open and a water level was observed at about 20 inches one day after borings were performed.

6.6 Fox Valley Greenway Area

The streambed in this reach is composed mostly of gravel substrate with sand and occasional boulders and cobbles to a depth of about 1 foot. Underlying the substrate is what appears to be stiff glacial clay deposits.

7. GROUNDWATER

The groundwater elevation at the Oswegoland Greenway and Parkview Estates Areas will be an issue during construction. The contractor should be prepared to either dewater the site or to work in shallow water, especially at the Oswegoland Greenway site. The contractor will need to deal with the ground and surface water in a sufficient manner to allow excavation and hauling of the material, and the placement of a thin organic layer to allow establishment of vegetation.

7.1 Oswegoland Greenway Area

Wetland excavations in this area are estimated to be no more than about 7 feet deep, which will mean about 1.5 feet of surface water depth at low-flow conditions. Groundwater could be encountered above this elevation. Recharge in the sand and gravel layer would be expected to be high, which would make dewatering the excavation difficult and potentially very expensive.

7.2 Parkview Estates Area

Wetland excavations in this area are estimated to be no more than 3 feet deep, to around elevation 654 ft., which should be about 1 foot below the water table at seasonally depressed conditions. Groundwater is expected to be higher than this at wetter times of the year, and the area serves as a detention basin so large surface water inflows following rain events should be anticipated. It appears that in places these excavations would be within the upper clay layer, which would probably mean that groundwater could be controlled by minor pumping. The recharge of the underlying sand layer may be relatively low, as several of the borings that encountered the sand layer did not establish a water surface prior to backfilling. The installation of several groundwater observation wells at this site would provide useful information for final design.

8. EARTHWORK

Only minor excavation is anticipated for the in-stream construction, consisting mostly of excavating the streambed and banks to properly key the rock structures into solid ground. The streambed and banks appear to be composed of suitable, stable materials in the areas where structures are proposed.

The wetland excavations constitute the bulk of effort for this project. The wetlands in the Oswegoland Greenway Area can be excavated by standard methods (dozer/scraper) until the water table is encountered, a depth anticipated to be about 4 feet. At that point, the excavations will likely need to be performed by excavator to meet final grade. The Parkview Estates Area should be able to employ standard methods for excavation.

The Oswegoland Greenway Area has significant thicknesses (2 feet or more in places) of organic soil. This includes both what the boring logs identify as topsoil and the darker colored subsoil. These materials should be sufficient to establish vegetation when they are redistributed to the finished grades. The Parkview Estates Area has little depth of organic soil, so redistributed organic soil should come from the Oswegoland Greenway Area.

9. SLOPE STABILITY

The excavated wetlands are anticipated to entail maximum slope heights of about 7 feet and maximum slopes of 4H:1V. Based on the materials encountered, these slopes should be sufficiently stable to avoid shear failure. No formal slope stability analysis is deemed necessary.

10. ROCK STRUCTURES

Most of the rock for the in-stream structures will be quarried limestone. Source of quarried limestone will be the Joliet S&G Quarry, located approximately 27 miles away near Rockdale, Illinois. Gradation should be assumed to be Gradation 6 of Illinois DOT Standard Specifications, Article 1005.01. The rock ramp at the golf course dam will be composed of rounded fieldstone boulders obtained from local landscaping suppliers. The crests of the proposed riffle structures will be constructed of stacked cut limestone slabs.

11. RECOMMENDATIONS

The most important issue from a geotechnical perspective is informing the contractor of the ground water conditions and ensuring that the contractor is prepared to handle those conditions. This will entail not only excavation but also redistributing topsoil.

Slope stability, as stated earlier in this document, is not anticipated to be a problem. All wetland excavations should, however, be evenly graded to avoid concentrations of surface water flow. This could result in the development of erosional features. In general, none of the surface materials encountered in any of the project areas would be expected to be highly susceptible to erosion.

The bank protection in the Stonegate Area should consist of at least 18 inches of riprap overlying 6 inches of bedding stone. The riprap should be sized the same as that used to construct the adjacent in-stream structures. Bedding is not anticipated for the in-stream structures.

US Army Corps of Engineers
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

Designed By: AGB		Date: 20 FEB. 2002	
Drawn By: TPD		Scale: AS SHOWN	
Checked By: AGB		Project Code: TW55	
Reviewed By: KJS		Solicitation Number: DACW25-XX-B-XXXX	

ILLINOIS RIVER WATERSHED
WAUBONSIE CREEK RESTORATION
KENDALL/ KANE COUNTY, ILLINOIS

BORING LOCATIONS
OSWEGOLAND GREENWAY

PLATE E-1

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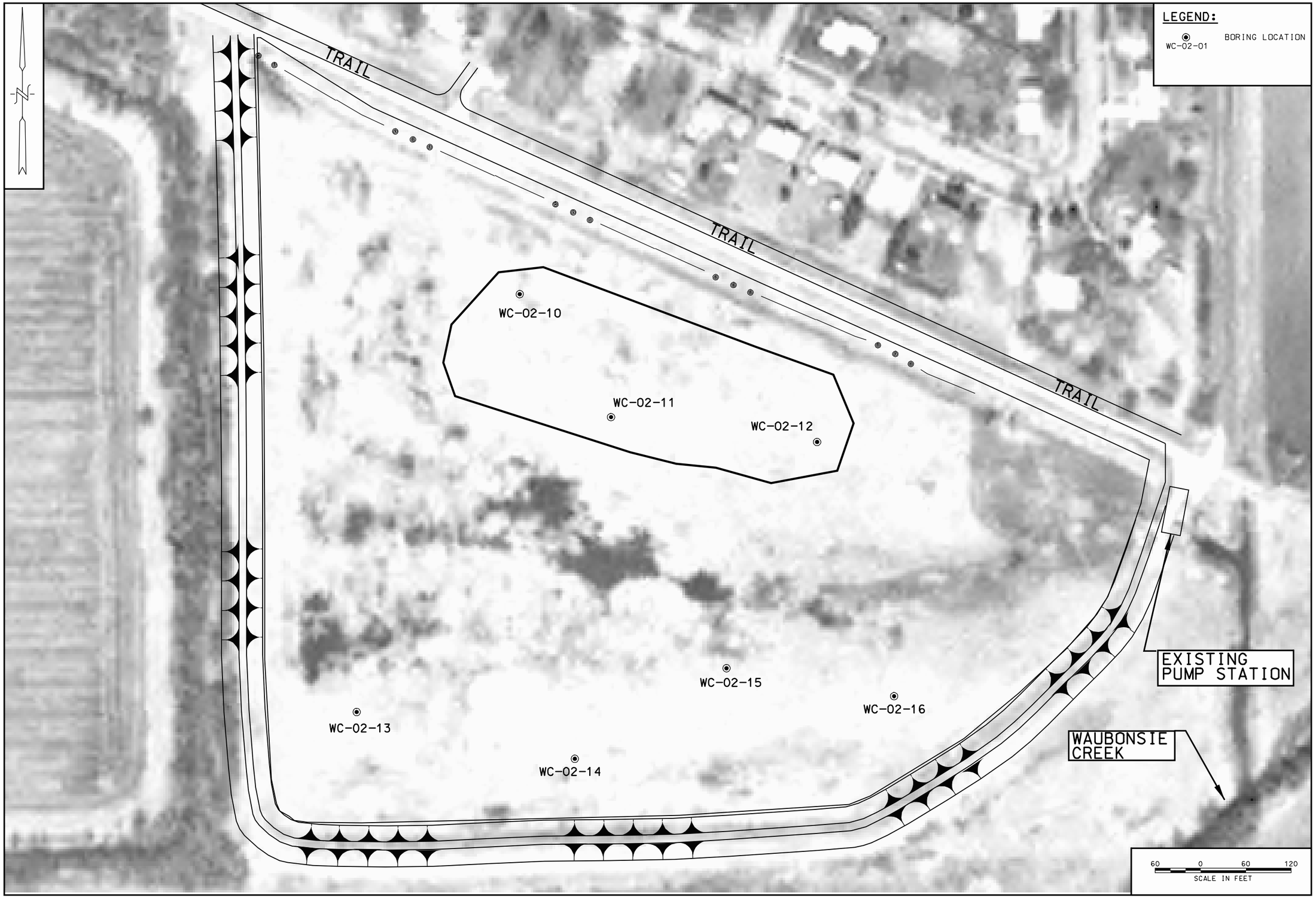

US Army Corps of Engineers
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By: AGB	Date: 20 FEB. 2002
Drawn By: TPD	Scale: AS SHOWN
Checked By: AGB	Project Code: 1w55
Reviewed By: KJS	Solicitation Number: DACW25-XX-B-XXXX

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS RIVER WATERSHED
WAUBONSIE CREEK RESTORATION
KENDALL/ KANE COUNTY, ILLINOIS

BORING LOCATIONS
PARKVIEW ESTATES

PLATE E-2

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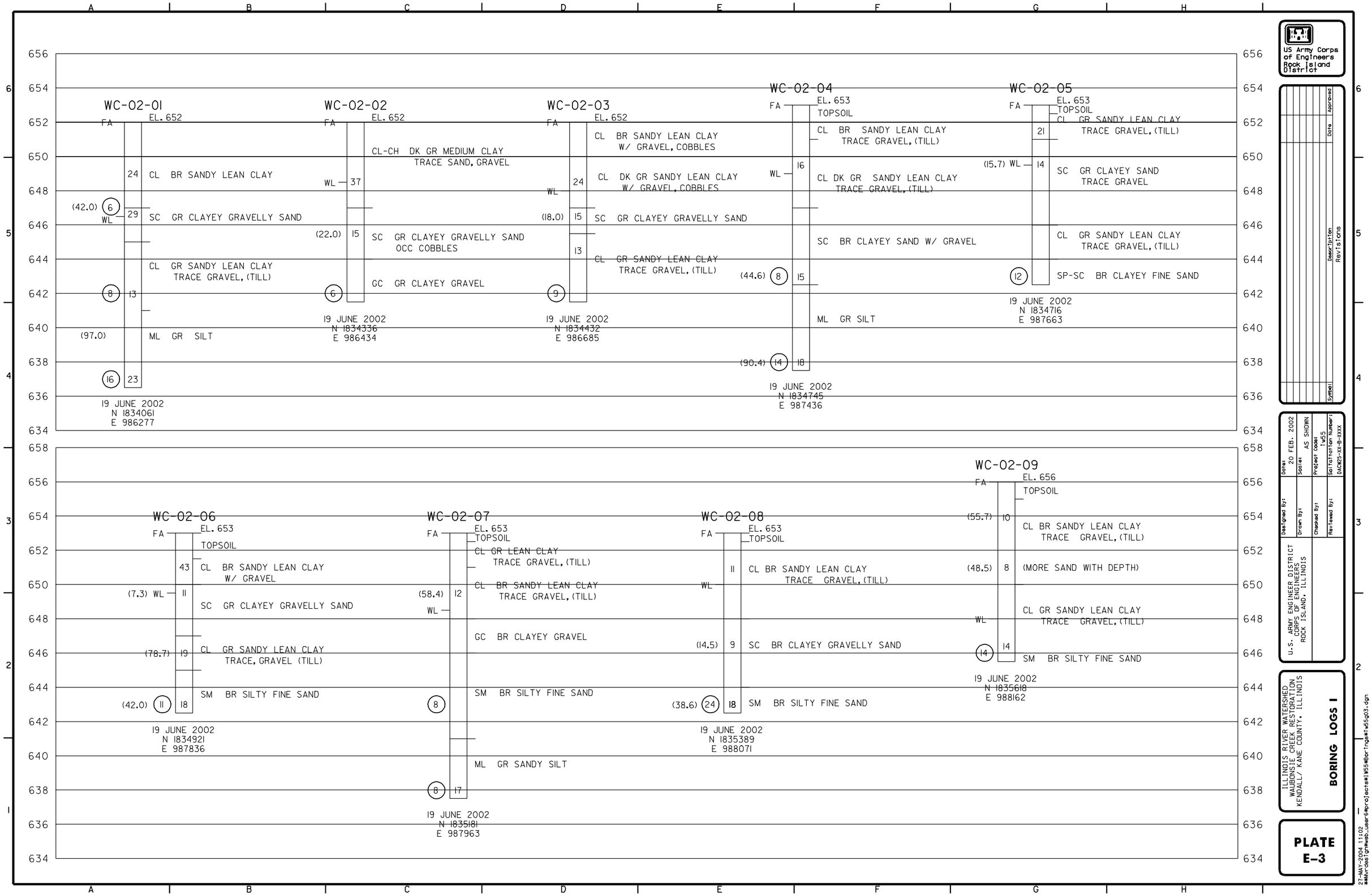

US Army Corps of Engineers
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

Designed By:
Drawn By:
Checked By:
Reviewed By:
Date: 20 FEB. 2002
Scale: AS SHOWN
Project Code: 1W55
Solicitation Number: DACW25-XX-B-XXXX

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS RIVER WATERSHED
WAUBONSIE CREEK RESTORATION
KENDALL/ KANE COUNTY, ILLINOIS

BORING LOGS I

PLATE E-3

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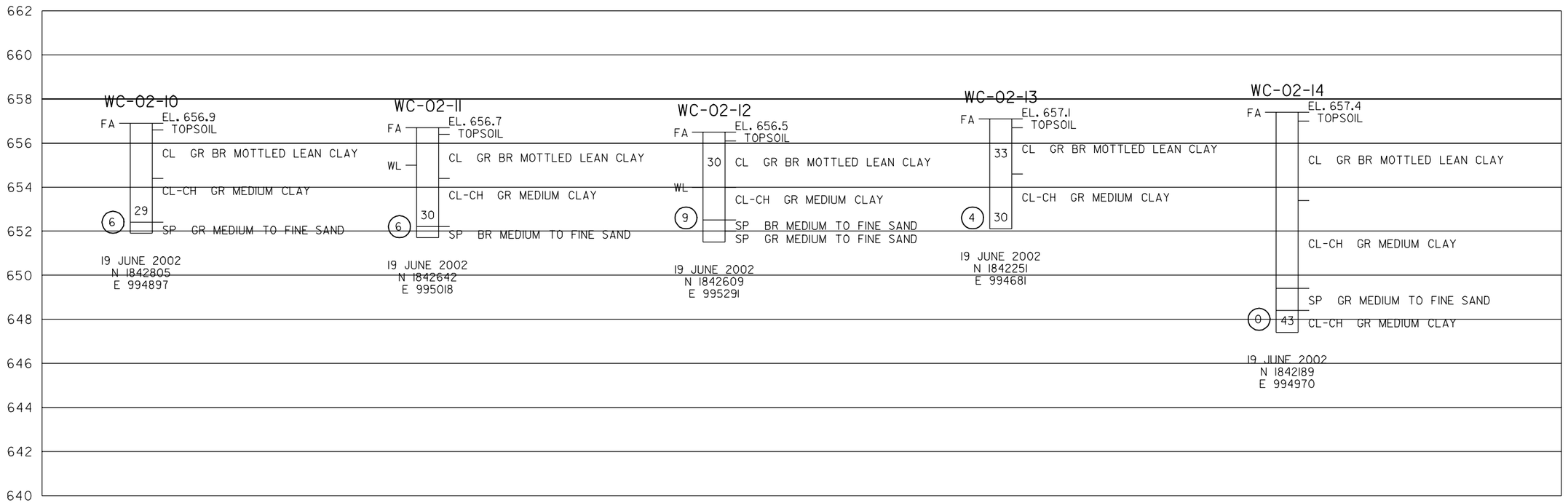

US Army Corps of Engineers
Rock Island District

Symbol	Description	Date	Approved
	Revisions		

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Drawn By:	Scale: AS SHOWN
Checked By:	Project Code: TwS
Reviewed By:	Solicitation Number: DACW25-XX-B-XXX

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS RIVER WATERSHED
WAUBONSIE CREEK RESTORATION
KENDALL/ KANE COUNTY, ILLINOIS

BORING LOGS II

PLATE E-4

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APPENDIX F

HYDROLOGY AND HYDRAULICS

ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX F
HYDROLOGY AND HYDRAULICS

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ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX F
HYDROLOGY AND HYDRAULICS

1. GENERAL

This report details the hydrologic and hydraulic analyses conducted by the U.S. Army Corps of Engineers Rock Island District to evaluate the preliminary restoration alternatives for Waubonsie Creek, Illinois. Waubonsie Creek flows from northeast to southwest through portions of the communities of Naperville, eastern Aurora, Montgomery, and Oswego, as well as unincorporated areas of the four surrounding counties: southeastern Kane County, northeastern Kendall County, southwestern DuPage County and northwestern Will County (main report, Plate 1). Regional regression equations were used to develop the peak discharges for 2-year, 5-year, 10-year, 50-year, and 100-year floods at several locations on Waubonsie Creek. These peak discharges were used as input to water surface profile models of various combinations of restoration features at three locations (Plate F-1) to evaluate hydraulic performance of restoration structures. Also, a continuous hydrologic model was used to estimate the characteristics of non-flood flows at the potential project locations.

The purpose of these analyses is to verify that any restoration projects do not increase flooding for any of the design events and to provide a basis for evaluating restoration benefits of different alternatives. As such, some of the design analyses required for flood studies, such as inundation area mapping, were not undertaken for this project. Instead, the analyses focused on establishing a reasonable model of existing system function and then evaluating the effects of potential changes to the system.

2. WAUBONSIE CREEK FLOOD FLOWS

Discharges for Waubonsie Creek were developed by using regional regression equations, a method commonly used for computing flow-frequency relationships. The flow-frequency values shown in Table F-1 were developed using the state regression equations (*USGS Water-Resources Investigations 87-4207, Technique for Estimating Flood-Peak Discharges and Frequencies on Rural Streams in Illinois*, 1987) and then accounting for existing basin development. The input data required for these equations includes rainfall intensity, waterway slope, watershed area, a regionalized factor given in the publication and the basin development factor (BDF). The BDF, as discussed in *USGS Water-Supply Paper 2207, Flood Characteristics of Urban Watersheds in the United States*, provides a measure of the efficiency of the drainage system. The BDF factors were calculated for existing conditions and ranged from 5 to 9 for the individual subbasins in the watershed with the higher values being at the upper area of the watershed due to high amounts of urbanization. A cumulative BDF was calculated at the lower end of each subbasin until the lower end of the watershed was reached. Table F-1 summarizes the input data and resulting discharges at the design frequencies for Waubonsie Creek reaches.

Table F-1. Waubonsie Creek design discharges.

Stream	Drainage Area (sq. mi.)	Channel Slope (ft./mi.)	BDF (10%-85%)	Calculated Discharge (cfs) Recurrence Interval in Years					1982 FIS
				2	**5**	**10**	**50**	**100**	*100*
WAUBONSIE CREEK									
Entire Basin	29.6	5.78	7	857	1266	1472	1952	2185	*2007*
US Route 34 – western crossing (Dam Sites	29.2	5.47	7	831	1225	1423	1882	2105	*1940*
Upstream end of golf course	24.0	5.28	7	704	1036	1203	1587	1771	*1481*
US Route 34 – eastern crossing (Oswegoland Greenway)	23.0	5.27	7	680	1001	1163	1534	1711	
Douglas Road	19.8	5.57	8	677	992	1148	1506	1679	*1460*
US Route 30	18.7	6.10	8			*774*	*1170*		*1447*
Kane/Kendall Co. Line	16.5	6.13	8	628	926	*1074*	1412	1575	*1373*
Outlet of Waubonsie Lake (Fox Valley Greenway)	7.7	5.92	9	357	521	602	779	862	*849*

Note: Numbers in italics are discharges from 1982 Kendall County Flood Insurance Study (FIS).

The hydrologic analysis was compared to the values for Waubonsie Creek published in the following flood insurance studies (FIS): Kane County, Revised June 4, 1996; City of Aurora, Revised March 3, 1997; Village of Oswego, December 1, 1981; Kendall County, January 19, 1982; and Report on the Regulation of Construction within the Flood Plain of Waubansee Creek and Tributary, Illinois Department of Transportation (IDOT), Updated May 15, 1980. The flow-frequency values calculated for this study are as much as 20% larger for the 100-year event than the values published in the *Waubonsie Creek Watershed Plan*, Waubonsie Creek Resource Planning Committee, August 1999 and in the County of Kendall, Illinois Flood Insurance Study, FEMA, January 19, 1982. For some areas in the watershed, the 50-year discharge calculated using the regression equations is greater than the 100-year 1982 FIS discharge. This is in part due to increased urbanization since the 1982 FIS, and may also be due to differences in the regression methodology. The watershed planning committee has asked FEMA to revise the 1982 FIS but this has yet to be undertaken. Because the hydraulic analysis conducted for the current restoration study was not designed to redefine the regulatory flood levels, the published FEMA 100-year flows were used to evaluate the regulatory flood but the calculated 2- through 50-year flows were used to evaluate performance under an appropriate range of high flows. Although not directly evaluated in this study, the published flows at US Route 30 also appear to be lower for the more frequent events than the flows calculated in this study (Table F-1), again due at least in part to increased urbanization.

3. WAUBONSIE CREEK HYDRAULICS

Using the Hydrologic Engineering Center River Analysis System (HEC-RAS), three project areas in Waubonsie Creek were modeled for the 2-year, 5-year, 10-year, and 50-year discharge events shown in Table F-1. The published regulatory discharges in Table 1 were used for the 100-year event. The first reach of stream, the Dam Sites, extends 5,268 feet from Route 25 to the Fox Bend Golf Course Dam (Plate F-1). The Dam Sites include the Golf Course, Pfund, and Stonegate Sites (Plate F-2). The second reach is 4,060 feet in length and starts approximately 3,000 feet upstream of U.S. Route 34 in Oswego; this site is referred to as the Oswegoland Greenway reach (Plate F-1). The final reach is 2,650 feet in length and is located between Montgomery Road and Waterford Drive in Aurora just downstream of Waubonsie Lake. This area is referred to as the Fox Valley Greenway reach (Plate F-1). These areas were modeled to determine the potential effects of the proposed plan on high-flow water surface elevations. Each modeled plan included a combination of all proposed features, including rock riffle structures within the stream channel, rock ramps at the face of low-head dams, lateral wetlands along the stream channel, and bank grading and protection.

Model cross sections were created from survey data collected by the Rock Island District and the Natural Resources Conservation Service during the winter of 2001-2002; 44 cross sections were surveyed in the Dam Sites area, 16 in the Oswegoland Greenway, and 11 in the Fox Valley Greenway. After initial model runs, it was necessary to extend several cross sections using as-built construction plans and aerial photos with contours. Manning's roughness values were obtained from previous FIS studies and field observations. Water surface elevations from the *Report on the Regulation of Construction Within the Flood Plain of Waubansee Creek and Tributary* (IDOT, 1980) were used to establish the conditions at the downstream end of each the three areas (Dam Sites, Oswegoland Greenway, and Fox Valley Greenway). The downstream water surface elevation was calibrated by adjusting the normal depth slope until the downstream water surface elevation for the 100-year event was equal to the 100-year downstream elevation in the 1980 study. This normal depth slope was then used in calculating the downstream water surface elevation for other events. For the Dam Sites model, it was assumed that the two golf course footbridges immediately upstream of the US Route 34 bridge would be overtopped and washed out during the 50- and 100-year discharge events. For the 2-year, 5-year, and 10-year events, the potential hydraulic effects of these bridges were considered within the model.

Restoration structures were modeled by changing the representation of the system within the HEC-RAS input data. Modifications in channel cross section were modeled by changing the cross section representation at the appropriate stream location. Rock ramps and riffle structures were represented as fixed objects in the stream with roughness characteristics different from the rest of the channel. The Manning's coefficient ("n") for the rock emplacements, both in the proposed riffle structures and the rock ramps, was varied based on depth of flow (Chow 1959); at the 2-year flood the "n" value was assumed to be 0.050, similar to boulder streams (Chow 1959), but it declined with increasing depth of flow and the value used for the 100-year flow was 0.040, representative of the roughness of riprap in channels (EM 1110-2-1601, Equation 5-2). The lateral wetlands were represented as permanent ineffective flow areas so that water in these areas would not contribute to the flow passing downstream; once the water overtopped the top of the wetland the flow on the floodplain would contribute to downstream conveyance but the flow in the wetland was assumed to be motionless. The portions of remnant channel within the former Stonegate pond were also modeled as permanent ineffective flow areas for flows smaller than the 50-year event. For the 50-year and 100-year event, the entire Stonegate channel was considered to convey flow. After the relevant changes were made to reflect the proposed project within the HEC-RAS input data, the model was rerun to evaluate the changed conditions.

Illinois floodplain regulations, Administrative Code Parts 3700 and 3708, delineate three areas of concern to address within this project: floodplain storage, water levels, and flow velocity. Part 3700 requirements apply to the portions of the project within Kendall County and Part 3708 requirements apply to those in Kane County. Provision of compensatory floodplain storage requires that floodplain storage volumes be equal or greater than pre-project volumes at every flood elevation. The introduction of rock into the channel does reduce the area available within the floodplain, but the quantity of excavation associated with this project creates a net increase of floodplain storage (Table F-2). The Part 3708 water level requirement is that "the proposed structure shall not result in an increase of upstream flood stages greater than 0.0 foot when compared to the existing conditions, for all flood events up to and including the 100-year frequency event; or the upstream flood stage increases will be contained within the channel banks...". The requirement in Part 3700 is similar, with an acceptable water level increase of 0.1 foot for the 100-year event. Flow velocity requirements, as stated in Part 3700, are to ensure that post-project flow velocities do not initiate erosion of the channel bed or banks.

Table F-2. Net change in floodplain storage for Waubonsie Creek project.

Flow Condition	Incremental Change (cubic yards)	Cumulative Change (cubic yards)
Normal	+60	+60
Normal to 2-year flow	+16540	+16600
2-year to 100-year flow	-9600	+7000

Plates F-3a and b, F-4, and F-5 display the design water surface profiles at the Dam Sites, Oswegoland Greenway, and Fox Valley Greenway Reaches, respectively; tables of all profile data are available upon request. Note that local stationing is used in the evaluation of all three sites, so there is no correlation between stations in the differing reaches.

Improved rock ramp structures were modeled at the Lower Stonegate Dam (Station 385), Lower Stonegate Riffle (Station 650), and Upper Stonegate Riffle (Station 915). The Upper Stonegate Dam (Station 1190) was modeled as notched, and rock ramps were added to the existing dam structures at the Upper Pfund site (Station 3776) and the Golf Course (Station 5129). The rock structures did not increase water levels for the 100-year event (Plate F-3); where they affected flows they tended to increase flow velocities to a certain degree, and this often resulted in slightly lower water elevations. All of the flow velocity increases associated with restoration in this section would be along the rock structures, and these velocities were used to calculate sizing for the rock as described in a later section.

As would be expected, the model predicted that notching the Upper Stonegate Dam would lower water surface elevations for all flows. Peak velocities in the vicinity of the dam would increase to nearly 10.1 feet per second, necessitating the installation of riprap to prevent scour.

For the events of 10-year recurrence and lower, there were instances of minor water level increases. The first is a 0.1-foot increase in water levels at the Pfund Dam for the 10-year and smaller flows due to the added friction from the ramp on the dam. This increase, which includes a 0.2-foot increase at one point for the 2-year flow, is constrained to the immediate location of the crest of the

Pfund Dam and 6 feet downstream, is contained within the stream channel for the 2-year event. For the 5- and 10-year events, the stream is either out of bank or nearly so, depending on the interpretation of bank conditions, but the 0.1-foot rise does not substantially change the area inundated for these events (less than 10 square feet of change) and is allowable under Administrative Code Part 3700.

The other two locations of water level increases for the smaller design storm events occur within the Stonegate area. In part, the water level increases in the Stonegate area are due to the assumption that the remnant channel in that area would not engage until after the 10-year flow was exceeded. This concentrates flow within the main flow channel for the smaller flows and increases the relative effect of the increased roughness due to the stone structures. This likely provides a conservative assessment of water level impacts for the 2- through 10-year flows as predicted water levels indicate that it is likely that some flow would bypass through the remnant channel and so the increased water levels at the structures would likely be somewhat less.

For approximately 100 feet upstream of the Upper Stonegate Riffle, the riffle structure acts as a slight obstruction, increasing water levels by up to 0.1 foot for the 2- through 10-year events. Even given the conservative assumptions described in the previous paragraph, this increase is within the limits prescribed in Administrative Code Part 3700, so this water level increase is allowable. Also, at one point along the face of the Lower Stonegate Riffle (Station 626), water levels are modeled to change by 0.2 foot for the 5- and 10-year events and 0.1 foot for the 2-year event. For the 10-year event, this change would bring the flow to the edge of the channel, but given the conservative assumption of constriction within the channel, it is apparent that the 0.2-foot water level change would remain well within the channel area and so would be acceptable under Administrative Code Part 3700.

Modeling of the measures proposed within the Oswegoland Greenway Reach, which includes riffle structures at stations 575 and 2873, bank retarding and lateral wetlands, indicates that both flood elevations and flow velocities would generally decrease (see profiles in Plate F-4). The reduced water surface elevations are especially evident at the lower flows where flow is predominantly through the larger channel cross section. Exceptions to the general reduction in water levels and velocities occur in the vicinity of the two upstream bridges, where flood levels decrease but velocities would increase by less than 1 foot per second and at the downstream end of the project reach. The maximum flow velocity induced by the changes is 7.1 feet per second at the upstream bridge; if the bank protection at the bridge is inadequate to withstand this velocity, the addition of a small quantity of riprap may be required. The modeled 0.1-foot water level increase at the downstream end of the project (Station 541-600) appears to be a model artifact arising from the increased channel area at that location and may not reflect an actual physical effect. Regardless, the modeled increase is within allowable limits under Administrative Code Part 3700.

The Fox Valley Greenway Reach profiles, displaying the effects of two proposed riffle structures at Stations 460 and 1078, are shown in Plate F-5. The riffles as designed do not increase flood elevations or flow velocities for events larger than the 5-year event. At low flows, the 2-year and 5-year events, the effects of the riffle structures are more pronounced and a 0.1-foot water level increase develops immediately upstream of Station 1078. Since this increase remains within the boundaries of the channel, the riffles are not considered to significantly affect flood heights according to Administrative Code Part 3708.

4. WAUBONSIE CREEK NON-FLOOD FLOWS

A hydrologic model of the Waubonsie Creek basin was developed using the Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS). HEC-HMS incorporates a soil moisture accounting (SMA) package that allows streamflow to be modeled for small time steps, such as every hour, over long periods of time—months to years. The SMA was used to estimate the pattern of flows generated by Waubonsie Creek to evaluate the low and moderate flow conditions that are important to determining potential habitat benefits.

The HEC-HMS model was established to use measured climate data as input to estimate flows from the simulated watershed. Evapotranspiration was estimated using monthly average values applied to the watershed, and the values used for this study were the long-term monthly average values from DeKalb, a station located 25 miles northwest of Waubonsie Creek. The hourly precipitation record at O'Hare International Airport, located 25 miles northeast of the Waubonsie Creek watershed, was used to provide the rainfall inputs from October 1962 through September 2000. Both meteorological stations are expected to have similar long-term climatological characteristics as the Waubonsie Creek watershed. Snow processes were not considered in this model; all precipitation was assumed to occur as rainfall.

The watershed model consists of nine subbasins (Table F-3 and Plate F-6). Each subbasin is represented as the sum of the different land types present, hydrologically routed through the subbasin and entering Waubonsie Creek at a distinct location. A preliminary analysis of STATSGO data indicated that most of the soils within the watershed are likely to display similar hydrologic function (silt loams on mild to moderate slopes) so land types were broken out based only on their 1991-1995 land use as mapped in Critical Trends Assessment Land Use Cover Database of Illinois, Illinois Department of Natural Resources. ArcView was used to determine the amount of area covered by each land use within each subbasin. The land use data in each subbasin was further refined by developing a set of hydrologic response units (HRUs), each of which represents a set of areas within the landscape that responds in a similar way to hydrologic inputs. In the interest of simplifying the model, three basic HRUs were identified: Urban Grass, Agricultural/Forest and Wetland/Impervious. Based on the assumed distributions of the HRUs within each land use classification (Table F-4), the total area of each HRU in each subbasin was calculated. Within the HEC-HMS model, each HRU is represented by a SMA unit so the outflow from each subbasin was calculated by the model as the sum of the area-weighted outflows from the SMA units representing the land uses in the subbasin. Outflows from each subbasin were then routed through the Waubonsie Creek using either Muskingum-Cunge hydraulic routing with average cross-sections obtained from prior FIS reports or reservoir routing at Spring Lake and Waubonsie Lake, and estimated flows were generated at the outlet of each subbasin (Plate F-6).

Although the HEC-HMS model was not calibrated in a rigorous way, model results were compared to data from a streamflow gage at the US Route 34 bridge in Oswego. The gage was maintained by the Illinois Department of Natural Resources, Office of Water Resources (OWR) from December 1997 to November 2001. Data included a water level record taken every 15 minutes and 8 measured flows (Tom Maloney, OWR). The measured flows were used to establish a stage vs. discharge rating curve for the site that was applied to the water level record to develop a record of flow at the gage. Several adjustments were necessary to account for data problems such as changing baselines and ice-related malfunctions, and based on gage resolution and flow measurement data the gage record is probably most accurate for moderate flows of between 30 and 275 cubic feet per second (cfs).

The initial parameter set for each SMA was estimated from soil characteristics using guidance from the HMS manual and the thesis written by Bennett (1998) that describes the development and application of the SMA methodology. The gage records for water years 1998 and 1999 were used to evaluate model performance; SMA model parameters were adjusted to better reflect the flow values observed during those times. Most of the parameter adjustment involved changing the simulated soil parameters to match the low-flow characteristics observed in the gage record. This primarily consisted of adjusting the soil and groundwater storage capacities and percolation rates for the Urban Grass and Agricultural/Forest units, which controlled their infiltration and groundwater outflow. After the low-flow characteristics were reasonably represented, the tension zone storage and infiltration rates were adjusted so that the model would better represent the surface water response to storms. However, as high flows are neither the primary concern for this modeling exercise nor reliably known in the gage record, this was not pursued in great detail. The gage data for water year 2000 were used to visually check the predictive power of the model configuration (Plate F-7). The model parameters used for simulation are presented in Table F-5.

Table F-3. Land types in Waubonsie Creek basin.

Subbasin	Land Type	Area (ac.)
Stonegate (1)	Deciduous Forest – Closed Canopy	19.2
	Deciduous Forest – Open Canopy	42.7
	Forested Wetland	4.5
	Rural Grassland	0.1
	Shallow Water Wetland	1.2
	Urban – High Density	40.3
	Urban – Low Density	69.1
	Urban – Medium Density	26.1
	Urban Grassland	98.5
South Subbasin (2)	Deciduous Forest – Closed Canopy	2.7
	Deciduous Forest – Open Canopy	8.7
	Forested Wetland	4.8
	Row Crop – Corn	2670.1
	Rural Grassland	392.5
	Shallow Marsh/Wet Meadow	5.5
	Small Grain – Wheat	0.6
	Urban – High Density	14.2
	Urban – Low Density	24.7
	Urban – Medium Density	9.3
	Urban Grassland	175.5
SE Tributary (3)	Deciduous Forest – Closed Canopy	4.8
	Row Crop – Corn	1366.7
	Rural Grassland	294.3
	Shallow Water Wetland	0.8
	Small Grain – Wheat	28.6
	Urban – High Density	1.5
	Urban – Low Density	11.4
	Urban – Medium Density	0.7
	Urban Grassland	107.8

Table F-3. Land types in Waubonsie Creek basin (cont.).

Subbasin	Land Type	Area (ac.)
Oswegoland Greenway (4)	Deciduous Forest – Closed Canopy	11.0
	Open Water	0.2
	Row Crop – Corn	202.8
	Rural Grassland	28.6
	Shallow Marsh/Wet Meadow	11.0
	Shallow Water Wetland	7.0
	Urban – Low Density	13.1
	Urban – Moderate Density	97.8
	Urban – High Density	45.1
	Urban Grassland	187.6
Downstream of Parkview (5)	Deciduous Forest – Closed Canopy	11.2
	Deciduous Forest – Open Canopy	28.3
	Forested Wetland	0.6
	Open Water	28.4
	Row Crop – Corn	1003.1
	Rural Grassland	190.0
	Shallow Marsh/Wet Meadow	8.0
	Shallow Water Wetland	2.9
	Urban – High Density	109.5
	Urban – Low Density	51.4
	Urban – Medium Density	42.6
	Urban Grassland	163.2
Parkview (6)	Deciduous Forest – Closed Canopy	6.6
	Deciduous Forest – Open Canopy	5.0
	Forested Wetland	2.3
	Row Crop – Corn	25.8
	Rural Grassland	8.0
	Shallow Marsh/Wet Meadow	20.4
	Urban – High Density	4.1
	Urban – Low Density	28.7
	Urban – Medium Density	54.6
	Urban Grassland	46.4

Table F-3. Land types in Waubonsie Creek basin (cont.).

Subbasin	Land Type	Area (ac.)
Fox Valley Greenway (7)	Deciduous Forest – Closed Canopy	76.8
	Deciduous Forest – Open Canopy	125.1
	Deep Marsh	42.0
	Open Water	87.9
	Row Crop – Corn	3058.9
	Rural Grassland	759.2
	Shallow Marsh/Wet Meadow	146.2
	Shallow Water Wetland	20.4
	Small Grain – Wheat	57.6
	Urban – High Density	186.2
	Urban – Low Density	382.2
	Urban – Medium Density	485.6
	Urban Grassland	742.1
Waubonsie Lake (8)	Deciduous Forest – Closed Canopy	41.7
	Deciduous Forest – Open Canopy	52.1
	Deep Marsh	5.1
	Forested Wetland	2.3
	Open Water	36.4
	Row Crop – Corn	352.3
	Rural Grassland	46.0
	Shallow Marsh/Wet Meadow	115.5
	Urban – High Density	77.2
	Urban – Low Density	315.6
	Urban – Medium Density	327.4
	Urban Grassland	615.7
Upper Basin (9)	Deciduous Forest:closed canopy	17.1
	Deciduous Forest:open canopy	14.8
	Open Water	65.6
	Row Crop:corn	597.4
	Rural Grassland	20.0
	Shallow Marsh/Wet Meadow	90.0
	Shallow Water Wetland	21.1
	Urban - High Density	657.1
	Urban - Low Density	260.9
	Urban - Medium Density	459.4
	Urban Grassland	701.6

Table F-4. Land distribution assumptions (based on Dinicola 1990).

Land Type	Urban Grass	Agricultural/Forest	Wetland/EIA
Deciduous Forest – Closed Canopy	0%	100%	0%
Deciduous Forest – Open Canopy	0%	100%	0%
Deep Marsh	0%	0%	100%
Forested Wetland	0%	0%	100%
Open Water	0%	0%	100%
Row Crop – Corn	0%	100%	0%
Rural Grassland	50%	50%	0%
Shallow Marsh/Wet Meadow	0%	0%	100%
Shallow Water Wetland	0%	0%	100%
Small Grain – Wheat	0%	100%	0%
Urban – Low Density	90%	0%	10%
Urban – Moderate Density	77%	0%	23%
Urban – High Density	15%	0%	85%
Urban Grassland	100%	0%	0%

Output from the HEC-HMS model can be used to estimate the flow characteristics at the Waubonsie Creek project locations. Plate F-8 displays the expected distribution of flows during the periods of March through April and March through October at the Fox Valley Reach, the Oswegoland Reach, and the Stonegate Dams based on the simulated flows. Because the HEC-HMS model provides a long-term simulated flow estimate at short time steps (30 minutes), any analysis that could be performed on a similar gage record can be used to estimate ecologically relevant hydrologic parameters for project performance. It should be noted that these results do not represent historical conditions but rather estimate the flow response that Waubonsie Creek, in its current land use condition, would likely produce for the meteorological conditions encountered in the past 38 years. As such, it provides a statistical approximation of what could be expected in the future if the watershed does not significantly change in the future, assuming that the climate is relatively similar to that observed in the past.

5. LOW-FLOW HYDRAULICS

The HEC-RAS models developed for the flood-flow analysis were also used to evaluate the function of the proposed project features under low-flow conditions. The rock ramps and the lateral wetlands were evaluated at 2, 5, 10, 15, 20, 30, 50, and 75 cfs. To better reflect the roughness characteristics of the stones to be used for the riffles and the rock ramps, the Manning's n values at those locations were adjusted to 0.12, reflecting the resistance expected when the rock significantly protrudes into the flow. The water depths and average velocities at the project locations were taken from the hydraulic model runs and then tied to the flow distributions shown in Plate F-8 in order to estimate the occurrence of the relevant habitat features after project implementation. Plate F-9 presents the expected performance characteristics of the rock ramps. The inundation depths in the lateral wetlands were evaluated for 200 cfs, 300 cfs and the 2-year, 5-year, 10-year, and 100-year events in addition to the flows used for the rock ramp evaluation. Plate F-10 presents the inundation frequencies predicted for these wetlands in terms of percent exceedence and extreme events. Seasonal exceedence analyses provided curves similar to the annual exceedence curve for the Oswegoland wetlands so only the annual curve is presented. These analyses can be utilized to directly assess potential fish passage and habitat availability due to project features.

6. RIPRAP DESIGN

Riprap sizing recommendations were developed using the average flow velocities developed from the HEC-RAS analyses at each rock structure. The highest flow did not always produce the highest average velocity so all of the modeled flows were evaluated. In order to reduce vandalism, EM 1110-2-1601 recommends using a minimum W_{50} of 80 lb, which can withstand flow velocities up to approximately 8.6 fps.

Table F-5. HEC-HMS final soil moisture accounting unit parameters.

	EIA	Urban Grass	Ag-Row Crop
Canopy Storage (in)	0	0.04	0.08
Surface Storage (in)	0.125	0.25	0.75
Max. Infiltration (in/hr)	0	2	6
Soil Storage (in)	0	4	8
Tension Zone (in)	0	1	2
Max. Percolation (in/hr)	0	0.2	0.2
Groundwater 1 Storage (in)	0	1	1
Groundwater 1 Max Percolation (in/hr)	0	0.1	0.1
Groundwater 1 Storage Coefficient (hr)	0	25	25
Groundwater 2 Storage (in)	0	6	6
Groundwater 2 Max Percolation (in/hr)	0	0	0
Groundwater 2 Storage Coefficient (hr)	0	1000	1000

Riprap meeting this requirement would be sufficient to accommodate the maximum average velocities in the Fox Valley Greenway, the Oswegoland Greenway, the Golf Course site and the Pfund site (except for the discontinued riffle structure downstream of the Upper Pfund Dam). The maximum velocities at the Stonegate site are from 7.6 to 10.1 fps; riprap with a W_{50} of 200 lb, equating to a D_{50} of 1.32 ft, is required for the Lower Stonegate Dam ramp and scour protection at the Upper Stonegate Dam, and riprap with a W_{50} of 95 lb (D_{50} of 1.03 ft) is the minimum requirement for the structure at the Upper Stonegate Riffle.

7. SEDIMENTATION

The wetlands constructed in the Oswegoland Greenway would be expected to trap some quantity of sediment. Sand and gravel being transported by Waubonsie Creek at high flows would have a tendency to deposit across the entrance to the wetlands and may accumulate in the downstream portions of the channels connecting the wetland to the creek. Based on experience with related projects, it is believed that each wetland channel will likely accumulate as much as 10 cubic yards of sediment per year, with the highest deposition rate and the coarsest sediment depositing in the portion of the channel closest to the creek. However, because they are designed to receive water backing in from Waubonsie Creek, the wetlands themselves are unlikely to fill with coarse sediment and instead would only trap silt. Unless exposed to a concentrated source of silt, such as runoff from soils exposed during construction activities, these wetlands would be expected to fill 1 foot or less over a 50-year design life. This is based on the fact that the sedimentation rate

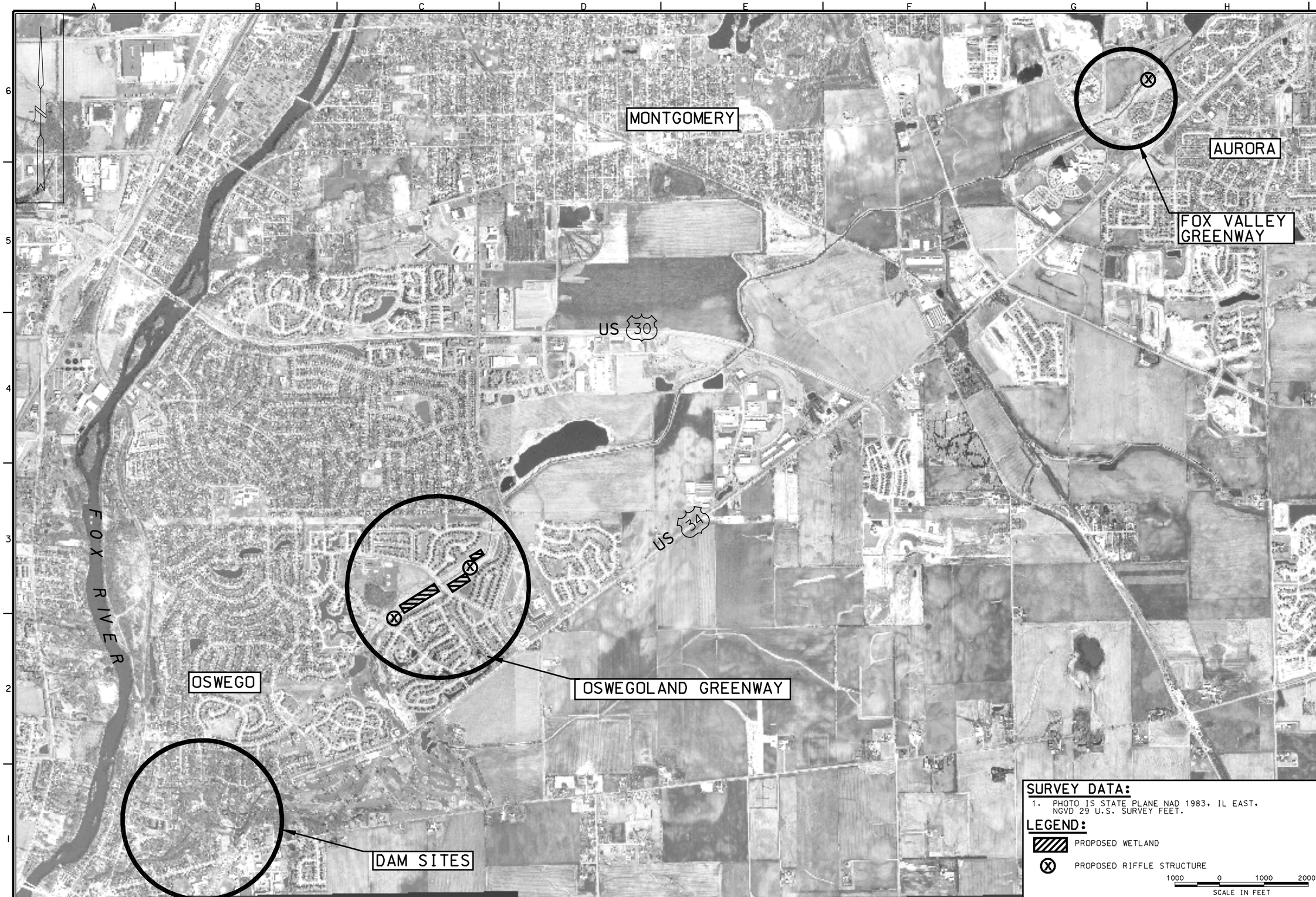
necessary to fill the wetlands 1 foot in 50 years, 0.24 inch per year, is close to that observed in Illinois River backwater areas, which tend to be exposed to much higher sediment loads than would be expected in these wetlands.

8. SUMMARY

Peak discharges were developed for project areas on Waubonsie Creek using regional regression equations for 2-year, 5-year, 10-year, 50-year, and 100-year floods. The regression methodology incorporated BDF factors to account for the current state of urbanization. The regression equation results indicated larger flows than did previous FIS studies, in part due to urbanization since the previous FIS studies were published and in part due to the use of different regression equations than were used in the past FIS studies. For the 100-year event analyses, the published regulatory discharges were used, and not the results from these regression equations.

The hydraulic analysis consisted of modeling several stream restoration features in three areas of the watershed to determine the difference in water surface elevation between the existing condition (no proposed features) and proposed condition (proposed features in place). The restoration projects as designed meet the requirements of Illinois Administrative Code Parts 3700 or 3708 as appropriate, meaning that the project would not reduce flood storage or unacceptably increase flood levels or flow velocities. In general, the project either has no effect or slightly reduces high water levels.

Low-flow hydrology and hydraulics were also investigated to assess habitat and fish passage benefits. The hydrology was assessed using a HEC-HMS model developed to provide continuous flow estimates. This model simulated flows using 38 years of meteorological record to develop the expected flows at the three project areas. These expected flows were then combined with water levels and velocity information developed by running the hydraulic models developed for the project (with modified roughness values) under several different discharge levels to evaluate the likely restored conditions. Also, velocity information was analyzed to provide guidance for sizing the riprap in the rock structures and sedimentation was estimated to evaluate potential maintenance.



SURVEY DATA:

1. PHOTO IS STATE PLANE NAD 1983, IL EAST, NGVD 29 U.S. SURVEY FEET.

LEGEND:

PROPOSED WETLAND

PROPOSED RIFFLE STRUCTURE

1000 0 1000 2000'
SCALE IN FEET

US Army Corps of Engineers
Rock Island District

Symbol	Description Revisions	Date	Approved

Designed By: AGB		Date: 20 FEB. 2002	
Drawn By: TPD		Scale: AS SHOWN	
Checked By: AGB		Project Code: WQS	
Reviewed By: KJS		Solicitation Number: DACW25-XX-B-XXXX	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS RIVER WATERSHED
WAUBONSIE CREEK RESTORATION
KENDALL/ KANE COUNTY, ILLINOIS

PROJECT AREAS & FEATURES

PLATE F-1

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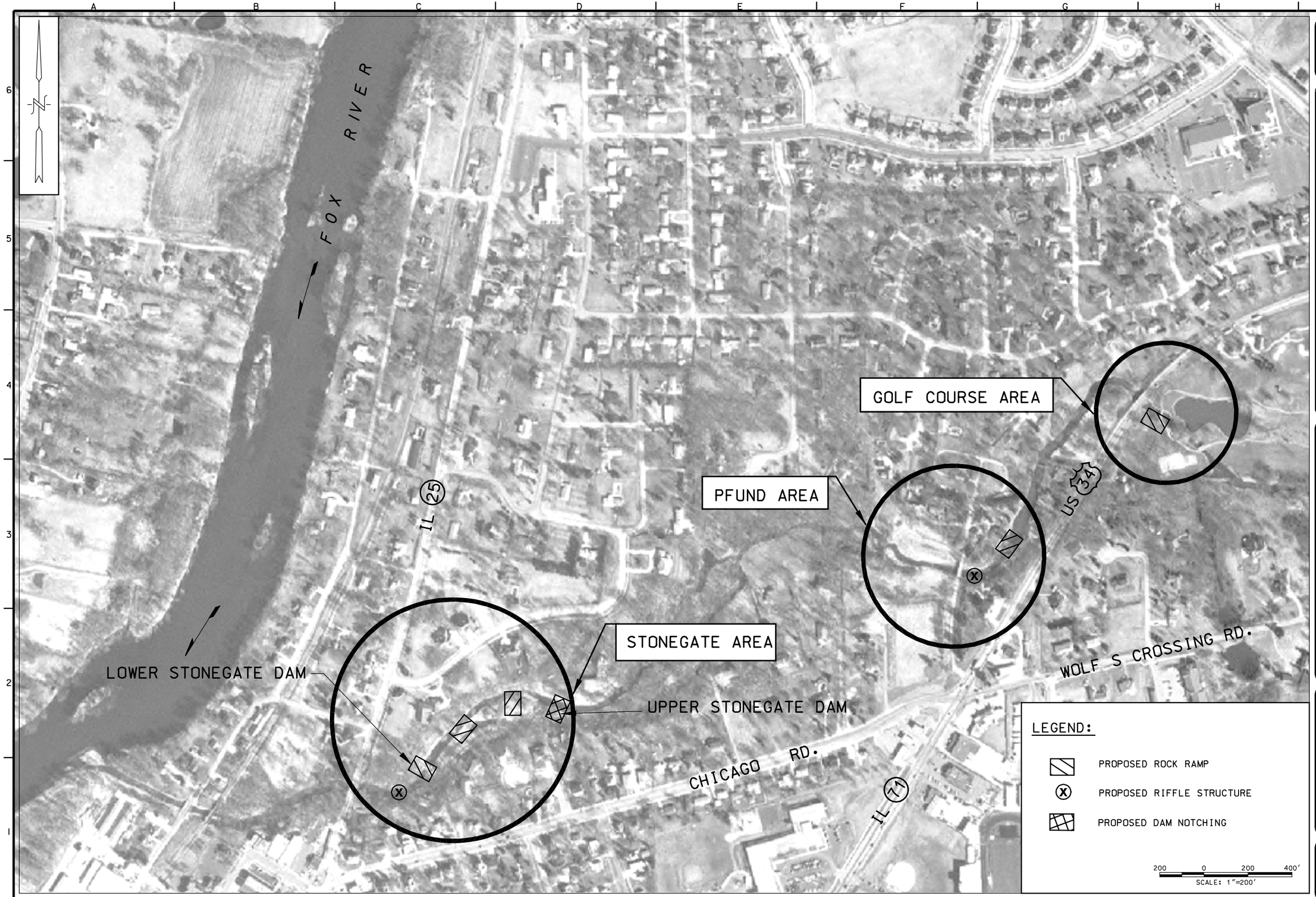

US Army Corps of Engineers
Rock Island District

Symbol	Description Revisions	Date	Approved

Designed By: AGB		Date: 20 FEB. 2002	
Drawn By: TPD		Scale: AS SHOWN	
Checked By: AGB		Project Code: WGS	
Reviewed By: KJS		Solicitation Number: DACW25-XX-B-XXXX	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ILLINOIS RIVER WATERSHED
WAUBONSIE CREEK RESTORATION
KENDALL/ KANE COUNTY, ILLINOIS

DAM AREA FEATURES

PLATE F-2

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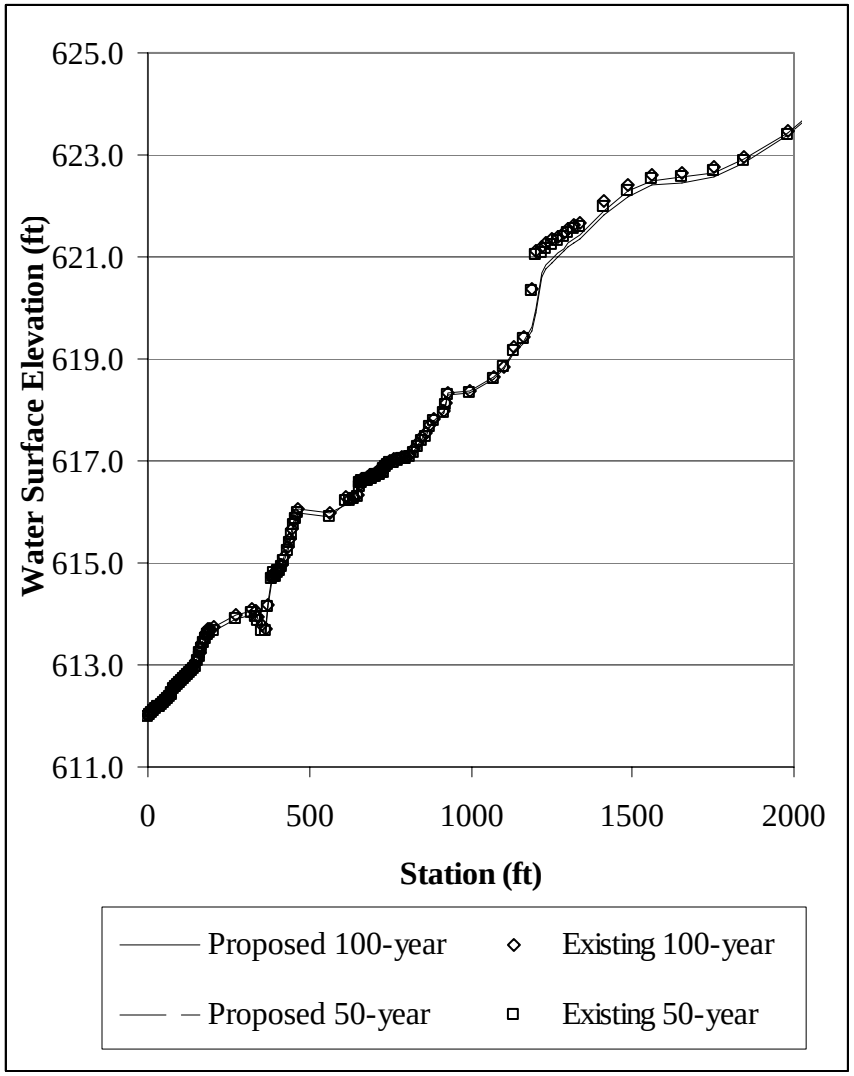


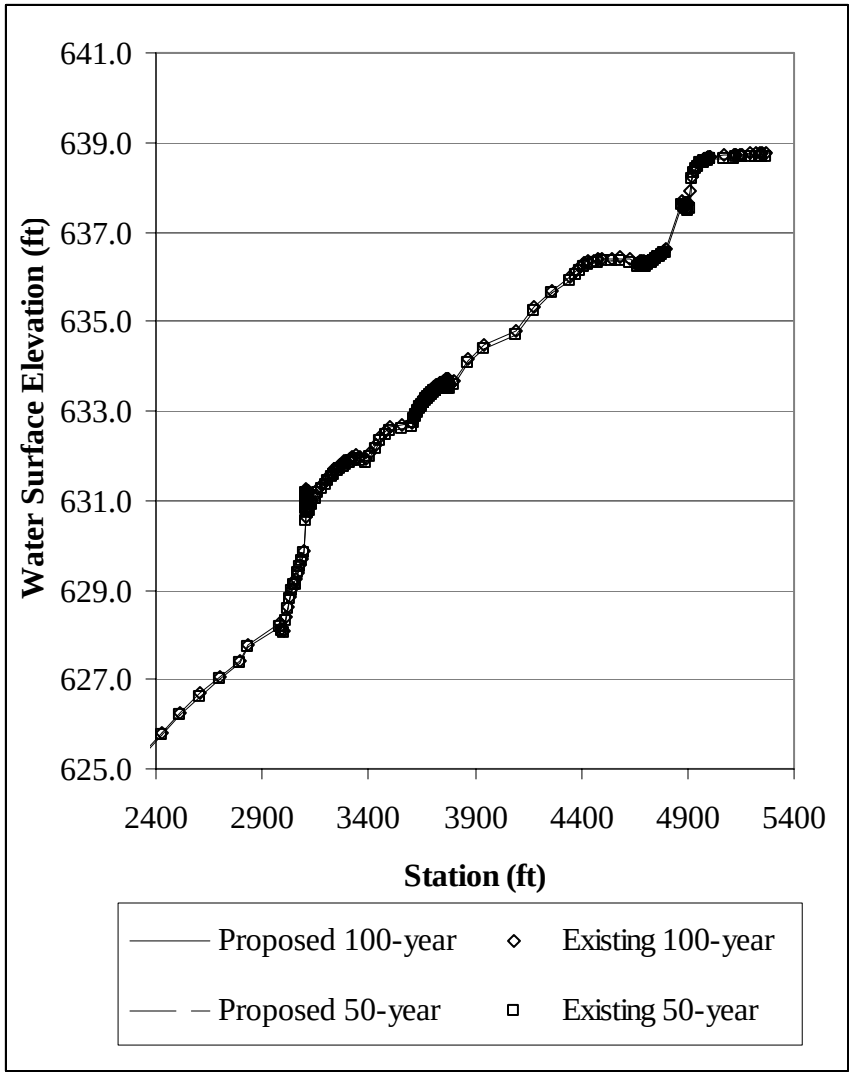
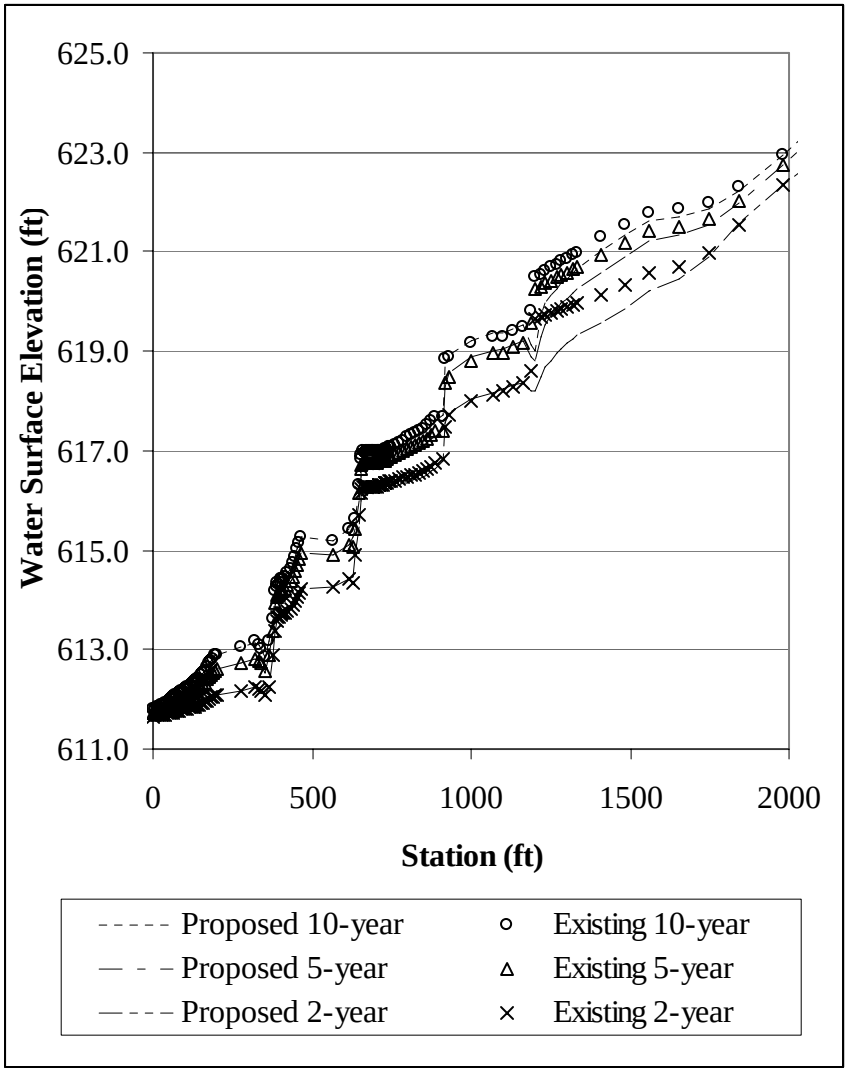


Plate F-3a. Dam Sites Reach Design Water Surface Profiles, 50- and 100-Year Recurrence Note that 100-year regulatory flow (1974-1979 cfs) is nearly the same as estimated current 50-year flow (1915 cfs).



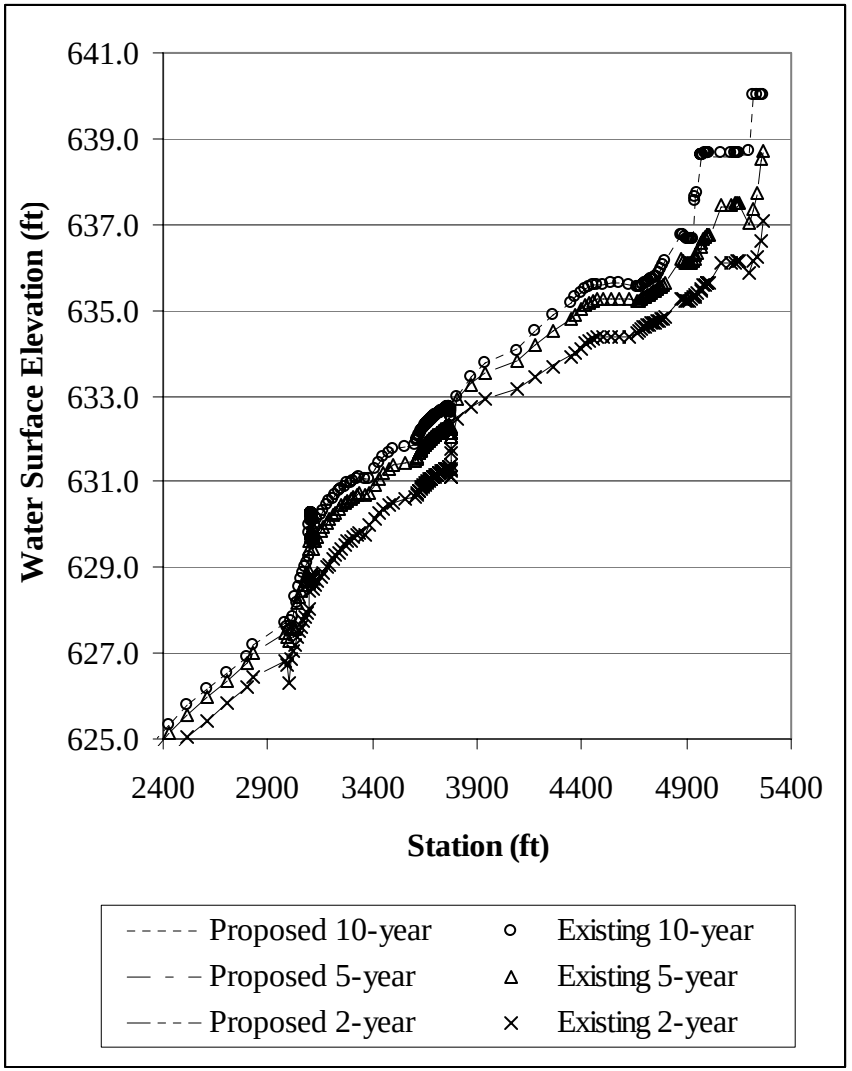
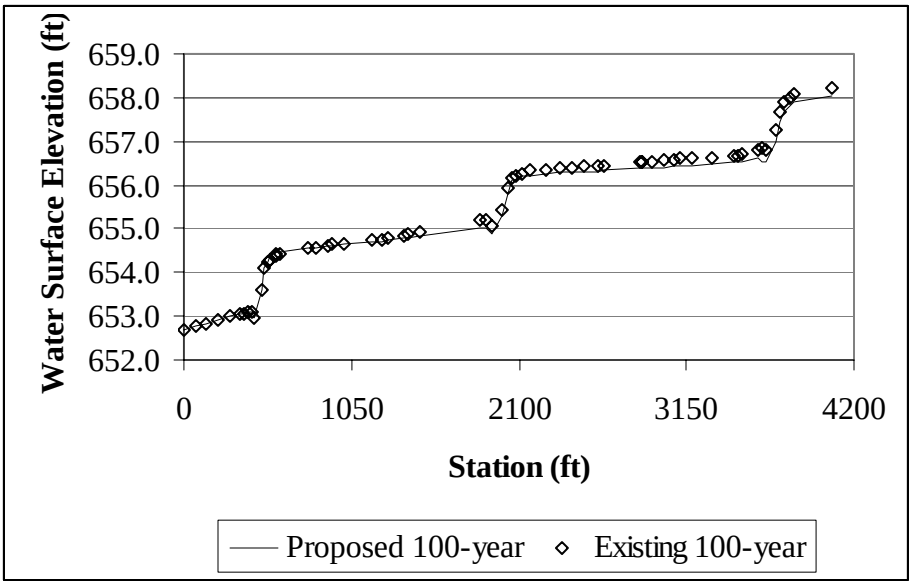


Plate F-3b. Dam Sites Reach Design Water Surface Profiles, 2-, 5- and 10-year Recurrence. Note that remnant channel in Stonegate pond assumed to convey no flow for these events.



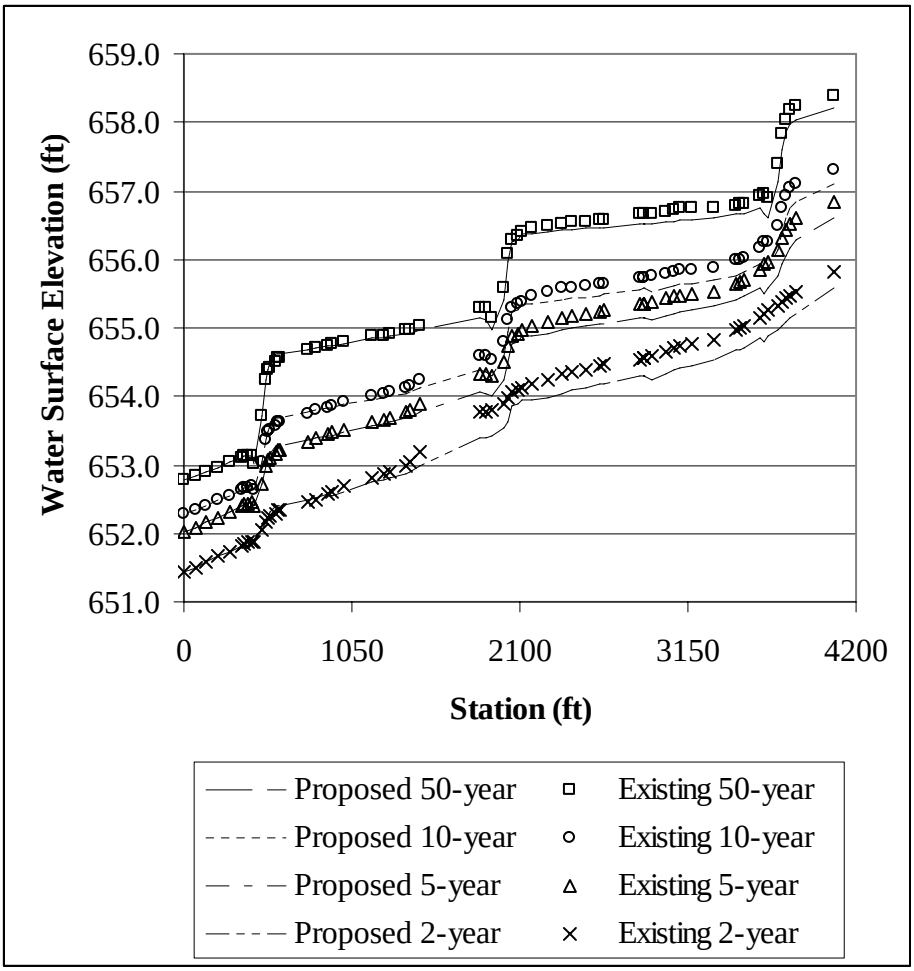


Plate F-4. Oswegoland Greenway Design Water Surface Profiles Note that 100-year regulatory flow (1481 cfs) is smaller than estimated current 50-year flow (1534 cfs).

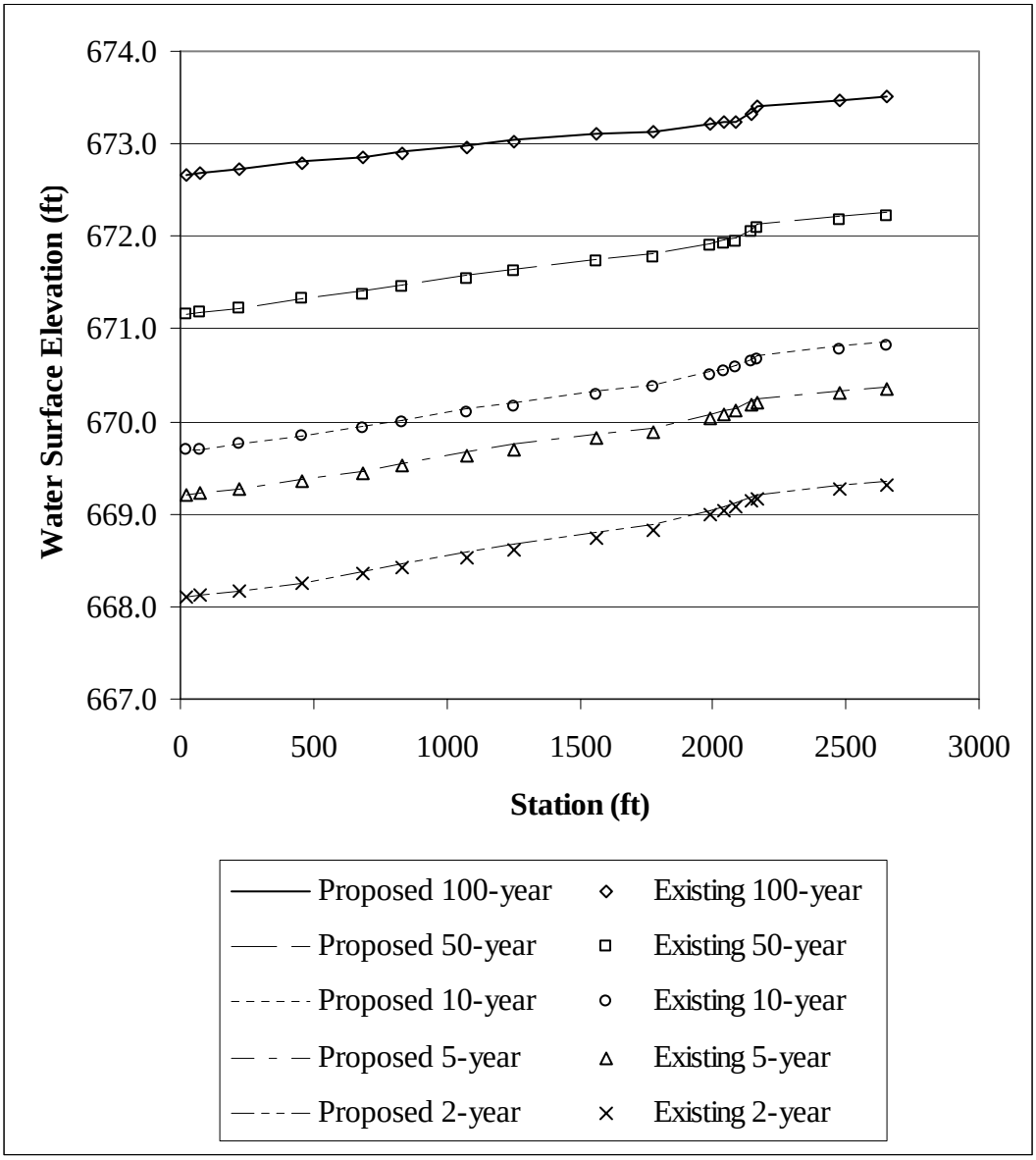


Plate F-5. Fox Valley Greenway Design Water Surface Profiles

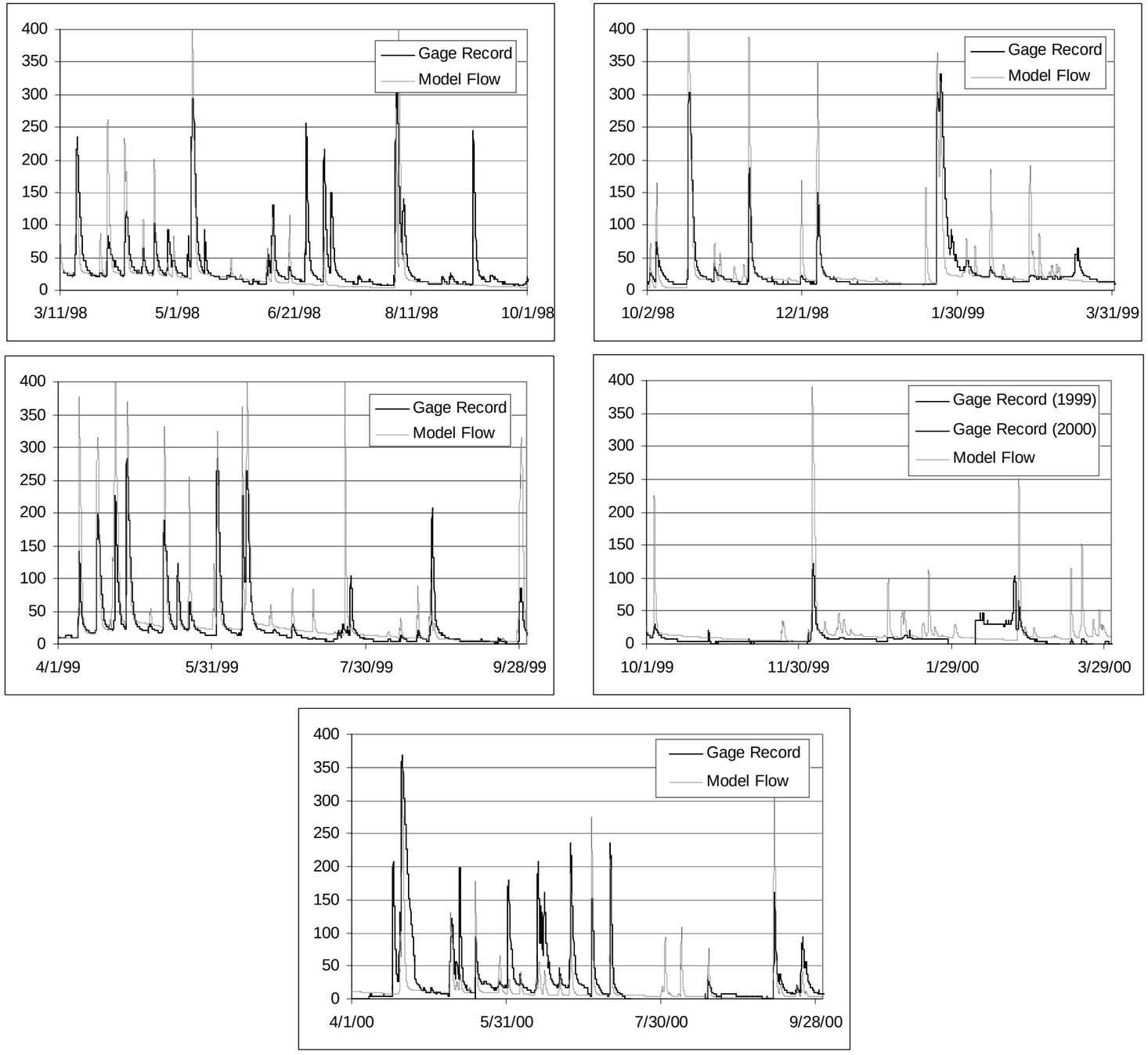
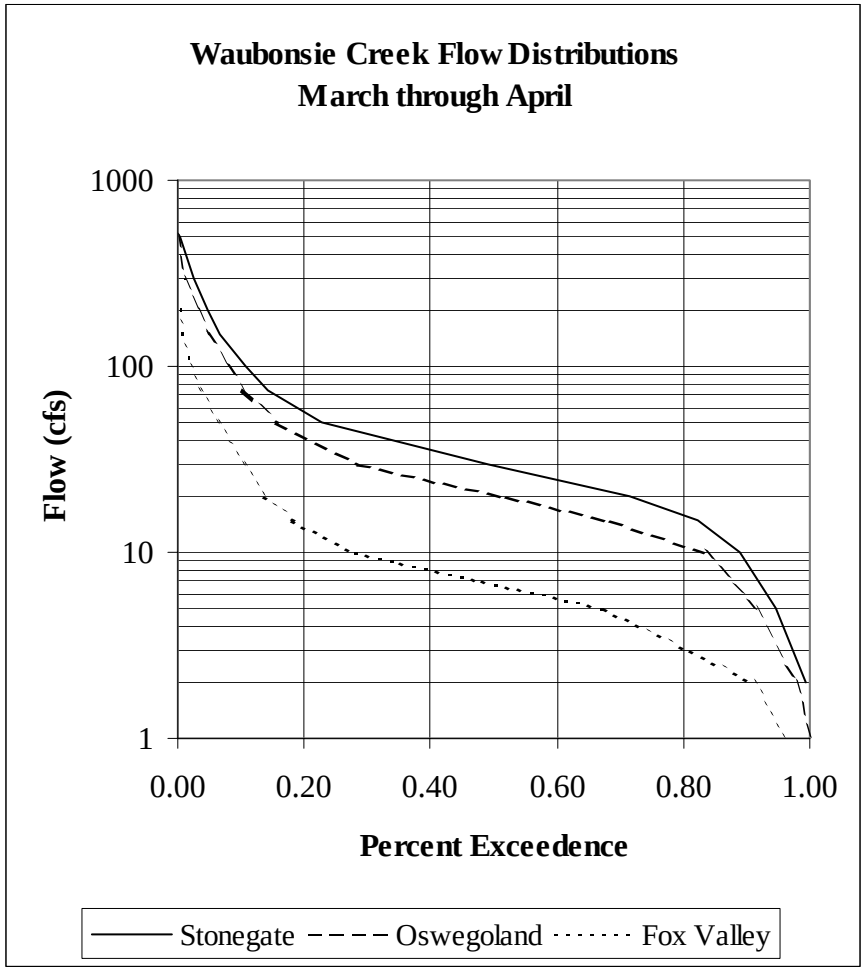


Plate F-7. Waubonsie Creek Low-Flow Model Performance



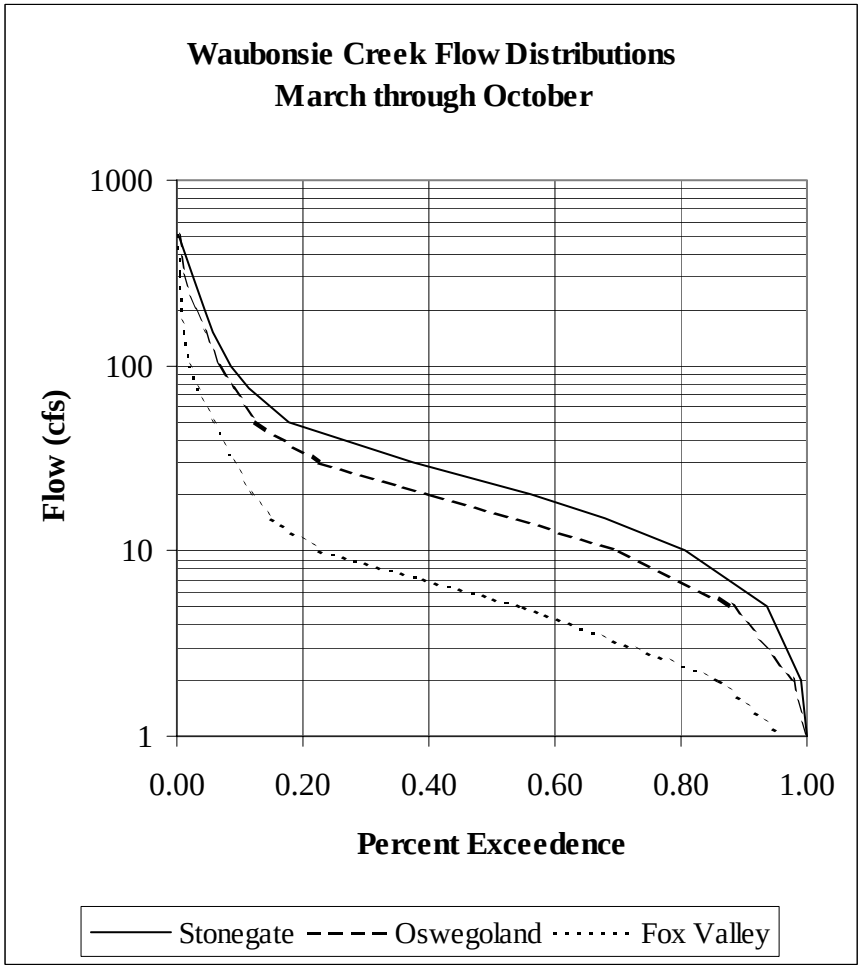
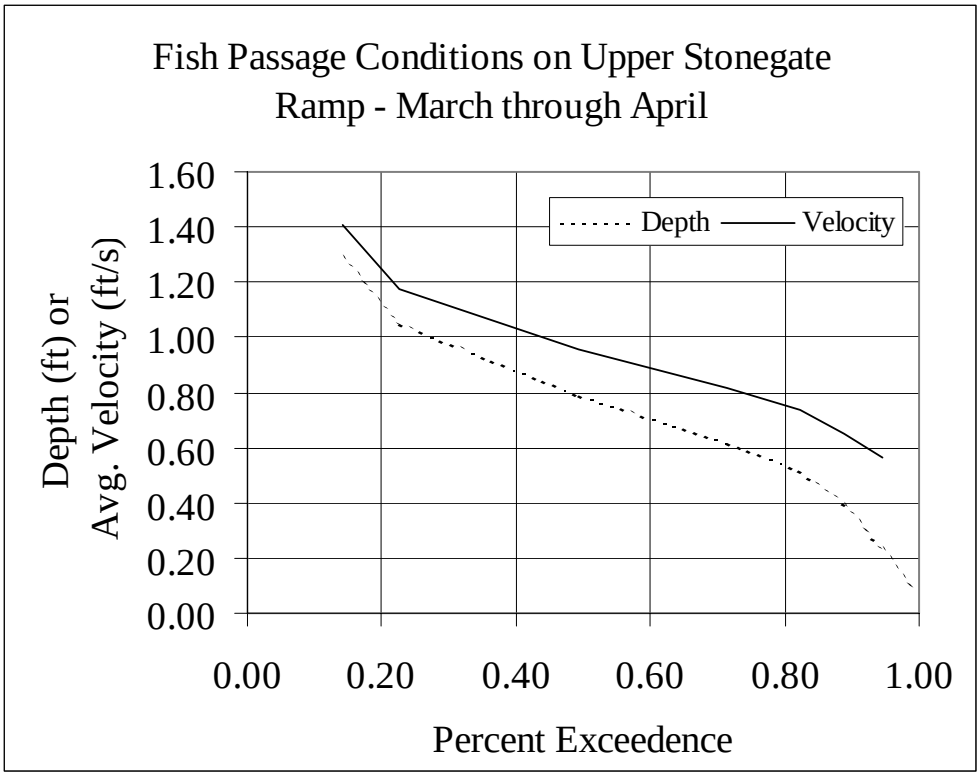


Plate F-8. Predicted Flow Distribution at Waubonsie Creek Sites During Fish Migration Period and Plant Growing Season



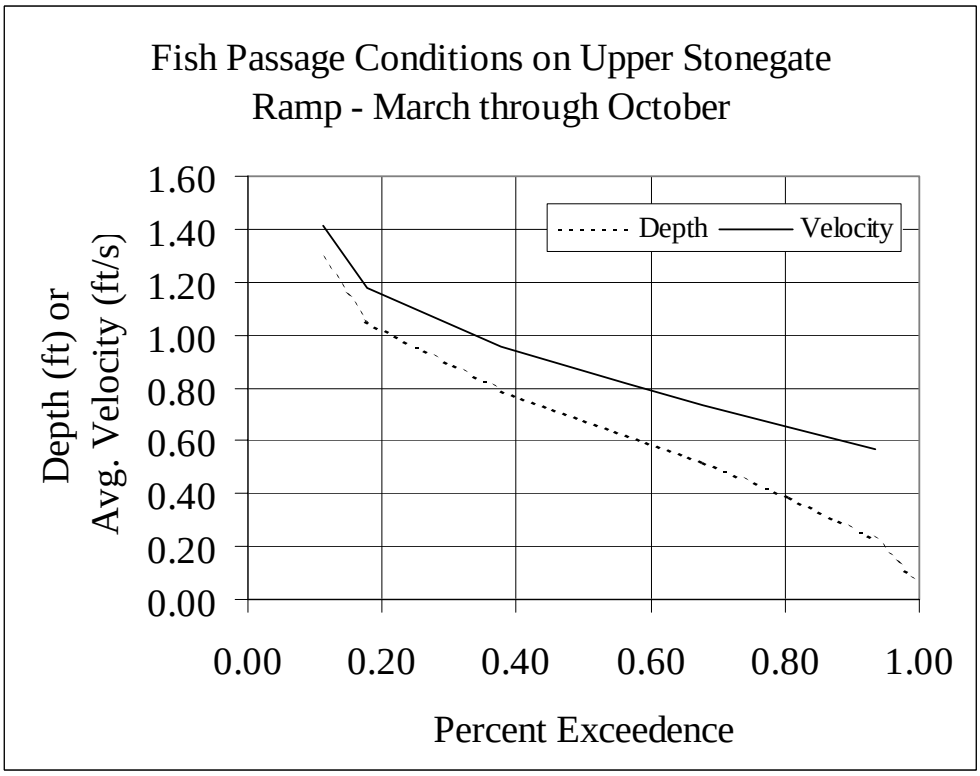
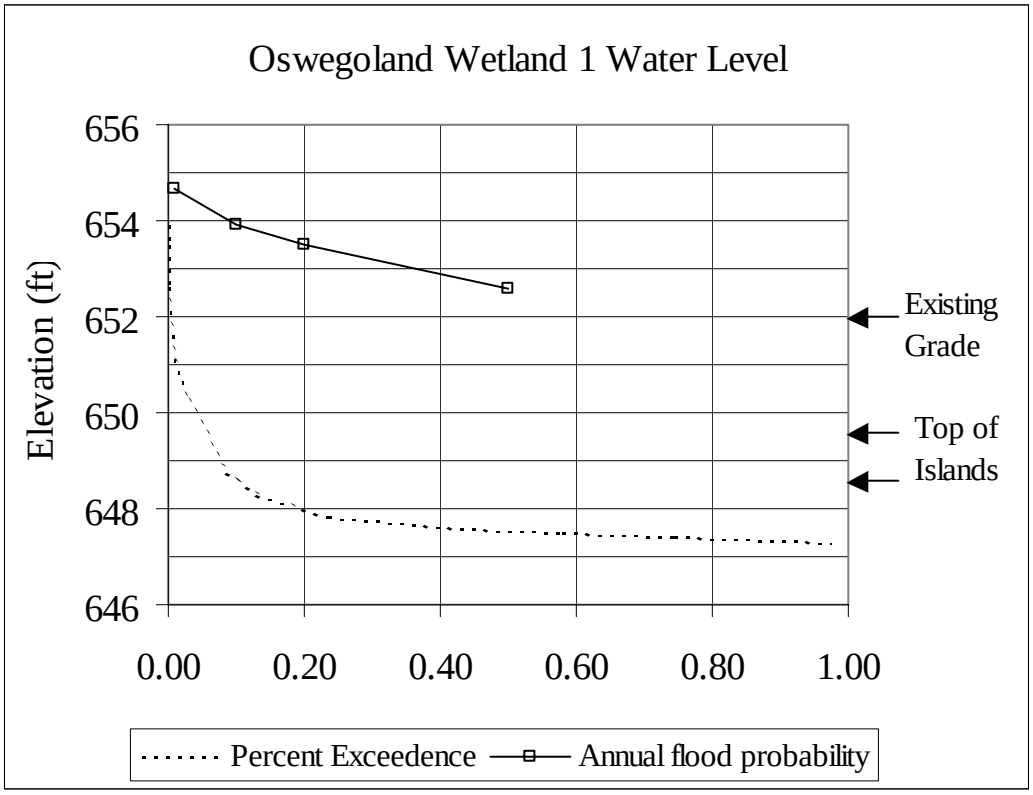


Plate F-9. Expected Performance of Stonegate Rock Ramps



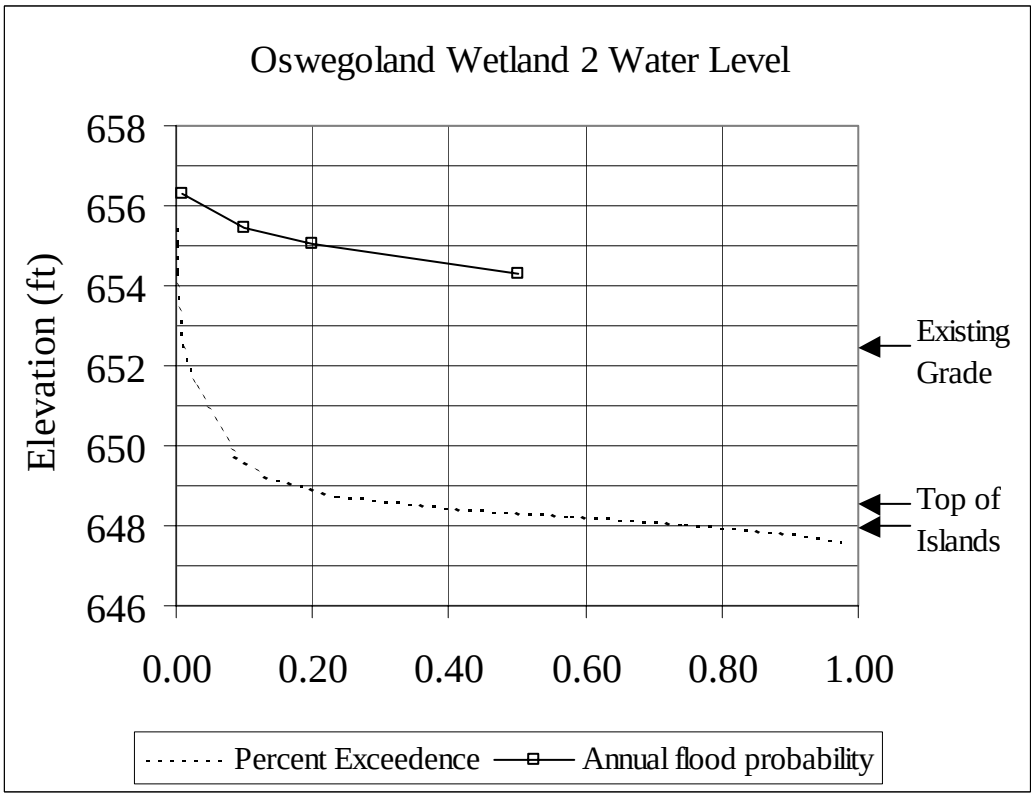


Plate F-10. Predicted Inundation Frequencies for Oswegoland Wetlands

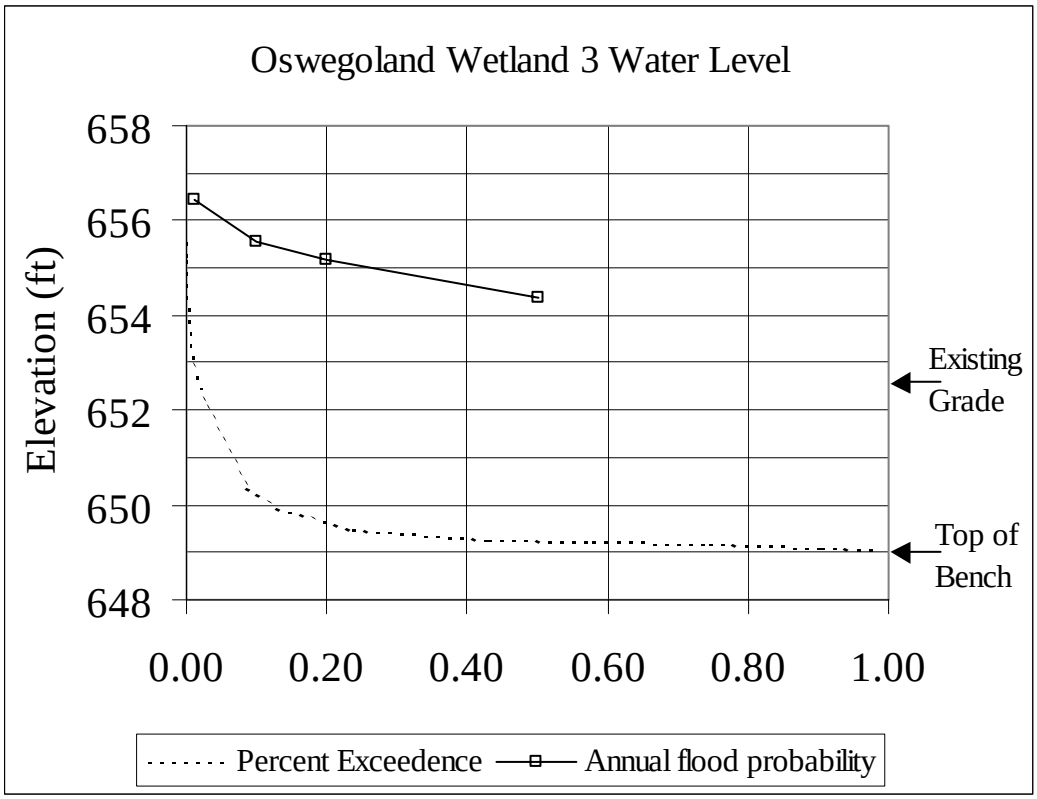


Plate F-10. Predicted Inundation Frequencies for Oswegoland Wetlands (continued)

APPENDIX G

COST ESTIMATES – ALTERNATIVES AND SELECTED PLAN

ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX G
COST ESTIMATES – ALTERNATIVES AND SELECTED PLAN

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ILLINOIS RIVER BASIN RESTORATION
WAUBONSIE CREEK RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

FEASIBILITY REPORT WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

APPENDIX G
COST ESTIMATES – ALTERNATIVES AND SELECTED PLAN

1. GENERAL

Unit costs were developed for each project feature studied for the Waubonsie Creek Restoration Project. The level of detail for the preliminary estimates is consistent with the level of design. A detailed estimate was developed for the selected alternative plan using the Micro Computer Aided Cost Estimating System (MCACES). This detailed estimate was prepared using preliminary project plans, information gathered from site visits and discussions with design team members and the local sponsor, and review of similar construction projects. The MCACES estimate incorporated local wage and equipment rates. Costs, including appropriate contingencies, are presented in accordance with EC 1110-2-1302, Civil Works Cost Engineering and EC 1110-2-538, Civil Works Project Cost Estimating – Code of Accounts.

2. PRICE LEVEL

The estimates are prepared to a March 2004 price level. These costs are considered to be fair and reasonable to a well-equipped and capable contractor and include overhead and profit. Calculation of the Fully Funded Estimate (FFE) was done in accordance with guidance from EM 1110-2-1304, Civil Works Construction Cost Index System (CWCCIS), updated March 2002. The project will be constructed in one stage. The midpoint of construction was used to determine the FFE for construction, construction management and engineering during construction. The midpoint of Planning, Engineering and Design was used to determine the FFE for plans and specifications.

3. CONTINGENCY DISCUSSION

After review of project documents and discussion with engineering and construction personnel involved in the project, cost contingencies were developed which reflect the uncertainty associated with each cost item. These contingencies are based on qualified cost engineering judgment of the available design data, type of work involved, and uncertainties associated with the work and schedule. The overall contingency for the cost estimate is about 25%. The basis for the selection of the contingency factor is primarily due to the conceptual design of a project feature, unknown quantities, and unknown site conditions. Many of the project features can be constructed using conventional methods and are similar to previous Rock Island District projects.

Table G1.1: Project Cost Summary

ACCOUNT	FEATURE	CURRENT WORKING ESTIMATE (CWE)	FULLY FUNDED ESTIMATE (FFE)
1	LANDS AND DAMAGES	$959,000	$959,000
6	FISH AND WILDLIFE FACILITIES[1]	$1,377,000	$1,459,600
30	PLANNING, ENGINEERING AND DESIGN[2]	$137,700	$140,500
	PROJECT COOPERATION AGREEMENT	$9,600	$9,600
31	CONSTRUCTION MANAGEMENT[3]	$123,900	$133,800
61	ENGINEERING DURING CONSTRUCTION[4]	$96,400	$104,100
	PROJECT COSTS SUBJECT TO COST SHARING	$2,703,600	$2,806,600
	NON-FEDERAL COSTS[5]	$946,300	$982,300
	ESTIMATED NON-FEDERAL LANDS AND DAMAGES[6]	($878,000)	($878,000)
	REQUIRE NON-FEDERAL CASH OR WORK-IN-KIND	$68,300	$104,300
	FEDERAL COST[5]	$1,757,300	$1,824,300

Notes:

[1] Includes 25% contingency

[2] Estimated at 10% of construction cost

[3] Estimated at 9% of construction cost

[4] Estimated at 7% of construction cost

[5] All project features are subject to 65% Federal and 35% non-Federal cost share.

[6] Non-Federal Lands and Damages include land payments for the required real estate expenses and incidental real estate expenses including mapping, title evidence appraisals, negotiating, closings, etc.

Table G1.2: Project Cost Summary by Site

ACCOUNT	FEATURE	SITE	DESCRIPTION	CURRENT WORKING ESTIMATE (CWE)	FULLY FUNDED ESTIMATE (FFE)
1	LAND AND DAMAGES			$959,000	$959,000
6	FISH AND WILDLIFE FACILITIES			$1,377,000	$1,459,600
		STONEGATE		**$88,700**	**$94,000**
			LOWER STONEGATE DAM - NOTCH DAM & EXTEND RAMP	$19,600	$20,700
			MIDDLE STONEGATE - IMPROVE RIFFLE STRUCTURES	$7,800	$8,300
			MIDDLE STONEGATE - BANK PROTECTION	$39,600	$42,000
			UPPER STONEGATE DAM - NOTCH DAM	$21,700	$23,000
		PFUND		**$65,900**	**$69,900**
			LOWER PFUND DAM - REMOVE DEBRIS	$5,200	$5,500
			UPPER PFUND DAM - REMOVE DAM	$60,700	$64,400
		GOLF COURSE		**$35,100**	**$37,200**
			GOLF COURSE DAM - RAMP DAM	$35,100	$37,200
		OSWEGOLAND GREENWAY		**$734,600**	**$778,609**
			WETLAND 1	$135,200	$143,300
			WETLAND 2	$130,900	$138,800
			WETLAND 3	$87,000	$92,200
			GRADE BANKS	$122,100	$129,400
			ESTABLISH VEGETATION	$170,100	$180,300
			DOWNSTREAM RIFFLE STRUCTURE	$28,500	$30,200
			UPSTREAM RIFFLE STRUCTURE	$33,000	$34,949
			GRADE CONTROL	$27,800	$29,460
		PARKVIEW ESTATES		**$434,800**	**$460,900**
			WETLAND	$296,300	$314,100
			ESTABLISH VEGETATION	$138,500	$146,800

	FOX VALLEY GREENWAY	**$17,900**		**$19,000**	
	RIFFLE STRUCTURE	$17,900		$19,000	
30	PLANNING, ENGINEERING AND DESIGN		$147,300		$150,100
	PLANS & SPECIFICATIONS	$137,700		$140,500	
	PROJECT COOPERATION AGREEMENT	$9,600		$9,600	
31	CONSTRUCTION MANAGEMENT		$123,900		$133,800
	STONEGATE	$8,000		$8,600	
	PFUND	$5,900		$6,400	
	GOLF COURSE	$3,200		$3,500	
	OSWEGOLAND GREENWAY	$66,100		$71,400	
	PARKVIEW ESTATES	$39,100		$42,200	
	FOX VALLEY GREENWAY	$1,600		$1,700	
61	ENGINEERING DURING CONSTRUCTION		$96,400		$104,100
	STONEGATE	$6,200		$6,700	
	PFUND	$4,600		$5,000	
	GOLF COURSE	$2,500		$2,700	
	OSWEGOLAND GREENWAY	$51,400		$55,500	
	PARKVIEW ESTATES	$30,400		$32,800	
	FOX VALLEY GREENWAY	$1,300		$1,400	
			$2,703,600		$2,806,600

APPENDIX H

REAL ESTATE PLAN

REAL ESTATE PLAN
WAUBONSIE CREEK RESTORATION
ILLINOIS RIVER BASIN RESTORATION
KANE AND KENDALL COUNTIES, ILLINOIS

I. Purpose.

This Real Estate Plan supports the Illinois River Basin Restoration - Waubonsie Creek Restoration Feasibility Report. The proposed project study areas are located within Kane and Kendall Counties in northeastern Illinois. Waubonsie Creek is approximately thirty square miles of watershed meandering downstream through Aurora, Oswego, and Montgomery, Illinois. Waubonsie Creek flows into the Fox River.

The Illinois Department of Natural Resources (IDNR) is the sponsor for this project.

The proposed project features are located in Kane and Kendall Counties in Illinois. The Waubonsie Creek project is divided into six individual project areas and one disposal site. The following areas will contain project features that will enhance and restore acquatic and wetland environments within and adjacent to streams. The recommended plan would restore fish passage at four dams and two artificial riffles; provide three lateral connected wetlands in the Oswegoland Greenway where fish could seek refuge from high flows; restore in-stream diversity by constructing three riffle structures; and construct a riparian wetland. These areas are identified as follows:

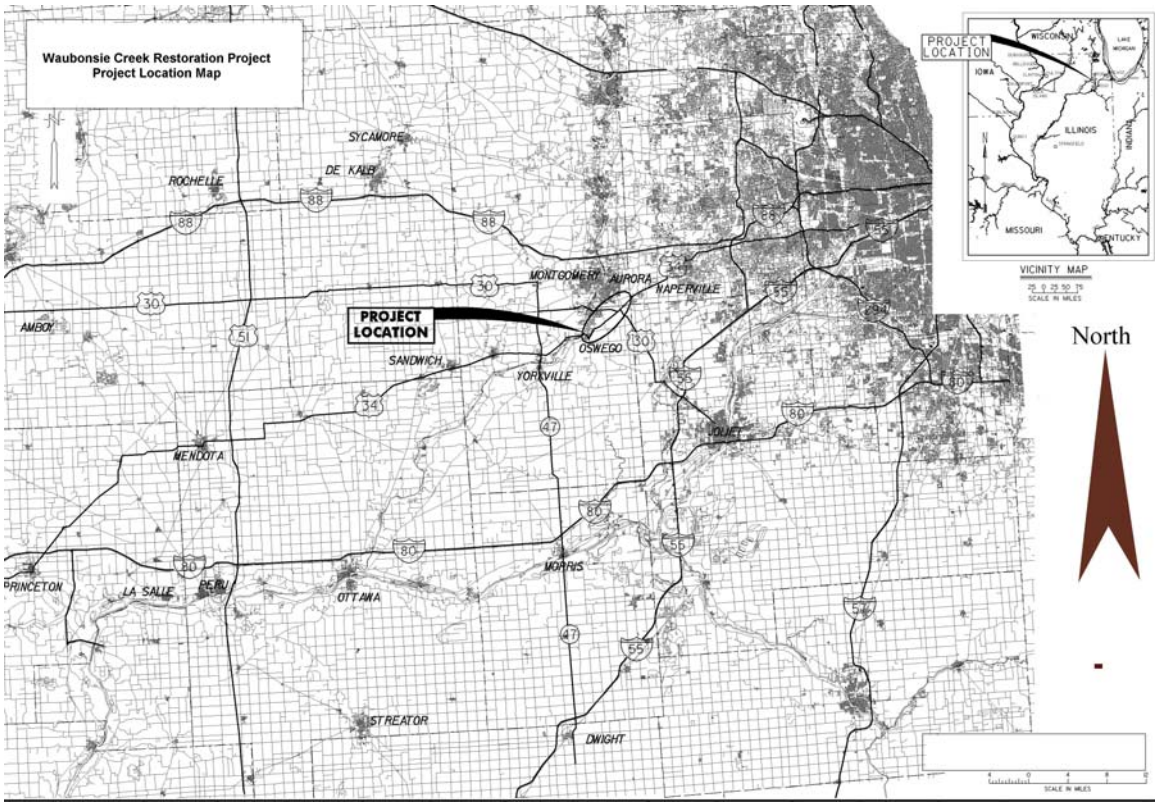
Stonegate Area
Pfund Area
Fox Bend Golf Course Area
Oswegoland Greenway I and II Area
Parkview Estates Area
Fox Valley Greenway Area

A disposal site has been identified, however, due to the constant construction efforts being performed in this area, another site may be necessary. The current disposal site is identified as:

Fox Ridge Sand & Gravel

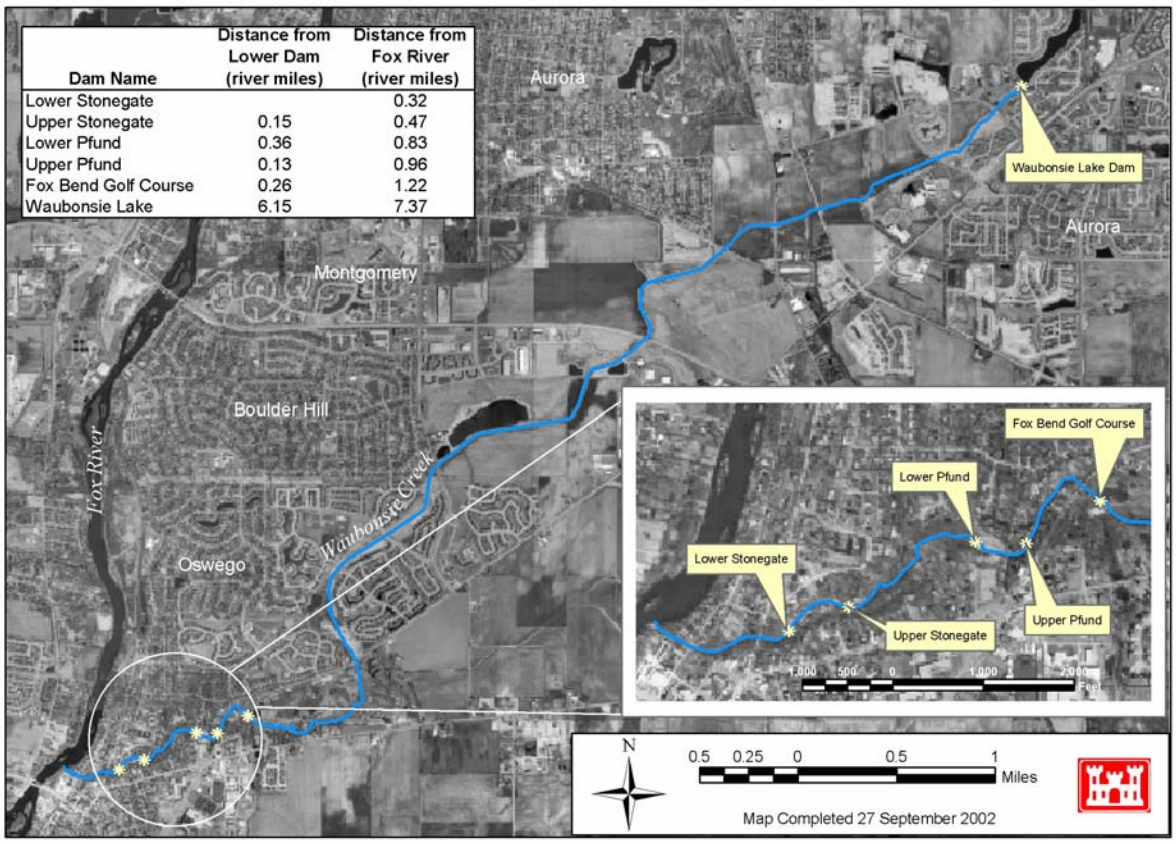
II. Description of Lands, Easements, and Right-of-Way (LER) Required for Construction, Operation and Maintenance of the Project.

A. The proposed study areas are located within Kane and Kendall Counties, Illinois. The following "Project Location Map shows where the project is located



Project Location Map

The map on the next page "Proposed Project Areas Map," provides more detail to help the reader identify where the individual project areas are located in regards to each other.



Proposed Project Areas Map

B. The following is a breakdown of each project area to include the location, the type and numbers of properties affected by the proposed project, the acreage required, and the proposed estates for each of the individual area. Also included is a brief description of the project features.

1. Stonegate

(a) Type and Number of Properties Affected by Proposed Project:

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	0	0
AGRICULTURAL	0	0
RESIDENTIAL	4	4
OTHER	1	1
TOTAL	5	5

(b) Acreage and Estate Required:

Channel Improvement Easement	1.22 acres
Temporary Work Area Easement	0.96 acres

(c) Location: The project is located in Section 17, Township 37 North, Range 8 East of the 3rd Principal Meridian, Kendall County, Illinois.

(d) The project features will include widening the existing notch in the spillway at the lower part of the dam. The two existing riffle structures between the Upper and Lower Stonegate Dams will be modified by flattening their downstream slopes. The left bank of the stream between the Upper Stonegate Dam and upper riffle will be lined with riprap to prevent flanking of the Upper Stonegate Dam and Upper Stonegate Riffle. The Upper Stonegate Dam will be severely notched such that the majority of the exposed spillway will be removed to facilitate fish passage.

(e) A map depicting the project area is shown on the next page as the Waubonsie Creek Restoration Project - Stonegate Detail Map.

Waubonsie Creek Restoration Project - Stonegate Detail Map

2. Pfund Area

(a) Type and Number of Properties Affected by Proposed Project:

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	1	1
AGRICULTURAL	0	0
RESIDENTIAL	2	2
OTHER	0	0
TOTAL	3	3

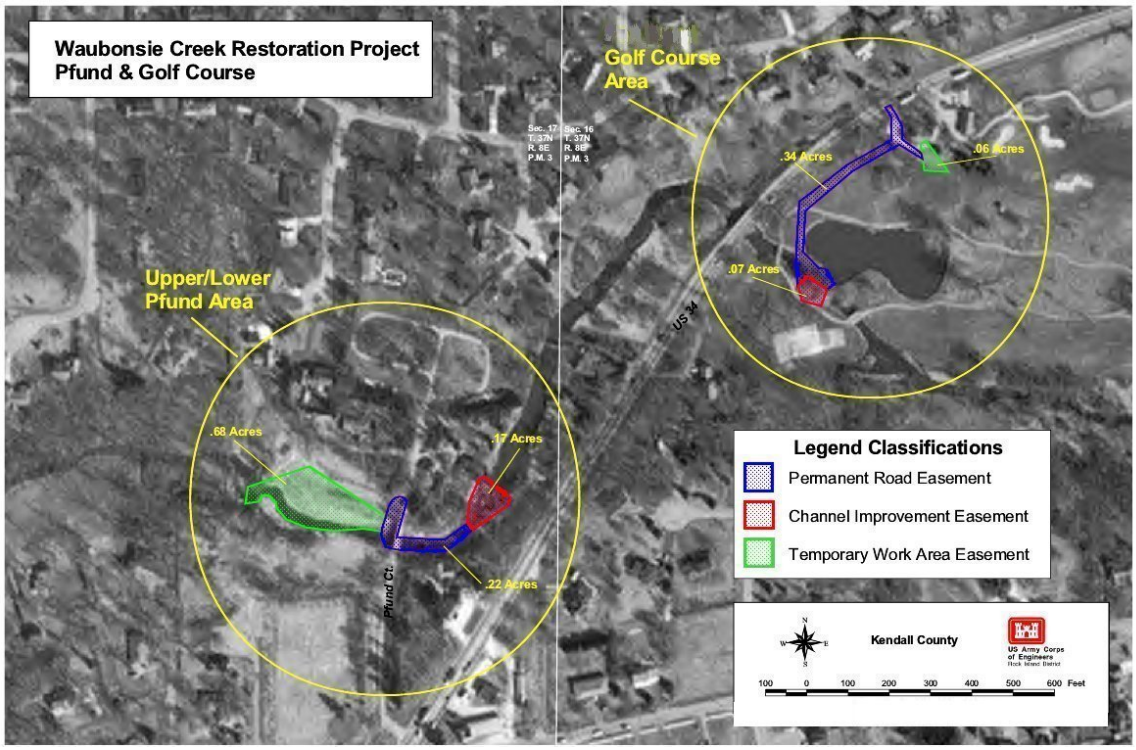
(b) Acreage and Estate Required:

Channel Improvement Easement	.17 acres
Road Easement	.22 acres
Temporary Work Area Easement	.68 acres

(c) Location: The project is located in Section 17, Township 37 North, Range 8 East of the 3rd Principal Meridian, Kendall County, Illinois.

(d) The project features will include the clearing large residual debris at the Lower Pfund Dam site. The Upper Pfund Dam will be modified by constructing a rock ramp on the downstream face of the structure, which will facilitate fish passage.

(e) A map depicting the project area is shown on the next page as the Waubonsie Creek Restoration Project - Pfund and Golf Course. The Pfund area is on the left hand side of the picture.



Waubonsie Creek Restoration Project - Pfund and Golf Course

3. Golf Course Area

(a) Type and Number of Properties Affected by Proposed Project:

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	0	0
AGRICULTURAL	0	0
RESIDENTIAL	0	0
OTHER	1	3
TOTAL	1	3

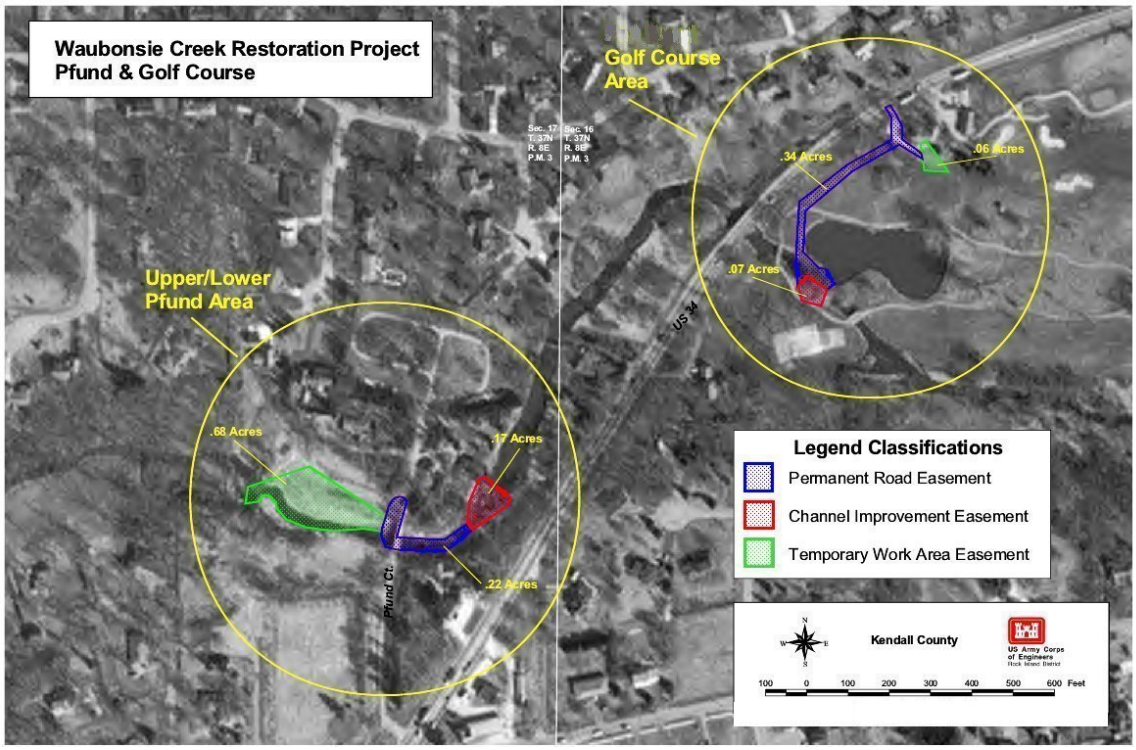
(b) Acreage and Estate Required

Channel Improvement Easement	.07 acres
Road Easement	.34 acres
Temporary Work Area Easement	.06 acres

(c) Location: The project is located in Section 16, Township 37 North, Range 8 East of the 3rd Principal Meridian, Kendall County, Illinois. The name of the establishment is the Fox Bend Golf Course.

(d) The proposed project features include constructing a rock ramp on the downstream face of the Golf Course Dam.

(e) A map depicting the project area is shown on the next page as – Waubonsie Creek Restoration Project – Pfund and Golf Course. The Golf Course area is shown on the right-hand side of this map.



Waubonsie Creek Restoration Project – Pfund and Golf Course

4. Oswegoland Greenway Area

(a) Type and Number of Properties Affected by Proposed Project:

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	0	0
AGRICULTURAL	0	0
RESIDENTIAL	0	0
OTHER	1	3
TOTAL	1	3

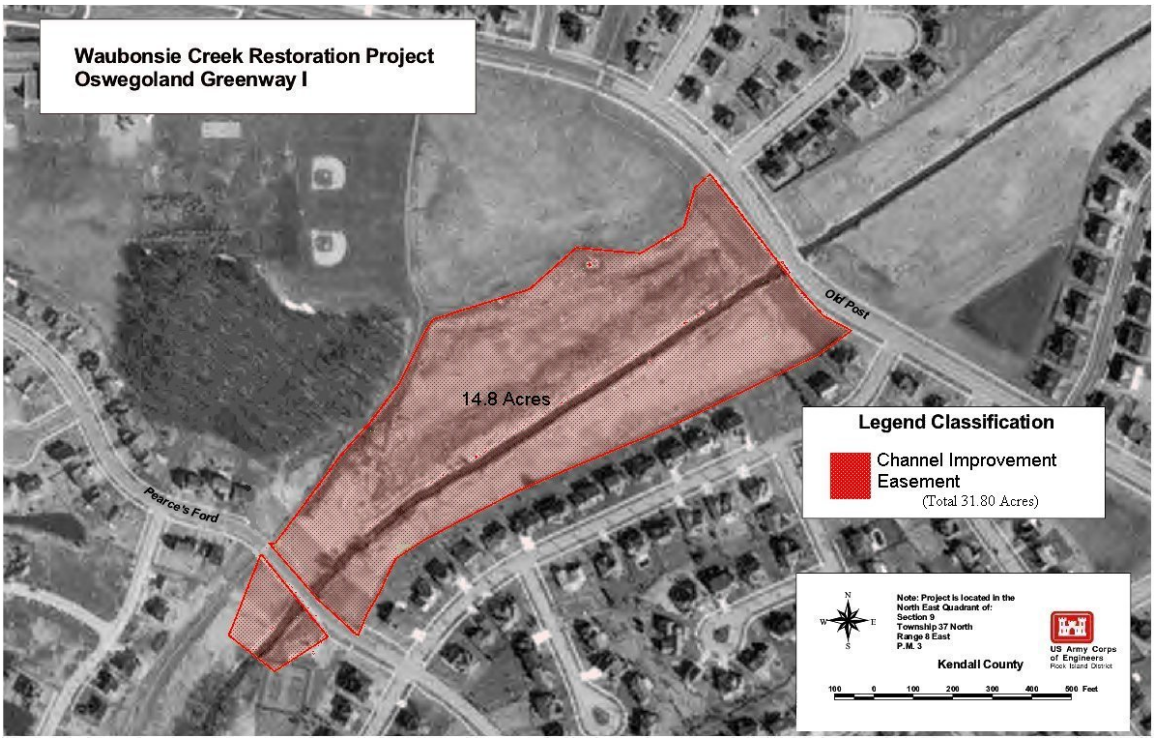
(b) Acreage and Estate Required

Channel Improvement Easement 31.80 acres

(c) Location: The project is located in Section 9 & 10, Township 37 North, Range 8 East of the 3rd Principal Meridian, Kendall County, Illinois.

(d) The proposed project features include three in-stream structures which include a grade control structure and two riffle structures. There will be three oxbow channel wetlands along the stream in this reach of the project. The wetland areas will be planted with native wetland vegetation, with emergent species in inundated areas and mesic prairie species in higher areas. Additionally, the entire surrounding greenway area will be replanted with mesic prairie species.

(e) Maps depicting the project area are shown on the next page as Waubonsie Creek Restoration Project - Oswegoland Greenway I, and Waubonsie Creek Restoration Project - Oswegoland Greenway II. The division line for both areas is Old Post Road



Waubonsie Creek Restoration Project - Oswegoland Greenway I

Waubonsie Creek Restoration Project - Oswegoland Greenway II

5. Parkview Estates Area

(a) Type and Number of Properties Affected by Proposed Project:

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	0	0
RESIDENTIAL	0	0
AGRICULTURAL	0	0
OTHER	2	2
TOTAL	2	2

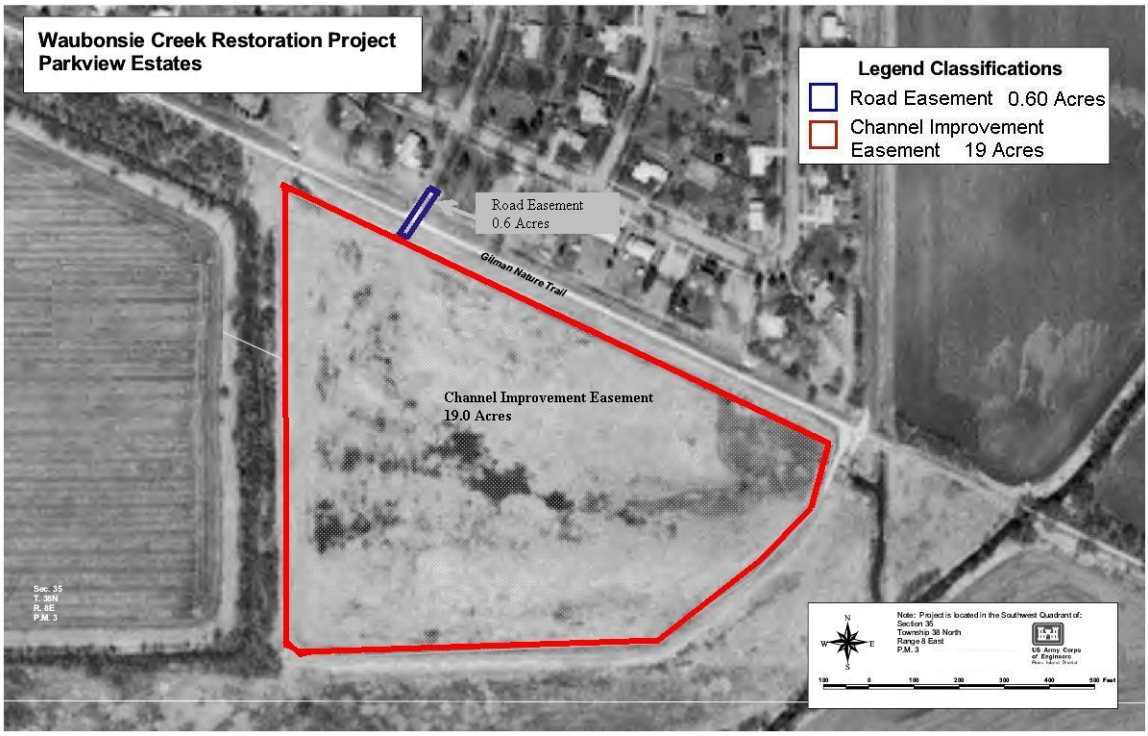
(b) Acreage and Estate Required

Channel Improvement Easement	19.0 acres
Road Easement	.60 acres

(c) Location: The project is located in Section 35, Township 38 North, Range 8 East of the 3rd Principal Meridian, Kane County, Illinois.

(d) The Project features include one off-channel wetland in this area within the existing dry reservoir. A 2.1-acre wetland is proposed in the northern portion. This wetland would be constructed so that at least 12 inches of water would be present over a majority of the wetland area. The wetland area will be planted with native wetland vegetation, with emergent species in inundated areas and mesic prairie species in the higher surrounding areas. Existing areas of more diverse plant cultures will be preserved to the extent possible. This area is expected to provide enhanced wetland habitat.

(e) A map depicting the project area is shown below as Waubonsie Creek Restoration Project - Parkview Estates.



Waubonsie Creek Restoration Project - Parkview Estates

6. Fox Valley Greenway Area

(a) Type and Number of Properties Affected by Proposed Project:

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	0	0
RESIDENTIAL	0	0
AGRICULTURAL	0	0
OTHER	1	2
TOTAL	1	2

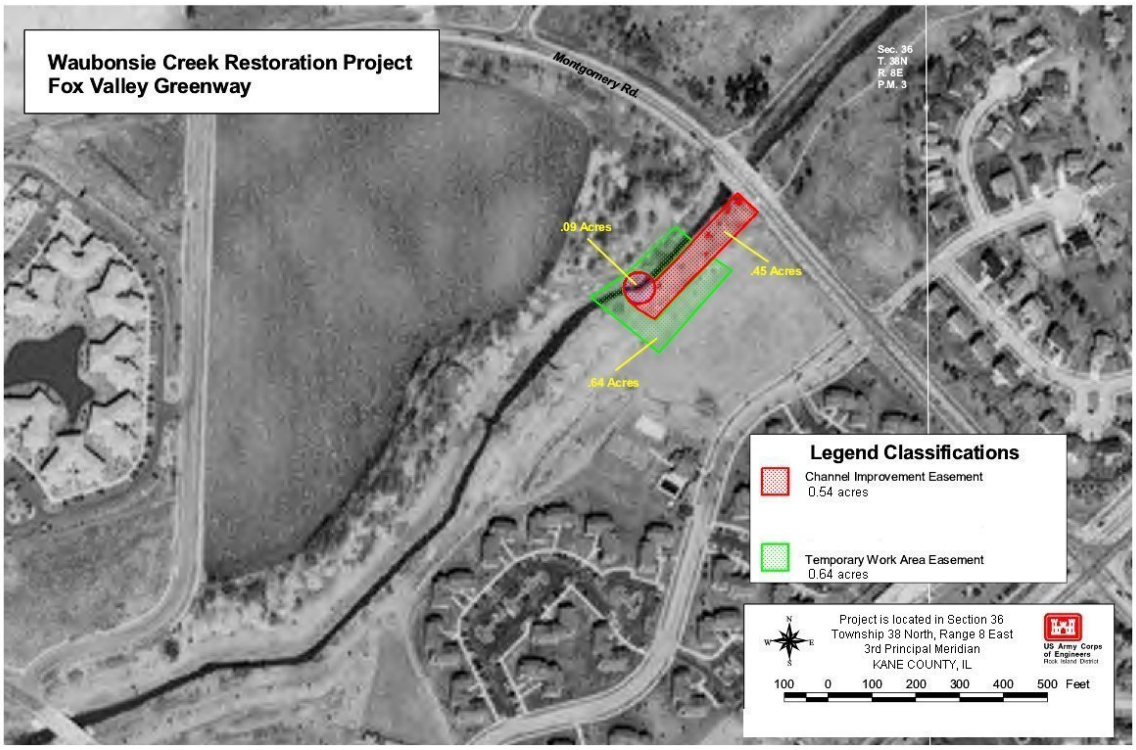
(b) Acreage and Estate Required

Channel Improvement Easement	.54 acres
Temporary Work Area Easement	.64 acres

(c) Location: The project is located in Section 36, Township 38 North, Range 8 East of the 3rd Principal Meridian, Kane County, Illinois.

(d) The project features include one riffle structure installed downstream of the Montgomery Road Bridge. This structure is expected to improve aquatic habitat by providing an area of increased water depth.

(e) A map depicting the proposed study area is shown on the next page as Waubonsie Creek Restoration Project – Fox Valley Greenway.



Waubonsie Creek Restoration Project - Fox Valley Greenway

7. Fox Ridge Sand & Gravel

A disposal site is identified as "Fox Ridge Sand and Gravel." This disposal area will accommodate the construction needs for the project.

(a) Type and Number of Properties Affected by Proposed Project:

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	1	1
RESIDENTIAL	0	0
AGRICULTURAL	0	0
OTHER	0	0
TOTAL	1	1

(b) Acreage and Estate Required

Temporary Work Area Easement 4.00 acres

(c) Location: The project is located in Section 36, Township 38 North, Range 8 East of the 3rd Principal Meridian, Kane County, Illinois.

(d) A map depicting the project area for this site is shown on the next page. An aerial graphic of this area is not available.

C. Consolidated Summary of Type and Number of Properties Affected by the Proposed Project

TYPE	NUMBER OF OWNERS	NUMBER OF TRACTS
COMMERCIAL	2	2
AGRICULTURAL	0	0
RESIDENTIAL	6	6
OTHER	6	11
TOTAL	14	18

D. Summary of Estates Required:

1. A **channel improvement easement** will be acquired over approximately 52.80 acres. This easement is needed in the Stonegate, Pfund, Fox Bend Golf Course, Oswegoland Greenway, Fox Valley Greenway, and Parkview Estates project areas. These areas are colored in red on the attached Project Maps within the text. The following is the standard estate set forth in ER 405-1-12 that will be acquired:

CHANNEL IMPROVEMENT EASEMENT

A perpetual and assignable right and easement to construct, operate, and maintain channel improvement works on, over and across Tract Nos. ___, ___, and ___ for the purposes as authorized by the act of Congress approved _____, including the right to clear, cut, fell, remove and dispose of any and all timber, trees, underbrush, buildings, improvements and/or obstructions there from; to excavate, dredge, cut away, and remove any or all of said land and to place thereon dredge or excavated material; and for such other purposes as may be required in connection with said work of improvement; reserving, however, to the owners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easements hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

2. A **temporary work area easement** is required over approximately 6.34 acres. This easement is needed in the Stonegate, Pfund, Golf Course, Oswegoland Greenway, Fox Valley Greenway, and Fox Ridge Sand & Gravel areas and is highlighted in green on the Project Maps within the text. The term of this easement will be for 3 years. The following is the standard estate set forth in ER 405-1-12 that will be acquired.

TEMPORARY WORK AREA EASEMENT

A temporary easement and right-of-way in, on, over and across (the land described in Schedule A) Tracts Nos. ___, ___ and ___, for a period not to exceed _____, beginning with date possession of the land is granted to the United States, for use by the United States, its representatives, agents, and contractors as a (borrow area) (work area), including the right to borrow and/or deposit fill, spoil and waste material thereon) (move, store and remove equipment and supplies, and erect and remove temporary structures on the land) and to perform any other work necessary and incident to the construction of the _____ Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other

vegetation, structures or obstacles within the limits of the right-of-way; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads, pipelines.

3. A **road easement** is required over approximately 1.16 acres. This easement is needed in the Pfund, Fox Bend Golf Course, and Parkview Estates project areas and is highlighted in blue on the Project Maps within the text. The following is the standard estate set forth in ER 405-1-12 that will be acquired

ROAD EASEMENT

A perpetual and assignable easement and right-of-way in, on, over and across Tracts Nos. ___, ___ and ___ for the location, construction, operation, maintenance, alteration and replacement of (a) road(s) and appurtenances thereto; together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; (reserving, however, to the owners, their heirs and assigns, the right to cross over or under the right-of-way as access to their adjoining land at the locations indicated in Schedule B); subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

E. Ownership Discussion: This project affects fourteen ownerships. They include Oswegoland Park District, Fox Valley Park District, Village of Montgomery, Fox Ridge Sand & Gravel, and seven private ownerships.

F. Land Values: A gross appraisal was prepared by Ron Williams, Senior Staff Appraiser, CEMVR-RE-P and is dated 19 February 2004. The appraisal was approved by Mr. Elwin Yoder, Chief, Partnership Programs and Support Branch. Land values are discussed in the Baseline Cost Estimate, paragraph X.

G. Justification for Easement Estates in Lieu of Fee: Acquisition of easements in Lieu of Fee is proposed for this project based upon the extent of the interest required for the construction, operation, and maintenance of the project. The Channel Improvement Easement is adequate for the project needs in that all restoration work will be performed within the stream or directly adjacent to the stream.

The temporary work areas are proposed to provide staging areas for equipment and supplies, and to be used as a material placement site. In addition**,** acquisition of easements versus fee simple title to these lands is preferable to the project sponsor, the Illinois Department of Natural Resources, and to the public and

private landowners who's lands are needed for the project. These landowners do not wish to convey fee simple title to the project sponsor. They are receptive to granting the necessary easements to the sponsor so that project features may be incorporated on their lands. The three public landowners, The Village of Montgomery, Oswegoland Park District, and Fox Valley Park District plan to enter into sub-agreements with the project sponsor to operate and maintain the project upon completion.

The Oswegoland Park District owns the lands associated with the Oswegoland Greenway I & II project areas. Waubonsie Creek is contained within a steep, straightened, narrow ditch and is surrounded by a buffer area of approximately 22 acres, averaging about 200 feet wide between the creek and the residential development that surrounds it. The goals for this area are to provide erosion protection along the bank line and enhance native vegetation within the area. The Channel Improvement Easement meets the needs of these project goals.

The land associated with the Parkview Estates project area is owned by the Village of Montgomery. The area is utilized as a dry detention facility serving the Parkview Estates subdivision in the Village of Montgomery. A nature trail bounds the 19-acre area on the north and by a levee on the remaining three sides. The goals for this are to restore wetland habitat to include more species of native vegetation, to continue to provide storm water detention functions, and to provide low-density recreational opportunities within the area. The Channel Improvement and the Road Easement meet the needs of these project goals.

In the other project areas, in order to have willing landowners, it is also recommended that easement be purchased in lieu of Fee.

H. Summary of LER required for the Illinois River Basin Restoration - Waubonsie Creek Restoration:

(1) Total Ownerships Affected: 14

(2) Total Acres Required (Permanent Channel Improvement Easement)	52.8
(3) Total Acres Required (Temporary Work Area Easement)	6.34
(4) Total Acres Required (Road Easement)	1.16

III. Lands Required Owned By Sponsor.

The project sponsor, The Illinois Department of Natural Resources, does not own any of the lands required for the project.

IV. Non-Standard Estate Discussion.

There are no Non-Standard Estates required for this project.

V. Federal Project within the LER Required for the Project.

There are no Federal projects within the LER required for this project.

VI. Federally Owned Land Required for the Project.

There are no federally owned lands required for the project.

VII. Navigational Servitude.

Navigational Servitude does not apply and will not be exercised for this project.

VIII. Map Depicting the Area.

A project map depicting the project area is included in “II. Description of Lands, Easements, and Right-of-Way (LER) Required for Construction, Operation and Maintenance of the Project”.

IX. Possibility of Induced Flooding Due to Project.

There is no possibility that induced flooding will be caused within the project areas.

X. Baseline Cost Estimate.

	NON-FEDERAL	FEDERAL
01 Lands & Damages (includes contingences)	$ 635,000	$ 0
01 Relocation Assistance (PL 91-646)	$ 0	$ 0
01 Incidental Acquisition Costs (Itemized as follows)		
a. Monitoring LS Acquisition	$	$54,000
b. Survey	$ 90,000	$
c. Title Evidence	$ 45,000	$
d. Negotiation/Closing	$ 63,000	$
e. Appraisal	$ 45,000	$27,000
f. Attorney's Opinion of Compensability	$	$
TOTAL	$878,000	$81,000

XI. Relocation Assistance Benefits.

The project does not require any known relocation of persons, farms, or businesses; therefore; there are no anticipated Public Law 91-646 Relocation Assistance Benefit payments.

XII. Mineral Activity/Timber Harvesting in Project Area.

No mineral activity is known to exist in the area of the project. There is no known timber harvesting in the project area that may affect the project.

XIII. Sponsor's Legal and Professional Capability to Acquire LER.

The sponsor signed a Feasibility Cost Sharing Agreement on 31 July 2002. The sponsor, The Illinois Department of Natural Resources, will enter into sub-agreements with the Village of Montgomery, Oswegoland Park District, and Fox Valley Park District for operation and maintenance of the completed project.

The sponsor, The Illinois Department of Natural Resources, has the legal capability and experience to perform the required construction, operation, and maintenance of the project. The assessment of the sponsor's capability is included as Exhibit A.

The sponsor, The Illinois Department of Natural Resources, is currently not adequately staffed to accommodate the land acquisition activities for the project. They anticipate hiring a firm to provide these services on their behalf.

The sponsor has been advised of the PL 91-646 responsibilities in acquiring the right-of-way for the project and has been advised of their responsibilities for documenting expenses for credit on the project. A Project Cooperation Agreement will be executed after project approval is received.

XIV. Zoning Ordnances Proposed.

No known zoning ordnances are proposed.

XV. Schedule of Land Acquisition Milestones.

A detailed schedule will be developed when the final right-of-way (ROW) limits have been determined. The sponsor will need a minimum of one year to acquire the necessary ROW. Additional time may be required if condemnation is necessary. The following schedule will be completed after project approval.

Acquisition Schedule

ROW Drawings Completed	12 Weeks
Initiate Acquisition	8 Weeks
Acquisition Complete	52 Weeks
ROW Certificate	4 Weeks

XVI. Facility or Utility Relocations.

There are currently no planned facility or utility relocations.

XVII. Impacts of Suspected or Known Contaminants.

The Rock Island District conducted a Phase 1 Environmental Site Assessment (ESA) in accordance with the appropriate standards and concluded there are no recognized environmental conditions. For more information, please consult the Phase 1 ESA for the property.

XVIII. Landowners Support or Opposition to the Project.

Public meetings have been held and landowners within the project area have been given the opportunity to express their interest in the proposed project. Landowner responses were favorable.

XIX. Risks of Acquiring Lands before Execution of the PCA.

The Sponsor will be advised in writing of the risks associated with acquiring land before execution of the Project Cooperation Agreement (PCA) IAW ER 405-1-12, Chapter 12. There are provisions in the Section 519 language of the Water Resources Development Act (WRDA) 2000 that state:

> (A) VALUE OF LANDS.—If the Secretary determines that lands or interests in land acquired by a non-Federal interest, regardless of the date of acquisition, are integral to a project or activity carried out under this section, the Secretary may credit the value of the lands or interests in land toward the non-Federal share of the cost of the project or activity. Such value shall be determined by the Secretary.

There are currently no known lands that apply to this provision. If such arises, the appropriate documentation will be provided to the Secretary for determination.

XX. Other Real Estate Issues Relevant to the Project.

There is a commercially available disposal site that has been noted within the content of this report as Fox Ridge Sand and Gravel. Acreages have been provided to accommodate the need for the sponsor to provide such site. There may be several changes to the disposal area due to the nature of the area. The area is in a constant state of change due to the proximity to the Chicago area and requirements for new lands for construction growth opportunities. The sponsor may be required to look at different sites for the purpose of disposal or the contractors may desire to dispose of the material on their own.

Original Signed
Rod Hallstrom
Realty Specialist
Partnership Programs and Support Branch

Dated: 27 February 2004

EXHIBIT A

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION CAPABILITY ILLINOIS RIVER BASIN RESTORATION WAUBONSIE CREEK (per Appendix 12E, ER 405-1-12)

I. **Legal Authority**

a. Does the sponsor have legal authority to acquire and hold title to real property for project purposes? (Yes/~~No~~)

b. Does the sponsor have the power of eminent domain for this project? (Yes/~~No~~)

The IDNR has the power of eminent domain. The authority to use this power needs to be approved by the Governor. The Director of the IDNR has not requested the use of eminent domain for this project. Eminent domain is not expected to be used because willing sellers will grant easements.

c. Does the sponsor have "quick take" authority for this project? (~~Yes~~/No)

The IDNR has the power of eminent domain. The authority to use this power needs to be approved by the Governor. The Director of the IDNR has not requested the use of eminent domain for this project. Eminent domain is not expected to be used because easements will be granted by willing sellers.

d. Are any of the land/interests in land required for the project located outside the sponsor's political boundary? (~~Yes~~/No)

e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn? (~~Yes~~/No)

II. Human Resource Requirements

a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of federal projects including P.L. 91-646, as amended? (~~Yes~~/No)

No relocation is expected because the property interest to be acquired is vacant land. If relocation is required, the IDNR will use in house relocation staff.

b. If the answer to IIa is "yes", has a reasonable plan been developed to provide such training? (Yes/No)

c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? (Yes/~~No~~)

d. Is the sponsor's projected in-house staffing level sufficient considering its other work load, if any, and the project schedule? (~~Yes~~/No)

Approximately one third of the IDNR staff has retired through an early retirement program offered in 2002. A hiring freeze has prevented the Department from filling these vacant positions. The IDNR is working to contract the acquisition of these agreements. The Office of Resource Conservation will oversee the contract for the acquisition of these easements and IDNR staff will negotiate some tracts if needed.

e. Can the sponsor obtain contractor support, if required in a timely fashion? (Yes/~~No~~)

The IDNR has been in contact with a potential contractor to assist in the negotiation of easements for this project. A copy of a contract will be sent to the USACE once it has been executed.

f. Will the sponsor likely request USACE assistance in acquiring real estate? (If "yes", provide description). (~~Yes~~/No)

III. Other Project Variables

a. Will the sponsor's staff be located within reasonable proximity to the project site? (Yes/~~No~~)

b. Has the sponsor approved the project/real estate schedule/milestones? (Yes/~~No~~)

IV. Overall Assessment

a. Has the sponsor performed satisfactory on other USACE projects? (Yes/~~No~~)

b. With regard to this project, the sponsor is anticipated to be: ~~highly capable~~/fully capable ~~moderately capable marginally capable insufficiently capable~~. (If sponsor is believed to be "insufficiently capable", provide explanation.)

V. Coordination

a. Has this assessment been coordinated with the sponsor? (Yes/~~No~~)

b. Does the sponsor concur with this assessment? (If "no", provide explanation). (Yes/~~No~~)

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