

**AGREEMENT TO ESTABLISH AN
IN-LIEU-FEE AQUATIC RESOURCE MITIGATION
PROGRAM
FOR THE STATE OF MISSOURI**



Submitted to:



U.S. Army Corps of Engineers, Northwestern Division
Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Regulatory Program

Submitted by:

Watershed Land Trust, Inc.



April, 2007

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	BACKGROUND AND PURPOSE	1
3.0	SPONSOR QUALIFICATIONS	2
4.0	PROGRAM OPERATION/ADMINISTRATION	3
5.0	WATERSHED PLANNING	4
6.0	INTERAGENCY REVIEW TEAM	4
7.0	MITIGATION REQUIREMENTS	5
8.0	SITE SELECTION	5
9.0	MITIGATION PLANS	6
10.0	MITIGATION FEES	7
11.0	ACCOUNTING	8
12.0	PROTECTION OF MITIGATION SITES	9
13.0	TIME FRAME FOR MITIGATION IMPLEMENTATION	9
14.0	GOOD FAITH	10
15.0	AMENDMENT AND TERMINATION	10
16.0	FORCE MAJEURE	10
17.0	EXECUTION	10
	APPENDIX A	21
	APPENDIX B	26
	MITIGATION GUIDELINES	27
	RIPARIAN BUFFER RESTORATION	28
	BANK STABILIZATION	29
	AQUATIC HABITAT CREATION	30
	DAYLIGHTING	32
	DAM REMOVAL	32
	WETLAND ENHANCEMENT, RESTORATION, CREATION	33
	MITIGATION REFERENCES	33
	APPENDIX C	36
	CHECKLIST: COMPENSATORY MITIGATION PLAN	37

1.0 INTRODUCTION

This document (the Agreement) establishes an in-lieu-fee (ILF) mitigation agreement between the Watershed Land Trust, Inc. (WLT) and the Kansas City, the St. Louis, the Rock Island, the Memphis, and the Little Rock Districts of the U.S. Army Corps of Engineers (USACE). This Agreement establishes the mechanism to compensate for adverse impacts to wetlands, streams, and riparian areas (aquatic resources) throughout Missouri. The WLT will cooperate with the USACE, U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (USEPA), and other appropriate organizations to manage an ILF mitigation program designed to replace aquatic resource functions and values that are lost as a result of the USACE permit process under the authority of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The WLT will establish the Aquatic Resources Trust Fund (ARTF) for receipt and disbursement of mitigation in-lieu-fees collected from USACE permit recipients.

2.0 BACKGROUND AND PURPOSE

The Clean Water Act (33 USC 1251 et seq.) establishes the basic regulatory structure to restore and maintain the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water." Additionally, Section 10 of the Rivers and Harbors Act prohibits the unauthorized obstruction or alteration of any navigable water of the United States. The USACE administers a permit program for both the discharge of dredge and fill materials into waters and wetlands of the United States under Section 404 of the CWA and for activities in navigable waters under Section 10 of the Rivers and Harbors Act. The Section 404 permit program relies on the use of compensatory mitigation to offset unavoidable aquatic resource impacts by replacing functions and values lost to authorized activities.

ILF agreements may be used to compensate for impacts authorized by USACE permits if the agreement is developed, reviewed, and approved using current guidance for the development of ILF agreements as published in the Federal Register. ILF monies must be used for replacing aquatic resource functions and values consistent with existing regulations and associated permit conditions. The purpose of this Agreement is to:

- Identify and assess ecologically appropriate wetland, stream, and riparian restoration opportunities in Missouri;

- Implement practical plans to protect, purchase, enhance, restore, and monitor as many aquatic resources as possible with the funds available in a timely fashion;
- Establish financial, technical, and legal mechanisms to ensure long-term success of compensatory mitigation sites authorized by USACE permit.

3.0 SPONSOR QUALIFICATIONS

The Watershed Land Trust, Inc. (WLT) is a nonprofit corporation with 501(c)(3) public charity status founded in 2007 with one of its primary purposes of facilitation of the In-Lieu Fee Program with the USACE. The WLT works closely with the Watershed Institute, Inc. and its staff.

The Watershed Institute, Inc. (TWI) is a not-for-profit Kansas corporation founded in 2003 and incorporated in 2004 to advance the science of natural resource conservation, holistic watershed management, and habitat restoration. The WLT team in association with TWI provides a multidisciplinary approach with staff skilled in public affairs, business, self-sustaining stream design, fluvial geomorphology, stream ecology, wildlife biology, endangered species conservation, and environmental and water rights law as well as other areas of the law. WLT and TWI staff have over 100 years cumulative experience in streambank stabilization, wetland, stream and riparian restoration, aquatic and terrestrial ecological assessments, threatened and endangered species surveys and management plans, critical habitat identification, habitat mitigation and restoration, ecological monitoring, environmental permit compliance, contract law, environmental law, and water rights law.

Aquatic habitat rehabilitation is the primary focus of WLT. The WLT approach integrates stream stability and natural channel design concepts into stream, riverine wetland, and floodplain and watershed management services. WLT objectives are to create or rehabilitate wetlands, stabilize stream banks, improve habitat for native aquatic species, and restore the appropriate vegetative community at degraded stream and wetland sites. WLT team has provided field survey, structure design, and environmental permitting services on over 160 small stream and wetland projects (Appendix A). WLT team has also provided these services for projects on numerous small fluvial systems and major waterways including the Kansas, Republican, Delaware, Smoky Hill, Big Blue, Little Blue, Neosho, Cottonwood, and South Fork Ninnescah rivers.

4.0 PROGRAM OPERATION/ADMINISTRATION

WLT will establish a restricted account—ARTF—to handle and manage all fees received from USACE permittees and other entities. Funds shall be used solely for activities directly related to physical aquatic habitat and resource establishment, stabilization, restoration, enhancement, and protection to include the following: development and implementation of physical mitigation and monitoring, long-term management of mitigation parcels, administrative costs, overhead costs, and purchase of permanent easements, legal expenses, and land acquisition.

At the time funds are deposited in the ARTF, WLT Executive Director shall receive an overhead reimbursement equal to 10% of the funds. The overhead reimbursement will be used for expenses directly related to the day-to-day management of the ILF program and the ARTF. Sole authority and responsibility for decisions related to the use of deposited overhead reimbursement funds and administrative costs and expenditures shall be with WLT Executive Director. It is the intent of WLT to maximize the amount of funds that will be directly applied to the establishment, restoration, enhancement, and protection of aquatic resources. The WLT Executive Director will be the financial comptroller and manager of the ARTF.

After USACE determines that stream mitigation for a permitted activity is eligible for ILF payment, USACE will apply the Missouri Stream Mitigation Method to determine the total stream credits needed as mitigation. The permittee could then contact WLT to determine the amount of payment to offset the authorized impacts to the aquatic resources, the costs of long-term maintenance, monitoring, management and enforcement. If accepted by the permittee, WLT will identify a potential site, apply the Missouri Stream Mitigation Method to determine total stream credits to be restored, enhanced or preserved, develop and implement the compensatory mitigation plan. Wetland areas will be determined by acreage of impact (authorized) and acres of restoration, enhancement, etc. Wetland mitigation will predominately be at one location while stream credits can be accrued at multiple sites. Per USACE request, WLT may accrue mitigation payments from multiple permitted projects and apply to one large mitigation action. Additionally, WLT will ensure that all required federal, state, tribal, and local permits are obtained prior to implementation of projects carried out under the Agreement. The legal responsibility ensuring mitigation terms are satisfied fully will lie solely with WLT. WLT will provide an annual report to the USACE and the Interagency Review Team (IRT) documenting

funds received, approved ILF projects, fund disbursement, habitat types created, restored or enhanced, and the success of projects conducted under the Agreement.

5.0 WATERSHED PLANNING

WLT will identify and prioritize aquatic resource mitigation projects that serve the purposes of this Agreement. WLT will use a variety of available resources to prioritize projects and focus expenditure of ILF funds within a watershed that is biologically similar and hydrologically related to the area generating the funds. Project recommendations will be based on priority criteria, proximity to the permitted activity, similarity of habitat types, number of required mitigation credits, and availability of perpetual protection.

6.0 INTERAGENCY REVIEW TEAM

With implementation of the Agreement, USACE will establish and chair a IRT to include representatives of the following entities:

- U.S. Army Corps of Engineers – Appropriate District(s) Regulatory Branch processing the respective proposed permit action.
- U.S. Environmental Protection Agency – Watershed Planning and Implementation Branch
- U.S. Fish and Wildlife Service –Ecological Services Office
- Missouri Department of Natural Resources (MDNR)
- Missouri Department of Conservation (MDC)
- WLT

The IRT will provide recommendations and general guidance in development of the ILF document. Additionally, the IRT will meet annually to field review planned and implemented mitigation projects. WLT will provide an annual accounting of ILF fund expenditures to the IRT. IRT recommendations will ensure a careful consideration of the ecological suitability of compensatory mitigation sites, the technical feasibility for proposed mitigation techniques, and the long-term protection and maintenance of restoration sites funded under the Agreement.

7.0 MITIGATION REQUIREMENTS

The evaluation of aquatic resource impacts and determination of compensatory mitigation requirements lie solely with the USACE. When applicable, the USACE will provide WLT contact information to eligible permit recipients. Upon request, WLT will submit a cost estimate to the permittee for development and implementation of restoration actions that comply with USACE-determined mitigation requirements. Acceptance or rejection of the cost estimate lies solely with the eligible permittee.

8.0 SITE SELECTION

It is recognized by all parties that the Agreement will only be used in situations where compliance with the mitigation sequence of the Section 404(b)(1) Guidelines has occurred. The Guidelines require that compensatory mitigation occur after all appropriate and practicable steps have been taken to first avoid and then minimize aquatic resource impacts. Compensatory mitigation will be habitat-based and focus on the Clean Water Act goals to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Specific emphasis will be on the restoration and enhancement of aquatic resources to offset impacts and losses from USACE permitted activities. Other relevant information on comprehensive watershed function will be evaluated as available and incorporated into site selection and mitigation planning. Compensatory mitigation projects selected and funded under this Agreement must be located in the State of Missouri and should:

- Provide, to the extent possible, replacement of the amount, type, and function of aquatic resources impacted or lost by permitted activity
- Be designed for long term geomorphic stability and self-sustaining function
- Have provisions for long-term permanent management and protection by a responsible state agency, federal agency, or nonprofit corporation

Using the resources in Table 1 as a guide, WLT will select sites based on the following priority:

1st – Within the HUC 11 of the authorized activity.

2nd – Within the HUC 8 of the authorized activity.

3rd – Within the HUC 4 of the authorized activity.

4th – Outside the HUC 4 of authorized activity. (Will require prior approval of the USACE and IRT).

9.0 MITIGATION PLANS

Compensatory mitigation plans will be developed by WLT for each ILF eligible site and will include the application of the Missouri Stream Assessment Method to determine the mitigation credits generated by the specific mitigation project(s). Through Public Notice No. 200400295 (July 30, 2004), the USACE, Kansas City District (KCD) established Mitigation Guidelines and a Compensatory Mitigation Checklist for use in developing compensatory mitigation plans. WLT will use this Checklist (see Appendix C) and follow KCD Guidelines for all ILF projects. Although habitat preservation will be one mitigation option, to ensure compliance with *Federal Guidance*, WLT will emphasize restoration, enhancement, or creation over preservation. Each plan will contain the following:

- Assessment and quantification of aquatic resource functions and values impacted or lost to a permitted activity.
- Location and baseline habitat condition of proposed mitigation site.
- Goals and objectives of the mitigation plan to include the techniques proposed and anticipated gain in habitat quality and quantity.
- Work plan to include the boundaries of mitigation area; timing and sequence for survey, design, and construction; operation and maintenance schedule; vegetation planting schedule and weed control; erosion control; and additional management considerations.
- State and federal permit requirements.
- Water Quality Project Plan to ensure protection of receiving stream, including best management practices to prevent accidental introduction of exotic or invasive species to the mitigation site.
- Estimated cost to accomplish the mitigation work, including administrative fees.
- Performance standards to determine ecological success and/or identify remedial actions necessary to successfully establish the site.
- Long term management plan to include responsibility for remedial actions, reporting schedule, monitoring protocols, financial, technical, and legal protections.

- Plans for stream mitigation will include the application of the Missouri Stream Assessment Method to determine the mitigation credits generated by the specific mitigation project(s).

Over the first five years of all mitigation projects, WLT will provide an annual status report to the USACE and IRT.

10.0 MITIGATION FEES

WLT will determine appropriate fees to meet compensatory mitigation requirements for each ILF project. Upon receipt of the mitigation fee from a permitted entity, WLT will assume the responsibility of mitigation planning, implementation, monitoring, and long-term maintenance and management. Acceptance of a mitigation fee by WLT is an acknowledgement by WLT that it, and not the contributing party, is responsible for satisfying the mitigation requirements of the Section 10 or Section 404 permit, Section 401 Certification, or settled enforcement action. WLT reserves the right to reject any fee. Once said fee is received by WLT it is non-refundable.

The fee structure for individual ILF projects will be habitat-based and include all reasonable costs for implementing ILF projects including:

- Review of mitigation requirements and ILF fee negotiations
- Mitigation planning and design
- Construction
- Acquisition and permanent protection of the site
- Long-term maintenance, monitoring, and management
- Administrative, accounting, and legal costs
- Obtain necessary permits and clearances
- Contractor oversight
- WLT overhead (10%)

The fee structure will be categorized by mitigation treatment (e.g. riparian buffer restoration, stream bank stabilization, aquatic habitat creation) with fee for projects involving more than one treatment as the sum of each treatment cost. The fee structure will provide a breakdown to include salaries and benefits, legal costs, equipment, materials, subcontractors, other direct

costs—mileage, meals, lodging, telephone, postage—and administrative overhead for each mitigation technique plus other related costs.

Due to variability in project size and location, geomorphic setting, habitat conditions, and level of impact, it is difficult to standardize mitigation fees on a linear foot, per acre, or per credit basis. However, to provide a timely cost estimate for eligible projects WLT will seek to standardize mitigation costs to the extent practicable. Project costs will be influenced by, but not limited to the following factors:

- Length and/or acreage of mitigation area.
- Type of mitigation technique used: stream bank stabilization, riparian restoration, stream restoration, aquatic habitat creation, etc.
- Location of, and access to, the mitigation site.
- Design time.
- Local material cost.
- Local hourly cost of equipment.
- Local labor cost.
- Access to, amount needed, and price of native grass seed, bare-root tree seedlings, and other vegetation.
- Local real estate market.
- Legal costs
- Accounting costs
- Marketing costs

11.0 ACCOUNTING

WLT agrees to receive and expend fees in the manner and with the limitations described in this Agreement. Mitigation fees will be delivered to WLT by cash, certified check, or money order and held in a separate, federally-insured interest-bearing account (ARTF) to earn interest while maximizing the safety and preservation of the principal fees. WLT will account for the funds in accordance with generally accepted accounting principles. WLT will establish and maintain a written record of funds received to document date received, source of funds, USACE permit number, permit applicant, mitigation credits purchased, cost per credit, and disbursement for mitigation plan implementation. WLT will provide an annual accounting statement to the USACE and the IRT. With reasonable notice, the ARTF and WLT accounting practices will be

subject to audit when requested by the USACE or the IRT. Interest earned through the established banking instrument, donations from non-permitted entities, and assets left over from mitigation projects will remain in the ARTF for long-term maintenance and monitoring, future mitigation projects, and administrative costs.

12.0 PROTECTION OF MITIGATION SITES

WLT will ensure that all compensatory mitigation sites are permanently protected. With approval by the USACE and IRT, WLT may transfer interest in land to appropriate state or federal agencies, nonprofit corporations, local governments, or qualified land trusts. In all cases, WLT will procure appropriate legal agreements—conservation easements, deed transfer, deed restrictions, restrictive covenants, Memorandum of Agreement of Operation, signed assurances, or other legally binding agreement—to ensure that both publicly-owned and other properties are protected in perpetuity as viable aquatic habitats and resources serving the functions and values required by the USACE permit conditions. The protection agreements will prohibit physical alterations including, but not limited to agriculture, logging, mining, mowing—unless approved by the IRT—and land development. Long-term funding, monitoring and management responsibility for each compensatory mitigation site will remain with WLT.

13.0 TIME FRAME FOR MITIGATION IMPLEMENTATION

WLT is committed to developing compensatory mitigation projects that fully offset stream, wetland, and riparian impacts within a reasonable time of permit action. To reduce the time between permitted impact and compensatory mitigation, and ensure compliance with federal guidance, WLT will initiate a project within 12 months of receipt of sufficient ILF funds for that project. For purposes of this Agreement, the term “initiate” means that a site has been identified and mitigation plan is being developed. The completion of physical habitat improvements should not exceed two years from the receipt of sufficient funds from the permit recipient. If unforeseen circumstances prevent compliance with this timeframe, WLT will submit an amended implementation schedule and work plan to the USACE for approval. In recognition of initial funding and planning challenges, the USACE approves in advance that compensatory mitigation fees collected in the first and second year of ARTF establishment shall be obligated and initial physical and biological improvements shall be completed no later than the third full growing season of the ARTF existence.

14.0 GOOD FAITH

The signatory parties agree that all will exercise their rights and obligations contained in this Agreement in good faith. The parties also agree that it is their desire to facilitate the process set forth in this Agreement by open and timely communication and cooperation.

15.0 AMENDMENT AND TERMINATION

This Agreement may be amended by written approval of the USACE and WLT. While the USACE will consult with the IRT on proposed amendments, final approval authority lies with the USACE. Termination of this Agreement will require ninety (90) days written notice to the other signatory party and the IRT. Within sixty (60) days of written notice of termination, the signatory parties and the IRT shall meet to discuss the reasons for notice and any actions that may address the concerns leading to a desire to terminate the Agreement.

Prior to termination, WLT will provide a complete accounting of ILF funds received and disbursed along with uncompleted projects and associated remaining funds. Where feasible, all outstanding projects having available funds will be completed, with perpetual protection insured, prior to termination of this Agreement. Upon termination, the USACE and IRT will direct remaining funds as appropriate.

16.0 FORCE MAJEURE

Nothing contained in this Agreement shall be construed to impose upon the parties any liability arising from circumstances beyond the parties' control, including unauthorized actions by third parties, natural disasters such as drought, fire, storm, climate change, and earth movement, or from any prudent action taken in good faith by the parties under emergency conditions to prevent, abate, or mitigate significant injury to protected property resulting from such causes. The USACE shall make the final determination as to whether or not any corrective action by the ILF Administrator is required.

17.0 EXECUTION

Execution of this In-lieu-fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S.

Fish and Wildlife Service, and other appropriate agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

UNITED STATES ARMY CORPS OF ENGINEERS, KANSAS CITY DISTRICT

By: _____ **Date:** _____
Roger A. Wilson, Jr., Colonel, District Commander

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION SEVEN

By: _____ Date: _____
Margaret E. Stockdale, Chief, Watershed Planning and Implementation Branch

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

WATERSHED LAND TRUST, INC.

By: _____ **Date:** _____
FRANK L. AUSTENFELD, EXECUTIVE DIRECTOR

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

U.S FISH & WILDLIFE SERVICE, MISSOURI ECOLOGICAL SERVICES OFFICE

By: _____ **Date:** _____
Charles M. Scott, Field Supervisor

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

Missouri Department of Natural Resources, Division of Environmental Quality

By: _____ **Date:** _____
Daniel Schuette, Director

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

Missouri Department of Conservation, Policy Coordination Division

By: _____ **Date:** _____
Jane Epperson, Policy Supervisor

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

UNITED STATES ARMY CORPS OF ENGINEERS, ROCK ISLAND DISTRICT

By: _____ **Date:** _____
Robert Sinkler, Colonel, District Commander

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

UNITED STATES ARMY CORPS OF ENGINEERS, SAINT LOUIS DISTRICT

By: _____ **Date:** _____
Louis F. Setliff III, Colonel, District Commander

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

UNITED STATES ARMY CORPS OF ENGINEERS, MEMPHIS DISTRICT

By: _____ **Date:** _____
Thomas P. Smith, Colonel, District Commander

Execution of this In-lieu Fee Compensatory Mitigation Agreement by the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers, in consultation with the sponsor, The Watershed Land Trust, Inc., the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other selected agencies and the implementation of its terms evidences that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts., Corps of Engineers has afforded all cooperating parties (Review Team) an opportunity to comment on the undertaking and its effects on the aquatic resources in the State of Missouri and that the Kansas City, St Louis, Rock Island, Memphis, and Little Rock Districts, Corps of Engineers has taken into account the comments provided by the Review Team on the identified aquatic resources in order to complete this agreement.

Concur:

UNITED STATES ARMY CORPS OF ENGINEERS, LITTLE ROCK DISTRICT

By: _____ **Date:** _____
Donald E. Jackson, Jr., Colonel, District Commander

APPENDIX A

STREAM REHABILITATION PROJECTS

TWI Staff Stream Rehabilitation Experience

County	Name	Stream	Feet
Allen	Geffert	Neosho	2,300
Brown	Heinen	Craig Creek	600
	Finney	Wolf River	400
Butler	Sturbenz		300
	McLaren	W. Walnut	500
	Seibel	Hickory	550
Chase	Barett	Cottonwood River	500
	Sauble	Cedar Creek	900
Clay	Cotts	Republican River	4,300
	Mugler	Republican River	2,200
	KDWP	Republican River	1,650
	Koch	Republican River	1,320
	Long	Republican River	700
Cloud	Drainage	Republican River	1,100
	Dorman	Republican River	1,200
	Lynch	Solomon River	400
Cowley	Toma	Grouse Creek	240
	Stewart	Grouse Creek	200
	Stewart	Timber Creek	600
	Barber	Timber Creek	600
	Sunflower	Stewart Creek	650
Dickinson	Mills 1	Smoky Hill River	900
	Mills 2	Smoky Hill River	2,350
Douglas	Leslie	Kansas River	2,225
Ellsworth	Pflughoeft	Smoky Hill River	1,110
Geary	Stewart	McDowell Creek	440
Greenwood	KDWP	Otter Creek	500
	Ed	Bachelor Creek	400
Harvey	Schroll	unnamed	150
Jackson	Dickinson	Straight Creek	650
	Reed	Soldier	600
	Pottawattomi	Soldier	650
	Sudbeck	Soldier	500
	Douglas	Muddy Creek	650
		Banner	250
Jefferson	Ewert 1	Nine Mile Creek	350
	Ewert 2		530
	Swaney	Delaware	750
	Jeff Farms	Delaware	600
	Dorthy	Slough Creek	200
	Robb	Kansas River	800
Jewell	Leece	Republican River	850
	Leece	Republican River	750
	Rathman	Republican River	900
	Hansen	Republican River	1,500
	Ely	Republican River	1,200
Johnson	Overland Park	Deer Creek	250
	Overland Park	Tomahawk	200
	Johnson County	Antioch Park	500

TWI Staff Stream Rehabilitation Experience			
Johnson	Lenexa	Manchester Park	1,200
Kearny	Bob Price 1	Arkansas River	400
	Bob Price 2		320
	Bob Price 3		750
Kingman	Pace	S. F. Ninnescah	2,500
Leavenworth	Linwood	Stranger Creek	1,150
	Norman	Stranger Creek	850
Lincoln	Hoffman 1	Spring Creek	440
	Hoffman 2	Spring Creek	160
	Hoffman 3	Spring Creek	160
Linn	Highway	Big Sugar	600
Lyon	Stanford	Elm Creek	800
Marion	Johnson	N. F. Cottonwood	450
	County	N. F. Cottonwood	850
	Peabody	Spring Creek	200
Marshall	Petr 1	Elm Creek	680
	Petr 2	Elm Creek	550
	Petr 3	Elm Creek	400
	Nietfeld	Big Blue River	1,700
	Wilson	Walnut Creek	105
	Rudolph 1	Big Blue River	1,900
	Rudolph 2	Big Blue River	1,700
	Bigalow Twnbsp	Black Vermillion	645
	Pishney	Little Blue River	800
	Holle	Horseshoe Creek	750
McPherson	Shogren	Sharps Creek	500
	Dalhsten	Smoky Hill River	1,050
	Shogren	Smoky Hill River	400
	Ade	Smoky Hill River	800
	Johnson	Smoky Hill River	950
Mitchell	Campbell	Salt Creek	350
Morris	Amos	Elm Creek	1,000
	Collier	Munkers Creek	800
Nemaha	Schmidtz	Clear Creek	930
	Rettle	Clear Creek	750
	Becker	Harris Creek	300
	Becker	Dutch Branch	200
	Koester	Nemaha	1,100
	Haverkamp	Nemaha	1,100
	Feldkamp	Nemaha	1,200
	Sudbeck 1	Nemaha	800
	Sudbeck 2	Nemaha	1,000
	Sextro	Nemaha	1,100
Neosho	Fairfield	Clear Creek	500
	Kepley	Neosho	1,150
	King	Neosho	1,000
	Cutoff	Neosho	800
	Criser	Little Canville Crk.	300
Pottawattomie	Reece	Rock Creek	300
Riley	Sump	Otter Creek	150
	Richter	Fancy Creek	650

TWI Staff Stream Rehabilitation Experience				
Riley	Stumpff	Deep Creek	475	
	SBC	Wildcat Creek	600	
	?	Wildcat Creek	200	
	Mitchell	Wildcat Creek	300	
	COE	File Creek	650	
	Wienk	Swede Creek	150	
	Saline County	Land Institute	Smoky Hill River	1,000
Ryan Brothers		Smoky Hill River	1,600	
Lynch		Mulberry Creek	275	
Sedgwick	Schuster	Ninnescah River	1,700	
	Pauly	Ninnescah River	1,200	
	Mitchell	Little Arkansas	1,400	
Shawnee	Bilou	Trib to Wetstone	1,200	
	Garrett	Wakarusa River	460	
	Eakes	Stinson	200	
	Faith	Wetstone Creek	100	
		Soldier	300	
		Baxter	Wakarusa River	450
	Sumner	Gilliam	Ninnescah River	2,000
Wabaunsee	Schmidt	Spring Creek	600	
	Peters	Trib to Mill Creek	75	
	Miller	Kansas River	1,000	
Washington	Hennerberg	Little Blue River	2,100	
	Brenneis	Little Blue River	2,500	
	Stapulous	Little Blue River	1,250	
	Martin	Little Blue River	1,150	
	Martin - Jueneman	Little Blue River	1,240	
	Jueneman	Little Blue River	1,400	
	Neumann	Little Blue River	1,200	
	Hynek	Little Blue River	1,500	
	Callendar	Little Blue River	1,180	
	Travelute	Little Blue River	1,500	
	Callendar	Little Blue River	1,050	
	Mueller	Little Blue River	1,400	
	Goeckel	Little Blue River	1,500	
	Goeckel	Little Blue River	336	
	Imming	Little Blue River	2,016	
	Bruna	Little Blue River	882	
	Bruna	Little Blue River	900	
	Bruna	Little Blue River	1,360	
	Turk	Little Blue River	950	
	Bruna	Little Blue River	1,375	
	Jueneman	Little Blue River	1,140	
	Clark	Little Blue River	2,500	
	Jueneman	Little Blue River	950	
	Krainbill	Little Blue River	1,200	
	Krainbill	Little Blue River	800	
	Krainbill	Little Blue River	2,000	
	Hynek	Little Blue River	1,150	
Hynek	Little Blue River	1,150		
Jandera	Little Blue River	1,800		

TWI Staff Stream Rehabilitation Experience			
Washington	Bruna	Little Blue River	1,800
	Wilkinson	Little Blue River	1,950
	Kennedy	Little Blue River	1,200
	Yungeberg	Little Blue River	1,200
	Hatesohl	Trib to Coon Crk.	150
	Schwartz	Mill Creek	500
	Rogge	Peats Creek	500
	County	Mill Creek	475
	Meyer	Horseshoe Creek	500
Wilson	Kenny		300
			145,194 feet
			27.50 miles

TWI Wetland Project Experience			
County	Name		
Brown	Iowa Tribe	Wetland	1
Butler	Fry	Wetland	1
	Blankenship	Wetland	1
Jefferson	Mellard	Wetland	1
Lyon	Peterson	Wetland	1
Neosho		Wetland	1
		Wetland	1
Shawnee	Balch	Wetland	2
Jackson Co. Mo.	County	Wetland	1
TOTAL			10

APPENDIX B

MITIGATION GUIDELINES/TECHNIQUES

MITIGATION GUIDELINES

While the following mitigation practices are often considered “restoration,” WLT believes that true restoration (the return of an aquatic system to a pre-settlement state) is not possible given the present climate, land use patterns, and anthropogenic conditions. Therefore, as part of the ILF program, WLT proposes to assess and rehabilitate altered or degraded streams, wetlands and riparian areas to the best function and value the particular system is capable of supporting under present conditions. Therefore, compensatory mitigation projects will aim to establish the maximum physical, chemical, and biological functions and values possible within the existing environmental context. No poured concrete or concrete rubble will be used in any mitigation effort. When feasible, plantings will use material from within a 200-mile radius of the mitigation site to protect local genotypes.

Stream mitigation plans will be designed to offset the impacts of a proposed project through the establishment of riparian corridors; stabilization of eroding banks and channel grade; enhancement of in-stream habitat; reconstruction of channelized reaches; removal of dams, culverts, or other barriers to fish passage; and “daylighting” buried streams. Mitigation opportunities may be found on stream sites having:

- Channelized or impounded reaches
- Concrete or rip rap lined reaches
- Sections of eroding bank
- Areas with little or no riparian vegetation
- Sites with poorly construction road crossings
- Urban streams with minimal in-stream habitat
- Rural streams having degraded riparian or in-stream habitat

Stream sites with potentially greater ecological benefits will receive higher priority for mitigation. Specific techniques and credit ratios will be determined on the basis of the functions and values of the impacted habitat. The primary categories of mitigation treatments and specific techniques are provided below. The Missouri Stream Assessment Method and appropriate worksheets will be used for all stream mitigations.

RIPARIAN BUFFER RESTORATION

If the mitigation stream does not have an established riparian buffer, the mitigation plan will include the re-establishment of such. Buffer width should typically extend landward from bankfull elevation for 100 feet on both banks or for two times the width of the stream, whichever is greater. For large waterways where two times the width is not feasible, a minimum buffer of 150 feet landward from the bankfull elevation will be established. WLT reserves the right to adjust buffer widths to account for site specific factors such as steep slopes, highly erodible soils, or land uses that may contribute to high sediment yields. Mitigation credit may be given for increasing the buffer width on streams with minimal vegetation, improvement of the species mix or structural diversity at a site, and for livestock exclusion.

Specific Techniques

Live Staking is a practice where short (2 feet long) sections of tree and shrub branches are driven into moist ground where they establish roots systems and sprout leaves. Willows are most commonly used in this practice, although other species are acceptable. When correctly situated, these systems will provide dense cover suitable for avian species.

Live Fascines are bundles of tree or shrub branches placed in long trenches and covered with soil. The bundles of material develop roots, branches, and leaves providing a linear row of vegetation to prevent erosion and provide terrestrial habitat. Fascines can also be used to drain wet slopes. This vegetative method breaks slopes into shorter slopes separated by benches created by the fascines.

Brush Mattresses are dense layers of small tree and shrub limbs placed directly on the soil surface and fastened in place with live or dead stakes and covered with soil. This practice provides immediate surface protection and erosion control over a large surface area. Brush mattresses are resistant to high water velocities and create dense stands of vegetation.

Native Grass Planting involves planting an area with a suitable mixture of native grasses. Species combination and seed mixture will vary depending on the local climate and soils.

Bare-root Tree and Shrub Planting requires planting various species of trees and shrubs with established root systems. This style of planting allows a greater diversity of species to be planted within the riparian corridor.

Nut Planting is suitable for mast producing trees such as oaks, walnuts, and hickories along with seed bearing tree species such as maples, ash, redbud, and box elder.

Live Pole Planting places large, long trees or limbs in deep holes in the ground. Larger trees establish quickly stabilizing slopes having geotechnical soil failures. This practice can be used to create instant shade.

Branchpacking involves placing alternate layers of un-rooted cuttings and soil. It is useful in establishing vegetation in conjunction with bank shaping. Vegetation establishes quickly along the streambank or slope filtering pollutants from moving water. Branchpacking is also used for gully repair.

Brush Layering is similar to branchpacking and provides immediate soil reinforcement via developing root systems and is suitable for large slopes.

Willow Curtains requires placing larger willow trunks and limbs in shallow trenches on low banks, perpendicular to streamflow. Vegetation rows establish quickly providing roughness to slow water velocities and creating terrestrial habitat.

BANK STABILIZATION

Bank stabilization will incorporate flow redirection and bioengineering techniques that slow near-bank velocities and protect actively eroding areas. Re-sloping actively eroding banks and restoring an appropriate riparian community will be included in most stabilization projects.

Specific Techniques

Root Wads are a combination of tree trunks, with roots attached, and rocks placed along the outside bend to slow water velocities. Properly placed, root wads stabilize streambanks while providing scour holes and overhanging fish cover.

Vanes are a re-directive streambank stabilization method composed of rock and/or logs. Vanes are sharply angled into the stream flow and taper from the streambed elevation to a given design height near the streambank. These structures protect a vertical distance equal to 2X their height and are suitable for use on narrow streams or streams with a low width/depth ratio. Vanes can be enhanced with locked limbs, willow curtains, and instant shade.

Bendway Weirs are another re-directive method of streambank stabilization. These structures are low, level-crested rows of rock constructed in the stream channel. Weirs are designed at a slight angle into the stream flow. Water passing over the weir is redirected away from the streambank reducing water velocities in the near bank region and resulting in sediment deposition along the streambank. Weirs are normally used in streams with high a width/depth ratio due to their ability to reduce the w/d ratio and induce the stream toward a naturally stable type. On sand and gravel bed streams, weirs create scour holes on the streamward end. On many streams, scour holes provide immediate aquatic habitat which can be enhanced with locked limbs and in some cases, instant shade.

Live Cribwalls are a rectangular framework of logs layered with alternating soil and live cuttings. They also provide overhanging cover while protecting streambanks from erosion.

Properly constructed cribwalls provide excellent habitat for a variety of avian and terrestrial species.

Log Deflectors may function alone or in conjunction with another deflector or rootwad to direct flow away from unstable bank conditions. The effect will mimic a fallen tree within the channel, redirect flow toward the channel center, and create a scour pool on the downstream side.

Lunker Boxes act as an undercut bank but provide solid structure preventing bank slump. Lunkers may be constructed of wood or plastic and are buried along the stream bank just below the water line.

Cross Vanes are a row of rock that span the stream channel and function similar to a natural riffle. Cross vanes can be used to stabilize a degrading stream bed. A properly designed series of cross vanes can restore a stable streambed elevation in an incising stream channel or restore a natural riffle sequence to a channelized stream. Cross vanes should only be used in a pattern compatible with a natural stream riffle/pool sequence.

W-Weirs are normally constructed with rock to stabilize streambed gradients. They are also used in conjunction with bridges to reduce build up of large woody debris on bridge pilings. W-weirs will create multiple scour pools diversifying aquatic habitat.

J-Hook Vanes are similar to simple rock vanes, but create scour pools diversifying aquatic habitat.

Live Siltation involves rows of un-rooted cuttings planted perpendicular to stream flow. The result is a row of vegetation that slows water velocities, induces sediment deposition, reduces bank erosion, and increases terrestrial habitat.

Branchpacking (see previous section)

Brush Layering (see previous section)

Tree Revetments are a series of trees anchored along the toe of an eroding bank. They are designed to reduce water velocity, increase sediment deposition within the branches, and reduce bank slumping. Finely branched trees—typically eastern red cedar—are used to increase sediment deposition and bank protection.

Longitudinal Peaked Stone-Toe Protection (LPSTP) is a continuous streambank protection method utilizing rock to protect the toe, or lower portion of a streambank. This practice is often used in conjunction with rock vanes or bendway weirs on meanders with a low radius of curvature or on the lower 1/3 of large, unstable meander bends. This stabilization method can be combined with live staking to provide improved aquatic and terrestrial habitat by creating overhanging cover.

AQUATIC HABITAT CREATION

Aquatic habitat creation will consist of structures that offset limiting factors and enhance fish and macroinvertebrate habitat within the mitigation reach. Specific objectives of these mitigation

techniques are to increase the physical habitat diversity of the stream and create cover. These structures provide stable rock and wood features that increase habitat for a variety of organisms, including benthic invertebrates and several species of native fish. Except for the rock riffle, each structure allows an option to slope the bank and incorporate plantings to enhance the terrestrial habitat of the reach. Installed structures will match the natural, stable characteristics of the mitigation stream.

Specific Techniques

Boulder Clusters are groups of large boulders placed into stream channels to create fisheries habitat by disrupting and varying water velocities. Surface turbulence from boulder clusters may enhance dissolved oxygen levels.

Hydraulic Cover Stones are similar to boulder clusters, but employ single boulders rather than groups of stones.

Locked Limbs consists of combining small trees and other woody debris with bendway weirs. Tree limbs protrude into scour areas to provide overhanging cover for aquatic species.

Rock Riffles A rock riffle acts as grade control and increases substrate heterogeneity, providing habitat for benthic invertebrates and small fish. In most wadeable streams, riffles are the habitat type supporting the richest community of benthic organisms that in turn provide a food base for the fish community. Riffle height can be constructed to either increase backwater pool habitat or in a manner that minimizes backwater effects. Riffles may be constructed with a step-pool pattern allowing up- and down-stream fish passage through culverted systems.

Cross Vanes are similar to riffles but configured to create a downstream scour pool for aquatic habitat.

Newbury Riffles are a type of riffle designed and tested by Dr. Robert Newbury, British Columbia, Canada. The design of Newbury riffles will vary depending on stream type and fish community.

Converging Roller Eddy (CRE) works similarly to the rock riffle but creates more diversity in channel pattern, water velocities and backwater areas. They also increase substrate heterogeneity, providing habitat for invertebrates and small fish. The roller eddy can be used as an alternative to, or in combination with the rock riffle.

Log Deflectors mimic a fallen tree within the channel, redirect flow toward the channel center, and create a scour pool on the downstream side. This structure will increase habitat complexity by providing a variety of depths and current velocities. The log is also an excellent substrate for aquatic macroinvertebrates

Lunker Boxes act as an undercut bank but provide solid structure to prevent bank slump. Lunkers may be constructed of wood or plastic and are buried along the stream bank just below the water line. An open end faces the stream such that fish can swim in for shelter and protection.

These structures provide excellent cover for larger predatory fish species. Locked limbs within the lunker provide habitat for various size fish. The lunker boxes may be placed on the opposite bank and slightly downstream of the log deflector. This ensures sufficient flow through the lunker preventing sedimentation within the structure.

Root Wads diversify habitat complexity by varying current speeds among the roots, providing in-stream and overhead cover for fish, as well as an ideal substrate for other aquatic macroinvertebrates.

Large Woody Debris (LWD) provides a suitable substrate for invertebrates which are the basis of the aquatic food chain. In sand bed streams such as the Republican, Little Blue, South and North Fork Ninnescah, and Arkansas River, LWD is responsible for the bulk of scour holes, over hanging cover and invertebrate habitat.

Submerged Cover Logs provide overhead cover with varying depths and velocities. The log also provides excellent substrate for aquatic macroinvertebrates.

Instant Shade can be created by selectively half cutting trees along a streambank or by transplanting large willows or cottonwood trees in a manner so they provide over hanging cover on the water surface.

J-Hook Vanes create scour pools similar to cross vanes, but extend from one streambank rather than completely across a stream channel.

DAYLIGHTING

Daylighting deliberately exposes some, or all, of the flow of a previously buried river, creek, or stormwater drainage. Daylighting may re-establish a waterway in its old channel where feasible, or require construction of a new channel through excavation and grading. This method may have particular application in urban mitigation settings.

DAM/LOW WATER CROSSINGS REMOVAL

Dam/low water crossing removal is an accepted approach to deal with unwanted, unsafe, or obsolete dams and/or low water crossings. Though dams/low water crossings provide a variety of social benefits, they also cause negative impacts to stream systems and native fauna. Removal may be an appropriate mitigation tool to restore an altered ecosystem in both the rural and urban context.

WETLAND ENHANCEMENT, RESTORATION, CREATION

Previously drained wetlands can often be restored by blocking a drainage system in order to restore the natural hydrology. Enhancement can be accomplished through establishing filter strips, improving hydrology, or by vegetative plantings. Wetland creation establishes a wetland in a suitable area, but one where wetlands did not occur naturally. Filter strips—native grass planting—will be incorporated to provide cover habitat around existing or created wetlands and prevent sediment from filling the wetlands.

Seasonal Wetlands: Suitable for creation throughout the state.

Playa Lakes/Depressional Wetlands. Playa lakes are seasonal wetlands created when rainfall fills shallow depressions in the landscape.

Diked Terrace Wetlands are created by diking gradient terraces on cropland or previously cropped land. The resulting linear band of wetlands provides excellent habitat for amphibians such as chorus frogs, narrowmouth toads, cricket frogs, and aquatic plants such as spike rush and arrowhead.

Perennial Wetlands: Suitable for the State of Missouri.

Bottomland Hardwood Forest habitats where appropriate. Bottomland hardwood forests are normally established—by tree planting—on active floodplains.

Floodplain Wetlands can be created in an active floodplain by excavation of a pool or series of pools, or by building low dikes.

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APPENDIX C

MULTI-AGENCY COMPENSATORY MITIGATION PLAN CHECKLIST

CHECKLIST: COMPENSATORY MITIGATION PLAN

1. Mitigation Goals and Objectives

- Describe functions lost at impact site
- Describe functions to be gained at mitigation site
- Describe overall watershed improvements to be gained

2. Baseline Information for Impact and Proposed Mitigation Sites

- Provide data on physical attributes of sites (soils, vegetation, hydrology)
- Describe historic and existing land uses and resources impacted
- Describe reference site attributes if available

3. Mitigation Site Selection and Justification

- Describe process of selecting proposed site
- Likelihood of success, future land use compatibility, etc.

4. Mitigation Work Plan

- Location
- Construction Plan
- Describe planned hydrology, vegetation, soils, buffers, etc.

5. Performance Standards

- Identify success criteria
- Compare functions lost and gained at impact and mitigation sites
- Describe soils, vegetation and hydrology parameter changes

6. Site Protection and Maintenance

- List parties and responsibilities
- Provide evidence of legal protective measures
- Maintenance plan and schedule

7. Monitoring Plan

- Provide monitoring schedule, identify party(ies) and responsibilities

- Specify data to be collected, including assessment tools and methodologies

8. Adaptive Management Plan

- Identify party(ies) and responsibilities
- Remedial measures (financial assurances, management plan, etc.)

9. Financial Assurances

- Identify party(ies) responsible for assurances
- Specify type of assurance, contents and schedule