



Le Sueur County, MN

Tuesday, September 26, 2017

Board Meeting

Item 5

9:30 a.m. Darrell Pettis, County Administrator / Engineer (10 min)

RE: Lexington Avenue Street Assessments

RE: Draft Feasibility Studies for Le Sueur-Scott JD 4, CD 41 and CD 61

RE: German Jefferson Petition

Staff Contact:

**NOTICE OF HEARING ON PROPOSED ASSESSMENT
CITY OF LE CENTER, MN
2016 LEXINGTON AVENUE IMPROVEMENT PROJECT**

Le Sueur County Jail
Attn: Darrell Pettis
88 South Park Avenue
Le Center, MN 56057

TO WHOM IT MAY CONCERN:

Notice is hereby given that the city council will meet at 6:00 pm on Tuesday, October 10, 2017 at city hall to consider, and possibly adopt the proposed assessment roll for the 2016 Lexington Avenue Improvement Project; including bituminous street, curb & gutter, water and sewer main, water & sewer laterals, storm sewer, sidewalks, trees, and related work projects on the following: Lexington Avenue between West Derrynane Street (Hwy 99) and Bowler Street. Adoption by the Council of the proposed assessment may occur at this hearing. The area to be assessed for such improvements includes the abutting and/or directly benefiting properties.

The amount to be specially assessed against your particular lot, piece, or parcel of land is approx. \$12,235.15. Such assessment is proposed to be payable in equal annual installments extending over a period of 20 years, the first of the installments to be payable on or before the 1st Monday in January 2018, and will bear interest at the rate of 3.0 percent per annum from the date of the adoption of the assessment resolution. To the first installment shall be added interest on the entire assessment from the date of the assessment resolution until Dec. 31, 2017. To each subsequent installment when due shall be added interest for one year on all unpaid installments.

You may at any time prior to certification of the assessment to the county auditor, pay the entire assessment on your property, with no interest accrued to the date of payment. No interest shall be charged if the entire assessment is paid within 30 days from the adoption of this assessment. You may at any time thereafter, pay to the county the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before December 31 or interest will be charged thru December 31 of the succeeding year. If you decide not to prepay the assessment before the date given above, the rate of interest that will apply is 3.0 percent per year. The right to partially prepay the assessment according to Ordinance No. 34-86 is allowed in minimum \$100 increments prior to certification.

The proposed assessment roll is on file for public inspection at the city clerk's office. The total city cost of the project is \$1,827,532.70 (76.3%). The total amount of the proposed assessment is \$568,027.45 (23.7%) for property owners for re-construction, plus the 3% interest. Written or oral objections will be considered at the meeting. No contested appeal may be taken as to the amount of an assessment unless a signed, written objection is filed with the city clerk prior to the hearing or presented to the Mayor at the hearing. The council may upon such notice consider any objection to the amount of a proposed individual assessment at an adjourned or continued hearing upon such further notice to the affected property owners as it deems advisable.

If an assessment is contested and/or there is an adjourned hearing, the following procedure will be followed:

1. The city will present its case first by calling witnesses who may testify by narrative or by examination, and by the introduction of exhibits. After each witness has testified, the contesting party will be allowed to ask questions. This procedure will be repeated with each witness until neither side has further questions.
2. After the city has presented all its evidence, the objector may call witnesses or present such testimony as the objector desires. The same procedure for questioning of the city's witnesses will be followed with the objector's witnesses.
3. The objector may be represented by counsel.
4. Minnesota rules of evidence will not be strictly applied; however, they may be considered and argued to the council as to the weight of items of evidence or testimony presented to the council.
5. The entire proceedings will be tape-recorded.
6. At the close of presentation of evidence, the objector may make a final presentation to the council based on the evidence and the law. No new evidence may be presented at this point.
7. The council may adopt the proposed assessment at the hearing.

An owner may appeal an assessment to district court pursuant to Minnesota Statutes Section 429.081 by serving notice of the appeal upon the mayor or city clerk within 30 days after the adoption of the assessment and filing such notice with the district court within ten days after service upon the mayor or city clerk.

Under city ordinance sec. 34-84, the Council may defer the payment of assessments for five years on homestead property owned by a person age 65 or older whose annual income is at or less than the state prescribed poverty level. Application for deferment shall be made within 30 days after the adoption of the assessment roll by the council upon a form provided by the county assessor, and shall be renewed each following year by September 30th on the same form. The sale, transfer, or subdividing of any property under deferment shall cause the assessment plus interest to become due in full upon such occurrence.

/S/ Christopher L. Collins
Administrator, City of Le Center

**NOTICE OF HEARING ON PROPOSED ASSESSMENT
CITY OF LE CENTER, MN
2016 LEXINGTON AVENUE IMPROVEMENT PROJECT**

Le Sueur County Court House
Attn: Darrell Pettis
88 South Park Avenue
Le Center, MN 56057

TO WHOM IT MAY CONCERN:

Notice is hereby given that the city council will meet at 6:00 pm on Tuesday, October 10, 2017 at city hall to consider, and possibly adopt the proposed assessment roll for the 2016 Lexington Avenue Improvement Project; including bituminous street, curb & gutter, water and sewer main, water & sewer laterals, storm sewer, sidewalks, trees, and related work projects on the following: Lexington Avenue between West Derrynane Street (Hwy 99) and Bowler Street. Adoption by the Council of the proposed assessment may occur at this hearing. The area to be assessed for such improvements includes the abutting and/or directly benefiting properties.

The amount to be specially assessed against your particular lot, piece, or parcel of land is approx. \$28,287.99. Such assessment is proposed to be payable in equal annual installments extending over a period of 20 years, the first of the installments to be payable on or before the 1st Monday in January 2018, and will bear interest at the rate of 3.0 percent per annum from the date of the adoption of the assessment resolution. To the first installment shall be added interest on the entire assessment from the date of the assessment resolution until Dec. 31, 2017. To each subsequent installment when due shall be added interest for one year on all unpaid installments.

You may at any time prior to certification of the assessment to the county auditor, pay the entire assessment on your property, with no interest accrued to the date of payment. No interest shall be charged if the entire assessment is paid within 30 days from the adoption of this assessment. You may at any time thereafter, pay to the county the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before December 31 or interest will be charged thru December 31 of the succeeding year. If you decide not to prepay the assessment before the date given above, the rate of interest that will apply is 3.0 percent per year. The right to partially prepay the assessment according to Ordinance No. 34-86 is allowed in minimum \$100 increments prior to certification.

The proposed assessment roll is on file for public inspection at the city clerk's office. The total city cost of the project is \$1,827,532.70 (76.3%). The total amount of the proposed assessment is \$568,027.45 (23.7%) for property owners for re-construction, plus the 3% interest. Written or oral objections will be considered at the meeting. No contested appeal may be taken as to the amount of an assessment unless a signed, written objection is filed with the city clerk prior to the hearing or presented to the Mayor at the hearing. The council may upon such notice consider any objection to the amount of a proposed individual assessment at an adjourned or continued hearing upon such further notice to the affected property owners as it deems advisable.

If an assessment is contested and/or there is an adjourned hearing, the following procedure will be followed:

1. The city will present its case first by calling witnesses who may testify by narrative or by examination, and by the introduction of exhibits. After each witness has testified, the contesting party will be allowed to ask questions. This procedure will be repeated with each witness until neither side has further questions.
2. After the city has presented all its evidence, the objector may call witnesses or present such testimony as the objector desires. The same procedure for questioning of the city's witnesses will be followed with the objector's witnesses.
3. The objector may be represented by counsel.
4. Minnesota rules of evidence will not be strictly applied; however, they may be considered and argued to the council as to the weight of items of evidence or testimony presented to the council.
5. The entire proceedings will be tape-recorded.
6. At the close of presentation of evidence, the objector may make a final presentation to the council based on the evidence and the law. No new evidence may be presented at this point.
7. The council may adopt the proposed assessment at the hearing.

An owner may appeal an assessment to district court pursuant to Minnesota Statutes Section 429.081 by serving notice of the appeal upon the mayor or city clerk within 30 days after the adoption of the assessment and filing such notice with the district court within ten days after service upon the mayor or city clerk.

Under city ordinance sec. 34-84, the Council may defer the payment of assessments for five years on homestead property owned by a person age 65 or older whose annual income is at or less than the state prescribed poverty level. Application for deferment shall be made within 30 days after the adoption of the assessment roll by the council upon a form provided by the county assessor, and shall be renewed each following year by September 30th on the same form. The sale, transfer, or subdividing of any property under deferment shall cause the assessment plus interest to become due in full upon such occurrence.

/S/ Christopher L. Collins
Administrator, City of Le Center

**NOTICE OF HEARING ON PROPOSED ASSESSMENT
CITY OF LE CENTER, MN
2016 LEXINGTON AVENUE IMPROVEMENT PROJECT**

Le Sueur County Court Parking Lot
Attn: Darrell Pettis
88 South Park Avenue
Le Center, MN 56057

TO WHOM IT MAY CONCERN:

Notice is hereby given that the city council will meet at 6:00 pm on Tuesday, October 10, 2017 at city hall to consider, and possibly adopt the proposed assessment roll for the 2016 Lexington Avenue Improvement Project; including bituminous street, curb & gutter, water and sewer main, water & sewer laterals, storm sewer, sidewalks, trees, and related work projects on the following: Lexington Avenue between West Derrynane Street (Hwy 99) and Bowler Street. Adoption by the Council of the proposed assessment may occur at this hearing. The area to be assessed for such improvements includes the abutting and/or directly benefiting properties.

The amount to be specially assessed against your particular lot, piece, or parcel of land is approx. \$3,505.06. Such assessment is proposed to be payable in equal annual installments extending over a period of 20 years, the first of the installments to be payable on or before the 1st Monday in January 2018, and will bear interest at the rate of 3.0 percent per annum from the date of the adoption of the assessment resolution. To the first installment shall be added interest on the entire assessment from the date of the assessment resolution until Dec. 31, 2017. To each subsequent installment when due shall be added interest for one year on all unpaid installments.

You may at any time prior to certification of the assessment to the county auditor, pay the entire assessment on your property, with no interest accrued to the date of payment. No interest shall be charged if the entire assessment is paid within 30 days from the adoption of this assessment. You may at any time thereafter, pay to the county the entire amount of the assessment remaining unpaid, with interest accrued to December 31 of the year in which such payment is made. Such payment must be made before December 31 or interest will be charged thru December 31 of the succeeding year. If you decide not to prepay the assessment before the date given above, the rate of interest that will apply is 3.0 percent per year. The right to partially prepay the assessment according to Ordinance No. 34-86 is allowed in minimum \$100 increments prior to certification.

The proposed assessment roll is on file for public inspection at the city clerk's office. The total city cost of the project is \$1,827,532.70 (76.3%). The total amount of the proposed assessment is \$568,027.45 (23.7%) for property owners for re-construction, plus the 3% interest. Written or oral objections will be considered at the meeting. No contested appeal may be taken as to the amount of an assessment unless a signed, written objection is filed with the city clerk prior to the hearing or presented to the Mayor at the hearing. The council may upon such notice consider any objection to the amount of a proposed individual assessment at an adjourned or continued hearing upon such further notice to the affected property owners as it deems advisable.

If an assessment is contested and/or there is an adjourned hearing, the following procedure will be followed:

1. The city will present its case first by calling witnesses who may testify by narrative or by examination, and by the introduction of exhibits. After each witness has testified, the contesting party will be allowed to ask questions. This procedure will be repeated with each witness until neither side has further questions.
2. After the city has presented all its evidence, the objector may call witnesses or present such testimony as the objector desires. The same procedure for questioning of the city's witnesses will be followed with the objector's witnesses.
3. The objector may be represented by counsel.
4. Minnesota rules of evidence will not be strictly applied; however, they may be considered and argued to the council as to the weight of items of evidence or testimony presented to the council.
5. The entire proceedings will be tape-recorded.
6. At the close of presentation of evidence, the objector may make a final presentation to the council based on the evidence and the law. No new evidence may be presented at this point.
7. The council may adopt the proposed assessment at the hearing.

An owner may appeal an assessment to district court pursuant to Minnesota Statutes Section 429.081 by serving notice of the appeal upon the mayor or city clerk within 30 days after the adoption of the assessment and filing such notice with the district court within ten days after service upon the mayor or city clerk.

Under city ordinance sec. 34-84, the Council may defer the payment of assessments for five years on homestead property owned by a person age 65 or older whose annual income is at or less than the state prescribed poverty level. Application for deferment shall be made within 30 days after the adoption of the assessment roll by the council upon a form provided by the county assessor, and shall be renewed each following year by September 30th on the same form. The sale, transfer, or subdividing of any property under deferment shall cause the assessment plus interest to become due in full upon such occurrence.

/S/ Christopher L. Collins
Administrator, City of Le Center

FEASIBILITY STUDY FOR:

COUNTY DITCH 41:

LE SUEUR COUNTY, MINNESOTA

REPORT FOR:
Le Sueur County Drainage Authority
181 W. Minnesota St.
Le Center, MN 56057
507.357.4879

FROM:
Chuck Brandel, PE
Principal + Senior Civil Engineer
ISG
115 E. Hickory Street, Suite 300
Mankato, MN 56001
507.387.6651
chuck.brandel@is-grp.com

ISG

ARCHITECTURE + ENGINEERING + ENVIRONMENTAL + PLANNING



TABLE OF CONTENTS

Project Scope 1

Watershed 1

History 1

Existing Conditions..... 1

Proposed Conditions..... 2

Multi-Purpose Drainage Management..... 3

Cost/Separable Maintenance 3

Recommendation 4



Project Scope

At your request, I+S Group (ISG) completed a preliminary review of Le Sueur County Ditch No. 41 (CD 41). The scope included an examination of the existing CD 41, as well as recommendations for repairing and improving the existing open ditch and tile system. Maps of the CD 41 watershed and existing public open ditch and tile system is shown on the attached exhibits and is referenced herein.

It should be noted that some general assumptions were made during this analysis and minimal survey information was gathered. ISG received the original watershed map showing the tile locations and sizes from Le Sueur County for the CD 41 system. Additional information may or may not modify our findings, but it is not anticipated that a significant change to our recommendation would result. If you or any land owners have tile maps or any other information that can aid us in future work, please feel free to share this information with us. A future survey will be necessary to verify these assumptions.

Watershed

Le Sueur County Ditch No. 41 watershed lies in Sharon and Lexington Townships of Le Sueur County, Minnesota. The CD 41 main tile drains from the center of the NE ¼ of Section 31 of Lexington Township to the NW into the main open ditch in the NE ¼ of the SE ¼ of Section 25 of Sharon Township. The main open ditch drains from the main tile outlet to the NW into Le Sueur Creek in the SE ¼ of the NW ¼ of Section 25 of Sharon Township.

The CD 41 watershed consists primarily of gently rolling agricultural land which provides drainage to approximately 461 total acres. The watershed includes land from Sections 25 and 36 of Sharon Township as well as Sections 30 and 31 of Lexington Township. Elevations within the entire watershed range from approximately 992 to 1023 Mean Sea Level (MSL) according to county LIDAR data.

The hydrologic soil classification for the land in the CD 41 watershed is predominantly type "C/D," which is considered as a dual hydrological soil group. This means that this soil has the potential to be adequately drained. The "D" in this group corresponds to the soil having over 40 percent clay and restricted water movement. The "B" is named the drained condition. That means if adequately drained, the soil would have moderately high runoff potential when thoroughly wet.

History

Le Sueur County Ditch No. 41 was originally constructed in 1915 with an improvement in 1952. The original construction consisted of approximately 3,775 feet of open ditch as well as approximately 3,960 feet of buried tile. There is no record of the open ditch being cleaned since the original construction.

Existing Conditions

The open ditch channel contains a typical trapezoidal channel designed to convey both surface and subsurface tile water throughout the watershed. Based on the original plan maps, the open ditch slopes range from 0.05% to 0.50%. In most areas, existing tile outlets from both public branches and private tiles outlet near the bottom of the ditch. During rain events, the open ditch fills with water, covering the tile outlets and creates forced outlets. In some cases during larger rain events, the water depth in the channel is high enough to restrict the flow of the tiles and cause water to back up into the adjacent fields.

Drainage Capacity

The information in this document has been prepared with the original CD 41 alignment map. A close representation of the CD 41 watershed was created using this information in conjunction with LiDAR contours, Minnesota DNR Watershed lines, aerial photographs and USGS Stream-Stats.

The capacity of agricultural tile is expressed as a drainage coefficient, in inches per day (in/day), and is defined as the depth of water over the entire area of the upstream watershed that a tile can drain in a 24-hour period. For a system like CD 41, the Natural Resources Conservation Service (NRCS)

recommends a drainage coefficient of 0.50 to 0.75 in/day for buried tile and 1.0 in/day for open ditches. See Table 1 below for open ditch summary and Table 2 below for the existing tile inventory breakdown.

Table 1: Existing Open Ditch Drainage Capacities

Crossing #	Location	Existing Type	Existing Material	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
1	Main - TWP 71	ROUND CULVERT	CMP	48	0.05%	434	0.92
2	Main - Field Crossing	ROUND CULVERT	CMP	36	0.05%	52	3.58

Table 2: Existing Tile Drainage Capacity

Area	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
Main	14	0.10%	304.5	0.13
	12	0.10%	287.2	0.09
	10	0.10%	252.0	0.07
	8	0.90%	192.2	0.14
	8	0.20%	191.4	0.07

One of the two existing crossings of CD 41 is above the NRCS recommended drainage coefficient value and the other crossing is slightly below while all of the existing mainline tile is below the NRCS recommended drainage coefficient.

Proposed Conditions

It is recommended that eventually the entire system should be repaired or improved. The repaired tile would be installed following the existing tile alignments matching the existing tile slopes and elevations. Options to improve the existing system were considered along with the costs for repairing the system. All improvement options are sized to achieve at least a drainage coefficient of 0.50 in/day for underground tiles.

Repair Option 1

It is proposed in repair option 1 to clean the mainline open ditch as well as repair the main tile from the outlet upstream. The repair would consist of cleaning 3,800 linear feet of 4-foot bottom open ditch as well as installing 800 feet of 15-inch tile, 800 feet of 12-inch tile, 600 feet of 10-inch tile and 1,750 feet of 10-inch tile.

Improvement Option 1

It is proposed in improvement option 1 clean the entire mainline open ditch as well as improve the culvert crossings and main buried tile to achieve at least the NRCS recommended drainage coefficients. The improvement would consist of cleaning 3,800 feet of 4-foot bottom open ditch as well as installing 2,200 feet of 24-inch tile and 1,750 feet of 18-inch tile.

These options are summarized on the *Improvement Maps* attached with this report. The repair option and improvement option described above are a sample size of what can be done to repair or improve this system. Any and all branches can be added or removed as another option to best suit the landowners involved.

Multi-Purpose Drainage Management

Multi-purpose drainage management incorporates Best Management Practices (BMPs) which utilize effective measures aimed at reducing sediment and nutrient loading, and improving water quality. These BMPs are divided into three areas: preventative measures, control measures, and treatment measures. Preventative measures that can be applied throughout the watershed include crop rotation, cover crops, residue management, and nutrient management. These measures are aimed at controlling sediment, minimizing erosion and nutrient loss, and sustaining the soils health, all without dramatically changing the current land use of the landscape.

Control measures are practices aimed at improving water quality directly associated with the flow of water by reducing peak flows, providing in stream storage, sedimentation, and nutrient uptake. Examples of control measures include alternative intake structures, grassed waterways, two stage ditches, water control structures, and controlled subsurface drainage. These practices are directly linked to the conveyance of subsurface tile water or open channel ditch flow.

The function of treatment measures is to improve water quality by directly removing sediment and nutrients from the subsurface or surface water flow throughout a watershed. Examples of treatment measures include surge basins (storage ponds), filter/buffer strips, wetland restorations, woodchip bioreactors, and water and sediment control basins (WASCOBs). These practices may be incorporated to either the public or private drainage systems.

Conservative drainage practices, such as controlled drainage systems, provide an option for improving the water quality and reduce peak flow rates within a drainage system. Through utilization of control structures, these systems are designed to allow agricultural producers to regulate water levels in their fields. The water level in the ground can be lowered during planting and harvest seasons and allowed to rise during the growing season. Water and nutrients stored in the soil during the growing season can then be used by the crops during drier periods, potentially increasing yields.

Cost/Separable Maintenance

When a separable portion of a larger system is in need of repair, the drainage statute, M.S.103E.215, subd. 6, allows the separation of the cost of repair from the cost of improvement of the project. The condition of the existing system should be investigated further to discern the eligibility for separable maintenance costs. If it is determined that the system is in disrepair, separable maintenance costs can be applied to the project including the difference in costs associated between pipe/ditch replacement and pipe/ditch improvement. Separable maintenance for this system includes standard open ditch cleaning, rip rap outlet protection on all tile outlets, seeding (buffer and sideslopes), and standard tile installation.

A cost estimate was prepared for the above outline options for improvement to the system, as summarized in Table 3. The cost estimate summary includes the separable maintenance, improvement cost, and net benefit for each option.

Table 3: Cost Estimate Summary

Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 34,116	\$ 34,713	\$ 597
Main Tile	\$ 107,085	\$ 168,008	\$ 60,923
Subtotal without Road Crossings	\$ 141,201	\$ 202,721	\$ 61,520
Road Authority Cost	\$ 21,134	\$ 21,134	\$ -
Damages Paid To Road Authority	\$ 5,074	\$ 8,830	\$ 3,756
Total	\$ 125,141	\$ 190,417	\$ 65,276
Subtotal Landowner Costs			\$ 199,247
Net Costs			\$ 74,106
Redetermination of Benefits Costs			\$ 2,772
Permanent Damages (Buffer Strip Acquisition)			\$ 19,549
Total Project Costs for Landowners			\$ 221,568

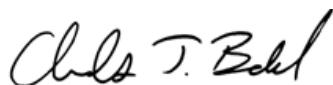
Recommendation

Currently, the existing tile system has a lower capacity than what is recommended by the NRCS. Upgrading the tile system would increase the capacity of the system to a drainage coefficient over 0.50 in/day for buried tile. The system is approximately 100-years old, which is the life expectancy for ditch systems like CD 41. These improvements would be a public benefit and contribute to the public welfare of this area.

This scenario assumes that the project is completed publically through Le Sueur County and utilizing Minnesota Statute 103E. If the project was completed privately, some of the administration costs could be saved, but would require 100% agreement with everyone in the watershed that is affected.

At this point we would recommend keeping the project as a public project as only 26% of the affected landowners would need to sign the petition to move forward. We would appreciate the opportunity to discuss this in greater detail and to potentially meet with a group of landowners to discuss. Please contact us with questions or comments.

Sincerely,



Chuck Brandel, PE

Civil Engineer/Principal

Enclosures

**LE SUEUR COUNTY
COUNTY DITCH No. 41**



PROPOSED OPTION #1 IMPROVEMENT COST SUMMARY

Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 34,116	\$ 34,713	\$ 597
Main Tile	\$ 107,085	\$ 168,008	\$ 60,923
Subtotal without Road Crossings	\$ 141,201	\$ 202,721	\$ 61,520
Road Authority Cost	\$ 21,134	\$ 21,134	\$ -
Damages Paid To Road Authority	\$ 5,074	\$ 8,830	\$ 3,756
Total	\$ 125,141	\$ 190,417	\$ 65,276
Subtotal Landowner Costs			\$ 199,247
Net Costs			\$ 74,106
Redetermination of Benefits Costs			\$ 2,772
Permanent Damages (Buffer Strip Acquisition)			\$ 19,549
Total Project Costs for Landowners			\$ 221,568



SEPARABLE MAINTANENCE (REPAIR)

Main Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 920.00	\$ 920
102	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	3,800	\$ 2.50	\$ 9,500
103	15-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 752.00	\$ 752
104	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	1.44	\$ 1,165	\$ 1,677
105	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	1.75	\$ 3,353	\$ 5,852
106	BUFFER STRIP MOWING	AC	1.44	\$ 85	\$ 122
107	WEED SPRAYING	AC	3.18	\$ 150	\$ 478
Total					\$ 19,301
10% Unforeseen					\$ 1,930
Subtotal					\$ 21,231
TEMPORARY DAMAGES		AC	2.9	\$ 650	\$ 1,885
County Administration Costs					\$ 1,500
Topographic Survey					\$ 4,000
Reports, Plans and Specifications					\$ 3,000
Construction Staking & Administration					\$ 2,500
Total Main Open Ditch Repair Cost					\$ 34,116

Main Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 3,620.00	\$ 3,620
102	TILE INVESTIGATION	HR	10	\$ 106.50	\$ 1,065
103	15-INCH AGRICULTURAL TILE	LF	800	\$ 22.00	\$ 17,600
104	12-INCH AGRICULTURAL TILE	LF	750	\$ 18.00	\$ 13,500
105	10-INCH AGRICULTURAL TILE	LF	550	\$ 16.00	\$ 8,800
106	8-INCH AGRICULTURAL TILE	LF	1750	\$ 14.60	\$ 25,550
107	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
108	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 400	\$ 1,600
Total					\$ 75,900
10% Unforeseen					\$ 7,590
Subtotal					\$ 83,490
TEMPORARY DAMAGES		AC	7.3	\$ 650	\$ 4,745
County Administration Costs					\$ 1,670
Topographic Survey					\$ 3,500
Reports, Plans and Specifications					\$ 7,000
Construction Staking & Administration					\$ 6,680
Total Main Tile Repair Cost					\$ 107,085

TOTAL REPAIR COST

				Main Open Ditch	\$ 34,116
				Main Tile	\$ 107,085
COMPLETE REPAIR COST					\$ 141,201



PROPOSED OPTION #1 IMPROVEMENT

Main Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 950.00	\$ 950
102	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	3,800	\$ 2.50	\$ 9,500
103	24-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 1,265.00	\$ 1,265
104	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	1.44	\$ 1,165	\$ 1,677
105	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	1.75	\$ 3,353	\$ 5,852
106	BUFFER STRIP MOWING	AC	1.44	\$ 85	\$ 122
107	WEED SPRAYING	AC	3.18	\$ 150	\$ 478
Total					\$ 19,844
10% Unforeseen					\$ 1,984
Subtotal					\$ 21,828
TEMPORARY DAMAGES		AC	2.9	\$ 650	\$ 1,885
County Administration Costs					\$ 1,500
Topographic Survey					\$ 4,000
Reports, Plans and Specifications					\$ 3,000
Construction Staking & Administration					\$ 2,500
Total Main Open Ditch Improvement Cost					\$ 34,713

Main Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 5,810.00	\$ 5,810
102	TILE INVESTIGATION	HR	10	\$ 106.50	\$ 1,065
103	24-INCH AGRICULTURAL TILE	LF	2100	\$ 29.20	\$ 61,320
104	18-INCH AGRICULTURAL TILE	LF	1750	\$ 24.60	\$ 43,050
106	INSTALL DROP INTAKE (18-INCH)	EA	4	\$ 1,085	\$ 4,340
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	16	\$ 400	\$ 6,400
Total					\$ 122,000
10% Unforeseen					\$ 12,200
Subtotal					\$ 134,200
TEMPORARY DAMAGES		AC	13.3	\$ 650	\$ 8,645
County Administration Costs					\$ 2,684
Topographic Survey					\$ 3,691
Reports, Plans and Specifications					\$ 8,052
Construction Staking & Administration					\$ 10,736
Total Main Tile Improvement Cost					\$ 168,008

TOTAL IMPROVEMENT COST

				Main Open Ditch	\$ 34,713
				Main Tile	\$ 168,008
COMPLETE IMPROVEMENT COST					\$ 202,721



ROAD CROSSING SUMMARY

Crossing	Road Authority	Repair Cost With Road	Repair Cost Without Road	Improvement Cost	Road Authority Cost (Difference of Repair Cost With Road and Repair Cost Without Road)	Damages Paid To Road Authority (Difference of Improvement Cost and Road Authority Cost)
MAIN						
Township 113	TOWNSHIP	\$ 6,974	\$ 2,592	\$ 7,690	\$ 4,382	\$ 3,308
MN 112	STATE	\$ 19,234	\$ 2,482	\$ 22,274	\$ 16,752	\$ 5,522
TOTAL		\$ 26,208	\$ 5,074	\$ 29,964	\$ 21,134	\$ 8,830
STATE ROAD AUTHORITY TOTAL		\$ 19,234	\$ 2,482	\$ 22,274	\$ 16,752	\$ 5,522
COUNTY ROAD AUTHORITY TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -
TOWNSHIP ROAD AUTHORITY TOTAL		\$ 6,974	\$ 2,592	\$ 7,690	\$ 4,382	\$ 3,308

ROAD CROSSINGS

MAINLINE TILE REPAIR COST WITH ROAD - TOWNSHIP 113

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 300.00	\$ 300
102	12-INCH AGRICULTURAL TILE	LF	50	\$ 18.00	\$ 900
103	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
104	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 5,340
10% CONTINGENCY					\$ 534
SUBTOTAL					\$ 5,874
County Administration Costs					\$ 200
Reports, Plans and Specifications					\$ 400
Construction Staking & Administration					\$ 500
ESTIMATED MAINLINE TILE REPAIR COST WITH ROAD - TOWNSHIP 113					\$ 6,974

MAINLINE TILE REPAIR WITHOUT ROAD - TOWNSHIP 113

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 100.00	\$ 100
202	12-INCH AGRICULTURAL TILE	LF	50	\$ 18.00	\$ 900
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400.00	\$ 800
TOTAL					\$ 1,800
10% CONTINGENCY					\$ 180
SUBTOTAL					\$ 1,980
County Administration Costs					\$ 100
Reports, Plans and Specifications					\$ 200
Construction Staking & Administration					\$ 200
TEMPORARY DAMAGES		AC	0.17	\$ 650	\$ 112
ESTIMATED MAINLINE TILE REPAIR WITHOUT ROAD - TOWNSHIP 113					\$ 2,592

MAINLINE TILE IMPROVEMENT COST - TOWNSHIP 113

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 300.00	\$ 300
302	24-INCH AGRICULTURAL TILE	LF	50	\$ 29.20	\$ 1,460
303	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
304	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 5,900
10% CONTINGENCY					\$ 590
SUBTOTAL					\$ 6,490
County Administration Costs					\$ 200
Reports, Plans and Specifications					\$ 400
Construction Staking & Administration					\$ 600
ESTIMATED MAINLINE TILE IMPROVEMENT COST - TOWNSHIP 113					\$ 7,690

ROAD CROSSINGS

MAINLINE TILE REPAIR COST WITH ROAD - MN 112

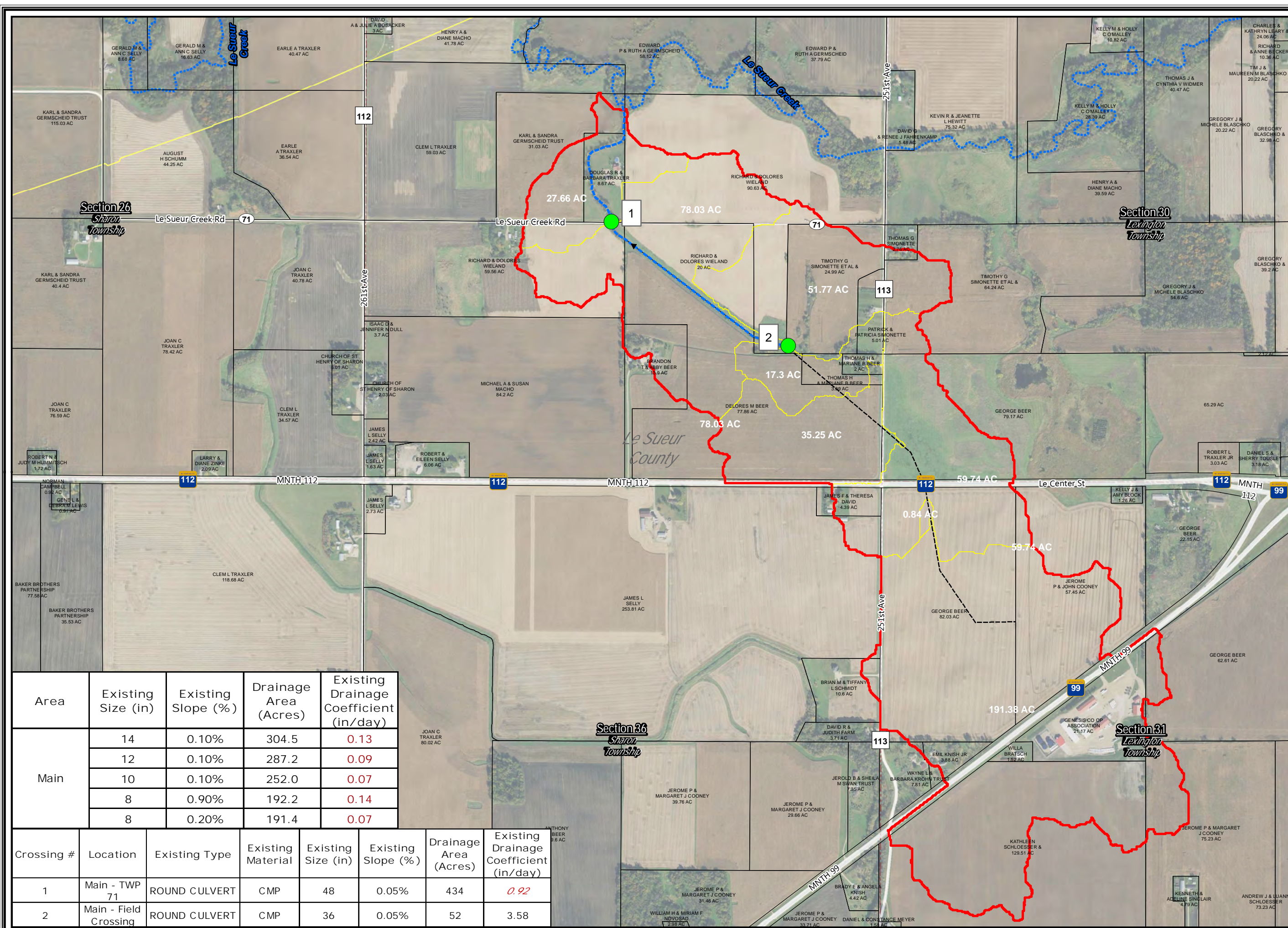
Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 800.00	\$ 800
102	BORE 10-INCH TILE	LF	50	\$ 200.00	\$ 10,000
103	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
104	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 14,940
10% CONTINGENCY					\$ 1,494
SUBTOTAL					\$ 16,434
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,000
Construction Staking & Administration					\$ 1,400
ESTIMATED MAINLINE TILE REPAIR COST WITH ROAD - MN 112					\$ 19,234

MAINLINE TILE REPAIR WITHOUT ROAD - MN 112

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 100.00	\$ 100
202	10-INCH AGRICULTURAL TILE	LF	50	\$ 16.00	\$ 800
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400.00	\$ 800
TOTAL					\$ 1,700
10% CONTINGENCY					\$ 170
SUBTOTAL					\$ 1,870
County Administration Costs					\$ 100
Reports, Plans and Specifications					\$ 200
Construction Staking & Administration					\$ 200
TEMPORARY DAMAGES		AC	0.17	\$ 650	\$ 112
ESTIMATED MAINLINE TILE REPAIR WITHOUT ROAD - MN 112					\$ 2,482

MAINLINE TILE IMPROVEMENT COST - MN 112

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 900.00	\$ 900
302	BORE 24-INCH TILE	LF	50	\$ 246.00	\$ 12,300
303	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
304	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 17,340
10% CONTINGENCY					\$ 1,734
SUBTOTAL					\$ 19,074
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,200
Construction Staking & Administration					\$ 1,600
ESTIMATED MAINLINE TILE IMPROVEMENT COST - MN 112					\$ 22,274



Area	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
Main	14	0.10%	304.5	0.13
	12	0.10%	287.2	0.09
	10	0.10%	252.0	0.07
	8	0.90%	192.2	0.14
	8	0.20%	191.4	0.07

Crossing #	Location	Existing Type	Existing Material	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
1	Main - TWP 71	ROUND CULVERT	CMP	48	0.05%	434	0.92
2	Main - Field Crossing	ROUND CULVERT	CMP	36	0.05%	52	3.58

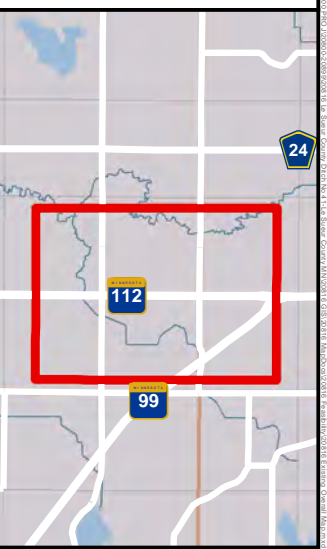


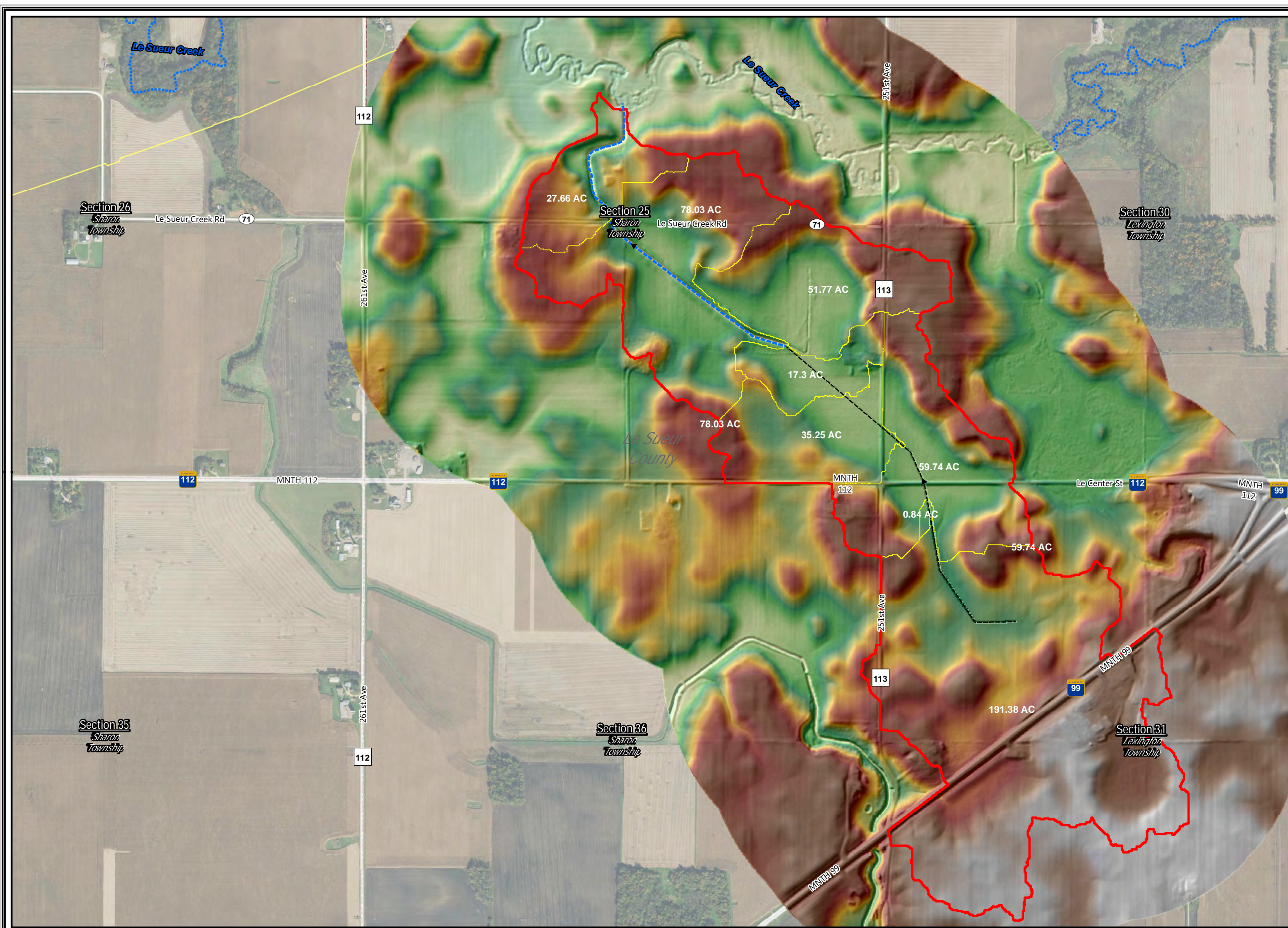
Existing
Overall Map
County Ditch No. 41
Le Sueur County,
Minnesota
Tuesday, September 05, 2017

- Legend**
- CD 41 Watershed
 - Sub-Catchments
 - Parcels
 - OPEN DITCH
 - TILE
 - Culverts

PN: 17-20816
Source:
Orthophotograph (Le Sueur County, 2016)
Tile/Ditch (Le Sueur County, 11/21/2016)
Parcels (Le Sueur County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

0 210 420 840 Feet
1 inch = 893 feet





Existing Hillshade Map County Ditch No. 41 Le Sueur County, Minnesota Thursday, August 17, 2017

Legend

- CD 41 Watershed
- Sub-Catchments
- OPEN DITCH
- TILE

Value

High : 1055.37

Low : 983.893

PN: 17-20816

Source:

Orthophotograph (Le Sueur County, 2016)

Tile/Ditch (Le Sueur County, 11/21/2016)

Parcels (Le Sueur County, 2/4/2016)

Lakes (MN DNR, July, 2008)

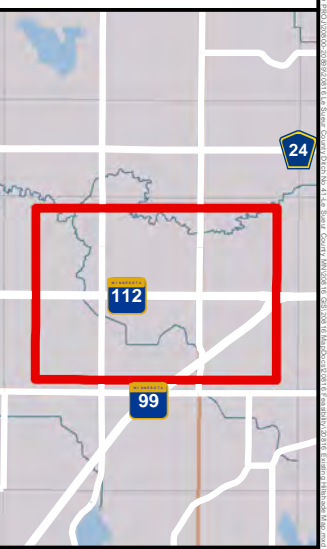
Major Stream (MN DNR, July 2008)

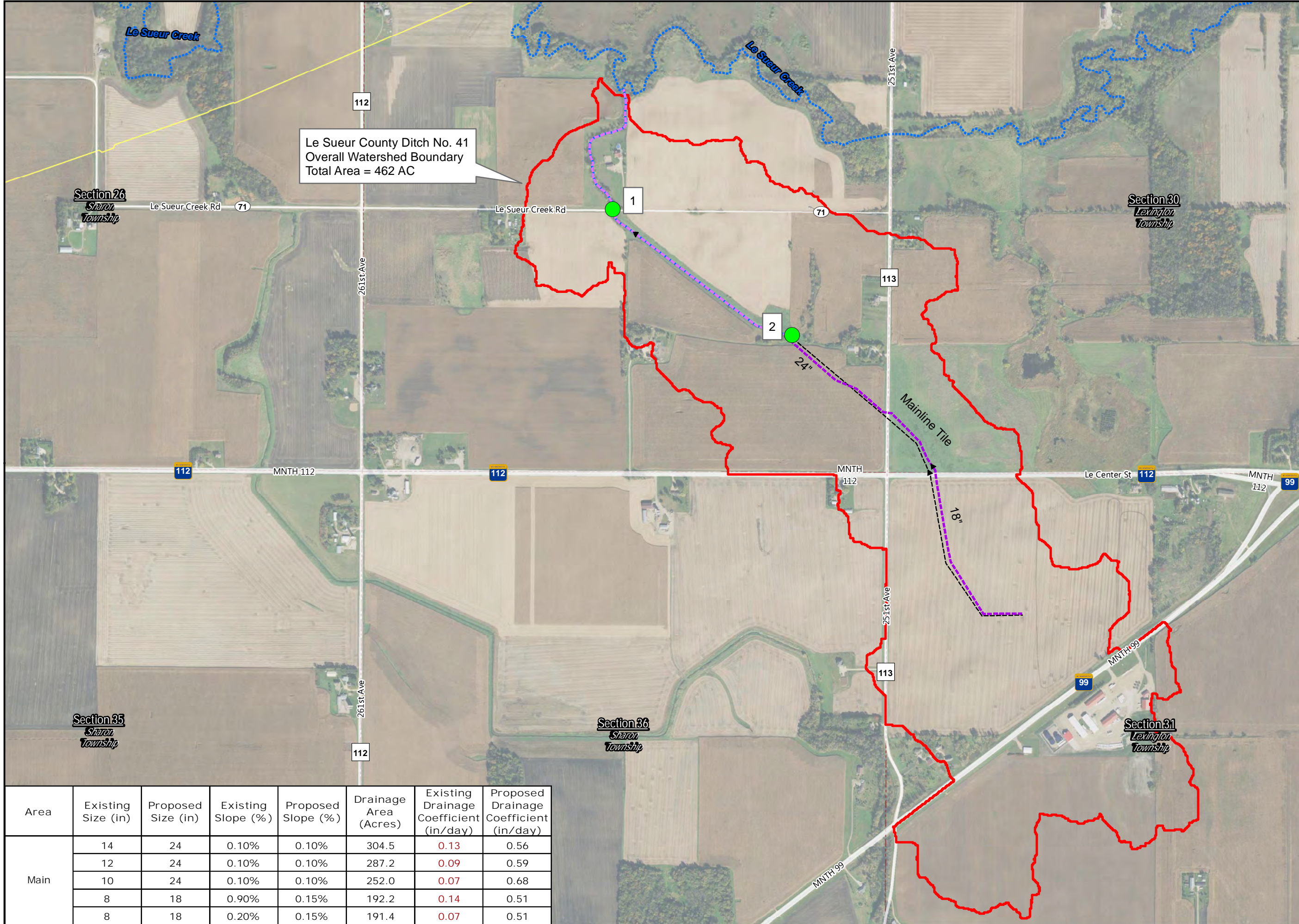
Counties (MN DNR, July 2013)

PLSS (MnGeo/USGS)

0 210 420 840 Feet

1 inch = 893 feet





Area	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
Main	14	24	0.10%	0.10%	304.5	0.13	0.56
	12	24	0.10%	0.10%	287.2	0.09	0.59
	10	24	0.10%	0.10%	252.0	0.07	0.68
	8	18	0.90%	0.15%	192.2	0.14	0.51
	8	18	0.20%	0.15%	191.4	0.07	0.51

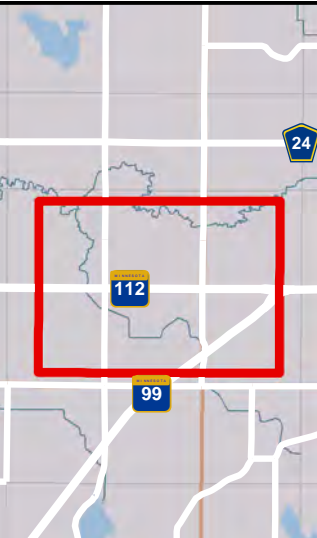


Proposed
Option 1 Map
County Ditch No. 41
Le Sueur County,
Minnesota
Tuesday, September 05, 2017

- Legend**
- CD 41 Watershed
 - OPEN DITCH
 - TILE
 - Proposed Option 1**
 - Clean Open Ditch
 - Proposed Tile
 - Culverts

PN: 17-20816
Source:
Orthophotograph (Le Sueur County, 2016)
Tile/Ditch (Le Sueur County, 11/21/2016)
Parcels (Le Sueur County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

0 210 420 840 Feet
1 inch = 893 feet



FEASIBILITY STUDY FOR:

COUNTY DITCH 61:

LE SUEUR COUNTY, MINNESOTA

REPORT FOR:
Le Sueur County Drainage Authority
181 W. Minnesota St.
Le Center, MN 56057
507.357.4879

FROM:
Chuck Brandel, PE
Principal + Senior Civil Engineer
ISG
115 E. Hickory Street, Suite 300
Mankato, MN 56001
507.387.6651
chuck.brandel@is-grp.com

ISG

ARCHITECTURE + ENGINEERING + ENVIRONMENTAL + PLANNING



TABLE OF CONTENTS

Project Scope 1

Watershed 1

History 1

Existing Conditions..... 1

Proposed Conditions 2

Multi-Purpose Drainage Management..... 3

Cost/Separable Maintenance 3

Recommendation 4



Project Scope

At your request, I+S Group (ISG) completed a preliminary review of Le Sueur County Ditch No. 61 (CD 61). The scope included an examination of the existing CD 61, as well as recommendations for repairing and improving the existing open ditch and tile. Maps of the CD 61 watershed and existing public open ditch and tile system is shown on the attached exhibits and is referenced herein.

It should be noted that some general assumptions were made during this analysis and minimal survey information was gathered. ISG received the original watershed map, showing the tile locations and sizes from Le Sueur County for the CD 61 system. Additional information may or may not modify our findings, but it is not anticipated that a significant change to our recommendation would result. If you or any land owners have tile maps or any other information that can aid us in future work, please feel free to share this information with us. A future survey will be necessary to verify these assumptions.

Watershed

Le Sueur County Ditch No. 61 open ditch lies in Cordova Township of Le Sueur County, Minnesota. The CD 61 mainline open ditch drains from the SE quarter of the NW quarter of Section 23 of Cordova Township and flows southwest where it outlets into County Ditch No. 64 open ditch in the SE quarter of the SE quarter of Section 22 of Cordova Township.

The CD 61 watershed consists primarily of gently rolling agricultural land which provides drainage to approximately 1,003 total acres. The watershed includes land from Sections 14, 15, 22, 23, and 26 of Cordova Township. Elevations within the entire watershed range from approximately 1018 to 1090 Mean Sea Level (MSL) according to county LIDAR data.

The hydrologic soil classification for the land in the CD 61 watershed is predominantly type "B/D," which is considered as a dual hydrological soil group. This means that this soil has the potential to be adequately drained. The "D" in this group corresponds to the soil having over 40 percent clay and restricted water movement. The "B" is named the drained condition. That means if adequately drained, the soil would have moderately low runoff potential when thoroughly wet.

History

Le Sueur County Ditch No. 61 was originally constructed in 1957. This consisted of the construction of the banks of approximately 4,555 feet along the mainline open ditch along the East side of County Road 128 as well as installing two culverts throughout this portion of the open ditch. The construction also consisted of installing five buried tile branches labeled as Branch 1, 2, 3, 4 and 4-A.

Existing Conditions

The open ditch channel contains a typical trapezoidal channel designed to convey both surface and subsurface tile water throughout the watershed. Based on the historical data of the area, the open ditch slopes range from 0.03% to 0.19%. In most areas, existing tile outlets from both public branches and private tiles outlet near the bottom of the ditch. During rain events, the open ditch fills with water, covering the tile outlets and creates forced outlets. In some cases during larger rain events, the water depth in the channel is high enough to restrict the flow of the tiles and cause water to back up into the adjacent fields.

Drainage Capacity

The information in this document has been prepared with the original CD 61 alignment map. A close representation of the CD 61 watershed was created using this information in conjunction with LiDAR contours, Minnesota DNR Watershed lines, aerial photographs and USGS Stream-Stats.

The capacity of agricultural tile is expressed as a drainage coefficient, in inches per day (in/day), and is defined as the depth of water over the entire area of the upstream watershed that a tile can drain in a 24-hour period. For a system like CD 61, the Natural Resources Conservation Service (NRCS) recommends a drainage coefficient of 0.50 to 0.75 in/day for buried tile and 1.0 in/day for open ditches. See Table 1 below for open ditch summary and Table 2 below for the existing tile inventory breakdown.

Table 1: Existing Open Ditch Drainage Capacities

Crossing #	Location	Existing Type	Existing Material	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
1	440th St.	ROUND CULVERT	CMP	48	0.05%	809	0.49
2	440th St.	ROUND CULVERT	CMP	48	0.19%	856	0.91

Table 2: Existing Tile Drainage Capacity

Area	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
Branch 1	14	0.30%	283.5	0.25
	12	0.30%	247.8	0.19
	12	1.84%	247.8	0.47
Branch 2	10	0.30%	142.3	0.20
	10	0.87%	78.5	0.62
	10	0.30%	77.8	0.37
Branch 3	10	0.15%	98.8	0.21
Branch 4	14	0.20%	278.6	0.21
	14	0.90%	254.3	0.48
	14	0.14%	252.4	0.19
Branch 4-A	14	0.30%	47.9	1.47

The majority of the existing crossings of CD 61 are below the NRCS recommended drainage coefficient values as well as the majority of the existing tiles.

Proposed Conditions

It is recommended that eventually the entire system should be repaired or improved. The repaired tile would be installed following the existing tile alignments matching the existing tile slopes and elevations. Options to improve the existing system were considered along with the costs for repairing the system. All improvement options are sized to achieve at least a drainage coefficient of 0.50 in/day for underground tiles and 1.0 in/day for open ditch crossings.

Repair Option

It is proposed in the repair option to clean the mainline open ditch, as well as repair all open ditch culverts that are below the NRCS recommended drainage coefficient. The repair will consist of cleaning 4,555 feet of 4-foot bottom open ditch. As well as installing approximately 3,900 feet of 15-inch tile, 1,260 feet of 12-inch tile, and 2,270 feet of 10-inch tile.

Improvement Option

It is proposed in the improvement option to clean the Main open ditch as well as improve the mainline open ditch crossings that are below the NRCS recommended drainage coefficient. The improvement will consist of cleaning approximately 4,555 feet of 4-foot bottom open ditch. The improvement will consist of replacing; Crossing 1 (CR 128) with a 48" RCP round culvert, Crossing 2 (private driveway) with a 48" RCP round culvert. Improvement Option 1 will also consist of replacing all tile throughout the entire system, which will consist of installing approximately 440 feet of 24-inch tile, 3,070 feet of 18-inch tile, 2,040 feet of 15-inch tile, and 1,925 feet of 12-inch tile.

Multi-Purpose Drainage Management

Multi-purpose drainage management incorporates Best Management Practices (BMPs) which utilize effective measures aimed at reducing sediment and nutrient loading, and improving water quality. These BMPs are divided into three areas: preventative measures, control measures, and treatment measures. Preventative measures that can be applied throughout the watershed include crop rotation, cover crops, residue management, and nutrient management. These measures are aimed at controlling sediment, minimizing erosion and nutrient loss, and sustaining the soils health, all without dramatically changing the current land use of the landscape.

Control measures are practices aimed at improving water quality directly associated with the flow of water by reducing peak flows, providing in stream storage, sedimentation, and nutrient uptake. Examples of control measures include alternative intake structures, grassed waterways, two stage ditches, water control structures, and controlled subsurface drainage. These practices are directly linked to the conveyance of subsurface tile water or open channel ditch flow.

The function of treatment measures is to improve water quality by directly removing sediment and nutrients from the subsurface or surface water flow throughout a watershed. Examples of treatment measures include surge basins (storage ponds), filter/buffer strips, wetland restorations, woodchip bioreactors, and water and sediment control basins (WASCOBs). These practices may be incorporated to either the public or private drainage systems.

Conservative drainage practices, such as controlled drainage systems, provide an option for improving the water quality and reduce peak flow rates within a drainage system. Through utilization of control structures, these systems are designed to allow agricultural producers to regulate water levels in their fields. The water level in the ground can be lowered during planting and harvest seasons and allowed to rise during the growing season. Water and nutrients stored in the soil during the growing season can then be used by the crops during drier periods, potentially increasing yields.

Cost/Separable Maintenance

When a separable portion of a larger system is in need of repair, the drainage statute, M.S.103E.215, subd. 6, allows the separation of the cost of repair from the cost of improvement of the project. The condition of the existing system should be investigated further to discern the eligibility for separable maintenance costs. If it is determined that the system is in disrepair, separable maintenance costs can be applied to the project including the difference in costs associated between pipe/ditch replacement and pipe/ditch improvement. Separable maintenance for this system includes standard open ditch cleaning, rip rap outlet protection on all tile outlets, seeding (buffer and sideslopes), and standard tile installation.

A cost estimate was prepared for the above outline options for improvement to the system, as summarized in Table 3. The cost estimate summary includes the separable maintenance, improvement cost, and net benefit for each option.

Table 3: Cost Estimate Summary

PROPOSED OPTION #1 IMPROVEMENT COST SUMMARY			
Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 43,867	\$ 51,907	\$ 8,040
Branch 1 Tile	\$ 68,754	\$ 72,540	\$ 3,786
Branch 2 Tile	\$ 34,669	\$ 38,719	\$ 4,050
Branch 3 Tile	\$ 32,777	\$ 40,352	\$ 7,575
Branch 4 Tile	\$ 95,524	\$ 112,245	\$ 16,721
Branch 4-A Tile	\$ 16,129	\$ 16,129	\$ -
Main Crossing # 1 (440th St. Crossing)	\$ 34,421	\$ 34,421	\$ -
Main Crossing # 2 (Driveway Crossing)	\$ 31,940	\$ 31,940	\$ -
Subtotal without Road Crossings	\$ 358,081	\$ 398,253	\$ 40,172
Road Authority Cost	\$ 31,985	\$ 31,985	\$ -
Damages Paid To Road Authority	\$ 6,602	\$ 6,800	\$ 198
Total	\$ 396,668	\$ 437,038	\$ 40,370
Subtotal Landowner Costs			\$ 405,053
Net Costs			\$ 40,370
Redetermination of Benefits Costs			\$ 6,018
Permanent Damages (Buffer Strip Acquisition)			\$ 22,750
Total Project Costs for Landowners			\$ 433,821

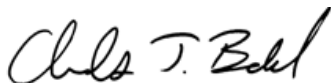
Recommendation

Currently, the existing tile system has a lower capacity than what is recommended by the NRCS. Upgrading the tile system would increase the capacity of the system to a drainage coefficient over 0.50 in/day for buried tile and 1.0 in/day for open ditch crossings. The system is approximately 60-years old, which is slightly less than the life expectancy for ditch systems like CD 61. These improvements would be a public benefit and contribute to the public welfare of this area.

This scenario assumes that the project is completed publically through Le Sueur County and utilizing Minnesota Statute 103E. If the project was completed privately, some of the administration costs could be saved, but would require 100% agreement with everyone in the watershed that is affected.

At this point we would recommend keeping the project as a public project as only 26% of the affected landowners would need to sign the petition to move forward. We would appreciate the opportunity to discuss this in greater detail and to potentially meet with a group of landowners to discuss. Please contact us with questions or comments.

Sincerely,



Chuck Brandel, PE

Civil Engineer/Principal

Enclosures



PROPOSED OPTION #1 IMPROVEMENT COST SUMMARY

Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 43,867	\$ 51,907	\$ 8,040
Branch 1 Tile	\$ 68,754	\$ 72,540	\$ 3,786
Branch 2 Tile	\$ 34,669	\$ 38,719	\$ 4,050
Branch 3 Tile	\$ 32,777	\$ 40,352	\$ 7,575
Branch 4 Tile	\$ 95,524	\$ 112,245	\$ 16,721
Branch 4-A Tile	\$ 16,129	\$ 16,129	\$ -
Main Crossing # 1 (440th St. Crossing)	\$ 34,421	\$ 34,421	\$ -
Main Crossing # 2 (Driveway Crossing)	\$ 31,940	\$ 31,940	\$ -
Subtotal without Road Crossings	\$ 358,081	\$ 398,253	\$ 40,172
Road Authority Cost	\$ 31,985	\$ 31,985	\$ -
Damages Paid To Road Authority	\$ 6,602	\$ 6,800	\$ 198
Total	\$ 396,668	\$ 437,038	\$ 40,370
Subtotal Landowner Costs			\$ 405,053
Net Costs			\$ 40,370
Redetermination of Benefits Costs			\$ 6,018
Permanent Damages (Buffer Strip Acquisition)			\$ 22,750
Total Project Costs for Landowners			\$ 433,821

SEPARABLE MAINTANENCE (REPAIR)

Main Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,370.00	\$ 1,370
102	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	4,555	\$ 2.00	\$ 9,110
103	15-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	2	\$ 752.00	\$ 1,504
104	10-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	2	\$ 680.00	\$ 1,360
105	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	3.50	\$ 1,165	\$ 4,078
106	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	3.00	\$ 3,353	\$ 10,059
107	BUFFER STRIP MOWING	AC	3.50	\$ 85	\$ 298
108	WEED SPRAYING	AC	6.50	\$ 150	\$ 975
Total					\$ 28,753
10% Unforeseen					\$ 2,875
Subtotal					\$ 31,628
TEMPORARY DAMAGES		AC	3.5	\$ 650	\$ 2,275
County Administration Costs					\$ 633
Topographic Survey					\$ 4,000
Reports, Plans and Specifications					\$ 2,800
Construction Staking & Administration					\$ 2,531
Total Main Open Ditch Repair Cost					\$ 43,867

Branch 1 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,340.00	\$ 2,340
102	TILE INVESTIGATION	HR	5	\$ 106.50	\$ 533
103	15-INCH AGRICULTURAL TILE	LF	790	\$ 21.00	\$ 16,590
104	12-INCH AGRICULTURAL TILE	LF	1261	\$ 18.00	\$ 22,698
105	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,085	\$ 3,255
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	9	\$ 400	\$ 3,600
Total					\$ 49,100
10% Unforeseen					\$ 4,910
Subtotal					\$ 54,010
TEMPORARY DAMAGES		AC	7.1	\$ 650	\$ 4,615
County Administration Costs					\$ 1,081
Topographic Survey					\$ 1,486
Reports, Plans and Specifications					\$ 3,241
Construction Staking & Administration					\$ 4,321
Total Branch 1 Tile Repair Cost					\$ 68,754

SEPARABLE MAINTANENCE (REPAIR)

Branch 2 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,170.00	\$ 1,170
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
103	10-INCH AGRICULTURAL TILE	LF	1172	\$ 16.00	\$ 18,752
104	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	5	\$ 400	\$ 2,000
Total					\$ 24,500
10% Unforeseen					\$ 2,450
Subtotal					\$ 26,950
TEMPORARY DAMAGES		AC	4.1	\$ 650	\$ 2,665
County Administration Costs					\$ 539
Topographic Survey					\$ 742
Reports, Plans and Specifications					\$ 1,617
Construction Staking & Administration					\$ 2,156
Total Branch 2 Tile Repair Cost					\$ 34,669

Branch 3 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,110.00	\$ 1,110
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
103	10-INCH AGRICULTURAL TILE	LF	1097	\$ 16.00	\$ 17,552
104	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	5	\$ 400	\$ 2,000
Total					\$ 23,200
10% Unforeseen					\$ 2,320
Subtotal					\$ 25,520
TEMPORARY DAMAGES		AC	3.8	\$ 650	\$ 2,470
County Administration Costs					\$ 511
Topographic Survey					\$ 702
Reports, Plans and Specifications					\$ 1,532
Construction Staking & Administration					\$ 2,042
Total Branch 3 Tile Repair Cost					\$ 32,777

SEPARABLE MAINTANENCE (REPAIR)

Branch 4 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 3,270.00	\$ 3,270
102	TILE INVESTIGATION	HR	6	\$ 106.50	\$ 639
103	15-INCH AGRICULTURAL TILE	LF	2680	\$ 21.00	\$ 56,280
104	CONNECT EXISTING 15-INCH TILE	EA	1	\$ 644.50	\$ 645
105	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,085	\$ 3,255
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	11	\$ 400	\$ 4,400
Total					\$ 68,500
10% Unforeseen					\$ 6,850
Subtotal					\$ 75,350
TEMPORARY DAMAGES		AC	9.3	\$ 650	\$ 6,045
County Administration Costs					\$ 1,507
Topographic Survey					\$ 2,073
Reports, Plans and Specifications					\$ 4,521
Construction Staking & Administration					\$ 6,028
Total Branch 4 Tile Repair Cost					\$ 95,524

Branch 4-A Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 560.00	\$ 560
102	TILE INVESTIGATION	HR	1	\$ 106.50	\$ 107
103	15-INCH AGRICULTURAL TILE	LF	430	\$ 21.00	\$ 9,030
104	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400	\$ 800
Total					\$ 11,600
10% Unforeseen					\$ 1,160
Subtotal					\$ 12,760
TEMPORARY DAMAGES		AC	1.5	\$ 650	\$ 975
County Administration Costs					\$ 256
Topographic Survey					\$ 351
Reports, Plans and Specifications					\$ 766
Construction Staking & Administration					\$ 1,021
Total Branch 4-A Tile Repair Cost					\$ 16,129

SEPARABLE MAINTANENCE (REPAIR)

Main Crossing # 1 (440th St. Crossing)

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,250.00	\$ 1,250
102	REMOVE CMP CULVERT	LS	1	\$ 765.75	\$ 766
103	48-INCH CLASS III RCP PIPE	LF	74	\$ 128.00	\$ 9,472
104	48-INCH RCP APRON	EA	2	\$ 2,000.00	\$ 4,000
105	RIPRAP WITH GEOTEXTILE FABRIC	CY	100	\$ 62.00	\$ 6,200
106	MnDOT CATEGORY 4 EROSION CONTROL BLANKET	SY	150	\$ 2.80	\$ 420
107	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
108	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
Total					\$ 26,300
10% Unforeseen					\$ 2,630
Subtotal					\$ 28,930
TEMPORARY DAMAGES		AC	0.1	\$ 650	\$ 65
County Administration Costs					\$ 579
Topographic Survey					\$ 796
Reports, Plans and Specifications					\$ 1,736
Construction Staking & Administration					\$ 2,315
Total Main Crossing # 1 (440th St. Crossing) Repair Cost					\$ 34,421

Main Crossing # 2 (Driveway Crossing)

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,170.00	\$ 1,170
102	REMOVE CMP CULVERT	LS	1	\$ 765.75	\$ 766
103	48-INCH CLASS III RCP PIPE	LF	60	\$ 128.00	\$ 7,680
104	48-INCH RCP APRON	EA	2	\$ 2,000.00	\$ 4,000
105	RIPRAP WITH GEOTEXTILE FABRIC	CY	100	\$ 62.00	\$ 6,200
106	MnDOT CATEGORY 4 EROSION CONTROL BLANKET	SY	150	\$ 2.80	\$ 420
107	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
108	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
Total					\$ 24,400
10% Unforeseen					\$ 2,440
Subtotal					\$ 26,840
TEMPORARY DAMAGES		AC	0.1	\$ 650	\$ 65
County Administration Costs					\$ 537
Topographic Survey					\$ 739
Reports, Plans and Specifications					\$ 1,611
Construction Staking & Administration					\$ 2,148
Total Main Crossing # 2 (Driveway Crossing) Repair Cost					\$ 31,940

TOTAL REPAIR COST

Main Open Ditch	\$ 43,867.30
Branch 1 Tile	\$ 68,754.00
Branch 2 Tile	\$ 34,669.00
Branch 3 Tile	\$ 32,777.00
Branch 4 Tile	\$ 95,524.00
Branch 4-A Tile	\$ 16,129.00
Main Crossing # 1 (440th St. Crossing)	\$ 34,421.00
Main Crossing # 2 (Driveway Crossing)	\$ 31,940.00
COMPLETE REPAIR COST	\$ 358,081.30

PROPOSED OPTION #1 IMPROVEMENT

Main Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,650.00	\$ 1,650
102	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	4,555	\$ 2.00	\$ 9,110
103	24-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	2	\$ 1,265.00	\$ 2,530
104	15-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	6	\$ 752.00	\$ 4,512
105	10-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	2	\$ 680.00	\$ 1,360
106	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	3.50	\$ 1,165	\$ 4,078
107	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	3.00	\$ 3,353	\$ 10,059
108	BUFFER STRIP MOWING	AC	3.50	\$ 85	\$ 298
109	WEED SPRAYING	AC	6.50	\$ 150	\$ 975
Total					\$ 34,571
10% Unforeseen					\$ 3,457
Subtotal					\$ 38,028
TEMPORARY DAMAGES		AC	3.5	\$ 650	\$ 2,275
County Administration Costs					\$ 761
Topographic Survey					\$ 4,000
Reports, Plans and Specifications					\$ 3,800
Construction Staking & Administration					\$ 3,043
Total Main Open Ditch Improvement Cost					\$ 51,907

Branch 1 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,480.00	\$ 2,480
102	TILE INVESTIGATION	HR	5	\$ 106.50	\$ 533
103	18-INCH AGRICULTURAL TILE	LF	790	\$ 24.60	\$ 19,434
104	12-INCH AGRICULTURAL TILE	LF	1261	\$ 18.00	\$ 22,698
105	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,085	\$ 3,255
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	9	\$ 400	\$ 3,600
Total					\$ 52,000
10% Unforeseen					\$ 5,200
Subtotal					\$ 57,200
TEMPORARY DAMAGES		AC	7.1	\$ 650	\$ 4,615
County Administration Costs					\$ 1,144
Topographic Survey					\$ 1,573
Reports, Plans and Specifications					\$ 3,432
Construction Staking & Administration					\$ 4,576
Total Branch 1 Tile Improvement Cost					\$ 72,540

Branch 2 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,320.00	\$ 1,320
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	15-INCH AGRICULTURAL TILE	LF	500	\$ 21.00	\$ 10,500
104	12-INCH AGRICULTURAL TILE	LF	300	\$ 18.00	\$ 5,400
105	10-INCH AGRICULTURAL TILE	LF	372	\$ 16.00	\$ 5,952
106	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	5	\$ 400	\$ 2,000
Total					\$ 27,600
10% Unforeseen					\$ 2,760
Subtotal					\$ 30,360
TEMPORARY DAMAGES		AC	4.1	\$ 650	\$ 2,665
County Administration Costs					\$ 608
Topographic Survey					\$ 835
Reports, Plans and Specifications					\$ 1,822
Construction Staking & Administration					\$ 2,429
Total Branch 2 Tile Improvement Cost					\$ 38,719

PROPOSED OPTION #1 IMPROVEMENT

Branch 3 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,380.00	\$ 1,380
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
103	15-INCH AGRICULTURAL TILE	LF	1097	\$ 21.00	\$ 23,037
104	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	5	\$ 400	\$ 2,000
Total					\$ 29,000
10% Unforeseen					\$ 2,900
Subtotal					\$ 31,900
TEMPORARY DAMAGES		AC	3.8	\$ 650	\$ 2,470
County Administration Costs					\$ 638
Topographic Survey					\$ 878
Reports, Plans and Specifications					\$ 1,914
Construction Staking & Administration					\$ 2,552
Total Branch 3 Tile Improvement Cost					\$ 40,352

Branch 4 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 3,870.00	\$ 3,870
102	TILE INVESTIGATION	HR	6	\$ 106.50	\$ 639
103	24-INCH AGRICULTURAL TILE	LF	400	\$ 29.20	\$ 11,680
104	18-INCH AGRICULTURAL TILE	LF	2280	\$ 24.60	\$ 56,088
105	CONNECT EXISTING 15-INCH TILE	EA	2	\$ 644.50	\$ 1,289
106	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,085	\$ 3,255
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	11	\$ 400	\$ 4,400
Total					\$ 81,300
10% Unforeseen					\$ 8,130
Subtotal					\$ 89,430
TEMPORARY DAMAGES		AC	9.3	\$ 650	\$ 6,045
County Administration Costs					\$ 1,789
Topographic Survey					\$ 2,460
Reports, Plans and Specifications					\$ 5,366
Construction Staking & Administration					\$ 7,155
Total Branch 4 Tile Improvement Cost					\$ 112,245

Branch 4-A Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 560.00	\$ 560
102	TILE INVESTIGATION	HR	1	\$ 106.50	\$ 107
103	15-INCH AGRICULTURAL TILE	LF	430	\$ 21.00	\$ 9,030
104	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400	\$ 800
Total					\$ 11,600
10% Unforeseen					\$ 1,160
Subtotal					\$ 12,760
TEMPORARY DAMAGES		AC	1.5	\$ 650	\$ 975
County Administration Costs					\$ 256
Topographic Survey					\$ 351
Reports, Plans and Specifications					\$ 766
Construction Staking & Administration					\$ 1,021
Total Branch 4-A Tile Improvement Cost					\$ 16,129

PROPOSED OPTION #1 IMPROVEMENT

Main Crossing # 1 (Driveway Crossing)

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,250.00	\$ 1,250
102	REMOVE CMP CULVERT	LS	1	\$ 765.75	\$ 766
103	48-INCH CLASS III RCP PIPE	LF	74	\$ 128.00	\$ 9,472
104	48-INCH RCP APRON	EA	2	\$ 2,000.00	\$ 4,000
105	RIPRAP WITH GEOTEXTILE FABRIC	CY	100	\$ 62.00	\$ 6,200
106	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
107	MnDOT CATEGORY 4 EROSION CONTROL BLANKET	SY	150	\$ 2.80	\$ 420
108	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
Total					\$ 26,300
10% Unforeseen					\$ 2,630
Subtotal					\$ 28,930
TEMPORARY DAMAGES		AC	0.1	\$ 650	\$ 65
County Administration Costs					\$ 579
Topographic Survey					\$ 796
Reports, Plans and Specifications					\$ 1,736
Construction Staking & Administration					\$ 2,315
Total Main Crossing # 1 (Driveway Crossing) Repair Cost					\$ 34,421

Main Crossing # 2 (Driveway Crossing)

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,170.00	\$ 1,170
102	REMOVE CMP CULVERT	LS	1	\$ 765.75	\$ 766
103	48-INCH CLASS III RCP PIPE	LF	60	\$ 128.00	\$ 7,680
104	48-INCH RCP APRON	EA	2	\$ 2,000.00	\$ 4,000
105	RIPRAP WITH GEOTEXTILE FABRIC	CY	100	\$ 62.00	\$ 6,200
106	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
107	MnDOT CATEGORY 4 EROSION CONTROL BLANKET	SY	150	\$ 2.80	\$ 420
108	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
Total					\$ 24,400
10% Unforeseen					\$ 2,440
Subtotal					\$ 26,840
TEMPORARY DAMAGES		AC	0.1	\$ 650	\$ 65
County Administration Costs					\$ 537
Topographic Survey					\$ 739
Reports, Plans and Specifications					\$ 1,611
Construction Staking & Administration					\$ 2,148
Total Main Crossing # 2 (Driveway Crossing) Repair Cost					\$ 31,940

TOTAL IMPROVEMENT COST

				Main Open Ditch	\$ 51,907.10
				Branch 1 Tile	\$ 72,540.00
				Branch 2 Tile	\$ 38,719.00
				Branch 3 Tile	\$ 40,352.00
				Branch 4 Tile	\$ 112,245.00
				Branch 4-A Tile	\$ 16,129.00
				Main Crossing # 1 (Driveway Crossing)	\$ 34,421.00
				Main Crossing # 2 (Driveway Crossing)	\$ 31,940.00
COMPLETE IMPROVEMENT COST					\$ 331,892.10



ROAD CROSSING SUMMARY

Crossing	Road Authority	Repair Cost With Road	Repair Cost Without Road	Improvement Cost	Road Authority Cost (Difference of Repair Cost With Road and Repair Cost Without Road)	Damages Paid To Road Authority (Difference of Improvement Cost and Road Authority Cost)
Main Open Ditch						
440th St.	COUNTY	\$ 31,448	\$ 3,845	\$ 31,448	\$ 27,602	\$ 3,845
Branch 4						
209th Ave.	COUNTY	\$ 7,139.00	\$ 2,756.91	\$ 7,337.00	\$ 4,382.09	\$ 2,954.91
TOTAL		\$ 38,587	\$ 6,602	\$ 38,785	\$ 31,985	\$ 6,800
STATE ROAD AUTHORITY TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -
COUNTY ROAD AUTHORITY TOTAL		\$ 38,587	\$ 6,602	\$ 38,785	\$ 31,985	\$ 6,800
TOWNSHIP ROAD AUTHORITY TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -



ROAD CROSSINGS

BRANCH 4 TILE REPAIR COST WITH ROAD - 209TH AVE.

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 300.00	\$ 300
102	15-INCH AGRICULTURAL TILE	LF	50	\$ 21.00	\$ 1,050
103	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
104	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 5,490
10% CONTINGENCY					\$ 549
SUBTOTAL					\$ 6,039
County Administration Costs					\$ 200
Reports, Plans and Specifications					\$ 400
Construction Staking & Administration					\$ 500
ESTIMATED BRANCH 4 TILE REPAIR COST WITH ROAD - 209TH AVE.					\$ 7,139

BRANCH 4 TILE REPAIR WITHOUT ROAD - 209TH AVE.

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 100.00	\$ 100
202	15-INCH AGRICULTURAL TILE	LF	50	\$ 21.00	\$ 1,050
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400.00	\$ 800
TOTAL					\$ 1,950
10% CONTINGENCY					\$ 195
SUBTOTAL					\$ 2,145
County Administration Costs					\$ 100
Reports, Plans and Specifications					\$ 200
Construction Staking & Administration					\$ 200
TEMPORARY DAMAGES		AC	0.17	\$ 650	\$ 112
ESTIMATED BRANCH 4 TILE REPAIR WITHOUT ROAD - 209TH AVE.					\$ 2,757

BRANCH 4 TILE IMPROVEMENT COST - 209TH AVE.

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 300.00	\$ 300
302	18-INCH AGRICULTURAL TILE	LF	50	\$ 24.60	\$ 1,230
303	REPLACE GRAVEL ROAD OR DRIVEWAY	LS	1	\$ 1,970.00	\$ 1,970
304	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 5,670
10% CONTINGENCY					\$ 567
SUBTOTAL					\$ 6,237
County Administration Costs					\$ 200
Reports, Plans and Specifications					\$ 400
Construction Staking & Administration					\$ 500
ESTIMATED BRANCH 4 TILE IMPROVEMENT COST - 209TH AVE.					\$ 7,337



Existing Watershed Map

County Ditch No. 61
Le Sueur County,
Minnesota
Thursday, September 14, 2017

Legend

- CD61 Watershed
- Culverts
- Subcatchments
- Existing, Open Ditch
- Existing, Main Tile

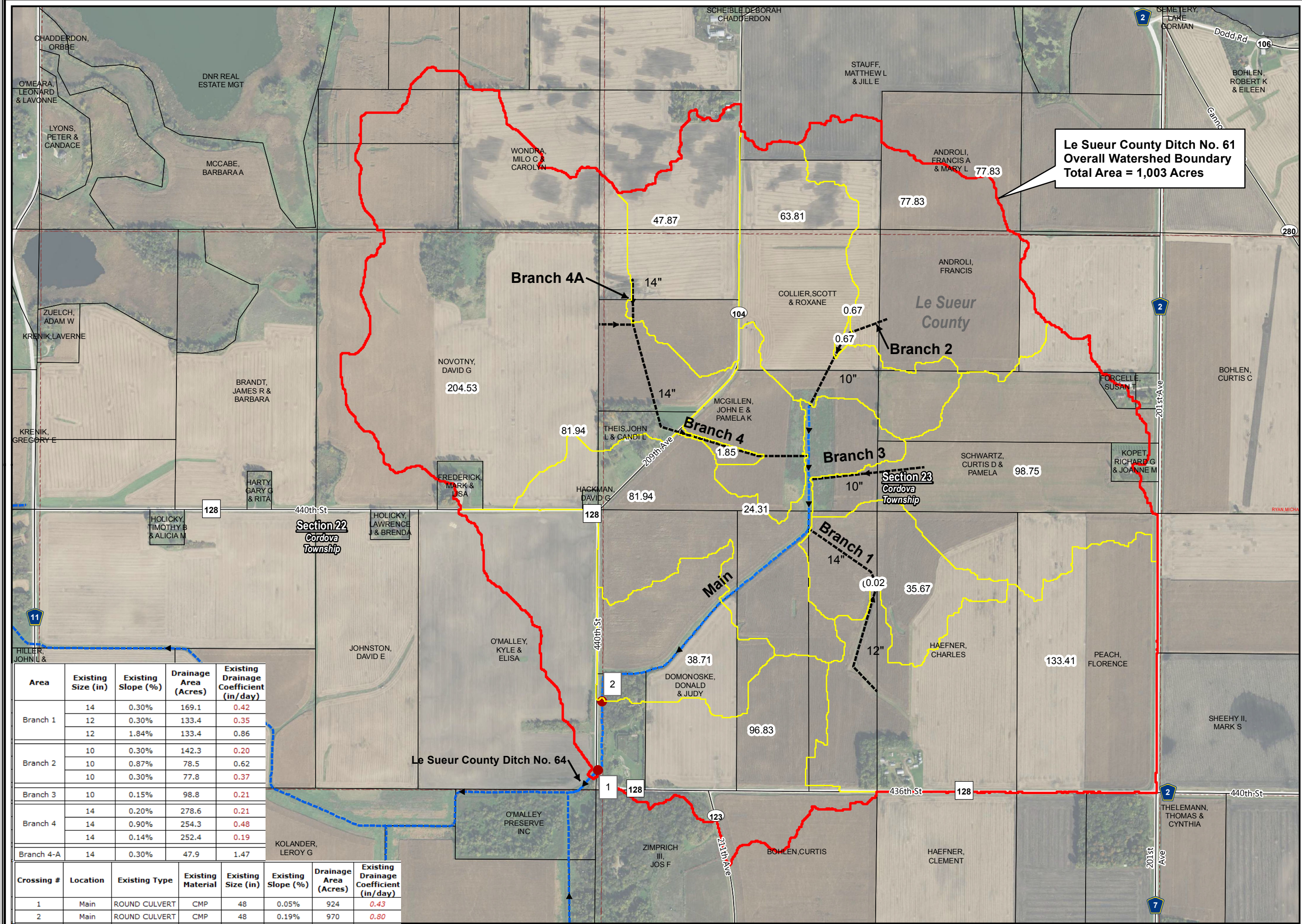
PN: 17-20817

Source:

Orthophotograph (Le Sueur County, 2016)
Tile/Ditch (Le Sueur County, 11/21/2016)
Parcels (Le Sueur County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

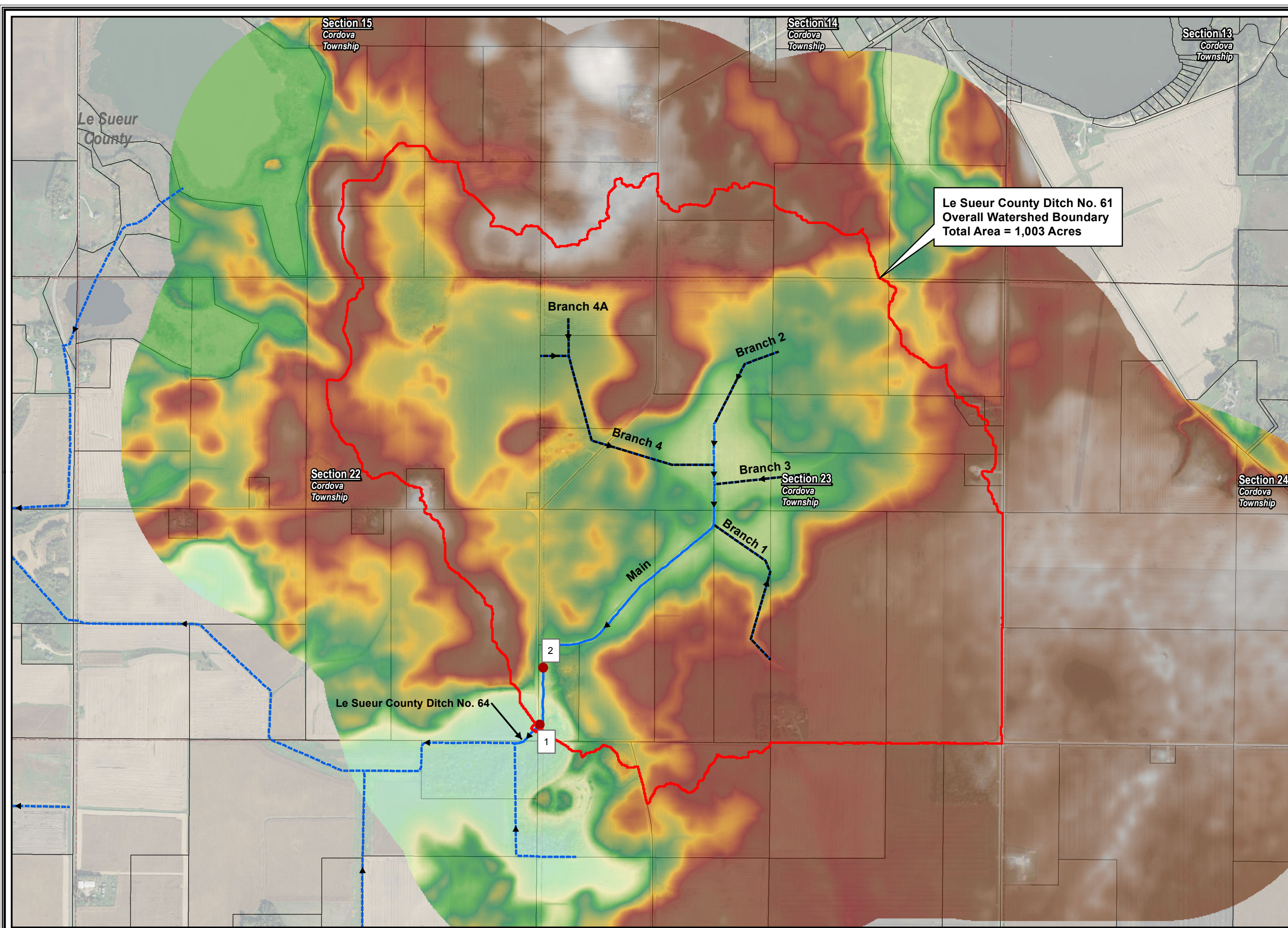


0 200 400 800 Feet
1 inch = 833 feet



Area	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
Branch 1	14	0.30%	169.1	0.42
	12	0.30%	133.4	0.35
	12	1.84%	133.4	0.86
Branch 2	10	0.30%	142.3	0.20
	10	0.87%	78.5	0.62
	10	0.30%	77.8	0.37
Branch 3	10	0.15%	98.8	0.21
Branch 4	14	0.20%	278.6	0.21
	14	0.90%	254.3	0.48
	14	0.14%	252.4	0.19
Branch 4-A	14	0.30%	47.9	1.47

Crossing #	Location	Existing Type	Existing Material	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
1	Main	ROUND CULVERT	CMP	48	0.05%	924	0.43
2	Main	ROUND CULVERT	CMP	48	0.19%	970	0.80



Hillshade Map County Ditch No. 61 Le Sueur County, Minnesota Thursday, September 14, 2017

- Legend**
- CD61 Watershed
 - Culverts
 - Exsiting, Open Ditch
 - Existing, Main Tile
- DEM**
- Value**
- High : 1095.81
- Low : 1019.1

PN: 17-20817

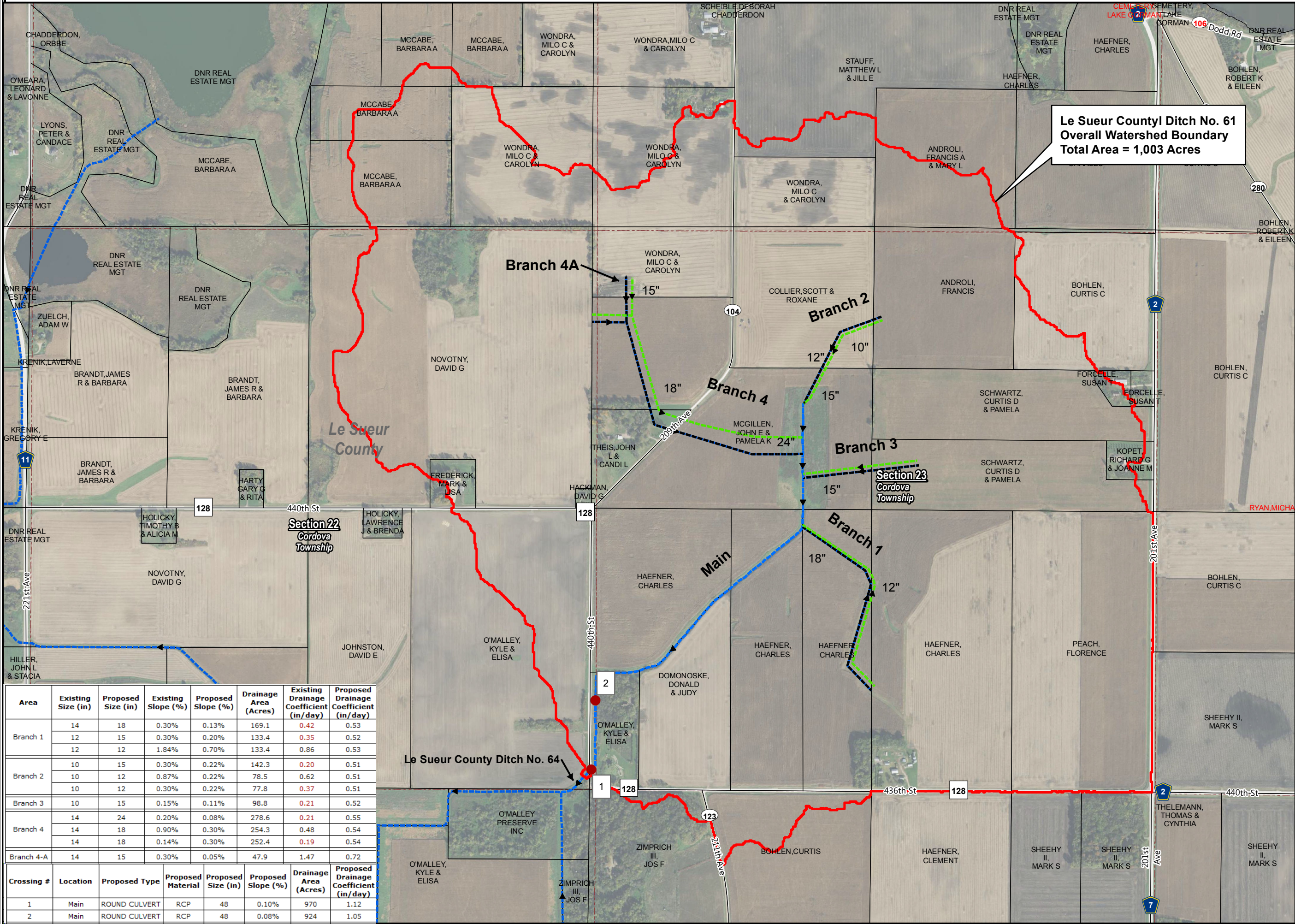
Source:

Orthophotograph (Le Sueur County, 2016)
 Tile/Ditch (Le Sueur County, 11/21/2016)
 Parcels (Le Sueur County, 2/4/2016)
 Lakes (MN DNR, July, 2008)
 Major Stream (MN DNR, July 2008)
 Counties (MN DNR, July 2013)
 PLSS (MnGeo/USGS)

0 237.5 475 950 Feet

1 inch = 1,000 feet





Area	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
Branch 1	14	18	0.30%	0.13%	169.1	0.42	0.53
	12	15	0.30%	0.20%	133.4	0.35	0.52
	12	12	1.84%	0.70%	133.4	0.86	0.53
Branch 2	10	15	0.30%	0.22%	142.3	0.20	0.51
	10	12	0.87%	0.22%	78.5	0.62	0.51
	10	12	0.30%	0.22%	77.8	0.37	0.51
Branch 3	10	15	0.15%	0.11%	98.8	0.21	0.52
Branch 4	14	24	0.20%	0.08%	278.6	0.21	0.55
	14	18	0.90%	0.30%	254.3	0.48	0.54
	14	18	0.14%	0.30%	252.4	0.19	0.54
Branch 4-A	14	15	0.30%	0.05%	47.9	1.47	0.72
Crossing #	Location	Proposed Type	Proposed Material	Proposed Size (in)	Proposed Slope (%)	Drainage Area (Acres)	Proposed Drainage Coefficient (in/day)
1	Main	ROUND CULVERT	RCP	48	0.10%	970	1.12
2	Main	ROUND CULVERT	RCP	48	0.08%	924	1.05



**Improvement
Option 1**
County Ditch No. 61
Le Sueur County,
Minnesota
Tuesday, September 12, 2017

- Legend**
- CD 61 Watershed
 - Culverts
 - Imp Option 1
 - Exsiting, Open Ditch
 - Existing, Main Tile

PN: 17-20817
Source:
Orthophotograph (Le Sueur County, 2016)
Tile/Ditch (Le Sueur County, 11/21/2016)
Parcels (Le Sueur County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

0 195 390 780 Feet
1 inch = 833 feet



FEASIBILITY STUDY FOR:

JOINT COUNTY DITCH 4:

LE SUEUR & SCOTT COUNTIES, MINNESOTA

REPORT FOR:
Le Sueur County Drainage Authority
181 W. Minnesota St.
Le Center, MN 56057
507.357.4879

FROM:
Chuck Brandel, PE
Principal + Senior Civil Engineer
ISG
115 E. Hickory Street, Suite 300
Mankato, MN 56001
507.387.6651
chuck.brandel@is-grp.com

ISG

ARCHITECTURE + ENGINEERING + ENVIRONMENTAL + PLANNING



TABLE OF CONTENTS

Project Scope 1

Watershed 1

History 1

Existing Conditions..... 1

Proposed Conditions..... 4

Multi-Purpose Drainage Management..... 4

Cost/Separable Maintenance 5

Recommendation 7



Project Scope

At your request, I+S Group (ISG) completed a preliminary review of Le Sueur and Scott County Joint County Ditch No. 4 (JCD 4). The scope included an examination of the existing JCD 4, as well as recommendations for repairing and improving the existing open ditch and tile system. Maps of the JCD 4 watershed and existing public open ditch and tile system is shown on the attached exhibits and is referenced herein.

It should be noted that some general assumptions were made during this analysis and minimal survey information was gathered. ISG received the original watershed maps, showing the tile locations and sizes from Le Sueur County for the JCD 4 system. Additional information may or may not modify our findings, but it is not anticipated that a significant change to our recommendation would result. If you or any land owners have tile maps or any other information that can aid us in future work, please feel free to share this information with us. A future survey will be necessary to verify these assumptions.

Watershed

Le Sueur and Scott County Joint County Ditch No. 4 open ditch lies in Tyrone and Derrynane Township of Le Sueur County, Minnesota. The mainline open ditch drains from the NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 6 of Derrynane Township and flows southwest where it outlets into Forest Prairie Creek in the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 11 of Tyrone Township.

The JCD 4 watershed consists primarily of gently rolling agricultural land which provides drainage to approximately 3,467 total acres. The watershed includes land from Sections 31 and 32 of Belle Plaine Township and Section 36 of Blakeley Township of Scott County as well as Sections 5, 6, 7 and 8 of Derrynane Township and Sections 1, 2, 11 and 12 of Tyrone Township of Le Sueur County. County Ditch No. 70 of Le Sueur County provides drainage to approximately 1,657 acres which drains into the JCD 4 system through Branch H open ditch in the NE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 11 of Tyrone Township. Elevations within the entire watershed range from approximately 905 to 1027 Mean Sea Level (MSL) according to county LIDAR data.

The hydrologic soil classification for the land in the JCD 4 watershed is predominantly type "C/D," which is considered as a dual hydrological soil group. This means that this soil has the potential to be adequately drained. The "D" in this group corresponds to the soil having over 40 percent clay and restricted water movement. The "C" is named the drained condition. That means if adequately drained, the soil would have moderately high runoff potential when thoroughly wet.

History

Le Sueur and Scott County Joint County Ditch No. 4 was originally constructed in 1958 with minor repairs completed throughout the years and no known improvements. The original construction consisted of approximately 24,620 linear feet of open ditch as well as approximately 30,105 linear feet of buried tile. There are approximately nine culvert crossings throughout the entire length of the mainline open ditch.

Existing Conditions

The open ditch channel contains a typical trapezoidal channel designed to convey both surface and subsurface tile water throughout the watershed. Based on the original profiles, the open ditch slopes range from 0.04% to 0.49%. In most areas, existing tile outlets from both public branches and private tiles outlet near the bottom of the ditch. During rain events, the open ditch fills with water, covering the tile outlets and creates forced outlets. In some cases during larger rain events, the water depth in the channel is high enough to restrict the flow of the tiles and cause water to back up into the adjacent fields.

Drainage Capacity

The information in this document has been prepared with the original JCD 4 alignment map. A close representation of the JCD 4 watershed was created using this information in conjunction with LiDAR contours, Minnesota DNR Watershed lines, aerial photographs and USGS Stream-Stats.

The capacity of agricultural tile is expressed as a drainage coefficient, in inches per day (in/day), and is defined as the depth of water over the entire area of the upstream watershed that a tile can drain in a 24-hour period. For a system like JCD 4, the Natural Resources Conservation Service (NRCS) recommends a drainage coefficient of 0.50 to 0.75 in/day for buried tile and 1.0 in/day for open ditches. See Table 1 below for open ditch summary and Table 2 below for the existing tile inventory breakdown.

Table 1: Existing Open Ditch Drainage Capacities

Crossing #	Location	Existing Type	Existing Material	Existing Size (in)	Existing Rise x Span (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
1	Main - Field Crossing	ARCH CULVERT	CMP	-	63 x 87	1.25%	5123	1.34
2	Main - TWP 118	ARCH CULVERT	CMP	-	63 x 87	2.06%	4947	1.79
3	Main - Field Crossing	ROUND CULVERT	CMP	60	-	1.00%	3051	1.06
4	Main - Field Crossing	ROUND CULVERT	CMP	60	-	1.83%	2754	1.59
5	Main - TWP 119	ROUND CULVERT	RCP	54	-	0.30%	2454	1.05
6	Main - Field Crossing	ROUND CULVERT	CMP	54	-	0.42%	2407	0.65
7	Main - Field Crossing	ROUND CULVERT	CMP	54	-	0.83%	1929	1.16
8	Main - Field Crossing	ROUND CULVERT	CMP	54	-	0.56%	1528	1.19
9	Main - CSAH 11	ROUND CULVERT	RCP	54	-	0.31%	1486	1.77
10	Main - Field Crossing	ROUND CULVERT	CMP	42	-	2.50%	482	4.10

Table 2: Existing Tile Drainage Capacity

Area	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
Main	18	0.22%	460.0	0.26
	18	0.20%	441.2	0.25
	18	0.17%	409.7	0.25
	10	0.20%	103.1	0.23
Branch A	8	0.30%	13.9	1.14
	6	0.90%	9.5	1.34
Branch B	10	0.40%	229.4	0.14
	10	0.20%	228.6	0.10
Branch C	8	0.10%	75.6	0.12
	6	0.40%	65.4	0.13
Branch D	18	0.12%	402.8	0.22
	18	0.08%	286.7	0.25
	12	0.50%	275.4	0.22
Branch D-1	8	0.10%	27.5	0.33
Branch E	8	0.10%	44.7	0.20
	6	0.10%	43.9	0.10
Branch F	10	0.10%	202.1	0.08
Branch L	16	0.06%	209.8	0.21
	14	0.08%	207.3	0.17
	14	0.06%	187.3	0.17
	12	0.06%	178.6	0.12
	8	0.06%	100.9	0.07
	6	0.06%	96.1	0.03
Branch J	18	0.30%	468.3	0.29
	16	0.30%	468.2	0.21
	14	0.30%	289.5	0.24
	10	0.10%	75.2	0.22
	6	0.40%	25.2	0.34
Branch J-1	12	0.30%	138.1	0.34
	10	1.10%	130.7	0.42
	14	0.10%	129.3	0.31
	12	0.15%	114.5	0.29
	8	0.10%	96.4	0.09
Branch J-2	6	0.20%	10.7	0.56
Branch J-3	6	0.75%	18.2	0.64
Branch J-4	10	0.10%	3.3	5.04
Branch J-5	10	0.10%	130.8	0.13
Branch K	14	0.10%	254.7	0.16
	12	0.10%	226.8	0.12
	10	0.10%	201.8	0.08
	8	0.10%	200.1	0.05

The majority of the existing crossings of JCD 4 are above the NRCS recommended drainage coefficient values while majority of the existing tiles are below the recommended drainage coefficient.

Proposed Conditions

It is recommended that eventually the entire system should be repaired or improved. The repaired tile would be installed following the existing tile alignments matching the existing tile slopes and elevations. Options to improve the existing system were considered along with the costs for repairing the system. All improvement options are sized to achieve at least a drainage coefficient of 0.50 in/day for underground tiles and 1.0 in/day for open ditch crossings.

Repair Option 1

It is proposed in repair option 1 to clean the entire mainline open ditch, repair any of the culvert crossings within the open ditch that are below the NRCS recommended drainage coefficient and repair the mainline buried tile. The repair will consist of cleansing approximately 2,025 feet of 18-foot bottom open ditch, 1,300 feet of 8-foot bottom open ditch, 2,700 feet of 6-foot bottom open ditch and 20,375 feet of 4-foot bottom open ditch as well as 3,156 feet of 18-inch tile and 1,624 feet of 10-inch tile. The repair will also consist of replacing culvert crossing #6 with a 54-inch RCP culvert.

Repair Option 2

It is proposed in repair option 2 to clean the entire mainline open ditch, repair any of the culvert crossings within the open ditch that are below the NRCS recommended drainage coefficient and repair the mainline buried tile. The repair will consist of cleansing approximately 2,025 feet of 18-foot bottom open ditch, 1,300 feet of 8-foot bottom open ditch, 2,700 feet of 6-foot bottom open ditch and 20,875 feet of 4-foot bottom open ditch as well as 8,156 feet of 18-inch tile, 5,550 feet of 15-inch tile, 3,550 feet of 12-inch tile, 5,699 feet of 10-inch tile, 2,625 feet of 8-inch tile and 2,146 feet of 6-inch tile. The repair will also consist of replacing culvert crossing #6 with a 54-inch RCP culvert.

Improvement Option 1

It is proposed in improvement option 1 clean the entire mainline open ditch, repair any of the culvert crossings within the open ditch that are below the NRCS recommended drainage coefficient and repair the mainline buried tile. The repair will consist of cleansing approximately 2,025 feet of 18-foot bottom open ditch, 1,300 feet of 8-foot bottom open ditch, 2,700 feet of 6-foot bottom open ditch and 20,375 feet of 4-foot bottom open ditch as well as 3,156 feet of 24-inch tile and 1,624 feet of 18-inch tile. The improvement will also consist of replacing culvert crossing #6 with a 54-inch RCP culvert.

Improvement Option 2

It is proposed in improvement option 2 to clean the entire mainline open ditch, repair any of the culvert crossings within the open ditch that are below the NRCS recommended drainage coefficient and repair the mainline buried tile. The repair will consist of cleansing approximately 2,025 feet of 18-foot bottom open ditch, 1,300 feet of 8-foot bottom open ditch, 2,700 feet of 6-foot bottom open ditch and 20,875 feet of 4-foot bottom open ditch as well as 15,956 feet of 24-inch tile, 3,527 feet of 18-inch tile, 4,874 feet of 15-inch tile, 2,175 feet of 12-inch tile and 1,490 feet of 10-inch tile. The improvement will also consist of replacing culvert crossing #6 with a 54-inch RCP culvert.

These options are summarized on *the Improvement Maps* attached with this report. The repair option and improvement option described above are a sample size of what can be done to repair or improve this system. Any and all branches can be added or removed as another option to best suit the landowners involved.

Multi-Purpose Drainage Management

Multi-purpose drainage management incorporates Best Management Practices (BMPs) which utilize effective measures aimed at reducing sediment and nutrient loading, and improving water quality. These BMPs are divided into three areas: preventative measures, control measures, and treatment measures. Preventative measures that can be applied throughout the watershed include crop rotation, cover crops, residue management, and nutrient management. These measures are aimed at controlling sediment,

minimizing erosion and nutrient loss, and sustaining the soils health, all without dramatically changing the current land use of the landscape.

Control measures are practices aimed at improving water quality directly associated with the flow of water by reducing peak flows, providing in stream storage, sedimentation, and nutrient uptake. Examples of control measures include alternative intake structures, grassed waterways, two stage ditches, water control structures, and controlled subsurface drainage. These practices are directly linked to the conveyance of subsurface tile water or open channel ditch flow.

The function of treatment measures is to improve water quality by directly removing sediment and nutrients from the subsurface or surface water flow throughout a watershed. Examples of treatment measures include surge basins (storage ponds), filter/buffer strips, wetland restorations, woodchip bioreactors, and water and sediment control basins (WASCOBs). These practices may be incorporated to either the public or private drainage systems.

Conservative drainage practices, such as controlled drainage systems, provide an option for improving the water quality and reduce peak flow rates within a drainage system. Through utilization of control structures, these systems are designed to allow agricultural producers to regulate water levels in their fields. The water level in the ground can be lowered during planting and harvest seasons and allowed to rise during the growing season. Water and nutrients stored in the soil during the growing season can then be used by the crops during drier periods, potentially increasing yields.

Cost/Separable Maintenance

When a separable portion of a larger system is in need of repair, the drainage statute, M.S.103E.215, subd. 6, allows the separation of the cost of repair from the cost of improvement of the project. The condition of the existing system should be investigated further to discern the eligibility for separable maintenance costs. If it is determined that the system is in disrepair, separable maintenance costs can be applied to the project including the difference in costs associated between pipe/ditch replacement and pipe/ditch improvement. Separable maintenance for this system includes standard open ditch cleaning, rip rap outlet protection on all tile outlets, seeding (buffer and sideslopes), and standard tile installation.

A cost estimate was prepared for the above outline options for improvement to the system, as summarized in Table 3. The cost estimate summary includes the separable maintenance, improvement cost, and net benefit for each option.

Table 3: Cost Estimate Summary

PROPOSED OPTION #1 IMPROVEMENT COST SUMMARY

Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 215,435	\$ 217,139	\$ 1,704
Main Tile	\$ 175,725	\$ 215,195	\$ 39,470
Subtotal without Road Crossings	\$ 391,160	\$ 432,334	\$ 41,174
Road Authority Cost	\$ 17,127	\$ 17,127	\$ -
Damages Paid To Road Authority	\$ 3,065	\$ 4,365	\$ 1,300
Total	\$ 411,352	\$ 453,826	\$ 42,474
Subtotal Landowner Costs			\$ 436,699
Net Costs			\$ 25,346
Redetermination of Benefits Costs			\$ 20,799
Permanent Damages (Buffer Strip Acquisition)			\$ 121,946
Total Project Costs for Landowners			\$ 579,444

PROPOSED OPTION #2 IMPROVEMENT COST SUMMARY

Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 215,435	\$ 217,139	\$ 1,704
Main Tile	\$ 175,725	\$ 216,911	\$ 41,186
Branch B Tile	\$ 16,415	\$ 22,621	\$ 6,206
Branch C Tile	\$ 23,533	\$ 31,055	\$ 7,522
Branch D Tile	\$ 69,299	\$ 87,515	\$ 18,216
Branch E Tile	\$ 24,325	\$ 26,041	\$ 1,716
Branch F Tile	\$ 11,273	\$ 13,649	\$ 2,376
Branch H Open Ditch	\$ 38,565	\$ 62,325	\$ 23,760
Branch L Tile	\$ 137,266	\$ 195,478	\$ 58,212
Branch J Tile	\$ 295,526	\$ 353,870	\$ 58,344
Branch J-1 Tile	\$ 82,410	\$ 91,520	\$ 9,110
Branch J-5 Tile	\$ 10,089	\$ 13,653	\$ 3,564
Branch K Tile	\$ 74,106	\$ 88,175	\$ 14,069
Potential Storage - 4.25 AC	\$ -	\$ 75,578	\$ 75,578
Subtotal without Road Crossings	\$ 1,173,967	\$ 1,495,530	\$ 321,563
Road Authority Cost	\$ 60,664	\$ 60,664	\$ -
Damages Paid To Road Authority	\$ 11,049	\$ 23,729	\$ 12,680
Total	\$ 1,245,680	\$ 1,579,923	\$ 334,243
Subtotal Landowner Costs			\$ 1,519,258
Net Costs			\$ 273,578
Redetermination of Benefits Costs			\$ 20,799
Permanent Damages (Buffer Strip Acquisition)			\$ 121,946
Total Project Costs for Landowners			\$ 1,662,003

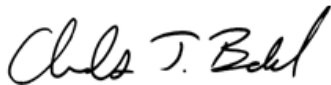
Recommendation

Currently, the existing tile system has a lower capacity than what is recommended by the NRCS. Upgrading the tile system would increase the capacity of the system to a drainage coefficient over 0.50 in/day for buried tile and 1.0 in/day for open ditch crossings. The system is approximately 60-years old, which is half the life expectancy for ditch systems like JCD 4. These improvements would be a public benefit and contribute to the public welfare of this area.

This scenario assumes that the project is completed publically through Le Sueur County and utilizing Minnesota Statute 103E. If the project was completed privately, some of the administration costs could be saved, but would require 100% agreement with everyone in the watershed that is affected.

At this point we would recommend keeping the project as a public project as only 26% of the affected landowners would need to sign the petition to move forward. We would appreciate the opportunity to discuss this in greater detail and to potentially meet with a group of landowners to discuss. Please contact us with questions or comments.

Sincerely,



Chuck Brandel, PE

Civil Engineer/Principal

Enclosures

**LE SUEUR & SCOTT COUNTY
JOINT COUNTY DITCH No. 4**



PROPOSED OPTION #1 IMPROVEMENT COST SUMMARY

Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 215,435	\$ 217,139	\$ 1,704
Main Tile	\$ 175,725	\$ 215,195	\$ 39,470
Subtotal without Road Crossings	\$ 391,160	\$ 432,334	\$ 41,174
Road Authority Cost	\$ 17,127	\$ 17,127	\$ -
Damages Paid To Road Authority	\$ 3,065	\$ 4,365	\$ 1,300
Total	\$ 411,352	\$ 453,826	\$ 42,474
Subtotal Landowner Costs			\$ 436,699
Net Costs			\$ 25,346
Redetermination of Benefits Costs			\$ 20,799
Permanent Damages (Buffer Strip Acquisition)			\$ 121,946
Total Project Costs for Landowners			\$ 579,444

**LE SUEUR & SCOTT COUNTY
JOINT COUNTY DITCH No. 4**

ISG

PROPOSED OPTION #2 IMPROVEMENT COST SUMMARY

Area	Separable Maintenance	Improvement Cost	Net Cost
Main Open Ditch	\$ 215,435	\$ 217,139	\$ 1,704
Main Tile	\$ 175,725	\$ 216,911	\$ 41,186
Branch B Tile	\$ 16,415	\$ 22,621	\$ 6,206
Branch C Tile	\$ 23,533	\$ 31,055	\$ 7,522
Branch D Tile	\$ 69,299	\$ 87,515	\$ 18,216
Branch E Tile	\$ 24,325	\$ 26,041	\$ 1,716
Branch F Tile	\$ 11,273	\$ 13,649	\$ 2,376
Branch H Open Ditch	\$ 38,565	\$ 62,325	\$ 23,760
Branch L Tile	\$ 137,266	\$ 195,478	\$ 58,212
Branch J Tile	\$ 295,526	\$ 353,870	\$ 58,344
Branch J-1 Tile	\$ 82,410	\$ 91,520	\$ 9,110
Branch J-5 Tile	\$ 10,089	\$ 13,653	\$ 3,564
Branch K Tile	\$ 74,106	\$ 88,175	\$ 14,069
Potential Storage - 4.25 AC	\$ -	\$ 75,578	\$ 75,578
Subtotal without Road Crossings	\$ 1,173,967	\$ 1,495,530	\$ 321,563
Road Authority Cost	\$ 60,664	\$ 60,664	\$ -
Damages Paid To Road Authority	\$ 11,049	\$ 23,729	\$ 12,680
Total	\$ 1,245,680	\$ 1,579,923	\$ 334,243
Subtotal Landowner Costs			\$ 1,519,258
Net Costs			\$ 273,578
Redetermination of Benefits Costs			\$ 20,799
Permanent Damages (Buffer Strip Acquisition)			\$ 121,946
Total Project Costs for Landowners			\$ 1,662,003

SEPARABLE MAINTANENCE (REPAIR)

Main Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 6,830.00	\$ 6,830
102	DITCH CLEANING (18' WIDE DITCH BOTTOM)	LF	2,025	\$ 4.50	\$ 9,113
103	DITCH CLEANING (8' WIDE DITCH BOTTOM)	LF	1,300	\$ 2.75	\$ 3,575
104	DITCH CLEANING (6' WIDE DITCH BOTTOM)	LF	2,700	\$ 2.25	\$ 6,075
105	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	20,375	\$ 2.00	\$ 40,750
106	18-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	3	\$ 860.00	\$ 2,580
107	15-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 752.00	\$ 752
108	10-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	2	\$ 680.00	\$ 1,360
109	8-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	3	\$ 635.00	\$ 1,905
110	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	20.00	\$ 1,165	\$ 23,300
111	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	12.12	\$ 3,353	\$ 40,642
112	BUFFER STRIP MOWING	AC	20.00	\$ 85	\$ 1,700
113	WEED SPRAYING	AC	32.12	\$ 150	\$ 4,818
Total					\$ 143,400
10% Unforeseen					\$ 14,340
Subtotal					\$ 157,740
TEMPORARY DAMAGES		AC	20.0	\$ 650	\$ 13,000
County Administration Costs					\$ 3,155
Topographic Survey					\$ 19,455
Reports, Plans and Specifications					\$ 9,465
Construction Staking & Administration					\$ 12,620
Total Main Open Ditch Repair Cost					\$ 215,435

Main Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 5,950.00	\$ 5,950
102	TILE INVESTIGATION	HR	10	\$ 106.50	\$ 1,065
103	18-INCH AGRICULTURAL TILE	LF	3156	\$ 24.60	\$ 77,638
104	10-INCH AGRICULTURAL TILE	LF	1624	\$ 16.00	\$ 25,984
105	CONNECT EXISTING 18-INCH TILE	EA	1	\$ 871.50	\$ 872
106	INSTALL DROP INTAKE (18-INCH)	EA	5	\$ 1,085	\$ 5,425
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	20	\$ 400	\$ 8,000
Total					\$ 125,000
10% Unforeseen					\$ 12,500
Subtotal					\$ 137,500
TEMPORARY DAMAGES		AC	16.5	\$ 650	\$ 10,725
County Administration Costs					\$ 2,750
Topographic Survey					\$ 5,500
Reports, Plans and Specifications					\$ 8,250
Construction Staking & Administration					\$ 11,000
Total Main Tile Repair Cost					\$ 175,725



SEPARABLE MAINTANENCE (REPAIR)

Branch B Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 550.00	\$ 550
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	10-INCH AGRICULTURAL TILE	LF	525	\$ 16.00	\$ 8,400
105	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	3	\$ 400	\$ 1,200
Total					\$ 11,500
10% Unforeseen					\$ 1,150
Subtotal					\$ 12,650
TEMPORARY DAMAGES		AC	1.9	\$ 650	\$ 1,235
County Administration Costs					\$ 253
Topographic Survey					\$ 506
Reports, Plans and Specifications					\$ 759
Construction Staking & Administration					\$ 1,012
Total Branch B Tile Repair Cost					\$ 16,415

Branch C Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 780.00	\$ 780
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	8-INCH AGRICULTURAL TILE	LF	700	\$ 14.60	\$ 10,220
104	6-INCH AGRICULTURAL TILE	LF	200	\$ 12.00	\$ 2,400
105	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 400	\$ 1,600
Total					\$ 16,300
10% Unforeseen					\$ 1,630
Subtotal					\$ 17,930
TEMPORARY DAMAGES		AC	3.1	\$ 650	\$ 2,015
County Administration Costs					\$ 359
Topographic Survey					\$ 718
Reports, Plans and Specifications					\$ 1,076
Construction Staking & Administration					\$ 1,435
Total Branch C Tile Repair Cost					\$ 23,533



SEPARABLE MAINTANENCE (REPAIR)

Branch D Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,340.00	\$ 2,340
102	TILE INVESTIGATION	HR	4	\$ 106.50	\$ 426
103	18-INCH AGRICULTURAL TILE	LF	900	\$ 24.60	\$ 22,140
104	12-INCH AGRICULTURAL TILE	LF	1100	\$ 16.75	\$ 18,425
105	CONNECT EXISTING 8-INCH TILE	EA	1	\$ 315.50	\$ 316
106	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	8	\$ 400	\$ 3,200
Total					\$ 49,100
10% Unforeseen					\$ 4,910
Subtotal					\$ 54,010
TEMPORARY DAMAGES		AC	6.9	\$ 650	\$ 4,485
County Administration Costs					\$ 1,081
Topographic Survey					\$ 2,161
Reports, Plans and Specifications					\$ 3,241
Construction Staking & Administration					\$ 4,321
Total Branch D Tile Repair Cost					\$ 69,299

Branch D-1 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 810.00	\$ 810
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	8-INCH AGRICULTURAL TILE	LF	900	\$ 14.60	\$ 13,140
104	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 400	\$ 1,600
Total					\$ 16,900
10% Unforeseen					\$ 1,690
Subtotal					\$ 18,590
TEMPORARY DAMAGES		AC	3.1	\$ 650	\$ 2,015
County Administration Costs					\$ 372
Topographic Survey					\$ 744
Reports, Plans and Specifications					\$ 1,116
Construction Staking & Administration					\$ 1,488
Total Branch D-1 Tile Repair Cost					\$ 24,325

Branch E Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 370.00	\$ 370
102	TILE INVESTIGATION	HR	1	\$ 106.50	\$ 107
103	8-INCH AGRICULTURAL TILE	LF	100	\$ 14.60	\$ 1,460
104	6-INCH AGRICULTURAL TILE	LF	325	\$ 12.00	\$ 3,900
105	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400	\$ 800
Total					\$ 7,800
10% Unforeseen					\$ 780
Subtotal					\$ 8,580
TEMPORARY DAMAGES		AC	1.5	\$ 650	\$ 975
County Administration Costs					\$ 172
Topographic Survey					\$ 344
Reports, Plans and Specifications					\$ 515
Construction Staking & Administration					\$ 687
Total Branch E Tile Repair Cost					\$ 11,273



SEPARABLE MAINTANENCE (REPAIR)

Branch F Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,290.00	\$ 1,290
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
103	10-INCH AGRICULTURAL TILE	LF	1300	\$ 16.00	\$ 20,800
105	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	6	\$ 400	\$ 2,400
Total					\$ 27,000
10% Unforeseen					\$ 2,700
Subtotal					\$ 29,700
TEMPORARY DAMAGES		AC	4.5	\$ 650	\$ 2,925
County Administration Costs					\$ 594
Topographic Survey					\$ 1,188
Reports, Plans and Specifications					\$ 1,782
Construction Staking & Administration					\$ 2,376
Total Branch F Tile Repair Cost					\$ 38,565

Branch H Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 120.00	\$ 120
102	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	500	\$ 2.00	\$ 1,000
103	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	0.38	\$ 1,165	\$ 441
104	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	0.23	\$ 3,353	\$ 770
105	BUFFER STRIP MOWING	AC	0.38	\$ 85	\$ 32
106	WEED SPRAYING	AC	0.61	\$ 150	\$ 91
Total					\$ 2,454
10% Unforeseen					\$ 245
Subtotal					\$ 2,700
TEMPORARY DAMAGES		AC	0.4	\$ 650	\$ 260
County Administration Costs					\$ 54
Topographic Survey					\$ 27
Reports, Plans and Specifications					\$ 162
Construction Staking & Administration					\$ 216
Total Branch H Open Ditch Repair Cost					\$ 3,419

Branch L Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 4,610.00	\$ 4,610
102	TILE INVESTIGATION	HR	7	\$ 106.50	\$ 746
103	18-INCH AGRICULTURAL TILE	LF	500	\$ 24.60	\$ 12,300
104	15-INCH AGRICULTURAL TILE	LF	1700	\$ 21.00	\$ 35,700
105	12-INCH AGRICULTURAL TILE	LF	1100	\$ 16.75	\$ 18,425
106	8-INCH AGRICULTURAL TILE	LF	200	\$ 14.60	\$ 2,920
107	6-INCH AGRICULTURAL TILE	LF	781	\$ 12.00	\$ 9,372
108	INSTALL DROP INTAKE (18-INCH)	EA	5	\$ 1,085	\$ 5,425
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	18	\$ 400	\$ 7,200
Total					\$ 96,700
10% Unforeseen					\$ 9,670
Subtotal					\$ 106,370
TEMPORARY DAMAGES		AC	14.8	\$ 650	\$ 9,620
County Administration Costs					\$ 2,128
Topographic Survey					\$ 4,255
Reports, Plans and Specifications					\$ 6,383
Construction Staking & Administration					\$ 8,510
Total Branch L Tile Repair Cost					\$ 137,266



SEPARABLE MAINTANENCE (REPAIR)
Branch J Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 9,990.00	\$ 9,990
102	TILE INVESTIGATION	HR	15	\$ 106.50	\$ 1,598
103	18-INCH AGRICULTURAL TILE	LF	3600	\$ 24.60	\$ 88,560
104	15-INCH AGRICULTURAL TILE	LF	2350	\$ 21.00	\$ 49,350
105	10-INCH AGRICULTURAL TILE	LF	1550	\$ 16.00	\$ 24,800
106	6-INCH AGRICULTURAL TILE	LF	840	\$ 12.00	\$ 10,080
107	CONNECT EXISTING 12-INCH TILE	EA	1	\$ 494.50	\$ 495
108	CONNECT EXISTING 10-INCH TILE	EA	2	\$ 447.50	\$ 895
109	CONNECT EXISTING 6-INCH TILE	EA	2	\$ 281.00	\$ 562
110	INSTALL DROP INTAKE (18-INCH)	EA	9	\$ 1,085	\$ 9,765
111	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	34	\$ 400	\$ 13,600
Total					\$ 209,700
10% Unforeseen					\$ 20,970
Subtotal					\$ 230,670
TEMPORARY DAMAGES		AC	28.8	\$ 650	\$ 18,720
County Administration Costs					\$ 4,614
Topographic Survey					\$ 9,227
Reports, Plans and Specifications					\$ 13,841
Construction Staking & Administration					\$ 18,454
Total Branch J Tile Repair Cost					\$ 295,526

Branch J-1 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,760.00	\$ 2,760
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
102	15-INCH AGRICULTURAL TILE	LF	900	\$ 21.00	\$ 18,900
103	12-INCH AGRICULTURAL TILE	LF	1000	\$ 16.75	\$ 16,750
104	10-INCH AGRICULTURAL TILE	LF	400	\$ 16.00	\$ 6,400
105	8-INCH AGRICULTURAL TILE	LF	350	\$ 14.60	\$ 5,110
106	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,085	\$ 3,255
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	11	\$ 400	\$ 4,400
Total					\$ 57,900
10% Unforeseen					\$ 5,790
Subtotal					\$ 63,690
TEMPORARY DAMAGES		AC	9.2	\$ 650	\$ 5,980
County Administration Costs					\$ 1,274
Topographic Survey					\$ 2,548
Reports, Plans and Specifications					\$ 3,822
Construction Staking & Administration					\$ 5,096
Total Branch J-1 Tile Repair Cost					\$ 82,410



SEPARABLE MAINTANENCE (REPAIR)
Branch J-5 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 340.00	\$ 340
102	TILE INVESTIGATION	HR	1	\$ 106.50	\$ 107
103	10-INCH AGRICULTURAL TILE	LF	296	\$ 16.00	\$ 4,736
104	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400	\$ 800
Total					\$ 7,100
10% Unforeseen					\$ 710
Subtotal					\$ 7,810
TEMPORARY DAMAGES		AC	1.1	\$ 650	\$ 715
County Administration Costs					\$ 157
Topographic Survey					\$ 313
Reports, Plans and Specifications					\$ 469
Construction Staking & Administration					\$ 625
Total Branch J-5 Tile Repair Cost					\$ 10,089

Branch K Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,490.00	\$ 2,490
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
103	15-INCH AGRICULTURAL TILE	LF	900	\$ 21.00	\$ 18,900
104	12-INCH AGRICULTURAL TILE	LF	1000	\$ 16.75	\$ 16,750
105	10-INCH AGRICULTURAL TILE	LF	400	\$ 16.00	\$ 6,400
106	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,085	\$ 3,255
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	10	\$ 400	\$ 4,000
Total					\$ 52,200
10% Unforeseen					\$ 5,220
Subtotal					\$ 57,420
TEMPORARY DAMAGES		AC	8.0	\$ 650	\$ 5,200
County Administration Costs					\$ 1,149
Topographic Survey					\$ 2,297
Reports, Plans and Specifications					\$ 3,446
Construction Staking & Administration					\$ 4,594
Total Branch K Tile Repair Cost					\$ 74,106

TOTAL REPAIR COST

Main Open Ditch	\$ 215,435
Main Tile	\$ 175,725
Branch B Tile	\$ 16,415
Branch C Tile	\$ 23,533
Branch D Tile	\$ 69,299
Branch E Tile	\$ 24,325
Branch F Tile	\$ 11,273
Branch H Open Ditch	\$ 38,565
Branch L Tile	\$ 137,266
Branch J Tile	\$ 295,526
Branch J-1 Tile	\$ 82,410
Branch J-5 Tile	\$ 10,089
Branch K Tile	\$ 74,106
COMPLETE REPAIR COST	\$ 1,173,967



PROPOSED OPTION #1 IMPROVEMENT

Main Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 6,900.00	\$ 6,900
102	DITCH CLEANING (18' WIDE DITCH BOTTOM)	LF	2,025	\$ 4.50	\$ 9,113
103	DITCH CLEANING (8' WIDE DITCH BOTTOM)	LF	1,300	\$ 2.75	\$ 3,575
104	DITCH CLEANING (6' WIDE DITCH BOTTOM)	LF	2,700	\$ 2.25	\$ 6,075
105	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	20,375	\$ 2.00	\$ 40,750
106	24-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 1,265.00	\$ 1,265
107	18-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	3	\$ 860.00	\$ 2,580
108	15-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 752.00	\$ 752
109	10-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	2	\$ 680.00	\$ 1,360
110	8-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	3	\$ 635.00	\$ 1,905
111	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	20.00	\$ 1,165	\$ 23,300
112	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	12.12	\$ 3,353	\$ 40,642
113	BUFFER STRIP MOWING	AC	20.00	\$ 85	\$ 1,700
114	WEED SPRAYING	AC	32.12	\$ 150	\$ 4,818
Total					\$ 144,735
10% Unforeseen					\$ 14,474
Subtotal					\$ 159,209
TEMPORARY DAMAGES		AC	20.0	\$ 650	\$ 13,000
County Administration Costs					\$ 3,185
Topographic Survey					\$ 19,455
Reports, Plans and Specifications					\$ 9,553
Construction Staking & Administration					\$ 12,737
Total Main Open Ditch Improvement Cost					\$ 217,139

Main Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 7,380.00	\$ 7,380
102	TILE INVESTIGATION	HR	10	\$ 106.50	\$ 1,065
103	24-INCH AGRICULTURAL TILE	LF	3156	\$ 29.20	\$ 92,155
104	18-INCH AGRICULTURAL TILE	LF	1624	\$ 24.60	\$ 39,950
105	CONNECT EXISTING 18-INCH TILE	EA	1	\$ 871.50	\$ 872
106	INSTALL DROP INTAKE (18-INCH)	EA	5	\$ 1,085	\$ 5,425
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	20	\$ 400	\$ 8,000
Total					\$ 154,900
10% Unforeseen					\$ 15,490
Subtotal					\$ 170,390
TEMPORARY DAMAGES		AC	16.5	\$ 650	\$ 10,725
County Administration Costs					\$ 3,408
Topographic Survey					\$ 6,816
Reports, Plans and Specifications					\$ 10,224
Construction Staking & Administration					\$ 13,632
Total Main Tile Improvement Cost					\$ 215,195

TOTAL IMPROVEMENT COST

				Main Open Ditch	\$ 217,139
				Main Tile	\$ 215,195
COMPLETE IMPROVEMENT COST					\$ 432,334



PROPOSED OPTION #2 IMPROVEMENT

Main Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 6,900.00	\$ 6,900
102	DITCH CLEANING (18' WIDE DITCH BOTTOM)	LF	2,025	\$ 4.50	\$ 9,113
103	DITCH CLEANING (8' WIDE DITCH BOTTOM)	LF	1,300	\$ 2.75	\$ 3,575
104	DITCH CLEANING (6' WIDE DITCH BOTTOM)	LF	2,700	\$ 2.25	\$ 6,075
105	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	20,375	\$ 2.00	\$ 40,750
106	24-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 1,265.00	\$ 1,265
107	18-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	3	\$ 860.00	\$ 2,580
108	15-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	1	\$ 752.00	\$ 752
109	10-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	2	\$ 680.00	\$ 1,360
110	8-INCH TILE OUTLET (20 LF OF PIPE & RIPRAP ON GEOTEXTILE FABRIC)	EA	3	\$ 635.00	\$ 1,905
111	16.5' BUFFER STRIP SEEDING (SEED MIX: BUFFER BLEND WITH TYPE 3 MULCH)	AC	20.00	\$ 1,165	\$ 23,300
112	SIDESLOPE SEEDING (SEED MIX: BUFFER BLEND WITH BFM)	AC	12.12	\$ 3,353	\$ 40,642
113	BUFFER STRIP MOWING	AC	20.00	\$ 85	\$ 1,700
114	WEED SPRAYING	AC	32.12	\$ 150	\$ 4,818
Total					\$ 144,735
10% Unforeseen					\$ 14,474
Subtotal					\$ 159,209
TEMPORARY DAMAGES		AC	20.0	\$ 650	\$ 13,000
County Administration Costs					\$ 3,185
Topographic Survey					\$ 19,455
Reports, Plans and Specifications					\$ 9,553
Construction Staking & Administration					\$ 12,737
Total Main Open Ditch Improvement Cost					\$ 217,139

Main Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 7,440.00	\$ 7,440
102	TILE INVESTIGATION	HR	10	\$ 106.50	\$ 1,065
103	24-INCH AGRICULTURAL TILE	LF	3156	\$ 29.20	\$ 92,155
104	18-INCH AGRICULTURAL TILE	LF	1624	\$ 24.60	\$ 39,950
105	CONNECT EXISTING 24-INCH TILE	EA	1	\$ 1,232.50	\$ 1,233
106	CONNECT EXISTING 18-INCH TILE	EA	1	\$ 871.50	\$ 872
107	INSTALL DROP INTAKE (18-INCH)	EA	5	\$ 1,085	\$ 5,425
108	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	20	\$ 400	\$ 8,000
Total					\$ 156,200
10% Unforeseen					\$ 15,620
Subtotal					\$ 171,820
TEMPORARY DAMAGES		AC	16.5	\$ 650	\$ 10,725
County Administration Costs					\$ 3,437
Topographic Survey					\$ 6,873
Reports, Plans and Specifications					\$ 10,310
Construction Staking & Administration					\$ 13,746
Total Main Tile Improvement Cost					\$ 216,911



PROPOSED OPTION #2 IMPROVEMENT

Branch B Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 780.00	\$ 780
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	18-INCH AGRICULTURAL TILE	LF	525	\$ 24.60	\$ 12,915
105	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	3	\$ 400	\$ 1,200
Total					\$ 16,200
10% Unforeseen					\$ 1,620
Subtotal					\$ 17,820
TEMPORARY DAMAGES		AC	1.9	\$ 650	\$ 1,235
County Administration Costs					\$ 357
Topographic Survey					\$ 713
Reports, Plans and Specifications					\$ 1,070
Construction Staking & Administration					\$ 1,426
Total Branch B Tile Improvement Cost					\$ 22,621

Branch C Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 1,050.00	\$ 1,050
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	15-INCH AGRICULTURAL TILE	LF	700	\$ 21.00	\$ 14,700
104	12-INCH AGRICULTURAL TILE	LF	200	\$ 16.75	\$ 3,350
105	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 400	\$ 1,600
Total					\$ 22,000
10% Unforeseen					\$ 2,200
Subtotal					\$ 24,200
TEMPORARY DAMAGES		AC	3.1	\$ 650	\$ 2,015
County Administration Costs					\$ 484
Topographic Survey					\$ 968
Reports, Plans and Specifications					\$ 1,452
Construction Staking & Administration					\$ 1,936
Total Branch C Tile Improvement Cost					\$ 31,055



PROPOSED OPTION #2 IMPROVEMENT

Branch D Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 3,000.00	\$ 3,000
102	TILE INVESTIGATION	HR	4	\$ 106.50	\$ 426
103	24-INCH AGRICULTURAL TILE	LF	900	\$ 29.20	\$ 26,280
104	18-INCH AGRICULTURAL TILE	LF	1100	\$ 24.60	\$ 27,060
105	CONNECT EXISTING 10-INCH TILE	EA	1	\$ 447.50	\$ 448
106	CONNECT EXISTING 8-INCH TILE	EA	1	\$ 315.50	\$ 316
107	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
108	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	8	\$ 400	\$ 3,200
Total					\$ 62,900
10% Unforeseen					\$ 6,290
Subtotal					\$ 69,190
TEMPORARY DAMAGES		AC	6.9	\$ 650	\$ 4,485
County Administration Costs					\$ 1,384
Topographic Survey					\$ 2,768
Reports, Plans and Specifications					\$ 4,152
Construction Staking & Administration					\$ 5,536
Total Branch D Tile Improvement Cost					\$ 87,515

Branch D-1 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 870.00	\$ 870
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	10-INCH AGRICULTURAL TILE	LF	900	\$ 16.00	\$ 14,400
104	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	4	\$ 400	\$ 1,600
Total					\$ 18,200
10% Unforeseen					\$ 1,820
Subtotal					\$ 20,020
TEMPORARY DAMAGES		AC	3.1	\$ 650	\$ 2,015
County Administration Costs					\$ 401
Topographic Survey					\$ 801
Reports, Plans and Specifications					\$ 1,202
Construction Staking & Administration					\$ 1,602
Total Branch D-1 Tile Improvement Cost					\$ 26,041

Branch E Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 460.00	\$ 460
102	TILE INVESTIGATION	HR	1	\$ 106.50	\$ 107
103	12-INCH AGRICULTURAL TILE	LF	425	\$ 16.75	\$ 7,119
105	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400	\$ 800
Total					\$ 9,600
10% Unforeseen					\$ 960
Subtotal					\$ 10,560
TEMPORARY DAMAGES		AC	1.5	\$ 650	\$ 975
County Administration Costs					\$ 212
Topographic Survey					\$ 423
Reports, Plans and Specifications					\$ 634
Construction Staking & Administration					\$ 845
Total Branch E Tile Improvement Cost					\$ 13,649



PROPOSED OPTION #2 IMPROVEMENT

Branch F Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,150.00	\$ 2,150
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
103	24-INCH AGRICULTURAL TILE	LF	1300	\$ 29.20	\$ 37,960
105	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
106	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	6	\$ 400	\$ 2,400
Total					\$ 45,000
10% Unforeseen					\$ 4,500
Subtotal					\$ 49,500
TEMPORARY DAMAGES		AC	4.5	\$ 650	\$ 2,925
County Administration Costs					\$ 990
Topographic Survey					\$ 1,980
Reports, Plans and Specifications					\$ 2,970
Construction Staking & Administration					\$ 3,960
Total Branch F Tile Improvement Cost					\$ 62,325

Branch H Open Ditch

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 120.00	\$ 120
102	DITCH CLEANING (4' WIDE DITCH BOTTOM)	LF	500	\$ 2.00	\$ 1,000
103	16.5' BUFFER STRIP SEEDING	AC	0.38	\$ 1,165	\$ 441
104	SIDESLOPE SEEDING	AC	0.23	\$ 3,353	\$ 770
105	BUFFER STRIP MOWING	AC	0.38	\$ 85	\$ 32
106	WEED SPRAYING	AC	0.61	\$ 150	\$ 91
Total					\$ 2,454
10% Unforeseen					\$ 245
Subtotal					\$ 2,700
TEMPORARY DAMAGES		AC	0.4	\$ 650	\$ 260
County Administration Costs					\$ 54
Topographic Survey					\$ 27
Reports, Plans and Specifications					\$ 162
Construction Staking & Administration					\$ 216
Total Branch H Open Ditch Improvement Cost					\$ 3,419

Branch L Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 6,710.00	\$ 6,710
102	TILE INVESTIGATION	HR	9	\$ 106.50	\$ 959
103	24-INCH AGRICULTURAL TILE	LF	3300	\$ 29.20	\$ 96,360
104	18-INCH AGRICULTURAL TILE	LF	981	\$ 24.60	\$ 24,133
108	INSTALL DROP INTAKE (18-INCH)	EA	5	\$ 1,085	\$ 5,425
109	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	18	\$ 400	\$ 7,200
Total					\$ 140,800
10% Unforeseen					\$ 14,080
Subtotal					\$ 154,880
TEMPORARY DAMAGES		AC	14.8	\$ 650	\$ 9,620
County Administration Costs					\$ 3,098
Topographic Survey					\$ 6,196
Reports, Plans and Specifications					\$ 9,293
Construction Staking & Administration					\$ 12,391
Total Branch L Tile Improvement Cost					\$ 195,478



PROPOSED OPTION #2 IMPROVEMENT
Branch J Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 12,090.00	\$ 12,090
102	TILE INVESTIGATION	HR	17	\$ 106.50	\$ 1,811
103	24-INCH AGRICULTURAL TILE	LF	5950	\$ 29.20	\$ 173,740
104	12-INCH AGRICULTURAL TILE	LF	1550	\$ 16.75	\$ 25,963
105	10-INCH AGRICULTURAL TILE	LF	840	\$ 16.00	\$ 13,440
106	CONNECT EXISTING 18-INCH TILE	EA	1	\$ 871.50	\$ 872
107	CONNECT EXISTING 15-INCH TILE	EA	1	\$ 644.50	\$ 645
108	CONNECT EXISTING 12-INCH TILE	EA	1	\$ 494.50	\$ 495
109	CONNECT EXISTING 10-INCH TILE	EA	2	\$ 447.50	\$ 895
110	CONNECT EXISTING 6-INCH TILE	EA	2	\$ 281.00	\$ 562
111	INSTALL DROP INTAKE (18-INCH)	EA	9	\$ 1,085	\$ 9,765
112	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	34	\$ 400	\$ 13,600
Total					\$ 253,900
10% Unforeseen					\$ 25,390
Subtotal					\$ 279,290
TEMPORARY DAMAGES		AC	28.8	\$ 650	\$ 18,720
County Administration Costs					\$ 5,586
Topographic Survey					\$ 11,172
Reports, Plans and Specifications					\$ 16,758
Construction Staking & Administration					\$ 22,344
Total Branch J Tile Improvement Cost					\$ 353,870

Branch J-1 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 3,100.00	\$ 3,100
102	TILE INVESTIGATION	HR	6	\$ 106.50	\$ 639
102	15-INCH AGRICULTURAL TILE	LF	2550	\$ 21.00	\$ 53,550
106	INSTALL DROP INTAKE (18-INCH)	EA	3	\$ 1,085	\$ 3,255
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	11	\$ 400	\$ 4,400
Total					\$ 65,000
10% Unforeseen					\$ 6,500
Subtotal					\$ 71,500
TEMPORARY DAMAGES		AC	8.8	\$ 650	\$ 5,720
County Administration Costs					\$ 1,430
Topographic Survey					\$ 2,860
Reports, Plans and Specifications					\$ 4,290
Construction Staking & Administration					\$ 5,720
Total Branch J-1 Tile Improvement Cost					\$ 91,520



PROPOSED OPTION #2 IMPROVEMENT
Branch J-5 Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 470.00	\$ 470
102	TILE INVESTIGATION	HR	1	\$ 106.50	\$ 107
103	18-INCH AGRICULTURAL TILE	LF	296	\$ 24.60	\$ 7,282
104	INSTALL DROP INTAKE (18-INCH)	EA	1	\$ 1,085	\$ 1,085
105	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400	\$ 800
Total					\$ 9,800
10% Unforeseen					\$ 980
Subtotal					\$ 10,780
TEMPORARY DAMAGES		AC	1.1	\$ 650	\$ 715
County Administration Costs					\$ 216
Topographic Survey					\$ 432
Reports, Plans and Specifications					\$ 647
Construction Staking & Administration					\$ 863
Total Branch J-5 Tile Improvement Cost					\$ 13,653

Branch K Tile

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 3,020.00	\$ 3,020
102	TILE INVESTIGATION	HR	2	\$ 106.50	\$ 213
103	24-INCH AGRICULTURAL TILE	LF	1350	\$ 29.20	\$ 39,420
104	18-INCH AGRICULTURAL TILE	LF	625	\$ 24.60	\$ 15,375
106	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085	\$ 2,170
107	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	8	\$ 400	\$ 3,200
Total					\$ 63,400
10% Unforeseen					\$ 6,340
Subtotal					\$ 69,740
TEMPORARY DAMAGES		AC	6.9	\$ 650	\$ 4,485
County Administration Costs					\$ 1,395
Topographic Survey					\$ 2,790
Reports, Plans and Specifications					\$ 4,185
Construction Staking & Administration					\$ 5,580
Total Branch K Tile Improvement Cost					\$ 88,175

Potential Storage - 4.25 AC

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 2,590.00	\$ 2,590
102	TILE INVESTIGATION	HR	3	\$ 106.50	\$ 320
103	COMMON EXCAVATION	CY	13,769.85	\$ 3.00	\$ 41,310
104	INSTALL STRUCTURE S-1 WITH GALVINIZED GRATE	LS	1	\$ 3,850.00	\$ 3,850
106	RIPRAP WITH GEOTEXTILE FABRIC	CY	100	\$ 62	\$ 6,200
Total					\$ 54,300
10% Unforeseen					\$ 5,430
Subtotal					\$ 59,730
TEMPORARY DAMAGES		AC	6.0	\$ 650	\$ 3,900
County Administration Costs					\$ 1,195
Topographic Survey					\$ 2,390
Reports, Plans and Specifications					\$ 3,584
Construction Staking & Administration					\$ 4,779
Total Potential Storage - 4.25 AC Improvement Cost					\$ 75,578



PROPOSED OPTION #2 IMPROVEMENT

TOTAL IMPROVEMENT COST

Main Open Ditch	\$	217,139
Main Tile	\$	216,911
Branch B Tile	\$	22,621
Branch C Tile	\$	31,055
Branch D Tile	\$	87,515
Branch E Tile	\$	26,041
Branch F Tile	\$	13,649
Branch H Open Ditch	\$	62,325
Branch L Tile	\$	195,478
Branch J Tile	\$	353,870
Branch J-1 Tile	\$	91,520
Branch J-5 Tile	\$	13,653
Branch K Tile	\$	88,175
Potential Storage - 4.25 AC	\$	75,578
COMPLETE IMPROVEMENT COST		\$ 1,495,530



ROAD CROSSING SUMMARY - OPTION #1

Crossing	Road Authority	Repair Cost With Road	Repair Cost Without Road	Improvement Cost	Road Authority Cost (Difference of Repair Cost With Road and Repair Cost Without Road)	Damages Paid To Road Authority (Difference of Improvement Cost and Road Authority Cost)
MAIN						
County Road 5	COUNTY	\$ 20,192	\$ 3,065	\$ 21,492	\$ 17,127	\$ 4,365
TOTAL		\$ 20,192	\$ 3,065	\$ 21,492	\$ 17,127	\$ 4,365
STATE ROAD AUTHORITY TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -
COUNTY ROAD AUTHORITY TOTAL		\$ 20,192	\$ 3,065	\$ 21,492	\$ 17,127	\$ 4,365
TOWNSHIP ROAD AUTHORITY TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -

ROAD CROSSING SUMMARY - OPTION #2

Crossing	Road Authority	Repair Cost With Road	Repair Cost Without Road	Improvement Cost	Road Authority Cost (Difference of Repair Cost With Road and Repair Cost Without Road)	Damages Paid To Road Authority (Difference of Improvement Cost and Road Authority Cost)
MAIN						
County Road 5	COUNTY	\$ 20,192	\$ 3,065	\$ 21,492	\$ 17,127	\$ 4,365
BRANCH J						
County Road 5	COUNTY	\$ 20,192.00	\$ 3,064.91	\$ 21,492.00	\$ 17,127.09	\$ 4,364.91
County Road 6	COUNTY	\$ 19,917.00	\$ 2,756.91	\$ 21,492.00	\$ 17,160.09	\$ 4,331.91
County Road 6	COUNTY	\$ 11,412.00	\$ 2,161.91	\$ 19,917.00	\$ 9,250.09	\$ 10,666.91
TOTAL		\$ 71,713	\$ 11,049	\$ 84,393	\$ 60,664	\$ 23,729
STATE ROAD AUTHORITY TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -
COUNTY ROAD AUTHORITY TOTAL		\$ 71,713	\$ 11,049	\$ 84,393	\$ 60,664	\$ 23,729
TOWNSHIP ROAD AUTHORITY TOTAL		\$ -	\$ -	\$ -	\$ -	\$ -

ROAD CROSSINGS

MAINLINE TILE REPAIR COST WITH ROAD - COUNTY ROAD 5

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 800.00	\$ 800
102	BORE 18-INCH TILE	LF	50	\$ 255.00	\$ 12,750
103	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 15,720
10% CONTINGENCY					\$ 1,572
SUBTOTAL					\$ 17,292
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,100
Construction Staking & Administration					\$ 1,400
ESTIMATED MAINLINE TILE REPAIR COST WITH ROAD - COUNTY ROAD 5					\$ 20,192

MAINLINE TILE REPAIR WITHOUT ROAD - COUNTY ROAD 5

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 200.00	\$ 200
202	18-INCH AGRICULTURAL TILE	LF	50	\$ 24.60	\$ 1,230
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400.00	\$ 800
TOTAL					\$ 2,230
10% CONTINGENCY					\$ 223
SUBTOTAL					\$ 2,453
County Administration Costs					\$ 100
Reports, Plans and Specifications					\$ 200
Construction Staking & Administration					\$ 200
TEMPORARY DAMAGES		AC	0.17	\$ 650	\$ 112
ESTIMATED MAINLINE TILE REPAIR WITHOUT ROAD - COUNTY ROAD 5					\$ 3,065

MAINLINE TILE IMPROVEMENT COST - COUNTY ROAD 5

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 800.00	\$ 800
302	BORE 24-INCH TILE	LF	50	\$ 275.00	\$ 13,750
303	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 16,720
10% CONTINGENCY					\$ 1,672
SUBTOTAL					\$ 18,392
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,200
Construction Staking & Administration					\$ 1,500
ESTIMATED MAINLINE TILE IMPROVEMENT COST - COUNTY ROAD 5					\$ 21,492

ROAD CROSSINGS

BRANCH J TILE REPAIR COST WITH ROAD - COUNTY ROAD 5

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 800.00	\$ 800
102	BORE 18-INCH TILE	LF	50	\$ 255.00	\$ 12,750
103	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 15,720
10% CONTINGENCY					\$ 1,572
SUBTOTAL					\$ 17,292
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,100
Construction Staking & Administration					\$ 1,400
ESTIMATED BRANCH J TILE REPAIR COST WITH ROAD - COUNTY ROAD 5					\$ 20,192

BRANCH J TILE REPAIR WITHOUT ROAD - COUNTY ROAD 5

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 200.00	\$ 200
202	18-INCH AGRICULTURAL TILE	LF	50	\$ 24.60	\$ 1,230
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400.00	\$ 800
TOTAL					\$ 2,230
10% CONTINGENCY					\$ 223
SUBTOTAL					\$ 2,453
County Administration Costs					\$ 100
Reports, Plans and Specifications					\$ 200
Construction Staking & Administration					\$ 200
TEMPORARY DAMAGES		AC	0.17	\$ 650	\$ 112
ESTIMATED BRANCH J TILE REPAIR WITHOUT ROAD - COUNTY ROAD 5					\$ 3,065

BRANCH J TILE IMPROVEMENT COST - COUNTY ROAD 5

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 800.00	\$ 800
302	BORE 24-INCH TILE	LF	50	\$ 275.00	\$ 13,750
303	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 16,720
10% CONTINGENCY					\$ 1,672
SUBTOTAL					\$ 18,392
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,200
Construction Staking & Administration					\$ 1,500
ESTIMATED BRANCH J TILE IMPROVEMENT COST - COUNTY ROAD 5					\$ 21,492

ROAD CROSSINGS

BRANCH J TILE REPAIR COST WITH ROAD - COUNTY ROAD 6

Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 800.00	\$ 800
102	BORE 15-INCH TILE	LF	50	\$ 250.00	\$ 12,500
103	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 15,470
10% CONTINGENCY					\$ 1,547
SUBTOTAL					\$ 17,017
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,100
Construction Staking & Administration					\$ 1,400
ESTIMATED BRANCH J TILE REPAIR COST WITH ROAD - COUNTY ROAD 6					\$ 19,917

BRANCH J TILE REPAIR WITHOUT ROAD - COUNTY ROAD 6

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 100.00	\$ 100
202	15-INCH AGRICULTURAL TILE	LF	50	\$ 21.00	\$ 1,050
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400.00	\$ 800
TOTAL					\$ 1,950
10% CONTINGENCY					\$ 195
SUBTOTAL					\$ 2,145
County Administration Costs					\$ 100
Reports, Plans and Specifications					\$ 200
Construction Staking & Administration					\$ 200
TEMPORARY DAMAGES		AC	0.17	\$ 650	\$ 112
ESTIMATED BRANCH J TILE REPAIR WITHOUT ROAD - COUNTY ROAD 6					\$ 2,757

BRANCH J TILE IMPROVEMENT COST - COUNTY ROAD 6

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 800.00	\$ 800
302	BORE 24-INCH TILE	LF	50	\$ 275.00	\$ 13,750
303	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 16,720
10% CONTINGENCY					\$ 1,672
SUBTOTAL					\$ 18,392
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,200
Construction Staking & Administration					\$ 1,500
ESTIMATED BRANCH J TILE IMPROVEMENT COST - COUNTY ROAD 6					\$ 21,492

ROAD CROSSINGS

BRANCH J TILE REPAIR COST WITH ROAD - COUNTY ROAD 6

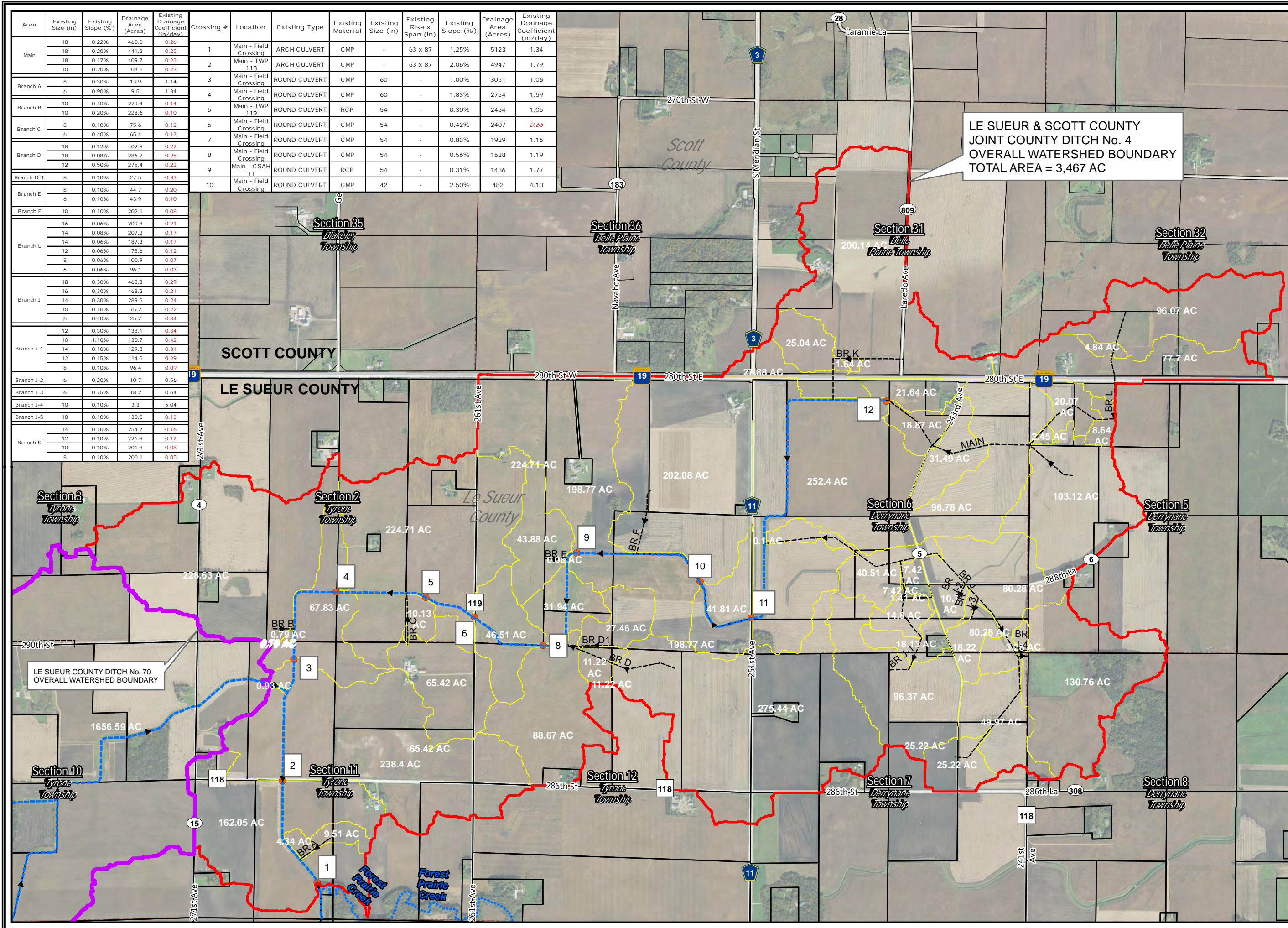
Item No.	Item	Unit	Quantity	Unit Price	Amount
101	MOBILIZATION	LS	1	\$ 500.00	\$ 500
102	BORE 6-INCH TILE	LF	50	\$ 125.00	\$ 6,250
103	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 8,920
10% CONTINGENCY					\$ 892
SUBTOTAL					\$ 9,812
County Administration Costs					\$ 200
Reports, Plans and Specifications					\$ 600
Construction Staking & Administration					\$ 800
ESTIMATED BRANCH J TILE REPAIR COST WITH ROAD - COUNTY ROAD 6					\$ 11,412

BRANCH J TILE REPAIR WITHOUT ROAD - COUNTY ROAD 6

Item No.	Item	Unit	Quantity	Unit Price	Amount
201	MOBILIZATION	LS	1	\$ 100.00	\$ 100
202	6-INCH AGRICULTURAL TILE	LF	50	\$ 12.00	\$ 600
203	CONNECT EXISTING TILE (SIZE & MATERIAL MAY VARY)	EA	2	\$ 400.00	\$ 800
TOTAL					\$ 1,500
10% CONTINGENCY					\$ 150
SUBTOTAL					\$ 1,650
County Administration Costs					\$ 100
Reports, Plans and Specifications					\$ 100
Construction Staking & Administration					\$ 200
TEMPORARY DAMAGES		AC	0.17	\$ 650	\$ 112
ESTIMATED BRANCH J TILE REPAIR WITHOUT ROAD - COUNTY ROAD 6					\$ 2,162

BRANCH J TILE IMPROVEMENT COST - COUNTY ROAD 6

Item No.	Item	Unit	Quantity	Unit Price	Amount
301	MOBILIZATION	LS	1	\$ 800.00	\$ 800
302	BORE 15-INCH TILE	LF	50	\$ 250.00	\$ 12,500
303	INSTALL DROP INTAKE (18-INCH)	EA	2	\$ 1,085.00	\$ 2,170
TOTAL					\$ 15,470
10% CONTINGENCY					\$ 1,547
SUBTOTAL					\$ 17,017
County Administration Costs					\$ 400
Reports, Plans and Specifications					\$ 1,100
Construction Staking & Administration					\$ 1,400
ESTIMATED BRANCH J TILE IMPROVEMENT COST - COUNTY ROAD 6					\$ 19,917



Area	Existing Size (in)	Existing Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)
Main	18	0.22%	460.0	0.26
	18	0.20%	441.2	0.25
	18	0.17%	409.7	0.25
	10	0.20%	103.1	0.23
Branch A	8	0.30%	13.9	1.14
	6	0.90%	9.5	1.34
Branch B	10	0.40%	229.4	0.14
	10	0.20%	228.6	0.10
Branch C	8	0.10%	75.6	0.12
	6	0.40%	65.4	0.13
Branch D	18	0.12%	402.8	0.22
	18	0.08%	286.7	0.25
Branch D-1	12	0.50%	275.4	0.22
	8	0.10%	27.5	0.33
Branch E	8	0.10%	44.7	0.20
	6	0.10%	43.9	0.10
Branch F	10	0.10%	202.1	0.08
	16	0.06%	209.8	0.21
Branch L	14	0.08%	207.3	0.17
	14	0.06%	187.3	0.17
	12	0.06%	178.6	0.12
	8	0.06%	100.9	0.07
Branch J	6	0.06%	96.1	0.03
	18	0.30%	468.3	0.29
	16	0.30%	468.2	0.21
	14	0.30%	289.5	0.24
Branch J-1	10	0.10%	75.2	0.22
	6	0.40%	25.2	0.34
Branch J-2	12	0.30%	138.1	0.34
	10	1.10%	130.7	0.42
	14	0.10%	129.3	0.31
	12	0.15%	114.5	0.29
Branch J-3	8	0.10%	96.4	0.09
	6	0.20%	10.7	0.56
Branch J-4	6	0.75%	18.2	0.64
	10	0.10%	3.3	5.04
Branch J-5	10	0.10%	130.8	0.13
	14	0.10%	254.7	0.16
Branch K	12	0.10%	226.8	0.12
	10	0.10%	201.8	0.08
	8	0.10%	200.1	0.05

Existing JCD No. 4 Watershed Map

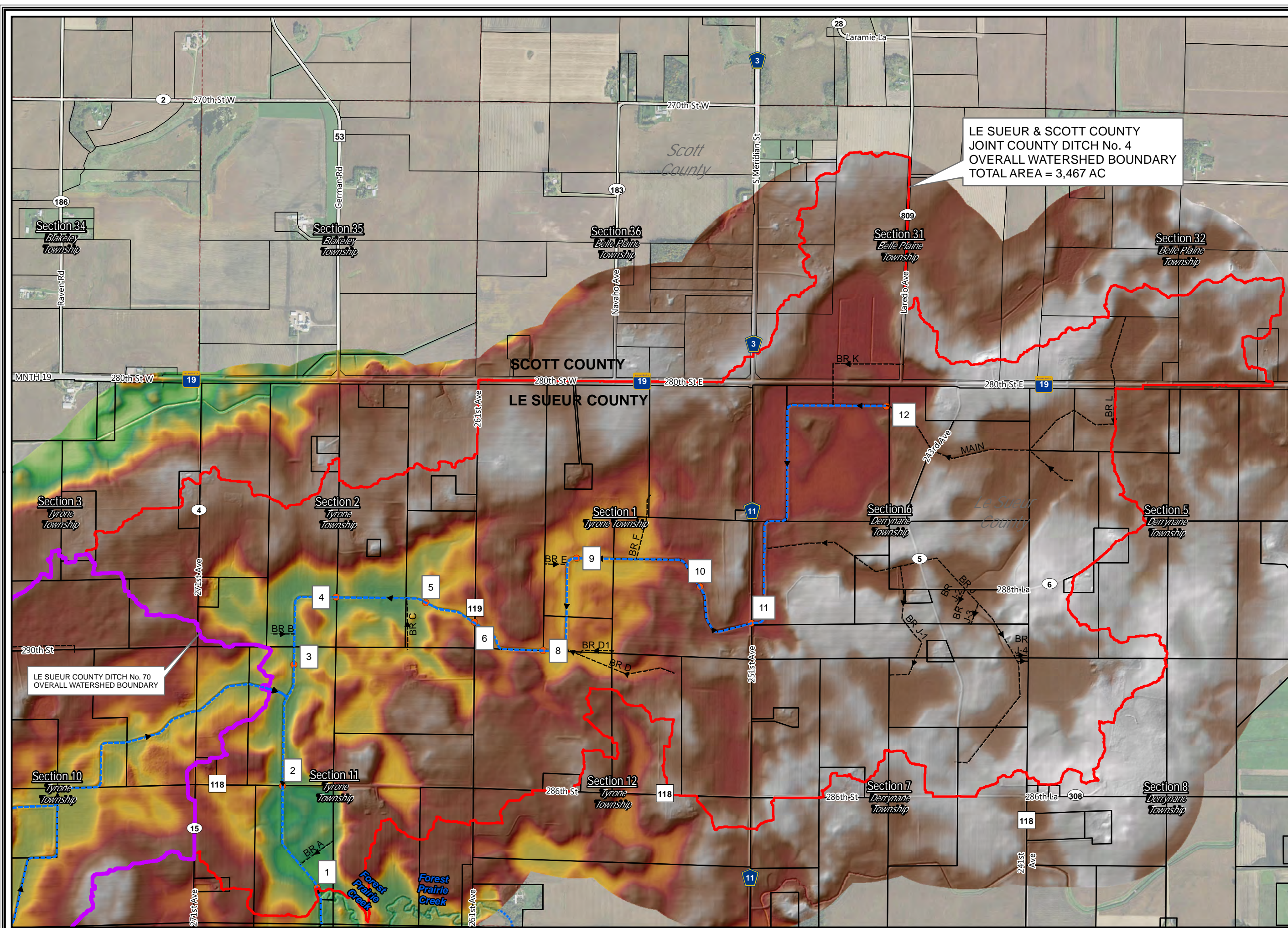
Joint County Ditch No. 4 and County Ditch No. 70
Le Sueur and Scott County, Minnesota
Thursday, September 07, 2017

Legend

- CD70 Watershed
- JCD 4 Watershed
- JCD 4 System TYPE
 - EXISTING OPEN DITCH
 - EXISTING TILE
 - Culvert Crossings
 - Subcatchments
 - Parcels

PN: 17-20815

Source:
Orthophotograph (Le Sueur County, 2016)
Tile/Ditch (Le Sueur County, 11/21/2016)
Parcels (Le Sueur County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)



Existing
Hillshade Map
Joint County Ditch
No. 4 and
County Ditch No. 70
Le Sueur and Scott
County, Minnesota
Thursday, September 07, 2017

Legend

- CD70 Watershed
- JCD 4 Watershed

JCD 4 System

CDtype

- EXISTING OPEN DITCH
- EXISTING TILE
- Culvert Crossings
- Parcels

DEM

Value

High : 1027.14

Low : 905.694

PN: 17-20815

Source:

Orthophotograph (Le Sueur County, 2016)

Tile/Ditch (Le Sueur County, 11/21/2016)

Parcels (Le Sueur County, 2/4/2016)

Lakes (MN DNR, July, 2008)

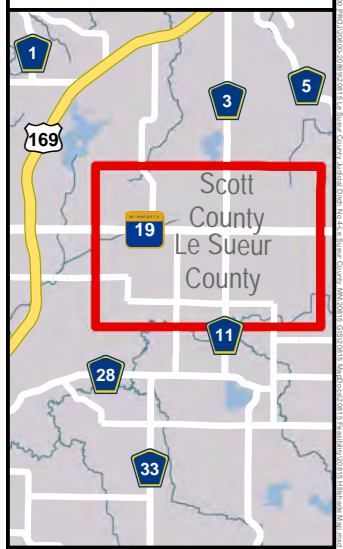
Major Stream (MN DNR, July 2008)

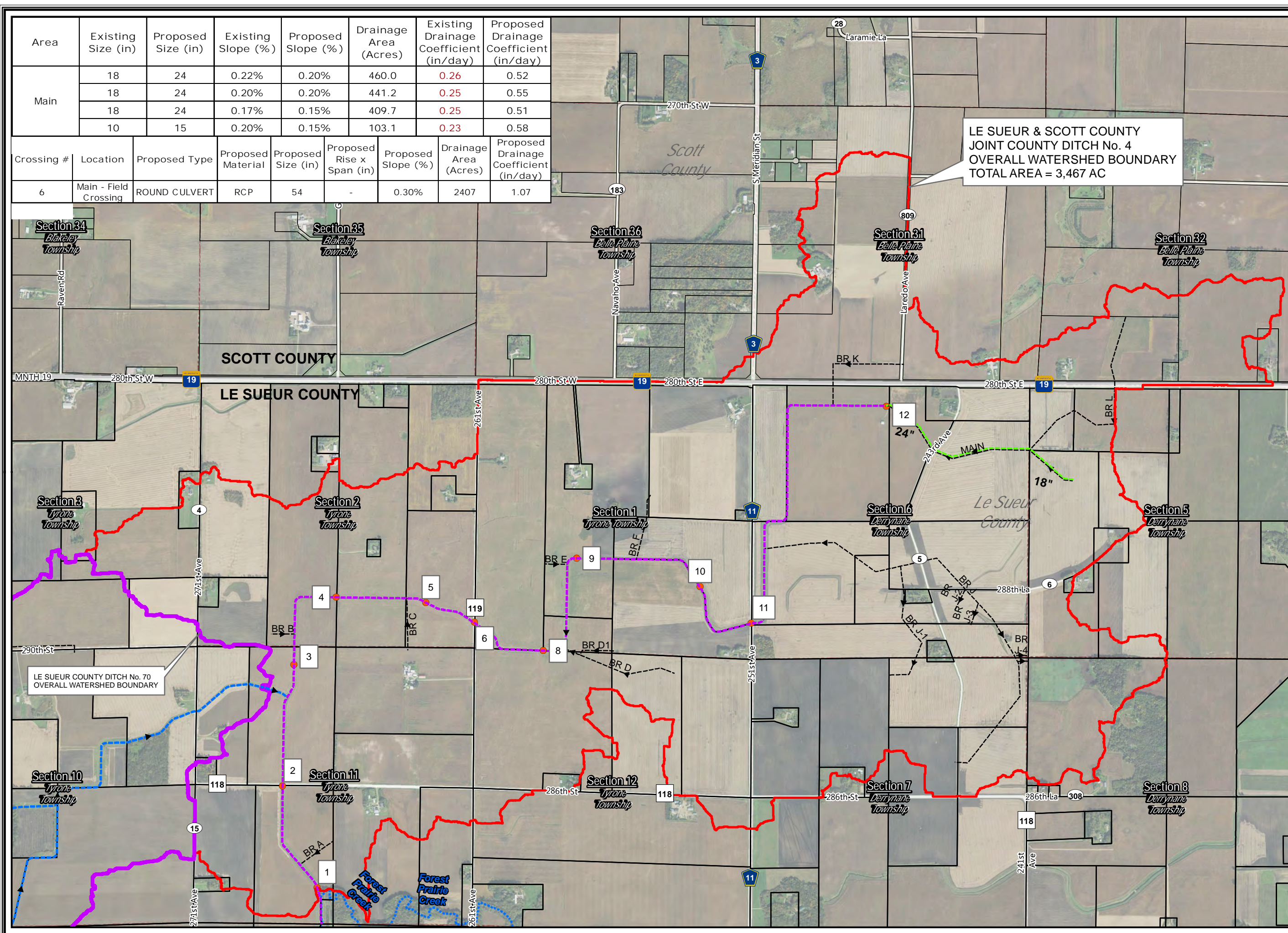
Counties (MN DNR, July 2013)

PLSS (MnGeo/USGS)

0 395 790 1,580 Feet

1 inch = 1,667 feet





Area	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)	
Main	18	24	0.22%	0.20%	460.0	0.26	0.52	
	18	24	0.20%	0.20%	441.2	0.25	0.55	
	18	24	0.17%	0.15%	409.7	0.25	0.51	
	10	15	0.20%	0.15%	103.1	0.23	0.58	
Crossing #	Location	Proposed Type	Proposed Material	Proposed Size (in)	Proposed Rise x Span (in)	Proposed Slope (%)	Drainage Area (Acres)	Proposed Drainage Coefficient (in/day)
6	Main - Field Crossing	ROUND CULVERT	RCP	54	-	0.30%	2407	1.07

Proposed Option #1 Watershed Map

Joint County Ditch No. 4 and County Ditch No. 70
Le Sueur and Scott County, Minnesota
Thursday, September 07, 2017

Legend

- CD70Watershed
- JCD 4 Watershed

JCD 4 System

TYPE

- EXISTING TILE
- CulvertCrossings

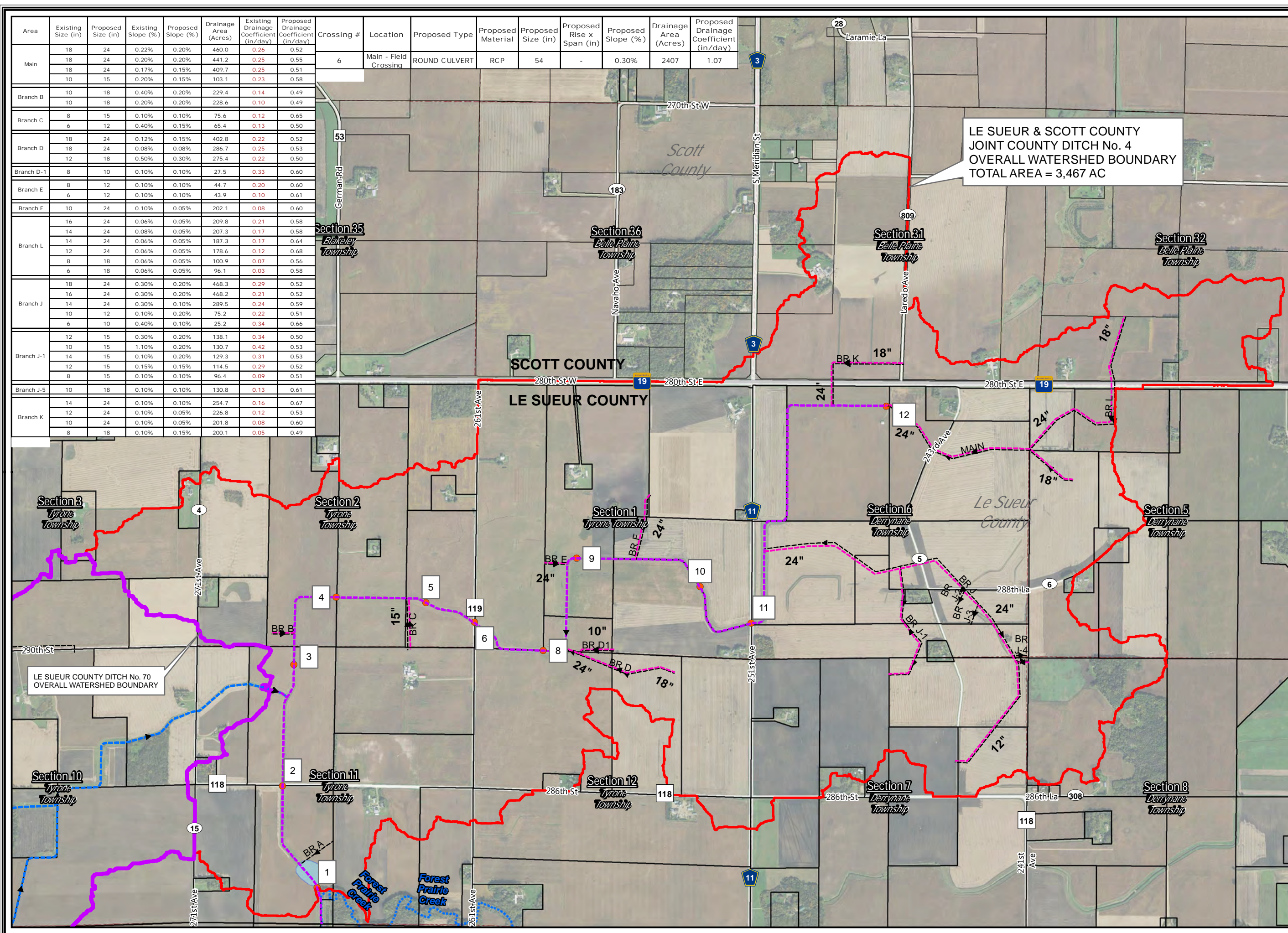
Proposed Option 1

TYPE

- OPEN DITCH CLEANING
- PROPOSED TILE
- Parcels

PN: 17-20815
Source:
Orthophotograph (Le Sueur County, 2016)
Tile/Ditch (Le Sueur County, 11/21/2016)
Parcels (Le Sueur County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

0 395 790 1,580 Feet
1 inch = 1,667 feet



Area	Existing Size (in)	Proposed Size (in)	Existing Slope (%)	Proposed Slope (%)	Drainage Area (Acres)	Existing Drainage Coefficient (in/day)	Proposed Drainage Coefficient (in/day)
Main	18	24	0.22%	0.20%	460.0	0.26	0.52
	18	24	0.20%	0.20%	441.2	0.25	0.55
	18	24	0.17%	0.15%	409.7	0.25	0.51
	10	15	0.20%	0.15%	103.1	0.23	0.58
Branch B	10	18	0.40%	0.20%	229.4	0.14	0.49
	10	18	0.20%	0.20%	228.6	0.10	0.49
Branch C	8	15	0.10%	0.10%	75.6	0.12	0.65
	6	12	0.40%	0.15%	65.4	0.13	0.50
Branch D	18	24	0.12%	0.15%	402.8	0.22	0.52
	18	24	0.08%	0.08%	286.7	0.25	0.53
	12	18	0.50%	0.30%	275.4	0.22	0.50
Branch D-1	8	10	0.10%	0.10%	27.5	0.33	0.60
Branch E	8	12	0.10%	0.10%	44.7	0.20	0.60
	6	12	0.10%	0.10%	43.9	0.10	0.61
Branch F	10	24	0.10%	0.05%	202.1	0.08	0.60
Branch L	16	24	0.06%	0.05%	209.8	0.21	0.58
	14	24	0.08%	0.05%	207.3	0.17	0.58
	14	24	0.06%	0.05%	187.3	0.17	0.64
	12	24	0.06%	0.05%	178.6	0.12	0.68
	8	18	0.06%	0.05%	100.9	0.07	0.56
Branch J	6	18	0.06%	0.05%	96.1	0.03	0.58
	18	24	0.30%	0.20%	468.3	0.29	0.52
	16	24	0.30%	0.20%	468.2	0.21	0.52
	14	24	0.30%	0.10%	289.5	0.24	0.59
	10	12	0.10%	0.20%	75.2	0.22	0.51
Branch J-1	6	10	0.40%	0.10%	25.2	0.34	0.66
	12	15	0.30%	0.20%	138.1	0.34	0.50
	10	15	1.10%	0.20%	130.7	0.42	0.53
	14	15	0.10%	0.20%	129.3	0.31	0.53
Branch J-5	12	15	0.15%	0.15%	114.5	0.29	0.52
	8	15	0.10%	0.10%	96.4	0.09	0.51
Branch K	10	18	0.10%	0.10%	130.8	0.13	0.61
	14	24	0.10%	0.10%	254.7	0.16	0.67
	12	24	0.10%	0.05%	226.8	0.12	0.53
	10	24	0.10%	0.05%	201.8	0.08	0.60
	8	18	0.10%	0.15%	200.1	0.05	0.49

Proposed Option #2 Watershed Map

Joint County Ditch No. 4 and County Ditch No. 70
Le Sueur and Scott County, Minnesota
Tuesday, September 12, 2017

Legend

Proposed Option 2

TYPE

- OPEN DITCH CLEANING
- PROPOSED TILE
- CD70 Watershed
- JCD 4 Watershed

JCD 4 System

TYPE

- EXISTING TILE
- Culvert Crossings
- Potential Storage
- Parcels

PN: 17-20815
Source:
Orthophotograph (Le Sueur County, 2016)
Tile/Ditch (Le Sueur County, 11/21/2016)
Parcels (Le Sueur County, 2/4/2016)
Lakes (MN DNR, July, 2008)
Major Stream (MN DNR, July 2008)
Counties (MN DNR, July 2013)
PLSS (MnGeo/USGS)

0 395 790 1,580 Feet
1 inch = 1,667 feet