

# Griffith's Island Design/Build Report

Kosciusko County, Indiana

September 23, 2004



Prepared for:

Wawasee Area Conservancy  
Foundation  
P.O. Box 548  
Syracuse, Indiana 46567

Prepared by:



708 Roosevelt Road  
Walkerton, Indiana 46574  
574-586-3400

## **GRIFFITH'S ISLAND DESIGN/BUILD REPORT EXECUTIVE SUMMARY**

This project addresses shoreline erosion and associated sediment delivery to Lake Wawasee in Kosciusko County, Indiana. The primary goal of the project was to stabilize the eroding shoreline of Griffith's Island along its southern point. This was accomplished through the utilization of bioengineering techniques. This project was made possible in part by the cooperation of the Wawasee Area Conservancy Foundation and with funding from the Indiana Department of Natural Resources' Lake and River Enhancement (LARE) Program.

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# GRIFFITH'S ISLAND DESIGN/BUILD REPORT KOSCIUSKO COUNTY, INDIANA

## 1.0 PROJECT DESCRIPTION AND PURPOSE

Griffith's Island is located near the southeastern shoreline of Lake Wawasee in Kosciusko County, Indiana (Figure 1). The project involved stabilizing approximately 40 lineal feet of eroding shoreline along Griffith's Island southern point using bioengineering techniques. Wave action had caused portions of the exposed shoreline to collapse or to be slowly washed away. The purpose of the project was to stabilize the eroding shoreline and thereby reduce the delivery of sediment and associated nutrients to Lake Wawasee.

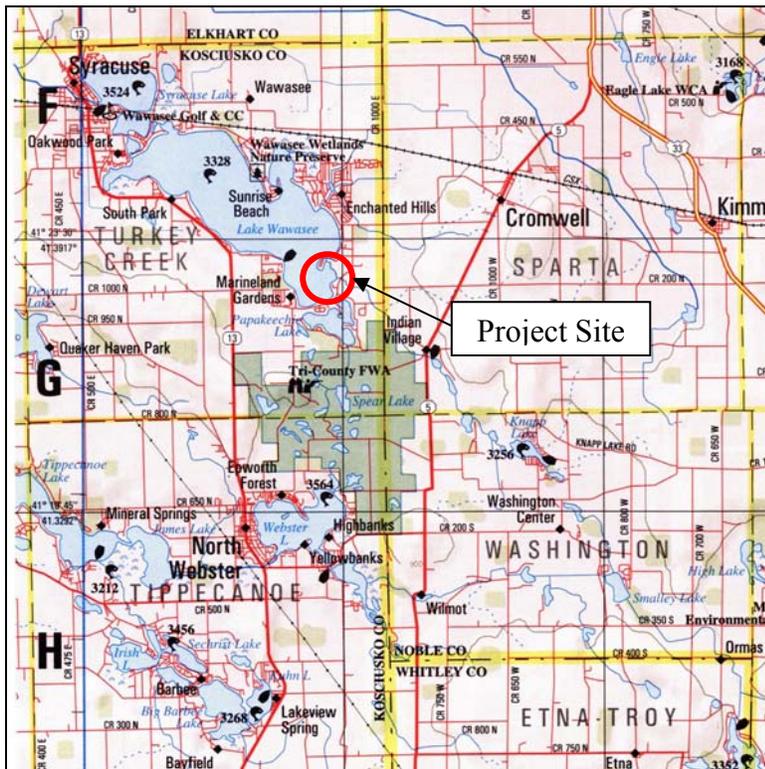


Figure 1. Approximate project site location.

## 2.0 DESIGN RATIONALE

The project was designed to stabilize Griffith's Island shoreline by reducing wave action along the shoreline and stabilizing the slopes with a visually appealing and natural approach. The design called for the utilization of bioengineering techniques. Pre-planted coir logs were installed along the length of the eroded face to protect the shoreline from erosive wave action. A fieldstone toe was placed lakeward of the coir logs to dissipate wave energy. Disturbed areas immediately upslope of the coir logs were seeded with native plant species, covered with an erosion control blanket, and then plugged with additional plants to help stabilize the slope.

### 3.0 DESIGN AND CONSTRUCTION SPECIFICS

#### 3.1 Permitting

Permit applications were submitted to the U.S. Army Corps of Engineers, Indiana Department of Environmental Management, and Indiana Department of Natural Resources. A Regional General Permit was granted from both the U.S. Army Corps of Engineers and Indiana Department of Environmental Management. A permit was issued under the Lake Preservation Act by the Indiana Department of Natural Resources. Permit correspondence can be found in Appendix A. A permit application (notification) is included for the Indiana Department of Environmental Management. Approval for the Regional General Permit is typically issued without notification after a 15-day waiting period if there are no further questions.

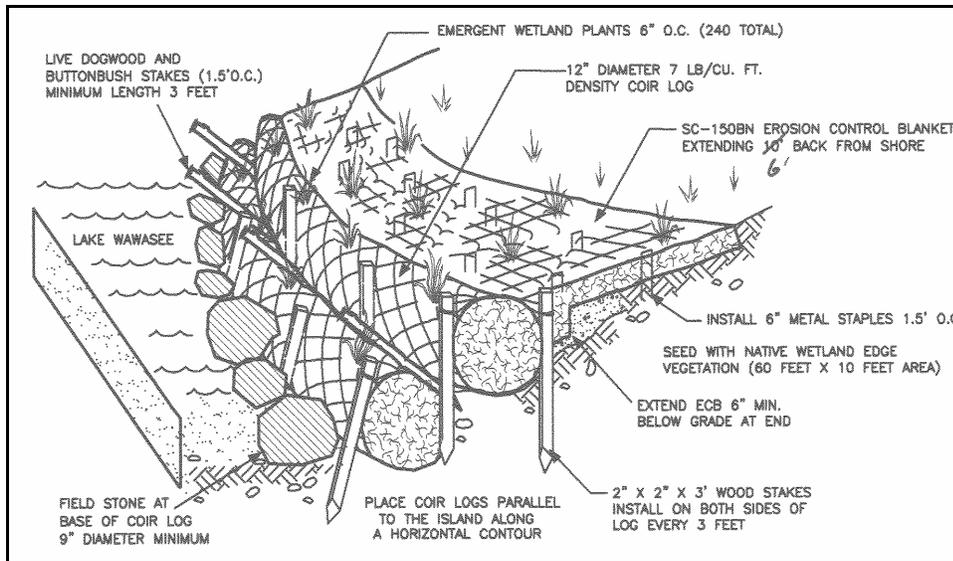
#### 3.2 Coir Logs

Prior to onsite construction, 12-inch diameter coir logs (7 lb/ft<sup>3</sup>) were pre-planted with native emergent wetland plant species at JFNew's nursery. Emergent wetland plants were placed on 6-inch centers within the coir logs and allowed to grow for several weeks at the nursery before being transported to the project site. Once delivered to the project site, the pre-planted coir logs were transported to Griffith's Island on a pontoon boat (Figure 2).



**Figure 2. Pre-planted logs loaded onto a pontoon boat for transport to Griffith's Island.**

Once transported to the island, the pre-planted coir logs were placed in parallel rows to the shoreline. The first coir log was placed approximately two feet lakeward of the island's shoreline and staked into place. The second coir log was placed immediately shoreward of the first coir log and then staked into place. The coir logs were secured by driving 3-foot long wood stakes into the ground every three feet along each side of the coir logs. The coir logs were then lashed in place with 3/8" diameter rope (Figure 3). This method proceeded upslope until a total of four coir log rows were installed. A complete plan view and cross section can be found in Appendix B.



**Figure 3. Cross sectional view showing construction detail.**

### 3.3 Fieldstone

Approximately 3.5 cubic yards of 9-12 inch diameter fieldstone was transported to Griffith's Island by boat. The fieldstone was placed along the base of the of the lowest coir log, extending approximately 1.5 feet into Lake Wawasee and 1-foot off the lake bottom (Figures 3 and 4). A complete plan view and cross section can be found in Appendix B.



**Figure 4. Fieldstone along base of coir logs.**

### 3.4 Erosion Control Blankets

Disturbed areas immediately upslope of the coir logs were seeded and then covered with a biodegradable erosion control blanket. The erosion control blanket was rolled out parallel to the shoreline and anchored below grade next to the coir logs (Figure 3). The erosion control blanket extended upslope approximately six feet. The erosion control blanket was secured with 6-inch

metal sod staples on 1.5 feet centers. Additional live plants were installed after the blanket was laid. A complete plan view and cross section can be found in Appendix B.

### 3.5 Native Plantings

Coir logs were planted with a variety of native emergent wetland species. These plants were installed as plugs at the JFNew nursery before delivery to the project site. Disturbed areas immediately upslope of the coir logs were planted with a native sedge meadow seed mix. Originally, the plans called for installation of live dogwood and buttonbush stakes (Figure 3). However, due to minor construction delays installation of live stakes was not feasible. Instead, supplemental live plants were installed along the erosion control blanket (Figure 5). A complete planting list is included in Appendix C.



**Figure 5. Native plant installation along erosion control blanket.**

### 4.0 CONSTRUCTION SCHEDULE

Originally, the construction of this project was slated to occur in June or July of 2004. Minor delays were encountered during the permitting process. Consequently, construction on Griffith's Island began and was completed during August of 2004.

### 5.0 MONITORING AND MAINTENANCE ACTIVITY

Monitoring of the project site should be conducted on an annual basis for the next three to five years. At a minimum, the project area should be inspected in early spring after ice out. Ice and high wave action pose the biggest threats to the structural integrity of the project site. Structural integrity failures would include, but are not limited to, items such as coir logs being washed out, ropes being severed, stakes being dislodged, and erosion control blankets being torn away. If any of these situations are noted during the inspection, action should be taken to resolve the situation in a timely manner. Other monitoring activities should include the inspection of plantings in the coir logs and erosion control blanket. Unsuccessful coir log plantings should be replaced if less than 70% survival is noted. If large barren patches, approximately one square yard, are noted along the erosion control blanket, they should be reseeded with an appropriate seed mix.

## **6.0 PROJECT SUMMARY**

The overall purpose of this project was to stabilize the eroding shoreline of Griffith's Island along its southern point. This was accomplished through the utilization of bioengineering techniques. Pre-planted coir logs were installed along the length of the project reach to protect the shoreline from erosive wave action. A fieldstone toe was placed lakeward of the coir logs to dissipate wave energy. Disturbed areas upslope of the coir logs were seeded with native species, covered with an erosion control blanket, and planted with additional live plants to help stabilize the slope. The functionality of this design will be further enhanced once the native plantings have become established.

**APPENDIX A**  
**PERMIT CORRESPONDENCE**

**DEPARTMENT OF THE ARMY**

DETROIT DISTRICT, CORPS OF ENGINEERS

REGULATORY OFFICE

SOUTH BEND FIELD OFFICE

2422 VIRIDIAN DRIVE SUITE # 101

SOUTH BEND, INDIANA 46628

May 24, 2004

IN REPLY REFER TO

File No. 04-143-005-0

Heather Harwood  
Wawasee Area Conservancy Foundation  
PO Box 548  
Syracuse, Indiana 46567

Dear Ms. Harwood:

Please refer to your application dated April 20, 2004, for a Department of the Army permit to build a bio-engineered seawall in Lake Wawasee on Griffith's Island, Syracuse, Kosciusko County, Indiana (Section 24, Township 34N, Range 7E).

Under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, Louisville and Detroit Districts issued Regional Permit 99-100-003-0 on Feb 11, 2000, for certain activities having minimal impact in Indiana. We have verified that your proposed work shown on the enclosed plans and described below is authorized under the Regional Permit. You may proceed with the work subject to the enclosed general conditions, any noted special conditions, and Indiana Department of Environmental Management (IDEM) Section 401 Water Quality Certification.

The following work is authorized:

Below the ordinary high water line of Lake Wawasee discharge approximately 60 feet of 12-inch diameter coir fiber logs (4.4 cubic yards) in two ranks adjacent to the shoreline and to each other, to build a bio-engineered seawall. 3.3 cubic yards of glacial stone will be discharged along the toe of the coir logs.

Any construction activity other than that shown on the plans may not qualify for the Regional Permit. If you plan changes or additional activities from those depicted on the plans, please submit them to this office for review prior to construction.

Upon completion of the work authorized by this RGP, the enclosed Completion Report form must be completed and returned to this office. This verification is valid until February 11, 2005, or 1 year from the date of this letter, whichever occurs later, unless the regional permit is modified, suspended or revoked.

If you have questions, please contact me at the above address or telephone (574) 232-1952. Please refer to File Number: 04-143-005-0.

Sincerely,

**ORIGINAL SIGNED BY**

Steven W. Sprecher  
Project Manager  
South Bend Field Office

Enclosures

Copies Furnished

IDEM, Office of Water  
IDNR, Division of Water  
J.F. New & Associates

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES

MAILED AUG 09 2004

**CERTIFICATE OF APPROVAL  
PUBLIC FRESHWATER LAKE**

**APPLICATION #** : PL-19728

**LAKE** : Lake Wawasee

**APPLICANT** : Wawasee Area Conservancy Foundation  
Heather Harwood, ASLA  
PO Box 548  
Syracuse, IN 46567

**AGENT** : JFNew  
Brian Majka  
128 Sunset Road  
Walkerton, IN 46574-1078

**AUTHORITY** : IC 14-26-2 with 312 IAC 11

**DESCRIPTION** : A bioengineered seawall will be constructed across 40' of the applicant's frontage. The lakeward face of the wall will be located along the lake's legal shoreline. A 12" layer of glacial stone will be placed at the base of the bioengineered seawall for toe protection. Details of the project are contained in information received electronically at the Division of Water on January 30, 2004, and in plans and information received at the Division of Water on February 9, 2004, February 25, 2004, May, 24, 2004, and May 27, 2004.

**LOCATION** : Griffith's Island, approximately 500' south and 2000' west of the County Road 1050 North and Turkey Creek Road intersection at Syracuse, Turkey Creek Township, Kosciusko County  
NW¼, NW¼, SW¼, Section 24, T 34N, R 7E, Lake Wawasee Quadrangle  
UTM Coordinates: Downstream 4582211 North, 611168 East

**APPROVED BY** :   
James J. Hebenstreit, P.E., Assistant Director  
Division of Water

**APPROVED ON** : August 9, 2004

Attachments: Notice Of Right To Administrative Review  
General Conditions  
Special Conditions  
Service List

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES

**NOTICE OF RIGHT TO ADMINISTRATIVE REVIEW**

**APPLICATION #: PL- 19728**

This signed document constitutes the issuance of a permit by the Department of Natural Resources, subject to the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

The permit or any of the conditions or limitations which it contains may be appealed by applying for administrative review. Such review is governed by the Administrative Orders and Procedures Act, IC 4-21.5, and the Department's rules pertaining to adjudicative proceedings, 312 IAC 3-1.

In order to obtain a review, a written petition must be filed with the Division of Hearings within 18 days of the mailing date of this notice. The petition should be addressed to:

Mr. Stephen L. Lucas, Director  
Division of Hearings  
Room W272  
402 West Washington Street  
Indianapolis, Indiana 46204

The petition must contain specific reasons for the appeal and indicate the portion or portions of the permit to which the appeal pertains.

If an appeal is filed, the final agency determination will be made by the Natural Resources Commission following a legal proceeding conducted before an Administrative Law Judge. The Department of Natural Resources will be represented by legal counsel.

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES

GENERAL CONDITIONS

APPLICATION #: PL- 19728

- ( 1 ) If any archaeological artifacts or human remains are uncovered during construction, federal law and regulations (16 USC 470, et seq.; 36 CFR 800.11, et al) and State Law (IC 14-21-1) require that work must stop and that the discovery must be reported to the Division of Historic Preservation and Archaeology within 2 business days.

Division of Historic Preservation and Archaeology  
Room W274  
402 West Washington Street  
Indianapolis, IN 46204

Telephone: (317) 232-1646, FAX: (317) 232-8036

- ( 2 ) This permit must be posted and maintained at the project site until the project is completed.
- ( 3 ) This permit does not relieve the permittee of the responsibility for obtaining additional permits, approvals, easements, etc. as required by other federal, state, or local regulatory agencies. These agencies include, but are not limited to:

<u>Agency</u>	<u>Telephone Number</u>
*US Army Corps of Engineers, Detroit District	(313) 226-2218
Kosciusko County Drainage Board	(574) 372-2367
Indiana Department of Environmental Management	(317) 233-8488 or (800) 451-6027
Local city or county planning or zoning commission	

- ( 4 ) This permit must not be construed as a waiver of any local ordinance or other state or federal law.
- ( 5 ) This permit does not relieve the permittee of any liability for the effects which the project may have upon the safety of the life or property of others.
- ( 6 ) This permit may be revoked by the Department of Natural Resources for violation of any condition, limitation or applicable statute or rule.
- ( 7 ) This permit shall not be assignable or transferable without the prior written approval of the Department of Natural Resources. To initiate a transfer contact:

Mr. Michael W. Neyer, PE, Director  
Division of Water  
Room W264  
402 West Washington Street  
Indianapolis, IN 46204

Telephone: (317) 232-4160, Toll Free: (877) 928-3755  
FAX: (317) 233-4579

- ( 8 ) The Department of Natural Resources shall have the right to enter upon the site of the permitted activity for the purpose of inspecting the authorized work.
- ( 9 ) The receipt and acceptance of this permit by the applicant or authorized agent shall be considered as acceptance of the conditions and limitations stated on the pages entitled "General Conditions" and "Special Conditions".

STATE OF INDIANA  
DEPARTMENT OF NATURAL RESOURCES

**SPECIAL CONDITIONS**

**APPLICATION #: PL- 19728**

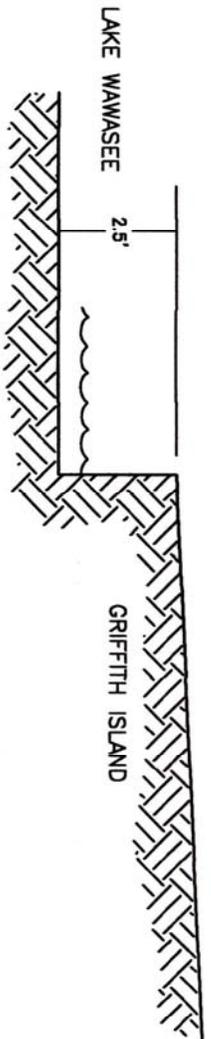
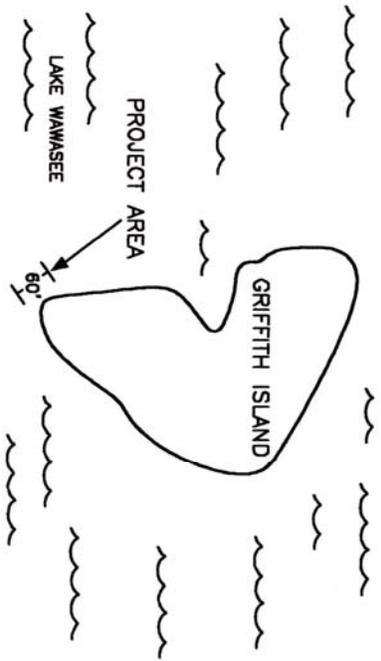
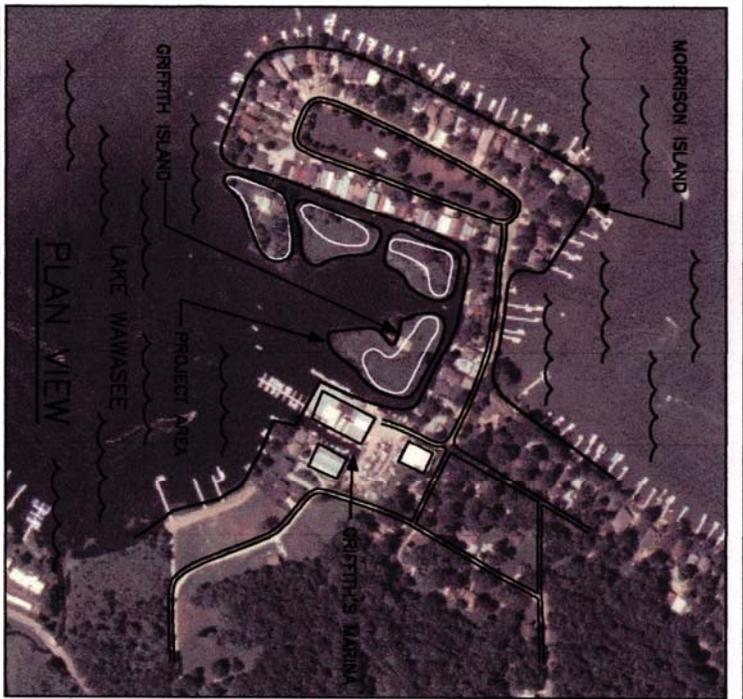
**PERMIT VALIDITY** : This permit is valid for 24 months from the "Approved On" date shown on the first page. If work has not been completed by August 09, 2006 the permit will become void and a new permit will be required in order to continue work on the project.

This permit becomes effective 18 days after the "MAILED" date shown on the first page. If both a petition for review and a petition for a stay of effectiveness are filed before this permit becomes effective, any part of the permit that is within the scope of the petition for stay is stayed for an additional 15 days.

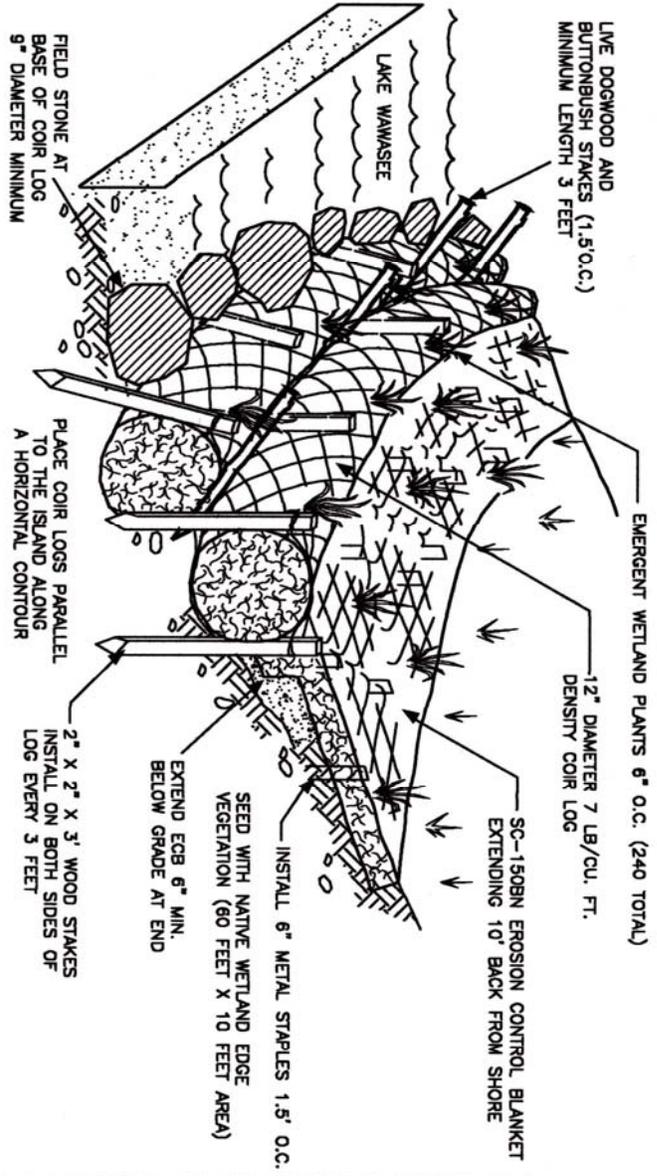
**CONFORMANCE** : Other than those measures necessary to satisfy the "General Conditions" and "Special Conditions", the project must conform to the information received by the Department of Natural Resources on: January 30, 2004, February 9, 2004, February 25, 2004, May 24, 2004 and May 27, 2004. Any deviation from the information must receive the prior written approval of the Department.

<u>Number</u>	<u>Special Condition</u>
( 1 )	minimize the movement of resuspended bottom sediment from the immediate project area
( 2 )	revegetate all bare and disturbed areas landward of the shoreline with a mixture of grasses (excluding all varieties of tall fescue) and legumes as soon as possible upon completion
( 3 )	all excavated material must be properly spread landward of the shoreline on the property described on page 1 under "DESCRIPTION" or completely removed from the project site such that erosion and off-site sedimentation of the material is prevented
( 4 )	pursuant to 312 IAC 11-4-2 (h), do not place an impermeable material or structure (including but not limited to concrete, steel, or vinyl retaining walls) directly behind the new seawall approved by this permit
( 5 )	do not extend the layer of glacial stone more than 12 inches lakeward of the seawall
( 6 )	construct the seawall in conformance with the attached sketch

**APPENDIX B**  
**SITE PLANS AND DESIGN DETAILS**



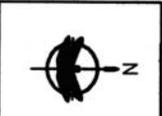
**EXISTING BANK**



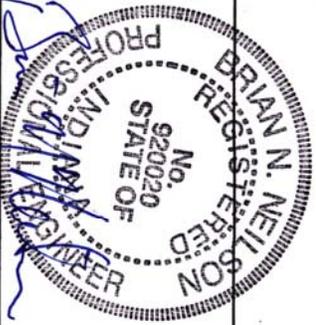
**PROPOSED BANK TREATMENT**

  
**JFNew**  
 709 Roosevelt Rd. Walkerton, IN 46574  
 (574) 586-3400 fax (574) 586-3446  
 www.jfnew.com

GRIFFITH ISLAND BANK STABILIZATION  
 WAWASEE AREA CONSERVANCY FOUNDATION  
 PLAN VIEW AND CROSS SECTION  
 LAKE WAWASEE  
 KOSCIUSKO COUNTY, INDIANA



SCALE: NOT TO SCALE  
 DATE: FEBRUARY, 2004  
 FILE: 030737V  
 SHEET 1 OF 1



**APPENDIX C**  
**PLANTING LIST**

### Sedge Meadow Seed Mix

Botanical Name	Common Name	Ounces/Acre
<b>Permanent Grasses/Sedges</b>		
<i>Calamagrostis canadensis</i>	Blue joint grass	2.00
<i>Carex comosa</i>	Bristly sedge	4.00
<i>Carex hystericina</i>	Porcupine sedge	6.00
<i>Carex stricta</i>	Common tussock sedge	1.00
<i>Carex vulpinoidea</i>	Brown fox sedge	4.00
<i>Echinochloa crusgalli</i>	Barnyard grass	10.00
<i>Elymus canadensis</i>	Canada wild rye	16.00
<i>Glyceria striata</i>	Fowl manna grass	2.00
<i>Leersia oryzoides</i>	Rice cut grass	2.00
<i>Panicum virgatum</i>	Switch grass	4.00
<i>Scirpus atrovirens</i>	Dark green rush	4.00
<i>Scirpus pungens</i>	Chairmaker's rush	1.00
<i>Scirpus validus creber</i>	Great bulrush	3.00
<i>Spartina pectinata</i>	Prairie cord grass	8.00
		<b>67.00</b>
<b>Temporary Cover:</b>		
<i>Agrostis alba</i>	Redtop	8
<i>Avena sativa</i>	Seed oats	360.00
<i>Phleum pratense</i>	Timothy	20.00
		<b>388.00</b>
<b>Forbs:</b>		
<i>Alisma subcordatum</i>	Common water plantain	1.00
<i>Angelica atropurpurea</i>	Great angelica	4.50
<i>Asclepias incarnata</i>	Swamp milkweed	1.50
<i>Aster novae-angliae</i>	New England aster	1.00
<i>Aster puniceus</i>	Bristly aster	1.00
<i>Aster simplex</i>	Panicled aster	1.00
<i>Aster umbellatus</i>	Flat-top aster	1.00
<i>Bidens cernua</i>	Nodding bur marigold	2.00
<i>Cassia hebecarpa</i>	Wild senna	1.00
<i>Coreopsis tripteris</i>	Tall coreopsis	1.00
<i>Eupatorium maculatum</i>	Spotted joe-pye weed	1.75
<i>Eupatorium perfoliatum</i>	Common boneset	1.00
<i>Gentiana andrewsii</i>	Bottle gentian	0.25
<i>Helenium autumnale</i>	Sneezeweed	2.00
<i>Iris virginica shrevei</i>	Blue flag iris	3.00
<i>Juncus effusus</i>	Common rush	1.00

<b>Forbs (continued)</b>		
<i>Liatis spicata</i>	Marsh blazing star	4.00
<i>Lobelia cardinalis</i>	Cardinal flower	0.25
<i>Lobelia siphilitica</i>	Great blue lobelia	0.25
<i>Ludwigia alternifolia</i>	Seedbox	0.50
<i>Peltandra virginica</i>	Arrow arum	16.00
<i>Physostegia virginiana</i>	Obedient plant	0.50
<i>Pycnanthemum virginianum</i>	Common mountain mint	0.25
<i>Sagittaria latifolia</i>	Common arrowhead	3.00
<i>Silphium perfoliatum</i>	Cup plant	3.00
<i>Solidago rugosa</i>	Rough goldenrod	1.00
<i>Sparganium eurycarpum</i>	Common bur reed	2.50
<i>Spiraea alba</i>	Meadowsweet	1.50
<i>Verbena hastata</i>	Blue vervain	1.25
<i>Vernonia fasciculata</i>	Common ironweed	3.00
<i>Zizia aurea</i>	Golden alexanders	0.50
		<b>61.50</b>

#### **Emergent Wetland Species for Coir Logs (Plugs)**

<b>Botanical Name</b>	<b>Common Name</b>	<b>Quantity</b>
<i>Acorus calamus</i>	Sweet flag	38
<i>Asclepias incarnata</i>	Swamp milkweed	38
<i>Aster novae-angliae</i>	New England aster	38
<i>Carex comosa</i>	Bristly sedge	38
<i>Carex hystericina</i>	Porcupine sedge	38
<i>Hibiscus palustris</i>	Swamp rose mallow	38
<i>Iris virginica shrevei</i>	Blue flag	38
<i>Juncus effusus</i>	Common rush	38
<i>Lobelia cardinalis</i>	Cardinal flower	38
<i>Lobelia siphilitica</i>	Great blue lobelia	38
<i>Scirpus atrovirens</i>	Dark green rush	38
<i>Scirpus pungens</i>	Chairmaker's rush	38