PIGEON CREEK WATERSHED MANAGEMENT PLAN

STEUBEN COUNTY, INDIANA

Preface: The Pigeon Creek Watershed Management Plan is intended as a guide for the protection and enhancement of the environment and quality of the Pigeon Creek watershed while balancing the different uses and demands of the community on this natural resource. This plan will be used as a platform to request and obtain additional grants to implement the suggested tools that accomplish the goals identified in the plan, such as education, community involvement from individual, municipal, county, and state levels, and continued Pigeon Creek Watershed improvement projects.

Prepared for: Steuben County Commissioners
317 S. Wayne St. Ste. 2H
Angola, IN 46703

Steuben County Soil and Water Conservation District
Peachtree Plaza 200
1220 N 200 W
Angola, Indiana 46703

Prepared by: V3 Companies, Ltd.
9601 N. Industrial Drive
Suite A
St. John, Indiana 46373

TABLE OF CONTENTS

CHAPTERS:

Executive Summary 1
Introduction 2
Watershed Description 19
Watershed Performance Benchmarks 52
Problem Cause and Stressor Identification 59
Stressor Source Identification 63
Critical Watershed Areas 65
Setting Goals and Indicator Selection for Performance Assessment 71
Selecting Measures for Improvement 74
Calculating Load Reductions 103
Implementation of Planned Measures 111
Monitoring Indicators 118
Plan Evaluation and Adaptation 120
Reference Materials 121

LIST OF TABLES:

Table 1: Lakes Located Within Pigeon Creek Drainage Way 2
Table 2: Watershed Concerns Identified by Stakeholders at the March 2004 Public Meeting17
Table 3: Pigeon Creek Watershed Land Use Areas, data from 1987 26
Table 4: Pigeon Creek Watershed Land Use Areas, data from 1996 26
Table 5: Pigeon Creek Watershed Land Cover Areas, data from 1999....28
Table 6: Pigeon Creek Watershed Land Top Four Zonings 28
Table 7: Livestock Operations by Pigeon Creek Subwatershed. 28
Table 8: Indiana T by 2000 Watershed Soil Loss Transect data for Tillage Practices in Steuben County for 2004 and 2005 30
Table 9: Pigeon Creek Fish Community Assessment, IDEM, July 17 – 18, 2000....36
Table 10: IDNR Land Tracts 37
Table 11: Total Wetland Acres within the Pigeon Creek Subwatersheds 42
Table 12: 303(d) Impaired Aquatic Resources – Year 2004 52
Table 13: 303(d) Fish Consumption Advisories – Year 2004 52
Table 14: 305(b) Lake Trophic Status – Years 2002 and 2004 53
Table 15: Pigeon Creek Watershed NPDES Permit Listing....53
Table 16: Sample Results March 10, 2004 54
Table 17: Sample Results March 10, 2004 54
Table 18: Nitrate, Nitrite, and Phosphate Samples in the Watershed....56
Table 19: Summary of Hoosier Riverwatch Sampling Data 56
Table 20: Summary of Average Baseline Measurements from Hoosier Riverwatch Sampling Data....57
Table 21: Correlation of Watershed Concerns and Probable Causes 62
Table 22: Goals for Pigeon Creek Watershed Improvements 72
Table 23: Summary of Improvement Measures....99
Table 24: Summary of Improvement Measures Benefit Potential....100
Table 25: Correlation of Improvement Measures and Stakeholder Concerns....101
Table 26: Estimates of Anticipated Load Reductions....106
Table 27: Summary of Load Reduction Calculations....107
Table 28: Summary of Anticipated Load Reductions by Measure....108
Table 29: Projected Load Reduction Measures of Success 110
Table 30: Summary of Implementation Process (Continues)....116
Table 31: Summary of Performance Indicators for Improvement Measures 118
Table 32: Monitoring Plan Tracking or Monitoring Suggestions....119

LIST OF FIGURES:

Figure 1: Project Overview Map....3
Figure 2: IDEM Flow Chart for Watershed Management Plans....18
Figure 3: Pigeon Creek Subwatersheds....20
Figure 4: Significant Depressional Areas Map....21
Figure 5: Hydrologic Soil Group Classification Map....22
Figure 6: Hydric Soils Map....24
Figure 7: Pigeon Creek Annual Soil Loss Estimate....25
Figure 8: Current Land Use....27
Figure 9: Current Land Zoning....29
Figure 10: Comparison of Hydric Soils and Livestock Locations....31
Figure 11: Comparison of Hydric Soils and Landuse....32
Figure 12: Comparison of Livestock Locations and Landuse....33
Figure 13: Floodplain Map....39
Figure 14: Stream Gauge Location Downstream of Hogback Lak....40
Figure 15: Annual Peak Discharge Downstream of Hogback Lake....40
Figure 16: Annual Mean Stream Flow Downstream of Hogback Lake....41
Figure 17: Wetland Location Map....43
Figure 18: Location of Cisco Population....51
Figure 19: Eroded Channel Bank in Upper Watershed....58
Figure 20: Eroded Channel Bank in Upper Watershed....58
Figure 21: Upper Watershed Critical Areas....68
Figure 22: Lake Chain Critical Areas....69
Figure 23: Lower Watershed Critical Areas....70
Figure 24: Location of Kankamp Property....80
Figure 25: Location of Bill Deller Road Project....82
Figure 26: Location of Potential Sediment Basins in the Upper Watershed....83
Figure 27: Location of Potential Rock Vortex Weirs and Cross Vanes in the Upper Watershed....85
Figure 28: Location of Potential Filter Strips in the Upper Watershed....87
Figure 29: Location of Proposed CR 150W Culvert Replacement....88
Figure 30: Location of Potential Sediment Basins in the Lake Chain....89
Figure 31: Location of Potential Shoreline Stabilization in the Lake Chain....90
Figure 32: Location of West Otter Lake Pump Station....91
Figure 33: Location of Potential Sediment Basins in the Lower Watershed....92
Figure 34: Location of Gravel Pits in the Lower Watershed....93
Figure 35: Location of Potential Rock Vortex Weirs and Cross Vanes in the Lower Watershed....95
Figure 36: Location of Potential Filter Strips in the Lower Watershed....96
Figure 37: Location of Potential Hammond Ditch Culvert Restriction....97
Figure 38: Location of Potential Arrowhead Lake Control Structure....98