



Real People. Real Solutions.

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September 9, 2025

Kossuth County Board of Supervisors
Acting as Trustees for Drainage District No. 20
114 West State Street
Algona, IA 50511

RE: South Main Tile Improvement
Drainage District No. 20
Kossuth County, Iowa
Project No.: 25X138901000

Dear Trustees,

Scope of Work

The purpose of this letter report is to provide information related to a drainage improvement request by a landowner of Drainage District No. 20, Kossuth County, Iowa (DD20). The Board of Supervisors, acting as Trustees, appointed Tyler A. Conley, P.E., Bolton & Menk, Inc. to complete the necessary preliminary survey, study, and engineering report. This report outlines the findings of the drainage review and the conditions that could be considered in pursuit of answering the drainage petition. A copy of the drainage petition is attached to this report.

Location & District Facilities

The watershed of the South Main of DD20 is directly east of Bancroft, approximately 3 miles. The South Main outlets to an open channel that flows into the Union Slough. Attached to this report is redrawn plat and profiles of the original DD20.

Field Investigation & Capacity Analysis

From the property divide between the privately owned land to the west and the Union Slough ground to the east there is approximately 60' of pipe between the concrete box structure that exists approximately on the property line and the existing open channel. The existing pipe outlet at the open channel is a 36" corrugated metal pipe. It is assumed that this portion of the pipe is 20' in length. It appears that the upstream portion of pipe between the corrugated metal and the concrete box structure (the remaining 40') is black plastic dual-wall pipe, also 36" in diameter. The grade between the outlet of the concrete box structure and the channel flowline was found to be approximately 2.4%. The watershed of the South Main was found to be approximately 1,835 acres in size. From this field information the capacity and drainage coefficient of the system can be calculated. A drainage coefficient is the amount of water, in inches, that could be theoretically drained from the landscape in a twenty-four-hour period. When calculating the outlet capacity of the existing system and factoring a partially submerged outlet, the Drainage Coefficient is approximately **0.6 inches per day**.

The capacity of the upstream portion of district facilities was also calculated. From the original plat and profile the South Main Tile is a 22" at 0.60% grade. This would equate to a drainage coefficient of approximately **0.18 inches per day**. These values were calculated using Bernoulli's equation for the outlet capacity and Manning's equation for the upstream tile capacity. A summary of capacities per different scenarios is provided in Table 1.

Scenario	Flow Capacity (cfs)	Drainage Area (ac)	Drainage Coefficient (in/day)
36" HDPE Flowing Full (Manning's Equation)	103.6	1,835	1.34
36" CMP Flowing Full (Manning's Equation)	56.1		0.73
36" CMP Free Flowing (Bernoulli's Equation)	69.9		0.91
36" CMP Submerged (Bernoulli's Equation)	48.3		0.63
42" CMP Free Flowing (Bernoulli's Equation)	74.1		0.96
42" CMP Submerged (Bernoulli's Equation)	51.3		0.67

From this analysis, it appears that the outlet is currently sufficiently sized for the upstream tile loading, unless an additional private system has been installed that requires additional outlet capacity above the ½" drainage coefficient. If the 1" drainage coefficient is desired, it would require the 36" plastic pipe be replaced with a 42" pipe and the outlet metal pipe be replaced with a 48" segment of pipe. This option would also require additional investigation due to a questionable amount of available ground cover for those pipe sizes. Additionally, at a minimum, the existing manhole structure would need to be retrofit to accommodate the larger outlet tile.

It would be most economical to increase the outlet size to accommodate the flow rates generated by a more comprehensive tile improvement project. However, if the desire of the Trustees, based on desires of the district landowners, is to increase the outlet size, a representative from the Union Slough have confirmed that such an improvement would be allowed. However, it has also been stated that there is not any interest in deepening or improving the capacity of the existing open channel downstream from the tile outlet. A cost estimate for the 1" drainage coefficient is attached to this report. These estimates represent our best judgment of the probable cost, based upon our experience with similar projects. The quantities and unit costs for construction are believed to be reasonably accurate for use in this report and hearing. Actual costs are subject to the market for the respective components, and to other economic forces. These estimates carry no actual or implied guarantees. If an improvement is considered there are additional considerations that should be noted.

Additional Improvement Considerations

First, with any improvement, under Iowa Code Chapter 468.126, any upstream farmed wetlands in the District could be assumed converted and mitigation of these converted acres would be required, at a minimum acre for acre basis to meet Farm Program Compliance.

Second, district improvement projects can be halted by a process known as "remonstrance". For remonstrance to be met, objections must be made to the auditor by "a majority of the landowners in the

district, and these remonstrants must in the aggregate own seventy percent or more of the lands to be assessed for benefits or taxed for said improvement” – Iowa Code Chapter 468.28.

Third, if the improvement options are approved, reclassification is required as stated in Chapter 468.131 of the Iowa Code: “When an assessment for improvements...exceeds twenty-five percent of the original assessment and the original or subsequent assessment or report of the benefit commission as confirmed did not designate separately the amount each tract should pay for the main ditch and tile lateral drains then the boards shall order a reclassification.”

Damages

Landowners would be entitled to full reimbursement for damages resulting from the work on their lands. These damages will be established at a project completion hearing after the work is complete. The contractor will be assigned temporary work limits along each side of the tile lines to allow for construction activities. The work limits for the tile would be set at approximately 40 to 65 feet on either side of the tile centerline.

Crops that are damaged during construction would be paid for by the District, based on crop appraisals. The construction zone would be minimized, and the work scheduled to minimize the loss of crops.

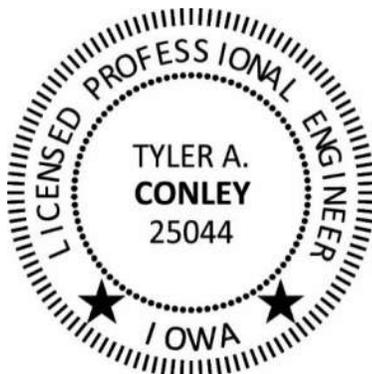
Buffer Strips may exist within the work area. Seeding of these areas is typically performed by the landowner, with reimbursement being made at the project completion hearing. Seed mixes for these lands are often specific for the type of conservation practice which is utilized. If farm program buffer strips do exist, the destruction of buffer strip vegetation by construction activities places the landowner in violation of farm program conservation rules. The penalties can include loss of the CRP contract, forfeiture of back CRP payments, and penalties. To avoid these, landowners must request a waiver from the USDA Farm Service Agency County Committee. The county committee will grant waivers for district projects if seeding restoration in compliance with NRCS requirements is completed. If the work is authorized, all farm program buffer strip owners on the repair portion of the ditch must independently seek the FSA County Committee waivers. This process will take two or three months and should be initiated immediately if work is approved.

Sincerely,

Bolton & Menk, Inc.

Tyler A. Conley, P.E.

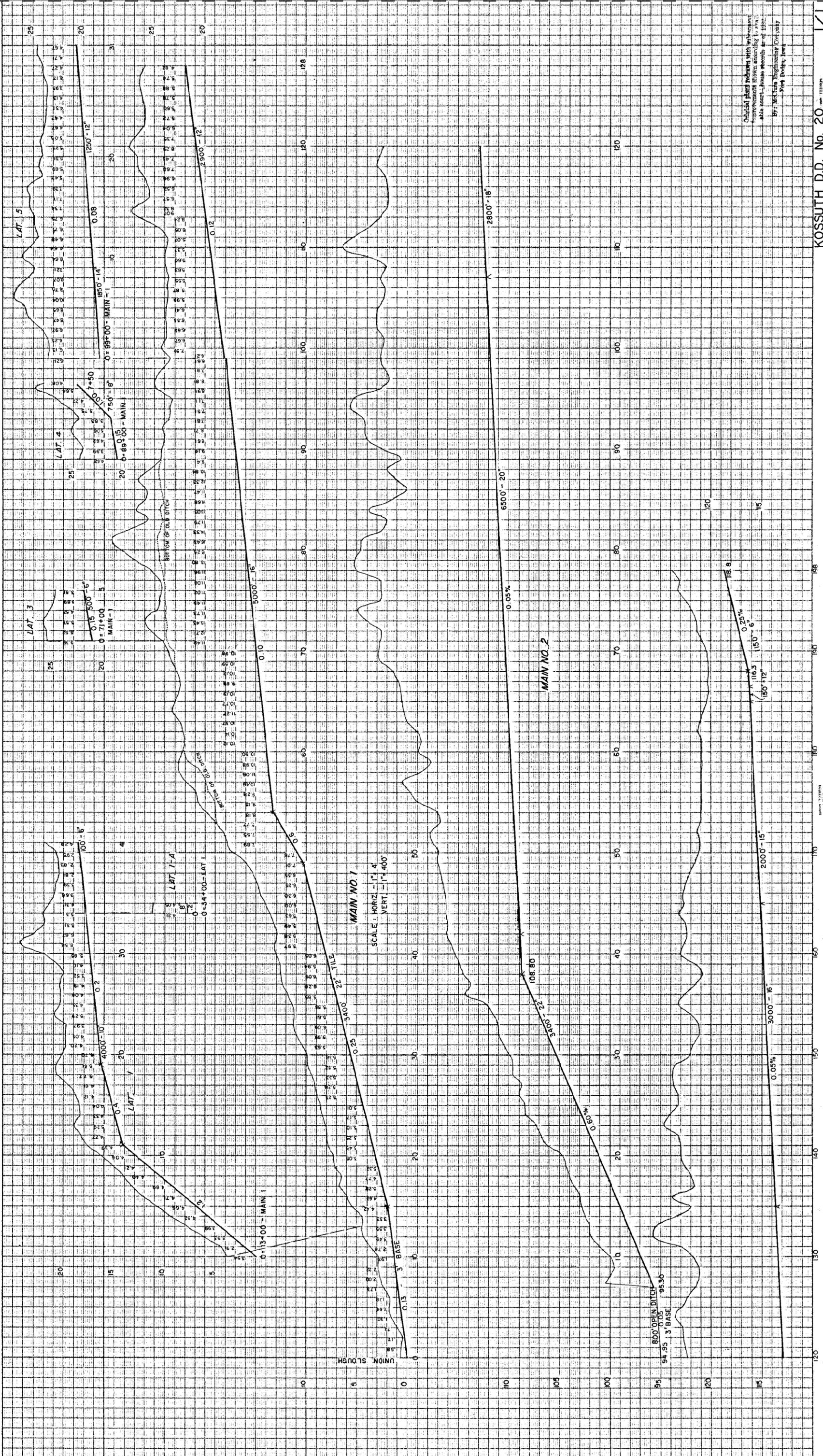
Project Manager



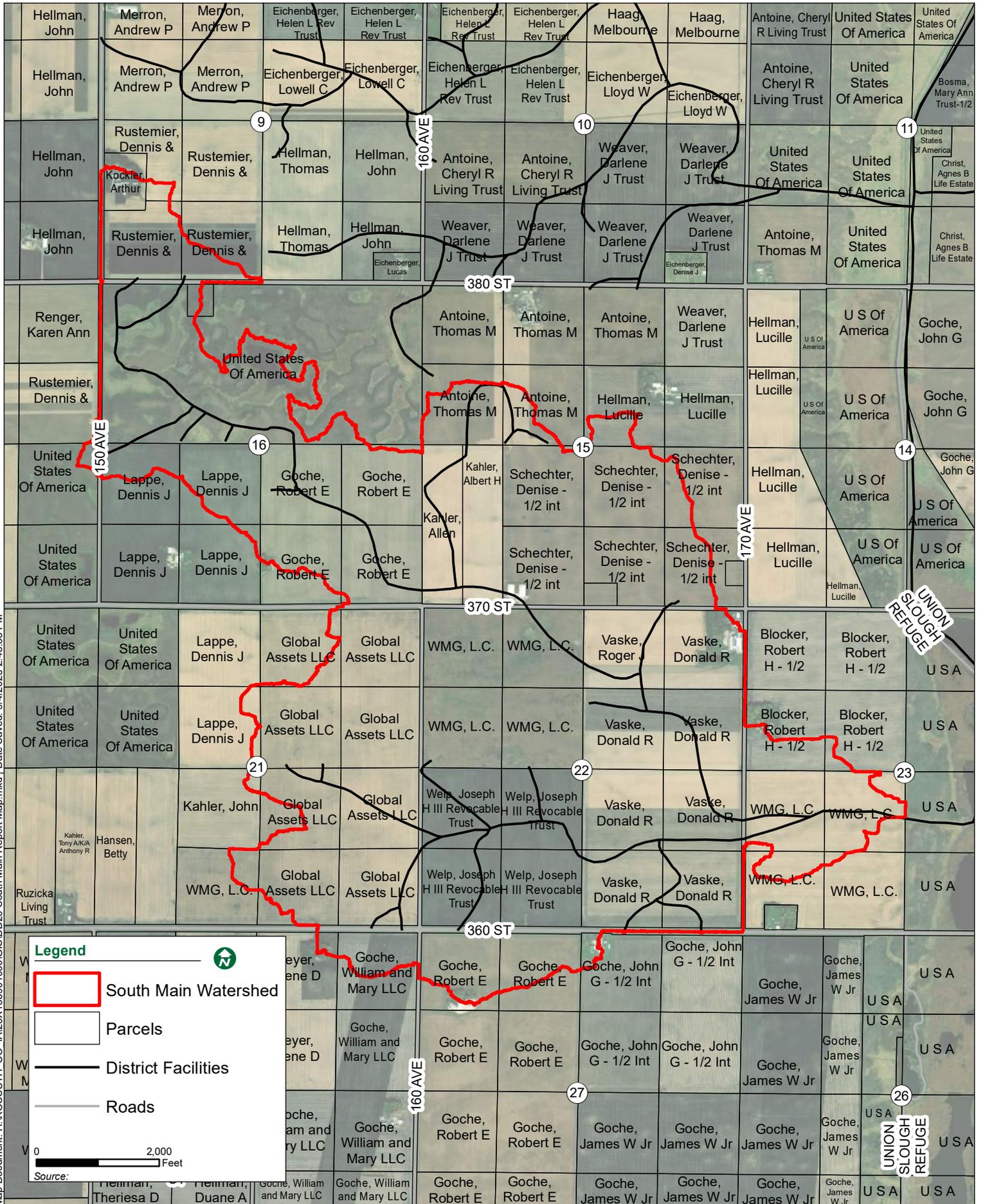
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Iowa. My renewal date is December 31, 2025.

By: 
Tyler A. Conley, P.E.
License No. 25044

Date: 9/9/2025



Original plan redrawn with pertinent
 improvements shown according to
 site plan, June records & of file.
 By: McVey Engineering Company
 Peaslee Building, Iowa



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Legend



South Main Watershed



Parcels



District Facilities



Roads



Source:

UNION SLOUGH REFUGE

UNION SLOUGH REFUGE



Legend

- South Main Watershed
- Parcels
- Roads

0 100 Feet

Source:

Map Document: H:\KOSSUTH_CO_IA\25X138901000\GIS\DD20_South_Main_Report_Map_Zoom.mxd | Date Saved: 9/4/2025 11:21:53 AM

**Engineer's Opinion of Probable Cost
Drainage District No. 20
South Main Tile
Kossuth County, Iowa
2025**

South Main Tile Outlet Improvement

<u>Item</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total</u>
1	Spot Tile Exploration	HR	4	\$250	\$1,000
2	Trench Foundation Stone	TN	60	\$30	\$1,800
3	Manhole Reconstruction	EA	1	\$3,000	\$3,000
4	Drain Tile, Trenched, HDPE, 42" Dia., <9'	LF	40	\$100	\$4,000
5	CMP Tile Extension, 42" Dia.	LF	20	\$150	\$3,000
6	Remove Existing Tile	LF	60	\$4	\$240
7	Fence Cuts	EA	2	\$100	\$200
8	Mobilization	LS	1	\$700	\$700
9	Construction Contingency	LS	1	\$1,560	<u>\$1,560</u>

Estimated Construction Cost \$15,500

Non-Construction Costs

Construction Related Damages	\$1,000
Basic Engineering Services	
Survey, Study & Report, Meetings & Hearing	\$10,000
Legal Services, Publications, Mailings, Etc..	\$1,000
Finance, Interest & Contingency	<u>\$800</u>

Estimated Total Non-Construction Costs \$12,800

Estimated Total Assessable Project Cost \$28,300