JACOBSON-WESTERGARD
& ASSOCIATES, INC.
Consulting Engineers & Land Surveyors

www.jacobson-westergard.com

105 South 6th Street
Estherville IA 51334
PHONE 712-362-2647 • FAX 712-362-2668
EMAIL jwa@jacobson-westergard.com

Scott A Brunsvold, PE
Patrick N Boggess, PLS
Richard A Hopper, PE
Collin J Klingbeil, PE

Jeffrey L Rose, PE
Dallas L Heikens, PE

Dale D Jacobson, PE (1922—1995)
Kenneth D Westergard, PE, PLS (1930—2020)
Robert V Bendixen, PLS (1947—2022)

"Bettering Iowa since 1970"

September 6, 2024

Board of Supervisors
Kossuth County Courthouse
114 W. State Street
Algona, IA 50511

Board of Supervisors
Palo Alto County Courthouse
1010 Broadway Street
Emmetsburg, IA 50536

RE: Amendment No. 2 to Engineer's Report for Main Open Ditch Repairs
Joint Drainage District No. 1 in Kossuth and Palo Alto County, Iowa
JWA PROJECT NO: E23114

Dear Board Members:

We filed an engineer's report regarding repairs to the Main Open Ditch of Joint Drainage District No. 1 (JDD1) on June 18, 2024. Said report included discussion regarding various options for repairing sloughed/failed banks along the approximately 30-mile Main Open Ditch of JDD1. We subsequently filed Amendment No. 1 to the report on July 16, 2024 which expanded on the option to flatten the bank slopes.

A hearing was held on July 23, 2024 regarding the project. At the hearing we were directed to investigate additional damages to the Main Open Ditch sustained in 2024 that may be eligible for Federal Emergency Management Agency (FEMA) funding. We were also directed to identify severe damage sites in greatest need of immediate repair. This Amendment No. 2 to the originally filed engineer's report addresses the aforementioned items.

A. 2024 Damages

A drone flight and recording of the approximately 30-mile Main Open Ditch was completed between August 6th and 7th, 2024 to help evaluate potential additional 2024 damages. The drone video was referenced against the Bolton & Menk drone video flown in the summer of 2023, as well as our GPS located damage sites and photographs. Our drone video will be posted to our YouTube Channel as soon as possible (@jacobsonwestergard3718).

In general, we found a minimal amount of additional discernable damage in 2024. It appears likely that some sites eroded more into the bank, but very few sites expanded in length

upstream or downstream. We did not feel a full field investigation was worth the time or expense and therefore opted not to complete it.

FEMA funding traditionally includes a 75% federal share and 10% state share, leaving the remaining 15% to be paid by the drainage district. The process of applying for and going through the process to get the funding can be a challenge, and takes time (and money). In our opinion it is not worthwhile to attempt to secure funding for repairs to 2024 disaster damages.

As an aside, we note that on the 2024 drone flight several damage sites previously identified in 2023 appear to have improved in condition. However, numerous sites remain in poor condition and we advise that repairs be made as soon as possible.

Additionally, we observed several reaches of the ditch with small trees growing on or near the Main Open Ditch. We recommend that these trees be sprayed and killed as soon as possible. The trees are concentrated from approximately Section 17 of Whittemore Township through Section 34 of Lotts Creek Township. The trees are especially bad near the town of Whittemore.

B. Severe Damages

As requested, we re-evaluated the damage sites to develop a list of the sites with the most severe damages. The most severe bank damage sites span just under 8,000 linear feet of the ditch. See the severe bank damage maps, enclosed.

As for repair options, many of the identified severely damaged sites will require riprap. The banks could be shaped (sloped back) for some sites as well. We would recommend a bank slope of 2:1 be used. Sloping the banks back would result in a lower construction cost, but quite a bit of land would be lost to the channel and additional land adjacent to the ditch would be damaged

by the placement of poor-quality spoil material. This may result in the need for large damage reimbursements and/or right-of-way acquisition.

As for pipe repairs, we recommend that all the repairs previously recommended be completed as part of any repair project that is decided upon for the Main Open Ditch of JDD1.

C. Cost Estimate

Cost estimates for Option #1 – Primarily Riprap Repairs, and Option #2 – Primarily Bank Shaping Repairs are included in the originally filed engineer's report. A cost estimate for Option #3 – Flattening the Ditch Banks is included in Amendment No. 1. A cost estimate for severe damage repairs only is shown below and assumes all severe bank damage will be repaired with riprap. It would not include any channel excavation to remove eroded material from the ditch bottom.

Option #4A – Severe Damages Only, Riprap

SECTION 1: CONSTRUCTION ASSESSABLE TO PRIVATE LANDS

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
1	CHANNEL BOTTOM EXCAVATION	0	LF	$5.00	$0.00
2	BANK SHAPING	0	LF	$5.00	$0.00
3	BANK SHAPING, UNDER RIPRAP	7,857	LF	$5.00	$39,285.00
4	RIPRAP, CLASS E	7,857	TN	$45.00	$353,565.00
5	GEOTEXTILE FABRIC	10,476	SY	$3.00	$31,428.00
6	12" DIA. CMP TILE OUTLET, RIVETED, ANNULAR CORRUGATIONS, 14 GAGE	144	LF	$32.00	$4,608.00
7	15" DIA. CMP TILE OUTLET, RIVETED, ANNULAR CORRUGATIONS, 14 GAGE	44	LF	$34.00	$1,496.00
8	15" DIA. CMP SURFACE DRAIN, RIVETED, ANNULAR CORRUGATIONS, 14 GAGE	196	LF	$34.00	$6,664.00
9	18" DIA. CMP SURFACE DRAIN, RIVETED, ANNULAR CORRUGATIONS, 14 GAGE	166	LF	$35.00	$5,810.00
10	24" DIA. CMP SURFACE DRAIN, RIVETED, ANNULAR CORRUGATIONS, 14 GAGE	88	LF	$36.00	$3,168.00
11	CUT OFF END OF EXISTING CMP, 12" DIA.	2	EA	$75.00	$150.00
12	CUT OFF END OF EXISTING CMP, 15" DIA.	6	EA	$80.00	$480.00
13	CUT OFF END OF EXISTING CMP, 18" DIA.	13	EA	$90.00	$1,170.00

ITEM NO.	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL PRICE
14	CUT OFF END OF EXISTING CMP, 24" DIA.	7	EA	$100.00	$700.00
15	CUT OFF END OF EXISTING CMP, 36" DIA.	1	EA	$120.00	$120.00
16	SEEDING & FERTILIZING, OPEN DITCH, ONE-SIDE	7,938	LF	$0.75	$5,953.50
17	ROCK CHUTE SITE EXCAVATION & GRADING	1	LS	$3,000.00	$3,000.00
18	GROUT (FOR ROCK CHUTE)	10	CY	$300.00	$3,000.00
19	FENCE REMOVAL	1	LS	$500.00	$500.00
20	MOBILIZATION	1	LS	$23,000.00	$23,000.00
ESTIMATED SUBTOTAL CONSTRUCTION COST:					$484,000
ESTIMATED SUBTOTAL CONSTRUCTION COST:					**$484,000**
CONSTRUCTION CONTINGENCIES					**$48,000**
ESTIMATED TOTAL ASSESSABLE CONSTRUCTION COST					**$532,000**
NON-CONSTRUCTION COSTS					
ENGINEERING - (REPORT, HEARINGS, PLANS & SPECS, BID LETTING, CONSTRUCTION, COMPLETION)					$150,000
PERMITTING ASSISTANCE					$10,000
LEGAL, PUBLICATIONS, MAILINGS, ETC.					$5,000
REIMBURSABLE CONSTUCTION DAMAGES					$20,000
INTEREST					$43,000
ESTIMATED TOTAL DISTRICT COST FOR OPTION #4					**$760,000**
AVG COST PER ACRE (BASED ON 42,721.23 ACRES):					$17.79
AVERAGE COST PER ACRE PER YEAR AT 5% INTEREST FOR 10 YEARS:					$2.30
AVERAGE COST PER ACRE PER YEAR AT 5% INTEREST FOR 20 YEARS:					$1.43

We estimate a total project cost of **$557,000** if bank shaping (sloping the bank back to 2:1) is done instead of riprap for 4,238 LF of the total 7,857 LF of most severely damaged ditch banks. This includes an estimated $70,000 for potential damage reimbursement and right-of-way acquisition, if needed. The project would result in average cost per acre of 73% of the values shown above. This will be referred to as Option 4B.

The table below is a cost comparison of all the repair options evaluated for the Main Open Ditch.

Comparison Factor	Option #1	Option #2	Option #3	Option #4A	Option #4B
Primary Bank Repair Method	Riprap	Bank Shaping	Flatten Bank Slopes	Riprap only most Severe Sites	Riprap or Bank-shape only most Severe Sites
Project Cost Estimate	$3,010,000	$1,548,000	$2,521,000	$760,000	$557,000
Avg. Cost Per Acre	$70	$36	$59	$18	$13

D. Permitting Update

For the bank flattening option (Option #3), we filed a permit application with the Iowa Department of Natural Resources (Iowa DNR) and requested an expedited review. On August 2, 2024 we received a permit to complete the work, if it is decided to proceed with that option.

No permit is required from the United States Army Corps of Engineers (USACE) for flattening the ditch banks. However, an individual permit will be required for riprap if we do more than 2,000 feet of bank stabilization. The USACE has said the permit issuance process takes a minimum of 6-months. We have not yet applied for a permit, as a decision has not been made on what repair option to proceed with. If the bank flattening option is chosen, we may consider limiting the riprap bank stabilization to 2,000 feet in order to avoid delays to the completion of the work.

E. Spreading the Repairs Out Over Time

During the July 23, 2024 hearing an idea was raised about spending a certain fixed amount on repairs to the ditch every year. The thought behind it was that it would spread the cost over time, and not result in any large one-time assessments.

Although a large single project can be costly, in our opinion it is more cost efficient than a piecemeal repair effort. This is because mobilization is only paid for once, and there is a bidding process (competition) which helps get the lowest price for the work. The project cost is spread over the entire district, and drainage district assessments to a parcel in excess of $500 can be paid over time (10 to 20 years as set by the Board of Trustees). Interest does accrue, typically at 5% which is not much above the average rate of inflation.

The Iowa Code also does not make provision for repairs spread over time, or budgeting. It simply requires that when repairs are necessary they be done. Also, if the cost of repairs will exceed $50,000 the law requires that notices be send to landowners in the district and a hearing be held. The Iowa Code specifically prohibits dividing repairs in order to avoid the notice and hearing requirements.

F. Recommendations

We understand that the lower cost associated with repairing only the most severely damaged portions of the ditch may be appealing (Option 4A or 4B), especially considering the large amount of money that was spent on repairs only a few years ago. However, we consider this to be the absolute bare minimum required. Some of the remaining damage sites may heal themselves over time, and some likely will worsen to the point where repairs will be needed over the next several years. If only the most severe damage sites are repaired, the Main Open Ditch will need to be closely monitored moving forward and repairs continue to be made as needed. In other words, we caution that although the upfront cost is much less than other options, there will be higher future costs.

As previously discussed, the 2023 damages to the Main Open Ditch are ineligible for FEMA funding. As time goes by it will be more difficult to differentiate new from old damage, and the fact that a full repair was not made may not be looked on favorably by FEMA in the case of

future disaster damages. FEMA looks at history of repairs when determining funding eligibility, and expects a standard level of maintenance preceding disaster damages.

We continue to believe that Option #3 – Flatten Bank Slopes is the best long-term solution. There is definitely a significant upfront cost, and approximately 30 acres of land would be lost to the channel, but moving forward the flatter banks would lessen the vulnerability of the ditch from damages, and save significantly on future repair expenses. We note that for this option there would be an average cost to lands in the district of $8 per acre per year if paid over 10 years and $5 per acre per year if paid over a 20 year period (factors in 5% interest).

We also recommend that sapling trees and shrubs growing in and along the Main Open Ditch be sprayed , particularly near the town of Whittemore.

We recommend that this Amendment No. 2 to the engineer's report be accepted, a hearing be scheduled, and notices be published in the newspaper and mailed to the landowners in JDD1.

Sincerely,

JACOBSON-WESTERGARD & ASSOCIATES INC.

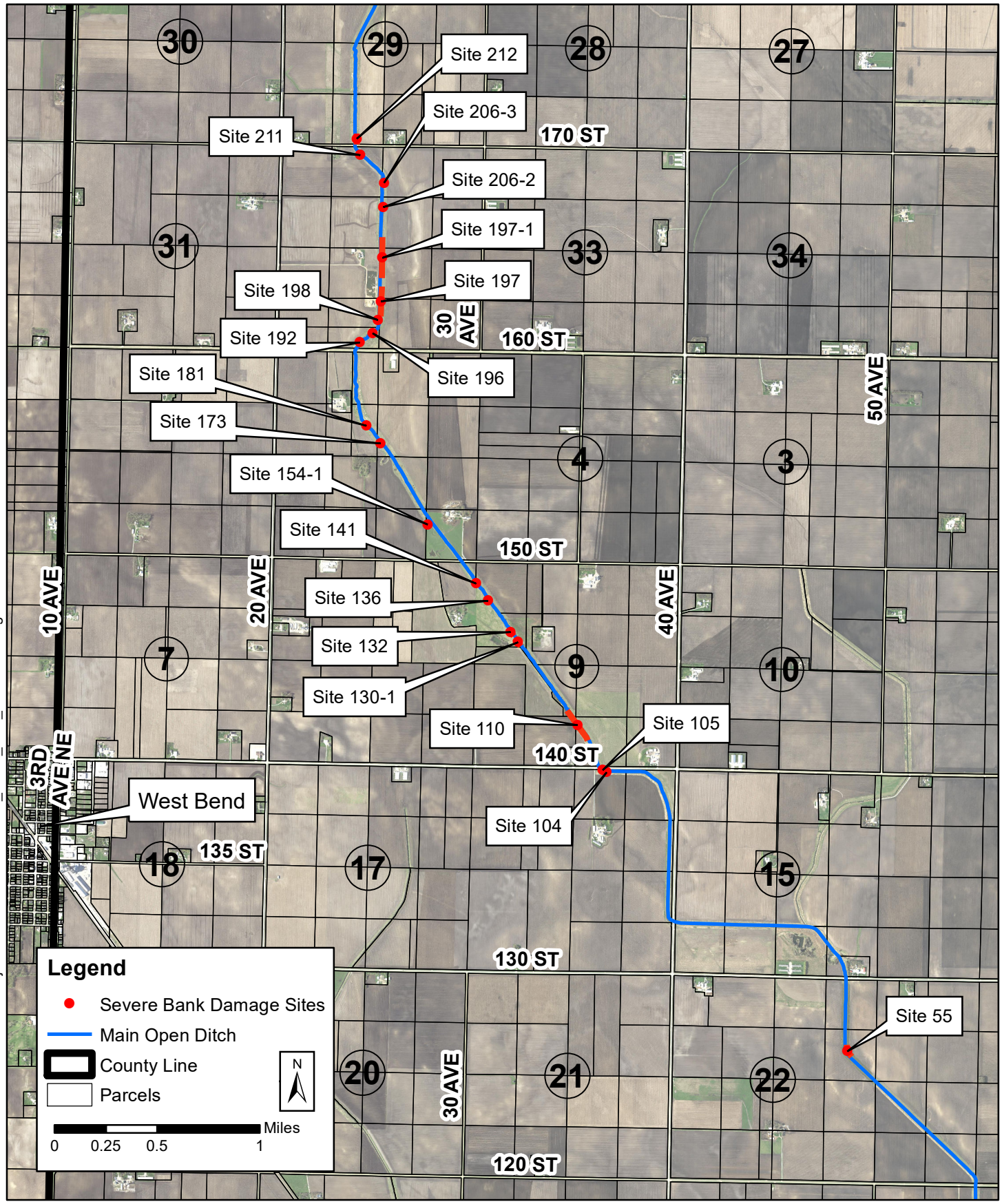
Collin J. Klingbeil, P.E.

Encl. Severe Bank Damage Maps

Joint Drainage District No. 1
Main Open Ditch
Severe Bank Damage Sites Map #1

Palo Alto and Kossuth County, Iowa

JACOBSON-WESTERGARD
& ASSOCIATES, INC.
Consulting Engineers & Land Surveyors
www.jacobson-westergard.com

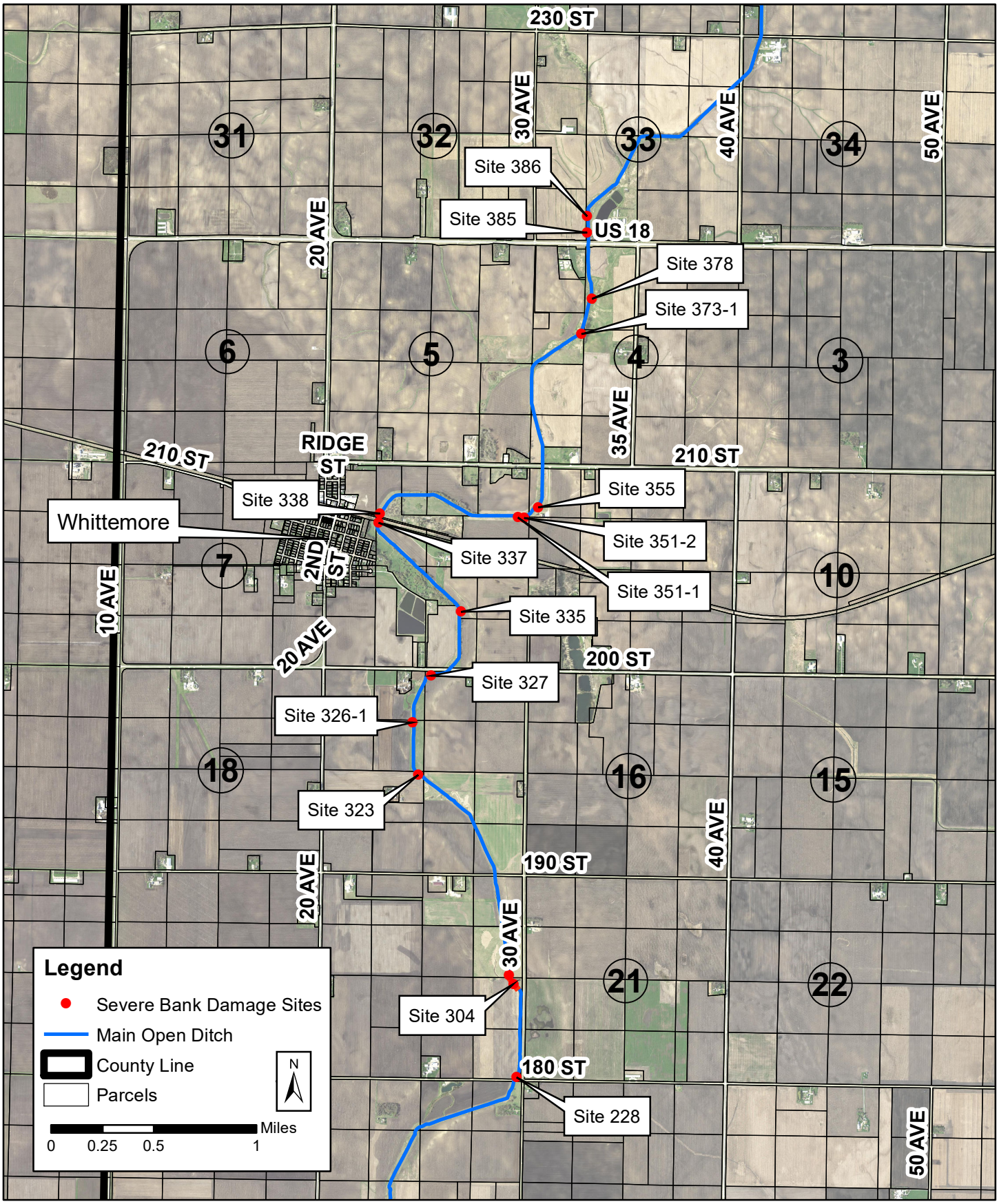


Document Path: P:\Arc View 8 Projects\2023\E23114\E23114_JDD1_PAK_SevereDamages.mxd

Joint Drainage District No. 1
Main Open Ditch
Severe Bank Damage Sites Map #2

Palo Alto and Kossuth County, Iowa

JACOBSON-WESTERGARD
& ASSOCIATES, INC.
Consulting Engineers & Land Surveyors
www.jacobson-westergard.com

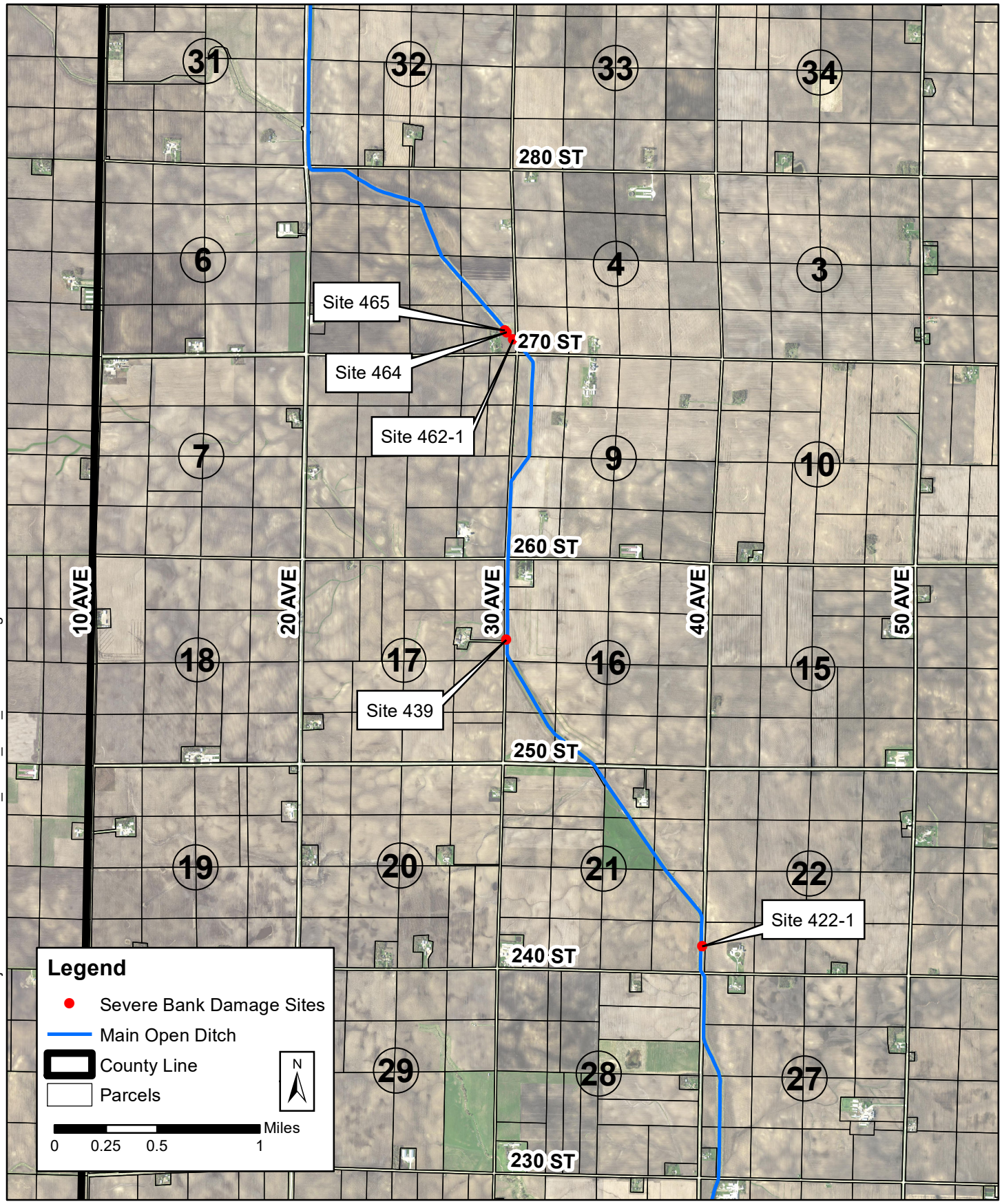


Document Path: P:\Arc View 8 Projects\2023\E23114\E23114_JDD1_PAK_SevereDamages.mxd

Joint Drainage District No. 1
Main Open Ditch
Severe Bank Damage Sites Map #3

Palo Alto and Kossuth County, Iowa

JACOBSON-WESTERGARD
& ASSOCIATES, INC.
Consulting Engineers & Land Surveyors
www.jacobson-westergard.com



Document Path: P:\Arc View 8 Projects\2023\E23114\E23114_JDD1_PAK_SevereDamages.mxd