

M.L. 2016 Project Abstract

For the Period Ending June 30, 2019

PROJECT TITLE: Morrison County Performance Drainage and Hydrology Management

PROJECT MANAGER: Shannon Wettstein

AFFILIATION: Morrison Soil and Water Conservation District

MAILING ADDRESS: 16776 Heron Road

CITY/STATE/ZIP: Little Falls, MN 56345

PHONE: (320) 631-3553

E-MAIL: shannon.wettstein@morrisonswcd.org

WEBSITE: www.morrisonswcd.org

FUNDING SOURCE: Environment and Natural Resources Trust Fund

LEGAL CITATION: M.L. 2016, Chp. 186, Sec. 2, Subd. 04r

APPROPRIATION AMOUNT: \$209,000

AMOUNT SPENT: \$209,000

AMOUNT REMAINING: \$0

Sound bite of Project Outcomes and Results

Morrison SWCD documented locations, elevations and construction conditions of culverts throughout 23 townships in Morrison County. This data provides an understanding of drainage capacity for watershed analysis and protection, will prevent wetlands from being drained due to improperly placed culverts and presents opportunities for habitat and wildlife restoration areas.

Overall Project Outcome and Results

Morrison County, like other agricultural counties, has experienced a vast increase in drainage. Thousands of acres are being tilled with no approval or oversight and wet weather patterns have exacerbated drainage issues along township and county roads. Major conflicts have exploded between neighbors and road authorities' due to impacts of standing water on agricultural fields and topping of public roads.

Morrison SWCD historically has taken the lead in managing drainage, county wide, and starting in 2016 centerline and driveway culverts were surveyed to better comprehend the hydrology and storm water management for the county. Morrison SWCD documented locations, elevations and conditions of culverts throughout 23 townships in Morrison County. The complete database of this information was shared with each township and Morrison County Public Works department for a more complete understanding of drainage capacity and infrastructure replacement needs. In addition to being used by Morrison SWCD to resolve landowner conflicts, watershed and wetland protection, it is also being used by other state and federal for water quality protection and enhancement, identifying wildlife project areas and for floodplain mapping. Limited database information is available for public viewing through the Morrison County interactive GIS viewer, Beacon.

This information has led to the creation of a Morrison County Comprehensive Drainage Management Plan. This plan was created to protect state water resources from runoff pollution and degraded water quality, stabilize soils, shores and banks from erosion, protect or provide riparian corridors and preserve natural drainage ways and wetlands from being drained filled and manipulated.

Morrison SWCD is committed to serving the public through a leadership role in managing drainage and sharing a more complete understanding of drainage infrastructure within the county and with other areas of the state struggling with drainage issues.

Project Results Use and Dissemination

Reports of the culvert inventory data were finished and delivered to 23 townships. These reports included locations and elevation data for centerline and private drive culverts along township roads. The reports also detailed material size, type, shape and conditions of pipes and flow direction. Culverts were then rated based on their current conditions and recommended maintenance activities were noted.

We are continuing to keep all the partner agencies up to data with our data and progress, attending township and county board meetings and presenting the information to our partners. A subset of the data from the inventory was made available for public viewing on the [Morrison County interactive GIS system, Beacon](#). Full data sets were shared with FEMA, DNR, Morrison County Public Works and US Fish and Wildlife Service.

LIDAR assessment of minor watersheds was done as data became available to determine drainage capacity and identify insufficient patterns. The number of requests made to the office for drainage assistance by Morrison County and township officials has significantly increased since the start of the project many long standing issues were able to be resolved with the use of the culvert inventory data and the field expertise of the drainage technician afforded through this grant.

Discussions continue with county officials regarding a drainage ordinance which was drafted as part of this project. The Morrison County Comprehensive Drainage Management Plan was created to protect state water resources from runoff pollution and degraded water quality, stabilize soils, shores and banks from erosion, protect or provide riparian corridors and preserve natural drainage ways and wetlands from being drained filled and manipulated.



Environment and Natural Resources Trust Fund (ENRTF) M.L. 2016 Work Plan Final Report

Date of Report: January 30, 2020

Final Report

Date of Approved Work Plan: June 7, 2016

Project Completion Date: June 30, 2019

PROJECT TITLE: Morrison County Performance Drainage and Hydrology Management

Project Manager: Shannon Wettstein

Organization: Morrison Soil and Water Conservation District

Mailing Address: 16776 Heron Road

City/State/Zip Code: Little Falls, MN 56345

Telephone Number: (320) 631-3553

Email Address: shannon.wettstein@morrisonswcd.org

Web Address: www.morrisonswcd.org

Location: Morrison County, MN

Total ENRTF Project Budget:

ENRTF Appropriation: \$209,000

Amount Spent: \$209,000

Balance: \$-0-

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd. 04r as extended by M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 19

Appropriation Language:

\$209,000 the second year is from the trust fund to the commissioner of natural resources for an agreement with the Morrison Soil and Water Conservation District to conduct an assessment of drainage infrastructure, in order to develop hydrology restoration priorities and a countywide performance drainage ordinance to address land use-change impacts to the hydrogeology. This appropriation is available until June 30, 2019, by which time the project must be completed and final products delivered.

Carryforward; Extension (a) The availability of the appropriations for the following projects is extended to June 30, 2020: (8) Laws 2016, chapter 186, section 2, subdivision 4, paragraph (r), Morrison County Performance Drainage and Hydrology Management;

I. PROJECT TITLE: Morrison County Performance Drainage and Hydrology Management

II. PROJECT STATEMENT: Morrison County like other agricultural counties has experienced a vast increase in drainage. Thousands of acres are being tilled with no approval or oversight, and the water moving across the landscape has altered drainage capacity of county and township roads, as well as creating major conflict between neighbors, road authorities, with the impacts of standing water on agricultural fields and topping public roads. The land conversion from perennial cover and proliferation of pattern tile drainage systems have impacted the local hydrology in Morrison Co. faster and often more negatively than local units of government can address.

The county board has expressed a willingness to approve an ordinance making land use conversions and tiling a permitted activity. Township boards have expressed their support for such an ordinance.

This issue is compounded with producers farming into road right of ways. There are no records for private drainage elevations and townships make road decisions on culverts without having the expertise to deal with the hydrology necessary to move water efficiently. An end result is chaos. The SWCD does not have adequate staff and or information to assist in these conflicts. We want to take the lead in managing drainage, county wide. First, we would inventory every ditch that can be found, find the elevations of every culvert and build a data base. A drainage technician with hydrology background would be hired to collect all of the information and then we would analyze with the road authorities where the problems exist and prioritize the workload. From that analysis, the hydrology technician would help design control structures on drainage systems, (both tiling and ditches), assist road authorities with drainage designs, and also oversee tiling designs to assure tile systems are more efficient and do not negatively impact roads, neighboring properties, or impact surface waters with nutrient loads.

Meeting this capacity involves the hiring of qualified staff and providing the person with transportation and the essential equipment needed. While stationed with the SWCD, the staff would work with County and Township road authorities.

The Morrison SWCD will hire a staff engineering technician with a hydrology background capable of working independently to inventory all culvert elevations, assess the culvert condition, model hydrology scenarios, and prioritize sensitive watersheds, county wide.

The staff person will work closely with the County Highway Department, Township Road Authorities, and the DNR to utilize all expertise in the area, and to avoid duplication of areas where information already exists.

Public drainage will be surveyed to update the inventory from the early 1900s and all culvert elevations will also be surveyed. From that, LIDAR will be used to determine the watershed size and capacity. Problem areas will be addressed first using the survey data, and determining restoration or corrective action.

Throughout the process, the SWCD will work closely with the County Board and Township Boards to conduct civic engagement opportunities for the public to understand the process and potential outcome. Private land drainage into public road drainage may have to be addressed if creating a problem.

III. OVERALL PROJECT STATUS UPDATES:

Project Status as of January 1, 2017

We successfully hired a qualified engineering technician with the right experience level to hit the ground running. Essential equipment (software and survey/data collection) were purchased.

Using a newer technology called Arrow 200, we completely surveyed three townships and determined the road/culvert conditions. The software being used is produced by a local firm and is capable of capturing much more data than anticipated with local tech support being immediately available.

Summaries are being prepared for those three townships. Meetings have been held with the township boards, the county and other groups to demonstrate what is being collected and what ultimately will be developed as an overall management plan.

Conflicts that occurred were revising and adding additional components to the software which were addressed immediately by local tech support. Some impatience occurred with township road authorities thinking we would now offer road design and more services than we are prepared to do.

We realize that the time it will take to do a complete analysis and inventory of each township is going to take much more time than predicted, hence our amendment request to the outcome timeline.

Overall, the township boards and county board are excited with the project and what the end result will be for all users.

AMENDMENT REQUEST - January 1, 2017

Explanation and Rationale:

We have not strayed from what our overall goal and outcomes will be. However, we had no real concept of the time it would take to do each township. There are approximately 300 culverts per township and three have been completed. Each culvert is being assessed for size, condition, shape, elevations of invert and flow of the pipe and the center line of the road above the pipe. We are collecting information on adjacent wetlands, road right of way condition, aprons, location, type of culvert (centerline or driveway) and several other parameters (28 in total). Therefore, it is taking a full month to complete just the inventory per township. Then a summary and notes captured need to be completed shortly after to prevent loss of recollection.

Winter weather disallows working the actual inventory during the winter months but will allow time to complete analysis and prepare documents for the township board and to work with the County Hwy. Dept. and the County GIS person to prepare appropriate information for the County GIS website.

Therefore, our amendment is solely to re-determine appropriate dates for completion of each outcome. We still feel very confident that we will be able to complete the project as projected. To assure that completion, we have decided to add a second person and equipment to assist the Engineering Technician, at District expense, on the field portion of the inventory. We feel our requested timelines will enable us to complete the tasks in a reasonable timeframe.

Amendment Approved by LCCMR December 28, 2017

Project Status as of July 1, 2017

The project is more intense than we imagined, but is proving already to be a sought-after product by the townships. In order to expedite things, we purchased a second set of equipment and hired another technician to hopefully meet our deadlines. We used some of our local capacity dollars to employ the second person.

The townships that have received their end product are finding it to be very useful. It helps them budget, prioritize their work, and work with contractors far more efficiently. The data sheets show location, size, elevation, condition, coordinates, length, and condition of the right of way adjacent. It also indicates whether there are wetlands adjacent to enable us to use it when working with the MN Wetland Conservation Act. We now have townships wanting to be next in line, but we are trying to do the project in a more systematic way.

The software was created by a local company so IT support is very efficient. The process is so impressive that we have shared and demonstrated it at a 12-county meeting, and also for a state-wide county engineering conference. It is a web based process so will be very user friendly to everyone, in the end.

We have completed a total of 12 townships throughout the county as of 6/30/2017. Since the previous update we have completed 7 townships. The total includes a total of 2630 culverts. The decision was made to try and get as much work completed during the summer months, when the snow stops our work we will than complete the documentation for the townships.

We have created a system of surveying the townships which will create blocks of adjacent townships that have been completed. We are currently working on completing the townships west of the Mississippi River. These blocks will allow

us to do more analyzing of the townships with LiDAR. Camp Ripley has offered some additional help in building the drainage model.

We have contacted 4 additional townships to have them mark their known infrastructure on a map for our field crew. This additional information should be completed this fall.

As townships are completed, the data is turned over to the County GIS person to begin the process of building a user model that will be available to townships, county, and contractors via a web site both through the SWCD and Morrison County.

Project Status as of January 1, 2018

As mentioned in July, the project is considerably more than predicted. When it was determined that driveway and field road culverts should be included, it became a much bigger product than originally discussed. Hiring an additional technician and supporting equipment though did indeed help the project run more smoothly. We will be matching the grant with farm more capacity dollars to be able to complete but we believe in the goal. By the end of next summer, however, we will need to determine if we need to seek additional funding, and request an extension.

Having completed 10 more townships in 2017, (14 altogether) we are a little more than a 1/3 completed. Through the winter months the reports by township will be prepared. With a total of 3506 culverts inventoried, reports are lengthy. We are gathering more data than originally planned as well, seeing greater need in other program areas, that the information will be useful. FEMA and DNR have been requesting priority areas due to the anticipated floodplain update.

Townships are participating by helping to inventory on a map where they know culverts to be located which helps immensely due to vegetation and lack of maintenance in right of way ditches. Blocks of townships are being created to help isolate minor watersheds and begin the analysis phase of the project.

Camp Ripley has come on board offering assistance in the hydrologic analysis. Outreach has been accomplished by demonstrating to other units of government and presenting to the annual township officials bi-annual meetings.

The county GIS specialist is working with us to determine how much and how the data can be used on the county website.

The townships are responding well when replacing or working on existing culverts since a critical step moving forward will be to develop the ongoing maintenance of the data.

Project Status as of July 1, 2018

The project inventory will most like need all next year to finish the inventory. Then the additional winter of 2019 to finish the reports and maps for each township.

The project is proceeding well. We have currently completed 6 townships (20 total) this year. This marks the half way point in the inventory. We are currently in the process of working on two more townships which should be done shortly. We plan on completing an additional 4 more townships this season, weather pending. To date we have inventoried 4,812 culverts.

We are continuing to keep all the partner agencies up to data with our data and progress. Our communications to these groups consists of presentation and data transfers. We are continuing to attend semiannual township meetings and county board meetings with updates.

We are always speaking with landowners about the project as we are out in the field. It is great to get the local persons view of what is going on with the waters onsite, since we are only onsite for a very short amount of time.

AMENDMENT REQUEST I - November 27, 2018

After reviewing the amount of work to be done on this project a time extension will be needed beyond the original June 30th, 2019 date. A request to extend the deadline an additional year to June 30th, 2020 would enable Morrison SWCD to complete the culvert inventory and final reports to township officials, develop a drainage ordinance and an updated

county GIS layer, create a restoration priority list and a drainage maintenance plan and submit a final report to Morrison County Commissioners and the LCCMR.

Timeline for project completion will be as follows:

- Completed Culvert Inventory and Database– October 31, 2019
- Final Reports to Township Officials- March 30, 2020
- Drainage Ordinance and Updated County GIS Layer- March 30, 2020
- Restoration Priority List and Drainage Management Plan- June 1, 2020
- Final Report to County Commissioners and LCCMR – June 30, 2020

In Section VI of the June 30th, 2018 report under the “Project Budget Summary, B. Other Funds:” you can see the actual amount Morrison SWCD has put in out of the district's own funds. The amount is well over the initial \$40,000 of what was initially proposed and as of our last report \$178,127.41 had been contributed by the district. In addition, within the same period the total in-kind time spent on this project by township government officials and Morrison County amounted to \$34,889. Our match on this project then has been over 1:1 with the LCCMR funds requested, received and spent.

Finishing this project is a high priority for Morrison SWCD and for Morrison County and we fully intend to complete it. Grant dollars from LCCMR will be spent by the end of first quarter in 2019 and will not carry us to the end of second quarter in 2019 when the project is slated to be complete. The projected amount of funds needed to complete this project will be \$93,341 of which the district is prepared to spend if allowed to extend the grant end date to June 30th, 2020.

BELOW EMAIL RECEIVED FROM PLATTE TOWNSHIP...

From: Jackie Keehr [<mailto:jackie.keehr@gmail.com>]

Sent: Friday, September 21, 2018 12:17 PM

To: Helen McLennan <helen.mclennan@morrisonswcd.org>

Cc: Alan Ringwelski <alan.ringwelski@morrisonswcd.org>; Mike Becker <mike.becker@morrisonswcd.org>

Subject: Realized Cost Savings - Platte Township Culvert Inspections

Hello Helen,

At our annual town meeting in March the Board will share with our town members our realized cost savings for having been provided the ability to install all failing culverts with a rating of 4. This savings is largely due to the initiative of MC Soil and Water to document and inspect our culverts.

The savings in labor/mileage to our town has been significant as we have discussed in the past. In addition, to date we have realized a cost savings of approximately \$6,498 stemming from; ability to effectively plan installations with our contractors, place orders in a timely manner minimizing the impact of increasingly cost to steel, ability to place orders large enough to purchase directly from vendors qualifying for free shipping.

With deepest appreciation,

Jackie Keehr

Supervisor

Platte Township/Morrison County

Email: Jackie.Keehr@gmail.com

Phone: 320-733-2700

**Amendment I - Pending Further LCCMR and Legislative Action as of 11/30/2018.
Amendment Request signed into law 5/31/19.**

AMENDMENT REQUEST II - November 27, 2018

A budget amendment has been submitted along with this work plan amendment to make minor changes within the original budget. Funds not expected to be spent in the budget areas of capital expenditures and travel will be moved to the personnel expense category.

Amendment II Approved by LCCMR November 30, 2018.

Project Status as of January 1, 2019

The project is proceeding well but will most likely need all next year to finish the inventory with the winter of 2019/2020 to finish the reports and maps for each township. We completed 9 townships (23 total) this year and partially completed another two. This marks the two-thirds point in the inventory. To date we have inventoried 5,286 culverts.

We are continuing to keep all the partner agencies up to data with our data and progress. Our communications to these groups consists of presentation and data transfers. We are continuing to attend semiannual township meetings and county board meetings with updates. We are finalizing details on making a subset of the data available for public viewing on the Morrison County interactive GIS system, Beacon. Discussions continue with county officials regarding a drainage ordinance.

One problem that was encountered this fall was the lack of adequate cell service in the far southeast corner of the county. The problem is the equipment uses a MNDOT Cell Tower for GPS correction and cell service to access the culvert database. This lack of service caused a delay in the inventory during the troubleshooting of the problem. The result is the project will need a cellular signal booster to enhance and strengthen the signal.

AMENDMENT REQUEST I –January 16, 2019

A budget amendment has been submitted along with this work plan to make a minor change to the amended budget of November 27, 2018. Funds not expected to be spent in the budget areas of capital expenditures (as there is a threshold of \$5000) will be moved to the personnel expense category.

Amendment Approved by LCCMR January 29, 2019

Project Status as of July 1, 2019 (submitted August 15, 2019)

Since January 2019 the project went well with a lot of interest in the project and data. The reports were finished and delivered to the newly completed townships. 23 townships have been completed out of 35 townships. Of the remaining 12 townships; 3 are partially finished and 9 have not been started.

We are continuing to keep all the partner agencies up to data with our data and progress. Our communications to these groups consists of presentation and data transfers. We are continuing to attend semiannual township meetings and county board meetings with updates. We made a subset of the data available for public viewing on the Morrison County interactive GIS system, Beacon.

The data collected from the completed townships were reviewed with GIS staff and engineers. Two different tools were investigated to analyze the data: Agricultural Conservation Planning Framework (ACPF) and a customized culvert ranking system. Both tools looked at different data sources to create quite different goals. The ACPF was not used now due to the fact it looks at a watershed scale. The watersheds have not been completed because we surveyed the townships based on the level of local cooperation and development.

The culvert ranking was used to put a point value on each culvert due to different criteria observed in the field. These point values ranked certain culverts with a higher value as more important in the system. These higher value culverts were then referenced with the proximity to public waters to further rank the culvert in order of most important.

The number of requests made to the office for drainage assistance by Morrison County and township officials has significantly increased since the last status update. Many long standing issues were able to be resolved with the use of the existing culvert inventory data and the field expertise of the drainage technician afforded through this grant.

To reiterate, our plan moving forward, made possible by the extension, is to provide final reports to township officials which includes restoration priorities and drainage maintenance recommendations. In addition, the district will update the county GIS layer with culvert conditions and locations and share the inventory data with all of our interested partners. Finally, the district will develop a model drainage ordinance which will be recommend to the Morrison County Commissioners. Due to financial constraints, the district will be unable to complete all of the proposed 35 townships, even with the time extension. As of June 30, 2019 when the dedicated funds for the project ran out 23 of the 35 townships had been completed.

Overall Project Outcomes and Results (to be submitted between July 1, 2020 and August 15, 2020):

Overall Project Outcome and Results

Morrison County, like other agricultural counties, has experienced a vast increase in drainage. Thousands of acres are being tiled with no approval or oversight and wet weather patterns have exacerbated drainage issues along township and county roads. Major conflicts have exploded between neighbors and road authorities due to impacts of standing water on agricultural fields and topping of public roads.

Morrison SWCD historically has taken the lead in managing drainage, county wide, and starting in 2016 centerline and driveway culverts were surveyed to better comprehend the hydrology and storm water management for the county. Morrison SWCD documented locations, elevations and conditions of culverts throughout 23 townships in Morrison County. The complete database of this information was shared with each township and Morrison County Public Works department for a more complete understanding of drainage capacity and infrastructure replacement needs. In addition to being used by Morrison SWCD to resolve landowner conflicts, watershed and wetland protection, it is also being used by other state and federal entities for water quality protection and enhancement, identifying wildlife project areas and for floodplain mapping. Limited database information is available for public viewing through the Morrison County interactive GIS viewer, Beacon.

This information has led to the creation of a Morrison County Comprehensive Drainage Management Plan. This plan was created to protect state water resources from runoff pollution and degraded water quality, stabilize soils, shores and banks from erosion, protect or provide riparian corridors and preserve natural drainage ways and wetlands from being drained, filled and manipulated.

Morrison SWCD is committed to serving the public through a leadership role in managing drainage and sharing a more complete understanding of drainage infrastructure within the county and with other areas of the state struggling with drainage issues.

IV. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1:

Description: Inventory, assess, and create a plan for performance drainage management

Summary Budget Information for Activity 1:

ENRTF Budget:	\$ 209,000
Amount Spent:	\$ 209,000

Outcome	Completion Date
1. Conduct culvert inventory (systematically township by township, collect existing information and completing for 35 townships, approx. 3,000 miles of roads for townships and county and 88 miles of public drainage ditching.	October 31, 2019
2. Create a data base of all culvert elevations throughout the county.	October 31, 2019
3. Conduct LIDAR assessment of minor watersheds to determine drainage capacity and identify insufficient patterns.	June 1, 2020
4. Develop drainage management plan to be shared with all road authorities to correct or improve drainage patterns.	June 1, 2020
5. Enter all information on County GIS web site.	March 30, 2020
6. Provide a final report and recommendation to Morrison County Board to assist in the development of a drainage management ordinance for Morrison County.	June 30, 2020

Activity Status as of January 1, 2017

The culvert inventory has been completed for 4 townships, with approximately 300 culverts each which was alarmingly more than anticipated. A data base has been created in Excel and a summary for each township showing recommended areas to be addressed, culvert condition, elevation, apron conditions, along with quite a few other parameters. Copies of the spreadsheets will be furnished to the townships immediately along with the summary and a key is being prepared to help them interpret some of the data that they may not be familiar with. It took approximately a month per each township and then days to complete and sort the information gathered as notes so as not to lose the information while fresh and produce a final product. Discs and hard copies are being prepared. Without being able to start until after July 1, and learning the time frame it will take to do a complete assessment and inventory, we know that we must submit a timeline amendment request.

The database will be on Excel as well as maps being created and a key to follow for the inexperienced user. We are working closely with the GIS specialist for the county who will be entering the information on the County website, for easy access to users. Several meetings have been held with the County Engineer and technicians to tie in the county road information and how the final product should be shaped and how the access will be handled, primarily for continued updates.

While we've begun to look at LiDAR, it has been determined that approaching the drainage management by HUC 8 or whatever level makes sense. Therefore, until all of the townships are completed, the thorough plan cannot be developed.

As stated, a summary is being furnished as each of the townships is completed. However, the overall plan and recommendations will follow towards the end of the project. But the summaries should help drive their annual plans and what should be addressed more immediately.

The Engineering Technician and the County GIS person are working closely to get the appropriate level of information on the Beacon (County/SWCD) websites.

We have presented to the County Board, the annual Township Association meeting, and to other smaller groups to demonstrate the project as completed to this date. The county board is being kept in the loop continually to take feedback. The whole project is very closely aligned with the County Public Works Dept. and DNR to make sure we have an overall project that serves each agency as well and any and all users.

Activity Status as of July 1, 2017

The culvert inventory has been completed for a total of 12 townships and 2,630 culverts. Each township ranges from 120 to 472 culverts in each. We continue to enter information gathered for each township in to our data base.

Overall the work in proceeding well with little problems. The GPS and software is working well with update to the usability of the software taking place in town and in real time.

The response from the townships that received the documents this last year has been very positive. They have claimed it has helped them have more efficient planning for the following maintenance year. The result in our office have saved trips out into the field and have made our office more informed of possible issues.

With it being obvious that time was going to be critical, a summer intern was hired this year and will be kept on until the project is complete. A second set of the required equipment was purchased as well. This has enabled us to work twice as fast.

The project utilized software and equipment from a local company. The IT support is immediate. Morrison County Public Works and Land Services Department are using the same equipment. This will allow all partnering agencies to utilize the gathered information in a compatible manner.

At this time, we estimate we will be inventorying culvert through summer 2018 to complete all 35 townships. The goal still remains to meet the work plan timeline.

Activity Status as of January 1, 2018

The culvert inventory has been completed for a total of 12 townships and 3506 culverts. Each township ranges from 120 to 472 culverts in each. We continue to enter information gathered for each township in to our data base.

Overall the work in proceeding well with little problems. The GPS and software are working well with update to the usability of the software taking place in town and in real time. We have added categories and removed categories that we have deem important.

The response from the townships that received the documents this last year has continued to be very positive. They have claimed it has helped them have more efficient planning for the following maintenance year. The result in our office have saved trips out into the field and have made our office more informed of possible issues.

The project utilizes software and equipment from a local company. The IT support is immediate. Morrison County Public Works and Land Services Department are using the same equipment. This will allow all partnering agencies to utilize the gathered information in a compatible manner.

At this time, we estimate we will be inventorying culvert through summer 2018 to complete all 35 townships. The goal remains to meet the work plan timeline. We will reassess the goal following the 2018 field season to see if the goal is still viable or will need to be amended. With the great variety of culverts per township the work load estimate is still questionable.

Activity Status as of July 1, 2018

The inventory is proceeding well, in spite of the late start with spring. Our equipment is functioning well with a few areas where the cellular service is a little spotty. In the areas for spotty cellular service other alternatives are being discussed on what and how we need to proceed. We again have an intern to help with the inventory this summer.

We have currently finished with 6 new townships (20 of 35) for this year's field season. Depending on weather and equipment we hope to finish 4-5 more by the time the weather changes. Some of the remaining townships are not nearly as populated so may go quicker. It was important to include driveway and field road culverts though, since some of the bottlenecks of holding water is due to inappropriately placed and sized culverts on private accesses.

Activity Status as of January 1, 2019

The inventory continued to proceed well until October when the weather turned to rain and stopped the inventory until spring. The further southeast we moved the more isolated and remote Morrison County is and the cellular service was less than adequate to continue the inventory.

Since last activity status we finished three additional new townships (23 of 35) and partially completed two more for this year's field season. The weather and cellular service problems delayed the progress this fall and is the reason for the partially completed townships. The remaining townships are mostly in the less populated areas of the county. It is hard to know if it will be quicker or slower to complete them. It all depends on road miles and the amount of water resources that the roads contact with and how many culverts are included in them.

Activity Status as of July 1, 2019 (Submitted August 15, 2019)

Since January 2019 the project went well with a lot of interest in the project and data. The reports were finished and delivered to the newly completed townships. Twenty-three townships have been completed out of thirty-five townships. Of the remaining 12 townships; 3 are partially finished and 9 have not been started.

We are continuing to keep all the partner agencies up to date with our data and progress. Our communications to these groups consists of presentation and data transfers. We attended 7 semiannual township meetings and 3 county board meetings with updates. We made a subset of the data available for public viewing on the Morrison County interactive GIS system, Beacon. The data has again been shared with the DNR and FEMA contractors.

The data collected from the completed townships were reviewed with GIS staff and engineers. Two different tools were investigated to analyze the data: Agricultural Conservation Planning Framework (ACPF) and a customized culvert ranking system. Both tools looked at different data sources to create quite different goals. The ACPF was not used now due to the fact it looks at a watershed scale. The watersheds have not been completed because we surveyed the townships based on the level of local cooperation and development. The culvert ranking was used to put a point value on each culvert due to different criteria observed in the field. These point values ranked certain culverts with a higher value as more important in the system. These higher value culverts were then referenced with the proximity to public waters to further rank the culvert in order of most important.

Approximately 98 requests total 340 hours made to the office for drainage assistance by Morrison County and township officials has significantly increased since the beginning of the inventory. Many long standing issues were able to be resolved with the use of the existing culvert inventory data and the field expertise of the drainage technician afforded through this grant.

Final Activity Status (to be submitted between July 1, 2020 and August 15, 2020):

Reports of the culvert inventory data were finished and delivered to 23 townships of 35. Reports included locations and elevation data for centerline and private drive culverts along township roads. The reports also detailed material size, type, shape and conditions of pipes and flow direction. Culverts were then rated based on their current conditions and recommended maintenance activities were noted. Data collected has been compiled into a hard copy and an electronic copy and shared with all of the completed townships. Maps detailing locations of culverts by sections along with the data which in an Excel spreadsheet format is included as is a key for the information. These summaries were presented help drive township annual plans and help prioritize replacement work so township budgets could be used more efficiently and very problem spots could be addressed more immediately. The response from the townships that received the documents has been very positive and they have claimed it has helped them have more efficient planning in the maintenance years that have followed.

We have presented to the County Board, the annual Township Association meetings, and to other smaller groups to demonstrate the project as completed to this date. The county board has been kept in the loop continually to take feedback. The whole project is very closely aligned with the County Public Works Dept. and DNR to make sure we have an overall project that serves each agency as well and any and all users. A subset of the data from the inventory was made available for public viewing on the Morrison County interactive GIS system, Beacon. Full data sets were shared with FEMA, DNR, Morrison County Public Works and US Fish and Wildlife Service. The project utilizes software and equipment from a local company so the IT support for the software was immediate. Morrison County Public Works and Land Services Department are using the same equipment so these partner agencies were able utilize the gathered information in a compatible manner.

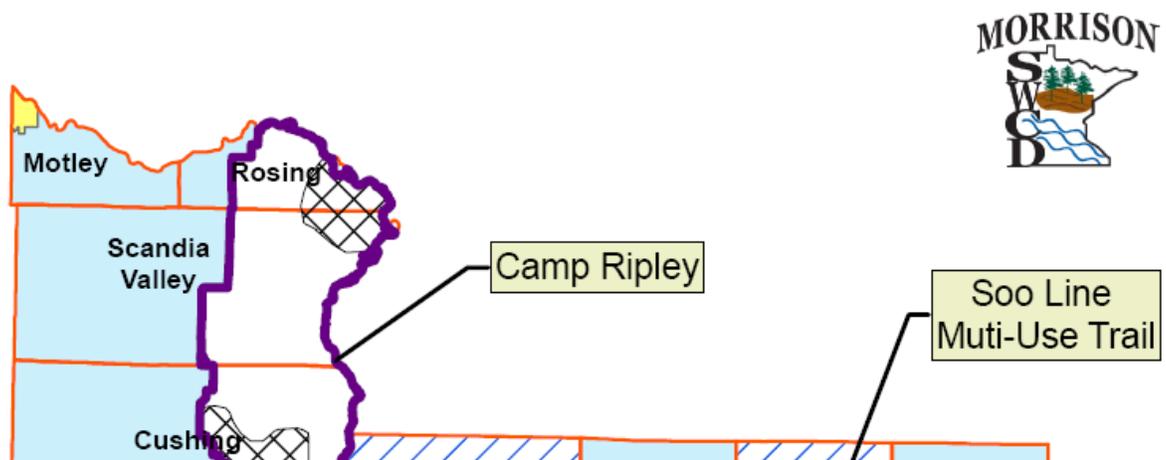
LIDAR assessment of minor watersheds was done as data became available to determine drainage capacity and identify insufficient patterns. The number of requests made to the office for drainage assistance by Morrison County and township officials has significantly increased since the start of the project. Many long-standing issues were able to be resolved with the use of the culvert inventory data and the field expertise of the drainage technician afforded through this grant. This data has resulted in saved trips out into the field, it has provided a mechanism for us to assess drainage points more accurately and pinpoint pressure points within a watershed.

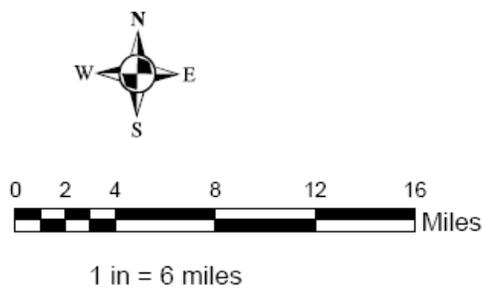
Throughout the life of the project there was an outpouring of support from township and county elected officials and from Morrison County staff. They saw the value this project provided and have financially benefited from the work afforded through this grant. The documented in-kind match throughout the life of the project was \$61,692.31. This was the equivalent of 1,116 hours of township staff and elected official time and 982 hours of county staff and elected official time contributed towards the project. Morrison SWCD contributed \$66,206.19 in staff wages from BWSR allocated Local Capacity dollars towards the project. In total \$127,898.50 worth of in-kind and cash contributions were made thus exceeding a 1:1 match for the grant dollars received when none were required.

Discussions continue with county officials regarding a drainage ordinance which was drafted as part of this project. The Morrison County Comprehensive Drainage Management Plan was created to protect state water resources from runoff pollution and degraded water quality, stabilize soils, shores and banks from erosion, protect or provide riparian corridors and preserve natural drainage ways and wetlands from being drained filled and manipulated.

The culvert inventory is not yet complete for the entirety of Morrison County. Of the remaining 12 townships, three are partially finished and nine have not been started. This was due to the enormity of the project as initially only centerline culverts were identified for survey but it will immediately recognized private driveway culverts were a vital part of the picture needed to assess drainage ways on a drainage system and watershed basis. In addition, data collection was limited to the time when the ground was not frozen. Many culverts were buried and needed to be dug out in order to take accurate measurements during the duration of the project and sampling outside of this time period proved to be ineffective.

In addition to the SWCD maintaining this data and affording a drainage technician as part of our service to Morrison County, two additional areas of the county were identified as being imperative to having a more complete understanding of drainage patterns. The additional areas include select culverts in and around Camp Ripley, a 53,000-acre Army National Guard training facility located in Morrison County which contributes a large watershed and the second is the 38 mile Soo Line Trail which bisects Morrison County. These areas were not initially identified as part of this grant but ultimately it was a piece which was overlooked. Additional funding will be sought in the future for phase II of the project which would complete the remaining townships and these two additional areas.





Legend

-  Camp Ripley Culverts Boundary- Phase II
-  Soo Line - Phase II
-  Camp Ripley Culverts Interior - Phase II
-  Political_Townships
-  Corporate_Limits
-  Completed Townships
-  Townships - Phase II

V. DISSEMINATION:

Description: The final plan will first be presented to the partners involved, Morrison County Board, Planning and Zoning, Morrison County Public Works, DNR Division of Waters, for approval and or modifications.

Once approved by the Morrison County Board, the mapping, elevations, and profiles of ditches will be entered into the Morrison County GIS web pages and be available to all users, contractors, road authorities, landowners, etc. A presentation will be made to the Morrison County Annual Township Board meeting to train them how to use the plan and information effectively. Road authorities will be trained on how to maintain the files for the townships. Radio and newspaper releases will be conducted and training classes offered.

The county will then utilize the plan to develop a land use permitting process for drainage maintenance that will ensure that records are kept up to date and maintained. The hope is also to generate enough revenue to keep the engineering technical position to assist users in effectively managing drainage issues.

Activity Status as of January 1, 2017

We have presented to the County Board, the annual Township Association meeting, and to other smaller groups to demonstrate the project as completed to this date. The county board is being kept in the loop continually to take feedback. The whole project is very closely aligned with the County Public Works Dept. and DNR to make sure we have an overall project that serves each agency as well and any and all users.

Activity Status as of July 1, 2017

The process is so impressive that we have shared and demonstrated it at a 12-county meeting, and also for a state-wide county engineering conference. The townships completed to date, are finding the work essential in their annual planning and funding needs.

We have shared project information on our weekly radio program and featured articles in the local newspaper to inform the public about what we are doing and an overview of the project itself. Many landowners have approached our field crew and inquired what they were doing. While time consuming, it's important to show transparency.

We are going to utilize the assistance of Camp Ripley hydrologist to help us create the final overall management plan.

At the county's annual township board meeting, we have had the opportunity to identify the designated road authority and have asked them to help map out known existing culverts, which speeds up the process in the field. Most townships have shown great cooperation.

Activity Status as of January 1, 2018

The process is so impressive that we have shared and demonstrated it at a 12-county meeting since the start of the project and two additional times since the last update. We have also presented for a state-wide county engineering conference. The townships completed to date, are finding the work essential in their annual planning and funding needs.

We have shared project information on our weekly radio program and featured articles in the local newspaper to inform the public about what we are doing and an overview of the project itself. Many landowners have approached our field crew and inquired what they were doing. While time consuming, it's important to show transparency.

We are collaborating with a Camp Ripley hydrologist to help us create the final overall management plan.

At the county's annual township board meeting, we have had the opportunity to identify the designated road authority and have asked them to help map out known existing culverts, which speeds up the process in the field. Most townships have shown great cooperation.

We are currently completing the reports for 10 townships that were surveyed this year. They should be receiving their reports within a few weeks.

Status as of July 1, 2018

We have completed and delivered the reports for each of the completed townships from the previous year. The reports are long and time consuming approximately 100 pgs. Examples of the reports are shown to each township upon the initial contact for information. The townships are furnished both digital and paper copies due to their own computer savvy or lack of.

Over the last 6-month period we have contacted the remaining townships about stopping by the SWCD to receive maps and pin flags to mark their culverts. The excitement and word of mouth is catching on with some of the townships that we have yet to make full contact with. We met a township official near their house and they stated that they have heard about the project but had not yet contacted us. I believe once they saw that we are out in their township they become much more willing to help us with the mapping.

Status as of January 1, 2019

The overall progress this last season was good despite the late spring and wet fall. The field season completed eight townships, most of them located on the far east side of the county. Due to the weather and distance to the area of inventory the progress was good.

The reports for the townships are still being generated from the previous season. When all the reports are finished they will be distributed to the completed township. The updated data has been supplied to our partners that we have in past years.

We have met with the Morrison County Land Services and GIS department to finalize the attributes and styles of what will be displayed on the County GIS Beacon page. We have also met with County Officials to discuss draft ordinances. We have been discussing different scenarios and protocols of how we will analyze the database for the final management report.

Status as of July 1, 2019 (submitted August 15, 2019)

The reports were all updated and delivered to the nine townships that were completed this last field season. The reports were submitted to the townships with a meeting to demonstrate the report and all the attributes and how to use the data supplied to the townships. The data reports will need to be updated as the townships move forward with maintenance and new construction. We attended 7 semiannual township meetings and 3 county board meetings with updates.

The County GIS Beacon page went live to the public with an abridged data table in March of 2019. The County GIS will also need to be updated once a year with the updated yearly data from county and township work. The updating process will need to be a cooperative approach by the local road supervisors with the SWCD to help maintain a up to date database. The data has again been shared with the DNR and FEMA contractors.

Approximately 98 requests total 340 hours made to the office for drainage assistance by Morrison County and township officials has significantly increased since the beginning of the inventory. Many long standing issues were able to be resolved with the use of the existing culvert inventory data and the field expertise of the drainage technician afforded through this grant.

Final Status (to be submitted between July 1, 2020 and August 15, 2020):

At the very onset of this project, the SWCD had the opportunity to identify the designated road authority and worked with them to map out known existing culverts, which sped up the process in the field immensely. Most townships showed great cooperation understanding the full value of what they would receive as an end product.

Reports of the culvert inventory data were finished and delivered to 23 townships. These reports included locations and elevation data for centerline and private drive culverts along township roads. The reports also detailed material size, type, shape and conditions of pipes and flow direction. Culverts were then rated based on their current conditions and recommended maintenance activities were noted.

We have shared project information on our weekly radio program and featured articles in the local newspaper to inform the public about what we are doing and an overview of the project itself. Many landowners have approached our field crew and inquired what they were doing. While time consuming, it is important for us to show transparency. In addition, we are continuing to keep all the partner agencies up to data with our data and progress, attending township and county board meetings and presenting the information to our partners. A subset of the data from the inventory was made available for public viewing on the Morrison County interactive GIS system, Beacon. This not only gives anyone who accesses the site to view the data but contractors, township residents and interested parties easy, fast access to culvert locations. Full data sets were shared with FEMA, DNR, Morrison County Public Works and US Fish and Wildlife Service.

This project has culminated with the drafting of the Morrison County Comprehensive Drainage Management Plan was first presented to the partners involved: Morrison County Board, Morrison County Planning and Zoning, Morrison County Public Works, DNR Division of Waters, for comments, modifications and approval. This document is currently still in draft form and has not yet been adopted by the county as an official addition to the Morrison County Land Use Ordinance. The county will then utilize the plan to develop a land use permitting process for drainage maintenance that will ensure that records are kept up to date and maintained.

VI. PROJECT BUDGET SUMMARY:

A. ENRTF Budget Overview:

Budget Category	\$ Amount	Overview Explanation
Personnel:	\$ 183,479	3 years FTE salary and benefits @ \$55,000 year
Equipment/Tools/Supplies:	\$ 1,374	ArcView map \$1,500
Capital Expenditures over \$5,000:	\$ 16,647	Arrow 200 L1/L2 GNSS receiver bundle \$24,700 /data base Auto-cad Civil 3D software \$6,800
Travel Expenses in MN:	\$ 7,500	Reimbursed mileage 20,371 miles @.54
TOTAL ENRTF BUDGET:	\$ 209,000	

Explanation of Use of Classified Staff: n/a

Explanation of Capital Expenditures Greater Than \$5,000: The Arrow 200 L 1/L2GNSS was determined to have a greater degree of accuracy and user compatible with DNR and County Public Works Dept. equipment which will enable us to share data easily. The auto cad is the appropriate software for data and mapping used by all partners which will lend to compatibility. The equipment will continue to be used by the agency and county for the same purpose for the life of the equipment. It is not envisioned that the equipment would ever be sold, but in the event it is, the funds would be returned to the ENRTF. If a neighboring entity or agency has need, the equipment will be shared accordingly.

Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation: 3 FTE

Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation: 0

B. Other Funds:

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
Non-state			
<i>Township government</i>	\$50,000	<u>\$40,218.41</u>	<i>\$50,000 In kind cooperation and maintenance implementation</i>
<i>County Board and Public Works</i>	\$10,000	<u>\$21,473.90</u>	<i>Ordinance development, public hearings, (in kind match)</i>
State			
<i>SWCD CWF accelerated capacity funds through BWSR and buffer kick start funds</i>	\$40,000	<u>66,206.19</u>	<i>The district will subsidize the grant wherever needed (travel, training, overhead expenses)</i>
TOTAL OTHER FUNDS:	\$100,000	<u>\$127,898.50</u>	

VII. PROJECT STRATEGY:

A. Project Partners: Partners in this project are all contributing in-kind or with cash matches and will not be receiving ENRTF funding but buy into the project for the resulting benefits. The following is a list of team members:

- Morrison County Public Works: Training in Soft Ware Coordination, Planning, and Oversight on County Road Ditches and Public Ditches also Co-Supervisor of Engineering Technician
- Morrison County DNR Area Hydrologist: Coordinating Public Water Culvert Elevations and Team Planning and Training of Software
- Morrison County Board Commissioner: Planning and County Ordinance Lead Facilitator
- Shannon Wettstein, Morrison SWCD Manager: Project lead and overall coordinator
- Alan Ringwelski, Morrison SWCD Technician: Team Member, Trainer, and Supervisory Capacity Over Technician
- Township Road Authorities: Assisting Technician with Culvert Locations if Known and Determining Priority Areas
- LeaAnn Nouis, Morrison SWCD Administration Assistant.: Financial Management Assistance
- Lance Chisholm, Morrison SWCD Water Plan Coordinator and GIS person: Assistance in Mapping and Reporting
- Mike Becker, Morrison SWCD Engineering Technician: Culvert Inventory Lead
- Amy Heinen, Morrison SWCD Intern: Culvert Inventory Assistance
- Todd Holman, The Nature Conservancy: Co-Author of Grant Request and Overall Team Chairman

- Jake Kitzman, Environmental Specialist Camp Ripley: Tying in Camp Ripley’s information and assisting with overall analysis of the plan

B. Project Impact and Long-Term Strategy: The intended impact and utility of this project is to better understand how landuse changes and increased storm events have affected our infrastructure and where change is needed to better manage water but to also assure that the water is moving across the landscape in an environmentally safe manner. The final plan may indicate more than drainage needs, such as flood storage needs such as restored wetlands, retention ponds, etc.

The data on hand in any township and even at a county level, needs to be brought up to modern expectations and has not been done for many generations. A drainage performance management plan will serve into the future allowing land use decision makers the ability to make qualified and quantified decisions based on science and fact, and not conjecture or controversy.

If the BWSR accelerated capacity funding continues, we should be able to maintain this position and keep the plan updated regularly. The need by the road authorities is on going so it’s not a short term need, but a long term need served with much needed information and strategies.

By publishing the information and plan on a public domain, the data will be available for every private and public user at no cost. This will assist in future development and driveway needs, maintaining existing roads and also upgrading existing roads.

C. Funding History: *N/A*

VIII. FEE TITLE ACQUISITION/CONSERVATION EASEMENT/RESTORATION REQUIREMENTS: *N/A*

IX. VISUAL COMPONENT or MAP(S): *See attached*

X. RESEARCH ADDENDUM: *N/A*

XI. REPORTING REQUIREMENTS:

Periodic work plan status update reports will be submitted no later than January 1, 2017, July 1, 2017, January 1, 2018, July 1, 2018, January 1, 2019, and July 1, 2019. AMMENDMENT REQUEST SIGNED INTO LAW 5/31/2019 A final report and associated products will be submitted between June 30 and August 15, 2020.

XII. Addendum

Morrison County Comprehensive Drainage Management Plan Draft Below:

TITLE, AUTHORITY AND PURPOSE

xxxx. Short Title. This ordinance shall be known as the MORRISON COUNTY COMPREHENSIVE DRAINAGE MANAGEMENT PLAN and herein referred to as the ordinance.

xxxx. Jurisdiction: General

This plan establishes drainage regulations regarding the location and elevation of drainage structures outlets in public Right of Ways or Public Ditches. Authority granted by Minnesota Statutes, Chapter 103B (Water Planning and Project Implementation), 103E (Drainage), 103F (Protection of Water Resources), 103G (Waters of the State) Chapters 115 (Water Pollution Control; Sanitary Districts) & 116 (Pollution Control Agency), the requirements of the Minnesota Wetland Conservation Act (WCA) of 1991, or as amended.

xxxx. County Comprehensive Plan

The Morrison County Comprehensive Plan shall be the document known as the "Morrison County Comprehensive Plan" adopted October 4th, 2005. The Comprehensive Plan may be amended by the County from time to time in accordance with the procedures set forth in Minnesota Statutes, Chapter 394.

xxxx. County Comprehensive Local Water Plan

The Morrison County Comprehensive Local Water Plan shall be the document known as the "Morrison County Comprehensive Local Water Plan" adopted June 28th, 2017. The Comprehensive Local Water Plan may be amended by the Local Governmental Units (LGUs) from time to time in accordance with the procedures set forth in Minnesota Statutes, Chapter 103B.

xxxx. Intent, Purpose and Policy

General Policy. Because the land and water of Morrison County are limited resources which must be used in a manner that will protect the environment and satisfy the needs of the County's population, and because these land and water resources are required to provide food and fiber, construction material, water recharge, recreation, wildlife, and living space, Morrison County finds it necessary to protect the land and water resources of the county to afford a desired quality of life to existing and future citizens of the county, and to promote the health, safety, and general welfare of the County's inhabitants.

xxxx. COMPREHENSIVE DRAINAGE MANAGEMENT PLAN

xxxx. Purpose and Intent

It is the purpose and intent of the Morrison Soil and Water Conservation District (SWCD) and Morrison County to:

- Protect state water resource from runoff pollution and degraded water quality
- Stabilize soils, shores, banks, from erosion
- Protect or provide riparian corridors
- Preserve natural drainage ways and wetlands from being drained, filled, or manipulated.

xxxx. Data Sharing/Management

SWCD Culvert Inventory

The SWCD is maintaining a culvert inventory of culverts within the public right of way (ROW). This inventory has been and continues to be instrumental to the successful management of the drainage throughout the county. When any pipe is placed on public ROW the Culvert Replacement form needs to be completed to maintain current inventory data and to display the final as built will meet the drainage requirements for the area.

The SWCD may enter into arrangements with the county, a watershed district if applicable, BWSR and other parties with respect to the creation and maintenance of, and access to, data concerning culverts and/or other drainage features under this ordinance. The SWCD will manage such data in accordance with the Minnesota Data Practices Act and other applicable laws.

The SWCD has made the data available in an abridged version on the Morrison County Beacon GIS website. The SWCD has also shared full data sets with the Morrison County Public Works and Auditor departments as well as federal and state partner agencies by request.

xxxx. Drainage Management

xxxx.x Subsurface Drain Tile

- a. The design, installation and use of drain tile in and around wetlands need the approval and inspection of the SWCD to ensure the placement of the tiles do not have a negative effect on surrounding wetlands. Lateral effect will be based off of depth and size of tile using known soil type information.
- b. When a drain tile outlet is discharging into a state, county, township, or city ROW, waters of the state (MN Statues Chapter 103G), or a county ditch (MN Statues Chapter 103B) the governing body needs to be notified of the proposed work.
- c. When a drain tile outlet is placed on any of these above sites the outlet needs to be reported using form from Culvert Replacement form and returned to the SWCD office.
- d. When the drain tile outlet is placed a neighboring private landowner's property, written approval must be submitted to the SWCD office and to the local township clerk before tile can commence.

xxxx.x Access/Driveway Culverts

- a. The authorization and installation of a new driveway on county ROWs needs to be requested to the Morrison County Public Works using the Application for Access (Driveway) Permit.
- b. The Application for Access (Driveway) Permit is only required for Morrison County public roads but it is suggested that all cities and townships use the same format to create consistency.
- c. When a driveway outlet is placed at any public ROW the culvert needs to be reported using the Culvert Replacement form and returned to the SWCD office.

xxxx.x Centerline Culverts

- a. The authorization and installation of a new/or replacement culvert on any public ROWs needs to notify the Morrison SWCD.
- b. This notification will allow the SWCD to verify that there is no impact to the Wetland Conservation Act of 1991. (see Section 1100)
- c. When a centerline outlet is placed at any Public ROW the culvert needs to be reported using the Culvert Replacement form and returned to the SWCD office.

xxxx.x Public Drainage/County Ditches

The modification or maintenance of Morrison County Public Ditches (MN Statutes Chapter 103B) is the jurisdiction of the county board of commissioners within Morrison County. The policies of these drainage systems shall be governed by the MN Statutes Chapter 103E and local county ordinance. Repair is defined in MN Statutes Chapter 103E.701 Subdivision 1:

“To restore all or a part of drainage system as nearly as practicable to the same hydraulic capacity as originally constructed and subsequently improved, including resloping of ditches and leveling of spoil banks if necessary to prevent further deterioration, realignment to original construction if necessary to restore the effectiveness of the drainage system, and routine operation that may be required to remove obstruction and maintain the efficiency of the drainage system.”

xxxx.x Private Surface Ditches

The modification or maintenance of private ditches governed under Wetland Conservation Act (WCA) Chapter 8420. WCA is the jurisdiction that enforces these ditches. A joint application for WCA at the Morrison SWCD office, a Notice of Decision, and a contractor liability form is needed before work can take place on these private surface ditches. The area will be investigated both remotely and on site to justify what work can take place. Along with the WCA Notice of Decision, a permit from the U.S. Army Corps of Engineers (USACE) may also need to be obtained.

xxxx.x Public Waters/Waters of the State

The modification or maintenance of Public Waters shall be governed by the MN Statute Chapter 103G. Work within in a Public Water is the jurisdiction of the Minnesota Department of Natural Resources (DNR). All work will need to be authorized through a general water permit from the DNR and under certain circumstances, a permit from the USACE will also need to be issued.

xxxx.x Non-Public Waters Wetlands

The modification in any non-public wetlands shall be governed under WCA Chapter 8420. WCA is the jurisdiction that enforces these non-public wetlands. A joint application for WCA must be submitted at the Morrison SWCD office explaining the project. The area will be investigated both remotely and on site to

justify what work can take place. Work cannot take place before the SWCD issues a Notice of Decision for the proposed activity. In addition, work cannot commence until a contractor liability form is on file with the SWCD before work can take place in wetlands. Along with the WCA Notice of Decision, a permit from the USACE may also need to be obtained.

xxxx. Preservation of Natural Drainageways

xxxx.x Waterways

- a. The use of storm sewers is not an acceptable alternative to the use of the natural above-ground drainage system to dispose of runoff. Storm sewers may only be used where it can be demonstrated that the use of above ground natural drainage system will inadequately dispose of runoff. Above ground runoff disposal waterways may be constructed to augment the natural drainage system.
- b. The widths of a constructed waterway shall be sufficiently large to adequately channel runoff from ten year storm. Adequacy shall be determined by the expected runoff when full development of the drainage area is reached.
- c. No fences or structures shall be constructed across the waterway that will reduce or restrict the flow of water.
- d. The banks of the waterway shall be protected with permanent vegetation.
- e. The banks of the waterway shall not exceed three feet horizontal to one foot vertical in gradient.
- f. The gradient of the waterway bed shall not exceed a grade that will result in velocity that will cause erosion of the banks of the waterway.
- g. The bottom of the waterway shall be protected with turf, sod, or clean fill (free of debris). If turf or sod will not function properly, riprap may be used. Riprap shall consist of quarried limestone, field stone (if random riprap is used) or construction materials provided said construction materials are limited to asphalt and concrete. The riprap shall be no smaller than six inches square, nor larger than thirty inches square. Construction materials shall be used only in those areas where the waterway is not used as part of a recreation trail system. DNR riprap standards will be followed for Best Management Practices (BMPs)
- h. If the flow velocity in the waterway is such that erosion of the turf sidewall will occur and said velocity cannot be decreased via velocity control structures, then other materials may replace turf on the side walls. Either gravel or rip rap would be allowed to prevent erosion at these points.
- i. Permits for riprap/fill maybe required from various agencies including Morrison County Land Services, DNR Waters and USACE.

xxxx.x Waterway Velocity

- a. The flow velocity of runoff waterways shall be controlled to a velocity that will not cause erosion of the waterway.
- b. Flow velocity shall be controlled through the installation of diversions, berms, slopes drains, restored wetlands, basins, impoundments, two stage ditch systems, grade control structures, and other similarly effective velocity control structures.

xxxx. Soil Erosion and Sedimentation Control

xxxx.x General Standards

- a. All development shall conform to the natural limitations presented by the topography and soil as to create the best potential for preventing soil erosion.
- b. Slope over thirty percent in grade shall not be developed.

- c. Development on slopes with a grade between twelve to thirty percent shall be carefully reviewed to insure adequate measures have been taken to prevent erosion, sedimentation, and structural damage.
- d. Erosion and siltation control measures shall be coordinated with different stages of development. Appropriate control measures shall be installed prior to development when necessary to control erosion.
- e. Land shall be developed in increments of workable size such that adequate erosion and siltation controls can be provided as construction progresses. The smallest practical area of land shall be exposed at any one period.
- f. The drainage system shall be constructed and operational as quickly as possible during construction.
- g. Whenever possible, natural vegetation shall be retained and protected.
- h. The natural drainage system shall be used as far as is feasible for storage and flow or runoff. Stormwater drainage shall be discharged to wetlands, retention basins, or other treatment facilities. Diversion of stormwater to wetland shall be considered for existing or planned surface drainage. Wetlands used for stormwater collection shall provide for natural or artificial water level control. Temporary storage areas or retention basins scattered throughout developed areas shall be encouraged to reduce peak flow, erosion damage and construction cost.
- i. All other cases the DNR BMPs must be followed. For larger sites of development, a Storm Water Pollution Prevention Plan (SWPPP) may need to be obtained from the Minnesota Pollution Control Agency (MPCA).
- j. Spoil must be stabilized in a manner that minimizes wetland impacts without jeopardizing the stability of the ditch or contributing to the degradation of the water quality.
- k. Side water inlets, grade control structures, alternate tile intakes, and similar designs must meet DNR and MPCA BMPs and Standards.

xxxx.x Exposed Slopes

The following control measures shall be taken to control erosion during construction:

- a. No exposed slopes shall be steeper in grade than three feet horizontal to one foot vertical.
- b. Exposed slopes steeper in grade than ten feet horizontal to one foot vertical shall be contour plowed to minimize direct runoff of water.
- c. At the foot of each exposed slope, a channel and berm shall be constructed to control runoff. The channelized water shall be diverted to a sedimentation basin (debris basin, silt basin, or silt trap) before being allowed to enter the natural drainage system.
- d. Along the top of each exposed slope, a berm shall be constructed to prevent runoff from flowing over the edge of the slope. Where a runoff collecting berm cannot be diverted elsewhere and must be directed down the slope, appropriate measures shall be taken to prevent erosion. Such measures shall consist of either an asphalt paved flow apron and drop chute laid down the slope or a flexible slope drain. At the base of the slope drain or flow apron a gravel energy dissipater shall be installed to prevent erosion at the discharge end.
- e. Exposed slopes shall be protected by whatever means will effectively prevent erosion considering the degree of slope, soils material, and expected length of exposure. Slope protection shall consist of mulch, sheets of plastic, burlap, or jute netting, sod blankets, fast growing grasses, or temporary seedings of annual grasses. Mulch shall be anchored to slopes with liquid tackifiers, stakes, and netting, or shall be worked into the soil to provide additional slope stability.
- f. Control measures, other than those specifically stated above, may be used in place of the above measures if it can be demonstrated that they will as effectively protect exposed slopes.
- g. Best Management Practices must be followed.

- h. Stockpiling of soil shall be outside of wetlands or waterways. Stockpiles shall be stabilized in a timely manner after the pile has been established with BMPs.

xxxx.x Sediment Control

- a. To prevent sedimentation of waterways, pervious and impervious sediment traps and other sediment control structures shall be incorporated throughout the contributing watershed.
- b. Temporary pervious sediment traps could consist of a construction of bales of hay with a low spillway embankment section of sand and gravel that permits a slow movement of water while filtering sediment. Check DNR and MPCA BMPs for a list of other approved sediment controls such as silt fence, vegetative buffer and other sediment barriers. Such structures would serve as temporary sediment control features during the construction state of development. Development of housing and other structures shall be restricted from the area on either side of the waterway required to channel a twenty-five year storm.
- c. Permanent impervious sediment control structures consist of sediment basins (debris basins, desilting basins, or silt traps) and will be utilized to remove sediment from runoff prior to its disposal in any permanent body of water and shall be designed based on volume of water they will be handling.

xxxx.x Maintenance of Erosion Control Systems

- a. The erosion and velocity control structures shall be maintained in a condition that will insure continuous functioning according to the provisions of this policy.
- b. Sediment basins will be maintained as the need occurs to insure continuous de-silting action.
- c. The area utilized for runoff waterways and sediment basins shall not be allowed to exist in an unsightly condition. The banks of the sediment basins and waterways will be landscaped.
- d. Prior to the approval of any plat for development, the developer shall make provisions for continued maintenance on the erosion and sediment control system.

Environment and Natural Resources Trust Fund
Final M.L. 2016 Project Budget



Project Title: Morrison County Performance Drainage and Hydrology Management

Legal Citation: M.L. 2016, Chp. 186, Sec. 2, Subd.04r

Project Manager: Shannon Wettstein

Organization: Morrison Soil and Water Conservation District

M.L. 2016 ENRTF Appropriation: \$ 209,000

Project Length and Completion Date: June 30, 2019

Date of Report: April 3, 2020

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget 06/30/2019	Amount Spent	BALANCE
BUDGET ITEM			
Personnel (Wages and Benefits)	\$183,479	\$183,479	\$0
Engineering Technician, \$55,000 (70% salary, 30% benefits, 1 full FTE each year for three years total 165k			
Equipment/Tools/Supplies	\$18,021	\$18,021	\$0
Arrow 200 L1/L2 GNSS receiver bundle \$24,700, Autocad Civil 3D software \$6,800, Arc ViewMap \$1,500			
Travel expenses in Minnesota	\$7,500	\$7,500	\$0
Travel to and from data gathering points 20,370 miles at IRS eligible rate (currently .54)			
COLUMN TOTAL	\$209,000	\$209,000	\$0