ENGINEER'S PRELIMINARY REPORT
Clay-Wilkin Judicial Ditch No. 1
Improvement

July 23, 2018
BRRWD Project No. 78
Barnesville, Minnesota
Buffalo-Red River Watershed District

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.

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for
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I. INTRODUCTION

A. Project Description

The proposed project consists of the Improvement of Clay-Wilkin Judicial Ditch No. 1 (JD-1). The petitioned improvement located along the east-west quarter line of Sections 25, 26, and 27, T137N, R48W (Holy Cross Township), and Section 30, T137N, R47W (Alliance Township), Clay County, utilizes Wolverton Creek (also known as Comstock Coulee) as its outlet. The proposed project and its drainage area are shown in Exhibit A on the Preliminary Plans.

The proposed project is a result of recurring flooding experienced by landowners along JD-1, especially those landowners with land adjacent and north of the Clay-Wilkin county line along the proposed improvement alignment. The improvement was investigated in order to study its potential effects on flood damage reduction. A petition received by the Buffalo-Red River Watershed District from landowners requested the Improvement of a portion of JD-1. A copy of the petition for the improvement is included as Exhibit D to this report.

The petition for the Improvement of JD-1 states “For the past several years (especially in 2013 and 2014) benefited landowners in Clay and Wilkin Counties along said drainage system have experienced flooding, causing crop loss, delayed planting, and erosion. This may be caused by a number of different factors, including: a wet hydrologic cycle, increased drainage in the upper watershed, and the installation of
drain tile.” The petition goes on to say that the proposed project would “help with flooding problems in Clay and Wilkin Counties along Clay-Wilkin Judicial Ditch No. 1; will protect adjoining properties from overflow; and the outlet of drainage system waters to the Coulee should not have a major impact to said Coulee, because the timing of the outlet water should be ahead of any peak flows on the Coulee”.

Informational meetings to discuss these problems were held by the Board of Managers, Buffalo-Red River Watershed District (drainage authority) on February 27, 2014 and September 4, 2014. All landowners within the current benefiting area for the drainage system were invited. The problems were reviewed, and possible solutions discussed. A preliminary analysis to look at a possible new outlet was completed in 2014 by Houston Engineering, Inc. (HEI). Further work completed on behalf of petitioners in 2017 showed that an improvement of the petitioned portion of the ditch would have a larger benefit to properties at similar or less cost.

Per the petition, the said improvement will “start at Wolverton Creek/Comstock Coulee (Coulee) in Section 27, Holy Cross Township, and proceed upstream (easterly) through Sections 27, 26, and 25 and the West Half of [Section] 30, Alliance Township, where it will tie into Branch No. 1 of Clay-Wilkin Judicial Ditch No. 1.” See attached Exhibit D for the full petition.

The petition for the improvement of Clay-Wilkin JD-1 was filed with the Board of Managers of the Buffalo-Red River Watershed District in accordance with Minnesota Statutes Annotated (M.S.A.)103E.221. The Board of Managers then designated it as
Project No. 78 and ordered preparation of the Engineer’s Preliminary Survey Report in accordance with Minnesota Statutes 103E.241, Subd. 1.

B. Project Background

The entire drainage area of JD-1 lies in the bed of glacial Lake Agassiz, commonly known as the Red River Valley plain. The majority of the land area is virtually flat with as little as one foot per mile of natural gradient. The natural drainage of the drainage basin is influenced by the flood stages of Wolverton Creek, which serves as its outlet. The Red River Valley is a flat lacustrine plain which, as indicated above, was the bed of glacial Lake Agassiz. The lacustrine deposits range up to 100 feet in depth in the Moorhead area to the north of the project area and are clay to silty clay in nature. The past history of this drainage system indicates that excessive flows historically have been a problem for the system. This can be attributed to the slightly steeper topography on the southeasterly portion of the drainage area as well as the intensive on-farm drainage in the area.

Drainage in this area has been affected through the different improvements throughout the years. Improvements were made in 1977 and 1996 along different portions of JD-1. Significant JD-1 improvement work was completed in 1977. This project improved the ditch in both Wilkin and Clay Counties, as well as reviewed all drainage structures along the ditch. According to the original Engineer’s Report for this project, the ditch was designed to contain the 15-year event below the general field elevation. In areas where there was insufficient depth to the ditch, spoilbanks were constructed to height provide additional freeboard. More recent hydrology indicate that
the current ditch design is close but slightly less than a 10-year design when including the spoilbanks as freeboard.

A ditch improvement project was completed in 1996 that focused on the east-west stretch of JD-1 east of confluence of the main ditch channel and Branch No. 1 in Section 30 of T137N, R47W (Alliance Township), Clay County. This portion of ditch is the easterly 8,900-foot portion of the Main Ditch of the drainage system and is located in section 29 and 30 of Alliance township of Clay County. The project set out to deepen the segment of the ditch from one foot to two feet along most of the 1.5 miles involved. Also, two culverts across County Road No. 11 were reset two feet lower than their existing inverts at that time.

While the existing ditch can contain the 10-year flood discharge, getting the water into the ditch during that size flood is problematic as the water in the ditch can be higher than the water in the adjacent field. In the portion of the ditch where the improvement is proposed, the ditch currently conveys between a 2-year and 5-year flood before the water level in the ditch exceeds the general field level. During the 2-year event, water is high enough in Judicial Ditch No. 1 that it is already backing-up some field drains. At a little larger than a 2-year event, runoff pooled above the general field level begins to be restricted by the water level inside the ditch. In the stretch that is petitioned for improvement, the 10-year event is held in the ditch by the freeboard provided by the spoilbanks. During that event, local runoff cannot enter the ditch due to the water level in the ditch being higher than the water level in the fields. This was observed in several locations along the ditch during the 2013 flood event.
II. RECOMMENDED SOLUTIONS TO ALLEVIATE EXISTING FLOODING AND DRAINAGE PROBLEMS

Prolonged flooding of agricultural lands has been a problem in Sections 24, 25, 26, 36, Holy Cross Township, Clay County T137N R48W; Sections 19, 20, 21, 28, 29, 30, 31, 32, 33, Alliance Township, Clay County, T137N R47W; Sections 1, 2, 12, 12, Wolverton Township, Wilkin County, T136N R48W; and Section 5, 6, 7, Deerhorn Township, Wilkin County, T136N R47W. Much of this area drainage was improved through the 1977 and 1996 Improvement projects, however, the downstream-most area (mainly in Clay County) continues to experience repetitive flooding losses. An investigation of the problems being experienced within the JD-1 drainage area indicates that the majority of the problems may be caused by a wetter hydrologic cycle and increased drainage in the upper watershed. The portion of the ditch in the proposed improvement area also lacks depth so during heavy rain events, the water in the ditch can be higher than the water in the adjacent fields eliminating the potential for drainage into the ditch system. In order to provide better drainage to these areas, a petition was filed to improve the downstream most portion of JD-1 (The portion of the Main downstream of its junction with Branch 1). The grades of the improvement will be 0.04%. The proposed cross-section consists of a 20-foot bottom with 5H:1V sideslopes. The improved outlet is contained to Sections 27, 26, and 25, T137N, R48W (Holy Cross Township), and Section 30, T137N, R47W (Alliance Township), Clay County.

In accordance with Minnesota Statutes 103E.021, a 16.5’ (1 rod) minimum width of grass buffer strip will be established as part of the project along the entire length of the improvement. Preliminary plans, included as Exhibit A to this report, provide a graphical
representation of the recommended solution to correct existing flooding and drainage problems in the benefiting area of JD-1. These plans also show the configuration of the grass buffer strip, recommended side slopes, requirements for centerline culverts, and requirements for field inlet culverts.

III. EVALUATION OF ALTERNATIVE SOLUTIONS

A. Alternative No. 1: Do Nothing

This alternative involves the completion of no work, either improvement or repair. The existing ditch system would remain under current conditions and existing problems would remain without a solution. Water from the drainage area would continue to cause crop loss, delay planting, and erode the soil. This alternative is considered unacceptable by the petitioners because flood damages are becoming intolerable considering the present high costs of farming.

B. Alternative No. 2: Provide Flood Water Detention within the Contributing Watershed

This alternative would involve the development of structural measures which would impound water on a temporary basis and meter it out in such a fashion that downstream channel discharge rates are reduced, and channel capacities are not exceeded. For this alternative to become affective, the volumetric storage capacity of any potential detention area would have to be large enough such that discharges downstream would not be greater than existing downstream channel capacity. While the Board of Managers promotes flood detention projects throughout the Buffalo-Red River Watershed District where such projects prove feasible, no such detention sites are found in the watershed of this project. Therefore, the detention of surface water was
rejected as a suitable alternative.

C. Alternative No. 3: Restore Previously Drained Wetlands

According to NWI maps of the project drainage area, it appears that there is limited wetland restoration potential within the project drainage area. The effect on reducing peak flows restoring drained wetlands would appear to be limited due to the relatively small area involved. Therefore, this alternative is unacceptable.

D. Alternative No. 4: Divert All Runoff West into a New County Line Outlet Channel

This alternative would involve constructing a large ditch that would take all the runoff upstream of the county line (Clay County Road No. 50) and divert it west into a new improved outlet. The ditch bottom would be 30’ wide and would have 4H:1V side slopes. The culverts underneath county line road would either be removed or blocked. This option would reduce the flooding that occurred downstream on JD-1. The channel bottom would follow a 0.04% slope and would flow west into Wolverton Creek. The ditch is designed as to keep the 10-year flood event at the field elevation. Spoil banks will be added to the edge of the ditch for added protection from flooding. Hydraulics upstream of the County line would be maintained but not significantly improved. Flood depths downstream of the County line were slightly improved with some reduction in flooding duration.

E. Alternative No. 5: Divert Some Runoff West into a New County Line Outlet

This option would allow a portion of the runoff coming to the County line to use a new outlet to bypass some of the flow. The flow split between what would be diverted west into a new outlet would be passive and both of the existing culverts that cross the county line road would remain open. Depending on the return period up to
approximately 30% to 40% of the flow would be diverted west. The upstream end of the diversion channel would be at elevation 921.50 (NAVD) and would be sloped downstream at a 0.05%. The proposed cross section consists of a 15’ bottom and 4H:1V side slopes. There would be improvement to the upstream hydraulics. The channel is designed to contain the 10-year event to the field level with the lowest elevations at the diversion point.

F. Alternative No. 6: Improve a portion of the JD-1 Main

This alternative would involve lowering the last 16,160 feet of JD-1 and improving the channel with a 20-foot wide and 5H:1V side slopes. No culvert changes are proposed but existing road centerline culverts would be lowered to the proposed grade and extended. The channel is designed to contain the 10-year event below the field level. This alternative is the only one that addresses the lack of grade separation between the field level and the bottom of the ditch.

Alternative No. 6 is the recommended alternative.

IV. COMPATIBILITY WITH EXISTING PLANS AND STATE LAW

A. Drainage Law – Section 103E, M.S.A.

1. Drainage Proceedings

The Managers of the Buffalo-Red River Watershed District, having been petitioned by resident landowners in Clay and Wilkin County for an improvement of a drainage project, are given the authority to order a Preliminary Survey Report by Minnesota Statutes 103E.241, Subd. 1 and 103E.245, Subd. 1.

Following the filing of the Preliminary Survey Report, the District will hold a preliminary hearing in accordance with MS 103E.261. Minnesota Statutes
103E.261, Subd. 1, Subd. 4 and Subd. 5 allows the District to either: 1) adjourn the hearing to a later date; 2) dismiss the improvement proceedings; or 3) state by order its findings and changes, if any.

If the proceedings are not dismissed and after the preliminary hearing order is filed, the District, following MS 103E.265, shall order the Engineer to make a detailed survey with plans and specifications. When this order is made, the District shall, by order, appoint viewers to assess benefits and damages in accordance with MS 103E.321, Subd. 1.

The District shall hold a hearing in accordance with MS 103E.325. At this hearing, the District has the authority under MS 103E.335 to: 1) adjourn and reconvene the hearing as necessary; 2) may amend the Engineer’s Detailed Survey Report or the Viewers’ Report or resubmit matters to the Engineer or to the Viewers for immediate consideration; or 3) resubmit the reports to the Engineer and Viewers for reexamination.

Following these proceedings, MS 103E.341 gives the District the authority to either dismiss the proceedings or order the improvement project.

2. **Content of Preliminary Survey Report**

   Minnesota Statutes 103E.245, Subd. 4, requires the designated Engineer, if he finds the improvement feasible, and complies with the environmental, land use, and multipurpose water management criteria in MS 103E.015, Subd. 1, to include in the Preliminary Survey Report a preliminary plan of the drainage project showing the proposed ditches, tile, laterals, and other improvements, the outlet of the project, the watershed of the drainage project or system, and
the property likely to be affected and its known users.

The plan must show:

a. The elevation of the outlet and the controlling elevations of the property likely to be affected referenced to standard sea level datum, if practical;

b. The probable size and character of the ditch necessary to make the plan practicable and feasible;

c. The character of the outlet and whether it is sufficient;

d. The probable cost of the drains and improvements shown on the plan;

e. All other information and data necessary to disclose the practicability, necessity, and feasibility of the proposed drainage project;

f. Consideration of the drainage project under the environmental land use, and multipurpose water management criteria in Section 103E.015, Subd. 1;

g. Consideration of the drainage project under the environmental land use, and multipurpose water management criteria in Section 103E.015, Subd. 1; and

h. Other information as ordered by the drainage authority.

3. Content of Detailed Survey Report

Minnesota Statute 103E.265 requires the Engineer, if ordered by the drainage authority and following the filing of the preliminary hearing order, to make a detailed survey and submit a Detailed Survey Report. Minnesota Statute 103E.285 requires that the Detailed Survey Report include the following data and information:

a. Map. A complete map of the proposed drainage project and drainage system must be drawn to scale, showing:

1) The terminus and course of each drain and whether it is ditch or tile, and the location of other proposed drainage works;
2) The location and situation of the outlet;
3) The watershed of the proposed drainage project and the subwatershed of main branches, if any, with the location of existing highway bridges and culverts;
4) All property affected, with the names of the known owners;
5) Public roads and railways affected;
6) The outline of any lake basin, wetland, or public water body affected;
7) Other physical characteristics of the watershed necessary to understand the proposed drainage project and the affected drainage system; and
8) The area to be acquired to maintain a grass strip under Section 103E.021.

b. Profile of drainage lines.
c. Bridge and culvert plans.
d. Tabular statement of excavation, construction, and cost. A tabular statement must be prepared showing:
   1) The number of cubic yards of excavation, linear feet of tile, and average depth of each tile line;
   2) The bridges, culverts, and works to be constructed under the plans for the drainage project; and
   3) The estimated unit cost of each item, a summary of the total cost, and an estimate of the total cost of completing the proposed drainage project that includes engineering and other costs.

e. Right-of-way acreage. The acreage must be shown that will be taken for ditch right-of-way on each government lot, 40-acre tract, or fraction of a lot or tract under separate ownership. The ditch right-of-way must include the area to be taken to maintain a grass strip under Section 103E.021.
f. Drain tile specifications (if applicable).
g. Soil survey report (if required).
h.  Recommendation for division of work.

i.  Other information on practicability and necessity of drainage project.

Other data and information to inform the drainage authority of the practicability and necessity of the proposed drainage project must be made available including a comprehensive examination and the recommendation by the Engineer regarding the environmental, land use, and multipurpose water management criteria in Section 103E.015, Subd. 1.

4. Watershed Law – Section 103D, M.S.A.

1. Section 103D.335, M.S.A.

   Section 103D.335, Subd. 5, enables watershed districts to exercise the power to “…make necessary surveys or use other reliable surveys and data and develop projects to accomplish the purposes for which the watershed district organized.” Section 103D.335, Subd. 8, gives the watershed district the power to “…construct, clean, repair, alter, abandon, consolidate, reclaim, or change the course or terminus of any public ditch, drain, sewer, river, watercourse, natural or artificial, within the watershed district.” In addition, Section 103D.335, Subd. 9, gives the power to “…acquire, operate, construct and maintain dams, dikes, reservoirs, water supply systems, and appurtenant works.”

2. Section 103D.625, M.S.A.

   Section 103D.625, Subd. 4, provides for the construction and improvement of drainage systems within a watershed district, and states “…construction of new drainage systems or improvements of existing drainage systems in the watershed district must be initiated by filing a petition with the managers. The proceedings for the construction or improvement of drainage systems in the watershed district must conform to Chapter 103E.”
3. **Section 103D.711, M.S.A.**

   a. Exhibit A is a set of Preliminary Project Plans. These plans show: a scaled map of the area to be improved; location of the proposed improvements; location of the respective outlets; the watershed of the project area; the location of the existing highways, bridges, and culverts; all lands, highways and utilities affected, together with the names of the owners thereof, or so far as known; the outlines of any public lands and public bodies of water affected; potential benefiting lands; easement maps; and principal project features.

   b. An estimate of project costs is attached as Exhibit C.

   c. **Permit Requirements**

      1) **Local**

         Local requirements for permits include a review and approval of the proposed plans by Clay County and the County Engineer. Holy Cross of Clay County along with Holy Cross Township of Clay County will also be given the opportunity to review the plans of the proposed improvements.

      2) **State**

         A permit will not be required from the Minnesota Department of Natural Resources, since the proposed project does not involve working in Public Waters. The Department of Natural Resources and Minnesota Board of Water and Soil Resources have the responsibility to review the Engineer’s Report and provide an Advisory Report to the Watershed District.

         A Stormwater Pollution Prevention Plan will be developed, and a permit will be required from the Minnesota Pollution Control Agency, since construction
activities will disturb more than one acre of land.

Wetland impacts will be determined for the proposed project. The project has been discussed with the Wilkin County Environmental Office who administers the Minnesota Wetland Conservation Act (WCA). If wetland mitigation is required, it would be completed in accordance to the requirements of the Minnesota Wetland Conservation Act.

3) Federal

The Corps of Engineers Section 404 permit may be needed for this project if it is determined that there are wetland impacts. A wetland delineation has not been completed at this time, but a review of National Wetlands Inventory (NWI) has been considered and indicates the presence of a drained wetland in the middle of the project. A review of historic aerial photos does not support the footprint of the wetland shown on the NWI. A wetland delineation will determine actual wetland extents. No other federal permits are envisioned.

d. Conformance with Existing Water Management Plans

1) Watershed District's Water Management Plan

The following excerpt from the Revised Watershed Management Plan indicates compatibility with the Plan of the Buffalo-Red River Watershed District.

“Goal: Manage legal drainage systems in accordance with MSA 103E, while recognizing the need for agricultural drainage and sensitivity to environmental concerns.”

2) Clay County Water Management Plan

The proposed project is consistent with the objectives of the Clay
e. Other Requirements of Law

The Managers are also aware of other requirements of state law applicable to the proposed project, including Minnesota Statutes 103E.015 – Consideration before Drainage Work is Done; 103E.501 to 103E.555 – Construction of Drainage Project; and 103E.601 to 103E.661 – Funding, Collection and Payment of Drainage System Costs.

V. EVALUATION OF SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACT OF THE PROJECT

A. Economic Analysis of Private and Public Benefits and Costs of the Project

1. Private Benefits

The private benefits to be expected from the project accrue mainly to adjacent agricultural lands and lands north of the county line. Private benefits would be experienced through reduced overland flooding, reduced seepage, and erosion prevention. The improved drainage will result in increased productivity for privately-owned lands in the project area. The area that will receive the greatest benefits will be the landowners adjacent and downstream of the county line. This would include sections 31, 30, (Alliance Township) and 25, 26, 27 (Holy Cross Township) of Clay County and Section 1 of Wolverton Township. Some improved drainage benefits would also be realized along JD-1 in Section 1 of Wolverton Township. The most significant benefits would be along the improved ditch segment in Sections 25, 26, and 27, T137N, R48W (Holy Cross Township), and Section 30, T137N, R47W (Alliance Township), Clay County. The duration of flooding all along JD-1 should be improved as a result of the project.
2. Public Benefits

The public benefits anticipated from the project are a reduction of road and drainage structure maintenance. Increased hydraulic capacity of the drainage system will reduce the probability of road damage and washouts of township, county, and state roads.

3. Project Costs

The opinion of probable total project costs for the recommended improvement described in this report is

<table>
<thead>
<tr>
<th></th>
<th>Construction Cost</th>
<th>*Other Costs</th>
<th>Total Cost</th>
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<td>$2,143,372</td>
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*Other costs include: easement and right-of-way acquisition, engineering, legal, contingencies and other miscellaneous and administrative costs.

A detailed breakdown of costs of the preferred project alternative is included as Exhibit C to this report, Project Itemized Cost Estimate.

In addition to economic costs, there are other non-quantifiable factors to be considered. These include impacts on the environment, social costs, and cultural costs. Because the land use of the project area is predominantly agricultural, there will be some adverse impacts in the area. These adverse impacts will include inconveniences caused by the construction operations, removal of some lands from agricultural production, and other miscellaneous impacts. The permanent right-of-way required for construction of the proposed Improvement of JD-1 will remove approximately 21 acres of land from agricultural production in the area. An additional 37 acres of existing agricultural
land will be required for spoil bank right-of-way along the proposed ditch. This spoil bank right-of-way is required for the placement and leveling of spoil and other construction activities. The land required for spoil bank right-of-way will be lost for one or two construction seasons at the most. After completion of the project construction, spoil bank right-of-way can be used for agricultural purposes.

Construction activities should not cause a significant amount of traffic impairment and construction inconvenience due to traffic rerouting and other related activities. In addition, typical noise and dust problems associated with the construction operations will likely occur.

There are no known cultural or archeological sites along the alignment of the proposed project. Therefore, there are no anticipated impacts on cultural or archaeological resources.

C. Alternative Measures

MN Statutes 103E.015 Subdivision 1. (2) requires the consideration of alternative measures, including measures identified in applicable state-approved and locally adopted water management plans, to:

(i) conserve, allocate, and use drainage waters for agriculture, streamflow augmentation, or other beneficial uses;

(ii) reduce downstream peak flows and flooding;

(iii) provide adequate drainage system capacity;

(iv) reduce erosion and sedimentation; and

(v) protect or improve water quality.
(3) the present and anticipated land use within the drainage project or system, including compatibility of the project with local land use plans;

Alternative measures identified in state and locally adopted water management plans would include changing land use by creating wetlands (since restoration is not an option), enrolling the effected land in a permanent easement program through the state of MN (Reinvest in Minnesota), or the federal government (ie. Conservation Reserve Program, Wetland Reserve Easement, etc.), or flood storage easement through the watershed. All of these alternative measures involve landowner participation on a voluntary basis and would meet the goals of Subd. 1. (2) (i-v). It is unlikely that these alternative measures would be pursued on a voluntary basis. Lands within the project area are essentially utilized for agricultural production. However, the project would incorporate some alternative measures such as buffer strips, side inlet culverts, and permanent erosion control that would address concerns identified in state and locally adopted water management plans.

D. Present and Anticipated Land Use within the Project Area

The present land use within the project area is, for the most part, agricultural. In general, land use will remain agricultural for the foreseeable future. The project is compatible with local land use plans.

E. Current and Potential Flooding Characteristics of the Property in the Drainage Project and Downstream for the 5-, 10-, 25-, and 50-year Flood Events, including adequacy of the outlet for the Drainage Project

The flooding characteristics of the project area are discussed under Section I, A.
– Project Description and B. – Project Background of this report. These specific flooding, drainage, and erosion problems, which lead to the petition for this project, are surface water related. Due to flat slopes and a lack of depth, runoff pools on farmland adjacent to Judicial Ditch No. 1. Spring flooding impacts agriculture by delaying the start of spring planting and the shortening of the growing season. This results in reduced crop yields.

Although less frequent, a just as serious situation is a result of flooding due to heavy and sustained summer storms in the project area. A severe summer storm occurred in 1975 and again in 2013. This type of flooding is particularly damaging to agriculture if it occurs in mid-summer and destroys mature crops. Floods which occur in late June or early July make reseeding impossible. Essentially all of the agricultural land within the project drainage area is directly impacted by drainage and flooding problems. However, the rate of flood water development and magnitude can be much greater than that which occurs in the springtime.

In the project area, the water surface elevation is currently contained by the field level during an event between the 2 and 5-year flood event. Water is backed up into field drains during the 2-year event. The improved channel provides a significant improvement to local drainage with a 10-year event that is carried below the field level. When events larger than about a 25-year flood occurs, the excess flow will spread out into adjacent fields and will be stored for a period of time. The channel improvement will significantly help reduce the depth of water in the JD-1 channel and will reduce the duration of flooding. The 10-year event design will be below the field elevation for this alternative.

An evaluation of the adequacy of the outlet is considered in Section VII of this
F. Effects of the Proposed Drainage Project on Wetlands

A review of the National Wetland Inventory (NWI) using the US Fish and Wildlife Services online Wetland Mapper indicates there is one wetland (PFO1/EM1Cd) along the proposed project alignment in the SE1/4, Section 26, T137N, R48W (Holy Cross Township). A review of aerial photos in this area indicate this land is effectively drained and has been farmed every year. Prior to 2008, the identified wetland area was a tree grove. A 1939 aerial photo shows a farmstead in this location. A detailed wetland delineation will need to be completed and mitigation needs determined.

G. Effects of the Proposed Drainage Project on Water Quality

The occurrence of an extreme runoff condition during project construction could cause an increased sediment load into the downstream channel system. A Storm water Pollution Prevention Plan will be prepared for the project. When the project is completed and well-vegetated, the sediment load from the project area will be lower than before construction. All of the additional ditch easement area required by the project is currently actively tilled. The improved channel area is designed for reduction of erosion and sediment production. Techniques have been incorporated into the project design, including piped side inlets and grass buffer strips. The serious erosion problems caused by wind and flooding will be reduced. The channels will have insignificant effect on the quantity of other water pollutants entering downstream watercourses.
H. Effects on the Proposed Drainage Project on Fish and Wildlife Resources

The proposed ditch improvement project does not contemplate any major excavation in any existing natural watercourse or lakes, and as a result will have insignificant effects on fish resources. Currently, the project area of the proposed outlet channel is nearly all intensively farmed agricultural land. Water flows in the ditch channel are intermittent and occur only after heavy rains or spring snow melt. All disturbed areas are to be seeded to grass as a part of the project. This grass will provide a small amount of cover to wildlife in the area and will have a positive effect on wildlife resources. There is no destruction of prairie or wooded wildlife contemplated as part of this project.

I. Effects of the Proposed Drainage Project Upon Shallow Ground Water Availability, Distribution, and Use

The proposed project for the improvement of Judicial Ditch 1 should have little or no impact on existing shallow ground water resources within the project drainage area. No known shallow ground water resources exist in the project area.

J. Overall Environmental Impact

The project engineer and project sponsors for this project envision that the overall impact of the project will contain no long-term adverse effects on the environment. While construction operations have an inherent adverse effect on the environment, these effects are temporary in comparison to the long-term benefits anticipated from the project operation.
K. Investigating Potential Use of External Sources of Funding and Technical Assistance

In accordance with MN Statutes 103E.015, Subd. 1a., the BRRWD investigated the potential use of external sources of funding to facilitate the purposes of MN Statutes 103E.011, subd. 5. This has included early coordination with the Clay Soil and Water Conservation District, and the Wilkin Soil and Water Conservation District. The discussions with these local government units will continue throughout the development of this project. The discussions to date have included using the Clean Water Fund grant and Buffer Cost-share programs administered by the MN Board of Water and Soil Resources as potential funding sources for the permanent erosion and sediment control features on this project. This project would be eligible for buffer cost share since the side inlets, berms and buffers are considered as alternative practices and there has not been a previous expenditure of public funds to establish buffers on this ditch.

VI. EVALUATION OF PUBLIC UTILITY, BENEFIT, OR WELFARE OF THE PROJECT

With consideration given to the conservation of soil, water, forests, wild animals, and related natural resources, and to other public interests affected, together with other material matters as provided by law in determining whether the project will be of public utility, benefit, or welfare, the project engineers, in consultation with the Board of Managers of the Buffalo-Red River Watershed District, provide the following observations.

1. Presently, the area proposed to be drained by the Improvement of JD-1 storm water and spring runoff is not utilized for municipal, industrial, or irrigation purposes within
the project area. It is not anticipated that these uses will materialize in the foreseeable future with or without the proposed improvements.

2. Ditch grades that are proposed for the Improvement of JD-1 have been established to maintain nonerosive velocities.

3. Seeded side slopes and the required one rod grassed buffer strips on the JD-1 Improvement will serve to retain and entrap nutrients, silt, and other materials which impair quality of downstream natural aquatic resources.

4. Recreational activities are currently limited within the project area. There is no anticipated adverse effect on recreation in this area.

5. Since the drainage system consists entirely of manmade ditch, there is no anticipated public navigation potential.

6. The project elements as proposed in this report include no drainage opportunities of existing lakes, non-isolated wetlands, or other protected water environments. Therefore, the proposed project will have little or no effect on fish resources. The ditch side slopes and a part of the berm will be seeded to grass as part of this project. This grass will provide a small amount of cover to wildlife native to the area and will have a positive effect on wildlife resources.

7. There are no known project areas currently designated as scientific natural areas. In addition, there are no known cultural or archaeological resources which would be endangered or adversely affected by.
VII. DETAILED DESCRIPTION OF THE PROJECT PROPOSED IMPROVEMENTS

A. General Information

At present, the area to be drained by the Improvement of Clay-Wilkin Judicial Ditch No. 1 is characterized by flat, poorly drained topography. The proposed Improvement of Judicial Ditch No. 1 conveys approximately a 10-year flood. Improvement of the ditch would include enlarging and deepening the existing channel with a gradeline of 0.04% through the Sections 25, 26, and 27, T137N, R48W (Holy Cross Township), and Section 30, T137N, R47W (Alliance Township), Clay County. The constructed ditch cross section would consist of a 20-foot bottom width and 5H:1V sideslopes. A ditch with these sideslopes have been shown to be stable in similar soil locations. The improvement of Judicial Ditch No. 1 in Clay County would improve drainage along Judicial Ditch No. 1 in both Clay and Wilkin County. The duration of flooding will be reduced as well. The following paragraphs, tables, and the preliminary plans contained in Exhibit A, provide the necessary information to develop the technical aspects of the proposed Improvement of JD-1. All elevations in this report are based on NAVD 1988.

The project consists of enlarging and deepening the existing channel of the Judicial Ditch No. 1 main. As a result, several of the culvert structures will need to be reset and extended along the proposed improvement alignment. Along the alignment of the road crossings culverts would be salvaged, reset to match the proposed ditch grade, and extended. No changes in culvert sizes are required. Some of the existing culverts do
not run full under the existing conditions even during extreme events and setting the culverts lower will allow them to run full.

B. Project Hydrology and Hydraulics

The project area for proposed outlet improvement encompasses approximately 24.4 sq. mi. This drainage area is shown on Exhibit A.

The relationship between rainfall and runoff was determined using the SCS Method and runoff response was modeled with HEC-HMS. HEC-HMS was used to develop inflow hydrographs which were then used as inputs to a HEC-RAS Unsteady model. The SCS curve number method converts rainfall to runoff based on the soil types and land use found in the contributing drainage area. The SCS method is widely accepted for use on drainage areas of the size draining to Project No. 78.

i. General

The SCS runoff curve number method is a procedure for hydrologic abstraction developed by the USDA Soil Conservation Service (USDA SCS) or (SCS). This agency has been renamed the Natural Resources Conservation Service (NRCS). In this method, runoff depth is a function of total rainfall depth and an abstraction parameter referred to as runoff curve number, curve number, or CN. The curve number varies in the range 1 to 100, being a function of the following runoff-producing catchment properties: (1) hydrologic soil type, (2) land use and treatment, (3) ground surface condition, and (4) antecedent moisture
condition. The runoff curve number method was developed based on 24-hr rainfall-runoff data.

In the runoff curve number method, actual runoff is referred to as \( Q \) and potential runoff (total rainfall) is represented by \( P \), with \( P > Q \). The following equation is used in the SCS method to determine the total volume of runoff.

\[
Q = \frac{(P - I_a)^2}{P - I_a + S}
\]

In which \( I_a = \) initial abstraction, and \( S = \) potential maximum retention

Potential maximum retention, \( S \), can be expressed in terms of the runoff curve number in the following form:

\[
S = \frac{1000}{CN} - 10
\]

In which \( CN \) is the runoff curve number (dimensionless) and \( S, 1000 \) and 10 are given in inches.

The initial abstraction consists mainly of interception, infiltration, and surface storage, all of which occur before runoff begins. Initial abstraction is related to potential maximum retention as follows:

\[ I_a = 0.2S \]

ii. **Curve Number**

Estimates of runoff curve numbers (CN) are given in tables supplied by the NRCS. Tables of runoff curve numbers for various hydrologic soil-cover complexes are widely available. The hydrologic soil-
cover complex describes a specific combination of hydrologic soil group, land use and treatment, hydrologic surface conditions, and antecedent moisture condition. All these have a direct bearing on the amount of runoff produced by a watershed. The hydrologic soil group describes the type of soil. The land use and treatment describes the type and condition of vegetative cover. The hydrologic condition refers to the ability of the watershed surface to enhance or impede direct runoff. The antecedent moisture condition accounts for the recent history of rainfall, and consequently it is a measure of the amount of moisture stored by the catchment.

The hydrologic soil groups, as defined by NRCS soil scientists, are also used to determine runoff coefficients. These hydrologic soil groups are defined by the following descriptions:

1) Hydrologic Soil Group 'A' - Low Runoff Potential. Soils having a high infiltration rate even when thoroughly wetted. These soils consist mainly of deep, drained sands or gravels.

2) Hydrologic Soil Group 'B' - Average Runoff Potential. Soils having a moderate infiltration rate when thoroughly wetted. These soils consist mainly of moderately well drained soils with moderately fine to moderately coarse texture.

3) Hydrologic Soil Group 'C' - Moderate Runoff Potential. Soils having a slow infiltration rate when thoroughly wetted. These
consist chiefly of soils with a layer that impedes downward movement of water. These sites generally have moderately fine to fine texture.

4) Hydrologic soil group 'D' - High Runoff Potential. Soils having a very slow infiltration rate when thoroughly wetted. These consist mainly of clay soils with a high swelling potential, soils with a permanent high-water table, soils with a clay pan or clay layer at or near the surface, and shallow soils over nearly impervious material.

Soil types for the Project No. 78 drainage area were obtained using the Clay and Wilkin County SURRGO digital soil information. For the Project No. 78 area, the average hydrologic soil group in the study area is “C”.

iii. Land Use and Treatment

The surface condition of a watershed is evaluated by means of land use and treatment classes. Land use pertains to the watershed cover, including every kind of vegetation, litter and mulch, fallow (bare soil), as well as nonagricultural uses such as water surfaces (lakes, swamps, and so on), impervious surfaces (roads, roofs, and the like), and urban areas. Land treatment applies mainly to agricultural land uses, and it includes mechanical practices such as contouring or terracing and management practices such as grazing control and crop rotation.
Antecedent Moisture Condition

The runoff curve number method has three levels of antecedent moisture, depending on the total rainfall in the 5-day period preceding a storm. A dry antecedent moisture condition (AMC I) has the lowest runoff potential, with the soils being dry enough for satisfactory plowing or cultivation to take place. The average antecedent moisture condition (AMC II) has an average runoff potential. The wet antecedent moisture condition (AMC III) has the highest runoff potential, with the watershed practically saturated from antecedent rainfalls. An “average” AMC II has been assumed for Project No. 78.

For the Project No. 78 drainage area, the curve number is 77.4

Storm depths for various rainfall events were determined using the NOAA Atlas 14 Volume 8 Version 2, *Rainfall-Frequency Atlas of the United States, Midwestern States*. Values taken from Atlas 14 are summarized in Table 1.

<table>
<thead>
<tr>
<th>Return Period (yrs.)</th>
<th>Rain Duration</th>
<th>Storm Depth</th>
</tr>
</thead>
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<tr>
<td>2-year</td>
<td>24-hr</td>
<td>2.45”</td>
</tr>
<tr>
<td>5-year</td>
<td>24-hr</td>
<td>3.10”</td>
</tr>
<tr>
<td>10-year</td>
<td>24-hr</td>
<td>3.70”</td>
</tr>
<tr>
<td>25-year</td>
<td>24-hr</td>
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<td>50-year</td>
<td>24-hr</td>
<td>5.38”</td>
</tr>
<tr>
<td>100-year</td>
<td>24-hr</td>
<td>6.21”</td>
</tr>
</tbody>
</table>

The inflow hydrographs used for this study were obtained from the existing conditions model completed as part of the Buffalo-Red River Watershed District Expanded Distributed Detention Study. This study utilized a Hydrologic Engineering...
Center – Hydrologic Modeling System (HEC-HMS v 3.5) software to evaluate the effects of various impoundments throughout the watershed. Modifications were made to the existing conditions HEC-HMS model in order to provide more detail within the study area. The 24-hour rainfall events with return periods of 2, 5, 10, 25, 50 and 100 years were then routed through the HEC-HMS model in order to produce runoff hydrographs along the Wolverton Creek and JD-1 tributaries. Wolverton Creek was also included in this study in order to accurately evaluate both the tailwater effects it might have on JD-1 and the effects of the proposed Wolverton Creek Restoration Project.

The hydraulic analysis for this project utilized the unsteady state Hydrologic Engineering Center – River Analysis System (HEC-RAS v 4.2 Beta) hydraulic modeling software. This is a widely accepted tool used to identify channel hydraulics and the effects a hydraulic structure or diversion channel may have on a river system. The base HEC-RAS model was derived from a combination of the steady state model developed for the Wolverton Creek Restoration Project and the unsteady state model from the Fargo-Moorhead Diversion Project (Phase 7.1). These models provided the most current data along Wolverton Creek. This model also accounts for floodwater storage on the fields during events that exceed the capacity of the ditch.

Because Judicial Ditch No. 1 lies in a rural agricultural area requiring gravity surface water field inlets for agricultural drainage, there are two levels of hydrologic design required. First, the channel system and structures must be of sufficient size and capacity to pass the design flood event. The second major objective is to provide adequate gravity surface water drainage from adjacent fields for the design flood event.
For the purposes of agricultural drainage, the proposed ditch conveys runoff produced from approximately the 10-year rainfall event.

C. Analysis of Outlet Conditions and Adequacy

Chapters 103D.711, 103E.015 (Subd. 1(4)), and 103E.245 of the Minnesota Statutes requires that the adequacy of the outlet be addressed in the Engineer’s Report. Outlet adequacy was analyzed using the unsteady HEC-RAS model for the 25-year and 100-year flood events. Due to timing on the Wolverton Creek, the proposed project does not adversely affect flood levels on the Wolverton Creek. Peak discharges from the JD-1 system tend to enter the Wolverton Creek Watershed ahead of the peak in flow on Wolverton Creek. Wolverton Creek is an adequate outlet for this project.

D. Hydraulic Design of Proposed Drainage and Flood Control Improvements

1. Channel Design of the Judicial Ditch No. 1 Outlet Improvement

The proposed channel cross-section for the Improvement of Judicial Ditch No. 1 consists of a channel with a 20’ bottom width and 5H:1V sideslopes. At the present time, the plan is to move the channel south from its current alignment since spoil heights on the south side of the channel are lower this should result in less excavation. The proposed channel varies from approximately eight to fourteen feet of depth below the field level.

2. Hydraulic Design of Culverts

Centerline drainage structures along the alignment of the Improvement of JD-1 serve as road crossing purposes. The crossings are placed to facilitate flow through township and county roads.

There are 3 effected centerline drainage structures along the proposed Improvement of Judicial Ditch No. 1. The existing crossings and the proposed crossings
will be the same size as existing but will be reset to the proposed channel gradeline. The following table provides the culverts at each of the crossings.

### TABLE 2

<table>
<thead>
<tr>
<th>Station</th>
<th>Description</th>
<th>Waterway Area</th>
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<tr>
<td>38+04</td>
<td>40th Street</td>
<td>200 sq.ft.</td>
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<tr>
<td></td>
<td>2 lines of 169” x 107” RCPA culverts</td>
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</tr>
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<td>90+83</td>
<td>40th Street</td>
<td>200 sq.ft.</td>
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<tr>
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<td>2 lines of 169” x 107” RCPA culverts</td>
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<td>143+79</td>
<td>60th Street</td>
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<tr>
<td></td>
<td>2 lines of 138” x 88” RCPA culverts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 lines of 78” RCP culverts</td>
<td></td>
</tr>
</tbody>
</table>

3. **Hydraulic Design of Field Inlets**

Field inlets into Judicial Ditch No. 1 will be piped side inlets.

4. **Right-of-Way**

Right-of-way requirements for the proposed project are shown on Exhibit B of this report. Damages will be paid for all right-of-way obtained for the improvements to the ditch.

Right-of-way is classified as permanent right-of-way or temporary (spoil bank) right-of-way. Permanent right-of-way includes that land necessary for the improvements, as well as the one-rod grass strip. This land will not be available for cultivation in the future. Temporary right-of-way will be utilized to deposit the remainder of the spoil.

5. **Operation and Maintenance**

The operation and maintenance responsibilities for the Improvement of Judicial Ditch No. 1 will reside with the Buffalo-Red River Watershed District.
procedures for repairing and maintaining the improved ditch will be followed in accordance with Minnesota Drainage Law.

The Board of Managers will finance all maintenance and repair activities through an assessment to the benefitting area in accordance with Minnesota Drainage Law.

VIII. PROJECT ECONOMIC ANALYSIS AND FINANCING

The total estimated costs for the establishment of JD-1, is $2,143,372. Of this amount, $662,162 is for right-of-way acquisition, engineering, legal expenses, contingencies and other miscellaneous and administrative costs. The specific details of the cost estimate are contained herein as Exhibit C to this study. It should be noted that we have assumed a value for right-of-way to be $5000/acre for permanent and $300/acre for temporary based on costs incurred on similar projects near the project area. The exact value to be paid for right-of-way must be determined by viewers and no firm number can be imposed on these costs in this report.

Benefits would be expected for land draining into JD-1 as well as roads in the project area. While all of the benefits are unlikely to be assessed equally, if we assume the benefiting area equals the drainage area (approximately 15,660 acres) and if all the benefiting area received equal benefits, the average cost per acre of the project would be $136.87. If the project is bonded for 10 years and assuming the interest rate to be 5%, the average annual payment for the 10-year period would be $17.71 per acre.

IX. PROJECT FEASIBILITY

In the opinion of the Project Engineer, the proposed project outlined herein is necessary, feasible, and practical. It is recommended that the Board of Managers take the necessary legal and administrative steps to proceed with Project No. 78 – Improvement of
X. ENGINEER’S FINDINGS AND RECOMMENDATIONS

In consideration of the drainage problems of the project area serviced by JD-1, the Project Engineer offers the following recommendations:

1. Judicial Ditch 1 should be improved and constructed in accordance with the alignment, bottom widths, and side slopes as shown on the preliminary plans.

2. Right-of-way should be obtained along JD-1 for the purpose of allowing establishment of a one-rod grassed strip.

3. Drainage structures should be installed, replaced, or modified as shown on the preliminary plans.

4. Lands which are found to benefit from the proposed project should be assessed accordingly for the local costs of said ditch.
Exhibit A
Preliminary Plans
PRELIMINARY PLANS FOR

BRRWD PROJECT NO. 78
CLAY-WILKIN JUDICIAL DITCH NO. 1 IMPROVEMENT
BARNESVILLE, MINNESOTA
JULY 2018

PREPARED BY: Houston Engineering Inc. FARGO, NORTH DAKOTA
SECTION 27
T137N, R48W
HOLY CROSS TOWNSHIP

SALVAGE & RELAY OUTLET
URBAN CONTROL STRUCTURE

PVIS: 0+00.00
PVIE: 909.04

PVIS: 38+03.93
PVIE: 910.56

EXISTING FIELD FROM LIDAR
200' NORTH OF ALIGNMENT

STATION 0+00 TO STATION 161+68
IMPROVE MAIN DITCH TO PROPOSED GRADE LINE
20' BOTTOM WIDTH, 5H:1V SIDE SLOPES

2014 REPAIR AS BUILT
0.040%

PRELIMINARY
Not for Construction

Houston Engineering Inc.
P: 701.237.5065
F: 701.237.5101

BARNESVILLE, MINNESOTA

BUFFALO-RED RIVER WATERSHED DISTRICT

CLAY-WILKIN JUDICIAL DITCH NO. 1 IMPROVEMENT

PROJECT NO. 1915-249
PLAN AND PROFILE

SHEET 3 of 10
Preliminary

March 2018

Not for Construction

Houston Engineering Inc.
P: 701.237.5065
F: 701.237.5101

Fargo

Project Number: 1915-249

AJK

ESJ

SWPPP

7-19-18

BRRWD Project No. 78

Clay-Wickin Judicial Ditch No. 1 Improvement

Buffalo-Red River Watershed District

Barnesville, Minnesota

Scale

Drawn by

Date

Checked by

PRELIMINARY

Not for Construction
Exhibit B
Land Area Required for Right-of-Way
Exhibit B

Land Area Required for Right-of-Way
BRRWD Project No. 78
Improvement of Clay-Wilkin Judicial Ditch No. 1
Buffalo-Red River Watershed District
Barnesville, Minnesota

<table>
<thead>
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<th>Tract Description</th>
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<th>Additional Permanent R/W from Existing R/W</th>
<th>Temporary R/W beyond Additional Permanent R/W</th>
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<td>Acres</td>
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<td><strong>26.9</strong></td>
<td><strong>20.0</strong></td>
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Exhibit C
Opinion of Probable Cost
## Exhibit C

### OPINION OF PROBABLE COST

Ditch Improvement of Judicial Ditch No. 1

7/23/2018

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
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<td>Seeding and Mulching</td>
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</table>

$1,481,210

Contingencies (20% total construction) $296,242

Engineering (Permitting, Survey, Design, Construction, PS&E) $200,000

Wetland Mitigation $30,000

Administration, Legal, RW and Funding Processing $25,000

Temp RW AC 36.4 $300.00 $10,920

Permanent RW AC 20 $5,000.00 $100,000

### OPINION OF TOTAL PROBABLE PROJECT COSTS

$2,143,372
Exhibit D
Project Petition
STATE OF MINNESOTA

CLAY-WILKIN JUDICIAL DITCH NO. 1

PETITION FOR IMPROVEMENT

TO: THE BOARD OF MANAGERS OF THE BUFFALO-RED RIVER WATERSHED DISTRICT

In accordance with Minnesota Statues Annotated (M.S.A.) 103E.215, and other applicable statutes, the undersigned Petitioners present this petition for the improvement of a portion of Clay-Wilkin Judicial Ditch No. 1.

1. THE DESCRIPTION OF THE PROPERTY WHERE THE PROPOSED IMPROVEMENT PASSES OVER AND THE NAMES AND ADDRESSES OF THE PROPERTY OWNERS ARE AS FOLLOWS:

The proposed drainage improvement will be for that portion of the main ditch, located in Sections 25, 26, and 27, Holy Cross Township, Clay County, T137N, R40W, and the W1/2, Section 30, Alliance Township, Clay County, T137N, R47W. See illustration attached hereto, labeled as Exhibit "A". The length of the proposed improvement is approximately 16,833 feet, beginning at Wolverton Creek/Comstock Coulee, hereinafter referred to as the “Coulee” in Section 27, Holy Cross Township, and continuing upstream or east, to the north-south quarter line in Section 30, Alliance Township, ending just east of where the main ditch meets with Branch No. 1 of Clay-Wilkin Judicial Ditch no. 1.

The names and addresses of owners of the above-described property are as follows:

Leland J. Larson
36647 S. Wind Crest DR
Tucson, AZ 85739-1500
SW'Z4 less ditch
27-137-48

Leland & Carol Larson
32389 Birchwood Shore DR
Underwood, MN 56586
NW'Z4 less ditch
27-137-48

Wayne C. Hoeck
1301 10th ST S
Sabin, MN 58103
W1/2 less ditch, RD & 1.13 AC.
30-137-47

Bruce Anderson
105 Burt CT
Leesburg, VA 20176
NE1/4 less ditch, RD, 3.62 AC & W72 AC
& 0.77 AC
26-137-48

Ardelle K. Brandt Revocable Living Trust
4503 3RD ST S
Moorhead, MN 56560
SE'Z4 less ditch
26-137-48

Ardelle K. Brandt Revocable Living Trust
4503 3RD ST S
Moorhead, MN 56560
SW'Z< less ditch
26-137-48
2. THE STARTING POINT, GENERAL COURSE, AND THE TERMINUS OF THE PROPOSED OUTLET PROJECT IS AS FOLLOWS:
The proposed outlet will start at Wolverton Creek/Comstock Coulee (Coulee) in Section 27, Holy Cross Township, and proceed upstream (easterly) through Sections 27, 26, 25, and the West Half of 30, Alliance Township, where it will tie into Branch No. 1 of Clay-Wilkin Judicial Ditch No. 1. See attached "Exhibit A". It's anticipated that the improvement will need to extend past the point of where the Branch enters the Main ditch to transition between the improved and existing sections.

3. THE NECESSITY OF THE PROPOSED DRAINAGE PROJECT:
For the past several years (especially in 2013 and 2014) benefited landowners in Clay and Wilkin Counties along said drainage system have experienced flooding, causing crop loss, delayed planting, and erosion. This may be caused by a number of factors, including: a wet hydrologic cycle, increased drainage in the upper watershed, and the installation of drain tile. Informational meetings to discuss these problems were held by the Board of Managers, Buffalo-Red River Watershed District (drainage authority) on 02/27/14 and 09/04/14. All landowners within the current benefiting area for the drainage system were invited. The problems were reviewed, and possible solutions discussed. A preliminary analysis to look at a possible new outlet was completed by Houston Engineering, Inc. and is dated 08/11/14. Said report is on file at the Watershed Office, 1303 4th AVE NE, Bamesville, MN, and is available for public inspection. At the time, the proposed outlet would: help with the flooding problems in Clay and Wilkin Counties along Clay-Wilkin Judicial Ditch No. 1; will protect adjoining properties from overflow; and the outlet of drainage system waters to the Coulee should not have a major impact to said Coulee, because the timing of the outlet water should be ahead of any peak flows on the Coulee.
Upon review of said potential project, other optional work was considered, leading to the petition for said improvement. It was determined that improvement of the main ditch could have similar or greater benefits, cost approximately the same, and be less controversial.

4. **PETITION REQUIREMENTS:**
   That said petition is signed by at least 26 percent of the owners of the property affected by the proposed improvement.

5. **PUBLIC UTILITY AND HEALTH:**
   The proposed outlet will be of public utility, be conducive to, and promote the public health, convenience, and welfare.

6. **COST AND EXPENSES:**
   We, the undersigned Petitioners and Signers will pay all costs and expenses which may be incurred in case the proceedings are dismissed or for any reason no construction contract is let for the proposed project.

   Dated this___________day of______________, 2018.

**THIS INSTRUMENT WAS DRAFTED BY:**

Bruce E. Albright, Administrator
Buffalo-Red River Watershed District
1303 4th AVE NE
Barnesville, MN 56514
218-354-7710
STATE OF MINNESOTA

CLAY-WILKIN JUDICIAL DITCH NO. 1-PROPOSED IMPROVEMENT

SIGNATURE PAGES TO PETITION FOR DRAINAGE PROJECT

The undersigned acknowledge that they have reviewed the Petition for the establishment of an Improvement to Clay-Wilkin Judicial Ditch No. 1 in this matter and they acknowledge by their signatures below that they sign and join in such Petition as a Petitioner. The Petitioners will pay all costs and expenses, which may be incurred in case the proceedings are dismissed or for any reason no construction contract is let for the proposed project. In this event, it is agreed between the Petitioners that the sharing of costs and expenses between Petitioners will be on a pro rata basis so that each Petitioner shall be responsible for an equal share of said costs and expenses, including Petitioners’ attorney’s fees and costs. Should several persons sign this Petition, all as owners of a particular 40-acre tract or Govt. Lot, all of said owners of that 40-acre tract or Govt. Lot shall be considered a single Petitioner for purposes of this cost and expense sharing, who shall as between themselves be jointly and severally liable. It is understood that fewer than all of the Petitioners may make and file the bond or bonds required by law and engage counsel; should the ditch authority recover its costs and expenses from said bond or bonds, or from other Petitioners, each Petitioner agrees to contribute to any Petitioner who incurs a disproportionate loss hereunder such sum so that no Petitioner incurs any loss greater than that agreed to under this paragraph, such amount to include all costs of collections and reasonable attorney’s fees.

EACH PERSON WHO SIGNS ON PAGE 5 OF 5 ACKNOWLEDGES THAT HE OR SHE UNDERSTANDS THAT HE OR SHE MAY NOT WITHDRAW AS A PETITIONER AT ANY TIME AFTER THIS PETITION IS FILED EXCEPT WITH THE WRITTEN CONSENT OF ALL OTHER PETITIONERS.

All signatories must indicate the capacity in which they sign, i.e., owner, co-owner, corporate official, or general partner. Each signature should indicate the legal description of each 40-acre tract or government lot that entitles that signer to be a petitioner. In the case of a partnership, only one general partner need sign. In the case of a corporation, only one corporate officer need sign. In the case of co-ownership, all co-owners must sign. In the case of a trust, all trustees must sign. Use as many of these signature pages as needed. Be sure all information is fully completed. If you are unsure of who must sign or how to sign, please contact Bruce E. Albright, Administrator, Buffalo-Red River Watershed District, PO Box 341, Bamesville, MN 56514 (Telephone 218-354-7710).

Because this project is a continuation of an earlier improvement of an outlet on the Clay-Wilkin County line, we, the undersigned were petitioners for that project, understand that those costs can be charged to this drainage project proceeding (M.S.A. 103E.055). We the undersigned also agree to keep the necessary bond(s) in place in accordance with M.S.A. 103E.202, Subd. 5, for this improvement petition.

Bryan Knitzebergen
M. Z. Tonsfeldt

Page 4 of 6
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These data are provided on an "AS-IS" basis, without warranty of any type, expressed or implied, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.

Date: 6/6/2018

"Exhibit A"
RIDER INCREASING OR DECREASING PENALTY OF BOND

To be attached to and form part of Ditch Petition Buffalo-Red River Watershed District (Description of Bond)

Bond No. 71760670 issued on behalf of Bryan Kritzberger

as principal in favor of Buffalo-Red River Watershed District

Obligee.

WESTERN SURETY COMPANY, (hereinafter called the Company) hereby increases

the penalty from Forty Thousand and 00/100 DOLLARS ($40,000.00),

to Sixty Thousand and 00/100 DOLLARS ($60,000.00),

subject to the covenants and conditions of said bond, except as herein stated.

This rider becomes effective on the 24th day of May, 2018, at twelve and one minute o'clock AM standard time.

Signed and dated this 24th day of May, 2018.

Principal

By

ACCEPTED

Obligee

By

By

By

WESTERN SURETY COMPANY

By Paul T. Buflati, Vice President

Form 480-10-2012
Western Surety Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS:


Paul T. Bruflat of Sioux Falls, South Dakota, its regularly elected Vice President, as Attorney-in-Fact, with full power and authority hereby conferred upon him to sign, execute, acknowledge and deliver for and on its behalf as Surety and as its act and deed, the following bond:

One Ditch Petition Buffalo-Red River Watershed District

bond with bond number 71760670

for Bryan Kritzberger

as Principal in the penalty amount not to exceed: $60,000.00

Western Surety Company further certifies that the following is a true and exact copy of Section 7 of the by-laws of Western Surety Company duly adopted and now in force, to-wit:

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, Assistant Secretary, or the Treasurer may appoint Attorneys-in-Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

In Witness Whereof, the said WESTERN SURETY COMPANY has caused these presents to be executed by its Vice President with the corporate seal affixed this 24th day of May, 2018.

ATTEST

L. Nelson, Assistant Secretary

WESTERN SURETY COMPANY

By

Paul T. Bruflat, Vice President

STATE OF SOUTH DAKOTA

COUNTY OF MINNEHAHA

ss

On this 24th day of May, 2018, before me, a Notary Public, personally appeared

Paul T. Bruflat and L. Nelson

who, being by me duly sworn, acknowledged that they signed the above Power of Attorney as Vice President and Assistant Secretary, respectively, of the said WESTERN SURETY COMPANY, and acknowledged said instrument to be the voluntary act and deed of said Corporation.

M. Bent

Notary Public

My Commission Expires March 2, 2020

Form P1975-11-2015