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Final Engineer's Report

Improvement of Judicial Ditch No. 91

Redwood County and Yellow Medicine County, Minnesota

July 2020

S15.120237

Submitted by:
Bolton & Menk, Inc.
1243 Cedar Street NE
Sleepy Eye, MN 56085
P: 507-794-5541
F: 507-794-5542

Certification

Final Engineer's Report

For

Improvement of Judicial Ditch No. 91

In

Redwood County and Yellow Medicine County, Minnesota

S15.120237
July 2020

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.

By: Shaun P. Luker

Shaun P. Luker, P.E.
License No. 48756

Date: 7-14-2020

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STATE OF MINNESOTA

REDWOOD COUNTY & YELLOW MEDICINE COUNTY

IN THE MATTER OF THE PETITION FOR AN IMPROVEMENT OF A PUBLIC DRAINAGE SYSTEM IN REDWOOD COUNTY AND YELLOW MEDICINE COUNTY, MINNESOTA:

In December 2019, the Redwood County and Yellow Medicine County Joint Board acting as the Drainage Authority accepted a petition for the improvement of Redwood County and Yellow Medicine County Judicial Ditch No. 91 (JD 91) in accordance with Minnesota Statute 103E.215.

The Drainage Authority considered the matter at a Preliminary Hearing on May 19, 2020. At that time the Drainage Authority found that the proposed project meets the requirements for an Improvement and ordered the preparation of this Final Engineer's Report and appointed Viewers to determine the benefits and damages for the system.

This report summarizes the findings of the research, and analysis and is submitted for consideration by the Drainage Authority.

I. LOCATION AND SCOPE OF IMPROVEMENT

The petitioned area for the improvement of Judicial Ditch No. 91 lies within and provides drainage to portions of Sections 4, 5, 8 and 9 of Underwood Township in Redwood County and portions of Section 33 of Posen Township in Yellow Medicine County. The system consists of open ditches and underground tiles. At the end of the open ditch is an existing pump station that pumps the water from the main open ditch, and into culverts under County State Aid Highway 46 and into Timm Lake in Section 34 of Posen Township, Yellow Medicine County. The total estimated watershed for the ditch system, is 886 acres.

The proposed improvement of Judicial Ditch No. 91include upgrades to the pumping station near the outlet into Timm Lake. Exhibit 1 is the copy of the petition for the improvement. Exhibit 2 shows the general location of the JD 91 system and the pumping station.

II. EXISTING DITCH SYSTEM

The existing ditch system was established in 1954 with the original pump station constructed in 1954. Since then, minor repairs and replacements have been made to the original pump station structure, and the pumps themselves.

The existing pump station consists of two mixed flow pumps, one with a 20-horsepower capacity and the other with a 30-horsepower capacity. The discharge pipes for each of the pumps is 12-inches in diameter. Each of these discharge pipes connects to culverts that drain under County State Aid Highway 46 and discharges into Timm Lake.

III. CAPACITY OF EXISTING DRAINAGE SYSTEM

The existing drainage system is comprised of both open ditch and drain tile with a pumping station at the outlet. The portion petitioned for improvement is for the pumping station. The design capacity of the existing pumping station from the original construction plans with both pumps in operation is 4,000 gallons per minute.

The petitioners have reported that the pumping capacity of the existing station is inadequate to keep up with the drainage needs of the watershed. The petitioners have reported that the tile systems that drain into the open ditch system are often underwater and unable to drain freely. The petitioners

have reported that the high-water elevations in the open ditch have resulted in regular crop loss in the depressional areas of the watershed.

The estimated capacity of the existing open ditch used the Manning equation. The amount of drainage needed for modern crop production has been compared to standards recommended by the Natural Resources Conservation Service (NRCS). The NRCS Engineering Field Handbook Minnesota Supplement 650.0703 for Grassed Waterways Curve 2 was used to determine the design discharge for the ditch watershed.

NRCS Code 608 guidance states that one foot of freeboard should be provided between the design water surface profile in the open ditch, and the ground elevation of the low areas being served by the open ditch. A summary of the existing capacity for the open ditch is in Table 1.

Table 1: Existing Ditch System Capacity						
Tile/Branch	Location	Drainage Area (Acres)	NRCS Flow (CFS) (Curve 2)	NRCS Flow (GPM)	Calculated Ditch Capacity (CFS)	Ditch Efficiency (%)
JD 91 Main	Outlet	886	33	14,811	64	1.93

As can be seen in Table 1, the existing ditch system should be able to provide a flow capacity of 33cfs or approximately 14,800 gallons per minute in order to meet the NRCS recommended capacity for this watershed. The shape and slope of the ditch can provide a capacity of 64cfs, or nearly double the recommended capacity, but the pumping station is only able to pump at 4,000 gallons per minute or approximately 27% of the recommended capacity.

This limitation on the outlet of the JD 91 open ditch causes water to sit in the main open ditch for extended periods causing the water to become stagnant and prone to algae blooms which can then clog the pumps. The sitting water in the ditch also causes the ditch banks to become saturated and kills off the vegetation that line the open ditch banks. This combination results in greater erosion of the ditch banks.

The petitioners also noted that the existing pumping station requires frequent maintenance and observation to make sure that the pump station is operating properly. The pump station must be manually shut off during cold weather to prevent damage to the pumps from ice. The pump wet well also needs to be cleaned of vegetation during the summer months that plug the pumps. The petitioners would also like to ensure that adequate controls are installed so that the pumps can operate more independently.

IV. DISCUSSION OF IMPROVEMENT

As noted earlier, the petitioners have requested the improvement of JD 91. The petitioners have requested the consideration of improvements to the pumping station near the outlet of JD 91 into Timm Lake. A preliminary hydrologic and hydraulic analysis of such a drainage system was performed to establish a preliminary size of the pumping station, to determine quantities for construction of such a system, and analyze the outlet. General observations and results of the analysis are summarized as follows:

A. DESCRIPTION

1. Pump Station Improvements Option 1

The first option that the petitioners wanted to consider was improvements to just the controls and sensors that are used to operate the existing 20-horsepower and 30-horsepower pumps. The goals of upgrading the controls and sensors are as follows:

- Installation of a non-contact level sensor for determining the water level in the wet well.
- The ability to operate the existing pumps at variable speeds to match the water level in the wet well.
- The ability to purge the sump of floating vegetation that occurs seasonally.
- Alarm system and temperature control system.

2. Pump Station Improvements Option 2

The second option will be to rehabilitate the existing pumping station to provide a pumping capacity approximately equal to a 1-inch per day drainage coefficient for the upstream watershed of 16,000gpm.

The pumping station rehabilitation will consist of the following items:

- Spot repairs as necessary to the structure of the concrete wet well.
- Two 75 H.P. pumps with a pumping capacity of 8,000gpm each.
- Pump station controls, non-contact level sensor, temperature control, and alarm.
- Two 24-inch diameter forcemain pipes from the wet well
- Riprap at the outlet of the forcemain to minimize erosion.
- The power supply to the new pumping station site will need to be upgraded.
- Three phase power would need to be brought from approximately two miles away.

3. Pump Station Improvements Option 3

The third option will be to rehabilitate the existing pumping station to provide a pumping capacity approximately equal to a ¾-inch per day drainage coefficient for the upstream watershed of 12,000gpm, but allow the pumps to potentially be operated at a higher rate in order to achieve the 1-inch per day drainage coefficient of 16,000gpm. The benefit of this option is that the overall pump sizes are smaller and therefore less expensive, and three phase power would not need to be supplied.

The pumping station rehabilitation will consist of the following items:

- Spot repairs as necessary to the structure of the concrete wet well.
- One new 30 H.P. pump with a pumping capacity of 4,000gpm each, and modifications to the existing 30 H.P. pump and 20 H.P pump to obtain a pumping capacity of 4,000gpm each.
- Pump station controls, non-contact level sensor, temperature control, and alarm.
- Three 16-inch diameter forcemain pipes from the wet well
- Riprap at the outlet of the forcemain to minimize erosion.
- The power supply to the new pumping station site will need to be upgraded.

B. DESIGN DATA

The pumping capacity for the proposed lift station was selected by comparing the NRCS recommended capacity for the open ditch system.

The NRCS recommended drainage coefficient for the JD 91 open ditch is 0.89 inches per day, or approximately 1.0 inches per day. The existing design capacity of the pumping station is 4,000 gallons per minute. Table 2 provides a summary of the comparison of providing different drainage coefficients to the equivalent pumping rates in gallons per minute.

Table 2: Proposed Pumping System Capacity Comparison		
Drainage Coefficient (In. Per Day)	Equivalent Flow (CFS)	Equivalent Pumping Rate (GPM)
1.0	36	16,158
0.75	27	12,117
0.5	18	8,079
0.25	9	4,039

C. OTHER DITCH FACILITIES

Once the pumping station is constructed, and the water level in JD 91 can be lowered, the existing ditch should be inspected, and if needed, cleaned. Additionally, the ditch banks should be inspected for areas that need repair or re-seeding. Costs for these items of work are not included in the project cost estimate.

V. ALTERNATIVE SOLUTIONS

Two other alternative solutions to the proposed Improvement have been evaluated as part of this study.

A. "DO NOTHING" ALTERNATIVE

The "Do Nothing" Alternative was discussed. However, petitioners have experienced poor drainage throughout the drainage system for many years with excess surface water damaging crops and resulting in frequent crop stress or crop loss. The loss of production equates to an economic loss for Redwood County, Yellow Medicine County, and the State of Minnesota. The loss results in reduced property value for the wet acres, thus affecting the taxing capacity of the Counties and State. Also, the ability of the landowners to receive a reasonable return on their investment is diminished because of inadequate drainage.

For these reasons, the "Do Nothing" alternative was dismissed. The economic question of the cost of the Improvement versus the benefits derived still needs to be evaluated. However, the "Do Nothing" alternative is not viewed as solving the drainage problem in the watershed.

B. WETLAND RESTORATION

Another alternative would be to restore the typically flooded areas of the watershed to wetland use. This alternative would provide storage in watershed depressional areas for water which is currently accumulating in these areas and drowning out agricultural crops. The proposal would also have added benefits for wildlife and possibly water quality.

Wetland restoration remains a viable option for providing some improvement in the expectations of the drainage system. Finding willing landowners to participate in a restoration project and locating enough funding would be critical to make this option viable. Copies of the Preliminary Engineer's report were provided to to the SWCD and NRCS so early coordination could occur for potential funding and technical assistance toward this option. At the time of this Final Engineer's Report no willing landowners have been identified.

VI. OTHER CONSIDERATIONS

A. PERMIT REQUIREMENTS

No permits are anticipated to be required for this Improvement.

B. WETLANDS

National Wetland Inventory Maps was reviewed to locate potential wetlands subject to regulations and none are found within the area of the improvement.

Drainage of non-directly impacted wetlands will be controlled by supplemental drainage systems installed by private owners. Owners are advised that such supplemental drainage may not be permitted under State Wetland Conservation Act, US Army Corps of Engineers and NRCS rules and may affect US Department of Agriculture program eligibility.

C. PUBLIC AND PRIVATE BENEFITS AND COSTS

The estimated cost of the proposed Improvement to JD 91 is shown in Exhibit 3 of this report. Benefits for the Improvement, both public and private, will be established by the viewers and a report will be available at the final hearing.

Landowners certainly have other costs associated with construction and maintenance of their individual drainage systems. The proposed Improvement would only serve as an outlet or collector of runoff and drainage flow from the lands within the watershed. Each landowner is responsible to construct and maintain their own drainage system to adequately drain their farmlands. Individual benefits for an adequate drainage system are in increased crop production from farmlands.

The estimated cost of the proposed Improvement is included in this report. The public and private benefits and damages will be available at the final hearing.

The estimated annual cost of pumping the water is not anticipated to substantially change as a result of the improvement. The same volume of water will be pumped on an annual basis, but over a shorter duration of time. Additionally, the inclusion of variable frequency drive controls will allow the pumps to be operated more efficiently.

D. AGRICULTURAL EFFECTS

Once installed, the lands within the improved watershed will be largely dependent on this drainage system for both surface and subsurface drainage flows. Thus, it is imperative that the proposed system have adequate capacity to allow for modern farming operations.

E. ALTERNATIVE MEASURES

Alternative measures, including those identified in the Redwood County Water Management Plan have been considered in conjunction with this project. Specific proposals as part of the project to incorporate these measures include:

1. Measures to conserve, allocate and use drainage waters include the maintaining of the existing ditch bottom so that groundwater is preserved for crop use and the continued infiltration which will occur in depressional areas of the watershed.
2. Reduce downstream peak flows and flooding by out letting into Timm Lake to attenuate the peak flows.
3. Provide adequate drainage system capacity by providing a pumping capacity for the watershed according to NRCS recommendations.
4. Measures to reduce erosion and sedimentation include the restoration of the construction area as soon as possible so surface erosion of disturbed soil is reduced, the use of inlet protection during construction so the discharge of suspended solids is reduced.
5. Protect or improve water quality by reducing the saturated portion of the JD 91 open ditch, allowing vegetation to grow along the JD 91 open ditch banks, reducing overland flow and the associated sediment and nutrient transport within the JD 91 watershed.

F. WATER QUALITY

Little change in measurable water quality is anticipated because of this Improvement.

The construction documents will contain an erosion and sediment control plan. Incorporation of such devices as inlet protection, riprap at the outlets and permanent grasses as soon as possible following construction are anticipated. These measures will help to reduce erosion and maintain water quality during construction.

G. FISH AND WILDLIFE

The threatened or endangered species having the potential to be in the area at the time of this report are the northern long-eared bat. According to the Minnesota DNR, there are no known northern long-eared bat roost trees or hibernacula in the area. Additionally, there are no trees to be removed as a part of the improvement, so there is no anticipated impact to the northern long-eared bat.

Current wet areas within the project watershed do provide for transitory stop over locations for migratory waterfowl. However, these areas currently dry up following wet periods and are then under cultivation and production. It is anticipated that some of these temporary ponding areas will still exist after the construction of the Improvement although ponding times will likely be reduced. Therefore, the provisions for adequate drainage of these lands will not be of a detrimental nature to local wildlife resources.

H. GROUNDWATER

The purpose of an agricultural drainage system is to maintain the elevation of the shallow groundwater table sufficiently below the surface to provide for efficient production of crops. The level at which groundwater will be maintained has been and will be determined by the depth of the tile system and private tiles in the area. The proposed improvements do not include the lowering of any existing tiles or the bottom of the open ditch. Therefore, no change in the availability, distribution or use of shallow groundwater within the watershed is anticipated by improvement.

I. ENVIRONMENTAL IMPACT

Adverse effects of the proposed Improvement are temporary in nature and are as follows:

1. Temporary noise and dust generation can be expected from construction operations. These impacts are not viewed as significant since there are few residences near the proposed construction route.
2. Temporary erosion of soil may occur in the construction area until permanent ground cover and ground stabilization occurs. This construction erosion will be minimized using inlet protection, riprap and rapid establishment of permanent grass cover.

Numerous beneficial effects are anticipated from the proposed Improvement. Most of these benefits are directly attributable to increased crop production from lands presently damaged through period flooding and ponding. Among the most obvious benefits are:

1. Increased personal farm income.
2. Increased value of benefited farmland.
3. Contribution to the local economy through additional purchases, farm modernization and expansion.

J. LAND USE

The present use of land in the JD 91 watershed is largely agricultural. This use is expected to continue.

K. RESPONSE TO DNR ADVISORY LETTER

The drainage authority received an advisory report from the Minnesota Department of Natural Resources (DNR) on May 18, 2020 that was read aloud at the Preliminary Hearing. A copy of the DNR advisory report Exhibit 4. The response to the DNR comments is in the same order as the comments in the Advisory Report and is as follows:

1. Exhibit 2 contains the existing ditch watershed boundary and features.

2. Work will not take place north of County Road 46 so no permit will be required from the DNR.

3. No modeling was performed for this report. The DNR Timm Lake Management Plan (DOW #87001700) dated January 2018 and Table 3 in that report were used to linearly interpolate, using the slope-intercept equation, the change in outflow and peak elevation based on the change in the peak inflow.

4. The determination of the minimal impact to fish and wildlife was based on the relatively small increase in peak inflow and outflow rates to Timm Lake as shown in the Adequacy of the Outlet section of the report.

5. Infiltration rates in this area are relatively low. Providing adequate drainage will aid in the growth of crops which in turn will increase the volume of water that is taken up through evapotranspiration.

6. The sitting water in the ditch causes the ditch banks to become saturated and kills off the vegetation that line the open ditch banks that helps to reduce erosion. Providing adequate underground drainage in the system will reduce the amount of overland flow and overland erosion. Copies of this report were provided to the Redwood County and Yellow Medicine County SWCD and NRCS offices so that additional coordination can occur between those agencies and the landowners to help install and maintain individual landowner best management practices.

7. The number of acres benefitted by the improvement can be found in the Viewers Report. Timm Lake naturally provides such an attenuation in peak flow rates that no areas downstream of Timm Lake are anticipated to be impacted by this improvement.

VII. ADEQUACY OF THE OUTLET

A. GENERAL INFORMATION

As mentioned earlier, the outlet for this ditch system is into Timm Lake in Section 34 of Posen Township in Yellow Medicine County.

B. ADEQUACY OF THE OUTLET

The adequacy of Timm Lake to accept the change in flow resulting from the Improvement has been evaluated as required by the ditch statutes. The DNR Timm Lake Management Plan (DOW #87001700) dated January 2018, specifically Table 3 in that report, was used as the basis for the existing peak inflow and existing peak outflow. From Table 2, the existing pumping capacity of the JD 91 pump station is approximately 9cfs. the proposed capacity for Option 2 and the upper limit for Option 3 is 36cfs, an increase of 27cfs. A linear interpolation of the existing information was used to determine the proposed conditions. A comparison of the impact for the 2-Year through 100-Year events on Timm Lake is in Table 3.

Table 3: Impact to Timm Lake							
Design Event (24-Hour)	Existing Peak Inflow to Timm Lake (cfs) (Note 1)	Proposed Peak Inflow to Timm Lake (cfs)	Existing Peak Outflow from Timm Lake (Note 1)	Proposed Peak Outflow from Timm Lake	Existing Peak Elevation in Timm Lake (Note 2)	Proposed Peak Elevation in Timm Lake	Change in Elevation in Timm Lake (ft.)
2 Year	272	299	16	17	1071.42	1071.49	0.07
5 Year	403	430	25	27	1071.68	1071.73	0.05
10 Year	536	563	35	38	1071.94	1071.97	0.03
25-Year	754	781	53	56	1072.34	1072.37	0.03
50-Year	948	975	70	72	1072.68	1072.72	0.04
100-Year	1,164	1191	89	90	1073.05	1073.12	0.07
Note 1: From Table 2 of DNR Timm Lake Management Plan							
Note 2: From Table 3 of DNR Timm Lake Management Plan							

Because the improvement portion of JD 91 is not adding any additional amount of water to the outlet, and merely changing the rate that the water is discharged, the impact to Timm Lake will be minimal. As can be seen in Table 3 the proposed Option 2 and Option 3 improvement will temporarily raise the peak outflow from Timm Lake 1-3cfs, and will raise the peak elevation in Timm Lake 0.03 feet to 0.07 feet. It is therefore our opinion that the outlet is adequate for the proposed Improvement.

Per the DNR Timm Lake Management plan, the lake bottom is at elevation 1067, and the weir outlet full service level is at elevation 1070.7. In between those two elevations is approximately 652-acre feet of storage. Table 4 shows the impact on Timm Lake if the starting elevation of the Lake is at 1068, the stop logs were at 1070.7, and the only inflow to the lake is from the JD 91 pumping station.

Table 4: Pumping Duration and Elevation Change in Timm Lake			
Design Event (24-Hour)	JD 91 Runoff (Acre-ft)	Peak Elevation in Timm Lake	Pumping Time @ 12,000 gpm (hours)
2 Year	68	1068.4	25.6
5 Year	102	1068.6	38.4
10 Year	136	1068.8	51.2
25-Year	194	1069.0	73.1
50-Year	246	1069.2	92.7
100-Year	304	1069.5	114.6

Without any outflow from the lake the increase in elevation from the JD 91 pumping station ranges from 0.4 feet to 1.5 feet. The existing pumping station would cause the same increase in water elevation over a duration 3 times longer. It is therefore our opinion that the outlet is adequate for the proposed Improvement.

VIII. ESTIMATE OF COST

The preliminary cost estimate to construct the proposed Improvement, as described in this report is shown in Exhibit 2. The cost estimate is broken into two parts. The cost to construct Option 1 to only upgrade the controls and sensors for the existing pumps, and the cost to construct Option 2 to upgrade the pumps, forcemain outlets, and controls.

The total estimated cost for Option 1 is $44,000.

The total estimated cost for Option 2 is $758,700. This cost estimate does not include any potential income from the sale of the existing 20 H.P. and 30 H.P. pumps.

The total estimated cost for Option 3 is $168,200.

IX. RECOMMENDATIONS

The proposed Option 3 is the preferred option to obtain adequate capacity at the pumping station. The normal operation of the pumping station will be 12,000gpm but will have the capability to be ramped up to approximately 16,000gpm.

The proposed Improvement of JD 91 in Redwood County and Yellow Medicine County, as described in this report, is feasible, practical and necessary to provide drainage for the cultivation of crops within the watershed area. The outlet of Timm Lake is adequate to convey the discharge.

It is the recommendation of your engineer that the Final Engineer's Report be approved, and that if there are adequate benefits, the Drainage Authority order the Improvement.

Exhibit 1: Petition for JD 91 Improvement

PETITION FOR IMPROVEMENT OF
REDWOOD AND YELLOW MEDICINE COUNTY JUDICIAL DITCH 91

The undersigned hereby petition pursuant to Minn. Stat. 103E.215 for an improvement of Redwood and Yellow Medicine County Judicial Ditch #91 as follows:

1) The undersigned Petitioners constitute at least twenty-six percent (26%) of the property area affected by the proposed improvement.

2) The undersigned Petitioners also constitute the owners of at least twenty-six percent (26%) of the property area that the proposed improvement passes over.

3) The undersigned Petitioners also constitute at least twenty-six percent (26%) of the property area affected by the proposed improvement.

4) That accordingly the undersigned Petitioners constitute the required parties with an interest to proceed with this Petition for Improvement.

5) The undersigned Petitioners request that the pump house and underground drainage tile of the Redwood and Yellow Medicine County Judicial Ditch 91 system located near Timm Lake be reviewed and improved to current drainage standards.

6) The undersigned Petitioners state that said system is old, obsolete and in need of upgrade and improvement so as to function correctly and to current standards.

7) Petitioners state that the drainage system has insufficient capacity and needs enlarging in size to furnish sufficient capacity.

8) Petitioners request that an engineer be retained to provide a design for said improvement, but Petitioners generally state and allege that the pump house and underground drainage tile capacity and size needs to be upgraded and enlarged and the system otherwise upgraded and improved so as to function correctly in light of current agricultural customs and standards.

9) Petitioners state the proposed improvement will be a public utility and promote the public health.

10) The undersigned Petitioners warrant and agree that they will pay all costs and expenses that may be incurred if the improvement proceedings are dismissed.

11) Request is made that the entire system be improved or such portions as the engineer deems appropriate (and then as thereafter approved by the Board), based upon the beginning request that the entire system be improved; the names and addresses of certain of the owners that the improvement passes over are as follows:

NAME	ADDRESS	PROPERTY
Mary Holmberg – Seller on Contract for Deed Ryan Holmberg – Buyer on Contract for Deed	606 Adobe Road Marshall, MN 56258 10330 325th Street Vesta, MN 56292	Pt. Lot 1 NE¼; Lot 2 NE¼, Section 5, Underwood Township, Redwood County, State of Minnesota
Daniel Leach, Daryl Leach and David Leach	11297 295th Street Marshall, MN 56258	Pt. Lot 2 NE¼; Lot 3 NW¼; Lot 4 NW¼, Underwood Township, Redwood County, State of Minnesota
Mary Busiahn Trust	33327 Balsa Avenue Wood Lake, MN 56297	Tr. W½SW¼, Underwood Township, Redwood County, State of Minnesota
Gerry Busiahn Family Trust	33327 Balsa Avenue Wood Lake, MN 56297	Pt. NW¼SW¼; NE¼SW¼; SE¼SW¼; Pt. SW¼SW¼, Underwood Township,

		Redwood County, State of Minnesota
Bradley J. Matthys and Sharon M. Matthys	33635 Acorn Avenue Cottonwood, MN 56229	Lot 3 NW¼, Underwood Township, Redwood County, State of Minnesota
Christensen Living Trust	2148 Trenohlme Drive Monument, CO 80132	SW¼SE¼; SE¼SE¼, Underwood Township, Redwood County, State of Minnesota
Robert Vieaene and Laurie Hill	3126 County Road 9 Marshall, MN 56258	NW¼NE¼; NE¼NE¼; SW¼NE¼, Underwood Township, Redwood County, State of Minnesota

12) The undersigned Petitioners therefore request that this Petition for Improvement be accepted by the Auditors of Redwood County and Yellow Medicine and submitted to the appropriate Board for further proceedings.

Dated: October 21, 2019

Mary Holmberg

Ryan Holmberg

Daniel Leach

Daryl Leach

David Leach

MARY BUSIAHN TRUST

By: Trust Agreement of Mary Ellen Busiahn
Mary Ellen Busiahn
Its Trustee

Bradley J. Matthys

GERRY BUSIAHN FAMILY TRUST

By: Gerry Busiahn Family Trust
Lydia Liepke
ItsTrustee

Sharon M. Matthys

SEE ADDITIONAL SIGNATURES ON PAGE 4

CHRISTENSEN LIVING TRUST

By: _____

Its: Trustee

Robert Viaene

Laurie Hill

CHRISTENSEN LIVING TRUST

By: _____

Its: Trustee

_____ _____

Robert Viaene Laurie Hill

RINKE NOONAN
attorneys at law

November 20, 2019

Kdeter@RinkeNoonan.com

Redwood and Yellow Medicine Joint Board
of Commissioners
c/o Mr. Scott Wold
403 South Mill Street
P.O. Box 130
Redwood Falls, MN 56283

SENT VIA EMAIL & U.S. MAIL

Re: Petition for Improvement of JD 91
Our File No. 29136-0001

Dear Joint Board of Commissioners and Scott:

I have reviewed the Petition for the Improvement to Redwood/Yellow Medicine County Judicial Ditch #91. The information I received did not indicate that the petitioners had submitted a minimum of a $10,000.00 bond or $10,000.00 in cash, as required under Minnesota Statutes 103E.202, Subd. 5. It may be that it was submitted and I just have not received a copy of it. Based on the information I received, I would make the following comments:

1. The Petition contains the six items to be alleged under Minnesota Statutes 103E.215, Subd. 4(c). Specifically, the area that the Improvement passes over has been properly described, the 40-acre tracts have been listed and an acknowledgement that the petitioners will pay all costs and expenses if the proceedings are dismissed has been included in the Petition.

2. It is difficult for me to determine, based on the Petition, whether the names and addresses of the owners of the 40-acre tracts or government lots are the landowners that the Improvement passes over or whether it is all the land that is affected by this Improvement. There are four ways to meet the necessary 26% signatures under Minnesota Statutes 103E.215, Subd. 4. It is only necessary to meet one of the four methods of the jurisdictional requirements, so I would make the following comments:

    a. Assuming these are the owners of the property affected by the proposed Improvement, there appears to be seven property owners that may be affected and they have the signatures of four of those landowners, which is over 50% and meets the 26%. I am not counting the Leach property as you need to have all landowners to sign in order for it to be counted.

    b. Assuming these are the owners of the property that the proposed Improvement passes over, they again would have in excess of 26% of the owners of the property that the proposed Improvement passes over.

    c. Again, assuming they are the owners of at least 26% of the area affected by the proposed Improvement, they do appear to own more than 26% of the property area affected by the proposed Improvement.

Suite 300 US Bank Plaza
1015 W. St. Germain St.
P.O. Box 1497
St. Cloud, MN 56302
320.251.6700

www.rinkenoonan.com

d. The last method is that they are the owners of at least 26% of the property area that the proposed Improvement passes over and, again, assuming it passes over these 8 properties, they have well in excess of 26%. They clearly would have even more if they can get the last signature on the Leach property.

I have not made an independent determination that the ownership or trustees are correct based on review of deeds, etc., but the petitioners have represented, by their Petition, that the proper and necessary owners are listed and have signed the Petition. I do not have a map of the project, but it does appear that based on my review of the Petition, the Petition does meet at least one of the statutory requirements under Minnesota Statutes 103E.215, Subd. 4.

As I earlier indicated, the statutory minimum amount of a $10,000.00 bond, or we now accept cash, must be met by supplying it prior to the Joint Board accepting the Petition. The Joint Board cannot accept the Petition until this has been completed.

Since this is a joint drainage system, the only Board that can accept the Petition is the Joint Board made up of the Redwood and Yellow Medicine County Commissioners. When that Joint Board meets, and assuming the bond or cash is posted, they would accept the Petition and appoint an engineer. I don't know if the petitioners have been working with the engineer that they would like to recommend be appointed by the Joint Board. I am sending a copy of this letter to Chris Balfany in Yellow Medicine County so that you don't have to forward it to him and he is aware of the Petition.

If you have any questions or would like to discuss it further, please contact me.

Very Truly Yours,

Kurt A. Deter
KAD/cmt

cc: Chris Balfany (via email)

Exhibit 2: JD 91 Watershed Map

JUDICIAL DITCH 91

REDWOOD COUNTY

FIGURE 1

MAY 2020

BOLTON & MENK

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JUDICIAL DITCH 91
REDWOOD COUNTY

FIGURE 2
MAY 2020

BOLTON & MENK

PAUL & TERRI FRANK
14-032-1020

ROBERT & TERESA
14-033-3011

NATHAN SCHRADER
14-033-4030

DENNIS & DELORES NAAB
14-033-4010

DEPARTMENT OF
NATURAL RESOURCES
14-034-310
TIMM LAKE

JOHN & TA
14-034

DANIEL & MARILYN SCHMIDT
14-032-4010

IRENE EVERS
14-033-3010

& MARILYN SCHMIDT
14-032-4010

JD 91 PUMP STATION

DNR-REAL ESTATE MGT
70-004-1080

DNR-REAL ESTA
70-003-20

HOLMBERG/RYAN J
700051020

DANIEL,DARYL & DAVID LEACH
70-004-1060

70-005-2020

JD 91 TILE

CARL JANAC
70-003-

ELIZABETH SCHUSTER
70-004-1020

GEORGE & JENIFER
GOBLISH
70-004-1040

JD 91 OPEN DITCH

JD 91 WATERSHED BOUNDARY

5

4

70-005-3060

DARLENE BUYSSE (ETAL)
70-005-1040

MARY ELLEN BUSIAHN TRUST
70-004-3020

JEROME BARBER
70-004-4020

GEORGE & JE
GOBLISH
70-003-20

JD 91 TILE

GERRY BUSIAHN FAMILY SHELTER
70-004-3040

HORZ. SCALE 0 660 1320 FEET

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JUDICIAL DITCH 91
REDWOOD COUNTY

FIGURE 3
MAY 2020

BOLTON & MENK

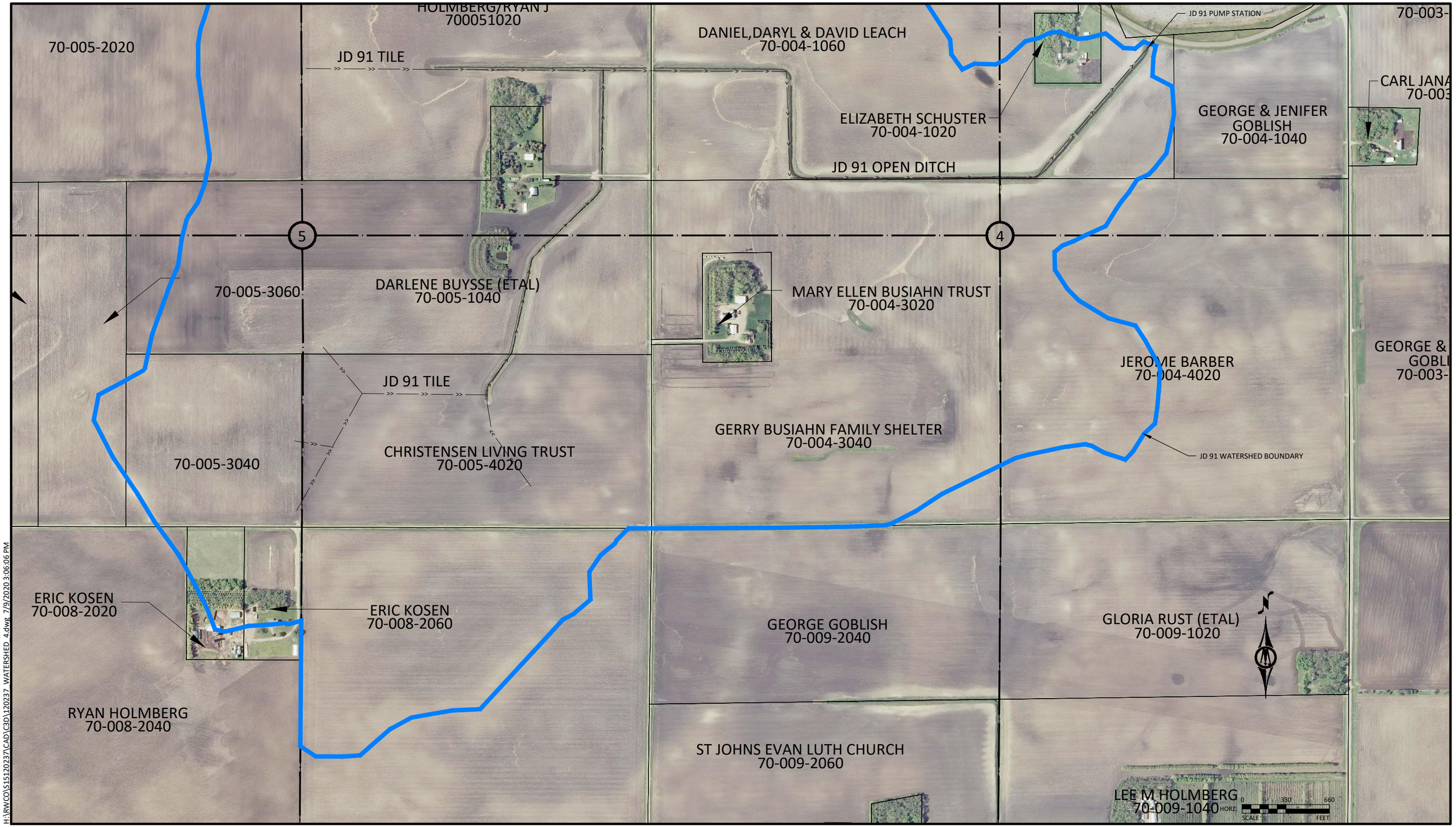

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Exhibit 3: Preliminary Cost Estimate

PRELIMINARY PROJECT COST ESTIMATE
JD NO. 91 IMPROVEMENT -PUMP STATION OPTION 1
REDWOOD AND YELLOW MEDICINE COUNTY, MINNESOTA

Date: 4/8/2020

Filename: H:\RWCO\S15120237\2_Preliminary\A_Calculations\[120237_Preliminary Cost Estimate.xlsx]Option 3

ITEM NO	ITEM DESCRIPTION	UNIT	TOTAL EST QNTY.	EST UNIT PRICE	TOTAL COST
1	Control Panel and Sensor Improvements	Lump Sum	1.0	$20,000.00	$20,000.00
	Subtotal Construction Cost				$20,000.00
	20% Construction Contingency				$4,000.00
	Engineering, Legal, and Viewing				$20,000.00
	TOTAL ESTIMATED COST				**$44,000.00**

PRELIMINARY PROJECT COST ESTIMATE
JD NO. 91 IMPROVEMENT -PUMP STATION OPTION 2
REDWOOD AND YELLOW MEDICINE COUNTY, MINNESOTA

Date: 4/8/2020

Filename: H:\RWCO\S15120237\2_Preliminary\A_Calculations\[120237_Preliminary Cost Estimate.xlsx]Option 3

ITEM NO	ITEM DESCRIPTION	UNIT	TOTAL EST QNTY.	EST UNIT PRICE	TOTAL COST
1	Mobilization	Lump Sum	1.0	$10,000.00	$10,000.00
2	Pumping Station Improvements	Lump Sum	1.0	$400,000.00	$400,000.00
3	Electrical Service Upgrades	Lump Sum	1.0	$10,000.00	$10,000.00
4	Random Rip Rap Class III	Tons	30	$60.00	$1,800.00
5	Rapid Stabilization Method 4	Square Yard	200	$4.00	$800.00
	Subtotal Construction Cost				$422,600.00
	20% Construction Contingency				$84,600.00
	Engineering, Legal, and Viewing				$101,500.00
	Three Phase Electrical	Miles	2	$75,000.00	$150,000.00
	TOTAL ESTIMATED COST				**$758,700.00**

PRELIMINARY PROJECT COST ESTIMATE
JD NO. 91 IMPROVEMENT -PUMP STATION OPTION 3
REDWOOD AND YELLOW MEDICINE COUNTY, MINNESOTA

Date: 4/8/2020

Filename: H:\RWCO\S15120237\2_Preliminary\A_Calculations\[120237_Preliminary Cost Estimate.xlsx]Option 3

ITEM NO	ITEM DESCRIPTION	UNIT	TOTAL EST QNTY.	EST UNIT PRICE	TOTAL COST
1	Mobilization	Lump Sum	1.0	$5,000.00	$5,000.00
2	Pumping Station Improvements	Lump Sum	1.0	$100,000.00	$100,000.00
3	Electrical Service Upgrades	Lump Sum	1.0	$10,000.00	$10,000.00
4	Random Rip Rap Class III	Tons	30	$60.00	$1,800.00
5	Rapid Stabilization Method 4	Square Yard	200	$4.00	$800.00
	Subtotal Construction Cost				$117,600.00
	20% Construction Contingency				$23,600.00
	Engineering, Legal, and Viewing				$42,400.00
	Electrical Transformers	Lump Sum	1	$5,000.00	$5,000.00
	TOTAL ESTIMATED COST				**$188,600.00**

Exhibit 4: DNR Advisory Report

DEPARTMENT OF NATURAL RESOURCES

Division of Ecological & Water Resources
1400 East Lyon Street
Marshall, MN 56258

May 18, 2020

Redwood – Yellow Medicine Judicial Ditch 91 Drainage Authority
C/O Scott Wold
Director of Planning and Environmental Services
403 South Mill Street
P.O. Box 130
Redwood Falls, MN 56283

RE: Proposed Improvement of Judicial Ditch No.91, Preliminary Engineers Report

Dear Mr. Wold:

On behalf of the Director of the Division of Ecological and Water Resources of the Minnesota Department of Natural Resources (DNR), I offer the following comments on the Preliminary Engineer's Report (PER) for the proposed improvement of Judicial Ditch No. 91, in accordance with Minnesota Statute 103E.255.

The DNR believes that this project will likely contribute to cumulative altered hydrology impacts, which are well-documented across Southern Minnesota. Altered hydrology components including drainage improvements and increased/altered precipitation patterns have resulted in unprecedentedly high river flows and excessively low dry season base flow. High river flows have caused downstream property flooding and damage, extensive streambank erosion, degraded fish communities, and poor water quality. Dry season base flows have resulted in streams and stream life drying up. Generally, these effects are expected outcomes of drainage improvements.

The DNR urges you to consider whether the cumulative impacts (mentioned above) associated with this and other drainage projects are consistent with local plans and environmental goals. The recently developed Yellow Medicine One Watershed One Plan (1W1P) identifies the JD10/Wood Lake watershed, of which the Timm Lake is a headwater region, as a priority area for water quality improvements. The 1W1P identifies three measurable goals to address altered hydrology within a 10-year period: (1) add 1,000 acre-feet of stormwater storage, (2) no net increase in annual peak flows, and (3) increase dry season base flow by 3 percent. Field-scale practices to mitigate altered hydrology including cover crops, residue management, wetland restorations, and controlled drainage - with drainage authorities working to promote conservation practice adoption during ditch repair and improvement projects – are recommended to meet these goals.

In addition to this project not being consistent with the goals and objectives of the Yellow Medicine River Watershed 1W1P, we have identified several issues within the PER that need to be address prior to the completion of the Final Engineers Report.:

1. The PER does not illustrate the proposed ditch, tile, laterals, outlet, project watershed, property likely to be affected, and affected properties' owners as required in 103E.245 Subd. 4.
2. The PER does not indicate work will take place north of County Road 46. The Ordinary High Water Level (OHW) of Timm Lake is at elevation 1071.76 (NAVD 88). Any work below this elevation north of County Road 46 will likely require a DNR permit. DNR strongly encourages the Drainage Authority to consider and require the project engineer to investigate and design into the project alternative measures to reduce downstream peak flows that are consistent with the Yellow Medicine River Watershed 1W1P.
3. Modeling to substantiate the estimated water level elevation noted in Table 3 should be provided to DNR staff to verify the estimated changes. If temporary increases in the water surface elevation (i.e. bounce) are expected, those increases should be identified.
4. The report neglects to identify that the immediate downstream receiving water, Timm Lake, is part of a DNR managed Wildlife Management Area (WMA). The report states that minimal impacts to fish and wildlife will occur from this project. We have no record that the project designer consulted with DNR Wildlife staff who manage water levels on Timm Lake regarding potential impacts of the project. Timm Lake is a known colonial waterbird nesting area, has a state-listed species of special concern, provides a critical migration habitat for waterfowl, and provides excellent breeding and brood rearing habitat. Currently, Timm Lake is in a state of active drawdown. The intent of the drawdown is to mimic the natural wet/dry cycle of wetlands draw down. A major goal of the drawdown is to improve water quality by drying out the bed of the lake and reestablish the growth of cattails and submergent vegetation throughout the basin. This vegetation will reduce wind action, prevent lakeshore erosion, improve water quality and waterfowl habitat. Any additional water pumped into the basin from this project may reduce or eliminate these improvements. Fluctuations or increases in the water level or water quality degradation have the potential to negatively impact wildlife using the WMA.
5. The report claims that the amount of water to be pumped downstream will remain the same (that just the flow rate will change). We believe that increases in the total volume are likely as the amount of time water is allowed to infiltrate and evaporate from the landscape is substantially reduced, effectively creating more total water pumped out of the watershed.
6. The project engineer should substantiate the claim that little change in measurable water quality will occur due to the project. The project designer should discuss potential water quality and quantity impacts with the Minnesota Pollution Control Agency (MPCA), the Yellow Medicine Watershed District, and/or the Yellow Medicine Soil & Water Conservation District (SWCD). We believe the project will increase the amount of sediment being discharged from the ditch into Timm Lake due to the reduced residence time in the ditch as a result of the increase pump capacity.
7. The JD #91 watershed is estimated to cover 850 acres. The project engineer should identify the number of acres that are currently experiencing poor drainage and the number of acres that are expected to be improve from this project and the degree to which crop yields are estimate. The project engineer should identify any areas downstream of Timm Lake that may be flooded as a result of this project. l

As a priority area in the Yellow Medicine 1W1P, DNR encourages the Drainage Authority and the project proposers to implement projects and land management practices that mitigate precipitation changes rather than sending additional water downstream more quickly. Practices that store and evaporate water from the landscape can support both sustainable farmland and healthy watersheds. Cover crops, crop rotations, and residue management could increase soil organic matter and soil water storage. Cover and alternate crops (e.g. alfalfa) can provide evapotranspiration in spring to help mitigate heavy rains, and conservation plantings and wetland restorations would further help store, infiltrate, and evaporate water from the landscape in addition to providing habitat. Substantial conservation funds are available through the 1W1P, and Conservation Reserve Program (CRP) and Reinvest in Minnesota (RIM) Programs may be available to further support conservation work.

If you have any questions, please contact Hydrologist Kyle Jarcho at 507-537-7258 or Kyle.Jarcho@state.mn.us.

Sincerely,

Jim Sehl
District Manager

Ec: Kyle Jarcho, Area Hydrologist
Robert Collett, Regional EWR Manager
Shane Lunker, Project Engineer

Equal Opportunity Employer