Lauerman Creek – Stream Bank Stabilization
Design-Build Project
Cedar Lake - Lake County, Indiana

October 2014

Prepared for:
Cedar Lake Enhancement Association
14415 Lauerman Street
Cedar Lake, Indiana 46303

And the

Lake and River Enhancement Program
Indiana Department of Natural Resources
Division of Fish and Wildlife
1353 Governors Drive
Columbia City, Indiana 46725

Prepared by:

S&L Environmental Group, Inc.
15504 County Road 42
Goshen, Indiana 46528
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Lauerman Creek – Stream Bank Stabilization Design-Build Project
Cedar Lake – Lake County, Indiana

1.0 Executive Summary
Eroding stream banks are a significant problem along several reaches of Lauerman Creek. Two sites were identified as critical due to the aggressive bank erosion and the potential damage to adjacent properties. The eroding banks where contributing an estimated 39.7 tons of sediment to Cedar Lake annually. Lauerman Creek is not a “regulated drain” under the jurisdiction and maintenance of the County Survey. Several previous attempts were made by private landowners and The City of Cedar Lake to control the bank erosion. While previous maintenance efforts temporarily slowed the erosion the banks continued to erode.

In 2013 the Cedar Lake Enhancement Association submitted a design-build application to the DNR-Lake and River Enhancement Program for funding assistance to design and implement erosion control measures on the two identified sites. The application was funded and the Cedar Lake Enhancement Association selected S&L Environmental Group, Inc as the design-build contractor.

2.0 Project Purpose
2.1 Objective
2.1.1 To eliminate stream bank erosion and thus the delivery and deposit of sediment into Cedar Lake.
2.1.2 Reduce the potential of further damage to adjacent property owners.
2.1.3 Stabilize the stream banks without restricting the current channel flow upstream and downstream.
2.2 Accomplishment – The eroding banks were stabilized by utilizing a combination of Best Management Practices, including rock toe wall; two-stage stream construction and rock armoring at the culvert outlet. The bank protection was completed without restricting the upstream and downstream flow capacity. The bench area on the two-stage stream was seeded to deep rooted Native Grasses and covered with erosion control blankets. Native trees and shrubs were planted to mitigate the loss of Fish and Wildlife benefits as a result of tree removal during construction. Live stakes were planted at normal lake level on the lower 150 LF of bank stabilization.
3.0 Project Description

3.1 General Location – The two project sites are located in Hanover Township within the City of Cedar Lake, Lake County, Indiana (Figure 1- General Location Map).

![Figure 1 – General Location Map](http://nationalmap.gov/ustopo)

3.2 Site Specific Location – Project Site #1 is the reach of Lauerman Creek between 142 Place Street and Lauerman Street. Project Site #2 is located approximately 200 LF downstream of Lauerman Street Bridge (Figure 2 – Site Specific Location Map).

![Figure 2 – Site Specific Location Map](Google Earth Software)
3.3 **Project Interest** – A coordinated effort between the Cedar Lake Enhancement Association, City of Cedar Lake, affected landowners and the DNR- Lake and River Enhancement Program made the project a reality. These individuals, agencies and organizations were involved and participated in the review of the design plans and construction activities. On-site and off-site meetings were held before finalizing the design plans. The Cedar Lake Department of Public Works provided significant In-kind Services by completing tree removal and hauling of excavated soil and stumps to an upland disposal site.

## 4.0 Project Design

The following “Job Tasks” were completed as noted in the “As Build” Appendix A of this report. Minor field adjustments were made during project layout to better reflect the site conditions following the removal of trees and debris. Photographs of each of the “Job Task” can be found in Appendix C.

4.1 **Tree Removal** – Four potential “Bat” Habitat trees were removed by the Department of Public Works prior to April 1st and sixteen additional trees were removed during construction activities.

4.2 **Stump, Soil, and Debris Removal and Disposal** – Stumps removed from the site will be recycled. Debris and soil were removed and disposed of at an upland site.

4.3 **Construction of Two-Stage Stream** – A 20 LF bench was constructed on the west side of Lauerman Creek approximately 1.4 feet above the creek bottom to allow for additional stream capacity, thus reducing the erosive velocities.

4.4 **Rock Toe Wall** – A rock toe wall was installed on both sides of the newly constructed two-stage stream and a 150 LF reach of bank east of Lauerman Street (project site #2) to prevent erosion undercutting of the banks.

4.5 **Rock Riprap Armoring** – Approximately 100 LF of stream banks downstream of the 142 Place Street culverts were armored to the top of banks to control erosion caused by the high velocity and volumes of runoff exiting the culverts.

4.6 **Erosion Control Measures** – The two-stage bench was seeded to Native deep rooted grasses and covered with Erosion Control Blankets (see Specifications Appendix “B” for seed mixture and type of Erosion Control blankets). Disturbed lawn areas and access points were reseeded (see lawn seed specification) and straw mulched. Temporary rock check dams were installed in the stream to minimize movement of sediment during construction activities.

4.7 **Tree Mitigation** – 50 Native Trees and 75 Native shrubs will replace the 20 trees 10” or greater in diameter removed during construction activities.
5.0 Project Logistics

5.1 Permit Requirements – An “Early Environmental Review” was requested and a meeting was held onsite with DNR. IDEM and ACOE were provided preliminary design and project objective information. IDEM completed an onsite review on a different date as they were already in the project area. ACOE did not see a need for onsite meeting. A DNR-Division of Water “Construction in a Floodway” and a “Public Freshwater Lake” permit were required. IDEM required a “Section 401 Water Quality Certification” permit and ACOE required a “Region General Permit 1” under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

5.2 Construction Timing – Construction began on September 8, 2014 and completed on October 1, 2014. Construction activities were scheduled during the summer months when creek flow is typically low.

5.3 Project Contractor – S&L Environmental Group, Inc was the low bidder for the Design-Build project and determined to be qualified to design and oversee the construction activities.

6.0 Future Project Inspection and Maintenance

6.1 Post Construction Inspections – Post construction inspections will be completed by representatives of the Cedar Lake Enhancement Association and Cedar Lake Department of Public Works. The improvements should be inspected, as a minimum, twice a year – spring and fall. During the first year of establishment it is recommended to complete an inspection after each significant storm event.

6.2 Vegetative Inspection – If vegetative cover is not 80% or more additional seeding may be required.

6.3 Structural Inspection – Replace any riprap which is significantly displaced.

6.4 Tree Mitigation – DNR Permit requires monitoring the tree and shrub survival rate for three years. A report will be submitted to the Lakes Permitting Biologist at the Division of Fish and Wildlife by December 31 each year. 75% survival is required after three years. See DNR “Construction in a Floodway” permit for contents of the reports and mailing address.

7.0 Estimated Load Reductions

The EPA Region 5 Load Reduction Program was used to estimate the load reductions of sediment, phosphorous and nitrogen. Results can be found in Appendix F.
APPENDIX ‘A’

“As Build” Engineering Plans
NOTE: Channel Bottom Lowered to remove sediment deposit and tie in with Box Culvert. Shelf Elevation lowered equivalent to channel Bottom lowering.

"As Built"
"As Built"

Station E+50

Scale: 1" Vertical = 20 ft,
1" Horizontal = 10 ft

Stream Cross-Section
Louden Creek - Cedar Lake

U. S. DEPARTMENT OF AGRICULTURE
NATIONAL RESOURCES CONSERVATION SERVICE
TYPICAL TWO-STAGE DITCH CROSS SECTION : ONE-SIDED CONSTRUCTION

Station 6+00 to 9+94 (Approximate)

NOTES:
Shore and top of bank to be mitigated with
Native trees and shrubs.
Approx 10ft strip. This area
will also be seeded to native
mix of grass, forb, etc.

Existing Ground

Bankfull Width

Flooded Width

Berm Width

No Berm - Soil to be hauled to upland site.

Total Depth Ave. 3.0' in the
Two Stage Ditch Section.

DESIGN BY: REVISION
NUMBER
DATE PROJECT NO. PAGE

DRAWN BY: CHECKED BY: APPROVED BY:

Horizontal Scale:

Vertical Scale:
Note: Toe Wall along two-stage ditch shelf toe constructed on a 2H:1V slope.
Toe Wall on north - East Bank (undisturbed side) on a 1.5H:1.0V. (Total 250 LF)
Minimum riprap thickness = larger of (1.5d₅₀ or dₜₜ)

Station 5+30 to 6+50
(Below culvert outlet)

10.9 ft - Top of Bank

Design high water

3.09 ft

Minimum riprap 12"-D₅₀ 12"-D₅₀

1.9 H - 1 V

Stream Bank

Toe down riprap to maximum scour depth

Riprap Stabilization (Typical) - Boll Books

Lauerman Creek
Cedar Lake
Lake County, Indiana

Riprap Stabilization (Typical)
APPENDIX ‘B’

Engineering Calculations and Specifications
Culvert Analysis Spreadsheet

Client: Cedar Lake Enhancement Assoc.  County: Lake County  Date: 10.19.2014
Design By: JW Stanger  Checked By: Wayne Stanger  Date: 10.20.2014
Comments: Identical twin barrel culvert, calculation is for a single barrel. Total Capacity = 225.0 cfs

Inputs:
- Headwater (Upstream Water Surface) Elevation: 701.55 Feet
- Culvert Inlet Invert Elevation: 695.00 Feet
- Culvert Diameter: 48.00 Inches
- Length of Culvert: 30.00 Feet
- Culvert Outlet Invert Elevation: 694.40 Feet
- Tailwater (Downstream) Elevation: 696.80 Feet

Select Culvert Material: CMP
Select Culvert Inlet Type: Projecting - Thin Edge

Outputs:
- CAPACITY = 112.5 cfs
- INLET CONTROLS (Submerged Equation)
  - Manning's n value: 0.024
  - Entrance Coefficient, Ke: 0.9
Figure 3  Headwater Depth for Concrete Box Culverts With Inlet Control

**Example**

6' x 3' Box Q = 225 cfs
Q/Span = 37.5 cfs/ft

<table>
<thead>
<tr>
<th>Inlet</th>
<th>HW Rise</th>
<th>HW Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>2.6</td>
<td>7.8</td>
</tr>
</tbody>
</table>

**Scale**

<table>
<thead>
<tr>
<th>HW Rise</th>
<th>Wing Wall Flare</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>30° to 75°</td>
</tr>
<tr>
<td>(2)</td>
<td>90° and 15°</td>
</tr>
<tr>
<td>(3)</td>
<td>0° (extensions of sides)</td>
</tr>
</tbody>
</table>

**To use scale (2) or (3) project horizonally to scale (1), then use straight inclined line through rise and Q scales, or reverse as illustrated.**
knowns:
- inlet elev: 693.00 ft
- crown of road: 699.50 ft
- length of culvert: 30.00 ft
- slope of culvert: 0.10%  
- box culvert size: 4 ft x 8 ft
- tailwater elev: 694.30 ft
- outlet elev: 692.97 ft

the structure does not have full flow conditions

determine:
- box culvert flow capacity: Q ft³/sec

calculate flow with inlet control

\[ \text{HW} = \text{crown of road elev.} - \text{inlet elev.} \]
\[ \text{HW} = 699.50 \text{ ft} - 693.00 \text{ ft} \]
\[ \text{HW} = 6.5 \text{ ft} \]

\[ \text{rise} = \text{height of box} \]
\[ \text{rise} = 4 \text{ ft} \]

figure 3: "headwater depth for concrete box with inlet control"
- connecting a line between height of box and the headwater depth
  in terms of height (HW/rise) will provide the ratio of discharge
  to width (Q/span). span is width of box \( \Rightarrow \text{span} = 8 \text{ ft} \)

\[ \frac{Q}{\text{span}} = 40 \text{ ft}^3/\text{ft} \]
\[ \frac{Q}{8} = 40 \text{ ft}^3/\text{ft} \]
\[ Q = 320 \text{ ft}^3/\text{sec} \]
VELOCITY DETERMINATION FOR ROCK RIPRAP

Trapezoidal Cross Section

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom Width</td>
<td>12 ft.</td>
</tr>
<tr>
<td>Side Slope</td>
<td>1.9:1</td>
</tr>
<tr>
<td>Depth</td>
<td>5 ft.</td>
</tr>
<tr>
<td>d50</td>
<td>12 inches</td>
</tr>
<tr>
<td>Bottom Slope</td>
<td>0.001 ft./ft.</td>
</tr>
<tr>
<td>&quot;n&quot;</td>
<td>0.045</td>
</tr>
<tr>
<td>Area</td>
<td>107.5 s.f.</td>
</tr>
<tr>
<td>Wetted Perimeter</td>
<td>33.5 ft.</td>
</tr>
<tr>
<td>Hydraulic Radius</td>
<td>3.21 ft.</td>
</tr>
</tbody>
</table>

Velocity = 2.3 fps

Critical Velocity = 10.6

Capacity = 245 cfs

Parabolic Cross Section

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Width</td>
<td>30 ft.</td>
</tr>
<tr>
<td>Depth</td>
<td>0.5943 ft.</td>
</tr>
<tr>
<td>Bottom Slope</td>
<td>0.10 ft./ft.</td>
</tr>
<tr>
<td>d50</td>
<td>8 inches</td>
</tr>
<tr>
<td>&quot;n&quot;</td>
<td>0.071</td>
</tr>
<tr>
<td>Area</td>
<td>11.9 s.f.</td>
</tr>
<tr>
<td>Wetted Perimeter</td>
<td>30.031 ft.</td>
</tr>
<tr>
<td>Hydraulic Radius</td>
<td>0.40 ft.</td>
</tr>
<tr>
<td>Critical Velocity</td>
<td>3.57 fps</td>
</tr>
<tr>
<td>Velocity</td>
<td>3.57 fps</td>
</tr>
</tbody>
</table>

Capacity = 42 cfs

Note - velocities greater than 70% of critical velocity are not permitted.
VELOCITY DETERMINATION FOR ROCK RIPRAP OUTLETS

Trapezoidal Cross Section

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom Width</td>
<td>12 ft.</td>
</tr>
<tr>
<td>Side Slope</td>
<td>1.9 : 1</td>
</tr>
<tr>
<td>Depth</td>
<td>4 ft.</td>
</tr>
<tr>
<td>d50</td>
<td>12 inches</td>
</tr>
<tr>
<td>Bottom Slope</td>
<td>0.001 ft./ft.</td>
</tr>
<tr>
<td>&quot;n&quot;</td>
<td>0.047</td>
</tr>
<tr>
<td>Area</td>
<td>78.4 s.f.</td>
</tr>
<tr>
<td>Wetted Perimeter</td>
<td>29.2 ft.</td>
</tr>
<tr>
<td>Hydraulic Radius</td>
<td>2.69 ft.</td>
</tr>
<tr>
<td>Velocity</td>
<td>1.9 fps</td>
</tr>
</tbody>
</table>

Critical Velocity = 9.6 Note-velocities greater than 70% of critical velocity
Capacity = 153 cfs

Parabolic Cross Section

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Width</td>
<td>30 ft.</td>
</tr>
<tr>
<td>Depth</td>
<td>0.5943 ft.</td>
</tr>
<tr>
<td>Bottom Slope</td>
<td>0.10 ft./ft.</td>
</tr>
<tr>
<td>d50</td>
<td>8 inches</td>
</tr>
<tr>
<td>&quot;n&quot;</td>
<td>0.071</td>
</tr>
<tr>
<td>Area</td>
<td>11.9 s.f.</td>
</tr>
<tr>
<td>Wetted Perimeter</td>
<td>30.031 ft.</td>
</tr>
<tr>
<td>Hydraulic Radius</td>
<td>0.40 ft.</td>
</tr>
<tr>
<td>Critical Velocity</td>
<td>3.57 fps</td>
</tr>
<tr>
<td>Velocity</td>
<td>3.57 fps</td>
</tr>
</tbody>
</table>

Capacity = 42 cfs

Station 6150
20 ft. Prior to Beginning Two-Stage
Trapezoidal Cross Section

- **Bottom Width**: 35 ft.
- **Side Slope**: 3.15 : 1
- **Depth**: 2 ft.
- **d50**: 6 inches
- **Bottom Slope**: 0.001 ft./ft.
- **"n"**: 0.042
- **Area**: 82.6 s.f.
- **Wetted Perimeter**: 48.2 ft.
- **Hydraulic Radius**: 1.71 ft.
- **Velocity**: 1.6 fps

Critical Velocity: 7.5 Note-velocities greater than 70% of critical velocity

Capacity: 134 cfs

<table>
<thead>
<tr>
<th>d50</th>
<th>Vmax</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot;</td>
<td>5.1</td>
</tr>
<tr>
<td>4&quot;</td>
<td>5.8</td>
</tr>
<tr>
<td>5&quot;</td>
<td>6.3</td>
</tr>
<tr>
<td>6&quot;</td>
<td>6.8</td>
</tr>
<tr>
<td>7&quot;</td>
<td>7.3</td>
</tr>
<tr>
<td>8&quot;</td>
<td>7.8</td>
</tr>
<tr>
<td>9&quot;</td>
<td>8.3</td>
</tr>
<tr>
<td>10&quot;</td>
<td>8.7</td>
</tr>
<tr>
<td>11&quot;</td>
<td>9.1</td>
</tr>
<tr>
<td>12&quot;</td>
<td>9.5</td>
</tr>
</tbody>
</table>

Parabolic Cross Section

- **Top Width**: 30 ft.
- **Depth**: 0.5943 ft.
- **Bottom Slope**: 0.1 ft./ft.
- **d50**: 8 inches
- **"n"**: 0.071
- **Area**: 11.9 s.f.
- **Wetted Perimeter**: 30.031 ft.
- **Hydraulic Radius**: 0.40 ft.
- **Critical Velocity**: 3.57 fps
- **Velocity**: 3.57 fps

Capacity: 42 cfs
VELOCITY DETERMINATION FOR ROCK RIPRAP OUTLETS

Trapezoidal Cross Section

- Bottom Width = 12 ft.
- Side Slope = 2 : 1
- Depth = 1.5 ft.
- \(d_{50} = 6\) inches
- Bottom Slope = 0.001 ft./ft.
- \("n" = 0.044\)
- Area = 22.5 s.f.
- Wetted Perimeter = 18.7 ft.
- Hydraulic Radius = 1.20 ft.

Velocity = 1.2 fps

Critical Velocity = 6.3

Capacity = 27 cfs

<table>
<thead>
<tr>
<th>d50</th>
<th>Vmax</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot;</td>
<td>5.1</td>
</tr>
<tr>
<td>4&quot;</td>
<td>5.8</td>
</tr>
<tr>
<td>5&quot;</td>
<td>6.3</td>
</tr>
<tr>
<td>6&quot;</td>
<td>6.8</td>
</tr>
<tr>
<td>7&quot;</td>
<td>7.3</td>
</tr>
<tr>
<td>8&quot;</td>
<td>7.8</td>
</tr>
<tr>
<td>9&quot;</td>
<td>8.3</td>
</tr>
<tr>
<td>10&quot;</td>
<td>8.7</td>
</tr>
<tr>
<td>11&quot;</td>
<td>9.1</td>
</tr>
<tr>
<td>12&quot;</td>
<td>9.5</td>
</tr>
</tbody>
</table>

Parabolic Cross Section

- Top Width = 30 ft.
- Depth = 0.5943 ft.
- Bottom Slope = 0.10 ft./ft.
- \(d_{50} = 8\) inches
- \("n" = 0.071\)
- Area = 11.9 s.f.
- Wetted Perimeter = 30.031 ft.
- Hydraulic Radius = 0.40 ft.
- Critical Velocity = 3.57 fps
- Velocity = 3.57 fps
- Capacity = 42 cfs

Note: velocities greater than 70% of critical velocity
VELOCITY DETERMINATION FOR ROCK RIPRAP

**Trapezoidal Cross Section**

<table>
<thead>
<tr>
<th>Bottom Width</th>
<th>Side Slope</th>
<th>Depth</th>
<th>d50</th>
<th>Vmax</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 ft.</td>
<td>2 :1</td>
<td>2.8 ft.</td>
<td>6 inches</td>
<td>5.1</td>
</tr>
<tr>
<td>Top Width= 30 ft.</td>
<td>Depth= 0.5943 ft.</td>
<td>Bottom Slope= 0.10 ft./ft.</td>
<td>d50= 8 inches</td>
<td>&quot;n&quot;= 0.071</td>
</tr>
<tr>
<td>Velocity= 1.9 fps</td>
<td>Critical Velocity= 8.3 Note-velocities greater than 70% of critical v</td>
<td>Capacity= 94 cfs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Parabolic Cross Section**

<table>
<thead>
<tr>
<th>Top Width</th>
<th>Depth</th>
<th>Bottom Slope</th>
<th>d50</th>
<th>&quot;n&quot;=</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 ft.</td>
<td>0.5943 ft.</td>
<td>0.10 ft./ft.</td>
<td>8 inches</td>
<td>0.071</td>
</tr>
<tr>
<td>Wetted Perimeter= 30.031 ft.</td>
<td>30.031</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic Radius= 0.40 ft.</td>
<td>Critical Velocity= 3.57 fps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Velocity= 3.57 fps</td>
<td>Capacity= 42 cfs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Product Category: Geotextiles

Industries: Erosion Control, Agricultural, Irrigation, Waterworks

Applications: Filter Fabric, Soil Separation, Septic and Drainage Systems, Landscaped Slopes, Retaining Walls, Weed Barrier, Pond Underlayment

DESCRIPTION

Christy’s™ 7.0 oz fabric is a nonwoven geotextile made up of polypropylene fibers. These fibers are needled to form a stable and durable network such that the fibers retain their relative position. It is non-biodegradable and resistant to most soil chemicals, acids and alkali with a pH range of 3 to 12. This fabric exceeds AASHTM - 28996-100, Class 2 material specification. It is manufactured to meet or exceed the following minimum average roll values:

### 7.0 oz - Nonwoven Drain & Filter Fabric

<table>
<thead>
<tr>
<th>Fabric Property</th>
<th>Test Method</th>
<th>Units</th>
<th>Minimum Average Roll Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength</td>
<td>ASTM D 4632</td>
<td>LBS</td>
<td>180</td>
</tr>
<tr>
<td>Tensile Elongation</td>
<td>ASTM D 4632</td>
<td>%</td>
<td>50</td>
</tr>
<tr>
<td>Trapezoid Tear</td>
<td>ASTM D 4533</td>
<td>LBS</td>
<td>75</td>
</tr>
<tr>
<td>Puncture</td>
<td>ASTM D 4833</td>
<td>LBS</td>
<td>105</td>
</tr>
<tr>
<td>Permittivity</td>
<td>ASTM D 4491</td>
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<td>UV Resistance after 500 hours</td>
<td>ASTM D 4355</td>
<td>% Strength Retained</td>
<td>70</td>
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NOTE

*This product can be used in a weed barrier application with proper surface treating and maintenance but is less effective than the TC.WB product series which is specifically engineered for weed barrier applications.*
ROLLMAX™
ROLLED EROSION CONTROL

Specification Sheet – BioNet® SC150BN™ Erosion Control Blanket

DESCRIPTION
The extended-term double net erosion control blanket shall be a machine-produced mat of 70% agricultural straw and 30% coconut fiber with a functional longevity of up to 18 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the straw and coconut evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with a 100% biodegradable woven natural organic fiber netting. The netting shall consist of machine directional strands interwoven through the twisted machine strands (commonly referred to as Leno weave) to form an approximate 0.50 x 1.0 in. (1.27 x 2.54 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

The SC150BN shall meet Type 3.B specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration’s (FHWA) FP-03 Section 713.17

Material Content
- **Matrix**: 70% Straw Fiber
- **Matrix**: 30% Coconut Fiber
- **Netting**: Top: Leno woven 100% biodegradable jute
- **Netting**: Bottom: 100% biodegradable organic jute
- **Thread**: Biodegradable

Standard Roll Sizes
- **Width**: 6.67 ft (2.03 m)
- **Length**: 108 ft (32.92 m)
- **Weight ± 10%**: 52.22 lbs (23.69 kg)
- **Area**: 80 sq yd (65.9 sm)

**Index Property** | **Test Method** | **Typical**
--- | --- | ---
**Thickness** | ASTM D6525 | 0.25 in. (6.35 mm)
**Resiliency** | ECTC Guidelines | 85%
**Water Absorbency** | ASTM D1117 | 31%
**Mass/Unit Area** | ASTM D6475 | 8.32 oz/sq yd (282.9 g/sm)
**Swell** | ECTC Guidelines | 46%
**Smolder Resistance** | ECTC Guidelines | Yes
**Stiffness** | ASTM D1388 | 0.42 oz-in
**Light Penetration** | ASTM D6567 | 7.6%
**Tensile Strength - MD** | ASTM D6818 | 201.6 lbs/ft (2.99 kN/m)
**Elongation - MD** | ASTM D6818 | 13.4%
**Tensile Strength - TD** | ASTM D6818 | 164.4 lbs/ft (2.44 kN/m)
**Elongation - TD** | ASTM D6818 | 14.2%
**Biomass Improvement** | ASTM D7322 | 641%

**Design Permissible Shear Stress**
- Unvegetated Shear Stress: 2.10 psf (100 Pa)
- Unvegetated Velocity: 8.00 fps (2.44 m/s)

**Slope Design Data: C Factors**

<table>
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<th><strong>Slope Gradients (S)</strong></th>
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<td>3:1 - 2:1</td>
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<td>0.055</td>
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<td>0.10</td>
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**Roughness Coefficients – Unveg.**
- Flow Depth: Manning’s n
  - ≤ 0.50 ft (0.15 m): 0.050
  - 0.50 - 2.0 ft: 0.050 - 0.018
  - ≥ 2.0 ft (0.60 m): 0.018

Tensar International Corporation warrants that at the time of delivery the product furnished hereunder shall conform to the specification stated herein. Any other warranty including merchantability and fitness for a particular purpose are hereby excluded. If the product does not meet specifications on this page and Tensar is notified prior to installation, Tensar will replace the product at no cost to the customer. This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to January 1, 2012.

©2013, Tensar International Corporation
### Native Trees and Shrubs

<table>
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<td>Betula nigra</td>
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<td>Cornus amomum</td>
<td>Silky Dogwood</td>
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<td>Corylus americana</td>
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### LIVESTAKES

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<tr>
<td>Annual Rye</td>
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</table>
### Woody Warehouse Nursery, Inc.

**Offering Superior American Native Trees**

**Address:**
3339 W 850 N  
PO Box 259  
Lizton, IN 46149

**Phone:** 317-994-5487  
**Fax:** 317-994-5494

---

**BILL TO**
S & L Environmental Group  
Brad Leeper  
15504 CR 42  
Goshen, IN 46528

**SHIP TO**
Coby Stanger 574-536-5835  
Delivers to:  
14316 Lauerman Street  
Cedar Lake, Indiana 46303

---

**Invoice**

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**P.O. NUMBER**
Cedar Lake

**TERMS**

**REP**
Pete

**SHIP**
9/18/2014

**VIA**
Direct Ship

**PROJECT**

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<td>Corylus americana - Hazelnut - 3 gallon 2.5-3'</td>
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<td>Physocarpus opulifolius - Common Ninebark - 3 gallon 2.5-3'</td>
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**Subtotal**

**Sales Tax (7.0%)**

**Payments/Credits**

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<td>PRG00623</td>
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**Total Weight**: 612.77 lbs

**Lot No. L68-12-0838**

**Tested**: 12/12 Sell By: 09/13
In FL Sell By: 07/13
In MT, NE, SD, and WY Sell By: 12/13
In AK, AZ, CA, CO, CT, DE, ID, IN, MN, MO, ND, NE, NJ, NY, OH, OR, PA UT, VA, VT, WA, WI and D.C. Sell By: 03/14

**Tractor Supply Co. 200 Powell Place Brentwood, TN 37027
AMS 68**
1. Tree removal along the west creek bank to allow construction of the two-stage bench and the placement of RipRap for bank protection

2. Sloping of existing eroded creek banks
3. Hauling away excavated soil to upland disposal site from construction of the two-stage bench

4. Installation of RipRap over Geotextile fabric
5. Large RipRap installed 100 ft downstream of the two 48” culvert pipes on 142\textsuperscript{nd} Place

6. RipRap installed to top of bank from Station 5+30 to 6+30
7. Construction of the 20 ft two-stage bench approximately 1.4 ft above the creek bottom

8. 150 ft of bank protection east of Lauerman Street
9. Planting of deep rooted Native Grasses and installation of Erosion Control Blankets on the newly constructed two-stage bench

10. Planting of Native Trees and Shrubs to mitigate for the loss of trees during construction
11. Fertilizing, seeding, and mulching of areas disturbed during construction activities

12. Completed Project – including bank protection, two-stage bench construction, Native Grasses with Erosion Control Blankets on the two-stage bench, seeding and mulching of areas disturbed during construction and planting of Native Trees and Shrubs
APPENDIX ‘D’

Correspondence
January 20, 2014

Bob Gross
Cedar Lake Enhancement Association

RE: Additional information providing greater detail for the Lauerman Creek Design/Build Bank Stabilization Project.

1. Additional Project Detail concerning the type and extent of various Best Management Practices (BMP’s).

A detailed field survey will be required before we can fully detail the extent and type of specific BMP’s to be installed. However, from a visual standpoint, we anticipate the bank re-grading, stone toe, floodplain excavation and sediment basin to be very similar to that provided on the “Site Location Map” prepared by Doug Nusbaum and JFNew. The “Soil Encapsulated Lifts” may or may not be needed since the bank is low (approximately 3 ft.). A more permanent solution may be installing stone to the top of bank through this area. The field survey and hydrology study will provide us with more information concerning the flow velocity so we can determine what BMP would be the most stable. We would anticipate installing approximately four “stone key ways” across the channel to stabilize the grade and reduce further channel erosion. During our two site visits we did identify additional scattered areas on the creek banks where a stone toe wall may be required due to the underlying soil type. The flood plain area will likely be excavated to a depth 1 -1.5 ft. above the creek bottom and re-established with vegetation. Again the field survey will provide more info for determining the most effective elevation.

2. What are the possibilities for in-kind match?

We estimate the in-kind match could be 10-20% depending on the availability of services which can be provided on a timely schedule. The following project task could be provided by the Association (Town):

a. Grubbing of trees and shrubs, including chipping and removal of debristo an off-site location.

b. Providing dump trucks to haul excavated soil (floodplain area) to an off-site location. We could provide equipment to load the trucks or could be done as in-kind.
c. Providing trucks to haul root balls and other debris encountered when re-grading the banks and excavating the flood plain.

All the in-kind work will need to be carefully coordinated and timely provided to not provide construction delays.

If you have further questions do not hesitate to contact me.

Wayne Stanger  
Senior Consultant  
574-536-9879  
wstanger@envirogroup.com

CC: Doug Nusbaum, LARE Program Specialist
February 28, 2014

Christie Stanifer
Environmental Coordinator
IDNR – Division of Fish and Wildlife
402 West Washington St. Rm W273
Indianapolis, Indiana 46204-2781

Ms Stanifer:

I am requesting an early coordination/environmental review for a stream bank and channel stabilization, and runoff storage/wetland project located in Lake County near Cedar Lake (see location maps). The stream name is Lauerman Creek. The project applicant is the Cedar Lake Enhancement Association, Bob Gross, President. S&L Environmental Group has been contracted to implement the design/build improvements and will be your contact. The project is being funded in part by a DNR Lake and River Enhancement Grant which was obtained by the Association.

Attached are aerial maps with the project site identified. The project is presently snow covered, thus unable to provide meaningful photographs. Photo’s will be provide with permit application.

The project will consist of approximately 600 LF of the Lauerman Creek where the eroding banks and channel will be stabilized by implementing “Best Management Practices” (BMP’s). After completing the field survey the appropriate bank and channel stabilization BMP’s will be selected, designed and implemented to provide long-term protection. Additional runoff storage will be provided by excavating a storage/wetland shelve adjacent to a portion of the stream. An in stream sediment trap may be installed.

It is anticipated the stream banks will be stabilized with a rock toe wall up to six inches to one foot above the Ordinary High Water Mark (OHWM) of the stream or rock protection to the top of bank in some areas. All bank slopes above the rock protection will be stabilized with erosion control blanket and planted to deep rooted native grass, forbs, and plugs. Rock keyways will be installed, approximately every 100 feet, within the channel to eliminate the severe channel erosion and scouring presently occurring. A wetland/storage shelve will be excavated at 1 to 1.5 ft. above ditch elevation to provide additional runoff storage and filtration during high stream flow. All excavated soil will be moved to an upland site. The shelve, approximately 0.25 acre, will be seeded to native wetland plants and grasses. Shrubs and small trees will need to
be removed along the stream banks. A few larger trees may need to be removed to allow excavation of the wetland/storage shelve.

A small excavator and skid loader will be used to implement the bank and channel improvements and potentially a larger excavator or dozer used for excavating the wetland/storage shelve.

A request has been sent to Ron Hellmich, Indiana Natural Heritage Data Center, for a review of endangered, threatened, and rare species within the project area.

We would like to meet onsite with the Biologist. If possible, we would like to coordinate the onsite meeting date with ACOE and IDEM. If the Biologist could provide us with first available date or two we will try to coordinate with the other agencies.

If you need additional information let us know.

Wayne Stanger  
Senior Consultant  
574-536-9879 (cell)  

Cc: Bob Gross, President  
Cedar Lake Enhancement Association  

Doug Nusbaum  
LARE Program Specialist  

Attachments
Wayne Stanger

From: Bob Gross [bobg@pcmarine.com]
Sent: Thursday, March 13, 2014 11:00 AM
To: Wayne Stanger
Subject: Re: Lauerman Stream Bank Stabilization

Wayne,

I will be in town Monday. Most of the property owners are aware of the project. What time do you want me to have the town meet with us?

Bob

From: Wayne Stanger
Sent: Thursday, March 13, 2014 8:30 AM
To: 'Bob Gross'
Subject: Lauerman Stream Bank Stabilization

Bob

Weather permitting we plan on surveying the creek on Monday, March 17th. Are the adjoining landowners all aware of the project? We will knock on doors and let them know that we will be surveying. I am trying to coordinate an onsite meeting with permitting agencies the same day.

One of the things DNR requires in most permits is that any trees suitable for bat habitat (dead or loose bark trees greater than 3" diameter) cannot be removed between April 1 and September 30. We will be tagging the trees which meet DNR criteria. These trees, if any, will need to be removed prior to April 1 to try and maintain a summer/fall construction schedule. Part of the in kind service we discussed was the town removing shrubs and trees from the banks. After tagging the trees we would like to meet with whoever will be responsible for the tree removal.

Will you be around the area on Monday? If not, is their someone with the town I can meet with to discuss and show those trees which need to be remove by April 1?

Wayne Stanger
Senior Consultant

S&L Environmental Group, Inc.
Cell: 574.536.9879
Bob

The following is a summary from our onsite activities on Monday:

1. Completed field survey of the creek and the shelve excavation area.
2. Marked six bat habitat trees and met with Street Department who will cut the trees down prior to April 1st.
3. Met with you to discuss placing fill in some low areas of lawns adjacent to creek. Explained that typically DNR-Division of Water will not permit placing fill in the flood plain area. However, they might allow some fill given the fact we will be excavating a shelve for runoff storage which significantly exceeds the proposed area to place fill. We will have to identify the placement of fill locations on the design plans, but try to avoid making a big issue of it during the permit applications.
4. Landowner on the south side of creek, where access will be required, has not been contacted concerning the project. You will try to make contact with the property owner who actually owns the first two properties to the south.
5. Met with Lori White, DNR Biologist as part of the early environmental review for permitting. Explained to Lori the anticipated plans for the creek. Pretty obvious from our discussion she would like to see as much bio-diversity as possible. Meaning the inclusion of native plant materials along the banks to return the stream to a natural biological setting. We will be receiving a written site review report which will represent comments from all DNR Divisions. IDEM will be making an onsite environmental review within the next week to 10 days. We have made repeated contacts with the Army Core of Engineers (ACOE) but no response to date.
6. S&L will continue efforts to meet with ACOE onsite to get their early environmental comments before finalizing the design plans. The same day we meet onsite the remaining trees to be removed will be marked. We would also like to coordinate with the Street Department Superintendent and you to further discuss in kind task to be completed the same day.
7. Is the landowner along the Phase II site aware and on board with the project? We probably should follow up with letters to each landowner explaining the project and requesting their consent for right away access.

Bob, if you have any questions do not hesitate to ask.

Wayne Stanger
Senior Consultant
S&L Environmental Group, Inc.
Cell: 574.536.9879
April 12, 2014

Mirko Acamovic
1921 58th Avenue North, Apt 20
St. Petersburg, Florida 33714

Mirko:

As I promised I am sending you more information on the planned Lauerman Creek improvements that we discussed on the telephone. The purpose of the project is to increase the water capacity of the creek and slow the velocity of the flow which will decrease the bank erosion and the soil being eroded into the lake.

The project is being funded 100% by the Cedar Lake Enhancement Association through a Grant they were able to obtain. The Association has contracted with our firm to complete the design and construction.

I have enclosed a typical drawing of what we are considering. This project would affect approximately 30 ft. of your property on the south side of the creek. I have also enclosed an aerial map showing the location.

The drawing is of, what we call, a two-stage stream. Basically, the existing stream bottom will flow about 1.5 ft. in depth during low flow. During larger storm events the flow will spread out over the bench to provide additional channel capacity, slow the velocity of flow and reduce erosion within the stream. The bench area will be seeded with native grasses, forbs, some trees and shrubs to provide a more natural stream habitat. Flooding will still occur, but at less frequency. The benefits of the two-stage stream approach are:

1. Reduces nutrient pollution by filtering storm runoff through the vegetative bench.
2. Creates fewer disturbance to the biology of the stream.
3. Reduces the number of trees that would have to be removed (one side only).
4. Provides some storm water detention during flood events.

Please sign below giving your consent to move forward with this project. Any disturbance or damage to your property from equipment access will be repaired to preconstruction condition.

Mirko Acamovic

Date

15504 C.R. 42
Goshen, IN. 46528
Phone: (574) 229-1687
Fax: (574) 642-3390
www.slenvirogroup.com
contact@slenvirogroup.com
August 2, 2014

Mirko Acamovic
1921 58th Avenue North, Apt 20
St. Petersburg, Florida 33714

Mirko:

Once we receive the necessary Permits we will begin construction on the Lauerman Creek Project. The Cedar Lake Enhancement Association and I appreciate your cooperation in completing this project. We are hopeful construction can begin early September.

There is one large Maple tree, located about 15 feet from the Creek, which is in the path of construction. We would like to remove this tree. Approximately 10-15 new trees will be planted along the edge of the Creek on your property to mitigate for the lost of the Maple tree and other trees removed within the banks of the Creek. If you agree to allow the Maple tree to be removed please sign and return as soon as possible.

If any questions give me a call at 574-536-9879.

Mirko Acamovic

Wayne Stanger
574-536-9879

Cc: Bob Gross, President
   Cedar Lake Enhancement Association

15504 C.R. 42
Goshen, IN. 46528
Phone: (574) 229-1687
Fax: (574) 642-3390
www.slenvirogroup.com
contact@slenvirogroup.com
August 20, 2014

Patricia Hegyi
8911 142nd Place
Cedar Lake, Indiana 46303

Patricia:

I met with you the day we were surveying along Lauerman Creek. I would have given you a call but must have misplaced your telephone number.

We anticipate beginning construction on the Lauerman Creek improvements on or around September 8th. If that date changes I will let you know. When I was at the project site two weeks ago I noticed you have a boat and car which will need to be moved to allow for the construction activities.

I would like to talk with you when we get started so you have a full understanding of the construction activities along your property. Hopefully, I can touch base with you one of the first days we get started.

If any questions, give me a call. Otherwise I will see you in a couple weeks.

Thanks

Wayne Stanger
Senior Consultant
574-536-9879

Cc: Bob Gross
Cedar Lake Enhancement Association
WORK ORDER CHANGE
September 8, 2014

RE: Lauerman Creek Design/Build Bank Stabilization Project

One of the conditions to obtain the necessary permits for project construction is to mitigate the loss of trees during the construction process. The condition states 50 Native Trees (1” dia. at breast height) and 75 Native Shrubs will be replanted.

The contractor is requesting approval for $9,900.00 to cover the additional cost for the plant material and installation to meet the required condition. The increase in cost would be added to the current contract of $62,100 bring the total contract amount to $73,000.00.

Wayne Stanger
Senior Consultant

Date: 9/9/14

Bob Gross, President
Cedar Lake Enhancement Association

Date: 9/9/14
APPENDIX ‘E’

Permits
STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

CERTIFICATE OF APPROVAL
CONSTRUCTION IN A FLOODWAY

APPLICATION #: FW-27574

LAKE: Unnamed Tributary Cedar Lake

APPLICANT: Cedar Lake Enhancement Association
Bob Gross
14415 Lauerman Street
Cedar Lake, IN 46302

AGENT: S&L Environmental Group, Inc.
Wayne Stanger
15504 County Road 42
Goshen, IN 46528

AUTHORITY: IC 14-28-1 with 312 IAC 10

DESCRIPTION: A total of approximately 614' of streambank will be stabilized using three (3) different methods. Area 1 located immediately south of 142nd Place will be stabilized for approximately 100' by placing a 12" layer of riprap along both the east and west streambanks. Area 2 located immediately south of Area 1 will consist of stabilizing approximately 364' of stream by constructing a Two-Stage ditch along the west bank. The west bank along Area 2 will be excavated to approximately 2' below existing ground elevations to create a 20' wide bank full shelf. The area adjacent to the new shelf will be stabilized by planting a 10' wide strip of native trees and shrubs and also native grasses. The west and east banks of the low flow channel along Area 2 will be stabilized with the installation of a riprap toe wall. Area 3 located east of Lauerman Street will be stabilized for approximately 150' by constructing a new bioengineered seawall along the south ditch bank. The bioengineered seawall will be using the joint planting method with 40 live stakes consisting of Redosier Dogwood, Silky Dogwood, Elderberry and Buttonbush native plant species planted within a 12" thick layer of riprap. Details of the project are contained in information and plans received at the Division of Water on May 30, 2014 and July 1, 2014.

LOCATION: Beginning immediately downstream (south) of the West 142nd Street stream crossing and continuing approximately 800' downstream (south and east) at Cedar Lake, Hanover Township, Lake County
Section 34, T 34N, R 9W, Lowell Quadrangle
UTM Coordinates: Downstream 4578702 North, 463277 East

APPROVED BY: James J. Hebenstreit, PE, Assistant Director
Division of Water

APPROVED ON: August 19, 2014

Included: Notice Of Right To Administrative Review - General Conditions - Special Conditions - Service List
STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

GENERAL CONDITIONS
APPLICATION #: FW- 27574

(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:

<table>
<thead>
<tr>
<th>Agency</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kankakee River Basin Commission</td>
<td>(219) 763-0696</td>
</tr>
<tr>
<td>Lake County Drainage Board</td>
<td>(312) 846-5539</td>
</tr>
<tr>
<td>US Army Corps of Engineers</td>
<td>(317) 233-8488 or (800) 451-6027</td>
</tr>
<tr>
<td>Indiana Department of Environmental Management</td>
<td></td>
</tr>
<tr>
<td>Local city or county planning or zoning commission</td>
<td></td>
</tr>
</tbody>
</table>

(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".
PERMIT VALIDITY: This permit is valid for 24 months from the "Approved On" date shown on the first page. If construction work in the floodway has not been completed by August 19, 2016 the permit will become void. This permit may be renewed one (1) time for a period not to exceed two (2) additional years only if a written request for the two (2) year permit renewal is received by DNR, Division of Water prior to August 19, 2016. Thereafter 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: May 30, 2014 and July 1, 2014. Any deviation from the information must receive the prior written approval of the Department.

<table>
<thead>
<tr>
<th>Number</th>
<th>Special Condition</th>
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</thead>
<tbody>
<tr>
<td>(1)</td>
<td>revegetate all bare and disturbed areas with a mixture of grasses (excluding all varieties of tall fescue), legumes, and native shrub and hardwood tree species as soon as possible upon completion</td>
</tr>
<tr>
<td>(2)</td>
<td>minimize and contain within the project limits in-channel disturbance and the clearing of trees and brush</td>
</tr>
<tr>
<td>(3)</td>
<td>do not work in the waterway from April 1 through June 30 without the prior written approval of the Division of Fish and Wildlife</td>
</tr>
<tr>
<td>(4)</td>
<td>do not cut any trees suitable for Indiana bat roosting (greater than 3 inches dbh, living or dead, with loose hanging bark) from April 1 through September 30</td>
</tr>
<tr>
<td>(5)</td>
<td>do not excavate in the low flow area except for the placement of piers, foundations, and riprap</td>
</tr>
<tr>
<td>(6)</td>
<td>do not construct any temporary runarounds or causeways</td>
</tr>
<tr>
<td>(7)</td>
<td>use minimum average 6 inch graded riprap stone extended below the normal water level to provide habitat for aquatic organisms in the voids</td>
</tr>
<tr>
<td>(8)</td>
<td>if this project involves the removal of more than 5 trees in the floodway, incorporate tree planting into the site revegetation and/or mitigation plan</td>
</tr>
<tr>
<td>(9)</td>
<td>minimize the movement of resuspended bottom sediment from the immediate project area</td>
</tr>
<tr>
<td>(10)</td>
<td>appropriately designed measures for controlling erosion and sediment must be implemented to prevent sediment from entering the stream or leaving the construction site; maintain these measures until construction is complete and all disturbed areas are stabilized</td>
</tr>
</tbody>
</table>
STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
SPECIAL CONDITIONS
APPLICATION #: FW-27574

(11) seed and protect all disturbed streambanks and slopes that are 3:1 or steeper with erosion control blankets (follow manufacturer’s recommendations for selection and installation); seed and apply mulch on all other disturbed areas.

(12) 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.

(13) implement the mitigation plan received at the Division of Water on July 23, 2014, within one complete growing season of project initiation.

(14) the mitigation site must be monitored for the survival of the plantings for a minimum of three years; a report must be submitted to the Lakes Permitting Biologist at the Division of Fish and Wildlife, 402 W. Washington St., RM W264, Indianapolis, IN 46204-2641 by December 31 of each year to monitor the initiation, progress, and success of the mitigation site; the report must include appropriate pictures of vegetative plantings, a narrative describing the activity accomplished to date, acres planted, number planted, list of species planted on site, and estimated survival; reports must be submitted annually, even if work has not been initiated on site; there shall be a minimum of three full reports beginning after the first complete growing season after the last planting and seeding; reports are required until the mitigation site is complete or determined to be successful; if the mitigation site is not successful three years after work initiation, the permit will be considered out of compliance and another plan must be submitted for approval.

(15) the replacement habitat areas must have a minimum survival of 75% of planted material at the end of the monitoring period or additional plant material must be installed to meet the minimum survival.

(16) except for the material used as backfill as shown on the above referenced project plans on file at the Division of Water, place all excavated material landward of the floodway.

(17) all work must conform with the existing bank at the upstream and downstream limits of the project site.

(18) do not leave felled trees, brush, or other debris in the floodway.

(19) all riprap placed for bank stabilization must conform to the bank.

(20) upon completion of the project, remove all construction debris from the floodway.

(21) size and/or anchor the riprap to resist displacement by current or wave action.

(22) * Note: for regulatory purposes, the floodway is defined as the area inundated by the Special Flood Hazard Area shown on Panel 327 of the Lake County Flood Insurance Rate Map dated January 18, 2012.
STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
CERTIFICATE OF APPROVAL
PUBLIC FRESHWATER LAKE

APPLICATION #: PL-22557
LAKE: Cedar Lake
APPLICANT: Cedar Lake Enhancement Association
Bob Gross
14415 Lauerman Street
Cedar Lake, IN 46302
AGENT: S&L Environmental Group, Inc.
Wayne Stanger
15504 County Road 42
Goshen, IN 46528

AUTHORITY: IC 14-26-2 with 312 IAC 11
DESCRIPTION: As part of a three (3) phase bank stabilization project along an inlet to Cedar Lake, a new bioengineered seawall will be constructed across 150' of the inlet channel's south frontage (Area 3). The bioengineered seawall will be using the joint planting method using 40 live stakes consisting of Redosier Dogwood, Silky Dogwood, Elderberry and Buttonbush native plant species planted within a 12" thick layer of riprap. The lakeward face of the wall will be located along the lake’s average normal shoreline. Details of the project are contained in information and plans received at the Division of Water on May 30, 2014, July 1, 2014, July 7, 2014 and July 23, 2014.

LOCATION: Approximately 150' east of Lauerman Street at Cedar Lake, Hanover Township, Lake County
Section 34, T 34N, R 9W, Lowell Quadrangle
UTM Coordinates: Downstream 4578702 North, 463258 East

APPROVED BY: James J. Hebenstreit, PE, Assistant Director
Division of Water

APPROVED ON: August 19, 2014

Included: Notice Of Right To Administrative Review - General Conditions - Special Conditions - Service List - U.S. Army Corp of Engineers - Federal General Conditions.
STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

GENERAL CONDITIONS
APPLICATION #: PL- 22557

(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:

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(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) 528-3755
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- 22557  

PERMIT VALIDITY : This permit is valid for 60 months from the "Approved On" date shown on the first page. If work has not been completed by August 19, 2019 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: May 30, 2014, July 1, 2014, July 7, 2014 and July 23, 2014. Any deviation from the information must receive the prior written approval of the Department.

Number Special Condition

(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) construct the bioengineered seawall according to the sketch received at the Division of Water on July 23, 2014

(5) the vegetative component of a bioengineered wall is critical to the function of the wall and must be maintained throughout the life of the wall; replace dead or lost plants with the same species or other approved species within one growing season; do not change the approved plant species without prior written approval of the Division of Fish and Wildlife; contact the Lakes Permitting Biologist to discuss potential species changes

(6) 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 walls) directly behind the approved bioengineered seawall, or within 10' of the legal shoreline and below the legal lake level

(7) the placement of this bioengineered seawall along this shoreline does not constitute an alteration that would change the shoreline classification on this project or nearby sites where shoreline classifications would be necessary for future permit application review

(8) send photos, digital or hard copy, of the bioengineered seawall no later than 14 days after completion to Nate Thomas, Lakes Permitting Biologist, Division of Fish and Wildlife, 1353 S Governors Dr., Columbia City, IN 46725; NThomas@dnr.in.gov
STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES

SPECIAL CONDITIONS

APPLICATION #: PL-22557

Note: This Certificate of Approval serves as Federal authorization under the Indiana Programmatic General Permit (PG), LRE-1998-1000100-S12, issued on March 4, 2013 under authority of Section 404 of the Clean Water Act as administered by the U.S. Army Corps of Engineers. This authorization requires that the permittee comply with the attached Federal General Conditions. Commencement of work authorized in this Certificate of Approval is considered acceptance of the Federal General Conditions. If you have questions on about the Federal General Conditions, contact the U.S. Army Corps of Engineers, Detroit District Office, at 313-226-5381, or the Louisville District Office, at (502) 315-6686 or the Chicago District Office, at (312) 846-5539. Refer to the Service List page of this Certificate of Approval for the appropriate U.S. Army Corps of Engineers District Office.

Note: The conditions stated on the pages entitled Federal General Conditions are not eligible for appeal through the procedures described on page 2 of this Certificate of Approval. If you object to any one or more of the Federal General Conditions, this Certificate of Approval is not considered valid for your Federal permit under the Indiana Programmatic General Permit, LRE-1998-1000100-S12, and you must contact the U.S. Army Corps of Engineers to request a case-specific review of your project.
FEDERAL GENERAL CONDITIONS

The following federal general conditions must be followed in order for any Programmatic General Permit (PGP) authorization to be valid:

GENERAL REQUIREMENTS

1. Other Permits: Authorization under this general permit does not obviate the need to obtain other Federal, State, or local authorization required by law.

2. The Corps of Engineers retains authority, on a case-by-case basis, to require review for an individual permit based on concerns for the aquatic environment or for any other factor of the public interest. This authority may be invoked where there is a particular resource or concern associated with a project, or where potential cumulative environmental impacts warrant additional review.

3. Jurisdiction: PGP permits issued by the EDNE include an implicit preliminary jurisdictional determination (JD) by the U.S. Army Corps of Engineers that the proposed work will impact waters within the Corps’ jurisdiction. Commencement of work verified under the PGP is considered acceptance of Federal jurisdiction. Applicants wishing to appeal the preliminary JD must notify the Corps to request an approved JD, and await a response before starting work or choosing to appeal the approved JD.

4. Property Rights: Authorization under this general permit does not grant any property rights, exclusive privileges, or authorize any injury to the property or rights of others.

5. Proper maintenance: Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.

6. Case by case conditions: The activity must comply with any case specific conditions added by the Corps or by the State in its section 401 Water Quality Certification.

7. Federal Liability: The Federal Government does not assume any liability for the following: a) damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes; b) damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest; c) damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit; d) design or construction deficiencies associated with the permitted work; and/or e) damage claims associated with any future modifications suspension, or revocation of this permit.

NATIONAL CONCERNS

8. Navigation:

a. No activity may cause more than a minimal adverse effect on navigation.

b. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal of alteration.
FEDERAL GENERAL CONDITIONS

9. Endangered Species:

a. No activity is authorized under any PGP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act, or which is likely to destroy or adversely modify the critical habitat of such species. No activity is authorized under the PGP which “may affect” a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

b. Non federal permittees shall notify the District Engineer if any listed species or critical habitat might be affected or is in the vicinity of the project, and shall not begin work on the activity until notified by the District Engineer that the requirements of the Endangered Species Act have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, PGP applicants will have to provide the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. The District Engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have “no effect” on listed species or critical habitat, or until Section 7 consultation has been completed.

c. As a result of formal or informal consultation with the U.S. Fish and Wildlife Service (FWS), the District Engineer may add species-specific endangered species conditions to any PGP verification.

d. Authorization of an activity by a PGP does not authorize the “take” of a threatened or endangered species as defined under the Federal Endangered Species Act. In the absence of separate authorization (e.g. an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS, both lethal and non-lethal “takes” of protected species are in violation of the Endangered Species Act. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS or at their website: http://www.fws.gov/midwest/endangered/lists/cty_index.html#indiana.

10. Historic properties:

a. In cases where the District Engineer determines that the activity may affect properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.
FEDERAL GENERAL CONDITIONS

b. Non-federal permittees must submit a notification to the District Engineer if the authorized activity may have the potential to cause effects to any historic properties listed, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historical Places, including previously unidentified properties. For such activities, the notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer (SHPO/THPO), as appropriate, and the National Register of Historic Places (see CFR 330.4(g)). The District Engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the District Engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the District Engineer that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

c. The District Engineer will notify the prospective permittee whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on properties (see 36 CFR 800.3(a)). If NHPA Section 106 consultation is required and will occur, the District Engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed.

11. Tribal rights: No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

MINIMIZATION OF ENVIRONMENTAL IMPACTS:

12. Soil erosion and sediment controls: The permittee shall install sedimentation and soil erosion control measures prior to any construction activity, and maintain them in effective operating condition during construction. This shall include the installation of straw bale barriers, silt fencing and/or other approved methods to control sedimentation and erosion. The permittee shall immediately stabilize areas disturbed by any construction activity, including channel banks, and revegetate with a combination of grasses, legumes, and shrubs compatible to the affected area.

13. Equipment: All construction equipment shall be refueled and maintained on an upland site away from existing streams, drainageways, and wetland areas. Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.

14. Suitable material: No activity, including structures and work in waters of the United States or discharges of dredged or fill material, may consist of unsuitable material (e.g. trash, debris, car bodies, asphalt, timbers, slag, slash/fly ash, etc.). Material used for construction or discharge must also be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).
FEDERAL GENERAL CONDITIONS

15. Water Quality: Some PGP authorizations may not be valid unless a case-specific Section 401 Water Quality Certification is obtained from or considered waived by the IDEM and/or IDNR. Where the State (either generically or individually) does not require/approve a water quality management plan, the permittee must include design criteria and techniques that provide for protection of aquatic resources. The permittee must comply with all project conditions associated with general or case-specific Water Quality Certifications.

16. Water Supply Intakes: The permittee shall not perform any work under the PGP where the discharge of dredged and/or fill material would occur in the proximity of a public water supply intake except where the activity is for the repair of the public water supply structure or adjacent bank stabilization.

17. Minimization/Avoidance: Discharges of dredged and/or fill material into waters of the United States must be minimized or avoided to the maximum extent practicable at the project site (i.e. on-site). In determining the minimal impact threshold, the Districts will consider the direct and secondary impacts of the fill or work and any mitigation measures.

18. Mitigation: The permittee shall provide a mitigation/monitoring plan for any activity where the adverse impact on special aquatic sites is determined to be more than minimal. If mitigation is required, the permittee shall develop the mitigation site concurrently with site construction.

19. Waterfowl breeding areas: Activities, including structures and work in navigable waters of the United States or discharges of dredged and/or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

20. Removal of temporary fills: Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

21. Access: A representative from the Corps of Engineers may inspect any authorized activity or mitigation site at any time deemed necessary to ensure compliance with the terms and conditions of the PGP.
FEDERAL GENERAL CONDITIONS

GLOSSARY

Bioengineered*: The use of a combination of biological elements (plant materials) and structural or mechanical reinforcements for stabilization, revetment, or erosion control. Biological and mechanical elements must function together in an integrated and complementary manner.

Boat well*: A manmade excavation along the shoreline or waterline of a public freshwater lake that 1) is used for the mooring of a boat and 2) has been stabilized to prevent erosion.

Bulkhead seawall*: A vertical or near-vertical, solid concrete, steel sheetpile or vinyl piling structure which has the purpose of shoreline protection.

Currently serviceable: Currently serviceable means useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Glacial stone*: A rounded stone that satisfies the following 1) was produced by glacial activity, 2) no individual stone weighs more than 120 pounds, 3) at least 90% of the material passes through a 12-inch sieve, and 4) no more than 10% passes through a 6-inch sieve.

Ordinary High Water Mark (OHWM): The line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Programmatic General Permit (PGP): A type of general permit founded on an existing state, local, or other Federal agency program and designed to avoid duplication with that program.

Public freshwater lake*: A lake that has been used by the public with the acquiescence of a riparian owner. Does not include Lake Michigan, any lakes lying wholly or in part within the city of East Chicago, Gary, or Hammond, or any privately owned bodies of water used for the purpose of or created as a result of surface coal mining.

Seawall*: A manmade structure placed along the shoreline or water line of a public freshwater lake for the purpose of shoreline stabilization.

Seawall reface*: Reinforcing of an existing seawall along the lakeward face.

Significant wetland*: A transitional area between terrestrial and deep-water habitats containing at least one of the following: 1) At least 2,500 square feet of contiguous, emergent vegetation or rooted vegetation with floating leaves landward or lakeward of the shoreline or water line. The areal extent is independent of ownership, 2) Adjacent wetland areas designated by a federal or state agency under one of the following—the National Wetland Inventory, the US Army Corps of Engineers Wetlands Delineation Manual (1987), or the National Food Security Act Manual (1994), and 3) The existence of a species listed at 15 IR 1312 in the Roster of Indiana Animals and Plants that are Extirpated, Endangered, Threatened, or Rare.

Underwater beach*: An area of lakebed that is 1) lakeward of the shoreline or waterline of a public freshwater lake and 2) used for a recreational purpose, such as wading or swimming.
VIA CERTIFIED MAIL  91 7190 0005 2710 0035 3030

Mr. Bob Gross  
Cedar Lake Enhancement Association  
14415 Lauerman Street  
Cedar Lake, IN 46302

Dear Mr. Gross:

Re: Section 401 Water Quality Certification  
Project: Lauerman Creek Stream Bank Stabilization  
IDEM No.: 2014-290-45-MTM-A  
County: Lake

The Office of Water Quality has reviewed your application for Section 401 Water Quality Certification dated May 22, 2014, and received June 30, 2014. According to the application, you propose to a total of 394 linear feet of bank work on Lauerman Creek. The work includes the placement of riprap along 100 linear feet of streambank, making 364 linear feet of Lauerman Creek a two stage stream, and installing a total of 250 linear feet of toewall on the opposite bank of the two stage shelf and 150 linear feet of toewall on the east side of Lauerman Creek. Approximately 190 cubic yards of riprap will be placed below the Ordinary Highwater Mark. You will plant fifty (50) native trees and fifty (50) native shrubs to mitigate the loss of 20 trees greater than 10" in diameter. The project is located in the North 1/2 of Section 34 of Township 34 North and Range 9 West in Cedar Lake, Lake County.

Based on available information, it is the judgment of this office that the proposed project will comply with the applicable provisions of 327 IAC 2 and Sections 301, 302, 303, 306, and 307 of the Clean Water Act if you comply with the conditions set forth below. Therefore, subject to the following conditions, the Indiana Department of Environmental Management (IDEM) hereby grants Section 401 Water Quality Certification for the project described in your application received June 30, 2014. Any changes in project design or scope not detailed in the application described above or modified by the conditions below are not authorized by this certification.

CONDITIONS OF THE SECTION 401 WATER QUALITY CERTIFICATION:

You shall:

1) By December 31, 2015, submit a report which describes the construction schedule, lists any deviation from the approved plans, and includes photos of the completed project. In total, the photos should show the entire length of the project, planting areas, and
upstream and downstream photos which would show the two-stage aspect of the stream channel.

2) Allow the commissioner or an authorized representative of the commissioner (including an authorized contractor), upon the presentation of credentials:

a) to enter your property, including impact and mitigation site(s);
b) to have access to and copy at reasonable times any records that must be kept under the conditions of this certification;
c) to inspect, at reasonable times, any monitoring or operational equipment or method; collection, treatment, pollution management or discharge facility or device; practices required by this certification; and any mitigation wetland site;
d) to sample or monitor any discharge of pollutants or any mitigation site.

3) Complete all approved discharges no later than two (2) years of the date of issuance of this Section 401 Water Quality Certification. You may request a one (1) year extension to the Section 401 Water Quality Certification by submitting a written request ninety (90) days prior to the deadline stated above. The written request shall contain an account of which discharges and mitigation have been completed and list the reasons an extension is requested.

4) Deposit any dredged material in a contained upland disposal area to prevent sediment runoff to any waterbody.

5) Install erosion control methods prior to any soil disturbance to prevent soil from leaving the construction site. Appropriate erosion control methods include, but are not limited to, straw bale barriers, silt fencing, erosion control blankets, phased construction sequencing, and earthen berms. Monitor and maintain erosion control structures and devices regularly, especially after rain events, until all soils disturbed by construction activities have been permanently stabilized.

6) Allow no construction equipment, temporary run-arounds, coffer dams, temporary causeways, temporary crossings, or other such structures to enter or be constructed within any waterbody, unless specifically stated, depicted, or detailed in the aforementioned correspondence and project plans. A modification of this Section 401 Water Quality Certification is required from this office if any of the aforementioned items are needed for project construction.

This certification does not relieve you of the responsibility of obtaining any other permits or authorizations that may be required for this project or related activities from IDEM or any other agency or person. You may wish to contact the Indiana Department of Natural Resources at 317-232-4160 (toll free at 877-928-3755) concerning the possible requirement of natural freshwater lake or floodway permits. In addition, you may wish to contact IDEM's Storm Water Permits Section at 317-233-1864 concerning the possible need for a 327 IAC 15-5 (Rule 5) permit if you plan to disturb greater than one (1) acre of soil during construction.
This certification does not:

(1) authorize impacts or activities outside the scope of this certification;
(2) authorize any injury to persons or private property or invasion of other private rights, or any infringement of federal, state or local laws or regulations;
(3) convey any property rights of any sort, or any exclusive privileges;
(4) preempt any duty to obtain federal, state or local permits or authorizations required by law for the execution of the project or related activities; or
(5) authorize changes in the plan design detailed in the application.

Failure to comply with the terms and conditions of this Section 401 Water Quality Certification may result in enforcement action against you. If an enforcement action is pursued, you could be assessed up to $25,000 per day in civil penalties. You may also be subject to criminal liability if it is determined that the Section 401 Water Quality Certification was violated willfully or negligently.

This certification is effective eighteen (18) days from the mailing of this notice unless a petition for review and a petition for stay of effectiveness are filed within this 18-day period. If a petition for review and a petition for stay of effectiveness are filed within this period, any part of the certification within the scope of the petition for stay is stayed for fifteen (15) days, unless or until an Environmental Law Judge further stays the certification in whole or in part.

This decision may be appealed in accordance with IC 4-21.5, the Administrative Orders and Procedures Act. The steps that must be followed to qualify for review are:

1) You must petition for review in writing that states facts demonstrating that you are either the person to whom this decision is directed, a person who is aggrieved or adversely affected by the decision, or a person entitled to review under any law.

2) You must file the petition for review with the Office of Environmental Adjudication (OEA) at the following address:

   Office of Environmental Adjudication
   100 North Senate Avenue
   IGCN Room N501
   Indianapolis, IN 46204

3) You must file the petition within eighteen (18) days of the mailing date of this decision. If the eighteenth day falls on a Saturday, Sunday, legal holiday, or other day that the OEA offices are closed during regular business hours, you may file the petition the next day that the OEA offices are open during regular business hours. The petition is deemed filed on the earliest of the following dates: the date it is personally delivered to OEA; the date that the envelope containing the petition is postmarked if it is mailed by United States mail; or, the date it is shown to have been deposited with a private carrier on the private carrier's receipt, if sent by private carrier.
Identifying the certification, decision, or other order for which you seek review by number, name of the applicant, location, or date of this notice will expedite review of the petition.

Note that if a petition for review is granted pursuant to IC 4-21.5-3-7, the petitioner will, and any other person may, obtain notice of any prehearing conferences, preliminary hearings, hearings, stays, and any orders disposing of the proceedings by requesting copies of such notices from OEA.

If you have procedural questions regarding filing a petition for review you may contact the Office of Environmental Adjudication at 317-232-8591.

If you have any questions about this certification, please contact Mr. Marty Maupin, Project Manager, of my staff by phone at 317-233-2471, or by e-mail at mmaupin@idem.in.gov or you may contact the Office of Water Quality through the IDEM Environmental Helpline (1-800-451-6027).

Sincerely,

Mary E. Hollingsworth, Branch Chief
Surface Water, Operations & Enforcement Branch
Office of Water Quality

cc: Paul Leffler, Chicago District, USACE
    Liz McCloskey, USFWS
    Lori White, Regional Env. Biologist, IDNR
    Wayne Stanger, S&L Environmental Group, Inc.
August 14, 2014

Technical Services Division
Regulatory Branch
LRC-2014-220

SUBJECT: Regional General Permit to construct a two stage stream and install riprap along Lauerman Creek southwest of 142nd Avenue and Lauerman Street in Cedar Lake, Lake County, Indiana

Cedar Lake Enhancement Association
Attn: Mr. Bob Gross
14415 Lauerman Street
Cedar Lake, IN 46302

Dear Mr. Gross:

The U.S. Army Corps of Engineers, Chicago District, has completed its review of your notification for authorization under the Regional General Permit (RGP), submitted on your behalf by S&L Environmental Group, Inc. Under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act, the Chicago, Louisville and Detroit Districts reissued Regional General Permit 1 on January 15, 2010 for certain activities having minimal impacts in Indiana. We have verified that your proposed work shown on the submitted plans and described below is authorized under the RGP. This certification expires three (3) years from the date indicated above.

This verification authorizes your proposal to construct a 364 linear foot two stage stream and to install a 250 linear feet of riprap toewall on the northeast bank and 150 linear feet of riprap toewall on the south bank. The following are conditions of this permit:

1. Native, non-invasive plants and trees must be installed along the bank and within the newly formed two stage shelf.

2. All excavated material must be disposed of in an upland area. You must notify this office of the disposal location prior to starting work.

3. All bank stabilization materials and any necessary backfill shall be constructed of non-polluted materials. The following materials may be used: suitable clean materials free from debris, trash, and other deleterious materials; rock, quarry stone, fieldstone, clay, non-polluted granular fill, vinyl sheet piling, broken concrete, steel sheet piling, cellular blocks, fabric formed concrete, concrete filled fabric mats, gabion baskets, rock and wire mattresses, sand/cement filled bags, geotechnical fabric materials, non-invasive
vegetation, and treated timber. If broken concrete is used it must be free from asphalt and oils, in addition all protruding material such as reinforcing rods shall be cut flush with the surface of the concrete and removed from the construction area.

4. All material utilized shall be properly sized or anchored to resist anticipated forces of wave action.

5. You shall comply with the authorization issued by the Indiana Department of Natural Resources for the project.

6. You shall comply with the water quality certification issued under Section 401 of the Clean Water Act by the Indiana Department of Environmental Management for the project. Conditions of the certification are conditions of this authorization.

7. This permit does not obviate the need to obtain approvals from property owners where work will occur.

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. For any additional information on the RGP, please access our website: www.lrc.usace.army.mil/co-r. If you have any questions, please contact Mr. Paul Leffler of my staff by telephone at 312-846-5529 or email at paul.m.leffler@usace.army.mil.

Sincerely,

Diedra Willis
Indiana Team Leader
Regulatory Branch

Copies Furnished:

S&L Environmental Group, Inc. (Mr. Stanger)
IDEM (Mr. Maupin, ID Number: 2014-290-45-MTM-A)
IDNR (Ms. White)
APPENDIX ‘F’

Estimated Load Reduction
Bank Stabilization

If estimating for just one bank, put "0" in areas for Bank #2.

Please select a soil textural class:

- Sands, loamy sands
- Sandy loam
- Fine sandy loam
- Loams, sandy clay loams, sandy clay
- Silt loam
- Silty clay loam, silty clay
- Clay loam
- Clay
- Organic

Please fill in the gray areas below:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Bank #1</th>
<th>Bank #2</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length (ft)</td>
<td>470</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>Height (ft)</td>
<td>4</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Lateral Recession Rate (ft/yr)*</td>
<td>0.4</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Soil Weight (tons/ft³)</td>
<td>0.0425</td>
<td>0.0425</td>
<td>0.04</td>
</tr>
<tr>
<td>Soil P Conc (lb/lb soil)**</td>
<td>USER</td>
<td>0.0005</td>
<td>0.0005</td>
</tr>
<tr>
<td>Soil N Conc (lb/lb soil)**</td>
<td>USER</td>
<td>0.001</td>
<td>0.001</td>
</tr>
</tbody>
</table>

** If not using the default values, users must provide input (in red) for Total P and Total N soil concentrations

*Lateral Recession Rate (LRR) is the rate at which bank deterioration has taken place and is measured in feet per year. This rate may not be easily determined by direct measurement. Therefore best professional judgement may be required to estimate the LRR. Please refer to the narrative descriptions in Table 1.

Estimated Load Reductions

<table>
<thead>
<tr>
<th></th>
<th>BMP Efficiency* Bank #1</th>
<th>BMP Efficiency* Bank #2</th>
<th>Bank #1</th>
<th>Bank #2</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sediment Load Reduction (ton/yr)</td>
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<td>1.0</td>
<td>32.0</td>
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<td>150</td>
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<tr>
<td>Phosphorus Load Reduction (lb/year)</td>
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<tr>
<td>Nitrogen Load Reduction (lb/yr)</td>
<td>63.9</td>
<td>15.3</td>
<td>300</td>
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</table>