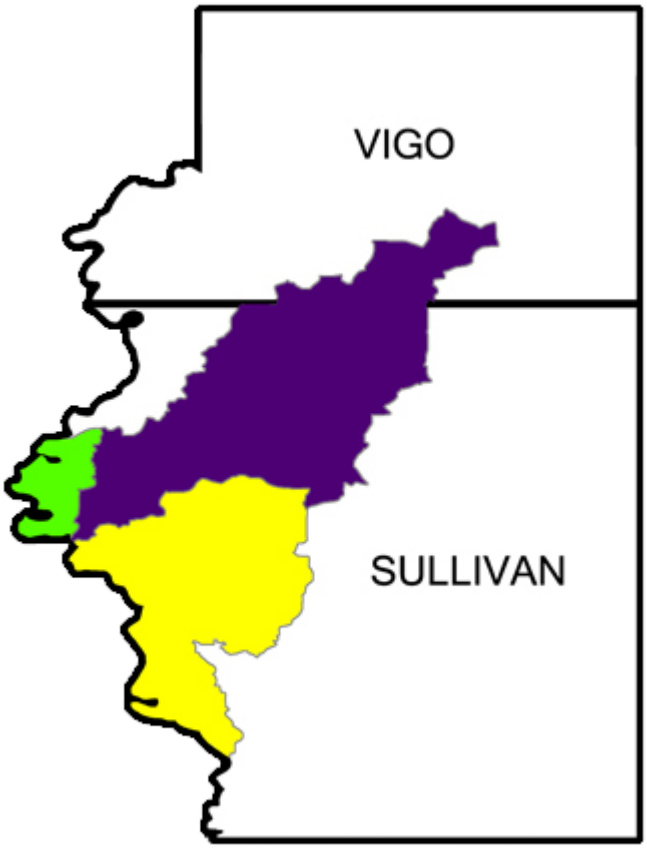
2013-2017

TTK Watershed

319 Planning and Implementation Project

Final Report



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Project Sponsor: Sullivan Co. SWCD

Report Period: August 23rd, 2013 – January 31st, 2017

Report Completed by:

Laura Demarest, Watershed Coordinator

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INTRODUCTION and OVERVIEW

The TTK (Turman Creek, Turtle Creek, and Kelley Bayou watersheds) 319 Planning and Implementation project officially began on August 23rd, 2013 and ended on January 31st, 2017. It ran concurrently with the TTK Implementation grant (A305-6-224) for its final 10 months, allowing for the successful carryover of producers, partners, and practices. The purpose of the TTK 319 Planning and Implementation project was two-fold: to develop a comprehensive Watershed Management Plan that would expand upon the original 1999 Partnership for Turtle Creek project plan and to implement a variety of conservation BMPs throughout the area, resulting in significantly improved regional water quality and management changes at the individual farm level.

The original application for funding included several generalized goals, which were adapted into 'Tasks' for the Grant Agreement and can be found summarized in the next section of this report. In addition to the outlined Task objectives, a goal of implementing over 5,000 acres of BMPs was also declared in the application.

The goals from the TTK Watershed Management Plan (pg. 148) are more specific, providing load reduction targets both in short-term and long-term increments, along with a number of biologic and administrative goals.

Short-Term Goals:

1. Reduce Sediment loads by at least 15% in each subwatershed within the next 5 years (992.07 t/yr)
2. Reduce Nitrogen loads by 15% in each subwatershed within the next 5 years (165,436.25 lbs/yr)
3. Reduce Phosphorus loads by 15% in each subwatershed within the next 5 years (24,192.2 lbs/yr)
4. Reduce E.coli loads by 4% in each subwatershed within the next 5 years (1.1857E+13 cfu/yr)

Long-Term Goals:

5. Reduce TSS loads by 100% in each subwatershed within the next 25 years (6,613.81 t/yr)
6. Reduce Nitrogen loads by 100% in each subwatershed within the next 20 years (1,102,869.4 lbs/yr)
7. Reduce Phosphorus loads by 100% in each subwatershed within the next 25 years (161,278.9 lbs/yr)
8. Reduce E.coli loads 60% in each subwatershed within the next 30 years (1.77808E+14 cfu/year)

Habitat/Biological Goals:

9. Continue to promote programs and conservation practices that establish riparian corridor, wetland habitat, field buffers, and filter strips.
10. Document significant QHEI and macroinvertebrate PTI score improvements on 70% of the 30 monitoring sites within the next 20 years.

Administrative Goals:

11. Continue to pursue advantageous partnerships and additional funding sources in order to make improvements throughout TTK and surrounding watersheds in the future.
12. Continue to promote a variety of Best Management Practices (BMPs) that will help bring about long-term behavioral changes, better land management, and continued conservation throughout the region.

The TTK 319 Planning and Implementation grant (A305-3-77) was primarily managed by Watershed Coordinator, Laura Demarest, with the financial oversight of Sullivan SWCD Coordinator/Educator, Carrie (Green) Dohner. In June 2016, a new SWCD Coordinator/Educator (Allison McKain) was hired when Ms. Dohner resigned. Some slight differences in documentation and signatures may be noted due to this change of personnel, though the requirements of the grant were successfully fulfilled by its close in January 2017.

PROJECT GOALS AND OBJECTIVES

Fulfilling the goals of the TTK WMP was to be accomplished through a variety of efforts that were organized according to "Tasks". Within the scope of each Task were a number of objectives to be completed in order to satisfy the overall goals of the TTK 319 Planning and Implementation project. The completion of these tasks will be presented at length in the next section of this report. The requirements of each Task are summarized as follows:

Task A: Produce a Watershed Management Plan

- Develop a Watershed Management Plan that will meet state and federal requirements for approval.
- Form an Advisory Committee and hold quarterly, public meetings.
- Geolocate all monitoring sites and BMPs installed.

Task B: Develop and Promote a Cost-Share Program

- Develop a state-approved cost-share program according to *Section 319 Cost-Share Program Development Guidelines.*

Task C: BMP Cost-Share Implementation

- Implement the approved cost-share program described in Task B (after the WMP is approved).
- Ensure that all BMPs conform to NRCS specifications or other applicable, approved specifications.
- Implement BMPs only in critical areas as described in the TTK WMP.
- Follow cost-share payment and reporting protocol according to IDEM 319 program requirements.
- Tabulate pollutant load reductions for every BMP funded by 319 or utilized for match.
- Create and maintain a geo-referenced database for all BMPs implemented through the 319 project.

Task D: Water Quality Monitoring and Analysis

- Develop a Quality Assurance Project Plan (QAPP) for monitoring activities: submit to the State for approval.
- Monitor at least 20 selected sites monthly for one year and then quarterly thereafter.
- Lab testing for one year will include: NO_2/NO_3, Total Phosphorus, TSS, and E.coli
- Additional parameters shall include: Flow, Temperature, Dissolved O_2, Salinity, Specific Conductance, Total Dissolved Solids, pH, Turbidity, Color, Odor, and photo documentation
- Complete one QHEI assessment on all sites.
- Conduct annual macroinvertebrate sampling on all sites.

Task E: Education and Outreach

- Conduct an education and outreach program that includes the following efforts:
  - Participate in no fewer than six (6) Pesticide Applicator Registration Program accreditation workshops; field days; or other local and regional program promoting events to promote the cost share program and the work of the West Central Indiana Watershed Alliance (WCIWA).
  - Conduct one public meeting each year to inform watershed stakeholders about the project.
  - Update the WCIWA webpage www.watershed-alliance.org at least quarterly.
  - Produce the WCIWA quarterly newsletter and distribute to stakeholders.
  - Maintain filterable database of volunteers, groups and partners.
  - Host or participate in no fewer than 2 regional water quality related workshops.
  - Provide no fewer than 3 releases to local newspapers, radio stations, and/or TV stations about the project.
  - Provide no fewer than 3 updates to governing bodies (County Council, County Commissioners, Drainage Boards, partner SWCDs, etc.).
  - Work with local educators/coordinators and government agencies to provide support for

environmental education activities in K-12 schools, home schools, and youth organizations at least 2 times.

- The Grantee shall provide an electronic copy of all products to the State.

Task F: Demonstration

- Implement at least one demonstration project according to the IDEM 319 program requirements.
- Provide a pollutant load reduction estimate of the demonstration BMP.

Task G: Reporting

- Prepare and submit a progress report to the State with each invoice package, at least quarterly.
- Submit two electronic copies of a final report to the State.

EVALUATION OF GOAL ACHIEVEMENT

Overall, the TTK 319 Planning and Implementation project proved to be a resounding success, allowing for seamless carry-over into ongoing supplementary implementation efforts in the area. This success can largely be validated by assessing the completion of the items listed in each of the previously outlined Tasks. Additionally, favorable trends in producer interest and participation in conservation efforts were noted throughout the duration of the project. Moreover, many helpful lessons were gleaned during the course of this grant project, which will enable future conservation efforts to benefit considerably.

The TTK 319 Planning and Implementation project was divided into two main phases: Planning and Implementation. The Planning Phase took over two years to complete, with the Watershed Management Plan receiving IDEM and EPA approval in early 2016. The Implementation Phase officially commenced immediately following the approval of the WMP, allowing for many queued projects to be moved forward. In the end, every cent of the TTK 319 grant funding was utilized, the match goal exceeded, a wealth of water quality data collected, an extensive Watershed Management Plan was completed and approved, and the application goal of implementing over 5,000 acres of BMPs was achieved.

When considering the specific goals stated in the Watershed Management Plan and the original grant application, it is premature to gauge completion, as the TTK initiative continues in the form of the TTK 319 Implementation project, for which an additional 319 grant was awarded in 2016. This grant serves as a Phase II for the TTK initiative, and is slated to conclude in the spring of 2019. However, at this stage, it is advantageous to review the outlined goals in order to determine if the overall project is on a successful trajectory for goal completion by 2019.

A series of 'Project Outcomes' and 'Measures of Success' was posited in the original TTK 319 Planning and Implementation grant application (presented below). Each 'Measure of Success' below will receive a check mark to indicate if it was completed in actuality. Additional discussion may be included, as necessary.

Project Outcomes:

1. Revise and expand the scope of the existing Turtle Creek and Little Turtle Creek Watershed Management Plan.
    - ✓ Administrative: Plan is expanded to include 12-digit HUCs listed in Section 3.
    - ✓ Administrative: Plan is completed and approved
    - ✓ Social: (Quantify) number of stakeholders participating in development of WMP
        - Note: The Advisory Committee consisted of approximately 10 core members and several occasional participants. Records of meeting attendance can be found in Appendix A.
2. Establish a water quality monitoring and assessment program to identify pollutant sources, loads, and trends.
    - ✓ Administrative: Quality Assurance Project Plan developed and implemented
    - ✓ Administrative: Historic and contemporary water quality data collected and analyzed.
        - Note: Historic water quality data largely could not be considered for the TTK WMP study due to inconsistencies in collection methods and unclear record-keeping.
    - ✓ Social: (Quantify) number of volunteers involved in water monitoring activities

- Note: Volunteers were not relied upon due to the possibility of contamination and constraints in time and scheduling. Carrie Dohner, Sullivan SWCD primarily assisted with water monitoring duties. During the course of monitoring, 5 volunteers participated.

3. Continue and expand WCIWA Outreach and Education programs.
   - ✓ Administrative: (Quantify) number of newsletters, web updates, presentations, workshops
     - Note: All outlined Grant Agreement requirements were fulfilled
   - ✓ Administrative: (Quantify) number of other groups' events in which WCIWA participated
     - Note: All outlined Grant Agreement requirements were fulfilled
   - ✓ Social: (Quantify) number of attendees at workshops and field days
     - Note: Attendance estimates will be included in the discussion of each Task completion.
   - ✓ Social: (Quantify) number of stakeholders, schools, civic groups, etc. involved in the project.
     - Note: A number of worthy partners assisted with the TTK Planning and Implementation project including: The Nature Conservancy, NRCS, DNR, US Fish and Wildlife, ISDA, neighboring SWCDs (Vigo, Clay, Greene, Knox, and Crawford County, IL), Purdue Extension, Hoosier Energy, Merom Improvement Association, Indiana American Water, Indiana Master Naturalist, Sullivan FFA, RCA School, Sullivan County Highway Dept., Sullivan Park and Lake, Brendan Kearns of Healthy River Initiative, Island Levee Drainage Board, local contractors WLRM, Bryon Seeds, and an estimated 50 stakeholders.
4. Develop, promote, and implement a Cost-Share Program in critical areas as defined in the WMP.
   - ✓ Administrative: Cost-Share Plan completed and approved
   - ✓ Administrative: BMPs implemented on 5,000 acres
   - ✓ Administrative: Load reductions estimated for each installation
   - ▪ Environmental: Objective measurements of water quality improvements
     - Note: Insufficient time has passed to be able to measure water quality improvements as a direct result of BMP implementation. However, water monitoring efforts are ongoing.
   - ▪ Environmental: Subjective measurements of improvements (habitat assessments, etc.)
     - Note: Insufficient time has passed to be able to measure water quality improvements as a direct result of BMP implementation. However, water monitoring efforts are ongoing.
5. Submit progress and final reports to IDEM.
   - ✓ Administrative: Quarterly Progress Reports and Final Report submitted to IDEM
     - Note: All outlined Grant Agreement requirements were fulfilled

Watershed Management Plan Goals:

For the most part, the goals outlined in the new TTK Watershed Management Plan directly involve load reductions for short-term (5 years) and long-term (20-30 years) benchmarks. After only a single year of targeted BMP implementation it may be much too early to determine if any of the long or short-term goals have been met. The table below represents short-term load reduction goals outlined in the WMP alongside recorded load reductions as a result of installed BMPs during the TTK Planning and Implementation project.

When it comes to Nitrogen and Phosphorus, it seems that implementation strategies are on track for meeting load reduction goals within the 5 year time period. Sediment loads, however, represent a head-scratching 657.56% load reduction – a calculation that hardly seems feasible if using 'common-sense' reckoning. Indeed, this conundrum, stemming from inconsistencies in load reduction calculation tools (L-THIA, StepL, and Region5 all offered variable results, especially when compared with the collected monitoring data), could be filed under 'Lessons Learned' for this project. Much scrutiny was paid to the load reduction calculation tools used during Watershed Management Planning and it now seems obvious that the goal for reducing sediment was likely much too low. In any case, theoretical load reduction calculation tools have their limitations and continued water monitoring throughout the project will help verify that the conservation practices installed have, in fact, had drastically positive effects on water quality.

	TTK WMP Reduction Goal (5 yrs)	TTK Phase I Reduction	Percentage
Nitrogen	165,436.25 lbs/year	72,447.85 lbs/year	43.79%

Phosphorus	24,192.2 lbs/year	8,922.7 lbs/year	36.88%
Sediment	992.07 tons/year	6,523.5 tons/year	657.56%
E.coli	1.857E+13 cfu/year	Cannot be determined	n/a

It is also worth noting that at the time of this report no adequate load reduction tool for E.coli has been definitively approved for use in 319 projects. Most BMPs implemented in this project do not have any measureable effect on E.coli load reduction, though ongoing public awareness education continues.

Habitat/Biological Goals:

- Continue to promote programs and conservation practices that establish riparian corridor, wetland habitat, field buffers, and filter strips.
  - ✓ During this time period, additional grants were acquired for the watershed through Clean Water Indiana and LARE. At this time, plans are being solidified through LARE for a wetland restoration project that would seasonally flood 700 acres of woodlands along the Wabash River corridor, making valuable habitat for thousands of migrating birds each year. As always, programs such as CREP, Healthy Rivers Initiative, WRP, CRP, EQIP, and offerings through The Nature Conservancy are made known to TTK stakeholders where applicable.

- Document significant QHEI and macroinvertebrate PTI score improvements on 70% of the 30 monitoring sites within the next 20 years.
  - After a single year of implementation, it is much too early to determine if significant improvements have been made, though monitoring continues.

Administrative Goals:

- Continue to pursue advantageous partnerships and additional funding sources in order to make improvements throughout TTK and surrounding watersheds in the future.
  - ✓ Many beneficial partnerships have been solidified through this grant and continue to offer support through match-funding, Advisory Committee participation, consultation, and outreach. During the time of the TTK Planning and Implementation grant, four grant applications for additional funding were compiled, submitted, and awarded as follows:
    - TTK 319 Implementation grant application - $336,660
    - Indiana American Water Environmental Grant for Merom Bluff Park - $1,120
    - Clean Water Indiana in partnership with Clay County SWCD - $72,000
    - DNR LARE Watershed Land Treatment grant for Turtle Creek - $30,000

- Continue to promote a variety of Best Management Practices (BMPs) that will help bring about long-term behavioral changes, better land management, and continued conservation throughout the region.
  - ✓ Many of the same programs previously highlighted in the Habitat/Biological goals apply to this parameter as well. In addition, programs such as INField Advantage (formerly On Farm Network) promote consideration and good management of Nitrogen, while innovative new practices such as saturated buffers, blind inlets, and modified cover crop seeders are being explored and encouraged.

COMPLETION OF TASKS

One straightforward way to quantify the success of the TTK Planning and Implementation grant project is to review the completion of the objectives outlined in each Task. More complex topics will be further discussed and analyzed as necessary. Supporting documentation can be found on the TTK Final Report CD (Appendix).

Task A: Administration, Development, and Promotion of Cost-Share Program

☑ Develop a Watershed Management Plan that will meet state and federal requirements for approval.

While drafting the WMP, new and impactful guidance was issued from EPA regarding the selection of critical areas and several other parameters regarding goal formation and load reduction calculations. Progress was slower than anticipated, but the new TTK Watershed Management Plan received IDEM approval on 1/20/16 and final EPA Approval on 2/2/16. The TTK WMP is available for view in its entirety on the watershed-alliance.org website.

Lessons Learned:

When the TTK Planning and Implementation project commenced, it was estimated that the WMP could be potentially completed within the span of a year, leaving 2 full years for cost-share implementation. This assumption proved to be quite an underestimate!

At the start of the TTK grant in August 2013, much energy was spent assembling the Advisory Committee, promoting the new TTK program, (admittedly finalizing the concurrent Busseron 319 grant), and writing the QAPP for the new monitoring program. Monitoring officially commenced in the spring of 2014 and an entire 12 months of collected (and analyzed) data was necessary for the completion of the WMP. Though monitoring was completed in the spring of 2015, the WMP drafting and approval process required additional time, in part due to changing EPA guidance on critical area selection. In addition, a 319 application was being compiled for additional TTK Implementation funding. When the WMP was finally approved at the start of 2016, this allowed less time for cost-share implementation and several producers on the "Interest List" had opted to complete their projects on their own rather than wait.

It is advisable that future projects not underestimate the amount of time needed to collect a thorough amount of information, review many sources of data, and receive feedback from Advisory Committee members, IDEM, and EPA. It should also be noted that for personnel who have never completed a WMP, there may be a need to develop/hone mapping skills and acquire new knowledge of modeling tools and programs (or outsource, if necessary!).

☑ Form an Advisory Committee and hold quarterly, public meetings.

The TTK Advisory Committee was formed during the August 29th, 2013 'Kick-Off' meeting. Many members had participated in the original Partnership for Turtle Creek project and others had been involved with the adjacent Busseron watershed Steering Committee. When the TTK Advisory Committee was formed, the Busseron watershed project was still in session, which allowed for beneficial cross-promotion. The TTK Advisory Committee was required to meet at least quarterly (a minimum of 14 times) during the time of the TTK 319 Planning and Implementation grant. Meetings were sometimes more or less frequent than quarterly, depending on the group's needs. The meetings continued on a regular basis for the duration of the grant, though once the requirement had been met, new Advisory Committee meetings were 'counted' for the Phase II TTK Implementation project and are therefore not listed below. Supporting documentation for all meetings can be found in **Appendix E** on the TTK A305-3-77 Final Report CD.

Advisory Committee Meeting Dates:

- August 29th, 2013
- October 29th, 2013
- January 14th, 2014
- March 11th, 2014
- May 20th, 2014
- July 22nd, 2014
- August 19th, 2014

- November 18th, 2014
- February 10th, 2015
- March 3rd, 2015
- May 12th, 2015
- July 14th, 2015
- August 11th, 2015
- January 26th, 2016
- April 5th, 2016

☑ Geolocate all monitoring sites and BMPs installed.

The latitude/longitude for each TTK monitoring site (30 total) was provided to IDEM in the QAPP as well as in the form of a shapefile (found in Appendix D on the TTK Final Report CD).

During the cost-share program, a shapefile was created for each type of BMP installed within the TTK watershed (Cover Crops, Nutrient Management, Alternative Waterway, and WASCOBs), either with 319, CWI, or LARE funding. This geodata was provided to IDEM in the Final Report CD – Appendix C). In addition, the latitude/longitude for each installed BMP was provided to IDEM on the 319A form, submitted for cost-share reimbursement or match. As the project continues, these shapefiles will be updated as new BMPs are installed throughout the watershed.

Task B: Cost-Share for BMP Implementation

☑ Develop a state-approved cost-share program according to *Section 319 Cost-Share Program Development Guidelines.*

Once the TTK Watershed Management Plan was approved by IDEM and EPA, the Cost-Share Guidelines were submitted shortly thereafter. The TTK Cost-Share Program (approved 2/8/16) was based on the successful Busseron Cost-Share Program that had just concluded in the adjacent watershed during the fall of 2013. The Advisory Committee wanted to prevent any confusion that may occur for producers farming in both watersheds and having potentially been involved with one or both programs. The TTK Cost-Share Guidelines offered the same tiered cost-share approach for certain practices (structural, precision ag., and planter upgrades), though the program was simplified considerably from the Busseron model.

Towards the end of the grant term, the TTK Cost-Share Guidelines were amended slightly to include the Little Turtle Creek watershed as a critical area in an effort to utilize all remaining cost-share funding before the end date. Though there has been no shortage of interested participants, several construction projects were pushed back to receive TTK Implementation cost-share due to weather delays. In order to meet the TTK Planning and Implementation grant deadline, the TTK Cost-Share Guidelines were amended slightly and approved on 12/2/16.

Task C: Cost-Share for BMP Implementation

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☑ Implement the approved cost-share program described in Task B (after the WMP is approved).

By the close of the TTK 319 Planning and Implementation grant, all of the cost-share funding had been completely utilized and more producers were still asking to apply. All BMPs were installed according to NRCS (or other approved) specifications and in accordance with IDEM 319 program guidelines. See the table below for a summary of BMP Implementation project and **Appendix C** on the TTK Final Report CD for a complete list of

BMP documentation (match and funded by 319 cost-share).

In summary, the TTK 319 Planning and Implementation grant worked with *22 unique producers* in approximately one year's time to install BMPs on an impressive number of acres in critical areas, including:

- 2,206.04 acres of Cover Crops
- 1 Grassed Waterway
- 2 WASCOBs
- 4,198.46 new acres utilizing Precision Agriculture tools (Nutrient Management)

Success: Many of these producers were first-time participants and young farmers who showed keen interest especially when it came to cover crops and precision agriculture. This is a promising observation for future conservation sustainability in the TTK watershed region. The allocated cost-share funds in Task C were completely spent by the end of the grant. The balance for Task C is $0.00, which is a success!

Included below is a complete list of participating producers, BMPs, and calculated load reductions, which can also be found in **Appendix C** on the TTK Final Report CD. The pollutant load reduction estimates of the BMPs installed as a direct result of the TTK 319 Planning and Implementation project (Cost-Share and Match projects) are summarized as follows:

- Total Nitrogen Load Reduction = 72,447.85 pounds/year
- Total Phosphorus Load Reduction = 8,922.70 pounds/year
- Total B.O.D. (Biological Oxygen Demand) Load Reduction = 39,745.20 pounds/year
- Total Sediment Load Reduction = 6,523.50 tons/year

Lessons Learned: Despite the final success of the program, it should be noted that there was a lot of initial uncertainty about the critical area selection process during the Planning phase of the grant which made it impossible to inform potential participants ahead of time as to whether or not they would be eligible. Several participants changed their mind and opted to construct projects on their own timeline while others waited two years through the Planning process, only to find out that their projects fell outside the critical area and were ineligible. It is important to promote the forthcoming cost-share program, but perhaps if a similar situation arises in the future, it may be best to carefully consider how early to begin cost-share program sign-up and promotion.

TTK 319 Planning and Implementation Project – Funded BMPs

Producer	Project	Units	Year	Nitrogen	Phos.	B.O.D.	Sediment
Joe Freeze	WASCoBs	2 (1,070 linear ft)	2015	191.00	95.50		95.50
Joe Freeze	Cover Crops	200 acres	2015	3,175.40	1,031.10	4,914.80	767.90
Alan Drake	Cover Crops	178 acres	2015	2,858.00	930.10	4,438.40	693.50
Noel Brothers (Tim Noel)	Cover Crops	120 acres	2015	2,002.40	656.10	3,143.30	491.10
Ben Poehlein	Cover Crops	13 acres	2015	271.50	92.10	449.60	70.20
Randy Kuppler	Cover Crops	56 acres	2015	1,007.80	334.40	768.80	252.10
James Watts	Cover Crops	153.8 acres	2015	2,504.90	817.20	3,905.70	610.30
Monte Watts	Cover Crops	147.1 acres	2015	2,406.20	785.60	3,756.40	586.90
Mike Bell	Cover Crops	93 acres	2015	1,591.30	523.70	2,515.00	393.00
Travis McKinney	Cover Crops	24 acres	2015	470.50	158.20	768.80	120.10
John T. Clark III	Cover Crops	13 acres	2015	399.50	134.70	655.40	102.40
Rick Pounds	Nutrient Management	331 acres	2016	3,972.00			
Tyler Pounds	Nutrient Management	297.91 acres	2016	3,574.92			
Justin Ferree	Nutrient Management	127.61 acres	2016	306.26			
JoAnn Ferree	Nutrient Management	233.12 acres	2016	2,797.44			
Gary Ferree	Nutrient Management	149.75 acres	2016	359.40			
Gary Ferree	Cover Crops	3 acres	2016	73.10	25.30	124.60	19.20
Mike Bell	Nutrient Management	383.1 acres	2016	4,597.20			
Mike Bell	Cover Crops	383.1 acres	2016	3,316.60	910.30	3,882.70	606.70
CCK Grain Farm	Cover Crops	574.89 acres	2016	4,760.00	1,282.50	5,392.70	842.60
Gary Ferree	Cover Crops	44 acres	2016	811.20	270.20	1,306.60	204.20
Travis McKinney	Cover Crops	92.46 acres	2016	805.80	251.70	1,172.40	183.20
Travis McKinney	Grassed Waterway	1 (270 linear ft.)	2016	172.10	86.10		86.10
Rick Pounds	Cover Crops	60 acres	2016	751.00	231.70	1,071.20	167.40
Gerald (Andy) Borders	Nutrient Management	596.21 acres	2017	7,154.52			
Dean Eslinger	Nutrient Management	123.21 acres	2017	295.70			
Joe Eslinger	Nutrient Management	1,441.62 acres	2017	17,299.44			
Clay Boston	Nutrient Management	246.4 acres	2017	2,956.80			
Jeff Boston	Nutrient Management	268.53 acres	2017	644.47			
			TOTAL	**71,526.45**	**8,616.50**	**38,266.40**	**6,292.40**

MATCH BMPs

Producer	Project/Description	Units	Year	N	P	B.O.D.	Sediment
Steve McCammon	Cover Crops, CWI	50.69 acres	2014	921.40	306.20	1,478.80	231.10
			TOTAL	**921.40**	**306.20**	**1,478.80**	**231.10**

Unique Producers	**22**
Cover Crop acres	**2,206.04**
Total WASCOBs	**2**
Total WWs	**1**
Total Nutrient Man.	**4,198.46**

☑ Ensure that all BMPs conform to NRCS specifications or other applicable, approved specifications.

☑ Implement BMPs only in critical areas as described in the TTK WMP.

☑ Follow cost-share payment and reporting protocol according to IDEM 319 program requirements.

☑ Tabulate pollutant load reductions for every BMP funded by 319 or utilized for match .

Pollutant load reduction totals can be viewed on the BMP Table above and are reported in the Quarterly Progress Reports submitted to IDEM with each Invoice Package.

☑ Create and maintain a geo-referenced database for all BMPs implemented through the 319 project.

As stated previously, all installed BMPs (match or otherwise) were tabulated in a shapefile that was provided to IDEM on the TTK Final Report CD.

Task D: Water Quality Monitoring and Analysis

☑ Develop a Quality Assurance Project Plan (QAPP) for the monitoring activities and submit it to the State for approval.

For the TTK 319 Planning and Implementation project, 20 sites were selected for 12 months of monthly monitoring. To date, no regular monitoring had been conducted in the TTK watershed and the few grab samples that had been collected locally were dismissed for WMP analysis due to unclear collection methods. The number of sites chosen for TTK monitoring was based on available 319 funding for one year of lab analysis. Hoosier Energy generously donated funding towards the monitoring of 9 additional sites within the Turtle Creek watershed and The Nature Conservancy also donated funding for equipment and monitoring of one site on the Kelley Bayou oxbow. In total, 30 sites within the TTK watershed were sampled monthly for one year. After the 12 months of lab analysis, the sites were monitored quarterly using methods adapted from the Hoosier Riverwatch program. Additionally, macroinvertebrates would be collected at each site on an annual basis and a QHEI evaluation was performed at each site at each site the first year to establish a baseline habitat score. In the spring of 2015, Hoosier Energy also funded 3 grab sample tests for Herbicide/Pesticide analysis.

At times, some of these sites were not able to be sampled due to weather-related hazards or dangerous access. Some sites were unsafe to sample or conduct macroinvertebrate collection during times of high flow or hunting season restrictions. A note to indicate the reason that sampling was not performed was included if data was not present. An overview of the sampling sites can be found in **Appendix d** on the TTK Final Report CD. All compiled data from the TTK water monitoring program can be found in **Appendix D,** as well. Further discussion regarding the collected data can be found of page 20 of this report.

☑ Monitor at least 20 selected sites monthly for one year and then quarterly thereafter. Lab testing for one year will include: NO_2/NO_3, Total Phosphorus, TSS, and E.coli. Additional parameters shall include: Flow, Temperature, Dissolved O_2, Salinity, Specific Conductance, Total Dissolved Solids, pH, Turbidity, Color, Odor, and photo documentation

A summary of sampling occurrences is described below. The sample number varies due to the addition of duplicate samples or the inability to sample a site due to access concerns, drought, or unfavorable weather conditions. All data collected was entered into the specified IDEM Spreadsheet, which can be found in **Appendix D** on the TTK Final Report CD. Sampling was generally conducted with the assistance of Sullivan SWCD Coordinator/Educator Carrie Dohner or Allison McKain.

- April 2014 (29 sites)
- May 2014 (29 sites)

- June 2014 (26 sites)
- July 2014 (21 sites)
- August 2014 (22 sites)
- September 2014 (28 sites + QHEI and macroinvertebrates)
- October 2014 (30 sites sampled)
- November 2014 (29 sites sampled)
- December 2014 (29 sites sampled)
- January 2015 (26 sites)
- February 2015 (3 sites – extreme cold/frozen streams)
- March 2015 (26 sites)
- April 2015 (1 site – TNC oxbow site only)
- May 2015 (3 sites – Hoosier Energy Herbicide/Pesticide testing + 1 site – TNC oxbow)
- June 2015 (1 site – TNC oxbow)
- June 2015/July 2015 – Summer quarterly monitoring (Hoosier Riverwatch methods)
- July 2015 (1 site – TNC oxbow)
- August 2015 (1 site – TNC oxbow)
- October 2015 – Fall quarterly monitoring (Hoosier Riverwatch methods) + macroinvertebrates
- March 2016 – Winter quarterly monitoring (Hoosier Riverwatch methods)
- April 2016 – Spring quarterly monitoring (Hoosier Riverwatch methods)
- July/August 2016 – Summer quarterly monitoring (Hoosier Riverwatch methods)
- November 2016 – Fall quarterly monitoring (Hoosier Riverwatch methods) + macroinvertebrates

After fall 2016 data was collected and entered into the IDEM Spreadsheet for the TTK Final Report, the QAPP needed to be updated for the subsequent TTK 319 Implementation grant. Monitoring will resume again once the QAPP is updated and approved for TTK Implementation.

☑ Complete one QHEI assessment on all sites.

☑ Conduct annual macroinvertebrate sampling on all sites.

Macroinvertebrate sampling was to be conducted once per year from July to mid-November at all sites and all collected data can be found in the IDEM Spreadsheet in **Appendix D** on the TTK Final Report CD. A summary sheet of QHEI and Macroinvertebrate data can also be found in the same location.

Task E: Education and Outreach

☑ Conduct an education and outreach program that includes the following efforts:

- Participate in no fewer than six (6) Pesticide Applicator Registration Program accreditation workshops; field days; or other local and regional program promoting events to promote the cost share program and the work of the West Central Indiana Watershed Alliance (WCIWA).

The TTK watershed project generated many opportunities to partner with other agencies for local and regional events that promoted conservation practices. The WCIWA assisted and participated in a wide variety of events, seminars, workshops, and field days. Listed below is an account of known events, trainings, and other programs that personnel from the WCIWA attended or assisted with in some way. In many cases, the Watershed Coordinator gave a presentation regarding the TTK 319 program and its mission to improve regional water quality. Even if WCIWA personnel had no direct involvement in the planning of an event, the networking, training, and idea-sharing opportunities were beneficial to the project on a broader scale. Attendees were tracked at most events, as represented

below. Further discussion regarding each individual event can be found within the Quarterly Progress Reports, which have been compiled in **Appendix G** on the TTK Final Report CD.

Workshops highlighted in **blue** indicate those in which the WCIWA provided a presentation or served as a primary partner in organizing the event as a part of the TTK 319 Planning and Implementation project. A minimum of 6 events were needed to satisfy the requirement of this task. Youth education events do not count towards this task, but are highlighted in blue, as well.

2017

- 1/26/17 – Conservation Showcase Field Day at the McKinney Farm (DEMO Project)
- 1/23-24/17 – IASWCD Annual Conference, Indianapolis, IN

2016

- 12/15/16 – Indiana American Water Wellhead Protection meeting, Merom, IN
- 12/12/16 – Indiana Water Monitoring Council Symposium, Danville, IN
- 12/5-6/16 – Indiana Society of Mining Reclamation Conference, Evansville, IN
- 11/30/16 – INField Advantage meeting, Indianapolis, IN
- 10/17/16 – SWCD SW Regional meeting, Loogootee, IN
- 10/15/16 – TTK Wabash River Canoe Float Field Day (~12 attendees - ORGANIZED)
- 9/27-29/16 – Sullivan 8th Grade Annual Wabash River Expedition (~350 attendees - PRESENTATION)
- 9/1/16 – Crawford County, IL Cover Crop workshop
- 8/16/16 – INFA meeting/equipment pick-up, Bedford, IN
- 8/11/16 – Women's Ag Forum, Vigo County and Carter Farms
- 7/15-21/16 – Sullivan County 4-H Fair booth
- 6/13/16 – Hoosier Riverwatch E.coli training, Clay Co. SWCD
- 6/3-5/16 - Merom Chautauqua Festival booth (~200 attendees)
- 5/31/16 – FFA Committee meeting
- 5/25/16 – NRCS Area Meeting on Grazing Management at Scott Foster's farm (Turman Creek)
- 5/23/16 – RCPP meeting in Bloomfield, IN for upcoming regional reclaimed mine lands initiative
- 4/15/16 – RCA School Earth Day (YOUTH PRESENTATION)
- 3/12/16 – Sullivan AG Day booth (estimated 500 people attended)
- 3/9/16 – RCA School middle school students (YOUTH PRESENTATION)
- 3/7/16 – Envirothon study/presentation on water quality for Sullivan High School students/FFA
- 3/4/16 – Kinze Planter Clinic, Sullivan, IN (approx. 70 people in attendance - PRESENTATION)
- 3/3/16 – Nutrient Load Reduction Strategy meeting, Crawfordsville, IL
- 3/2/16 – Southern Indiana Grazing Conference, Odon, IN
- 2/22/16 – Sullivan SWCD Annual Meeting (~80 attendees – PUBLIC UPDATE)
- 2/19/16 – Science Fair judge for RCA School
- 2/10/16 – Indiana Master Naturalist (35 people attended - PRESENTATION)
- 1/27-28/16 – NRCS Toolkit Intensive Training, Indianapolis, IN
- 1/20/16 – As-Built Training with NRCS Greencastle CIT
- 1/14-15/16 – IASWCD Annual Conference, Indianapolis, IN

2015

- 12/17/15 – Indiana Water Monitoring Council Annual Symposium, Indianapolis, IN
- 11/30/15 – INField Advantage Meeting, Indianapolis, IN
- 9/29/15-10/1/15 - Sullivan 8th Grade Raft Trip on the Wabash River (PRESENTATION)
- 9/22/15 - GIS Conference in Indianapolis, IN
- 8/27/15 - IN Field Advantage meeting (Bedford, IN)

- 8/25/15 – Assist Ouabache Land Conservancy with Otter Creek 319 grant application
- 8/18/15 State Fair volunteer Glass Barn with Indiana Soybean Alliance
- 7/17-24/15 Sullivan County 4-H Fair booth (~300 attendees)
- 7/1/15 Assisted with NRCS application for watershed-based EQIP funding through MRBI
- 6/25/15 Reclamation Field Day, Bear Run Mine (160 attendees)
- 6/18/15 INField Advantage promotional video shoot (on location: Mann farm) https://vimeo.com/140183500
- 6/5/15-6/7/15 Merom Chautauqua Festival booth (~200 attendees)
- 6/4/15 - Vigo Co. Extension "Pond Management & Water Quality" (40 present, televised PRESENTATION)
- 5/27/15 NRCS Invasive Species workday at Shakamak State Park (50 attendees)
- 5/20/15 L-THIA meeting with TNC, Sara Peel
- 5/13/15 Indiana Master Naturalist – Shiitake Mushroom log inoculation work day
- 5/13/15 RCA School Career Day (YOUTH PRESENTATION)
- 4/29/15 NRCS Area Meeting (cover crops, pollinator habitat, organic producers)
- 4/15/15 3rd Grade Ag Day, Sullivan County Fairgrounds (YOUTH PRESENTATION)
- 4/1/15 TTK 'Technology in Ag' Field Day – gave TTK presentation (16 attendees - ORGANIZED)
- 3/16/15 Indiana Ag Forum, Indianapolis Convention Center (INField Advantage sponsorship)
- 3/7/15 Sullivan County Ag Day – booth (500+ attendees)
- 3/4/15 Southern Indiana Grazing Conference, Odon, IN
- 3/3/15 Kinze Planter Clinic, Sullivan, IN – TTK Cost-share promotion (125 attendees - PRESENTATION)
- 2/27/15 RCA School Science Fair judge
- 2/24/15 On Farm Network – Middle Wabash group meeting/ data review (16 attendees - ORGANIZED)
- 2/16/15 Sullivan SWCD Annual Meeting – WCIWA update (80 attendees - PUBLIC UPDATE)
- 2/4/15 Vigo County SWCD Annual Meeting – received Conservation Educator of the Year Award

2014

- 12/17/14 – Merom Town Council meeting – (TTK/Rain Garden PRESENTATION – 12 attendees)
- 12/16/14 – Indiana American Water Wellhead Protection mtg. – (TTK grant PRESENTATION – 12 present)
- 12/11/14 – Indiana Water Monitoring Council Symposium
- 11/5/14 – ICP "Conservation Selling Skills" workshop
- 10/30/14 – Busseron Invasive Species workshop
- 10/23/14 – Turtle Creek Reservoir Evening Boat Cruise (~15 attendees – ORGANIZED)
- 10/18/14 - Set up a display at the Southern Indiana Outdoor Festival (~150 people in attendance)
- 9/30, 10/1, 10/2/14 – Sullivan Co. SWCD 8th Grade Raft Trip – Water Quality (PRESENTATION)
- 8/23/14 - Posey County Wabash Float Trip (~50 attendees - Water Quality PRESENTATION)
- 8/18/14 - Attend On Farm Network preparatory meeting
- 8/6/14 - Volunteer at Pathway to Water Quality, Indiana State Fair
- 8/4/14 - Update to Sullivan County Commissioners
- 7/22/14- Sullivan County Council update
- 7/11-18/14- Sullivan County Fair booth (~300 people attended)
- 7/9/14 - Merom Public Library program "Worms and Dirt" (YOUTH PRESENTATION)
- 7/7/14 - Crawford Co. IL, SWCD Board meeting – update
- 7/3/14 - Governor Pence Conservation Tour, Carter Farms, Vigo Co
- 6/12/14 - Sullivan Public Library program "Worms and Dirt" (YOUTH PRESENTATION)
- 6/6-8/14 - Merom Chautauqua Festival booth (~200 people attended)
- 4/9/14 - Greene Co. American Bottoms Cover Crop workshop
- 4/1/14 - Vigo Co. Otter Creek 319 Grant planning meeting
- 3/25/14 - AML Committee meeting, Brazil, IN
- 3/10/14 - CCSI Brocksmith Farm Advanced Cover Crop training
- 3/8/14 - Sullivan County Ag Day booth (~500+ people attended)
- 2/28/14 - RCA Science Fair Judge

- 2/26/14- IDEM Wetland Stakeholder meeting, Jasper, IN
- 2/25/14 - Pigg Kinze Planter Clinic (approximately 80 producers - PRESENTATION)
- 2/25/14 - Middle Wabash On Farm Network meeting (~12 attendees - ORGANIZED)
- 2/17/14 - Sullivan SWCD Annual Meeting (PUBLIC UPDATE)
- 1/24/14 - Purdue Extension PARP workshop (~15 attendees - PRESENTATION)

2013

- TTK Kick-Off Public Meeting August 30th, 2013

➢ Conduct one public meeting each year to inform watershed stakeholders about the project.

- 8/30/13 TTK Public Kick-Off meeting
- 2/17/14 Sullivan SWCD Annual meeting report
- 2/16/15 Sullivan SWCD Annual meeting report
- 2/22/16 Sullivan SWCD Annual meeting report

➢ Update the WCIWA webpage www.watershed-alliance.org at least quarterly.

In August 2013, a completely new website was launched for the beginning of the TTK grant with the help of a consulting web-developer (offering services in-kind). The website can be currently found at http://watershed-alliance.org. The busseron.org-link was allowed to expire in 2014 in favor of a more expansive title that will include future conservation efforts, such as the TTK (Turtle Creek, Turman Creek, Kelley Bayou) 319 project.

In addition to the website, a Twitter account (@WCIWA) was regularly updated with agriculture and watershed-related news. Starting in 2013, watershed photos were posted to a Flickr account for WCIWA. It is updated periodically and can be found at the following link:

http://www.flickr.com/photos/100018070@N07/.

➢ Produce the WCIWA quarterly newsletter and distribute to stakeholders

The TTK 319 Planning and Implementation project was to be promoted through the distribution of a quarterly E-Newsletter (14 total). The newsletters were distributed regularly to the TTK email list and placed on the watershed-alliance.org website. The format of the newsletter was derived from a template found on Google Docs and was kept concise in an effort to make sure they could be completed and sent out in a timely fashion. Copies of all TTK Newsletters can be found in Appendix E on the TTK Final Report CD and are still housed on the website.

- Fall 2013, Winter 2014, Spring 2014, Summer 2014, Fall 2014, Winter 2015, Spring 2015, Summer 2015, Fall/Winter 2015, Spring 2016, Summer 2016, Fall/Winter 2017, Winter 2017, TTK Wrap-Up Final Newsletter (14 total completed)

- Maintain filterable database of volunteers, groups, and partners.

The free software called Plaxo (www.plaxo.com) was used for this purpose. Existing contacts were synced into the program from Outlook and updated accordingly. This software requires login information which has been shared with the Sullivan SWCD Coordinator/Educator. New contacts can be easily added to this list, sorted into groups, and edited quickly. Group emails can be sent efficiently using this software and access is shared with the Sullivan SWCD Coordinator/Educator.

- Host or participate in no fewer than 2 regional water quality related workshops.

Two regional water quality field days were organized and hosted by WCIWA. An additional "Manure Management" workshop with CCSI was slated for 2015, but fell through for unknown reasons. The following field days hosted by WCIWA are summarized below:

- 4/1/15 – TTK 'Technology in Ag' Field Day (16 attendees) – This field day was held at the Merom Conference Center with speakers from Beck's Hybrids, including Dave Wilson (speaking on the diverse technological applications in precision farming) and Jim Bell, who brought a number of different UAV (a.k.a. 'drones') to demonstrate outside. After the field day, lunch and tours were available for interested parties at the Merom Conference Center.
- 10/15/16 – TTK Wabash River Canoe Float Field Day (~12 attendees) with speaker Brad Smith of The Nature Conservancy. Boats were launched in Hutsonville and traveled approximately 7 miles downstream to finish at the Merom Boat Ramp with lunch and door prizes at the Merom Bluff Park. Canoe rental and lunch services provided by Merom Conference Center; Conservation Officers were on-site to oversee safety and set GPS waypoints for scavenger hunt. Event insurance was purchased through Springer Insurance and the route was scouted beforehand in July by Brad Smith, Allison McKain (Sullivan SWCD), and Watershed Coordinator, Laura Demarest. Scouting canoe and transportation were provided by Bruce Marheine. This event was originally schedule for a Saturday in late August, but unfortunately was postponed due to flooding. The original date had RSVP numbers of over 25; the October date, despite scenic fall beauty, may have seen fewer attendees due to being scheduled at the same time as Parke County's Covered Bridge Festival.

- Provide no fewer than 3 releases to local newspapers, radio stations, and/or TV stations about the project.

An abundance of news regarding the TTK watershed project was featured in the Sullivan Daily Times newspaper. Since the watershed is situated primarily in Sullivan County it was not necessary to interface with the media of neighboring counties as frequently. Copies of press releases can be found in Appendix E on the TTK Final Report CD. In total, 12 documented media sources (excluding advertisements) were reported, which exceeds the requirement of 3 total publications for the project.

- Sullivan Daily Time press releases:
8/27/13, 3/1/14, 3/10/14, 8/6/14, 10/17/14, 3/6/15, 4/2/15, 8/25/15, 3/15/16, 7/15/16, 9/4/16, 10/13/16

- Provide no fewer than 3 updates to governing bodies (County Council, County Commissioners, Drainage Boards, partner SWCDs, etc.).

Municipal organizations were directly addressed on a regular basis. Listed below is a summary of occurrences.

- *7/7/14 Crawford County, IL SWCD Board mtg.*

- *7/22/14 Sullivan County Council mtg.*
- *8/4/14 Sullivan County Commissioner's mtg.*
- *12/17/14 Merom Town Council mtg.*

➢ Work with local educators/coordinators and government agencies to provide support for environmental education activities in K-12 schools, home schools, and youth organizations at least 2 times.

The number of educational events exceeded the goal from the grant agreement. There were many opportunities to assist with the events of partners and cooperating organizations through youth education events.

- 2/28/14 - RCA Science Fair judge
- 3/6,13,20/14 – ROAD Scholar tutoring for Carlisle Science Olympiad students (middle school)
- 6/12/14 – Sullivan Public Library program "Worms and Dirt" K-3
- 7/9/14 – Merom Public Library program "Worms and Dirt" K-3
- 9/30-10/2/14 – Sullivan SWCD 8th Grade Annual Raft Trip
- 2/27/15 RCA School Science Fair judge
- 4/15/15 3rd Grade Ag Day
- 5/13/15 RCA School Career Day
- 9/29-10/1/15 – Sullivan SWCD 8th Grade Annual Raft Trip
- 2/10/16 – Indiana Master Naturalist presentation
- 2/19/16 – RCA Science Fair judge
- 3/7/16 – Envirothon prep presentation with Sullivan High School students/FFA
- 3/9/16 – RCA School water quality/monitoring presentation
- 4/15/15 – RCA School Earth Day presentation
- 8/25/16 – Sullivan High School Natural Resources class Invasive Species (with T. Walters, NRCS)
- 11/17/16 – Sullivan High School Natural Resources class Invasive Species Field Day

➢ The Grantee shall provide an electronic copy of all products to the State

This Final Report as well as all supporting documentation for the TTK 319 Planning and Implementation project will be stored on a CD. Two copies of this CD and a dedicated USB were provided to the State at the close of this project.

Task F: Demonstration Project

☑ Implement at least one demonstration project according to the IDEM 319 program requirements.

Originally, the TTK Advisory Committee had planned to use a diverse cover crop plot along the highly visible Highway 41 as a demonstration site. The cover crop plot was to be donated by Byron Seeds and 319 funding would have paid for large promotional signs encouraging cover crops as a conservation practice. However, planning a successful cover crop plot requires some pre-planning and good fortune with weather. The farmer who volunteered his site had a late harvest, which left the only options for a plot to be aerial seeding or late season drilling. Aerial seeding is not able to achieve the precision needed for demonstration plots and late season planting means fewer choices for cover crop species, making a demonstration plot not feasible. In the end, the cover crop plot idea was tabled for another year with better

preparation beforehand.

Instead, the demonstration project was hosted on Travis McKinney's farm. Travis has completed a number of new (to the watershed) BMPs through EQIP, 319, and LARE. He is an Advisory Committee member and past recipient of the "Friend of the Watershed" award. Since 2013, Travis has installed an innovative Alternative Grassed Waterway on the edge of his field to control erosion and runoff. He also had an Animals Trails and Walkways project slated for Fall 2016 as part of his Prescribed Grazing operation, but due to weather delays, was not able to complete it before January 2017. Through EQIP, Travis has installed a stream crossing, overhauled his pond to include a pumping station and sediment basins, new exterior and exclusion fence, and hundreds of acres of cover crops.

In January 2017, a 'Showcase Farm' field day was held at Travis McKinney's farm. Attendance was low due to extremely cold weather, but several folks attended to see the conservation BMPs. It would have been held earlier, but was delayed while waiting to see if the Animals Trails and Walkways project could be completed beforehand. A large sign was installed along a roadside to indicate Travis' contributions to the TTK watershed project.

Supporting documentation and photos can be located in **Appendix F** on the TTK Final Report CD.

Lessons Learned: Demonstration projects require a sufficient amount of pre-planning, even for seemingly routine practices such as cover crop plots.

☑ Provide a pollutant load reduction estimate of the demonstration BMP.

This information can be found in **Appendix C (Travis McKinney WW)** on the TTK Final Report CD as well as on Page 11 of this report. According to the Region 5 model, this project resulted in the following pollutant load reductions:

- Total Nitrogen Load Reduction = 172.1 pounds/year
- Total Phosphorus Load Reduction = 86.1 pounds/year
- Total Sediment Load Reduction = 86.1 tons/year

Task G: Reporting

☑ Prepare and submit a progress report to the State with each invoice package at least quarterly.

A total of 13 Quarterly Progress Reports were submitted during the course of the TTK 319 Planning and Implementation project, meeting the Task G requirement. Copies of all Progress Reports can be found in **Appendix G** on the TTK Final Report CD.

- August 23rd, 2013 - November 22nd, 2013
- November 23rd, 2013 - February 21st, 2014
- February 22nd, 2014 - July 22nd, 2014
- July 23, 2014 - December 23rd, 2014
- December 24th, 2014 - April 6th, 2015
- April 7th, 2015 – July 14th, 2015
- July 14th, 2015 – September 2nd, 2015
- September 3rd, 2015-December 31st, 2015
- January 1st, 2016-March 15th, 2016

- March 16th, 2016-June 30th, 2016
- July 1st, 2016-September 30th, 2016
- October 1st, 2016-December 1st, 2016
- December 2nd, 2016-January 31st, 2017

☑ Submit two electronic copies of a final report to the State.

The TTK 319 Planning and Implementation project Final Report and all supporting documentation was submitted to the State on two CDs and provided to the Watershed Specialist on a dedicated USB.

Discussion of Monitoring Results

When the TTK Watershed project commenced in 2013(after being expanded from the 1999 Turtle Creek watershed project), there was little to no existing data to be considered for the Watershed Management Plan. Some grab samples had been collected as part of the Turtle Creek Watershed project, but handling methods were not clearly outlined and therefore deemed unreliable. Additional routine sampling had been conducted by IDEM to identify impairments, labeling several streams in the Turman Creek watershed as 5A impaired for E.coli and Biotic Communities.

After carefully considering the allocated 319 grant funding for monitoring, 20 sites were chosen throughout the TTK watersheds. Hoosier Energy and The Nature Conservancy also contributed funding for additional monitoring sites (Hoosier Energy – 9, TNC – 1 oxbow site); in total, 30 sites were monitored monthly for one year in the TTK watersheds.

All collected data can be found in **Appendix D** on the TTK Final Report CD as well as detailed and discussed at length in the TTK Watershed Management Plan. Funding for lab testing (NO_2, NO_3, Total Phosphorus, E.coli, TSS) was available for the first 12 months and then quarterly trend monitoring was conducted afterward for the remaining parameters: pH, Dissolved Oxygen, Flow, TDS (Total Dissolved Solids), Turbidity, Salinity, and Specific Conductivity, color, odor, and photo documentation. A QHEI score was collected for each site and annual macroinvertebrate assays were conducted in the fall.

During the TTK Planning and Implementation 319 project, a total of 304 samples were collected for lab analysis. Each watershed's pollutant loads were calculated (as documented in the TTK WMP) in order to determine critical areas. For summary purposes, a percentage of impaired samples for each parameter is included below. More extensive analysis is included in the WMP.

Parameter	# of Samples Collected	# of Samples Exceeding WQT*	Total % of Impaired Samples
E.coli	304	164 (over 235 cfu/100ml)	54%
NO_2, NO_3	304	152 (over 1.0 mg/L)	50%
Total P	304	236 (over 0.07 mg/L)	78%
TSS	304	185 (over 10.0 mg/L)	61%

*WQT = Water Quality Targets (developed for TTK WMP, based on general EPA/IDEM guidelines)

The data represented above represents concentration only, but it is obvious that many sites consistently exceed the quality targets for healthy water. In fact, many of the samples exceeded the water quality targets by alarming proportions on a regular basis. E.coli and Total Phosphorus were consistently elevated, though Nitrate/Nitrite concentrations were lower than expected in several highly agricultural watersheds, though still exhibiting impairments. Sedimentation continues to be of very high concern, especially as evidenced in QHEI and macroinvertebrate scores, where streams are heavily embedded and lacking beneficial substrate in most cases. The subwatersheds (HUC 12 sizes) of the Turman Creek

watershed were designated as critical for cost-share implementation, though Little Turtle Creek watershed reflected alarming TSS and E.coli loads, despite its comparatively smaller size.

Though no significant reductions in pollutant concentrations could be detected from the monitoring results in this short amount of time, the WCIWA is optimistic that the considerable amount of conservation work and promotion being conducted in the TTK watershed will yield measurable results in the future. Many producers are adopting new methods and strategies for implementing conservation on their farms through the back-to-back TTK 319 programs. The numerous BMPs, workshops, field days, and cost-share opportunities will serve to influence producers to continue utilizing conservation practices for years to come.

Public Participation and Partnerships

The TTK 319 Planning and Implementation program celebrated a successful outcome chiefly because of the dedication and commitment of those involved. Led by a motivated Advisory Committee, the project was highly-promoted through widely promoted field days and events. Many beneficial partnerships were forged as a result of this project including Hoosier Energy, The Nature Conservancy, Wildlife, Land and Resource Management L.L.C., Byron Seeds, Pigg Implement, Purdue Extension, Indiana American Water, Merom Town Council, Merom Improvement Association, E.C. Labs (now McCoy and McCoy), neighboring SWCDs (Vigo and Crawford County Illinois). Additionally, many helpful contacts were made in the form of regional agronomists, seed dealers, contractors, and implement sales personnel. The NRCS CIT and District Conservationist were also instrumental in providing specifications, cost-estimates, and engineering plans for structural practices in the 319 program. Many local officials on the County Council and Commissioners are also directly tied to farming and were happy to learn more and help advocate the 319 program. The success of this project can largely be attributed to the Sullivan SWCD Board for their oversight and management of the 319 project, as well as SWCD Coordinator/Educators, Carrie Dohner and Allison McKain, for their efficient administration skills and careful scrutiny of the finances.

One major credit to the TTK Planning and Implementation program is the fact that the Match requirement was not only fulfilled, but exceeded! Indeed, the match requirement was $177,500 and the final total reached $215,136.78 exceeding the goal by $37,636.78! This is a true testament to the commitment of local partners, producers, and volunteers. The momentum only continues to gain speed as the project rolls over into the TTK Implementation project!

Successes, Challenges, and Lessons Learned

In summary, the TTK 319 Planning and Implementation project demonstrated many positive efforts, including:

- Exceeded match requirement by $37,636.78
- BMPs installed on thousands of acres
- Large load reductions achieved through Nutrient Management and Cover Crops
- Widespread adoption of precision agriculture techniques and innovative cover cropping methods
- Strong Advisory Committee involvement and overwhelming local interest
- High level of participation from landowners and producers due to strong word-of-mouth promotion
- Collected a large amount of monitoring data from 2014-2015 in areas previously not sampled.
- Other conservation efforts including:
    - $30,000 LARE grant for Turtle Creek watershed
    - +$35,000 Clean Water Indiana grant for conservation practices
    - $1,120 Indiana American Water Environmental grant for Merom Bluff Park
    - INField Advantage Middle Wabash group
    - Continued promotion of CREP and NRCS/FSA programs
    - Hoosier Energy donations for costly monitoring
    - TNC assistance with stream buffer analysis for WMP and monitoring funds

However, all roads to success often have a number of 'bumps' along the way. Below are some challenges the TTK 319 Planning and Implementation project experienced (and learned from):

- Difficulty in estimating the time needed to collect sufficient data (monitoring, mapping, local information) for thorough completion of a Watershed Management Plan and IDEM/EPA approval, leaving a high-pressure time-crunch to complete Implementation tasks in the final year of the grant.
- Uncertainty regarding critical area selection made it difficult to plan projects with certainty, causing some producers to feel 'led on' for an extended amount of time.
- Some confusion about obtaining precise pollutant load estimates using available tools and data
- Quickly evolving precision agriculture technology can make it challenging to stay informed.
- Care to recommend good cover crop seeding mixes/practices based on next year's crop, etc.
- As always, careful attention must be paid to all aspects of the budget to ensure sufficient funding is available for all intended tasks for the duration of the grant timeline.

Future Activity

The West Central Indiana Watershed Alliance came to fruition in response to the many different conservation efforts that were ongoing in the region, starting with the Busseron watershed. After expanding beyond a single watershed, a more encompassing title for the group was adopted. Currently, the WCIWA has expanded the 319 program into the Turman Creek, Turtle Creek, and Kelley Bayou watersheds, while seeking additional funding in the form of Clean Water Indiana, LARE, and other applicable sources. The WCIWA has assisted neighboring watershed groups with their own 319 grants, acting as a consulting partner at times. At the time of this report, the WCIWA is also operating in the nearby Plummer Creek watershed, situated in Greene, Monroe, and Owen counties.

When it comes to the TTK watershed efforts, the Sullivan County SWCD continues to act as the backbone of the project, overseeing the completion of required tasks and handling all expenditures. The WCIWA continues to look for opportunities to promote conservation in the region while facilitating ongoing implementation in the TTK watershed.