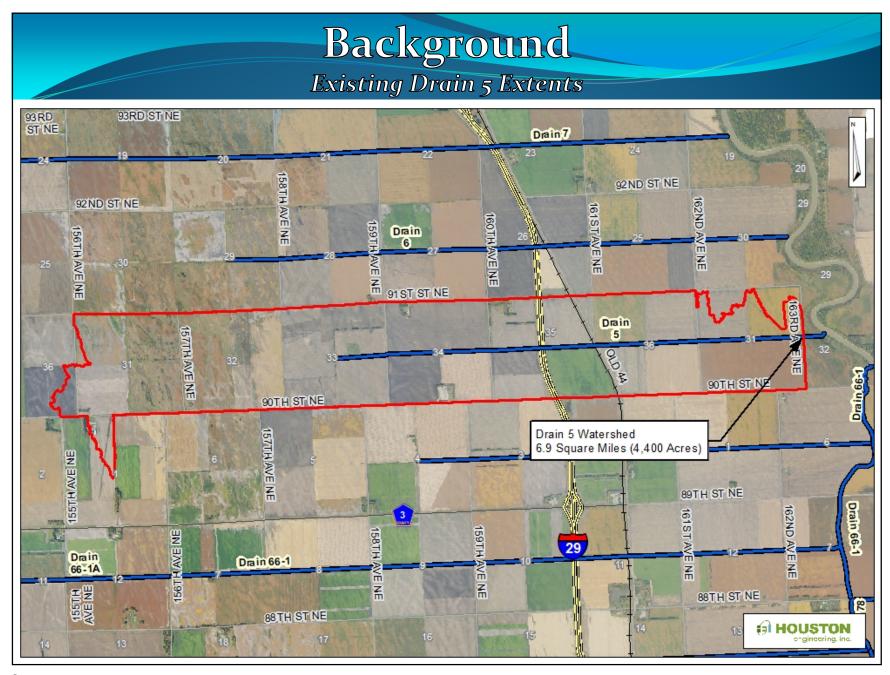
# Pembina County Drain 5 Extension

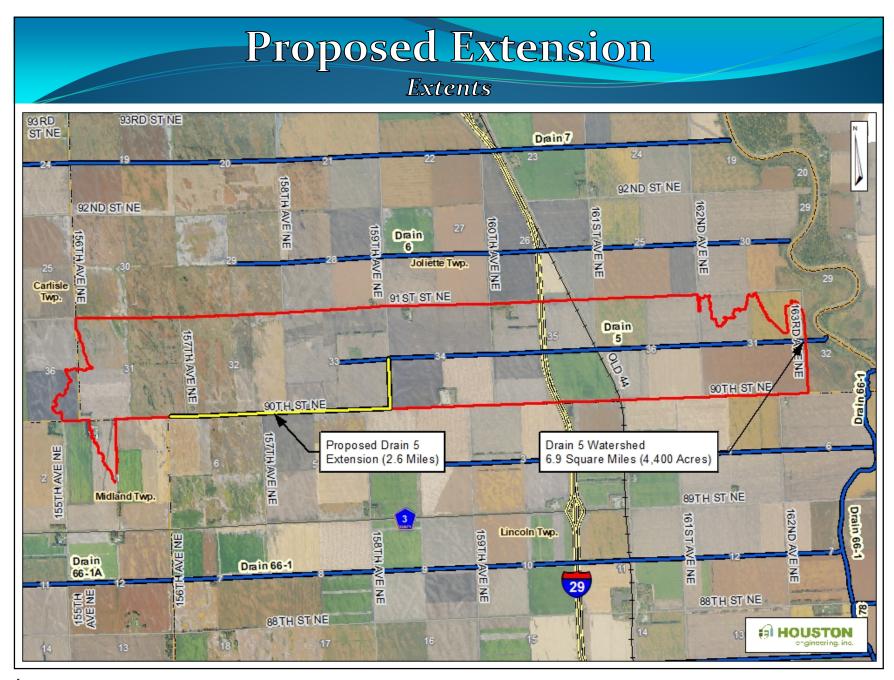
Preliminary Design Landowner Meeting

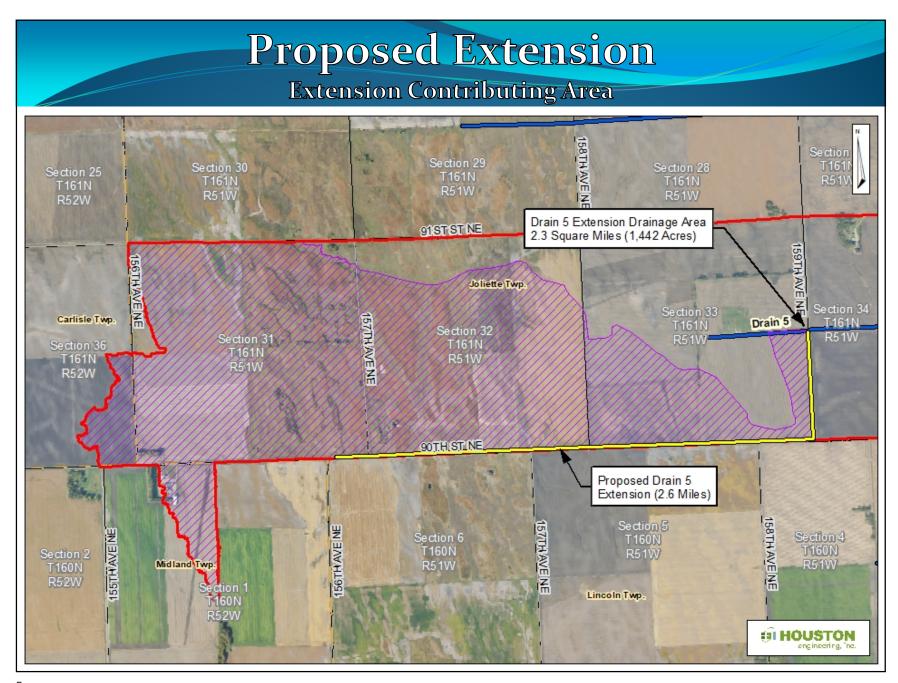
> November 19, 2024 Cavalier, ND

#### Scope

- <u>Purpose of Study</u>: Explore alternatives that will provide additional benefits to the upper reaches of the Drain 5 drainage area.
- Project Phases
  - Field Survey
  - Existing Conditions Hydrology and Hydraulics
  - o Alternative Development and Analysis
  - o Summary Report
- Purpose of this Meeting:
  - o Discuss areas of concern in the watershed and historical flooding along the drain.
  - o Present Alternatives, and develop a path forward







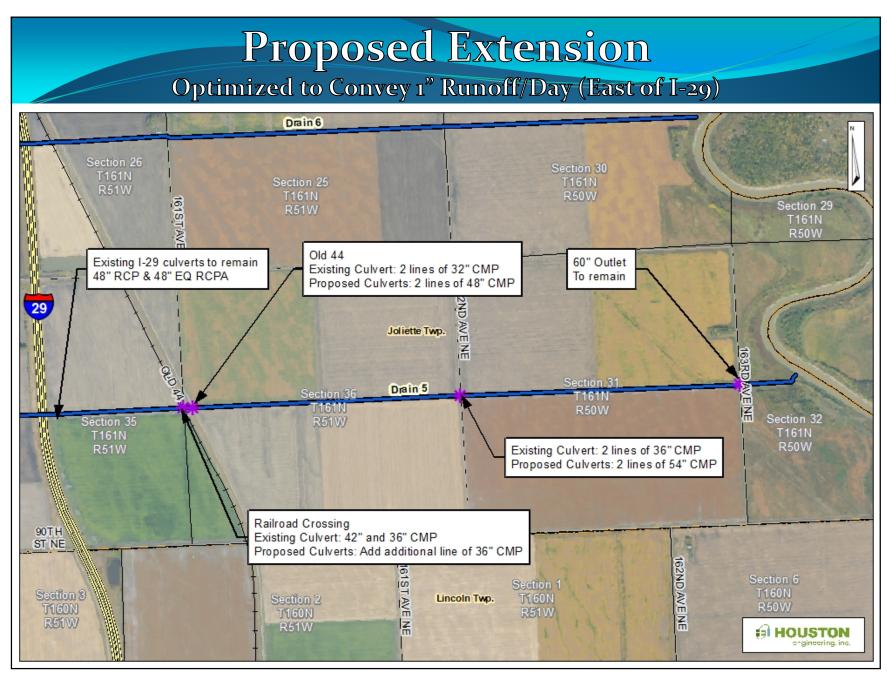
### Proposed Matching Capacity Alternative

- Match Extension Capacity to Existing Drain 5 Capacity of 0.25"-0.5" Runoff/Day
  - 0.5" of runoff is expected from a 2 to 5-year event.
- Existing I-29 culverts to remain

#### **Proposed Extension** Matching Downstream Capacity Alternative Drain 6 Section 26 Section 28 H AVE NE Section 30 T161N Existing I-29 culverts to remain T161N **R51W** 48" RCP & 48" EQ RCPA Existing Culverts: 24" and 36" CMP to Remain 159TH AVE NE Joliette Twp. Existing Culvert: All Under 24" CMP Proposed Culvert: All 24" CMP Section 34 Drain 5 ection 32 Section 31 T161N R51W T161N **R51W R51W** R51W Green Dashed Line: Existing Channel Cleanout ST NE 90TH ST NE Existing Culvert: 30" CMP Proposed Culvert: 42" CMP Start of Cleanout Section 3 Lincoln Two Drain 3 Yellow Line: New extension channel matching Existing Culvert: 30" CMP capacity of existing downstream channel **R51W** Midland Two. Replace in kind. Section 1 T160N R52W Section 9 13 HOUSTON 89TH STINE T160N

### Proposed Optimized Alternative

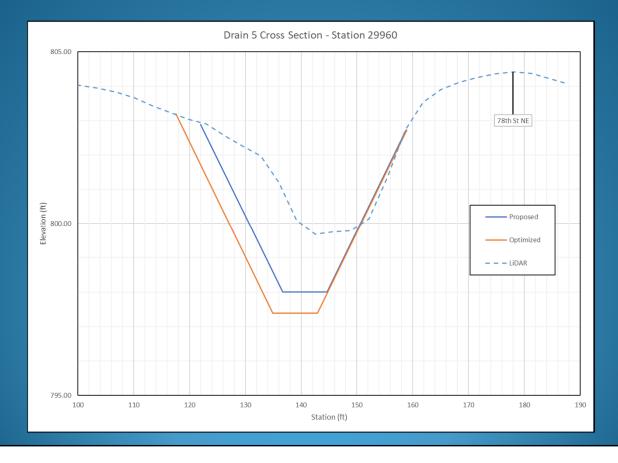
- Increase entire Drain 5 Capacity to 1" Runoff/Day
  - 1" of runoff is expected from a 10-year event.
- Existing I-29 culverts to remain
- Ensure all road crossings are meeting ND Stream Crossing Standards



#### **Proposed Extension** Optimized to Convey 1" Runoff/Day (West of I-29) Drain 6 Section 26 Section 28 H AVE NE Section 30 T161N Existing I-29 culverts to remain T161N **R51W** 48" RCP & 48" EQ RCPA Existing Culverts: 24" and 36" CMP 160TH AVE NE Proposed Culverts: 2 lines of 48" CMP Existing Culvert: All Under 24" CMP Proposed Culvert: 36" CMP Section 34 Drain 5 Section 33 ection 32 T161N Section 31 R51W **R51W R51W** R51W Green Dashed Line: Existing Channel Cleanout ST NE Existing Culvert: 30" CMP 90TH ST NE Proposed Culvert: 42" CMP Red Dashed Line: Regrading at 0.05% Section 3 157TH AVE Lincoln Two. Drain 3 Section 4 Existing Culvert: 30" CMP T160N **R51W** AVE Proposed Culvert: 42" CMP R51W **R51W** Midland 띪 Section 1 T160N **R52W** Section 9 13 HOUSTON 89TH STINE T160N

## Alternative Comparison

Alternative	Project Scope	Estimated Capacity	Total Cost	Estimated Cost Share	Local Cost Share
	Improvements limited to West of I-29 Matching Existing Drain 5 Capacity	0.25"-0.5" Runoff/Day	\$ 765,000	\$ 280,000	\$ 485,000
Optimized	Improve Crossings East of I-29 (Outlet to Remain) Increased Capacity	1" Runoff/Day	\$ 1,315,000	\$ 525,000	\$ 790,000



#### Discussion

- Based on your observations is the existing Drain 5 system adequate?
- Is there desire to improve the existing Drain 5 system?
  - If Yes, are there specific issues that you would like to see addressed?
  - If No, what concerns do you have with the extension alternative that matches the existing Drain 5 capacity?
- Any other items for the good of the order?

#### Next Steps

- Consensus on path forward? (Today)
- Finalize concept design and cost estimate.
- Legal proceedings, public vote likely required.
- Pursue State Cost Share (Pre-construction)
- Railroad and Road Authority Coordination
- Finalize Design Plans and Specs.
- Permitting
- Land Rights
- Pursue State Cost Share (Construction)
- Contractor Procurement & Construction
- Operation and Maintenance

