

High Island Creek Watershed District Proposed Improvements to Project 10



Prepared by:

**Ulteig Engineers
4285 Lexington Avenue North
St. Paul, MN 55126
October 2019**

**Preliminary Engineers Report
for
High Island Creek Watershed District
Proposed Improvements to Project 10**

Certification

I hereby Certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

October 28, 2019

Roger A. Clay, PE
Senior Civil Engineer
Registration Number 23452

Date

Ulteig Engineers
4285 Lexington Avenue
St. Paul, MN 55126

TABLE OF CONTENTS

1.0	CHAPTER 1 – Introduction	1
1.1	Petition and Order	1
1.2	Project Location and Proposed Improvements	2
1.3	Watershed Characteristics and History	2
1.4	Existing Conditions	4
2.0	CHAPTER 2 – ALTERNATIVE SOLUTIONS	6
2.1	Alternative 1 – Petition Proposal	6
2.1.1	Discussion of Pump Capacity	6
2.1.2	Discussion of Relocating the Pump Station	7
2.2	Alternative 2	7
2.2.1	Discussion of Alternative 2 Pump Capacity	7
2.2.2	Discussion of Replacing the County Road 64 Culvert	8
2.2.3	Other Features of Alternative 2	9
2.2.4	Summary of Alternative 2	9
2.3	Other Alternatives	9
2.4	Feasibility	10
2.5	Probable Cost	10
3.0	CHAPTER 3 – Environmental, Land Use and Multipurpose Water Management (MS 103E.015 Sub. 1)	10
3.1	Private and Public Benefits and Costs	10
3.2	Alternative Measures	11
3.3	Land Use	11
3.4	Flood Characteristics	12
3.5	Adequacy of Outlet	12
3.6	Wetlands	13
3.7	Water Quality	13
3.8	Fish and Wildlife Resources	13
3.9	Shallow Groundwater	13
3.10	Overall Environmental Impact	14
3.11	Permits	14
3.12	Potential Sources of Funding	14
4.0	CHAPTER 4 – RECOMMENDATIONS	14
5.0	CHAPTER 5 – REFERENCES	15

List of Figures

Figure 1-1 Project Location Map 3

List of Tables

Table 1 Stream Stats Results for Project 10 Watershed.....6

Appendices

- Appendix A – Petition
- Appendix B – Proposed Improvement Plan
- Appendix C – Opinion of Probable Construction Cost
- Appendix D – Wetlands in Project 10 Watershed

1.0 CHAPTER 1 – Introduction

1.1 Petition and Order

IN THE MATTER OF THE PETITION FOR THE IMPROVEMENT OF HIGH ISLAND CREEK WATERSHED DISTRICT PROJECT 10

On June 24, 2019, the High Island Creek Watershed District received a Petition for Improvement of Project 10 in Sibley County in accordance with Minnesota Statute 103.E.215 with the purpose of relocating and improving the pump station associated with the project (Appendix A). High Island Watershed District approved the Petition on the same date. In response to that authorization, preliminary field surveys were performed to determine the condition of the existing drainage facilities, to consider moving the pump station, to consider increasing the capacity of the pump station, and to analyze the outlet for the system. A detailed analysis was completed of the drainage capacity of the system, water storage designs, alternatives to the proposed improvement, potential impacts of the improvement, and recommendations on the allocation of separable maintenance.

High Island Watershed District appointed Ulteig Engineers as the engineer and the subsequent order added no further refinements

This report summarizes findings of the investigations, surveys and analysis and is submitted for consideration by the Board of Managers of the High Island Creek Watershed District.

1.2 Project Location and Proposed Improvements

High Island Creek Watershed District Project 10 is located in Sections 27, 28, 32, 33, and 34 of Washington Lake Township, Sibley County. Project 10 consists of a main line open ditch (Main Line) which includes a lift-pump system, the pump station being located in the east $\frac{1}{2}$ of the southeast $\frac{1}{4}$ of Section 33 of Washington Lake Township. The open ditch outlets through a culvert crossing of Sibley County Highway 64 into the northeast $\frac{1}{4}$ of Jessenland Township. At that point a natural channel conveys water south approximately one quarter mile to a legal Minnesota Department of Natural Resources flowage easement at Silver Lake.

The Petitioners proposed to increase the Project 10 drainage capacity and efficiency of its outlet by the following:

1. Relocating the existing lift-pump station closer to Sibley County Road 64 (220th Street) and utilize the road culvert as a restriction for the purpose of water quality management.
2. Improving the lift-pump system by replacing the existing lift-pump and upgrading the pump size to current design capacities (“Proposed Improvements”) which would increase the pump system from 2,000 gallons per minute to 15,100 gallons per minute.

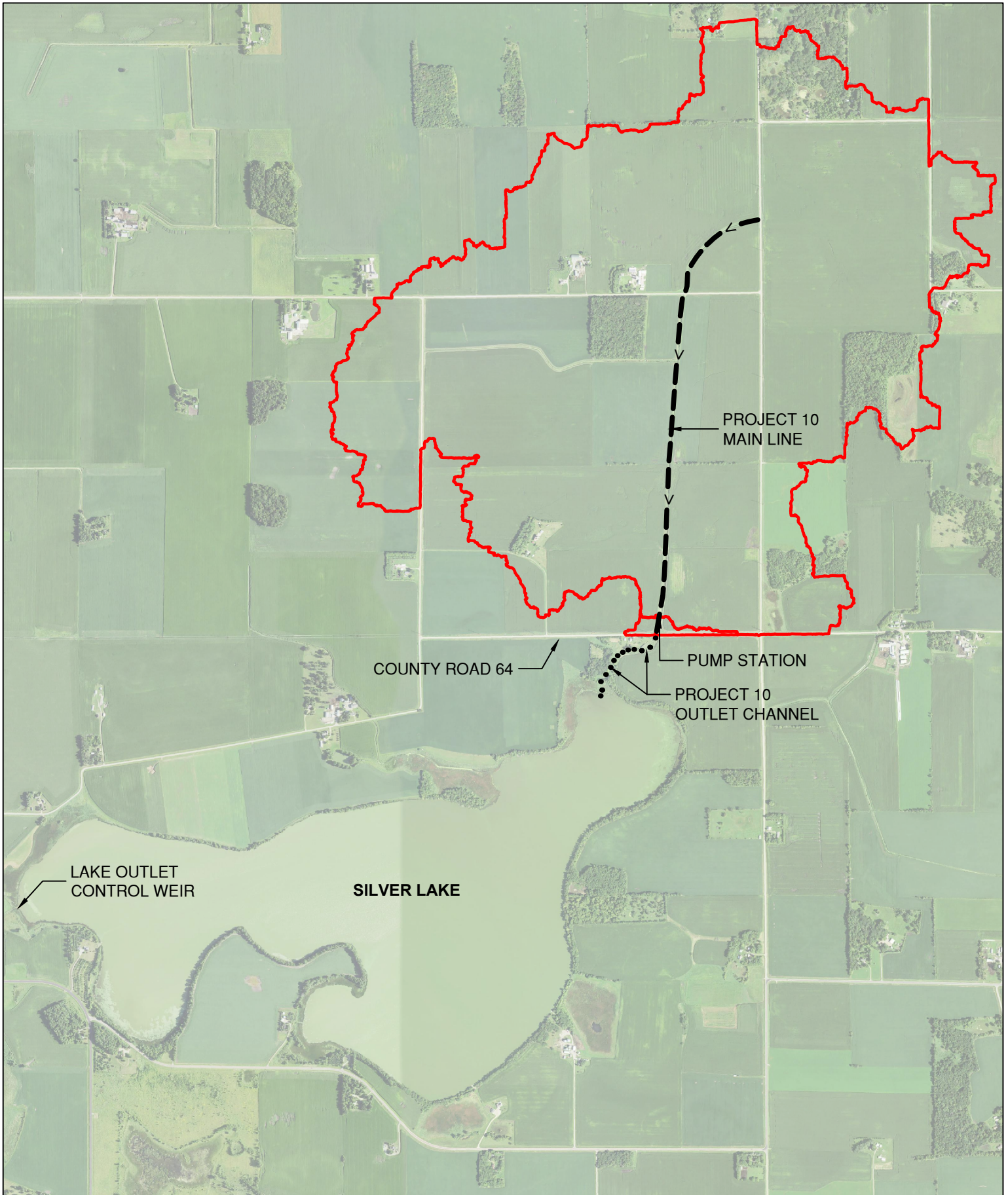
The petition proposes to make Project 10 more efficient by several means. By moving the pump station closer to County Road 64 the petitioners desire to gain a more efficient discharge hydraulically into the natural channel downstream of the county road. In addition, the larger pump station capacity would provide more timely draw down of water in the Main Line to allow private tile systems discharging to the Main Line to function more efficiently.

No improvements are requested for the Main Line open ditch system. Installation of public tile lines is not requested by the Petition.

1.3 Watershed Characteristics and History

The Project 10 watershed is gently rolling agricultural land and provides drainage to approximately 1,400 acres. A network of private tile lines and one private ditch drain to the Project 10 Main Line. At the outlet of the watershed the elevation is approximately 982-ft and the elevation ranges up to 1034-ft near the watershed boundary. Figure 1 provides an overview of the project location.

Project 10 discharges under Sibley County Road 64 to an approximately 1430-ft long natural channel that discharges to Silver Lake. This lake is a Public Water for which the Minnesota Department of Natural Resources has a flowage easement. Silver Lake has a surface area of approximately 650 acres and has an outlet control at the western end of the lake. The elevation of the outlet control weir is 981.46-ft (NGVD-1929), compared to the downstream



COUNTY ROAD 64

PROJECT 10
MAIN LINE

PUMP STATION

PROJECT 10
OUTLET CHANNEL

LAKE OUTLET
CONTROL WEIR

SILVER LAKE

LEGEND	
	WATERSHED BOUNDARY
	MAIN LINE
	OUTLET CHANNEL

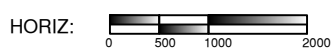


	EXHIBIT 1 PROJECT 10 OVERVIEW
	HIGH ISLAND CREEK WATERSHED DISTRICT
	SIBLEY COUNTY, MINNESOTA

invert of the County Road 64 culvert, which has elevation 981.93. There are times when backwater from Silver Lake affects the hydraulic conditions at CR 64.

A private open ditch system was constructed in the 1970's in Washington Lake Township through the east half of Section 33, southeast quarter of the southeast quarter of Section 28 and terminating in the southwest quarter of the southwest quarter of Section 27 (RCM, 1995). A pump station was constructed about 1977 and consisting of a berm to pond water and a 2,000 gallon per minute (gpm) pump having a lift of 16-ft. In addition to the pump station, a 36-inch overflow pipe was constructed to provide additional drainage during spring runoff and periods of high flows in the Main Line.

In 1996 the private open ditch (Main Line), with the exception of one lateral ditch entering from the west, became a public drainage system with High Island Creek Watershed District (HICWD) becoming the drainage authority. The public drainage system also included the pump station comprised of a berm, a 2000 gallon per minute pump, and two overflow culverts. Both overflow culverts are at an elevation relatively near the top of the berm and do not discharge water from near the bottom of the Main Line. The pump station ponds water upstream of the berm, with the Main Line functioning as a long linear settling pond. There was no construction in 1996 when the system became public with the exception of the addition of a one rod wide vegetated buffer strip along both sides of the Main Line.

In November of 2017 two maintenance activities were completed. The first was the removal of accumulated sediment from the entire Main Line. Secondly, the pump was replaced with a similar unit having the same pumping capacity as the original, 2000 gpm.

1.4 Existing Conditions

The Project 10 Main Line ditch is approximately 7200-ft long and has varying design bottom width and side slopes. On the basis of the 1996 plans by RCM, the bottom width is estimated to be 4-ft at the upper end of the ditch, and a maximum of 12-ft at the lower end. Ditch side slopes range from approximately 1 vertical to 1.5 horizontal to 1 vertical to 2 horizontal. Depths of ponding during high water in the Main Line are estimated to be approximately 7-ft at the upper end and 10-ft near the pump station.

Field investigation for this Preliminary Engineering Report only identified one isolated area where the Main Line ditch bank needs repair, and that is on the east bank immediately downstream of the pump station. There was also scour damage to the channel banks immediately downstream of the CR 64 culvert. The 48-inch diameter reinforce concrete pipe (RCP) county road culvert, which has extensions that were installed in 1963, was observed to be near its useful life span.

The vegetated buffer strip along the Main Line was observed to be densely vegetated with grasses. Some but not all landowners periodically mow the buffer strip. Maintenance operations by the HICWD include periodic tree removal in the buffer strips where they are found to have grown.



Main Line with Vegetated Buffers

A review of bank conditions in the channel downstream of CR 64 did not identify eroding banks there. The channel banks were well vegetated with grasses and appeared to be stable.

A comprehensive up to date inventory of private tile drains entering the Main Line is not available. A tile inventory was not completed as part of this review because potential construction for the proposed improvement will not conflict with tile drains, nor will it involve the installation of additional tile. The Project 10 ditch plans that were developed in 1995 show tile that were inventoried at that time.

The tile lines that discharge into the Main Line are all privately owned and typically at about 4-ft in depth. Maintenance of these tile lines is the responsibility of the individual owners. Landowners report that the existing pump station does not draw down the water in the Main Line to an elevation where the tile lines would function for relatively long periods of time, particularly during spring run off and periods of heavy or frequent rain events.

2.0 CHAPTER 2 – ALTERNATIVE SOLUTIONS

Chapter 2 discusses alternatives solutions to the improvements requested by the Petition including the alternative in the Petition and an alternative identified by this preliminary engineering review. A primary purpose of the petition was to increase the pumping capacity, and this work will review pumping capacity and other factors related to pumping capacity.

2.1 Alternative 1 – Petition Proposal

Foremost in the Petition were two requests, the first being relocating the pump station closer to Sibley County Road 64 with the second being the increase in pump capacity from 2000 to 15,100 gpm. The increase in pump capacity has the greatest influence on cost and potential impacts of the two proposals and will be discussed first.

2.1.1 Discussion of Pump Capacity

To put the pump capacity for the Petition Alternative into prospective, the proposed pump capacity was compared to peak flows generated by the Project 10 watershed at the CR 64 culvert for different recurrence interval flood events. The flow rate of 15,100 gpm is equivalent to 33.6 cubic feet per second (cfs), the typical unit used for stream flow. Using the peak flow prediction software StreamStats (US Geological Survey, 2019), peak flow statistics were computed. Results from StreamStats for the 1.5 and 2-year recurrence interval storms for the Project 10 watershed are found in Table 1. It is seen that the 1.5-year peak flow has a

Table 1

StreamStats Results for Project 10 Watershed

Recurrence Interval Storm (year)	Predicted Peak Flow Rate (cfs)
1.5	31
2	46

magnitude just under the proposed pumping rate. The significance of the 1.5-year recurrence interval peak flow is it is in the range of stream flows known as channel forming flows (FISRWG, 1998). When the channel forming stream flow range occurs, scour of the banks and bed is likely. The conclusion drawn by this analysis, when considering the channel downstream of County Road 64, is it would not be prudent to have a system that discharges in the channel forming stream flow range multiple times a year, and a lower pump capacity should be selected.

2.1.2 Discussion of Relocating the Pump Station

One reason for moving the pump station is to potentially reduce head losses associated with the discharge of water through the county road culvert. Moving the pump station would require reconstruction of the pump station berm at the edge of the county road right-of-way. The road embankment itself was not constructed to impound water and would not be capable of that purpose. It may be necessary to construct a separate discharge pipe from the new pump station through the embankment, which would be another expense. Furthermore, the existing 300-ft of ditch between the pump station and CR 64 provides water quality benefits which would be lost if the pump station were moved. There are other means of reducing head loss associated with the discharge of Project 10 pump station through the CR 64 culvert. For example, replacing the culvert with a larger culvert and adding end sections. Overall, moving the pump station closer to CR 64 is not seen as having significant benefit.

2.1.3 Summary of Petition Alternative

The alternative for the pumping capacity found in the Petition, increasing the pump capacity to 12,500 gpm, is not feasible because the discharge rate is higher than expected thresholds for scour and erosion in the downstream channel and the alternative is dismissed.

2.2 Alternative 2

Alternative 2 includes adding a new 7,500 pump, keeping the existing 2000 gpm pump and overflow culverts in operation, and leaving the pump station at the existing location. This alternative would include a substantial increase in pumping rate, continued use of the 2-year old 2000 gpm pump, improving hydraulics at the county road by replacing the culvert and adding culvert end sections, and keeping the 300 feet of channel between the pump station and county road as an area for water quality improvement.

2.2.1 Discussion of Alternative 2 Pump Capacity

A combined pump capacity of 9,500 gpm (21.2 cfs) was chosen because it is below the range of flows associated with channel forming flows. Velocities for this discharge rate were calculated for the channel downstream of the county road and found to be below 2 feet per second (fps), except immediately below the county road, where velocities were found to be

4 fps. The predicted velocities are in the range withstood by vegetation (MNDOT, 2000), allowing the conclusion that scour will not be an issue at this proposed pump capacity.

Draw down rates in the Main Line ditch were calculated for the Alternative 1 pump capacity. It was found that if the ditch were full, it would be drawn down in approximately 15-hours. The calculated time of draw down for 1-inch of precipitation with a full ditch was estimated to be three days. It is expected that draw down times would be somewhat lower than estimated because of the operation of the over flow culverts.

There is an added benefit to having 2 pumps which is increased reliability. If one of the pumps was to experience a mechanical failure there would remain another pump that could continue to function.

The set points (elevations) for when the pumps are turned on and off would not need to be the same for the two pumps. For instance, the larger of the two pumps could be turned off at a slightly higher elevation, for instance 0.5-ft higher, such that the final draw down of the ditch would be completed by the smaller pump. This would be an operation measure that assures draw down of the water to below the tile elevation in the most timely basis, but also limits the time when the discharge downstream is at the maximum rate.

2.2.2 Discussion of Replacing the County Road 64 Culvert

The hydraulic capacity of the County Road 64 reinforced concrete pipe (RCP) culvert can be improved by adding end sections, and by increasing the pipe size from 48-inch to 60-inch. The existing pipe is in poor enough condition such that end sections could not be added to it requiring the culvert to be replaced to add end sections. However, end sections will decrease head loss at this culvert, with the decrease being proportion to flow rate with a maximum improvement of approximately 20 percent.

The culvert design software HY-8 was used to compare the hydraulic characteristics of 48 and 60-inch RCP within the pump discharge and stream flow range expected at County Road 64. At the proposed Alternative 2 pump capacity of 9,500 gpm, the 60-inch RCP would have 0.2-ft less head loss than a 48-inch RCP. At higher flow rates, such as when the pump station and overflow pipes are both functioning, there will be a larger difference in head loss between these two RCP sizes. It is anticipated that the maximum headloss difference between these two pipe diameters would be approximately 0.5-ft, which is significant given the backwater conditions that can occur upstream of Silver Lake. A decision on which diameter to replace the culvert with will need input from the Sibley County Highway Department. However, using the 60-inch diameter pipe would improve the hydraulics of the pump station. It would also decrease velocities in the channel immediately downstream of the culvert reducing scour potential there.

Replacing the CR 64 culvert will likely require county highway clear zone design requirements be met. This could be accomplished several ways, including constructing guard rails near the culvert or flattening the county road side slopes.

2.2.3 Other Features of Alternative 2

Alternative 2 would leave the pump station at its present location, and keep the 300-ft long section of Main Line between the pump station and county road. This short section of channel has several beneficial aspects including providing an area where turbulence associated with the pump discharge can dissipate prior to the entrance of the culvert and providing an area where sediment can settle or be filtered by vegetation growing on the banks.

Work completed as part of Alternative 2 would include repair of the east ditch bank immediately downstream of the pump station and repair of the channel bank immediately downstream of the CR 64 culvert. This work, however, would be routine maintenance of Project 10 facilities and would not be part of the cost for work completed for the petition.

2.2.4 Summary of Alternative 2

Alternative 2 provides a substantial increase in pump capacity, retains the relatively new 2000 gpm pump, improves the hydraulics of the CR 64 culvert crossing, and does not involve moving the pump station. A figure depicting the improvements included in Alternative 2 is found in Appendix B.

2.3 Other Alternatives

2.3.1 Do Nothing Alternative

The do nothing alternative was considered. However, the petitioners have experienced poor functioning of drain tiles and subsequent crop loss. Loss of productivity experienced by poor drainage in the Project 10 watershed equates to an economic loss to Sibley County and the State of Minnesota and a reduced return on the investment made by the petitioners.

The Do Nothing Alternative was dismissed for these economic reasons and because it does not solve the drainage issues in the Project 10 watershed. The economic balance between the cost of improvements versus benefits derived still needs to be addressed.

2.3.2 Lower Pump Capacity

There is a range of pump station capacities that could be considered between the existing capacity and the proposed Alternative 2 capacity (9,500 gpm). The alternative 2 capacity balances the need to protect the natural channel downstream of CR 64 with the time needed to draw down water in the Main Line and therefore additional pump station capacities were not considered.

2.4 Feasibility

The proposed Alternative 2 Improvement of the High Island Creek Watershed District Project 10, as described in this report, is feasible and practical and is necessary to provide effective drainage for the cultivation of crops.

2.5 Probable Cost

Details of the preliminary Opinion of Probable Construction Cost are found in Appendix C. A total cost of \$265,234.95 was estimated for the Proposed Improvements. There would be no land permanently lost from production. Additional county road right-of-way would be needed for purchased for lands needed for the clear zone and new CR 64 culvert. Temporary easements would be needed for less than 0.1 acres of lands in production because other than this temporary impact the work can be confirmed to lands within the Project 10 lands or land not in production. The temporary easement is for land south of County Road 64. Two of the work items involving bank restoration are Separable Maintenance.

3.0 CHAPTER 3 – Environmental, Land Use and Multipurpose Water Management (MS 103E.015 Sub. 1)

3.1 Private and Public Benefits and Costs

The estimated cost of the proposed improvement of Project 10 is found in Appendix C. Benefits from the improvement, both public and private, will be identified by the Viewers and their report will be available at the final Improvement Hearing if the improvement is approved to proceed to the final design phase.

The improvement will provide increased effectiveness of tile systems by drawing down water ponded in the Main Line at a faster rate to levels where tile drains operate efficiently. This would allow land owners economic benefits by allowing for less saturated conditions and reducing crop loss. It may also reduce sloughing of the ditch banks by allowing them to dry sooner, reducing the need for ditch maintenance.

Landowners have other costs associated with the construction and maintenance of their individual drainage systems. The proposed improvements will only serve to improve the outlet of runoff and drainage flows from lands within the watershed. Each landowner is responsible to construct and maintain his or her private drainage system to adequately drain their farm lands. Individual benefits for an adequate drainage system are an increase in crop production from farm lands. It is difficult, if not impossible, to set a per acre value for individual land owner costs or benefits of an adequate drainage system due to the many

variables that affect value derived. Among these variables are the weather conditions during crop production, and the price the producer receives for their crop.

A statement of the estimated public and private benefits and damages will be prepared for the final Improvement Hearing if a decision is made to proceed to final design.

3.2 Alternative Measures

Increasing the pumping rate as proposed will not decrease the water quality of existing conditions. The Main Line will continue to pond water over its 6,800-ft length upstream of the pump station, providing settling of sediment which is periodically removed during routine maintenance.

The proposed improvements involve only the immediate area of the Project 10 pump station and the CR 64 culvert. Existing densely vegetated buffers along the Main Line will be maintained in that condition. Private landowners in the Project 10 watershed can work independently with resource agencies such as the Sibley County Soil and Water Conservation District or the USDA Service Office located in Gaylord to identify additional best management practices to implement such as winter cover crops, alternative inlets, wetland restoration, or additional water storage to reduce soil erosion and protect water quality.

3.3 Land Use

The present land use within the Project 10 watershed is predominantly agricultural, with there also being wood lots, wetlands, farm building sites and roads. This is consistent with the Sibley County zoning map, which shows the watershed to either have agricultural lands or areas with non-prime soils. No change in land use is expected as a result of the proposed improvements.

3.4 Flood Characteristics

Runoff from the Project 10 watershed is significantly influenced by the ponding in the Main Line, the pump station, the overflow culverts at the berm and the CR 64 culvert. In addition, peak flows leaving the Project 10 watershed will undergo a significant amount of attenuation in the 650-acre Silver Lake, which is approximately one quarter mile downstream of CR 64. When a major storm occurs the Project 10 infrastructure and Silver Lake serve to attenuate peak flows discharged from the watershed.

A conservative calculation was completed to estimate how much additional bounce in Silver Lake would occur as a result in the proposed increase in pump capacity (10,500 gpm). It is estimated that Silver Lake would rise approximately an additional 0.06-ft in 24-hours compared to existing conditions, and assuming there was no outflow. Taking outflow into account would reduce this estimate. The surface area of Silver Lake is large in comparison to the size of the Project 10 watershed, and flow attenuation by the lake is therefore significant. Bounce on the order of that conservatively estimated would not create a flooding issue.

Silver Lake and the channel downstream of CR 64 are mapped as having a 100-year floodplain with no base elevation determined. The Proposed Improvements will not alter the mapped floodplain.

3.5 Adequacy of Outlet

The outlet of Project 10 is the natural channel downstream of CR 64 and Silver Lake. Both have the capacity to convey the proposed pump station flows (10,500 gpm or 22.2 cfs). The proposed pump station capacity is a rate lower than the mean annual flood of the watershed draining to the CR 64 culvert. In periods of relatively high water levels in Silver Lake there will be a backwater influence on the hydraulics of the CR 64 culvert. However, during operation of the pump station water levels on upstream side of CR 64 will balance with the downstream conditions and the discharge from the pump station will pass downstream. The outlet is adequate for the Proposed Improvement.

3.6 Wetlands

The Proposed Improvements will have no direct impact on wetlands. There will be no excavation or fill of wetlands, nor will the project involve construction of new tile line. The proposed improvement would decrease the time it takes to draw down water ponded in the Main Line. However, it is the responsibility of the private landowners to provide the conditions and facilities needed for water drain from the land into the ditch. The proposed project does not increase hydraulic connections from the land into the Main Line. Landowners can work with resource agencies, such as described in Section 3.2, to obtain assistance with the installation of BMPs such as alternative inlets. A figure depicting wetlands in the Project 10 watershed is found in Appendix D.

3.7 Water Quality

The proposed increase in pumping rate will not decrease the water quality of the existing conditions. The Main Line ditch system will continue to function as a linear water quality pond where settling of sediment will occur. Flow velocities in the Main Line in the first 2000-ft upstream of the pump station will be approximately 0.1 feet per second when the ditch is relatively full and the pump station operating at capacity. Vegetative buffers along the Main line are in excellent shape and will continue to be maintained. Private landowners in the Project 10 watershed can work with resource agency to implement additional water quality BMPs as discussed in Section 3.2, Alternative Measures.

The 2013 Sibley County Water Plan includes a targeting of locations in the Silver Lake watershed with potential soil erosion. None of those locations are in the Project 10 watershed.

3.8 Fish and Wildlife Resources

There are no potential impacts of the proposed improvements on Fish and Wildlife Resources. Habitat will not be created or degraded by the project, with no overall change in the habitat. Existing wood lots, wetland and other habitat areas will remain.

3.9 Shallow Groundwater

Project 10 and private tile systems in the Project 10 watershed were constructed to maintain the elevation of shallow groundwater to a level that controls soil saturation in the root zone of crops grown there. Groundwater levels will be controlled by the depth of the Main Line and private tile lines. Typically the private tile lines are approximately 4-ft below the ground surface. The purpose of the proposed improvement is to provide a depth of water in the Main Line on a timely basis which allows effective operation of the private tile lines.

3.10 Overall Environmental Impact

It is expected that the proposed improvement would overall have no environmental impact.

3.11 Permits

It is anticipated that the following permits will need to be obtained:

- Public Waters Permit from the Minnesota Department of Natural Resources
- Sibley County Highway Department
- Nationwide 404 Permit from the Army Corps of Engineers

3.12 Potential Sources of Funding

The proposed improvements to Project 10 related to increasing the capacity of the pump station are not improvements where grant or cost share funding would be available. However, it is anticipated that County Road 64 culvert and clear zone improvements can be cost shared with Sibley County. The exact percentage will need to be negotiated with Sibley County if the decision is made to proceed with the proposed improvements. However, because the proposed improvements involve replacing a culvert at the end of its life span and increasing the safety of the highway by adding a clear zone at the culvert crossing it is expected that up to a 50% cost share would be available.

4.0 CHAPTER 4 – RECOMMENDATIONS

The Proposed Improvements involve increasing the pumping capacity of the Project 10 pump station, and increasing the hydraulic efficiency of the County Road 64 culvert to improve upstream drainage. The Proposed Improvements, as described in this report, are practical and feasible, and will be a public benefit and contribute to the public welfare of this area. Therefore, the Proposed Improvements should be considered for preliminary approval.

It is recommended that the High Island Creek Watershed District call the Preliminary Hearing for this project and submit this report to the regulatory agencies for input on project features and environmental concerns. If this project is received favorably at the Preliminary Hearing, then detailed plans should be prepared, the Final Hearing be held, and the project constructed.

5.0 CHAPTER 5 – REFERENCES

Federal Emergency Management Agency, revised 1999, Flood Insurance Study for Sibley County MN, Unincorporated Areas.

Federal Interagency Stream Restoration Workgroup (FISRWG), 1998, Stream Corridor Restoration, Principals, Processes, and Practices.

Minnesota Department of Transportation, 2000, Drainage Manual.

RCM, 1996, Engineer's Report, Project No. 10, High Island Watershed District.

US Geological Survey, 2019, StreamStats: Streamflow Statistics and Spatial Analysis Tools for Water Resources Applications, web-based software accessed 9/30/2019. <https://streamstats.usgs.gov/ss/>

Appendix A

Petition

**STATE OF MINNESOTA
BEFORE THE HIGH ISLAND CREEK WATERSHED DISTRICT
SITTING AS THE DRAINAGE AUTHORITY
FOR HIGH ISLAND CREEK WATERSHED DISTRICT PROJECT 10**

In the Matter of the Petition
for Improvement to High Island Creek Watershed District Project 10

PRELIMINARY FINDINGS AND ORDER ACCEPTING PETITION

WHEREAS, a Petition for an Improvement of High Island Watershed District Project No. 10 (the "Petition") has been filed by Robert A. Kloth and R H Grand, LLC (collectively "Petitioners") with the High Island Creek Watershed District ("HICWD"), acting as the drainage authority for High Island Creek Watershed District Project 10 ("Project 10"); and

WHEREAS, the HICWD, sitting as a drainage authority, considered the Petition during its regularly scheduled meeting on June 25, 2019; and

WHEREAS, Improvements to existing drainage systems managed by the HICWD must be initiated by filing a petition with the HICWD; and

WHEREAS, Pursuant to Minn. Stat. § 103D.625 subd. 4, proceedings for the improvement of a drainage system in the watershed district must conform to chapter 103E.

WHEREAS, Minn. Stat. § 103E.215 sets forth the requirements for a petition for improvement of a drainage system,

WHEREAS said Board of Managers of the HICWD has received and considered the Petition;

NOW, THEREFORE, on motion duly made by Manager Bryan Peris, and seconded by Manager Vern Schluter the HICWD adopts the following findings and makes the following orders:

1. Said Board hereby finds that that:
 - a. At least 26% of the owners of the property that the proposed improvement passes over have signed the petition. The proposed improvement involves relocating the current pumping station and increasing the size of the pump, all of which will occur on a single 40-acre tract located at the SW ¼ of the SE ¼ Section 33, Township 114, Range 26, which is part of a parcel

owned by R H Grand, LLC, one of the Petitioners herein. The Petition meets the signature requirement of Minn. Stat. 103E.215 subd. 4(a)(2).

- b. The Petition adequately designates the drainage system proposed to be improved, by identifying the Project 10 system.
- c. The Petition states that Project 10 has insufficient capacity.
- d. The Petition does not propose any extension of the of Project 10
- e. The Petition adequately describes the improvement, including describing the names and addresses of the owners of the 40-acre tracts or government lots and property that the improvement passes over.
- f. The Petition states that the proposed improvement will be of public utility and promote the public health.
- g. The Petition contains an agreement by the petitioners that they will pay all costs and expenses that may be incurred if the improvement proceedings are dismissed.
- h. The Petition is adequate and meets the legal requirements applicable to this proceeding.
- i. Pursuant to Minn. Stat. § 103E.215, because Petitioners have presented a Petition that meets the legal requirements applicable to an improvement proceeding, the Board is required to appoint an engineer to examine the drainage system and make an improvement report.
- j. Pursuant to Minn. Stat. § 103E.202, and Minn. Stat. § 103D.705, Petitioners must post a bond or deposit security conditioned on paying all costs and expenses incurred by HICWD in the event the project petitioned for is not constructed or the proceedings are dismissed. Petitioners have submitted a Surety Bond dated May 15, 2019, as amended by a Bond Rider effective June 5, 2019. The Bond Rider amends the name of the description of the project from "Sibley County Project #10" to "High Island Watershed Project #10." This amended named still differs from the name of the "High Island Creek Watershed District Project 10." In addition, the Bond, as amended, names the obligee as the "High Island Watershed District Board of Managers." This differs from the correct name of the HICWD.

2. Subject to Petitioners satisfying the conditions set forth in Paragraph 2.a., below, the Board accepts the Petition.

- a. Within two weeks of this Resolution, Petitioners shall submit a new or amended Surety Bond, naming the "High Island Creek Watershed District" as the Obligee, and identifying "High Island Creek Watershed

District Project 10" as the risk described. The Bond shall be submitted through Dean M. Zimmerli, attorney for the Board.

3. If Petitioners fail to submit a new or amend bond as required above, the Petition shall be immediately dismissed without further action. Regardless of whether a new or amended bond is submitted, Petitioners shall remain liable to HICWD for the costs of the project.

4. The Board appoints Roger Clay + Ulteig Engineers to serve as an engineer for this proposed improvement.

5. The engineer shall prepare a preliminary improvement report and file said report within 120 days of this order. The preliminary improvement report shall comply with Minn. Stat. § 103E.245.

6. The engineer shall file and oath to faithfully perform the assigned duties in the best manner possible and file a bond with the auditor. The bond shall be in the amount of \$5,000.00 and must be conditioned to pay any person or the HICWD for damages and injuries resulting from negligence of the engineer while the engineer is acting in the proceedings or construction provide that the engineer will diligently and honestly perform the engineer's duties.

7. The preliminary improvement report shall include an investigation of the current condition of the portion of the project proposed to be improved, and provide a recommendation on separable maintenance allocations of project costs.

8. The preliminary improvement report shall include an investigation of the scope of the improvement, alternatives to the proposed improvement, the impact of any regulatory, permitting, and wetland requirements, and other environmental factors. The preliminary improvement report shall include analysis of downstream impacts of the proposed improvement on drainage, flooding, water quality, and similar environmental factors.

Dated this 24 day of June, 2019.



President of the High Island Creek Watershed
District Board of Managers

**PETITION FOR AN IMPROVEMENT OF
HIGH ISLAND WATERSHED PROJECT NO. 10**

TO: THE HIGH ISLAND WATERSHED DISTRICT (“DISTRICT”) BOARD OF MANAGERS, AS DRAINAGE AUTHORITY FOR HIGH ISLAND WATERSHED PROJECT NO. 10 (“DRAINAGE AUTHORITY”)

The Petitioners herein respectfully represent:

WHEREAS, High Island Watershed Project No. 10 is located in Sections 27, 28, 32, 33, 34 Washington Lake Township, Sibley County, and consists of a Mainline open ditch (“Mainline”) which includes a lift-pump system, the station being located in E ½ of the SE ¼ Section 33 of Washington Lake Township. Said open ditch outlets through a culvert across Sibley County Road No. 64 into the NE ¼ of Section 4, Jessenland Township, where the open ditch continues to its outlet to a legal DNR flowage easement into Silver Lake (together, “the system”); and

WHEREAS, the current Mainline commences in the SW corner of Section 27 of Washington Lake Township and proceeds southwesterly to cross the SE ¼ of the SE ¼ of Section 28, thence southerly through the NE ¼ of Section 33 and terminates at said outlet in Section 4 of Jessenland Township. Sibley County Road No. 64 lies upon the common boundary between Washington Lake and Jessenland Townships; and

WHEREAS, the existing system has insufficient capacity or requires maintenance and repairs, as well as improvements to furnish sufficient capacity or a better outlet; and

WHEREAS, the Petitioners’ intention is to increase the system’s drainage capacity and efficiency of its outlet by (1) relocating the existing lift-pump station closer to Sibley County Road 64 (220th Street) and utilizing the road culvert as a restriction for the purpose of water quality management, and (2) improving the lift-pump system by replacing the existing lift-pump and upgrading the pump size to current design capacities (“Proposed Improvement”) which would increase the pump system from 2,000 gallons per minute to 15,100 gallons per minute; and

WHEREAS, the starting point, general course and terminus of the proposed improvement project for the system is depicted on Exhibit A which is attached hereto for reference; and

WHEREAS, Petitioners assert that the proposed Improvement Project will benefit and be useful to the public and will promote the public health by controlling and alleviating the damage by flood waters; improving stream channels; regulating flow of streams and conserving the waters thereof; preventing, controlling, and alleviating soil erosion and sediment deposition in the water courses and other affected bodies of water; and

WHEREAS, Petitioners recognize that water storage benefits the entire system and requests that the engineer appointed by the Drainage Authority consider water storage designs into the Improvement Project. Petitioners further request and will support actively seeking outside funding for said water storage; and

WHEREAS, Petitioners further request that the engineer be specifically ordered to determine and offer alternative proposals for the consideration of the Drainage Authority which relate to the improvement of the drain capacity of the system that the engineer deems feasible, if any, including the cleaning of the Mainline as well as improvement to other portions of the ditch as necessary to improve the drainage capacity of the system to current standards; and

WHEREAS, a separable part of the drainage system may need repair, and Petitioners request, pursuant to Minn. Stat. §103E.215, subd. 6, that separable maintenance be used for those locations where existing tiles are being replaced with open ditch and/or new tile. Petitioners request that the engineer appointed by the Drainage Authority be ordered to determine a proportionate share of life span based on the existing condition versus the tiles original designed capacity, and further ordered to include in its detailed survey report and statement the proportionate estimated cost of the proposed improvement required to repair the separable part of the existing system and the estimated proportionate share of the cost of the added work required for the improvement.

WHEREAS, Petitioners recommend that the separable maintenance to be paid by the entire system is that percentage of the open ditch and in-place tile whose life span capacity has been used and that the improvement pay for that percentage of the open ditch and tile, life span or capacity that still is in repair. The landowners are requesting that a percentage be paid as separable maintenance by the entire system and a percentage be paid for by the improvement benefits as determined by the engineer and viewers; and

WHEREAS, the names and addresses of owners of the 40 acre tracts that the Proposed Improvement affects and passes over (indicated with a *), as depicted on the attached Exhibit A, are as follows:

Parcel 1	
Owner/Address:	Darren R. & Ursula M. Kroells 34355 200th St. Green Isle, MN 55338

Parcel 2
Owner/Address: Brian & Mark Zeiher and
Scott & Cory Zeiher
c/o Scott Zeiher
33956 206th St.
Green Isle, MN 55338

Parcel 2
Owner/Address: Scott A. Zeiher
33956 206th St.
Green Isle, MN 55338

Parcel 3
Owner/Address: Mark A. & Elaine A. Bates
P.O. Box 95
Green Isle, MN 55338

Parcel 4
Owner/Address: Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 5
Owner/Address: Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 6
Owner/Address: Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 7
Owner/Address: Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 8
Owner/Address: Mark A. & Elaine A. Bates
P.O. Box 95
Green Isle, MN 55338

Parcel 9

Owner/Address:

Mark A. & Elaine A. Bates
P.O. Box 95
Green Isle, MN 55338

Parcel 10

Owner/Address:

Randy & Sandy Malkow
34472 210th St.
Green Isle, MN 55338

Parcel 10

Owner/Address:

Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 11

Owner/Address:

Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 12

Owner/Address:

Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 13

Owner/Address:

Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 14

Owner/Address:

Paul R. Gohlke Revocable Trust and
Lisa M. Gohlke Revocable Trusts
31873 State Hwy. 25
Belle Plaine, MN 56011

Parcel 14

Owner/Address:

Robert & Brenda Holtberg
824 Sunrise Ln.
Belle Plaine, MN 56011

Parcel 15
Owner/Address: Gordon M. Bates & Sherry B. Bates
35479 210th St.
Green Isle, MN 55338

Parcel 16
Owner/Address: Gordon M. Bates & Sherry B. Bates
35479 210th St.
Green Isle, MN 55338

Parcel 17
Owner/Address: Gordon M. Bates & Sherry B. Bates
35479 210th St.
Green Isle, MN 55338

Parcel 18
Owner/Address: Fuller Family Farms Trust
c/o Walter H. Fuller
9124 W 47th St.
Brookfield, IL 60513

Parcel 19
Owner/Address: Fuller Family Farms Trust
c/o Walter H. Fuller
9124 W 47th St.
Brookfield, IL 60513

Parcel 20
Owner/Address: Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 21
Owner/Address: Daniel P. Graham
32420 224th St.
Henderson, MN 56044

Parcel 21
Owner/Address: John Dieball & Jennifer Faust Dieball
136 Morningside Dr. S.
Le Sueur, MN 56058

Parcel 21
Owner/Address: Randy Marttinen
417 2nd Ave. SE
Young America, MN 55397

Parcel 21
Owner/Address: Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 22
Owner/Address: Gordon M. Bates & Sherry B. Bates
35479 210th St.
Green Isle, MN 55338

Parcel 23
Owner/Address: Gordon M. Bates & Sherry B. Bates
35479 210th St.
Green Isle, MN 55338

Parcel 24
Owner/Address: Gordon M. Bates & Sherry B. Bates
35479 210th St.
Green Isle, MN 55338

Parcel 25
Owner/Address: Fuller Family Farms Trust
c/o Walter H. Fuller
9124 W 47th St.
Brookfield, IL 60513

Parcel 26
Owner/Address: Fuller Family Farms Trust
c/o Walter H. Fuller
9124 W 47th St.
Brookfield, IL 60513

Parcel 27
Owner/Address: Robert A. Kloth
13150 Tacoma Ave.
Nya, MN 55368

Parcel 28
Owner/Address: John Dieball & Jennifer Faust Dieball
136 Morningside Dr. S.
Le Sueur, MN 56058

Parcel 28
Owner/Address: Karl H. Dieball & Rosemary V. Dieball
33691 220th St.
Green Isle, MN 55338

Parcel 29
Owner/Address: Gordon M. Bates & Sherry B. Bates
35479 210th St.
Green Isle, MN 55338

Parcel 30
Owner/Address: Gerald & Jeanne C. Kreger
34726 220th St.
Henderson, MN 56044

Parcel 31
Owner/Address: Gerald & Jeanne C. Kreger
34726 220th St.
Henderson, MN 56044

Parcel 32
Owner/Address: Gerald & Jeanne C. Kreger
34726 220th St.
Henderson, MN 56044

Parcel 33
Owner/Address: Gerald & Jeanne C. Kreger
34726 220th St.
Henderson, MN 56044

Parcel 34
Owner/Address: Brian & Mark Zeiher and
Scott & Cory Zeiher
c/o Scott Zeiher
33956 206th St.
Green Isle, MN 55338

Parcel 35 Owner/Address:	Gerald & Jeanne C. Kreger 34726 220th St. Henderson, MN 56044
-----------------------------	---------------------------------------------------------------------

Parcel 35 Owner/Address:	R H Grand, LLC c/o Bruce E. Jeurissen 19450 281st Ave. Belle Plaine, MN 56011
-----------------------------	----------------------------------------------------------------------------------------

Parcel 36* Owner/Address:	R H Grand, LLC c/o Bruce E. Jeurissen 19450 281st Ave. Belle Plaine, MN 56011
------------------------------	----------------------------------------------------------------------------------------

Parcel 37 Owner/Address:	R H Grand, LLC c/o Bruce E. Jeurissen 19450 281st Ave. Belle Plaine, MN 56011
-----------------------------	----------------------------------------------------------------------------------------

Parcel 38 Owner/Address:	Brian & Mark Zeiher and Scott & Cory Zeiher c/o Scott Zeiher 33956 206th St. Green Isle, MN 55338
-----------------------------	---------------------------------------------------------------------------------------------------------------

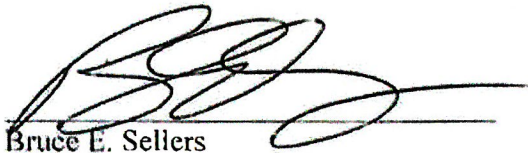
WHEREAS, this Petition is signed by: (1) at least 26% of the owners of the property affected by the proposed improvements; (2) at least 26% of the owners of the property that the proposed improvement passes over; (3) the owners of at least 26% of the property area affected by the proposed improvement; or (4) the owners of at least 26% of the property area that the proposed improvement passes over; and

WHEREAS, Petitioners provide herewith a corporate surety bond in the face amount of \$50,000 payable to the High Island Watershed District Board of Managers, as Drainage Authority for High Island Watershed Project No. 10, said bond conditioned to pay the costs incurred if the proceeding are dismissed or a contract is not awarded to allow the costs incurred to exceed the amount of the bond and that they will cause additional bond to be filed if it appears that the costs exceed the amount of the bond; and

WHEREAS, Petitioners have been informed and understand that they may not withdraw as a Petitioner at any time after this Petition is accepted by the Drainage Authority. Petitioners further acknowledge that if the proposed drainage project is not constructed, they are, and each Petitioner is, liable to the Drainage Authority for all of the costs incurred including engineering, legal and miscellaneous fees and expenses in relation to this Petition as outlined under Minnesota Statutes 103E; and

WHEREAS, this Petition may be signed in counterparts.

NOW THEREFORE, we, as Petitioners, ask the Sibley County Auditor to present this petition to legal counsel for the High Island Watershed District for examination and determination of its legal sufficiency. If the petition is determined sufficient, the Petitioners ask that the petition be presented to the High Island Watershed District Board of Managers, acting as the drainage authority for High Island Watershed Project No. 10, for the appointment of Jacob Rischmiller, I+S Group, or, in the alternative, another engineer skilled in drainage matters to examine the proposed work.



Bruce E. Sellers
Attorney for Petitioners
Wendland Sellers Bromeland, P.A.
825 East Second Street
P.O. Box 247
Blue Earth, MN 56013
507-526-2196

This petition is prepared by:
Bruce E. Sellers, Attorney at Law
Wendland Sellers Bromeland, P.A.
825 East Second Street, P.O. Box 247
Blue Earth, MN 56013
507-526-2196

**SIGNATURE PAGE FOR PROPOSED IMPROVEMENT PROJECT
TO HIGH ISLAND WATERSHED PROJECT NO. 10**

Printed or Typed Name of Petitioner(s): Robert A. Kloth

Ownership (check one)

- Individual
 Business
 Partnership
 Co-owner. How many _____
 Trust. How many trustees _____
 Other. _____

TRACT DESCRIPTION	ACRES "PASSED" OVER	ACRES AFFECTED
Tract 4	0.00	38.09
Tract 5	0.00	40.52
Tract 6	0.00	39.35
Tract 7	0.00	40.70
Tract 10	0.00	28.85
Tract 11	0.00	40.53
Tract 12	0.00	39.14
Tract 13	0.00	40.60

Tract 20	0.00	39.15
Tract 21	0.00	20.72
Tract 27	0.00	39.77

Robert A. Kloth
 Signature Title

5-10-19
 Date

Row-Kloth
 Signature Title

5-10-19
 Date

**SIGNATURE PAGE FOR PROPOSED IMPROVEMENT PROJECT
TO HIGH ISLAND WATERSHED PROJECT NO. 10**

Printed or Typed Name of Petitioner(s): R H Grand, LLC

Ownership (check one)

- Individual
- Business
- Partnership
- Co-owner. How many _____
- Trust. How many trustees _____
- Other. _____

TRACT DESCRIPTION	ACRES "PASSED" OVER	ACRES AFFECTED
Tract 35	0.00	12.43
Tract 36	38.69	38.69
Tract 37	0.00	40.82

Bruce Garrison President 5-4-19
 Signature Title Date

 Signature Title Date

 Signature Title Date

 Signature Title Date

ISG

Exhibit A
High Island
Project No 10
Sibley County,
Minnesota
Friday, April 26, 2019

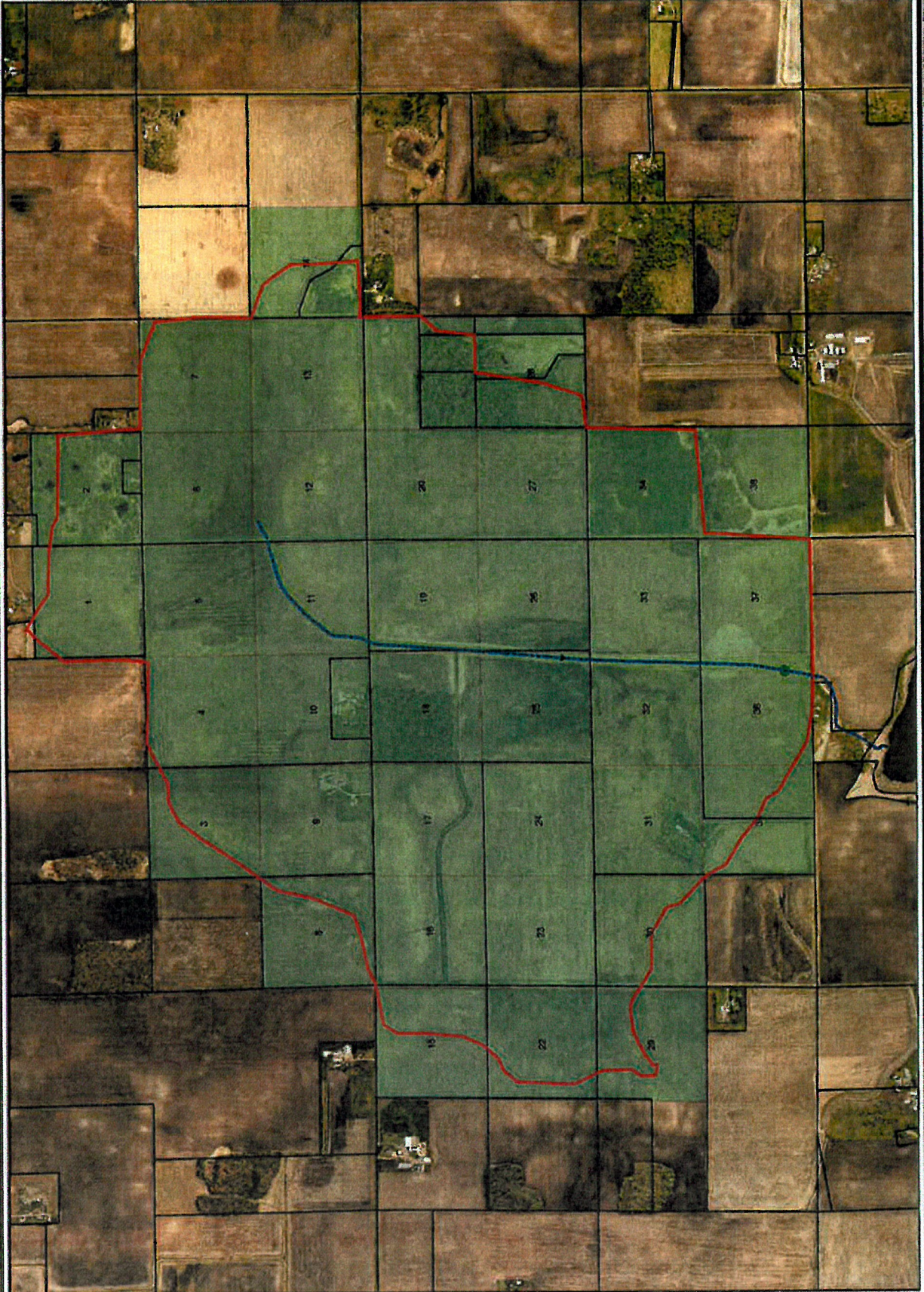
- Legend
- Orange 10 Watershed
 - Blue 10A Drainage Ditch
 - Green 10B Drainage Ditch
 - Black Sibley Parish
 - Green Pump/Location
 - Grey Empty Layer

PN: 19-00000X

SOURCE
Orthorectified Aerial Imagery, 2010
Minnesota State Plane, NAD 83
Minnesota State Plane, NAD 83
USDA (NR) (C) 2019
Maptarm (M) (C) 2019
Copyright (M) (C) 2019
PLEASE CONTACT ISG



0 250 500 1,000 Feet
1 Inch = 1,000 Feet



ENGINEER'S REPORT

Project No. 10

High Island Watershed District, Minnesota
RCM File No. 39040

RCM
rieke
carroll
muller
associates, Inc.
engineers
architects
land surveyors

Exh 4

RCM 39040

STATE OF MINNESOTA

HIGH ISLAND WATERSHED DISTRICT

TO THE HIGH ISLAND WATERSHED BOARD:

In the matter of High Island Watershed Project No. 10, the professional engineer appointed to act on this project reports that all matters set forth in the Petition and Order of the Board have been examined. A survey, plans, and specifications and a General Report on the watershed have been made.

THE PETITION

The Petition now under consideration states that:

"The Petitioners constitute a majority of the resident owners of the property over which this proposed improvement and extension passes.

"There presently exists a ditch created by private, and undertaking which commences in the Southwest Quarter of Section 27 of Washington Lake Township then proceeds to cross the Southeast Quarter of Section 28 and the East Half of Section 33 in Washington Lake Township. Sibley County Road No. 64 lies upon common boundary between Washington Lake and Jessenland Townships. On the north side of that road a pumping device has been lawfully installed which outlets the water through a culvert across the road into the Northeast Quarter of Section 4, Jessenland Township where the ditch continues and outlets into Silver Lake.

"It is the Petitioner's desire that said existing open ditch and pump be included as part of the High Island Watershed ditch system.

"That the inclusion of the private ditch within the High Island Watershed system is necessary to promote the orderly and efficient drainage of waters in the area and to provide for a system assessment for the costs incurred and the maintenance and repair of the ditch and pump."

THE LOCATION

The private ditch and pump station that is petitioned to become a public system is located in the Southwest Quarter of the Southwest Quarter of Section 27, Southeast Quarter of the Southeast Quarter of Section 28, and East One Half of Section 33, all located in Township 114, Range 26, Sibley County, Minnesota.

RCM 39040

THE WATERSHED

Lands that drain into this private ditch system are located in Sections 27, 28, 32, 33, and 34 of Township 114, Range 26, Sibley County, Minnesota.

The watershed consists of flat to gently rolling agricultural land currently drained by private ditches and networks of private tile lines. There are approximately 1,440 acres in the watershed of this project.

EXISTING CONDITIONS

A private open ditch system was constructed in the 1970's through the East Half of Section 33, Southeast Quarter of Southeast Quarter of Section 28, and terminated in the Southwest Quarter of the Southwest Quarter of Section 27. A pump station was installed about 1977 at Station 3+00. The pump installed was Parma Model No. 6, Serial No. 120432-2-6, consisting of a 30 hp motor, 12" suction pipe, capable of pumping approximately 2000 gpm (4.46 cfs) at a lift of 16.0'; the pump discharges through a 15" CMP outlet pipe into an open ditch. In addition to the pump station, a 36" overflow pipe was installed to carry spring runoff and flows from large rainstorm events.

The above open channel and pump station is proposed to be a part of the public drainage system.

There is also another private open ditch system that outlets into proposed High Island Ditch No. 10. This open ditch is located from the center of the Northeast Quarter of Section 33 to the west line of Section 33. This private open ditch is proposed to be left as a private ditch system. All of the private tile lines in the watershed are to remain as private tile lines.

NATURE OF THE PROJECT

No construction is proposed under this report. The private ditch from Station 0-33 (south right-of-way line of County Road #64) to Station 72+00 is to become a public drainage system including the pump station located at Station 3+00. The depths and widths of the open ditch are shown on the profile and cross section sheets.

The viewers on this project will be notified that Minnesota Statutes require a minimum of one-rod grass strip be left on each side of the open ditch as a permanent easement. The viewers should consider this when awarding benefits and damages to this project.

DESIGN & OUTLET CONSIDERATION

Storm water runoff from the watershed area drains downstream to the pump station location at ditch station 3+00 which is approximately 300 feet north of County Road #64. At this location there is the pump station and a 36 inch diameter overflow culvert.

RCM 39040

The pump station consists of a 6 foot diameter vertical sump with a 57"x38" CMP Arch inlet pipe. At present, there is one No. 6 Parma Pump with a 30 Hp electrical motor. The static lift is about 16 feet. The pump is reported to pump at a rate of about 2000 gpm (4.46 cfs). The pump invert is at about elevation 974.0 which is near the existing ditch bottom (see plans).

The 36 inch CMP overflow pipe has an invert elevation of 982.6 and a top of pipe elevation of 985.6. The top of pipe elevation is above or very close to low spot elevations which are present at various locations along the ditch system.

The 36 inch CMP overflow pipe was installed to discharge high flows in the ditch system from larger intensity rainfall events and spring snow melt/runoff. The pump station serves to pump ground water and low intensity rainfall events out of the lower portions of the ditch system in order to lower the water table and provide drainage to low lands along the system that would otherwise have ponding or a poor outlet into the drainage system.

The outlet system for proposed H.I. #10 consists of an existing 48 inch RCP culvert under Sibley County Road #64 and a drainage channel which leads into Silver Lake. The drainage channel is somewhat shallow and runs through a broad wetland/lake fringe area.

Because of low lying lands upstream of the 36 inch overflow culvert, this culvert can function as an acceptable drainage device when no surcharge or headwater exists at the upstream end of the culvert. Under this condition, the flow through the culvert is approximately 31 cfs. Even at this flow condition, some of the lowlands in the watershed have ponded areas of water. If the pump station is also running, its discharge is 4.46 cfs. The total discharge into the outlet system is 35.46 cfs.

The capacity of the 48 inch County Road #64 culvert at full flow conditions is 68 cfs. The channel from the county culvert to Silver Lake is a channel running through a broad wetland area capable of receiving the discharge from the pump station and the 36 inch overflow culvert.

The outlet is adequate.

CONFORMANCE WITH THE OVERALL PLAN OF THE HIGH ISLAND WATERSHED PROJECT

WATERSHED OBJECTIVES: (Revised 1988)

The High Island District was created by order of the Water Resources Board for the following enumerated purposes:

1. Control and alleviation of damage by flood waters.
2. Improvement of stream channels.
3. Reclaiming wet and overflowed lands.

RCM 39040

4. Regulating the flow of streams and conserving the waters thereof.
5. Diverting and changing water courses in part.
6. Conserving water supply for domestic, recreational and other public uses.
7. Consolidation of existing drainage systems within the District and the repair and improvement thereof.
8. The imposition of preventive and remedial measures for the control and alleviation of land and soil erosion and sediment deposition in water courses and other bodies of water affected thereby.
9. Providing the regulation and control of the use of streams, ditches and other water courses for the purpose of disposing of sewage and other wastes.

The following are also considered by the Managers and their advisory committee to be proper District objectives:

1. Providing for wildlife by controlling, preserving and regulating waters and by reclaiming wet and overflowed lands.
2. Providing for recreational areas such as parks and camps by controlling, preserving and regulating waters, by reclaiming wet and overflowed lands and by acquisition of lands where necessary in the public interest.

Comments on those objectives are as follows:

1. The project as completed in 1977 reduced the flooding of agricultural lands by construction of an open ditch and pump station. The petition requests that this construction now become a public system.
2. Prior to construction in the 1970's, this channel was a natural waterway affording minimal drainage to the watershed area. This waterway was realigned and deepened in the 1970's.
3. The majority of the lands in the watershed prior to 1970 were wet and overflowed because of inadequate outlet into Silver Lake.
4. The existing open ditch acts as a reservoir during certain periods of excess rainfall when the channel has been emptied by the pump station. The 36" overflow culvert at Station 3+00 meters the discharge rate of water flowing into Silver Lake during high rainfall events.
5. The channel was realigned during the 1970's construction period.

RCM 39040

6. Because the lands in the watershed have been used for agricultural purposes since construction of the ditch in the 1970's, there are no domestic, recreational, or other public uses in the watershed.
7. This project as petitioned is for changing a private system into a public system. Any future maintenance costs will be born by the system instead of individual landowners.
8. No additional construction is proposed for this project with the exception of providing a 1 rod grass strip on each side of the project to help protect the ditch banks from erosion and siltation.
9. The project, as petitioned, will have no affect on the use of streams or water courses within the watershed district.

Comments to additional objectives:

- A. This project does not propose any new construction except for creation of the 1 rod grass strip; therefore, wildlife will not be affected.
- B. This project will not change the characteristics of the watershed. There are no lands being acquired for public interest.

DAMAGES, BENEFITS, COST OF THE PROJECT

The petitioners for establishment of this project have stated that the cost of construction for the open ditch, pump station, electrical service, overflow culvert and land required for open ditch construction have been borne by the petitioners and the petitioners are not requesting payment nor reimbursement for these costs. Therefore, in the matter of establishing these items of the drainage system, there is no cost assessed to the befitted lands.

There will be a cost/damage incurred for taking land to create a permanent, one rod grass strip along both sides of the established drainage ditch system. This cost is shown elsewhere in this report. The petitioners have also stated that those landowners adjacent to the course of proposed H.I. #10 will each absorb the cost to prepare and seed the one rod grass strip next to the ditch bank and therefore, this will not be a cost for benefitted lands in the watershed area. There are other administrative, legal, engineering, and viewing costs which will be incurred; these costs are also shown elsewhere in this report.

The benefits aspect of this project involve a special approach for consideration and determination since there will be no actual construction taking place. Benefits must be considered based upon the drainage and outlet value of the inplace drainage system as compared to the natural drainage system and ponding areas existing prior to conversion of the land from its natural state to a constructed drainage system with pump station as described in this report.

The Engineer estimates that there are approximately 300 acres in the watershed which receive significant direct benefits from the drainage system; these benefits result from drainage of the lands, and improved outlet for private ditch or tile systems which would otherwise have submerged outlets or water ponded in these systems. The benefit to these lands is approximately \$1,100.00 per acre for a total benefit value of \$330,000.00.

There are other lands adjoining the directly benefitted lands that receive indirect benefits from the drainage system. It is estimated that there are approximately 300 acres receiving indirect benefits. These benefits result from drainage of the lands, furnishing or making available an improved outlet for surface and subsurface drainage, improved equipment access to lower and higher lands, increase capacity resulting from converted use of these lands, and costs related to increased maintenance expense in the system. The benefit to these lands is approximately \$700.00 per acre for a total benefit value of \$210,000.00.

There are some upland areas converted to farmed or developed lands which should be assessed benefits for the drainage system. These lands benefit from the system which serves to receive their storm water runoff, handle and control the runoff to the point of discharge, remove sediment or other debris which serves to improve water quality and reduce sediment deposition on the lands and private drainage systems, and benefits resulting from a need for the downstream drainage system to have greater capacity to handle or control the runoff from these lands as well as increased maintenance requirements related to sediment removal and other potential drainage system maintenance expenses. It is estimated there are approximately 800 acres of other benefitted areas receiving these types of benefits. The benefit to these lands is approximately \$20.00 per acre for a total benefit value of \$16,000.00.

The total dollar value to those lands expected to realize benefits from the drainage system is approximately \$556,000.00. In addition to the land benefits, there are also road benefits which would add to the amount of total benefit value.

NECESSITY

At the present time, only a few of the landowners pay for pumping and drainage system maintenance costs. There is a considerable amount of land that drains or outlets into the drainage system and is benefitted by the existing open ditch and pump station. These lands will be included in the public drainage system watershed.

ESTIMATED COST

Damages		
One Rod Grass Strip	5.5 Acres	\$6,600.00
Engineering Fees		15,000.00
Legal Fees		5,000.00
Administrative Costs		1,000.00
Viewing Fees		<u>5,000.00</u>
TOTAL ESTIMATED COST		\$32,600.00

RCM 39040

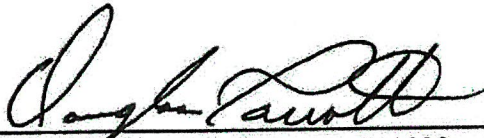
CONCLUSIONS

The project as petitioned and described in this report is practical and feasible and sufficient evidence for its establishment has been provided. The project will be a public benefit and continue contributing to the public health and welfare of the area. The existing open ditch channel and pumping system should be incorporated into a public drainage system. The estimated benefits exceed the estimated damages.

RECOMMENDATION

It is recommended that viewers be appointed and file a report on benefits and damages; the necessary hearings be held; the landowners adjacent to the ditch to be required to prepare and seed 1 rod of permanent grass strip adjacent to the ditch; and the system be established according to these plans and report from ditch Station 0-33 (south right-of-way line of County Road 64) to Station 72+00.

Respectfully submitted,



Douglas A. Parrott, P.E.; License #11632

February 22, 1999

Date

RCM 39040

AREA OF RIGHT-OF-WAY

<u>Description</u>	<u>Sec</u>	<u>Twp</u>	<u>Rge</u>	<u>1 Rod Grass Strip Area</u>
SW 1/4 of SE 1/4 ✓	33	114	26	1.0
NW 1/4 of SE 1/4	33	114	26	1.0
SE 1/4 of NE 1/4	33	114	26	0.3
SW 1/4 of NE 1/4	33	114	26	0.7
NE 1/4 of NE 1/4	33	114	26	0.7
NW 1/4 of NE 1/4	33	114	26	0.3
SW 1/4 of SW 1/4	27	114	26	0.1
SE 1/4 of SE 1/4	28	114	26	1.4

RCM 39040

DESCRIPTION OF COURSES

Beginning at a point 2 rods East and 70 rods North of the southwest corner of Section 27, Township 114, Range 26, Sibley County, Minnesota; thence Southwesterly through the Southeast Quarter of Southeast Quarter of Section 28, Township 114, Range 26 to a point 75 rods West of the southeast corner of said Section 28; thence Southerly through the Northeast Quarter of Section 33, Township 114, Range 26 to a point 85 rods West of the east quarter corner of said Section 33; thence continuing Southerly to and terminating at a point 95 rods West and 2 rods South of the northeast corner of Section 4, Township 113, Range 26.

LIST OF LANDOWNERS LIKELY TO BE AFFECTED BY PROJECT NO. 10

<u>Owner</u>	<u>Description</u>	<u>Sec</u>	<u>Twp</u>	<u>Rge</u>
Wm. J. & Joseph C. & Patrick McGuire Margaret A. Boyle	Part of Gov't. Lot 3	4	113	26
Brian & Roxanne Zeiher	Parcel in SW1/4 of NW1/4	27	114	26
Doris Zeiher	SW1/4 of NW1/4 Exc. Parcel	27	114	26
Donovan & Nelda Duenow	SW1/4	27	114	26
John Edward & Earl Louis Flynn	NW1/4 of SE1/4 & W1/2 of SW1/4 of SE1/4	27	114	26
Roger D. & Eldora L. Kroells	SE1/4 of NE1/4	28	114	26
Mark A. & Elaine A. Bates	E1/2 of SW1/4 & SW1/4 of SW1/4	28	114	26
Dennis K. & Elizabeth L. Tuchtenhagen	SE1/4	28	114	26
Gordon M. & Sherry B. Bates	E1/2 of NE1/4 & N1/2 of NE1/4 of SE1/4	32	114	26
Gordon M. & Sherry B. Bates	NW1/4	33	114	26
Walter H. & Beverly J. Fuller	NE1/4	33	114	26
Gerald Kreger	N1/2 of SE1/4, N1/2 of SW1/4 & W1/2 of SE1/4 of SW1/4	33	114	26
Wm. Joseph & Pat McGuire	S1/2 of SE1/4 & E1/2 of SE1/4 of SW1/4	33	114	26
Dennis K. & Elizabeth L. Tuchtenhagen	W1/2 of NW1/4 & N1/2 of NE1/4 of NW1/4	34	114	26
Doris Zeiher	NW1/4 of SW1/4	34	114	26

RCM 39040

Lee A. & Don R. Sauter	W1/2 of S1/2 of NE1/4 of NW1/4	34	114	26
Timothy E. & Mary J. Boelter	Parcel in S1/2 of NE1/4 of NW1/4	34	114	26
Karl H. & Rosemary Dieball	W1/2 of SE1/4 of NW1/4	34	114	26
Sibley County	County Roads			
Washington Lake Township	Township Roads			

SECTION 02480

TEMPORARY EROSION CONTROL AND SEEDING

PART 1: PRODUCTS

1.00 SEED

- A. Seed shall be tagged to comply with the requirements of the seed mixture required herein, subject to the approval of the Engineer. Seed shall conform to MnDOT Specification 3876.
- B. The seed mixture shall be as follows:

<u>KIND OF SEED</u>	<u>PURITY MINIMUM PERCENT</u>	<u>GERMINATION MINIMUM PERCENT</u>	<u>WEED SEED MAXIMUM PERCENT</u>
Smooth Brome	90	85	0.50
Alfalfa	99	85	0.50
Oats	99	85	0.10
Rye	99	85	0.10

The alfalfa shall be certified seed. Alfalfa may be pre-inoculated or if not pre-inoculated, it will be inoculated by being mixed with an approved inoculant at the recommended rate. No more seed shall be inoculated at one time than will be sowed within five (5) hours. If such seed stands more than five (5) hours, it shall be reinoculated before being sown. If pre-inoculated seed is used, the preceding is not required unless a period of greater than six (6) months expires from the date of treatment.

- C. The seed shall be delivered to the site in tagged and labeled bags to show the percentage of purity and germination. The seed shall have been tested within six months prior to the date of seeding and shall conform to the latest seed laws of the United States and of the state.

1.01 FERTILIZER

- A. Commercial formula fertilizer containing minor trace elements shall conform to applicable state fertilizer laws. All areas requiring seeding shall be fertilized with 20-10-10 (N.P.K.), unless otherwise noted in the drawings or specifications. Animal manure shall not be substituted for commercial fertilizer.

PART 2: EXECUTION

2.00 SEEDING BERMS, SPOIL BANKS, AND OTHER AREAS

- A. Seeding shall be performed immediately after completion of the finished shaping, unless otherwise directed by the Engineer, except that no seeding will be permitted from September 15 through April 14 except at the Contractor's own risk. All berm and spoil bank leveling work completed during this dormant period shall be seeded at the earliest opportunity in the following spring seeding period.
- B. The seedbed shall be prepared with a springtooth field tiller, disk or similar equipment to a minimum depth of three (3) inches. If the area to be seeded has dried unusually hard, a heavy soil conditioner shall be used to loosen the surface. All clods, rocks, blacktop chunks, roots, brush and other undesirable materials that would interfere with seeding operations shall be removed and disposed of as directed by the Engineer. If weeds have been allowed to grow up on the finished berm and spoil banks, they shall be mowed and raked off the area to be seeded prior to spreading fertilizer and preparing the seedbed.
- C. Seed type and application rate shall be as follows:
- Smooth Brome (Lincoln, Achenback or Fischer) 8 pounds per acre. Alfalfa (Vernal of Ranger), inoculated, 10 pounds per acre. Oats, 1 1/2 bushel per acre or Rye, 1/2 bushel per acre. (Note: Oats shall be used as a nurse crop for spring seeding from April 15 through August 14 and Rye shall be used as a nurse crop for fall seeding, August 15 through September 15.)
- D. Seed shall be uniformly sown over the area with a machine-operated mechanical seeder at the rates specified. Hand seeding around inlets or pipes and for a distance of ten (10) feet back on the approach to the inlet of the pipe shall be required to insure adequate distribution of seed. The grass and legumes shall be seeded to a depth of not more than one-half (1/2) inch; the Oats or Rye shall be seeded to a depth of between one and one-half (1 1/2) and two (2) inches.
- E. Immediately after the seed has been sown, the entire area shall be raked, dragged or harrowed sufficiently to cover the seed unless a cultipacker seeder or press drill was used. Any undesirable materials described above which are uncovered or exposed during seeding operations or which may be present in the seeded area shall be removed and buried or otherwise disposed of at locations approved by the Engineer. All pipe inlets and pipe drop inlets shall be cleaned of any material which may have been deposited in the inlets during seeding operations.

RCM 39040

2.01 FERTILIZING

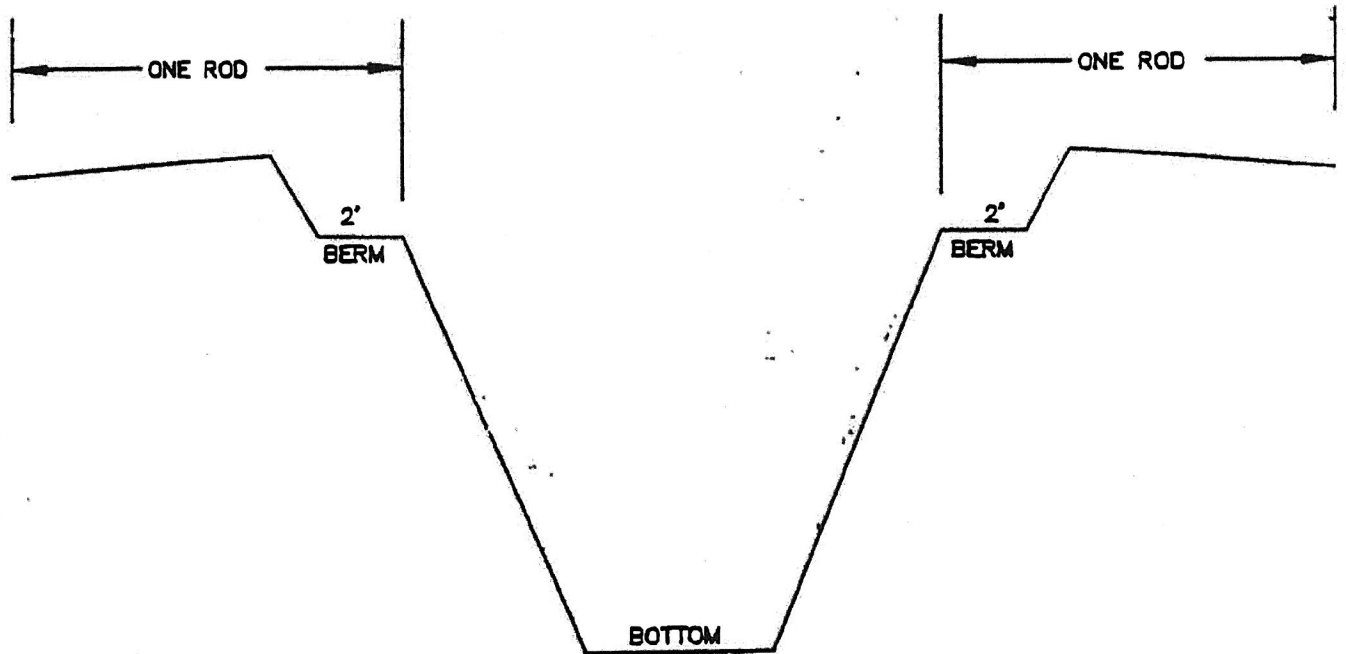
- A. Before the seeding operation, apply to all areas a 20-10-10 (N.P.K.) commercial fertilizer as specified at a rate of 400 pounds per acre. Fertilizer must be dry and free flowing when applied. Caked or deteriorated materials will not be permitted.
- B. On ditch bank slopes, apply fertilizer by hand or by hand operated cyclone applicator. Apply fertilizer in other areas with a mechanical spreader and thoroughly mix in. Seed and fertilizer shall NOT be applied in the same operation.

2.02 MAINTENANCE

- A. Maintenance of seeded areas shall commence immediately after planting. Contractor shall be responsible for maintenance of seeded areas until final acceptance by the Owner or until final stabilization has occurred. Final stabilization is defined as having a uniform perennial vegetative cover with a density of 70% vegetative area over the entire seeded area.
- B. Contractor shall be responsible for reseeding areas, which do not establish vegetative cover, in accordance with provisions for Risk described in the Summary of Work\Special Provisions. Additionally, Contractor shall be responsible for reseeding during those growing months/seasons where monthly average rainfall conditions are within 25% of SCS established monthly average rainfall conditions.
- C. For those events or seasons which exceed conditions described in paragraph B, Owner will pay Contractor for reseeding work.

END OF SECTION 02480

SEEDING DETAIL



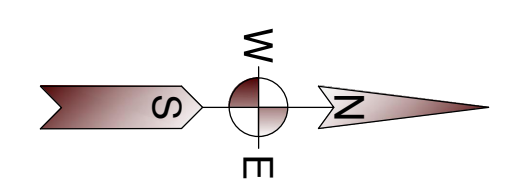
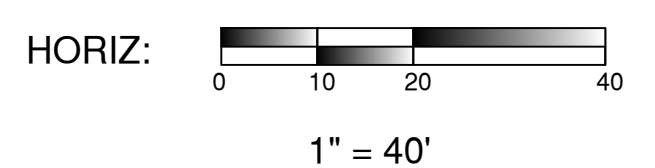
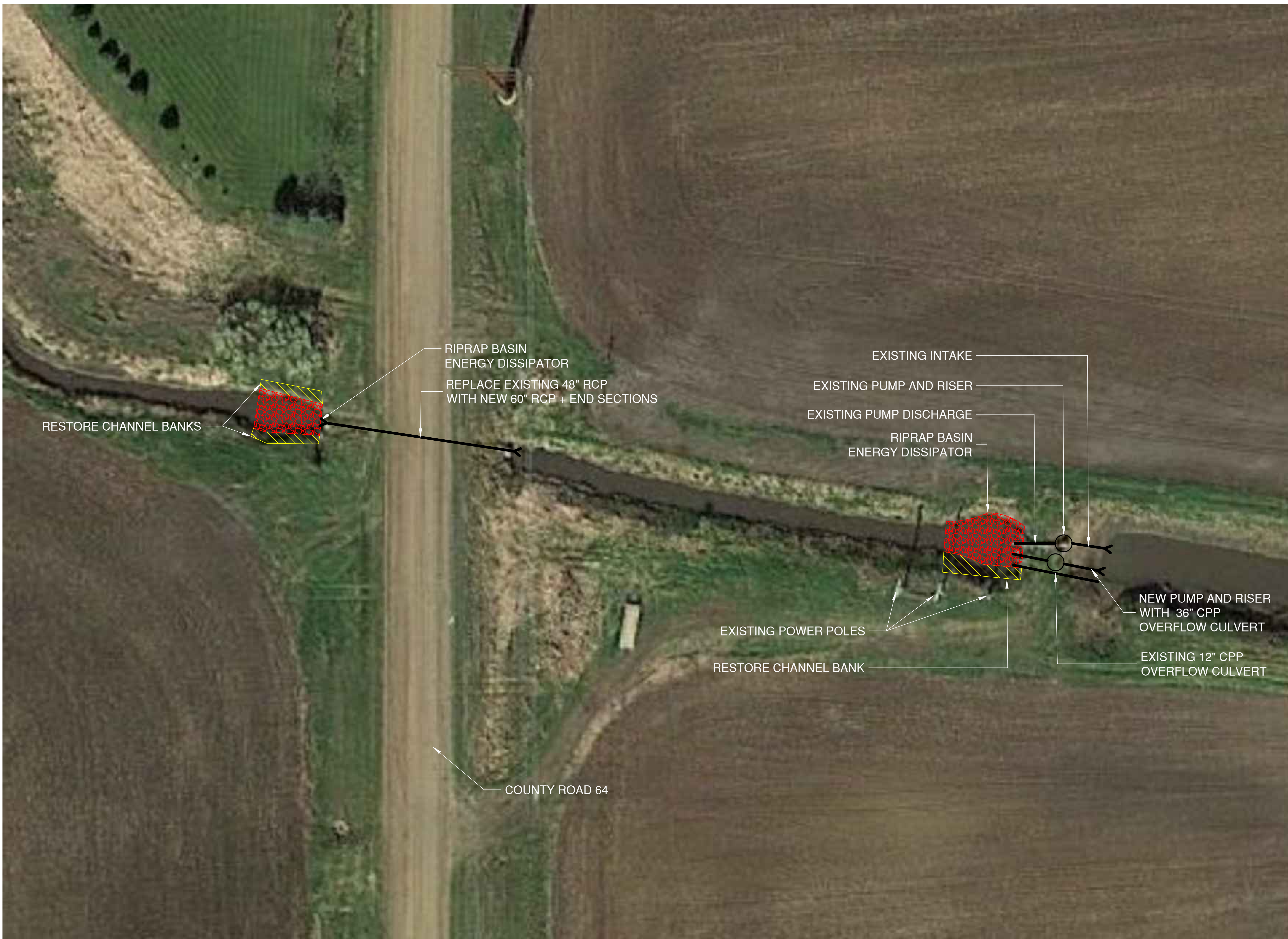
GA DRAWINGS: RCHL19\SEED-01 3-3-95 2:58:49 pm EST

RCM rieke
carroll
muller
associates, inc.

Appendix B

Proposed Improvement Plan

REVISION NO.	SECTION NO.	SHEET NO.
####	###	###
####	###	###



LEGEND	
	PUMP AND RISER
	PUMP DISCHARGE
	INTAKE
	CULVERT
	RIP RAP BASIN ENERGY DISSIPATOR
	RESTORE CHANNEL BANK

This document is preliminary and not for construction or implementation purposes.

Ulteig
 1345 Hwy 10 West
 Detroit Lakes, Minnesota 56501
 Phone: 701.280.8500
 Web: www.ulteig.com
We listen. We solve.™

HIGH ISLAND CREEK
 WATERSHED DISTRICT
 PROJECT 10

PROPOSED IMPROVEMENT PLAN

DRAWN BY: J. HALLISEY
 CHECKED BY: R. CLAY
 APPROVED BY: R. CLAY
 DATE: OCTOBER, 2019 | UEI PROJ. NO: 19.00929

Appendix C

Opinion of Probable Construction Cost

Opinion of Probable Construction Cost

Project: High Island Creek Watershed District Project 10 - 2019 Petition

28-Oct-19

Roadway

Line No.	Item	Quantity	Unit	Unit Price	Total Price
1	2021.501 Mobilization	1	LS	\$ 5,000.00	\$ 5,000.00
2	2101.501 Clearing and Grubbing	1	LS	\$ 2,000.00	\$ 2,000.00
3	2104.503 Remove 48" Reinforced Concrete Pipe Culvert	85	LF	\$ 25.00	\$ 2,125.00
4	2105.507 Common Borrow (LV)	500	CY	\$ 20.00	\$ 10,000.00
5	2211.503 Aggregate Base (CV) Class 5	200	CY	\$ 25.00	\$ 5,000.00
6	2501.511 60" RC Pipe Culvert Class 3	108	LF	\$ 460.00	\$ 49,680.00
7	2501.515 60" RC Pipe Aprons	2	EA	\$ 3,100.00	\$ 6,200.00
8	2451.609 Pipe Bedding Material	20	CY	\$ 40.00	\$ 800.00
9	2511.504 Random Rip Rap (Class III)	50	Ton	\$ 95.00	\$ 4,750.00
10	2568.60 Traffic Control	1	LS	\$ 2,500.00	\$ 2,500.00
11	2573.54 Filter Log Type Straw Bioroll	50	LF	\$ 3.00	\$ 150.00
12	2575.501 Seeding	0.4	Acre	\$ 500.00	\$ 200.00
13	2575.502 Seed Mixture Type 35-241	12	Pound	\$ 16.00	\$ 192.00
14	2575.503 Floation Silt Curtain Type Moving Water	40	LF	\$ 25.00	\$ 1,000.00
15	2575.511 Mulch Material Type 1	0.4	Ton	\$ 320.00	\$ 128.00
16	2576.523 Erosion Control Blanket Category 3	420	Sq Yd	\$ 1.50	\$ 630.00
17	2575.532 Fertilizer Type 3 (22-5-10)	140	Pound	\$ 0.70	\$ 98.00
	Roadway Subtotal				\$ 90,453.00

Pump Station

Line No.	Item	Quantity	Unit	Unit Price	Total Price
18	Supply Pump - 7500 gpm at 15-ft lift, 60HP 3 Phase with step up booster (convert 230v to 460v), 2-floats, electrical components	1	LS	\$ 49,879.00	\$ 49,879.00
19	Supply Discharge Piping for New and Existing Pumps, Buried	1	LS	\$ 5,008.00	\$ 5,008.00
20	Supply Rip Rap, Suction and Discharge Sides	1	LS	\$ 8,744.00	\$ 8,744.00
22	Install Pump, Piping, Rip Rap	1	LS	\$ 5,800.00	\$ 5,800.00
23	Supply and Install 72-inch Riser With 36-inch Intake	1	LS	\$ 26,400.00	\$ 26,400.00
	Subtotal Pump Station				\$ 95,831.00

Separable Maintenance Costs

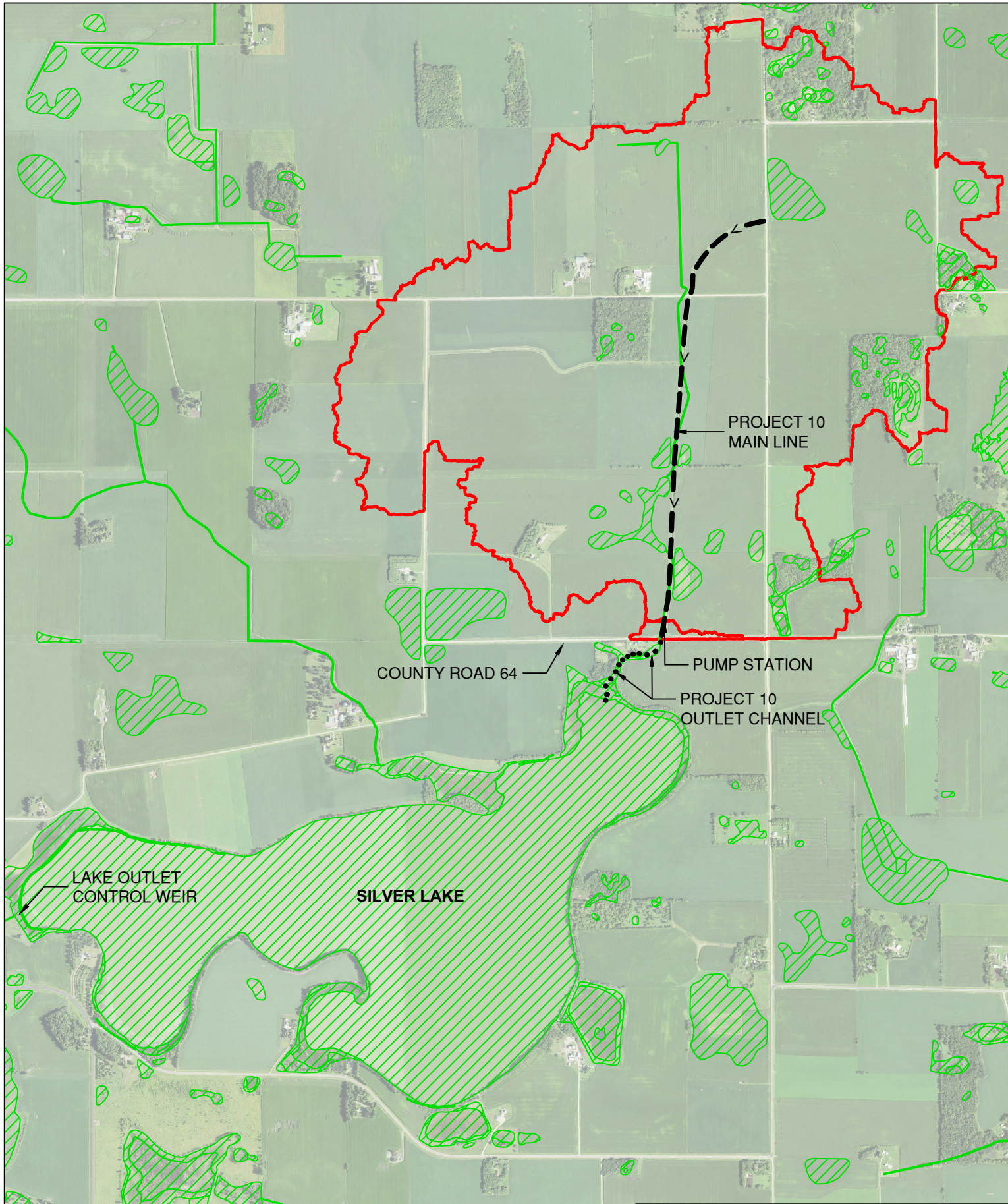
25	Bank Repair Downstream CR 64				\$ 8,550.00
26	Bank Repair Downstream Pump Station				\$ 4,500.00
	Subtotal Separable Maintenance				\$ 13,050.00

Summary

	5% Construction Contingency				\$ 9,966.70
	Permanent Easement for CR 64	0.15	Acre	\$ 8,000.00	\$ 1,200.00
	Temporary Easement for CR 64	0.05	Acre	\$ 8,000.00	\$ 400.00
	Total Estimated Construction Cost				\$ 210,900.70
	Legal, Administration, Viewing				\$ 10,000.00
	Engineering				\$ 44,734.25
	Total Estimated Improvement Cost				\$ 265,634.95

Appendix D

Wetlands in Project 10 Watershed



PROJECT 10
MAIN LINE





COUNTY ROAD 64

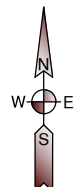
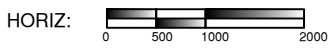
PUMP STATION

PROJECT 10
OUTLET CHANNEL

LAKE OUTLET
CONTROL WEIR

SILVER LAKE

LEGEND	
	WATERSHED BOUNDARY
	MAIN LINE
	OUTLET CHANNEL
	WETLAND






EXHIBIT 3

WETLANDS IN PROJECT 10 WATERSHED

HIGH ISLAND CREEK WATERSHED DISTRICT

SIBLEY COUNTY, MINNESOTA