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MEMO

To: Upper Cedar Watershed Management Improvement Authority
From: Amber Converse and Eric Thompson, PE
Subject: Upper Cedar Watershed: Previous Studies/Projects

The Upper Cedar Watershed has been subject to numerous studies and projects relating to both flooding and water quality concerns. The scope, scale and results of previous work can be useful as a learning tool for future work within the Upper Cedar watershed. The summaries of different efforts below give an idea of the breath and scope of work completed to date. The attached map highlights the project locations, and any final publications can be found either at the website link provided or in the appendix. Projects are grouped by scale and spatial location.

PROJECTS IN MINNESOTA

1. Cedar River Watershed District (Mower, Dodge, Freeborn and Steele Counties, MN)

The Watershed District was formed in 2007 with the aim of reducing stream flows and improving water quality. The state of Minnesota established a Watershed Act in 1955 (Minnesota Statutes 103D) to conserve natural resources by land use planning, flood control and other conservation practices. A provision of this act facilitated creation of watershed districts. A Watershed District in Minnesota has broad authorities including the ability to collect data and conduct studies, adopt rules concerning water resources, construct/implement projects, and levy property taxes and access properties to fund projects. The Cedar River Watershed District covers 434.7 square miles of primarily agricultural land and 45 miles of the Cedar River. A 10-year Watershed Management Plan was published in October 2009, providing a physical environmental inventory of the watershed, assessment of the major issues, goals and objectives and an implementation program.

The priority issues for the District include:

- Addressing existing flooding issues and preventing/minimizing the risk of future flooding
- Reducing non-point source pollution
- Implementing the action steps of TMDL studies, when completed
- Reducing sedimentation and turbidity in waterbodies within the CRWD
- Reducing nutrient loading to waterbodies, including nitrogen and phosphorus
- Reducing erosion within the CRWD
- Developing policies to guide the development and maintenance of sustainable agricultural and urban drainage systems
- Protecting groundwater quality from the detrimental impacts of improperly operating subsurface sewage treatment systems, nonconforming feedlot operations, and chemical contamination from landfills, storage tanks, spills and other similar activities

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2. Dobbins Creek SWAT Modeling (Mower County, MN)

Dobbins Creek watershed is located in southern Minnesota (HUC 12) covering 38 square miles and falls within the Cedar River Watershed District. Segments of Dobbins Creek were listed as impaired by the EPA due to fecal coliform (2006) and turbidity (2006, 2012). A study was completed in February 2010 to simulate hydrologic and sediment dynamics for the watershed to identify potential Best Management Practices (BMP) that could improve water quality for impaired segments of creek. The Soil & Water Assessment Tool (SWAT) was used for this work, calibrated to match the existing conditions and then modified to simulate proposed BMPs. The modeled BMPs included (1) Distributed Temporary Storage at locations previously studied within the watershed, (2) Perennial Vegetation of switchgrass replacing existing agricultural crops, (3) Erosion Control via conservation tillage and stream bank restoration, and (4) a Combination of BMPs including flood reduction sites, wetland restoration sites, temporary storage sites and conservation tillage. The report documented total suspended solid (TSS) reductions and projected cost for each BMP scenario.

The report offered recommendations for the following actions:

- Applying for funding to implement one of the modeled scenarios, incorporating a combination of BMPs (flood reduction sites, wetland restoration sites, and temporary storage)
- Complete an in-depth water quality study of East Side Lake to determine nutrient and sediment budgets
- Continue monitoring efforts and integrate procedures that will aide obtaining flow and TSS data during high flow events
- Education and engage stakeholders to voluntarily participate in runoff reducing practices, such as conservation tillage or no-till

www.cedarriverwd.org/documents/Final_DobbinsCreekReport.pdf

3. Turtle Creek Watershed District (Freeborn and Mower Counties, MN)

The Turtle Creek Watershed District was formed in 1968 in accordance with Minnesota Statutes 103D and has the primary roles of (1) addressing the goals to meet the needs of the watershed public, (2) encouraging and implementing practices that improve surface water quality, (3) effectively managing the flow of floodwaters, and (4) providing residents/landowners information to assure the protection and improvement of the watershed. The Turtle Creek Watershed District covers 314 square miles and is used primarily for agricultural crops and livestock production. A 10-year Watershed Management Plan was published in September 2003, which provided a history of the Watershed District, list of completed projects, district rules, and future goals and objectives.

The District goals are organized into four major areas of District involvement:

- *Watershed Management: Manage the watershed from an effective Watershed Management Plan that addresses goals and that meet the needs of the watershed public.*
 - Intergovernmental Cooperation: Pursue partnerships to provide effective, efficient and consistent water management activities throughout the watershed.
 - Restructure and expand the Citizen Advisory committee to establish strong connections for the Turtle Creek Watershed District
 - Financing: Utilize planning, education and partnerships to effectively fulfill District's goals and address water resource management issues.
 - Encourage partners and residents to work together on a lake management plan for Geneva Lake.

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- Continue to maintain the drainage system while researching new and innovative projects that will be benefiting the system economically as well as protect the resource.
- Water Quality: *Encourage and implement practices to improve and protect the quality of surface water in the District.*
 - Increase ditch miles of filter strips by implementing a buffer initiative.
 - To preserve and protect topsoil, while reducing sedimentation runoff to the surface waters of Turtle Creek.
 - Develop baseline monitoring data for each sub watershed in the Turtle Creek Watershed.
 - Reduce level of pollutants in surface waters of the watershed as identified in the Total Maximum Daily Load (TMDL) analysis.
- Water Quantity Management: *Effectively manage the flow of floodwaters within the District.*
 - Preserve existing flood levels of the District waters at or below the 100-year flood elevations.
 - Examine cost effective options to reduce agricultural and urban flood damages through wetland restorations.
 - Examine cost effective options to reduce agricultural and urban flood damages through researching culverts.
- Education: *Provide the residents and landowners with information to assure the protection and improvement of the Turtle Creek Watershed.*
 - Educate the public and provide information of the concept of Watersheds
 - Provide information to the public for understanding water resources
 - Communications: Residents, landowners and government agencies will be given updates of District initiatives, projects and challenges.

<http://www.turtlecreekwd.org/>

PROJECTS IN IOWA: WITHIN THE UPPER CEDAR WATERSHED

4. Burr Oak/Turtle Creek Water Quality Project (Mitchell County, IA)

The Water Quality Project began in 2006 after a noticeable decline in water quality in within Burr Oak and Turtle Creeks. The creeks are classified by the Iowa Department of Natural Resources (DNR) as cold water streams and can support trout populations if water quality is maintained and improved. The Burr Oak watershed covers 20 square miles and shares a watershed boundary with Turtle Creek (13.8 square miles); both creeks are impaired primarily by non-point agricultural sources. The project goals were to (1) reduce sediment delivery to the streams by 30%, (2) reduce manure runoff by developing manure utilization plans, constructing manure storage facilities and excluding livestock from the stream, (3) provide information and education to landowners on how nutrient loading and sediment delivery impacts the streams, and (4) address long-term protection needs for critical areas. A final report from July 2010 summarized the projects completed within the two watersheds, with most notable success in stream bank stabilization projects. Other Best Management Practices (BMPs) had reduced success rates and the report offers insight on “lessons learned” throughout the course of the project.

Final report included in the appendix.

5. Spring Creek MRBI Watershed Project (Mitchell County, IA)

The Spring Creek Watershed (HUC 12) was selected to be part of the USDA-NRCS Mississippi River Basin Healthy Watersheds Initiative (MRBI) with the goal to improve the overall health of the Mississippi River Basin. This project helps producers to voluntarily implement different conservation practices that reduce nutrient runoff and improve wildlife habitat while still maintaining agricultural productivity. The MRBI program provides financial assistance for different practices including: developing a Comprehensive Nutrient Management Plan, constructing a sediment basin, installing filter strips, using cover crops and a wide variety of other practices. A complete list of the supported practices can be found on the website below.

www.nrcs.usda.gov/wps/portal/nrcs/detail/ia/programs/?cid=nrcs142p2_007958

6. Rock Creek Watershed Management Plan (Mitchell and Floyd Counties, IA)

The Iowa Soybean Association is developing a watershed management plan for the Rock Creek Watershed, a HUC 12 covering 31.9 square miles of primarily agricultural land. Additional work is also underway to provide technical assistance to farms and landowners within the watershed. The final copy of the watershed management plan can be found on the website below:

<http://www.iasoybeans.com/environment/RockCreekWatershedPlanFINAL.pdf>

7. Beaver Creek Watershed Flood Mitigation (Floyd and Chickasaw Counties, IA)

The Iowa Flood Center and the University of Iowa – Hydroscience and Engineering received funding from the U.S. Department of Housing Urban Development to prepare watershed mitigation projects in select Iowa watersheds. The goals of the project include:

- Maximize soil water holding capacity from precipitation
- Minimize severe soil erosion and sand deposition during floods
- Manage water runoff in uplands under saturated soil moisture conditions
- Reduce and mitigate structural and nonstructural flood damage

The Upper Cedar River Watershed (HUC 8) was selected for Hydrologic Assessment and within that area, Beaver Creek Watershed (HUC 12) was chosen in 2013 for the construction and implementation of different demonstration projects. Potential projects include “active and passive water storage structures, buffer strips, advanced tile drainage systems, flood easement acquisition, and wetlands.” This project is ongoing with the final report anticipated in 2017.

www.iowafloodcenter.org/projects/watershed-projects

8. Upper Cedar MRBI Watershed Project (Floyd and Chickasaw Counties, IA)

Four HUC 12 watersheds (Beaver Creek, Colwell County Park-Little Cedar River, Gizzard Creek and the Little Cedar River) were selected to be part of the USDA-NRCS Mississippi River Basin Healthy Watersheds Initiative (MRBI) with the goal to improve the overall health of the Mississippi River Basin. This project helps producers to voluntarily implement different conservation practices that reduce nutrient runoff and improve wildlife habitat while still maintaining agricultural productivity. The MRBI program provides financial assistance for different practices including: developing a Comprehensive Nutrient Management Plan, wetland creation,

installing riparian forest buffers, using cover crops and a wide variety of other practices. A complete list of the supported practices can be found on the website below.

www.nrcs.usda.gov/wps/portal/nrcs/detail/ia/programs/?cid=nrcs142p2_007958

9. City of Carpenter Water Treatment Project (Mitchell County, IA)

The City of Carpenter sewer system contained several failed septic systems, with the untreated waste water discharging into Deer Creek via tile lines. Iowa DNR sampling confirmed the presence of fecal coliform indicating that sewage was entering the tile lines. In 2006, the City received grant funding from the Watershed Improvement Review Board (WIRB) to stop the wastewater discharge and provide the citizens with an environmentally sound and affordable wastewater treatment system. A two cell lagoon system was designed for the City and installation completed in 2009.

Final report included in the appendix to this memo.

10. Charles City River Redevelopment and Stormwater Management Project (Floyd County, IA)

In 2009, Charles City conducted a feasibility study for different sustainable urban stormwater management projects and sought funding for a permeable pavement project. Existing stormwater infrastructure within the project area was undersized and resulted in localized ponding and regular flooding. Six streets were chosen for the project based on concerns of deteriorating pavement and flooding issues. The City received an I-Jobs Improved Urban Storm Water Best Management Practices grant in 2010, and completed the “Charles City Green Streets” project in the Fall of 2010. Upon completion of the project, the City was evaluating other street locations for future “Green Street” expansion.

Final report included in the appendix to this memo.

11. City of Waverly Source Water Protection Plan (Bremer County, IA)

The City of Waverly received planning and technical assistance from the Cedar Valley Resource Conservation & Development (RC&D) council to develop a Source Water Protection Plan to stabilize nitrate levels in their well water. A final Action Plan was approved by the City in 2012, and submitted to the Iowa DNR in the spring of 2013. Action items include developing a planning team that is representative of the population, monitoring high nitrate wells on a monthly basis, developing education materials, and creating action plans for both urban and rural practices to reduce nitrates in source water.

Final report included in the appendix to this memo.

12. Mitchell County Devonian Aquifer Protection Project and Supplemental Evaluation Methods (Mitchell County, IA)

This project sought to protect the Devonian Aquifer, Mitchell County’s potable water source, from further degradation. Open sinkholes and soils shallow to bedrock above the aquifer allowed surface contaminants such as pesticides, animal wastes, and other nutrients to move quickly to the aquifer. Started in 1989, this project led to many improvements included installing 16 ag waste systems, cleaning 9 sinkholes, diverting runoff from 4 sinkholes, using crop scouting on 1200 acres, and planting trees on 270 acres. A supplemental project was created in 1989 to expand this effort to include a more comprehensive groundwater quality evaluation component. It assembled existing well water quality data for the study area and the adjacent control area into a single computer database that provided a comprehensive data analysis for an entire 5 year

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data set, selected wells for on-going monitoring, and assisted with education and information programs. A final report is not available at this time.

13. Monitoring of Streams in Mitchell County

The Iowa DNR sampled water from twelve different streams (21 sites), two Conservation Reserve Enhancement Program (CREP) wetlands, and at thirteen tile lines in Mitchell County between 2006 and 2013. Measured parameters included dissolved oxygen, pH, *E. coli* bacteria, nitrogen, and phosphorus. This project is ongoing and the DNR published a summary of the findings from 2006-2013.

Final report included in the appendix to this memo.

14. Floyd County Groundwater Protection Project and Monitoring ADW Closure Effects (Floyd County, IA)

The Floyd County Groundwater Protection Project aimed to preserve and improve groundwater quality in the Devonian aquifer by offering education and financial incentives to landowners. The project was initiated in 1990 with numerous partners and helped landowners close 23 of 69 agricultural drainage wells (ADWs). The wells were constructed in the early 1900s as an outlet for surface water runoff from agricultural fields, but can potentially move contaminants into underground drinking water. In 1994, the Iowa DNR monitored and documented groundwater quality changes after three agricultural drainage wells were closed in Floyd County. A summary of the study and results were published in 1999.

<ftp://ftp.igsb.uiowa.edu/igspubs/pdf/TIS-40.pdf>

15. Tri-County Rural Water Project (Mitchell, Floyd and Butler Counties, IA)

Groundwater contamination from both point and non-point sources was an issue in Floyd, Mitchell and Butler Counties, prompting the creation of the Tri-County Project to improve water quality. Throughout the course of the project, the CRP buffer program was used to install hundreds of acres of filter strips and riparian buffers along streams and around sinkholes, twenty-five agricultural drainage wells were eliminated, and eighteen manure management systems were applied. A final report was not available at this time.

16. Integrating Nutrient, Soil and Habitat Management in the Upper Cedar Watershed

Iowa Soybean Association (ISA) crop advisors and wild life biologists are currently working to provide whole farm planning, monitoring and outreach to farmers in the Upper Cedar Watershed. This project is ongoing, and a final report of the project is not available as of spring 2014.

17. Participatory Cover Crop Research on Upper Cedar River Watershed Farms

The Iowa Soybean Association (ISA) is working to evaluate the risks and benefits (economic, agronomic and environmental) for Upper Cedar River Watershed row crop farmers who implement cover crops on their land. The project is funded by a 2-year grant from the Iowa Department of Agriculture and Land Stewardship (IDALS), with trials beginning in the summer of 2013. This project is ongoing and a final report is not available as of spring 2014.

18. Rapid Watershed Assessment: Upper Cedar

The USDA Natural Resource Conservation Service (NRCS) conducts Rapid Watershed Assessments (RWA) on watersheds throughout the country to “provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and

stakeholders.” The USDA NRCS prepared a watershed assessment report for the Upper Cedar River Watershed, which served as a broad-brush assessment of critical issues within the watershed.

The main resource concerns in the watershed are flooding, sediment and erosion control, drinking and source water protection, animal waste management, nutrient management, wetland management, and stormwater and wastewater management. The report also identified water quality impairment in the forms of mercury, fecal coliform, turbidity, phosphorus nutrients, chlorine, and habitat.

www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_007006.pdf

PROJECTS IN IOWA: COVERING THE ENTIRE CEDAR BASIN

19. Cedar River SWAT Modeling

The U.S. Geological Survey and the Iowa Department of Natural Resources used the Soil and Water Assessment Tool (SWAT) to simulate streamflow and nitrate loads within the Cedar River Basin (approximately 7,815 square miles). The Cedar basin is relatively densely gaged in comparison to other watersheds in Iowa, and the goal of the project was to assess the ability of SWAT to model both gaged and ungaged watersheds in the state. The model was calibrated for 2000-2004 and then validated for 2005-2010.

A modified version of this SWAT model is currently being used by the Upper Cedar River Watershed Management Improvement Authority to focus specifically on the Upper Cedar HUC and water quality.

<http://pubs.usgs.gov/sir/2013/5002>

20. Floodplain Management and Communication of Risk in the Iowa-Cedar Watershed Basin

The Iowa Silver Jackets (an intergovernmental team of state and federal agencies) aimed to gather data on different flood risk management practices within the Iowa portion of the Cedar River Watershed, quantify current and future flood risks for individual communities and then communicate their findings to stakeholders. Through this effort, a database was created of communities that had developed flood related products such as hazard mitigation plans, future land use plans and zoning ordinances. The team also used the Federal Emergency Management Agency’s Hazard United States (FEMA-HAZUS) and other GIS-tools to estimate the current flood risk, both for structure loss and population at risk.

www.nfrmp.us/state/docs/iowa/FY12_IAPilot_Report_Final.pdf

21. Cedar River TMDL (Bacteria)

Nine segments within the Cedar River Watershed (eight segments of the Cedar River and one segment of Shell Rock River) were identified in Iowa’s 2006 Integrated Report Category 5 (303d list) as “impaired” based on monitoring from 2002 to 2004 for indicator bacteria, *E. coli*. The Federal Clean Water Act requires a Total Maximum Daily Load (TMDL) be developed for such impaired waters. The Iowa DNR published the final TMDL report in February, 2010 which provided a description of the watershed, problem identification for *E. coli*, modeling results using the EPA’s Hydrological Simulation Program-FORTRAN (HSPF) and an implementation plan (*for information purposes only and not officially part of the TMDL*).

The TMDL recommended an implementation plan consisting of four management practices thought to be highly effective at improving water quality conditions within the Cedar River Watershed:

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- All WWTP effluent and rivers entering Iowa will have bacteria concentrations less than or equal to the Iowa WQS
- Unpermitted feedlots will control/capture the first one-half inch of rain
- Cropland bacteria loading will be reduced by 40 percent through proper timing and application of animal waste
- Cattle in streams will be reduced by 40 percent and leaking septic systems will be eliminated

www.iowadnr.gov/Environment/WaterQuality/WatershedImprovement/WatershedResearchData/WaterImprovementPlans/PublicMeetingsPlans.aspx

22. Cedar River TMDL (Nitrate)

In 2006, the Iowa Department of Natural Resources prepared a Total Maximum Daily Load (TMDL) study of the Cedar River to determine the maximum allowable nitrate loading for the river that can occur without exceeding the drinking water standard of 10 mg/l NO₃-N. The study found that wastewater and urban stormwater runoff nitrogen loads to the Cedar River were comparatively minor. Row crop activities were found to be the major source of nitrates in the river. The TMDL implementation plan calls for the following:

- Spring or split nitrogen application (in lieu of fall application) to better time nitrogen availability with crop demand
- Use nitrogen application rates based on the Late-Spring Soil Nitrate Test (LSNT)
- Adoption of no-till or strip-till systems combined with injection of nitrogen, crop nitrogen use efficiency and decrease leaching of nitrogen-laden soil water through macro pores
- Ensuring that an appropriate nitrogen credit is subtracted from application rates for corn when rotating from a legume crop such as soybeans or alfalfa
- Addition of perennial species to crop rotation to reduce both nitrate and water losses to subsurface drainage systems and groundwater

In addition, to better managing row-cropped areas and replacing targeted row-crop agriculture with selected best management practices (such as CRP and wetlands) may also influence nitrate concentrations.

www.epa.gov/waters/tmdl/docs/32009_IACedarRiverTMDL.pdf

PROJECTS IN IOWA: STATE-WIDE EFFORTS

23. CREP Wetland Restorations

Iowa's Conservation Reserve Enhancement Program (CREP) is a state/federal cost-share initiative to construct strategically placed nitrate removal wetlands in drain-tiled landscapes. Removal of nitrates improves water quality for drinking water and reduces hypoxia in the Gulf of Mexico. The program is a partnership between the Iowa Department of Agriculture and Land Stewardship (IDALS), the USDA Farm Service Agency, and local Soil & Water Conservation Districts. As of spring 2014, eleven wetlands had been installed in the Upper Cedar Watershed, with a total wetland area of 105 acres and a watershed area of 12,815 acres. Annual nitrogen removal is estimated to be 157,500 lbs.

www.iowaagriculture.gov/waterresources/CREP.asp

24. Iowa's Non-point Source Management Plan

In 2012, the Iowa DNR published a Nonpoint Source Management Plan as a collective effort between state and federal agencies, soil & water conservation districts, universities and other stakeholders with the state. The plan represents the state's vision, goals, objectives and action steps to reduce nonpoint source pollution in order to improve water quality over five-to-ten years. The plan also satisfies a requirement of the Environmental Protection Agency (EPA) in order to be eligible for Clean Water Act Section 319 funding. The final report contains larger visions for the state, and written in a format that is accessible for the public at large.

The plan highlights four major goals:

- Build partnerships to enhance a collaborative watershed approach to nonpoint source water pollution
- Improve technical assistance, outreach and education to facilitate NPS Assessment, planning and implementation
- Science-based performance measured
- Funding

www.iowadnr.gov/Portals/idnr/uploads/water/watershed/files/npsmp_main.pdf

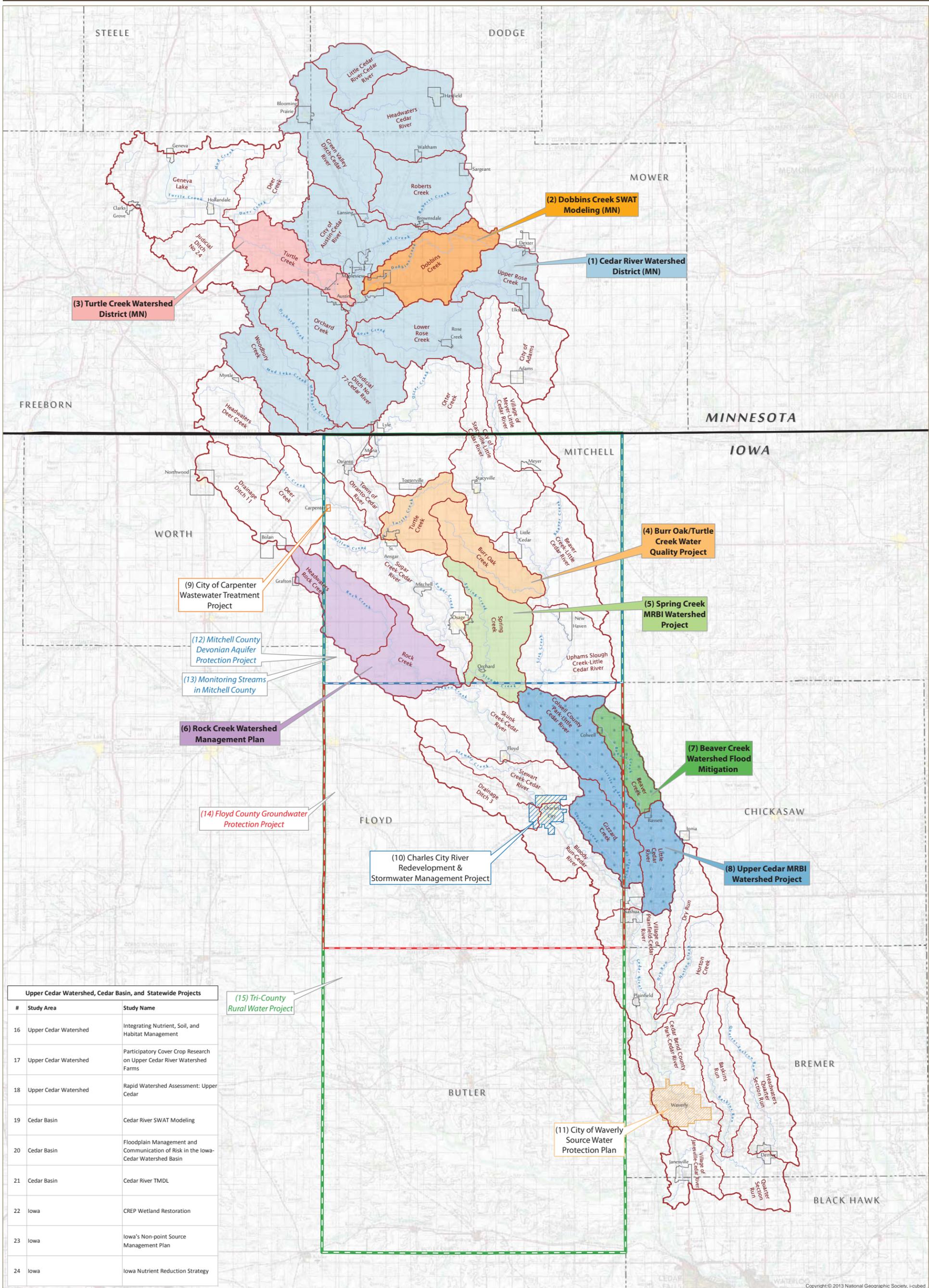
25. Iowa Nutrient Reduction Strategy

"The Iowa Nutrient Reduction Strategy is a science and technology-based approach to assess and reduce nutrients delivered to Iowa waterways and the Gulf of Mexico. The strategy outlines voluntary efforts to reduce nutrients in surface water from both point sources, such as wastewater treatment plants and industrial facilities, and nonpoint sources, including farm fields and urban areas, in a scientific, reasonable and cost effective manner. The development of the strategy reflects more than two years of work led by the Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources and Iowa State University. The scientific assessment to evaluate and model the effects of practices was developed through the efforts of 23 individuals representing five agencies or organizations, including scientists from ISU, IDALS, DNR, USDA Agricultural Research Service and USDA Natural Resources Conservation Service. The strategy was developed in response to the 2008 Gulf Hypoxia Action Plan that calls for the 12 states along the Mississippi River to develop strategies to reduce nutrient loading to the Gulf of Mexico."

The 2008 Hypoxia Action Plan defined the following goals:

- 45% reduction in riverine N load
 - *IDNR estimate: 4% from point sources*
 - *IDNR estimate: 41% from non-point sources*
- 45% reduction in riverine P load
 - *IDNR estimate: 16% from point sources*
 - *IDNR estimate: 29% from non-point sources*

www.nutrientstrategy.iastate.edu



WATERSHED RELATED STUDIES AND PROJECTS

UPPER CEDAR WATERSHED MANAGEMENT AUTHORITY
IOWA

- COUNTY
- UPPER CEDAR WATERSHED (HUC 8)
- CITY SCALE PROJECT/STUDY
- COUNTY SCALE PROJECT/STUDY
- WATERSHED SCALE PROJECT/STUDY
- CENSUS DESIGNATED PLACE (2013)
- SUBWATERSHED (HUC 12)
- RIVER/STREAM



DATA SOURCES:
WATERSHED BOUNDARIES AND NAMES PROVIDED BY IOWA DNR
POPULATED PLACES PROVIDED BY US CENSUS (2013)
PROJECTS/STUDIES WITHIN THE UPPER CEDAR WATERSHED
PROVIDED BY MEMBERS/AFFILIATES OF THE UPPER CEDAR
WATERSHED MANAGEMENT AUTHORITY
TOPO DERIVED FROM USGS QUADRANGLES.

BURR OAK/TURTLE CREEK
Water Quality Project
Final Report

Project Name: Burr Oak/Turtle Creek Water Protection Project

Project Number: 319 066-3.06

Soil and Water Conservation District: Mitchell

Reporting Period: January 1, 2006 – June 30, 2010

Date Report Prepared: July 28, 2010

Reporting Individual: Dan Bratrud

Preparer's Signature: *Dan Bratrud*

SWCD Commissioner's Signature: *Brad Johnson*

Burr Oak/ Turtle Creek Water Protection Project

Project Number: 319 066-3.06

Final Report

Section 1 - Background:

This water protection project consists of two designated cold water streams located in the central part of Mitchell County in northern Iowa. The two cold water streams are Burr Oak Creek and Turtle Creek. This project proposal will address the resource concerns within 11/4 mile of the stream corridor on both watersheds as a joint project.

Burr Oak Creek project area is a 12,900 acre watershed that flows northwest to southeast in Mitchell County and outlets into the Little Cedar River just north of the unincorporated town of New Haven. Turtle Creek project area is an 8,800 acre watershed that flows from the northeast to southwest in Mitchell County and outlets into the Cedar River northwest of St. Ansgar. Both of these streams headwaters originate in the same area in Mitchell County. In fact, they share six miles of common borders in the upper reaches of the watershed. See attached maps for project area.

Burr Oak and Turtle Creeks are classified by the Iowa Department of Natural Resources (IDNR) as a B(cw) cold water stream and as high quality streams. Burr Oak Creek is a cold water stream that according to IDNR Fisheries Biologist at Decorah, has exhibited some level of natural reproduction. Burr Oak is classified as a Category II stream. Categories II streams exhibit recent, but inconsistent reproductive success and generally are not capable of maintaining a viable population for the listed species at this time. The listed species for a two mile stretch of Burr Oak Creek is the Brown Trout.

This project will address the water quality issues in the two watersheds. Burr Oak and Turtle Creeks are impaired primarily by non point agricultural sources. Nutrients from agricultural fields are the primary impairment followed by manure (primarily in Burr Oak) and sediment. Again, these were identified by the landowners and operators in each watershed along with the local, state, and federal agency experts in the area.

The watershed of both Burr Oak and Turtle Creeks share many concerns and are very similar in nature from land use, type crops raised, farming systems used, land size, highly erodible areas, and non agricultural uses. There are differences in the amount and type of livestock enterprises in the two watersheds. See attached land use maps.

The landscape for Burr Oak and Turtle Creeks is generally flat with gently sloping areas near the lower stretches of both streams. Burr Oak Creek has 90 acres of land classified as highly erodible land (HEL) as per USDA-Food security act. Turtle Creek has 306 acres of (HEL) in the watershed.

A breakdown of the acres and percent of land use in the watershed project area is :

<u>Creek</u>	<u>Cropland</u>	<u>Pastureland</u>	<u>Timberland</u>	<u>Conservation Reserve</u>
Burr Oak	11,640 (90%)	600 (5%)	240 (2%)	360 (3%)
Turtle Creek	7,680 (87%)	80 (1%)	140 (2%)	900 (10%)

According to a completed resource inventory, 85 percent of both project areas are in a corn – soybean rotation. The upper two-thirds of both watersheds are highly productive land. According to a local Iowa State University expert, most farm operators in Burr Oak and Turtle Creeks have consistently over applied plant nutrients, set unrealistic yield goals, and have not taken credit for carry over nitrogen or credit for manure applied.

Continuous Conservation Reserve Practices are a good way to reduce sediment delivery and provide buffers to filter out nutrients before they reach the stream. With a small percentage of the land in these watersheds being in long term grass cover these practices will be an important tool to use to help achieve the goals of this project.

The majority of the pasture is located along the stream corridor. Livestock have 100 percent access to the stream whenever they are in the pastures, typically from late April through September. The pastures are overgrazed, unimproved blue grass pastures. Stream bank erosion is predominant and a serious problem where ever livestock are allowed to graze along the stream bank corridor.

The breakdown of farmstead and livestock enterprises inventoried is:

<u>Creek</u>	<u>Farmsteads</u>	<u>Cattle Lots</u>	<u>Hog-Open Lots</u>	<u>Hog- Confinements</u>
Burr Oak	61	9	9	13
Turtle Creek	44	3	5	6

Animal waste control systems and limiting livestock access to the streams are important elements of this project. Cost share programs already in place along with funds from this project will be used to promote the installation of these waste control systems, rotational grazing systems and practices that include fences that will limit livestock access to these streams.

Section 2 – Description:

Project Objectives:

- Reduce sediment delivered to the streams. This project proposes to use a variety of BMP to reduce the sediment reaching the two streams by 30 percent. The majority of the soil losses in the watershed are at “T” or less, but because of the high quality of these streams additional measures to reduce the amount of sediment reaching the stream is needed. The sediment reaching the streams is from stream bank erosion and sheet and rill erosion during rainstorms of one inch or greater during critical times of the year.

- Reduce manure runoff to Burr Oak and Turtle Creeks by working with producers to develop proper manure utilization plans (60 percent of landowners with livestock) and construct six manure storage facilities, and 30 percent of livestock excluded from stream corridor.
- Conduct an extensive information and education program to increase landowner awareness on the impacts of their management decisions on nutrient loading and sediment delivery to the streams. Encourage producer participation in nutrient and pest management education programs with a goal of 40 percent of the cropland enrolled. Included would be demonstrations in the watersheds on the nitrogen application rates and timing with incentives payments to cover the application payments to cover the application costs of split application nitrogen and pay for additional acres above the local NRCS EQIP program.
- Project long-term stream water quality protection. This project will also address long term protection of critical areas along the stream corridors by developing a conservation easement information and education program. An information brochure explaining conservation easements will be developed for use in discussing options with landowners in the targeted area of the watershed. Areas adjacent to stream corridors in CRP are prime areas that need to have long term protection after the CRP contracts expire. The local county conservation board will assist landowners on developing easements and monitoring of the easements.

The following table outlines the bmp's needed to achieve these objectives as calculated for the original proposal:

Best Management Practice	Original Total Needs
animal waste facilities	17
miles of filterstrips	20
streambank stabilization	9500'
nutrient management	20,000 acres
livestock waste management plans	25
pest management plans	15,000 acres
grassed waterways	75 acres
reduced tillage	18,000 acres
pasture management	400 acres
wetlands at tile outlets	6
timber stand improvement	300 acres
riparian forest buffer	100 acres
spring developments	2
rural septic systems	120

Project Planning and Organization:

The Mitchell County Soil and Water Conservation District Commissioners began discussion about a water quality project in 2003. The decision of which watershed(s) to write a project proposal for was influenced by the Iowa Department of Natural Resources (IDNR) designating both Burr Oak and Turtle Creek “cold water, high quality streams”. The watersheds were small enough and adjoined one another so it was decided to include both watersheds in the proposal.

This joint proposal was sent to the Iowa Department of Agriculture and Land Stewardship/Division of Soil Conservation (IDALS/DSC) seeking Water Protection Funds (WPF) and Watershed Protection Funds (WSPF). It was also sent to Iowa Department of Natural Resources (IDNR) who manages section 319 non-point source funding for the U.S. Environmental Protection Agency.

The following is a list of duties and responsibilities that various agencies and organizations had during the course of this project:

- IDALS/DSC provided WPF and WSPF funds to pay cost share for implementation of conservation practices and salary for a project coordinator.
- IDNR/319 provided funds to pay cost share for implementation of conservation practices and salary for project coordinator.
- The Mitchell County SWCD Commissioners administer the project and report practice implementation and activities to granting agencies.
- The Natural Resources Conservation Service (NRCS) provides office space and equipment for a project coordinator and technical assistance for practice implementation.
- The Mitchell County Conservation Board (MCCB) provided continued support for water sampling/monitoring and information/education.
- Other organizations, agencies and individuals that provided technical and/or funding support include; Iowa State University Extension, IDNR Fisheries, IDNR Water Monitoring Section, watershed stakeholders and landowner/producers.

Review of Project Activities:

The initial application for this project was filed in 2004. The application was revised to the current project area and resubmitted in 2005. Funding was granted for fiscal year 2006 but with no project coordinator there was no activity. A project coordinator was hired at the end of fiscal year 2006 and he began his duties in October 2007.

The first year of the Burr Oak/ Turtle Creek Water Protection Project, fiscal year 2007, had only three quarters of activity. The Project Coordinator moved to a new project and the fourth quarter was spent interviewing and hiring a new coordinator. The replacement coordinator did not begin duties until after the end fiscal year 2007.

The project began in fiscal year 2007 with a work plan that focused on information/ education and assessment/evaluation. Establishing contacts with landowner/operators and the gathering of credible data are key factors to a successful project. The original Project Coordinator had a good start on these objectives.

There were only eight months of activity in fiscal year 2008 due to the current Project Coordinator not starting until one month after the beginning of the fiscal year and the switch from the federal fiscal year to the state fiscal year. Much of the time this year was used to familiarize the new Project Coordinator with the project, project area, getting acquainted with the stake holders and following up with land owner contacts initiated by the original coordinator.

The Burr Oak/Turtle Creek Water Protection Project began building momentum in FY 2009. A variety of practices were implemented and the project coordinator continued to build a strong information and education program. The project also worked with and gained support from a number of government agencies, local business and individuals.

Through various funding sources there have been filterstrips, wetlands and tree plantings installed in the two watersheds. Watershed funds have been used to do streambank stabilization; a popular practice on Turtle Creek after the 2008 floods. Watershed funds were paired with EQIP funds to replace a failing ag-waste system in the Burr Oak Watershed.

FY 2009 was the first full fiscal year with a Project Coordinator working in the watersheds. There was a noticeable difference of interest in conservation practices and number of them that were successfully implemented. This was largely due to having a familiar face in the field office when landowner/operators come in.

Activity continued to increase into FY 2010. Participation in the Turtle Creek Watershed was noticeably better than in the Burr Oak Watershed due largely to the difference in farming practices and landowner attitudes. Burr Oak has more livestock operations and smaller farm operations making it harder for the producers to “give up”, as it is referred to, usable ground for conservation practices. Focus needs to be on these livestock operations to have a positive impact in the Burr Oak Watershed. This will require a continued education/information effort and the ability to incorporate some innovative conservation practices.

Project Introduction:

A mailing list of 150 landowners and operators was developed. A letter, that introduced the project, told of upcoming events and informed stakeholders of cost share opportunities, was produced and sent to the stakeholders. The letter requested stakeholders to contact the SWCD office with questions. Several initial contacts were made from this letter.

A kick-off meeting to allow landowners and producers to come together and meet the project coordinator and learn more about the project was planned and held. The meeting was well attended with 19 landowners and 10 individuals from various agencies involved in this project. Representatives from the different agencies presented information about their involvement in the project.

An article introducing the project was written and published in the local newspapers. Articles were written for the

Mitchell County Conservation Board quarterly newsletter that informs local residents about conservation related issues in the area.



The project coordinator and an NRCS field office employee set up an information booth at a well attended local farm machinery expo. The event was attended by more than 400 people and the booth was visited by more than 50 landowner/producers who gathered information about the watershed project and services available from the NRCS service center.

Meeting with individual landowners was the best method that the project coordinator found to introduce the project and inform the stakeholders about the activities planned for the project. The opportunity to talk to landowner/producers about conservation practices at the counter in the office or on their farm made the best connection. These meetings were the most productive way to promote the project.

Section 3 – Project Results:

An annual work plan was developed as a guideline to help the project coordinator stay focused on the goals of the project and to track achievements throughout the year. The following are work items and brief comments about accomplishments.

Administrative

The project coordinator worked with the SWCD commissioners, NRCS staff, IDALS staff and stakeholders to successfully accomplish work items. Monthly, quarterly and annual reports were prepared and delivered to the SWCD commissioners, IDALS/DSC and IDNR 319 in a timely fashion. Project extension and grant requests were completed and sent by the due dates. The annual work plans and budgets were done by the requested dates. An annual review meeting was held each year to update cooperating partners and stakeholders about the project achievements and plans for the following year.

Information and Education

A semi-annual newsletter was published to keep stakeholders informed about activities in the watershed and promote conservation practices. News releases were published throughout the project period. Field days and public meetings were held and did get some results but one on one “kitchen table” meetings were by far the most effective way to promote bmp’s and gain stakeholder support.

Assessment and Evaluation

The land use assessments for the two watersheds were completed before the start of this project in 2003. The RASCAL stream corridor assessment was completed early in the project, spring 2007, and interpreted a year later. All practices were entered in the sediment delivery calculator (SDC) to be evaluated for sediment delivery reduction rates. The SDC reports were sent annually to the IDNR for further evaluation. Demonstration sites were established with cooperating landowners to show the effectiveness of the practices installed. The project coordinator continued to evaluate the use of EQIP and various programs used to install bmp’s. Project used IOWATER volunteers to continue water quality monitoring during the project period.

Miscellaneous Activities

Activities in this category included a variety of additional promotions and evaluations. The coordinator assisted with daily office operation and attended beneficial trainings and meetings. Mitchell and Howard Counties are a shared management unit so project coordinator would help in Howard County when needed and get help in return when needed. Project coordinator assisted in project development and grant application process for the Spring Creek Watershed project.

Stream Corridor Assessment

The Burr Oak/Turtle Creek Water Quality project used the Rapid Assessment of Stream Corridor Along Length (RASCAL) method to observe and record conditions in and near the streams. Before the assessment was done a postcard was sent out to landowners giving them the opportunity to deny access to their property. When the physical data collection was complete the information was forwarded to the IDNR who quantified data and compiled a spreadsheet for future reference. IDNR GIS personnel also generated maps from the data that made for good visual aids throughout the project.

The data was later interpreted by a committee with members from IDNR, IDALS, MCCB and NRCS. The stream and watershed were divided into sections and each section was categorized according to the main concerns or threats in that stretch. Once the threat was identified the bmp's that would remedy the problem were listed for that section. The following is an example of the report by section that was generated from this interpretation.

Turtle Creek - Segment A:

The main concern in this segment is the lack of an adequate riparian area adjacent to the stream bank. The lack of permanent vegetation in these areas allows sediment and nutrients to easily enter the stream channel. A permanent vegetated strip along the stream bank will help to filter these contaminants. Including trees in these areas will also help to keep the water cooler in the summer months which is a benefit in this cold water trout stream.

Livestock is not a concern in this area. Bank erosion is concentrated to a few small areas that may benefit from filter strip installation discussed in the first paragraph. Bank stability is stable to moderately stable, will likely improve with installation of conservation practices in the riparian area and is not a concern at this time.

Working with individual land owners to install filter strips that include the planting of native grasses, trees and shrubs will address the concerns in this segment. The promotion of CRP practices CP 21 and CP 22 will be the best way to implement these practices.

Burr Oak - Segment A:

The main concern in this segment is the lack of an adequate riparian area adjacent to the stream bank. The lack of permanent vegetation in these areas allows sediment and nutrients to easily enter the stream channel. A permanent vegetated strip along the stream bank will help to filter these contaminants. Including trees in these areas will also help to keep the water cooler in the summer months which is a benefit in this cold water trout stream.

Bank stability is stable to moderately stable, will likely improve with installation of conservation practices in the riparian area and is not a concern at this time. Embeddedness and in-stream habitat are not an issue in this section. Gradient does not become a concern until further downstream.

Working with individual land owners to install filter strips that include the planting of native grasses, trees and shrubs will address the concerns in this segment. The promotion of CRP practices CP 21 and CP 22 will be the best way to implement these practices.

The complete RASCAL report for each of the streams are on file in the Mitchell SWCD office and available for review upon request.

BMP Implementation

BMP's to offer cost share for were selected by reviewing data from the land use survey, the RASCAL stream corridor survey and the stakeholder survey. Practices that qualified for EQIP cost share and were located in the watersheds received a higher score when ranked. Even though WSPF and 319 were the main cost share sources; other cost share sources that were used to fund practices included CRP, REAP and ECP. All practices that required engineering met NRCS standards and specifications.

The following table shows practices, goals, accomplishments and planned projects:

Practices	Project Goals	Accomplishments	Planned
Nutrient Management	3750 ac	0	0
Pest Management	2750 ac	0	0
Ag Waste Structure	6	1	1
Filterstrip	175 ac	31.2 ac	0
Streambank Stabilization	2100 ft	2315 ft	435 ft
Pasture Management	310 ac	0	0
Riparian Buffer	35 ac	6.6 ac	0
Timber Stand Improvement	85 ac	16 ac	0
Grassed Waterway	20 ac	0	0
Wetland Creation	5	2	0
N-Split Application	3045 ac	856 ac	0
Septic Systems	4	1	0
Strip Till/No Till	405 ac	221.2 ac	0

The following section of this report will include a brief explanation of each of the practices that were installed during the project, list the landowner that installed the practice, the year the practice was installed, the amount of cost share that the landowner received and the cost share source.

Animal Waste Systems



Animal waste systems can be one of many different structures from an in ground storage pit, as pictured above, to an entire containment building with dry manure stacking facilities. Of all the practices available these systems take the most commitment from the landowner; both in time and money. Even with cost share available there was one livestock producer in the Burr Oak Creek Watershed, Frank Jacobs, who made the commitment and funded his entire project himself.

The facility pictured above was to replace a failed system that was leaking and is located approximately one-quarter of a mile from Burr Oak Creek. The young producer that received the cost share for this facility was able to get the failed pit replaced much sooner thanks to the cost share. This saved the creek from a potential catastrophic event.

Waste Systems Cost Shared

Landowner	Fiscal Year	Cost Share Amount	Cost Share Source
Reed Kuper	2009	\$22,500.00	WSPF
		\$37,933.00	EQIP
Phillip Anderson	Obligated 2010	\$12,000.00	WSPF

Filterstrips



Filterstrips are an important component in any water quality project. Most of these two watersheds are highly productive row crop ground. If the producers fertilize, till, and spray right next to the streambanks the risk of these pollutants entering the stream is much higher than when an adequate buffer is left or installed.

Many producers in both watersheds were already maintaining adequate filterstrips to help filter sediment and nutrients before they reach the stream. The sites that were in need of filterstrip implementation or improvement were identified during the RASCAL survey and landowners were contacted about cost share opportunities.

Filterstrips Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Joel Nickerson	2010	4.2 ac	\$1,127.00	CRP
Hungerford Family Trust	2010	18.5 ac	\$4,975.00	CRP
Stephen Duenow	2010	7.3 ac	\$0	CRP(re-enroll)

Streambank Stabilization



Streambank stabilization was a popular practice in this project. Landowners realized the importance of protecting the streambanks from the excessive erosion that has occurred in the past several years. Some of these unprotected banks have receded as much as three feet in one storm event. It is easier to see something needs to be done when they soil at that rate.

Protecting these banks is costly but the savings in soil loss and sediment delivery to the stream have made this practice a wise investment. The heavy rain events have continued but the banks now stay in place saving the landowners ground. The water quality in Turtle Creek has improved enough to support “natural reproduction” of brown trout. This is largely due to the reduction in sediment.

Streambank Stabilization Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Leonard Amundson	2009	255 ft	\$7,641.16	319
Leonard Amundson	2009	300 ft	\$8,904.80	WSPF
Mel Schroeder	2009	50 ft	\$1,306.40	WSPF
Darlene Kittleson	2010	260 ft	\$9,038.16	319

James Koster	2010	140 ft	\$4,808.47	319
Gary Smolik	2010	110 ft	\$2,139.37 \$944.00	319 EQIP
Mitchell CCB	2010	100 ft	\$3,375.00	WSPF
Mitchell CCB	2010	1100 ft	\$44,000.00	U.S. Fish&Wildlife/IDNR

Riparian Buffer



Riparian buffers serve many purposes when implemented along a stream. They help to filter pollutants from run-off before it reaches the stream, help stabilize streambanks, can provide shade to keep water temperatures cooler and provide valuable wildlife habitat. This practice was not utilized much in the watersheds as the areas where trees and shrubs were desirable many times already had a good riparian area.

Riparian Buffer Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Shirley Lind	2010	6.6	\$3,564.00	CRP

Timber Stand Improvement



Timber Stand Improvement is a valuable practice in a watershed project because it helps maintain and improve the quality of the tree stand in the riparian corridor along the stream. This project had a landowner who was devoted to maintaining tree plantings that had been done by his forefathers. The project also included a public wildlife area where the county conservation board actively manages the timber in the riparian corridor of Turtle Creek. The MCCB also receives

help from the St. Ansgar FFA Chapter when it comes time to remove the undesirable vegetation and replant beneficial trees.

Timber Stand Improvement Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Gary Smolik	2010	16 ac	\$1,320.00	REAP
Shirley Lind	2010	2.5 ac	\$887.00	EQIP

Wetland Creation



Wetlands are the best bmp available for removing nutrients from runoff water before it reaches the stream. These wetlands can remove up to 80% of the nitrates from the water that is filtered through them. In the wetland pictured above, both the surface water and tile water are being routed through it so this wetland that is only several hundred feet from the stream is treating water from approximately 3000 acres of crop ground. Wetlands also provide some sediment delivery reduction.

Even though wetlands are the most effective at removing these nutrients they are also one of the harder bmp's to promote. The two main reasons for this are that most farmers view standing water as a problem and these wetlands can require a large number of acres and expense to be effective. Education is the best tool to use when promoting this practice.

Wetland Creation Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Mitchell CCB	2009	9 ac	\$5,214.00	CRP
Mitchell CCB	2009	10 ac	\$5,944.00	CRP
Mitchell County Historical Society	2010	7.3 ac	\$6,750.00	CRP

N-Split Application



N-split application became a popular practice in the Turtle Creek watershed in the last two year of the project. With rising costs for nitrogen it made good sense to these operators to side dress the nitrogen so it is applied when the crop can make more efficient use of it. Had it not been for the weather conditions making side dress application more difficult this practice would have been utilized even more.

N-split Application Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Russell Jensen	2007	100 ac	\$600.00	WSPF
Russell Jensen	2008	100 ac	\$600.00	WSPF
Pork-n-Pine Hill, Inc	2009	160 ac	\$960.00	WSPF
Thomas Landherr	2010	145 ac	\$868.80	WSPF
David B Lenz	2010	202 ac	\$1212.00	WSPF
David H Lenz	2010	149 ac	\$894.00	WSPF

Septic System



Rural septic systems that are substandard and not functioning properly are not uncommon in the two watersheds. According to the Mitchell County Sanitarian it is likely that 85% of the 145 systems would not meet present standards and are connected to tile systems that drain directly into the stream system. This project was allowed to do one “demonstration system”. These substandard systems are a major contributor to a bacterial impairment and need to be addressed.

Septic System Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
David Heimer	2007	1 system	\$4,000.00	WSPF

Strip Till/No Till



Strip till/no till is gaining popularity in Mitchell County. Several operators have been using this system for five years or more and are convinced that it not only is more economical than conventional tillage but has improved soil quality and maintained or increased their yield. This is a big benefit when promoting this practice. Some farmers feel that it takes the right kind of ground to use this tillage system. The other drawback is when the operator has livestock; manure application does not work well with current equipment. As new equipment is developed this practice will be used utilized more in the county.

Strip Till/No Till Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Mike Mullenbach	2009	105 ac	\$1050.00	WSPF
Karl Theis	2010	116.2 ac	\$1162.00	WSPF

Sediment Delivery Reduction

The reduction of sediment delivered to these two streams totaled less than five percent. Even though this reduction fell far short of the initial thirty percent reduction goals of this project significant improvement in water quality was witnessed. Most of the sediment delivery reduction occurred in Turtle Creek where the stakeholders were more willing participants in the project; this will be discussed at greater length later in this report.

The sediment delivery reductions resulted largely from the streambank stabilization efforts in the watersheds. On the recommendation of the federal soil conservation technician in the Osage office and suggestions from the fisheries biologist from Decorah; a more thorough assessment of the stream corridor was done. After flood events that occurred in spring 2008 it became very evident that a large portion of the sediment deposits were resulting from streambank erosion. These affected areas were targeted and landowners were contacted and encouraged to implement stabilization practices.

Project Name: **Burr Oak/Turtle Creek Water Protection Project**

Project Coordinator: **Dan Bratrud**

State Fiscal Year

Constructed practices only

<i>State Fiscal Year</i>	<i>BMP Type</i>	<i>SD Reductions (tons/yr)</i>
FY 2009		
	Management Practice	20
	Streambank Stabilization	52
Total for Fiscal Year		72
FY 2010		
	Filter Strip/Riparian Buffer	124
	Management Practice	53
	Streambank Stabilization	146
Total for Fiscal Year		323
Grand Total for all Fiscal Years		395

Information and Education

The following pages are an account of the information/education efforts done during this project.

St. Ansgar Source Water Protection Meeting

The Project Coordinator met with Jessica Lillie, Water Services Coordinator with Iowa Association of Municipal Utilities and the St. Ansgar City Council. St. Ansgar is the only municipality located in the watersheds and has a problem with their drinking water. The drinking water quality was tested and results showed high nitrate levels at 8.9 ppm. This ended up being a series of four meetings to discuss different alternatives and to develop a plan to improve the drinking water quality. CRP, through the wellhead protection practice, was discussed but the lack of cropland within the required distance from the well proved this was not a good option. Some were quick to judge the hog producers in the area and ask for some sort of regulation but after some discussion it was decided that education and promotion of manure management plans would be a better approach.

At the third meeting with St. Ansgar City Council it was decided that more sampling needed to be done and data gathered to find the exact source of the contaminants entering the cities well. It was suggested that a meeting be set up with the State Geologist. Mike Gannon, DNR Geologist, attended the fourth meeting and informed the group that after some research he feels that the water quality problem is being caused by the failing infrastructure of the well. He suggested running a camera down the well to inspect the condition of the casing and the grout. He also suggested that a new well be dug to replace the 100 year old well and that if repairs can be done to the existing well it might be used as a backup. His suggestions were taken under advisement and an information and education campaign was started to inform the citizens of the city about the problem and what they can do to help improve water quality.

Newsletters and Newspapers

Newspaper articles were written and published throughout the project period. The articles submitted were about activities and happenings throughout the year as well as issues that are crucial in these two watersheds. Copies of the articles are attached to this report.

Five newsletters were completed in during this project. Some were a joint effort with SWCD District and NRCS office. Project Coordinator included several articles dealing with the watersheds and covered costs of the copies sent to stakeholders. A copy of these newsletters are attached to this report. Other letters, brochures and correspondence was sent to landowners and operators throughout the project.

A news article about improvements in Turtle Creek was written and published in the local newspapers and on the BO/TC website. The article was written to report the findings of Mitchell County CCB Director, Milt Owen, and IDNR Fisheries Biologist, Bill Kalishek. They found Brown Trout spawning in most of the riffles they walked past as they were surveying additional bank stabilization sites. According to Kalishek this is a definite indication of improved water quality and the fisheries staff plans to do some fish tagging to determine whether or not we are experiencing some natural reproduction.

Fifth Grade Tree Distribution

Trees were purchased by the Mitchell SWCD and distributed to the fifth grade students of Mitchell County in FY 2008, 2009 and 2010. The trees were distributed to over 150 fifth graders each year. This was done in recognition of Arbor Day and NACD's National Stewardship Week. Project Coordinator assisted office staff with delivery to the four schools in Mitchell County.

Before handing out the trees the Project Coordinator and NRCS staff were given a few minutes to talk to the kids about the importance of trees for wildlife habitat, soil conservation and energy conservation. This was a great opportunity to make this age group aware of the watershed project and conservation efforts happening in their community. This program was well received.



**Trees delivered to
Washington Elementary, Osage.**

North Iowa Tillage Field Day

The North Iowa Tillage Day was held here in Mitchell County on 9/24/08. This was a great success with 140 people in attendance. Nine machinery displayers, speakers from ISU, a local panel of farmers who are presently using strip-till/no till practices in their operations, the rainfall simulator from the Iowa Learning Farm and a steak sandwich meal at noon rounded out the day.

The Project Coordinator used this opportunity to invite landowners in the watershed to come and learn more about strip till-no till. Several people from the watershed were in attendance and were informed that there is additional incentives available from project funds if they would consider trying strip till-no till on their farms. Ten RSVP cards that stated they would like to learn more about conservation practice opportunities were received from invitations sent out. Project Coordinator did follow-up with the respondents. This resulted in one sign up for strip till/no till and interest in other practices.

**Local operators and owners inspect
strips behind the strip till unit**



Stream Identification Signs



Identification sign located on Turtle Creek near a popular “fishing hole” for stocked trout.

Identification signs were installed at all crossings on both Turtle Creek and Burr Oak Creek. The signs were a great way to get local people to recognize the streams and give them a sense of ownership. Several inquiries about conservation practices came about due to the installation of the signs.

The signs were purchased from Prison Industries of Iowa, the posts were purchased from Mitchell County Secondary Roads; who also provided help installing the signs and the hardware was purchased from a local hardware store. A total of 4 crossings were marked on Turtle Creek and 12 crossings were marked on Burr Oak Creek.

Fish Sampling

The IDNR Fisheries Management Unit from Decorah did fish sampling in Turtle Creek in the summer of 2008 and 2009. The sampling was to help measure the success of the trout stocking program. The Project Coordinator assisted both years and invited public to assist and observe. Two sites that were approximately one quarter of a stream mile long were sampled each year. One was located in the Darlene Kittleson pasture and the other in the Boerjan Wildlife Area. Several year classes were observed with fish ranging in size from 4 inch fish (which were from spring fingerling stocking in 2008 and natural reproduction in 2009) to 17 inch brown trout, which would be about 5 years old and all sizes in between. Fisheries Biologist said that from the looks of things; the stocking program is working well and expect natural reproduction to increase with improved water quality.

Electro shocking for fish in Turtle Creek. The trout are weighed, measured and released unharmed after they are caught.

Monthly Activities:



February 2007 - Lechtenberg and Ray Frana, Soil Conservation Technician, set up a booth at John Deere Days. John Deere Days is a customer appreciation day put on by Norby's Green Country, John Deere dealer in Osage, for anyone to come and view different booths and enjoy a free meal. Roughly 400 – 500 people attended the event. Lechtenberg displayed various photos and other information about the Project. He also provided informational brochures for attendees to take and learn more about conservation issues and the Project. Well over 50 people stopped by at the booth and visited for a little bit. Many were interested in what the Project was about and the different programs available for cost-share. There were a lot of positive comments on the photos of the more protected areas of both streams. Lechtenberg informed them of how important areas with buffers and trees along the corridor were for water quality.

May 2007 - Lechtenberg attended the 2nd St. Ansgar Source Water Protection Plan Meeting. The meeting went over more options for reducing the high nitrate levels in St. Ansgar's wells. There is very little potential for using the CRP Wellhead practice due to lack of cropland within 2000 ft. of the public wellhead. There were also concerns about the current rental rates being too low compared to cash rent in the area. Most attendees agreed upon better education to producers along with incentives from the Burr Oak/Turtle Creek Project. Also, there is a need to pinpoint the source of the problem. It was requested that a geologist come and do some probing to locate an approximate source of contamination.

Lechtenberg attended the 3rd Source Water Protection Plan Meeting in St. Ansgar. Jessica Lillie, Coordinator, had a draft work plan set up for the attendees to go over and make changes where needed. It was also determined that there needed to be more data taken to see where an exact source could be found. Jessica and Becky Ohrtman will be looking to set up a meeting with the State Geologist to come and speak with the group and look at the source area. The city is also looking at distributing information to residents and landowners about the problem and how they can help.

June 2007 - Lechtenberg sent out a newsletter to over 200 landowners, producers, homeowners, Iowa Senators, Coordinators, DNR Staff, DSC Staff, and other stakeholders.

February 2008 - Project Coordinator made final preparation for the Upper Cedar River meeting which was to be held February 14, 2008. This meeting was also postponed due to weather but was rescheduled and held March 22, 2008. This meeting was well attended with 15 people representing 10 different agencies from both Minnesota and Iowa present that day. We heard reports and saw presentations about projects and work being done by each of these agencies in the Upper Cedar River Watershed. A follow-up meeting to discuss summer activities and consider the possibilities of a larger joint project is planned for November 2008.

April 2008 - The semi-annual newsletter was completed this month. This was a joint effort with SWCD District and NRCS office. Project Coordinator included several articles dealing with the watershed and will pay for printing of the copies sent to stakeholders. A copy of this newsletter will be included with the quarterly report for this project.

October 2008 - News articles were written about the tillage field day and the stream bank stabilization projects underway. The stream bank article and picture were in the local paper last week and the tillage day article and pictures made the Farm Bureau paper two weeks ago.

November 2008 - Signs are up at all crossings on both creeks. Project Coordinator spent one morning with an employee from Mitchell County Secondary Roads Dept. installing them. There have been a few comments about them, mostly positive.

January 2009 - The letter to watershed landowners that was reviewed by the commissioners at the meeting held 1/2/09 was sent on Tuesday 1/6/09. This letter was to inform landowners that funding opportunities provided by the project would soon be ending and asking for participation if a project extension is applied for by the Mitchell County SWCD. To date, 1/15/09, project coordinator has received eight responses, five from Turtle Creek and three from Burr Oak.

March 2009 - Mitchell County Field Office Staff has created posters that will be displayed at the Osage Home and Garden show this weekend 3/22 & 3/23/09. The Project Coordinator made posters featuring practices installed in the Burr Oak/Turtle Creek Watershed and information brochures will be distributed during the two day event.

May 2009 - A joint newsletter (Burr Oak/Turtle Creek Watershed, Mitchell SWCD and Mitchell NRCS) was written and is in the process of being published and distributed. A variety of topics are covered and an invitation extended to receive a free gift if they stop in and discuss conservation practices with the Mitchell FO staff.

August 2009 - Project Coordinator was interviewed about the work being done on Turtle Creek and the natural reproduction of brown trout in the stream. KIMT television did the interview on 8/26/09 and ran clips on three different newscasts.

December 2009 - The watershed newsletter was completed and mailed out to stakeholders on 12/11/09. Copies are available at the NRCS office.

January 2010 - Project Coordinator presented a power point program for the Osage Kiwanis Club on 1/20/10. The program informed club members about the BO/TC Watershed Project and conservation practices in Mitchell County. The meeting was attended by 25 members and 5 guests.

March 2010 - The Osage Field Office hosted a meeting on 3/19/10 to discuss the possibility of an application for the Mississippi River Basin Initiative (MRBI). The meeting was attended by the project coordinator, IDALS personnel, NRCS personnel, Mitchell SWCD Commissioners, Mitchell CCB, Mitchell Co. Supervisors, representative from The Nature Conservancy and local concerned citizens. After good discussion it was decided to meet a second time in two weeks. This should allow everyone adequate time to decide on project area and consider potential bmp's to be included in a project application.

June 2010 - Project Coordinator participated in a conservation open house held by the Mitchell County Conservation Board on Sunday 6/13/10. The Iowa Learning Farm brought the rain

simulator trailer out for the day and a display with informational brochures and posters was set up to promote federal and state cost share programs. It was a good opportunity to distribute information but the rainy weather was probably responsible for a poor attendance.

The information education efforts performed during the Burr Oak/Turtle Creek Watershed Project have been successful. When the current project coordinator started in Mitchell County the producers that stopped in the office had little idea that the district was involved in a watershed project. After nearly three years with the same coordinator in the office and successful info/ed program producers stop to talk about this watershed and what they might do to get a project started in their watershed.

Notable Achievements

The improvements that have taken place in the Turtle Creek Watershed are the most notable thing about this project. The willingness of the stakeholders to work with the project coordinator and the Mitchell SWCD has been the key to that success. Riparian corridor that could have been tilled has been re-enrolled in CRP and other practices have been implemented independently.

Streambank stabilization has been another major contributor to this success. The project has provided cost share to help install over 1200 feet of stabilization during the project period. Another 1300 feet has been stabilized using other funding sources that contributed over \$44,000.00 to the efforts of this project.

Thanks to the efforts of all the stakeholders, Mitchell CCB, Mitchell SWCD, IDNR Fisheries and local fisherman Turtle Creek currently has “**Natural Reproduction of Brown Trout**”. This has not been witnessed in this stream for decades.

Problems

Just as one watershed can be so cooperative another can practically turn their back; this was the case with Burr Oak Creek Watershed. The project coordinator soon found out that the stakeholders in this watershed were quite different. Many of the producers along Burr Oak Creek have livestock as part of their operation and not very open minded when it comes to talking about changing the farming practices they use on this ground. This made for a major obstacle when trying to promote conservation practices here.

This project had no project coordinator for the first nine months it was funded and a five month gap between the original coordinator and the current coordinator. This had a negative impact on project results in both watersheds. The lack of a familiar face and continued promotion caused a gap in practice implementation.

Section 4 – Conclusion:

The success of any watershed project relies on having four main components. There has to be a funding source, a supportive agency or group to administer the project, a project coordinator that sees the project through its completion and last but certainly not least, cooperative stakeholders. This project was lacking in two of these areas.

It may be a hard to deal with lack of continuity when it comes to the project coordinator with a 3 to 5 year project period but is critical to the success of the project. The first year a coordinator spends getting familiar with the watershed, making some contacts and earning some trust. Year two is when the coordinator earns a level of trust that may get some practices implemented and year three and four will probably get some results. By year five the coordinator needs to be looking toward the future so they are working on developing a new project. Anything less than a five year project is difficult to get results from.

This lack of continuity with a project coordinator in the Burr Oak/Turtle Creek Project had an obvious impact on the number of practices implemented in the project area. The project was first funded in FY 2006 and no practices were even obligated funds until late in FY 2007 and implementation did not begin until spring FY 2008. The change in staff just as the project was getting a good start caused a second lapse in activity.

Without willing participants there is no project. The lack of cooperative stakeholders in the Burr Oak Creek Watershed was a barrier that could not be broken during this project. Livestock issues were a big concern in this watershed. These farm operations are quite different than a strictly grain operation. Livestock producers tend to have use for even their marginal ground which might otherwise be devoted to conservation practices. Many of these producers are old generation and not willing to change their operations. It is evident that the younger generation producers are more willing to consider change. With more time and education it will be possible to get these producers to see the benefit of livestock management practices.

As new projects are developed there should be more emphasis put on assessment of stakeholder interest in participating in the project. The current methods of mailing surveys and having public meetings are good and necessary but it would likely be beneficial to take an extra step. Identification of bmp sites and personal contact of the landowner/producers, during project development, should increase stakeholder cooperation and participation.

New coordinator training and orientation needs to be stressed more. Even though every project is different there needs to be general procedures that new coordinators are trained as they start a project. An updated handbook would be helpful. The handbook should offer protocol that can be followed in any field office, for any project. This is especially important if there is a change in staff during the project period.

Section 5 – Project Funding

Total Funding by Program							
Cost Share Program	Year 1	Year 2	Year 3	Year 4	Year 5	Totals	% of Total
319	\$0.00	\$87,100.00	\$68,500.00	\$8,990.21	\$15,986.00	\$180,576.21	34%
WSPF	\$0.00	\$0.00	\$600.00	\$33,311.20	\$7,415.80	\$41,327.00	8%
WPF	\$0.00	\$860.36	\$877.84	\$818.22	\$286.58	\$2,843.00	1%
EQIP	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%
IFIP	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%
CRP	\$0.00	\$0.00	\$0.00	\$11,158.00	\$12,852.00	\$24,010.00	4%
REAP	\$0.00	\$0.00	\$0.00	\$0.00	\$1,320.00	\$1,320.00	0%
POL	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%
Matching	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%
Other	\$0.00	\$0.00	\$0.00	\$0.00	\$68,000.00	\$68,000.00	13%
Landowners	\$0.00	\$0.00	\$0.00	\$69,600.21	\$150,132.71	\$219,732.92	41%
Totals	\$0.00	\$87,960.36	\$69,977.84	\$123,877.84	\$255,993.09	\$537,809.13	100%

Total Public Expenditures by Group							
Item	Year 1	Year 2	Year 3	Year 4	Year 5	Totals	% of Total
Salary/Benefits	\$0.00	\$72,000.00	\$56,000.00	\$63,000.00	\$26,000.00	\$217,000.00	53%
Indirect Cost	\$0.00	\$15,100.00	\$12,500.00	\$0.00	\$0.00	\$27,600.00	7%
Travel/Training	\$0.00	\$198.46	\$877.84	\$818.22	\$286.58	\$2,181.10	1%
Supplies	\$0.00	\$313.17	\$0.00	\$133.86	\$0.00	\$447.03	0%
Contractual	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%
I & E	\$0.00	\$348.73	\$0.00	\$1,215.19	\$0.00	\$1,563.92	0%
Cost Share	\$0.00	\$0.00	\$600.00	\$54,710.36	\$107,073.80	\$162,384.16	39%
Totals	\$0.00	\$87,960.36	\$69,977.84	\$119,877.63	\$133,360.38	\$411,176.21	100%

Loading Reductions						
Impairment	Year 1	Year 2	Year 3	Year 4	Year 5	Cummulative Loading Reductions
Sediment	0	0	0	56	345	401 tons/year
Nitrogen	0	0	0	0	0	0 lbs./year
Phosphorus	0	0	0	0	0	0 lbs./year
Other	0	0	0	0	0	0 units/year

Budget Summary

The Burr Oak/Turtle Creek Water Protection Project was intended to be a three year project when the initial proposal was submitted in FY 2005. Although apparently funded for FY 2006 there is no record of activity for year one. Project extension requests were submitted and granted in fiscal years 2008, 2009 and 2010. The following is a brief overview of funding sources and amounts for this project.

FY 2006 - Not available

FY 2007 – Contract approved 7/10/2006. WPF - \$15,250.00, WSPF - \$44,260.00
319 – \$87,100.00

FY 2008 – Contract approved 7/13/2007. WPF - \$5,500.00, WSPF - \$89,187.50
319 - \$56,425.00

FY 2009 – Contract approved 7/23/2008. WPF - \$64,000.00, WSPF - \$71,687.50
319 - \$47,750.00

FY 2010 – Contract approved 7/28/2009. WPF - \$42,500.00, WSPF - \$38,685.00
319 - \$43,419.50

FY 2011 – Contract approved 7/20/2010. WPF - \$750.00, WSPF - \$59,261.80
319 - \$4,977.50

Burr Oak / Turtle Creek Water Protection Project

Project Number: 319 066-3.06

Final Report Addendum

July 1, 2010 – June 30, 2011

The final report for the Burr Oak / Turtle Creek Water Protection Project was filed in July 2010. This document will provide a report of the activities and accomplishments during the fiscal year 2011. The reporting period is July 1, 2010 – June 30, 2011. This addendum will be filed along with the final project report in the Mitchell Soil and Water Conservation District office. This report will also be delivered to IDALS Division of Soil Conservation personnel and IDNR Section 319 personnel.

Administrative

The project coordinator continued to work with various organizations and agencies to promote and implement conservation practices in the watersheds. Monthly reports were submitted to the SWCD commissioners. Accomplishment reports were sent to IDALS/DSC and IDNR/319. A final report was completed and filed in July 2010. Quarterly reports have been filed through fiscal year 2011 and will be continued until all obligated funds have been expended.

Along with finishing all business in the Burr Oak / Turtle Creek Watersheds the Mitchell SWCD and project coordinator have been in the process of developing and getting another project started. The Spring Creek MRBI Watershed project officially began in July 2010. Practice funds for this project are federal dollars so the project runs on the federal fiscal year. The project is considered to be in its second year even though the first year was only two months long.

The project coordinator has been promoting practices, reporting progress, developing contracts and overseeing implementation of practices in the Spring Creek watershed during state fiscal year 2011. Other activities in Spring Creek watershed will be noted later in this report along with those that have been taken place in the Burr Oak / Turtle Creek Project.

Information and Education

Information and education efforts continued through the final phase of the project. The project coordinator provided informational brochures for distribution from several businesses, during the Fourth of July activities and at the Mitchell County Fair. “Kitchen table” meetings continued to be the most effective way to educate and communicate the importance of conservation practices to landowners.

Participation in a conservation practice awards luncheon sponsored by the Mitchell County SWCD gave the opportunity to recognize some of the stakeholders for their conservation



efforts. Thirty people attended the luncheon and two of the awards winners were active participants in this watershed project. The Amundsons received the award for riparian buffer and have also done 550 feet of streambank stabilization on Turtle Creek. The Mitchell County Press News received the award for media/organization. This newspaper is delivered to residents county wide and has provided excellent news coverage for the watershed project.

A postcard mailing about the general CRP sign up and an informational meeting about CRP eligibility was sent to watershed stakeholders. The informational meeting was attended by eighteen landowners with some of them from the two watersheds. This was a good opportunity to promote not only the general CRP signup but to talk about other conservation practices. Contacts made from the post card mailing and the public meeting resulted in two CRP contracts. The final survey/questionnaire was sent to the 135 landowners in the two watersheds in November 2010. The two page survey asked for opinions about how the project was administered, what impact the project had on resource concerns and whether the individuals had participated in the project or would participate in future conservation efforts. There was a good response rate to the survey with 37 returned for a 27% response rate. Two of the responses were negative, some good comments were made and there were fourteen requests for future contact about conservation practices. A copy of the survey is attached.

Assessment and Evaluation

Most of the assessment activities done during this period had to do with conservation practice eligibility and feasibility. Several of the landowners/stakeholders who had expressed some sort of interest in conservation practices during the course of this project were contacted. This resulted in "kitchen table" meetings with eight landowners and site visits to evaluate conservation practice implementation.

Miscellaneous Activities

The project coordinator assisted with daily office operations and attended beneficial trainings and meetings. The Mitchell County SWCD has also begun a new watershed project in the Spring Creek watershed located in Mitchell County. The project coordinator has been assisting with the development, grant application and launch of this new water protection project.

BMP Implementation

Since the final report was filed in July 2010 the bmp implementation has been minimal. There have been a number of landowners that have done some waterway repair at their own expense. One producer I visited with is planning on implementing strip till/no till on some acres he operates in Burr Oak Watershed. He has signed up for EQIP cost share.

The 435 feet of streambank stabilization that was planned for Turtle Creek (Kittleson project) when the original report was filed has been completed and cost share has been paid. An additional 585 feet of streambank stabilization is planned for spring 2011. These two projects will have provided an additional 120 tons per year reduction in sediment loading to Turtle Creek.

Kittleson Streambank Pre-project



Kittleson Streambank Post-project



The Kittleson project also included a section of streambank that four bank hides were installed to provide in-stream habitat. The streambank protection and addition of habitat that has been made possible with cost share from this project has improved water quality enough that Turtle Creek now supports natural reproduction of brown trout. Funding for the Kittleson project was provided by EPA Section 319 (\$1432.50) and Watershed Protection Funds (\$13,125.00) for excavation and rip rap, and IDNR Fisheries (\$1400.00) for bank hides and installation.

The large rocks in the stream are “face rocks” that help anchor the bank hides in the stream and provide in-stream habitat for aquatic life.



Funds have been obligated for the following practices:

Practice	Watershed	Funds Obligated/Source
Waste Storage Facility	Burr Oak Creek	\$12,000 / WSPF
Streambank Stabilization	Turtle Creek	\$18,000 / WSPF
Strip Till/No Till	Burr Oak Creek	\$1,162 / WSPF

Burr Oak / Turtle Creek Water Protection Project

Project Number: 319 066-3.06

Final Report Addendum

July 1, 2011 – June 30, 2012

The final report for the Burr Oak / Turtle Creek Water Protection Project was filed in July 2010 and is included in prior pages of this document. This document will provide a report of the activities and accomplishments during fiscal year 2012, ending June 30, 2012. This document will be filed in the Mitchell Soil and Water Conservation District (SWCD) office. This report will also be delivered to IDALS Division of Soil Conservation personnel and IDNR Section 319 personnel.

Administrative

The project coordinator continued to work with stakeholders in the Burr Oak/Turtle Creek Watersheds during fiscal year 2012. Monthly reports were presented to the Mitchell County SWCD Commissioners at their monthly meetings and quarterly reports were filed with IDALS Division of Soil Conservation and IDNR Section 319 personnel.

A stakeholders meeting was held in November 2011. Discussion about the status of the project led to deciding to end the Burr Oak/Turtle Creek Project at the end of fiscal year 2012. Discussion about seeking funds to do more project work in Burr Oak Creek Watershed ended with a decision to re-assess the need and options for future practice funds at a later date.

Information and Education

The I&E efforts in the watershed consisted of brochures and flyers being made available at local businesses and events during the project period. The information distributed was to make stakeholders aware that the project would be ending soon but there are still cost share opportunities (i.e. CRP and EQIP) available for implementation of conservation practices. There were also post card mailings to inform stakeholders about general signups for CRP and cut off dates for EQIP applications.

Assessment and Evaluation

Potential sites for conservation practices were assessed as landowners expressed interest in individual practices. Recommendations of practice and cost share options were shared with landowners once the sites were evaluated.

Fish sampling took place on both Turtle Creek and Burr Oak Creek during the summer of 2011. Both streams had good results with more than 400 Brown Trout per stream mile. This is great news since a healthy sustainable stocking rate is anything over 300 trout per stream mile. Results from both streams also showed good numbers of multiple year classes and enough young of the year Brown Trout to show there is **natural reproduction** occurring in both Turtle Creek and Burr Oak Creeks.



Natural reproduction of Brown Trout is evidence of improved water quality in both Turtle Creek and Burr Oak Creeks.

Miscellaneous Activities

The Mitchell County SWCD continued its “Trees for Kids” program that distributes Black Hills Spruce trees to all fifth grade students in Mitchell County. The project coordinator uses this opportunity to talk about the watershed projects underway in the county.

Other activities included power point presentations and project display board for various civic groups such as the Kiwanis and Lions Clubs. The display board was taken to a number of events: the REAP assembly in Cedar Falls, the county fair and several events at the Mitchell County Conservation Board nature center. Participation in the Cedar River Watershed Coalition has allowed the project coordinator to present activity updates and accomplishments at some of these meetings as well.

BMP Implementation

The conservation practices implemented during this period have been limited to the streambank stabilization project that funding was obligated for in FY 2011, some CRP renewal and an EQIP contract for more strip till/no till acres. Even though upland protection was in place early in the project, sediment delivery in Turtle Creek continued to be a problem. In stream erosion, especially from streambanks, was found to be the major contributor. With emphasis on streambank stabilization and funding received from a number of sources, there has been more than a mile of streambank stabilization completed on Turtle Creek during the six year project period.



Streambank Stabilization

Turtle Creek streambank stabilization and habitat project 2011.

Streambank Stabilization Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Mitchell County CCB	2012	*625 ft	\$13,195.31	WSPF

* Total project was 1,210 feet with cost share funds from other sources used for the additional 585 feet.

Strip Till/No Till



Strip Till/No Till has been gaining popularity in the Burr Oak/Turtle Creek watersheds and Mitchell County in general. This tillage practice is one of the best management practices we have for improving water quality. Reducing the amount of nutrients used means less nutrients delivered to the stream, increased crop residue reduces soil erosion and improved soil quality as organic matter increases.

Strip Till/No Till Cost Shared

Landowner	Fiscal Year	Amount Installed	Cost Share Amount	Cost Share Source
Dale Hemann	2012	95 ac	\$9,975.00	EQIP

Budget Summary

Budgets for prior fiscal years are summarized earlier in this report. The following is a summary for fiscal year 2012.

FY 2012 – Approved 8/24/11. WSPF - \$18,000.00, WPF - \$9825.00
MRBI funding - \$63,875.00

Detailed budget items are accounted for in the following spreadsheets.

Project Summary Spreadsheet

Project:		Burr Oak/Turtle Creek Water Quality Project				District:		Mitchell	
Total Funding by Program									
Cost Share Program	Year 6	Year 2	Year 3	Year 4	Year 5	Totals	% of Total		
319	\$4,977.50	\$87,100.00	\$56,425.00	\$11,590.21	\$41,986.00	\$202,078.71	26%		
WSPF	\$33,308.93	\$2,580.54	\$600.00	\$33,311.20	\$5,385.00	\$75,185.67	10%		
WPF	\$65,167.05	\$860.36	\$877.84	\$63,818.22	\$39,286.58	\$170,010.05	22%		
EQIP	\$887.00	\$0.00	\$0.00	\$0.00	\$0.00	\$887.00	0%		
IFP	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%		
CRP	\$3,564.00	\$0.00	\$0.00	\$11,158.00	\$12,852.00	\$27,574.00	4%		
REAP	\$0.00	\$0.00	\$0.00	\$0.00	\$1,320.00	\$1,320.00	0%		
POL	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%		
Matching	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%		
Other	\$0.00	\$0.00	\$0.00	\$0.00	\$68,000.00	\$68,000.00	9%		
Landowners	\$10,795.39	\$0.00	\$0.00	\$69,600.21	\$150,132.71	\$230,528.31	30%		
Totals	\$118,699.87	\$90,540.90	\$57,902.84	\$189,477.84	\$318,962.29	\$775,583.74	100%		
Total Public Expenditures by Group									
Item	Year 6	Year 2	Year 3	Year 4	Year 5	Totals	% of Total		
Salary/Benefits	\$67,500.00	\$72,000.00	\$46,125.00	\$63,000.00	\$65,000.00	\$313,625.00	57%		
Indirect Cost	\$595.00	\$15,100.00	\$10,300.00	\$0.00	\$0.00	\$25,995.00	5%		
Travel/Training	\$474.06	\$198.46	\$877.84	\$818.22	\$286.58	\$2,655.16	0%		
Supplies	\$142.99	\$313.17	\$0.00	\$133.86	\$0.00	\$590.02	0%		
Contractual	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	0%		
I & E	\$0.00	\$348.73	\$0.00	\$1,215.19	\$0.00	\$1,563.92	0%		
Cost Share	\$42,044.43	\$2,580.54	\$600.00	\$54,710.36	\$105,043.00	\$204,978.33	37%		
Totals	\$110,756.48	\$90,540.90	\$57,902.84	\$119,877.63	\$170,329.58	\$549,407.43	100%		
Loading Reductions									
Impairment	Year 6	Year 2	Year 3	Year 4	Year 5	Cummulative Loading Reductions			
Sediment	238	0	0	56	305	599 tons/year			
Nitrogen	0	0	0	0	0	0 lbs./year			
Phosphorus	0	0	0	0	0	0 lbs./year			
Other	0	0	0	0	0	0 units/year			

Total sediment loading reductions do not include reductions from the streambank stabilization project done in 2011. Total project loading reductions would include the 599 tons from the summary spreadsheet and the 79 tons from the FY 2012 spreadsheet for a project total of 678 tons of sediment loading reduction.

Conclusion

The willingness to implement conservation practices and get involved in conservation programs has increased during the project. This is evident from the difference in the results of the pre-project survey to the final survey. Continued information and education efforts in the watersheds and county wide will raise awareness of the need for more conservation practices and will further improve the water quality of these streams.

The cold water trout streams of Mitchell County are a unique natural resource and an important economic resource for the county. The streams bring fisherman to the county from a three state area. The revenue that these fishermen bring into the county benefits many local businesses such as restaurants and gas stations that in turn provide jobs for local citizens. Clean water will help these streams provide an excellent recreation opportunity for years to come.

The Burr Oak/Turtle Creek Water Protection Project has provided an excellent opportunity to establish and reestablish working relationships with the landowners/producers within these two watersheds and build on them into the future. The benefits of having this project will be realized for years to come, both from the practices that have been implemented during the project period and from these relationships that have been established between the stakeholders and the Mitchell County office. This makes a successful project.

Appendix A

Maps of the Project Area

- 1. Location and watershed boundary map**
- 2. Burr Oak Creek Sediment Delivery Map**
- 3. Turtle Creek Sediment Delivery Map**

Appendix B

Information and Education Materials

- 1. Newsletters**
- 2. Newspaper Article**
- 3. Flyers and Brochures**

6031-014 City of Carpenter



MITCHELL COUNTY SOIL & WATER CONSERVATION DISTRICT 1529 MAIN STREET OSAGE, IOWA 50461-1824

*In Partnership with Iowa Department of Ag & Land Stewardship-Division of Soil Conservation
and*

USDA Natural Resources Conservation Service

PHONE: (641) 732-5504
FAX: (641) 732-5518

To: Mark Rosenbury, Chair
Watershed Improvement Review Board

From: Brad Johnson, Chairperson

RE: IWIRB Agreement No. 6031-014 City of Carpenter
Final Project Report for Watershed Improvement Fund Project

The following summarizes the project completed on the City of Carpenter Sewage Treatment system being administered by the Mitchell County Soil & Water Conservation District:

Term of Grant Agreement: November 1, 2006 to October 31, 2009

Financial Ledger for Project: Included at end of final project report

Financial Accountability:

SUMMARY: WATERSHED IMPROVEMENT FUNDS

Grant Agreement Budget Line Item	Original WIRB Funds Approved (\$)	Total Funds Approved (\$), as amended by WIRB Board	Total Funds Expended (\$)	Available Funds (\$)
Engineering- Design	65,000	66,500	66,665	-165
Archaeological Study	4,000	2,500	2,500	0
Property Acquisition/Easements	30,000	30,000	29,835	165
Septic Collection System-low pressure sewer pipe/associated items	96,000	96,000	96,000	0
Septic Collection System-	125,000	168,400	168,400	0

Grinder pump stations/assoc. items				
Septic Collection System— street/railroad/property crossings	27,000	27,000	27,000	0
Lagoon—Controlled Discharge- earthwork	56,000	37,800	37,800	0
Lagoon—Controlled Discharge- piping/valves/discharge	62,000	43,800	43,800	0
Lagoon—Controlled Discharge- rip rap/fence/seeding	35,000	28,000	28,000	0
Total	\$500,000	\$500,000	\$500,000	0

The difference in WIRB funded originally estimated costs verses the amendment costs were related to the engineers estimate costs were used for the initial estimate and the contractor bid amount were utilized for the amended costs. The estimated costs were developed almost 4 years prior to the letting of bids for the project. Manufactured items had increased and labor and fuel related items had decreased.

SUMMARY: TOTAL PROJECT FUNDING

Grant Agreement Budget Line Item	WIRB FUNDS SPENT & PERCENTAGE OF TOTAL PROJECT COSTS ()	CITY/COUNTY FUNDING FOR PROJECT & % OF TOTAL PROJECT COSTS ()	TOTAL PROJECT COSTS
Engineering- Design	66,665 (80%)*	16,480 (20%)	83,145.00
Archaeological Study	2,500 (100%)*	0 (0%)	2,500.00
Property Acquisition/Easements	29,835 (70)*	12,825.93 (30%)	42,660.93
Septic Collection System- low pressure sewer pipe/associated items	96,000 (53%) **	85,324.71 (47%)	181,324.71
Septic Collection System-Grinder pump stations/assoc. items	168,400 (47%) **	193,049.19 (53%)	361,449.19
Septic Collection System— street/railroad/property crossings	27,000 (40%) **	40,588.75 (60%)	67,588.75
Lagoon—Controlled Discharge- earthwork	37,800 (51%) **	35,700.10 (49%)	73,500.10

Revised 02/23/2010

Lagoon—Controlled Discharge-piping/valves/discharge	43,800 (50%) **	43,602.60 (50%)	87,402.60
Lagoon—Controlled Discharge- rip rap/fence/seeding	28,000 (45%) **	34,702.54 (55%)	62,702.54
Total	\$500,000	\$462,273.82	\$962,273.82

* --These items could pay a maximum of 100% of cost as per agreement with WIRB Board

** -- These items could pay a maximum of 56% of the cost per agreement with WIRB Board

FUNDING SOURCES FOR THE PROJECT

Funding Source	Project Proposal/% of Project		Actual Amount/% of Project	
WIRB	\$500,000	51.3 %	\$500,000	52.0 %
Community Development Block Grant- CDBG	\$125,500		\$0	
USDA-Rural Development	\$0		\$205,000	Grant
USDA-Rural Development	\$349,500		\$257,273.82	Low Interest Loan
Total	\$975,000		\$962,273.82	

Changes in Funding: The CDBG was not chosen for funding through IDED. Because of the low income status of Carpenter, USDA-RD funds (Grant and Loan) became available for use in the fiscal year of planned construction. There were no USDA-RD funds available at time of the original application.

Environmental Accountability

Pre Project Water Quality Concerns:

The City of Carpenter sewer system consisted of a treatment system of failing septic systems (a lot of them steel) with the outlet water going directly into two tile lines. The untreated waste outlet was directly into Deer Creek. The Iowa DNR samplings of the tile showed the following results for Fecal Coli form Bacteria an indicator that sewage is entering the tile:

Date	Amount of fecal coliform bacteria/100 ml
2/23/88	2,200
4/18/90	41,000
12/14/99	2,600
3/15/00	12,000
8/31/00	160,000

Post Project Water Quality:

A two cell lagoon system was designed by Veenstra & Kimm, Inc, PE out of Mason City, Iowa. The system was designed in accordance with section 14.4.6.2 of the Iowa Wastewater Facilities Design Standards. They supervised all construction on the project and certified it was constructed as planned.

The two cell system will operate as a controlled discharge system. Sewage water from the houses, businesses and community center will be transported to the lagoon for treatment. The lagoon water will be drawn down in the spring and fall during high runoff time periods to meet Iowa standards for fecal coliform levels in Deer Creek. Cell #1 has 120 days of effective detention time and cell #2 has 60 days of effective detention time.

The installed system meets the state requirements of:

- Carbonaceous Biochemical Oxygen Demand (CBOD) of 26 mg/liter—Carpenter permit says 22.1
- Total Suspensible solids of 26 LBS/day
- Distance to drinking water wells increased from 50-100 ft. to 2000 ft

Activities and Practices completed were:

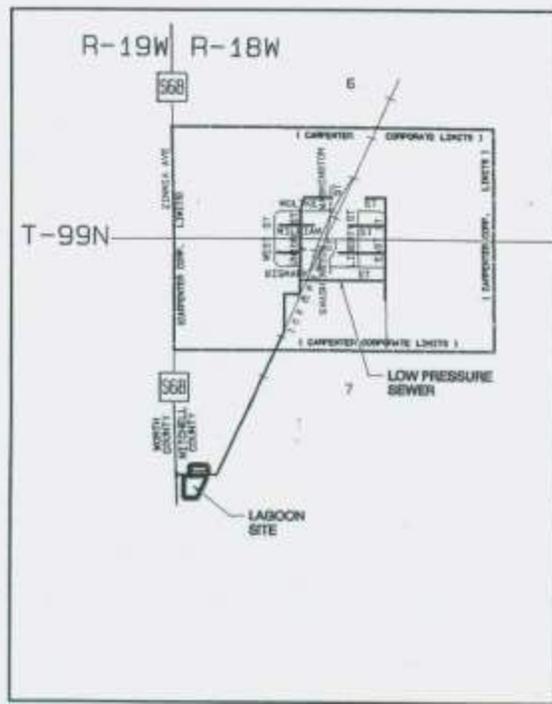
- An information meeting and an official public meeting was held on the project
- NPDES storm water discharge permit was obtained
- Plan of operations and management plan for the new treatment facility was completed
- IDNR/USDA-RD completed a final inspection of the constructed facility
- Practices installed
 1. 60 E-One Grinder pump stations installed for each business/residence/community building in Carpenter
 2. Two stage lagoon system installed according to IDNR/USDA-RD requirements
 3. 12,919 ft of low pressure sewer lines installed to convey the sewage to the lagoon site
 4. Erosion control measures installed to control erosion—rock rip rap, seeding of all disturbed area, gravel, erosion control fabric
 5. 1600 ft. of fence and gate was installed to protect the public from accidental injury
 6. plan map of project practice location attached

Program Accountability

The main challenge to overcome with community projects like the Carpenter project are the time constraints to get the project plans approved by the associated State and Federal Engineers.

The state wastewater construction permitting process project manual involves 52 steps. A simple concurrence on a step delayed this project for months in a few cases. Final design of the project took two and a half years; construction was completed in less than 6 months. If we would have had bad weather during construction, it would have been difficult to meet the deadlines.

WASTEWATER COLLECTION TREATMENT IMPROVEMENT CARPENTER, IOWA



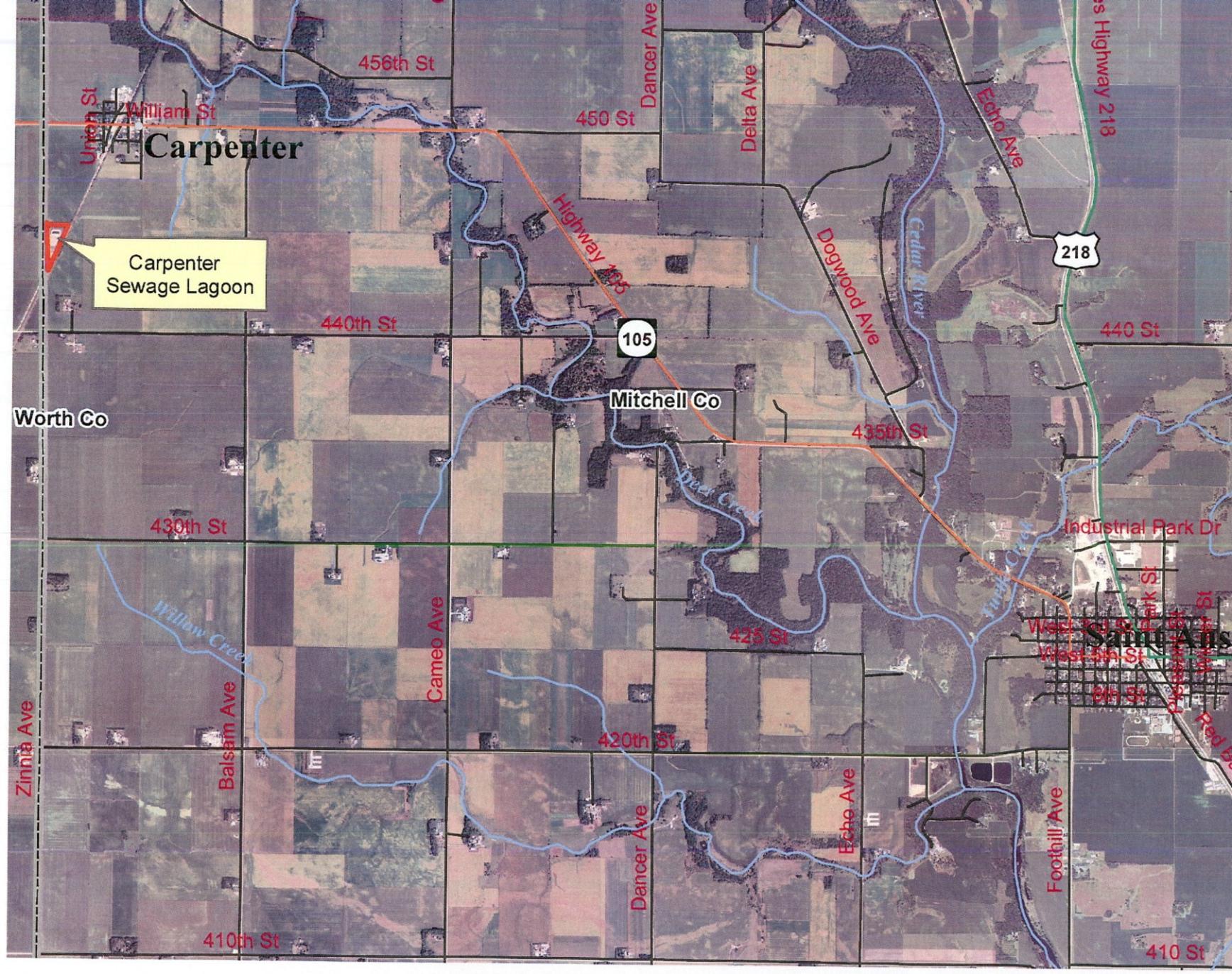
GENERAL LEGEND

	Survey Line & Station Indication		Flashed Edge and Type
	Concrete Surface		Flagged and Section
	Asphalt Surface		Building
	Concrete Surface Asphalt Overlay		Fence Wall Other
	Low Slope Asphalt Surface		Security Fence
	Brick/Paving Surface		Wood Fence
	Dirt Surface		Property Line
	Paved Surface		Property Fm
	Surface Removal/Replacement		Section Corner
	Earth Section		Plat Boundary
	New Manhole/Manhole		Wall/Stone
	New Manhole/Manhole		Elevation Marker
	New Water Main		Control Line
	New Force Main		DIA. Diameter
	New Manhole		ELEVATION
	New Water Valve		PVC Polyvinylchloride Pipe
	Existing Sanitary Manhole and Size		Cast Iron Pipe
	Existing Storm Sewer and Size		Ductile Iron Pipe
	Existing Water Main and Size		Corrugated Metal Pipe
	Existing Force Main and Size		Vitrified Clay Pipe
	Gas Main and Size		Reinforced Concrete Pipe
	Unreinforced Power Line		Reinforced Concrete and Pipe
	Overhead Power Line		Lined Reinforced Concrete Pipe
	Underground Telephone Line		Lined Concrete Pressure Pipe
	Cable Television Line		STA. Station
	Fenced Offsets		LA. Line Head
	Top of Embankment		LB. Line Back
	Top of Embankment		Sewer Main and Manhole
	Sewerage Conduit		Right-of-Way
	Manhole		Point of Intersection
	Gas Inlet		Point on Tangent
	Area of Existing Sewage		Linear Feet
	Existing Manhole		Tapped Man
	Existing Water Valve		Well, Spring and Pump
	Gas Valve		Point of Vertical Curvature
	Power Pole		Point of Vertical Tangency
	Telephone Pole		Vertical Curve
	Street Light		Point of Intersection
	Pole Utility Marker		Point of Tangency
	Tapped Manhole		Needle Borehole
	Sewer Manhole		Sewerage
	Telephone Cable Junction Box		Control Point and Manhole
	Powerline Control Limit		Typical
	Sewerage Control Limit		High Pressure Gas
	Water Main Sizing		Unreinforced Pressure Gas
	Utility Access Cover		Sewer
	Manhole Note		E.A., E.F. Each Way, Each Face
	This and Size		S.S. Each Way
	Proposed and Size		AT
	Stop and Size		Sewerage Manhole
	Sewer Sizing or Manhole		

D

NO.

- 1 INDEX A
- 2 LAGOON
- 3 LAGOON
- 4 LAGOON
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- 6 LAGOON
- 7 LAGOON
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- 9 LOW PRE
- 10 LOW PRE
- 11 LOW PRE
- 12 LOW PRE
- 13 LOW PRE
- 14 LOW PRE
- 15 COLLECT
- 16 COLLECT



Carpenter

Carpenter Sewage Lagoon

Worth Co

Mitchell Co

Smiths Branch

456th St

450 St

440th St

440 St

430th St

435th St

425 St

420th St

410th St

410 St

Union St

William St

Dancer Ave

Delta Ave

Echo Ave

Highway 218

Highway 105

Dogwood Ave

Zinnia Ave

Balsam Ave

Cameo Ave

Dancer Ave

Eche Ave

Foothill Ave

Industrial Park Dr

West 1st St

West 2nd St

West 3rd St

West 4th St

West 5th St

West 6th St

West 7th St

West 8th St

West 9th St

West 10th St

West 11th St

West 12th St

West 13th St

West 14th St

Red Bank St

218

105

Charles City Green Streets

Charles City is part of a growing trend of communities in the nation to take advantage of **green infrastructure technology** and one of the **first communities** to utilize permeable paving streets. The Green Streets project, which began in 2009, will reduce neighborhood flooding and provide a longer-lasting, more durable, and more beautiful street system.

What are Green Streets?

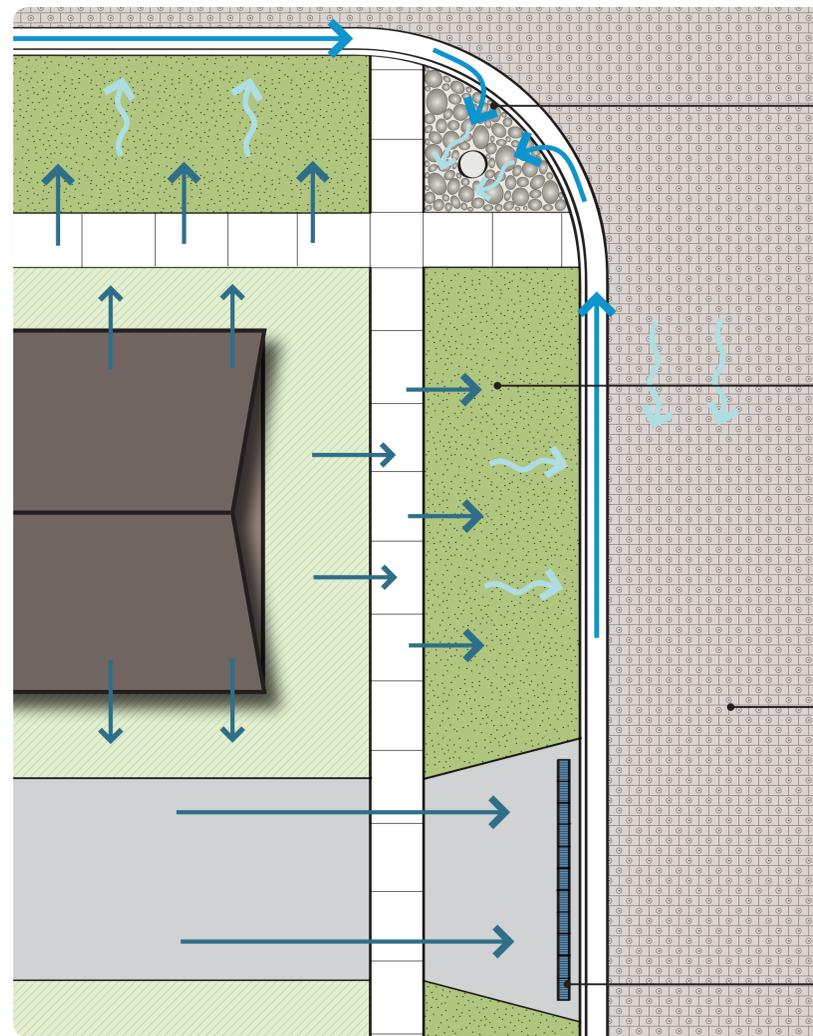
Green Streets are a rainwater management system that combines durable paving materials with ecologically sustainable stormwater best management practices (BMPs). The purpose of the BMP system is to emulate the water cycle of natural open space areas. The selected BMPs prevent stormwater runoff and associated flooding by allowing water to pass through the paving and infiltrate into the ground. The system also improves water quality by filtering and cleansing rainwater as it passes through the system.



Benefits of the Charles City Green Streets Project:

There are numerous benefits to the Green Streets improvements in the project area. In particular, the system:

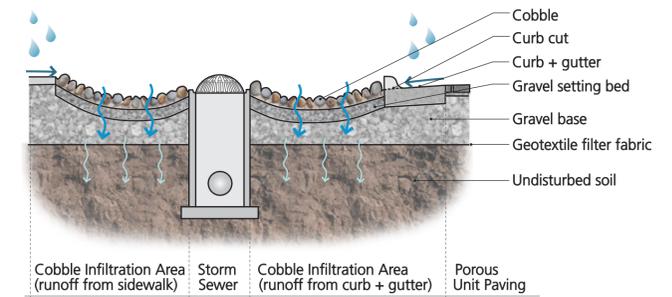
- Reduces the volume of stormwater by 100% during small rain storms and over 50% during large storms.
- Reduces the speed of stormwater during large rain storms by over 90%.
- Filters sediments, oil and grease, metals, fertilizers and pesticides, and other urban pollutants from runoff.
- Improves safety by reducing icing caused by ponding on the streets. In addition to making our roads safer, it reduces the need for salt, thereby improving water quality.



Cobble Infiltration Areas

To capture rainwater runoff that flows down the new curb and gutter, cobble infiltration areas are located in the triangular area between the sidewalks at the intersections. A cut-out in the curb (called a curb cut) allows water to flow from the gutter into the cobble infiltration area.

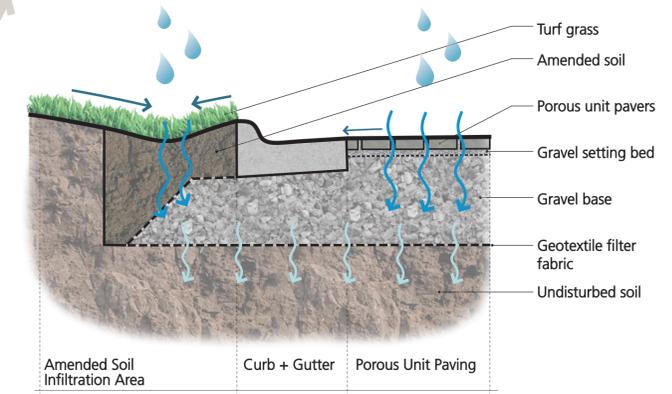
How it works:



Amended Soil Infiltration Areas

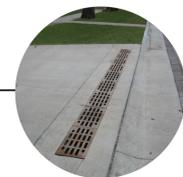
Amended soil infiltration areas are long, linear rain gardens composed of an engineered soil over a gravel drainage layer. They are located behind the curb at the edges of the porous unit paving. Runoff from the adjacent roofs, front yards, and sidewalks filters through the amended soil and into the gravel below the street's porous unit paving.

How it works:



Porous Unit Paving

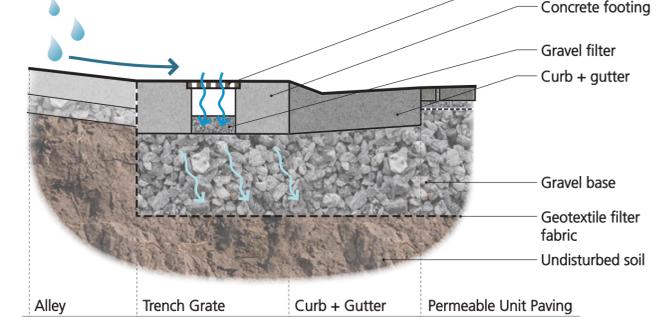
The new streets in the project area are constructed of porous interlocking pre-cast concrete unit pavers. Rainwater falling on the streets flows through the gaps between the pavers and infiltrates into the gravel layers below where adsorption and naturally occurring microbes cleanse the runoff.



Alley Trench Grate

To capture rainwater that flows from backyards and unpaved alleys, trench grates are located at the alleys directly behind the new curb and gutter to capture sediment that could clog the permeable pavers. The trench grate intercepts rainwater runoff before it can reach the porous unit street paving. Once in the grate, the water is filtered through a layer of gravel, and then released into the gravel beneath the porous unit paving.

How it works:



Project Extents:

The Charles City Green Streets project site was selected based on to the combined concerns of deteriorated streets and neighborhood flooding. The current extents of the project are shown in the map to the right. The City is currently evaluating other streets for future Green Streets projects and has applied for state and federal funding to reconstruct three additional streets.



The Charles City Green Streets project is brought to you by the **City of Charles City, IJOBS, the State Revolving Fund, and the Iowa DNR.**

To learn more about the system, request a brochure, or if you have any questions or comments regarding the Green Streets rainwater management system, please contact City Hall

105 Milwaukee Mall, Charles City, Iowa 50616
phone: (641) 257-6300
email: info@cityofcharlescity.org

Prepared by:

Conservation Design Forum
375 West First Street Elmhurst, IL 60126
p: (630) 559-2000
f: (630) 559-2030
www.cdfinc.com

Funded by:



Urban Storm Water Best Management Practices I-Jobs Grant Final Report

Contract #ESD0433JBERCH100107_01

In 2008 I attended a session at the Iowa Downtown Summit on “Water-centric Design and Sustainable Practices in Urban Communities.” For some time the City had been investigating the potential application of sustainable practices. I was very excited by the information presented during this educational session and in January 2009 we contracted with Conservation Design Forum (CDF) for a feasibility study for sustainable applications in certain locations of the City. In March 2009 we applied for American Recovery and Reinvestment Act (ARRA) funding for a permeable paving project in a portion of a larger study area. The existing roads in the proposed project location had been rated poor or very poor by the Pavement Management Project subsidized by the Iowa Department of Transportation and operated by the Center for Transportation Research and Education at Iowa State University. Storm water infrastructure was undersized or missing in a portion of the project area and localized ponding and flooding occurred frequently. In May 2009 the Intended Use Plan including the City project was officially approved. Also in May, Geotechnical and survey work was completed in the project area and CDF was awarded a contract for preliminary design. In September 2009 CDF was awarded a contract for final design, bidding and grant assistance, construction administration and preparation of a project maintenance manual. In November 2009 the City applied for an I-Jobs Improved Urban Storm Water Best Management Practices grant. In December 2009 a contract was awarded to Wicks Construction. In January 2010 the City received notice that it had been awarded a \$100,000 I-Jobs Improved Urban Storm Water Best Management Practices grant. Because of this award, a change order to the contract with Wicks Construction was approved adding an additional block of paving. In March 2010, work on the project began. The project was opened to traffic in Fall 2010. Punch list items and seeding was completed in the Spring of 2011. Also in 2011, CDF was hired to produce an educational brochure for homeowners in the project area and a second, general educational brochure. Printing of the brochures was done locally and the homeowner’s brochure was distributed to area residents.

At the time of this report, we believe all engineering and construction expenses have been billed. All invoices have been paid with the exception of the last invoice (payment in process) and \$30,000 in retainage. An educational sign has been erected within the project area. The expense for the educational sign and for the I-Jobs signage is not included in the figures. Erection was done by City crews.

The total budget for the project was:

	I-Jobs	ARRA	Local	Total
Permeable Paving	\$88,500.00	\$609,182.90	\$2,130,075.91	\$2,827,758.81
Bioretention (soil infiltration)	\$6,000.00	\$16,479.08	\$57,620.92	\$80,100.00
Cobble infiltration	\$2,500.00	\$5,338.02	\$18,664.98	\$26,503.00
I&E brochure	\$0.00	\$0.00	\$4,689.29	\$4,689.29
Total eligible	\$97,000.00	\$631,000.00	\$2,211,051.10	\$2,939,051.10
Sewer	\$0.00	\$0.00	\$299,060.00	\$299,060.00
Water	\$0.00	\$0.00	\$534,051.00	\$534,051.00
Grand Total	\$97,000.00	\$631,000.00	\$3,044,162.10	\$3,772,162.10

Administration by City staff and legal expenses related to financing are not included.

The project was financed through the State Revolving Loan Program administered by the Iowa Finance Authority (IFA). ARRA administrative services were provided by the IFA and the Iowa Department of Natural Resources.

Waverly Area

Source Water Protection Plan

Protecting Your Health One Drop At A Time



"The publication of this document has been funded in part by the Iowa Department of Natural Resources Source Water Protection Program through a grant from the U.S. Environmental Protection Agency".

Plan Prepared by: Cedar Valley RC&D, Kurt Hoeft, 3112 180th Street, Charles City, Iowa

Plan was approved by the City of Waverly September 2012 and the Bremer SWCD December 2012. Submitted to IDNR for final approval on March 20, 2013

SOURCE WATER PROTECTION ACTION PLAN

Waverly Area Municipal Utilities

Activity	Start Date	Completion Date	Responsible Person(s)	% Completed	Comments
Expand list of SWP planning team members to represent all fractions in the SWP area	12/2010	1/15/2011	Dee Heine/Cedar Valley RC&D/ Bremer SWCD	100%	SWP team consists of four farmers, county board of supervisors, county sanitarian, city officials, city council, local school district, college and businesses
Karst meeting to discuss the influence of Karst topography on local Water Quality and water issues	12/2010	12/14/2014	Cedar Valley RC&D/ SWCD/ IDALS/Flood Center/IDNR	100%	Team members attended meeting
SWP Team Meeting—to review planning team objectives, current watershed land use trends, other watershed concerns.	12/20/2010	2/21/2011	Becky Ohrtman/Heine/Cedar Valley RC&D/Team Members	100%	Team identified items to investigate, schedule of competition, potential BMPs and VIPs to talk to concerning SWP
Monitor high nitrate wells and compile data for SWP plan decisions	Monthly	On-going	Waverly Water Operator		Levels of Nitrates have stabilized at a constant level
Conduct ground-truthing of landuse, cropping history, well locations, livestock, and other urban and rural potential Nitrate contamination areas for two mile capture	2/1/2011	6/1/2011	Cedar Valley RC&D/ Bremer SWCD	100%	Land use map developed identifying areas in the watershed priority area.

zone.					
Develop a private well ordinance for the city of Waverly	4/1/2011	8/1/2012	Mike Cherry/City of Waverly		
Urban- Provide funding to plug Abandon wells in the city limits and for potential funding for high impact rural wells that may affect Waverly Water supply.	8/1/2012	7/2020	Public Works Administrator County Sanitarian		City of Waverly- 100% of cost of wells in city and will consider 50% cost share on high potential rural wells. State rural well funding for plugging
SWP Team Meeting—to review land use data, survey results, and local data collected, Alternatives, Action Items and potential funding sources for project implementation plan.	7/20/2011	7/20/2011	SWP Members/Bec ky Ohrtman/NR CS/Cedar Valley RC&D	100%	Reviewed items from land use survey, questionnaires, and other research. Concurred on alternatives and action items.
Utilize LiDar to identify additional sink holes and field check to confirm.	9/2011	11/2011	Cedar Valley RC&D Staff	100%	Cedar Valley RC&D Staff reviewed data and completed field review, no additions
Urban- Develop an education plan for the community home owners concerning the application of fertilizers, disposal of lawn and garden care products, disposal of yard clippings, maximum turf density and maximum/minimum turf height.	12/2011	3/2012	SWP Team, Bremer ISU Extension , Bryan Foster		Develop Marketing plan Title. By-line: Protecting your health one drop at a time. Develop logo.
Urban- management	12/2011	4/2011	John Wuertz,	100%	12/21/2011 large

meeting for Managers of Golf Courses, Parks and Recreation Areas, High School Grounds and Wartburg College Turf areas.			ISU Bremer County		turf grass managers meant to discuss concern and their use of fertilizers
Urban -large turf area action plan by managers <ul style="list-style-type: none"> 1. Develop 8 turf grass manage plan for their green spaces 2. 4 News features to inform public of their concern to be responsible in use of nitrogen fertilizers 3. Serve as local experts to assist the public (home owners and small business on the correct use of fertilizers rates and timing 4. Meet once per year (2nd Tuesday in Dec) to discuss environmental lawn management concerns 	1/2012	12/2012	John Wuertz, ISU Bremer County, Bryan Foster		
	4/2012	8/2015	Wartburg College, Waverly-Shell Rock Soccer Complex, Waverly Parks and Golf Course, Centennial Oaks Golf Course, CUNA Mutual, County Fair, Bartels Lutheran Home, Waverly Shell Rock Comm. Schools		
	4/2012	8/2016			
	12/2011	12/2016			
Urban - City monitor nitrate levels leaving lawn and leaf recycling center along	4/2013	continuous	City of Waverly Shane Pothast or Brian		IDALS, Flood Center, WIRB

dry run creek. Monitor 4 sites from April to October.			Sullivan		
Urban- provide information to home owners on lawn and garden Nitrogen reducing practices in through the City's Utility billings, newspapers and radio, Wartburg Go-Green Event (Review needs annually)	1/2011	12/2016	SWP Team, Dee Heine, Tab Ray, ISU Bremer County Extension		City of Waverly
1. Develop page on city web site with whom to contact for questions. Septic, fertilizer, abandoned wells, SRF funding, etc.	10/30/2012	3/15/2013	City of Waverly Heine		
2. Develop a marketing logo for Waverly source Water Protection	1/30/2013	5/30/2013	SWP Team Heine		
Urban- Implement an education program to install Nitrogen reducing projects (Bio Swales, Rain Gardens, reduces N application buffer zones) on private residences and business in the city.	3/2012	6/2016	SWP Team, Wayne Peterson, Bremer SWCD,		Funding- WIRB, Community Foundation
Rural- Develop thirteen Resource management farm	1/2012	5/2016	Bremer SWCD, NRCS,		Funding Sources: EQIP, IDALS cost share, Pheasant

plans for owners and operators in the critical areas. Practices to address in the plans are: Integrated Crop Management Systems, nitrogen reducing structural and grass practices.			Private Consultants		Forever, Whip,
Rural- Local City and County and SWCD recognize SWP area as a high priority for funding practices in Bremer County.	12/2011	4/2011	Neil Smith, Bob Busch, SWP Team, City Council		
Rural- Accelerate the current installation of septic system upgrades within 5200 ft. of a city well.	12/2011	12/2016	SWP Team, county Sanitarian, ISU Extension Bremer County, Farm Bureau		Funding: Potential private funding sources, SRF, No-Interest Loan Program
Rural- Target 8 landowners to install CRP (grass, shrubs, trees) opportunities in the SWP well head protection area and in areas with sink holes/depressions utilizing existing program; Identify funding sources for enhanced CRP to encourage accelerated application rates	12/2011	12/2015	SWCD, NRCS, FSA, SWP Team		USDA-Farm Service Agency
Rural- Assist 3 Livestock producers to develop and implement waste manage plans for their livestock enterprises	1/2012	12/2015	Private consultants, NRCS, SWCD		Funding sources: EQIP, WIRB, SRF
Rural- Develop a program to complete a	5/2012	7/2015	SWP team, county		Funding: Farm Bureau, Private

well testing program for all rural wells in the SWP area to gain additional information on private well concerns and depth of existing wells. Coordinate results from other groups with the county sanitarian for inclusion in data base.			sanitarian, Farm Bureau, ISU Extension		funding, county funded grant.
Rural- news media releases to inform landowners and operators of programs and practices to reduce Nitrates in source water.	3/2012	Continuous on a yearly basis	ISU Extension Bremer county, Bremer SWCD, NRCS		
SWP Team Meetings with IDNR Source Water Protection Manager	Yearly		SWP Team, Dee Heine, IDNR SWP Coordinator, Regional IDNR Staff		

Waverly Area Iowa

Source Water Protection Follow-up Plan

This plan was developed to assist the City of Waverly, Source Water Protection team members and the community to monitor the long range progress on the Source Water Protection Plan developed and approved.

ITEM	TASKS	RESPONSIBLE TO COMPLETE	DATE TO COMPLETE
Convene SWP-Planning Team once per year at minimum	<ol style="list-style-type: none"> 1. Review and update current progress on implementing the SWP plan for the City of Waverly. Revise as needed. 2. Review monthly water test results to determine progress on stabilizing/reducing nitrate levels in the city well water. 3. Discuss land use changes and discuss how they will impact the city's wells. 4. Discuss other issues in the urban and agricultural areas that may impact source water in the area. 5. Send report to IDNR SWP Coordinator on progress and program needs to address source water protection in Waverly. 	Heine SWP planning team members IDNR Field office Staff member	Seconded Tuesday in July each year
Assess progress addressing water quality issues in the rural areas in the source water area	City Representative and SWCD/NRCS representatives meet to discuss current programs available to landowners and operators of agricultural land, progress on developing resource management plans for farmers, water quality practices implemented and new program opportunities available.	SWCD Chairman Dee Heine	Third Tuesday in January of each year
Large Green Area managers	<ol style="list-style-type: none"> 1. Yearly meeting of managers to update progress on their 	John Wuertz Large Green Space	January of each year

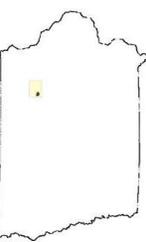
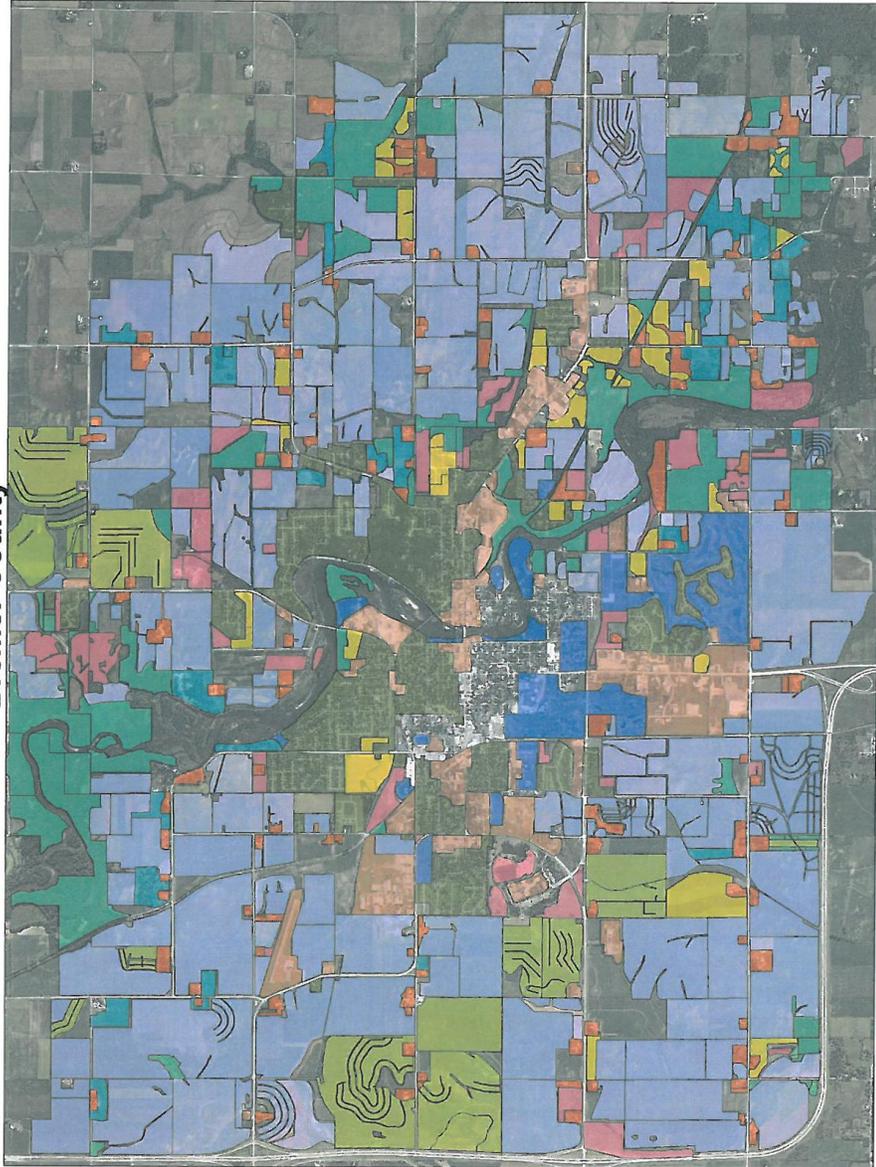
in the Watershed Area	management plans and to discuss new alternatives to protect the quality of the water in the Waverly SWP area.	Managers ISU Extension	
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IDNR Hazardous Spills Reported

DATE	LOCATION	TYPE
10/8/2011	1241 130 th St.	Transformer oil
5/17/2011	V14 & 188 th St.	32% Liquid Nitrogen Fertilizer
12/30/2010	2116 E. Bremer Ave.	Diesel Fuel
10/19/2009	1432 Hwy 218	Diesel Fuel
9/4/2009	4 Ave. SW	Transmission fluid
4/14/2009	Waverly	Cattle Manure
2/12/2009	2055 Butler Ave	Hog Manure
1/27/2009	1558 Garden Ave.	Hog Manure
7/9/2008	Waverly	Anti Freeze
7/2/2008	Waverly	Antifreeze
6/25/2008	Waverly	Transmission Fluid
5/15/2007	4 th St. SW	Cattle Manure
1/31/2007	400 E Bremer St.	Gasoline
11/6/2006	Reed Ave and 150 th St. Waverly	Potash and DAP
9/11/2006	1998 Ivory Ave	Cattle Manure

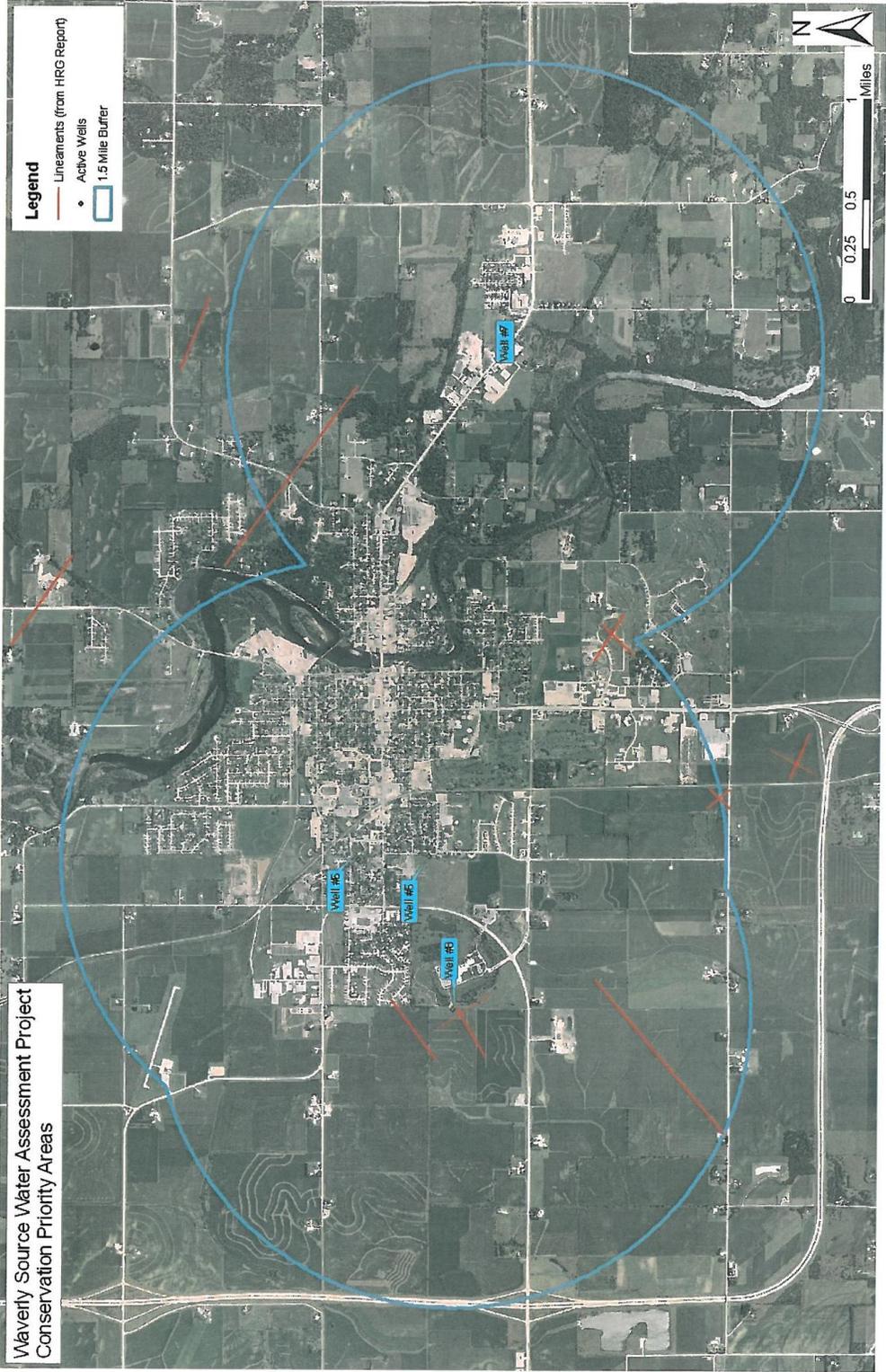
3/17/2005	Waverly	Diesel Fuel
2/9/2004	Waverly	Diesel Fuel
8/14/2003	70 6 th Ave NW	Diesel Fuel
10/28/2002	70 6 th Ave NW	Lubricating Oil
9/6/2002	Waverly	Fuel Oil
7/22/2002	106 12 th St. SE	Hydraulic Oil
1/22/2002	201 1 st St. SE	Hydraulic Oil
6/14/2001	Waverly	Hydraulic Oil
6/13/2001	70 6 th Ave NW	Diesel Fuel
5/16/2001	Waverly	Diesel Fuel
1/24/2001	1819 Joplin	Hydraulic Oil
7/26/2000	222 9 th St. NW	Mineral Oil
10/2/1997	Waverly	Diesel Fuel
4/6/1997	3601 E Bremer	28% Nitrogen
6/4/1996	311 E Bremer	Roundup
2/20/1996	1312 W Bremer	Gasoline

2010 Land Use Cover Near Waverly, Iowa Bremer County



- Legend**
- Commercial
 - Public Attractions and Landmarks
 - Hay
 - Pasture
 - Permanent Grass or CRP
 - Residential
 - Row Crop
 - Row Crop Terraced
 - Rural Residence or Acreage
 - Timber

Iowa DNR - Geological and Water Survey
Source Water Protection Program
2011



Public Water Supply Contingency / Emergency Plan
Affidavit

The Safe Drinking Water Act amendments of 1986 and 1996 established the concept of wellhead protection, and subsequently the Source Water Protection program. The program is currently overseen by the Iowa Department of Natural Resources (IDNR) and attempts to prevent potential contaminants from entering source waters and prepare for situations in which drinking water may be impaired through contamination, power outage and treatment or distribution system interruptions. In order to ensure a public water supply's preparedness in such events, a Contingency/Emergency Plan has been required in every approved Source Water Protection Plan (SWPP) or Wellhead Protection Plan (WHPP).

Due to recent and growing concerns over water system security and due to many systems having previously prepared such a plan under the provisions of the 2002 Bioterrorism Act, the IDNR is now allowing an affidavit in lieu of including a completed Contingency/Emergency Plan within the submitted SWPP/WHPP. Although public water supplies do not need to send IDNR completed plans, each must have an accessible and up-to-date plan in case a catastrophic event occurs within their system. It is necessary for the completed water supply Contingency/Emergency Plan to contain the following information, at a minimum:

- Contact information for the city's mayor, city clerk, water/wastewater operator.
- Contact information for the city's power company, a professional electrician, a professional plumber and an equipment repair company.
- System's critical users must be identified and a plan for immediate notification must be created. (i.e. hospitals, nursing homes, schools, etc.)
- Contact information for local media, including newspaper, radio and television.
- Contact information for a certified laboratory, local emergency contacts, state and local public health departments and the National Guard.
- Contact information for the IDNR's 24 hour emergency contact and the local IDNR field office.

I, SHANE POTHAOT, representing CITY OF WAVERLY certify that a Contingency / Emergency Plan has been created for our public water supply system and that this information can be presented to the IDNR upon request.



Signature

Date 6-15-12

