
Chaddock Drain

Preliminary Engineering Summary



Chaddock Drain
Board of Determination
Muskegon County Drain
Commissioner
September 22, 2020

Chaddock Drain Preliminary Engineering Summary



BOARD OF DETERMINATION OVERVIEW

- **Petition** filed by freeholders in the District for maintenance and improvement to alleviate drainage issues
- **Michigan Drain Code** requires a Board of Determination meeting
- **Board** composed of 3 disinterested members outside of Township affected
- Determine project **necessity** based on public health, convenience, and welfare after hearing testimony



Chaddock Drain Preliminary Engineering Summary



PRELIMINARY WORK PERFORMED:

- Review the history of drainage within the area at the MCDC's office. Chapter 8 petition for maintenance and improvements found not necessary in 2015.
- Review and Research existing record information (GIS, aerial photographs, topographic info, previous design drawings, etc.)
- Review 2015 petition and investigation report.
- Field inspection of the drainage, watercourses, and potential extensions within the Chaddock Drain Drainage District.
- Review areas of concern with MCDC staff and property owners.
- Provide an **independent and unbiased** assessment of the storm water conditions within the Drainage District.
- Compile all analyses and report on those findings at the Board of Determination.

Chaddock Drain Preliminary Engineering Summary



DISTRICT BOUNDARY OVERVIEW:

District Boundaries:

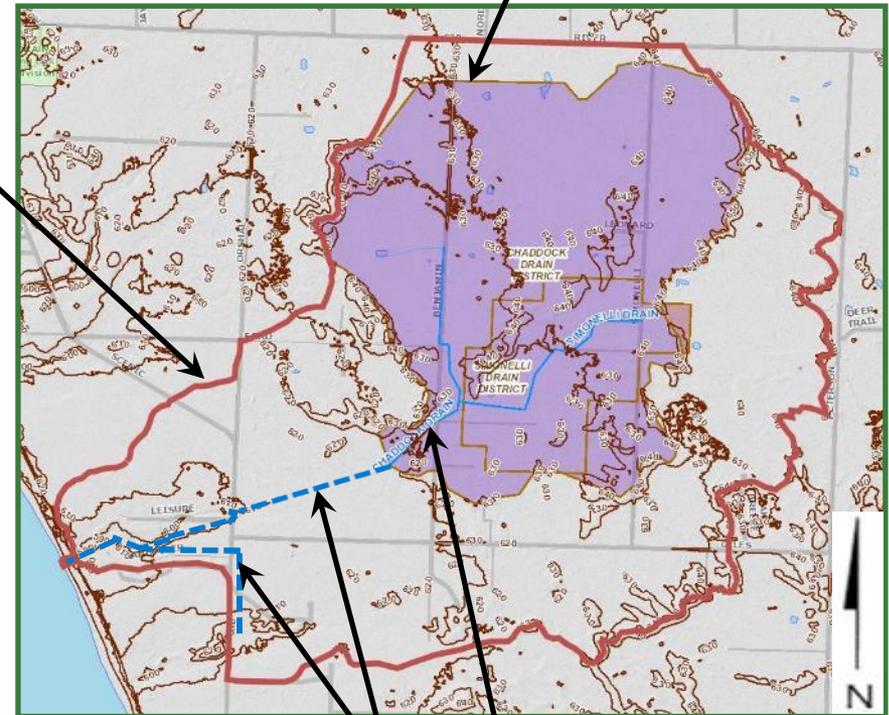
How Determined:

- Topographic Maps
- Muskegon County GIS
- Culvert, Storm Sewer, and Runoff Review
- Site Inspections

Drainage District Boundary Information:

- Proposed Drainage District Boundary = 1310 Acres +/-
- Entirely in Laketon Township

Proposed Chaddock Drain Drainage District Boundary



Ex. Chaddock Drain Drainage District Boundary

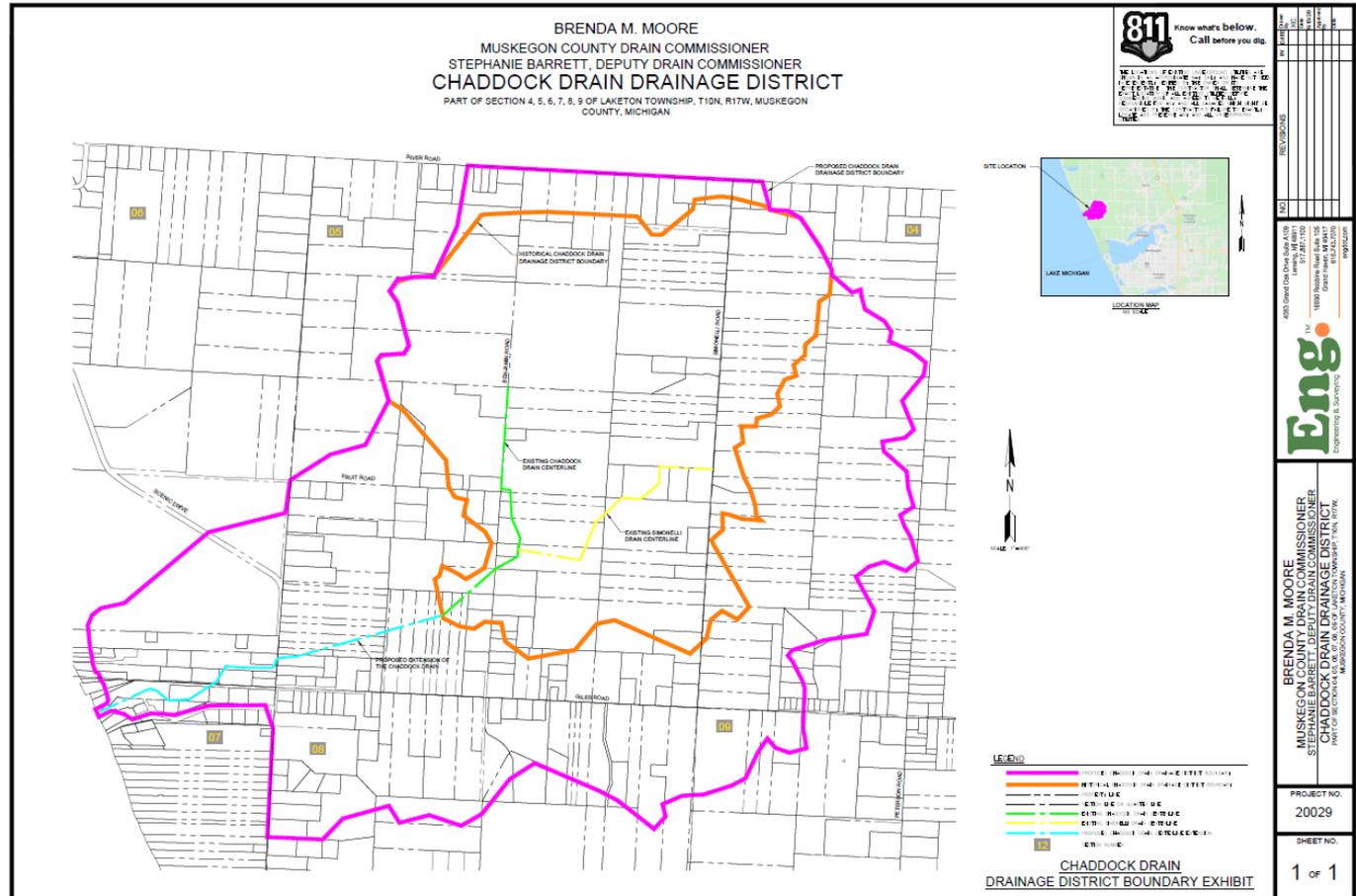
Proposed Chaddock Drain Extension & Branch

Chaddock Drain Route & Course

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DISTRICT BOUNDARY OVERVIEW:

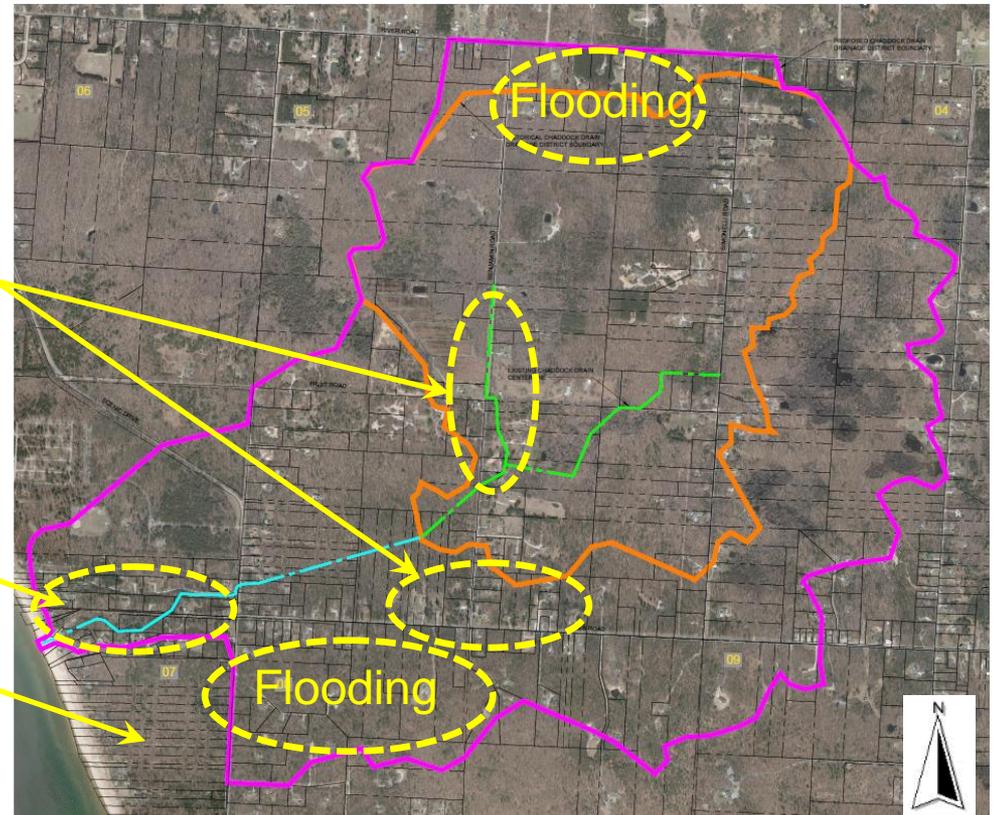


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EXISTING DRAINAGE CONDITIONS OVERVIEW

- Large contributing area and inadequate conveyance system in several locations
- Culvert restrictions and sizing issues
- Significant flooding
- Erosion and Sedimentation due to private nature of watercourse
- Lack of adequate outlet to Lake Michigan for southern portion



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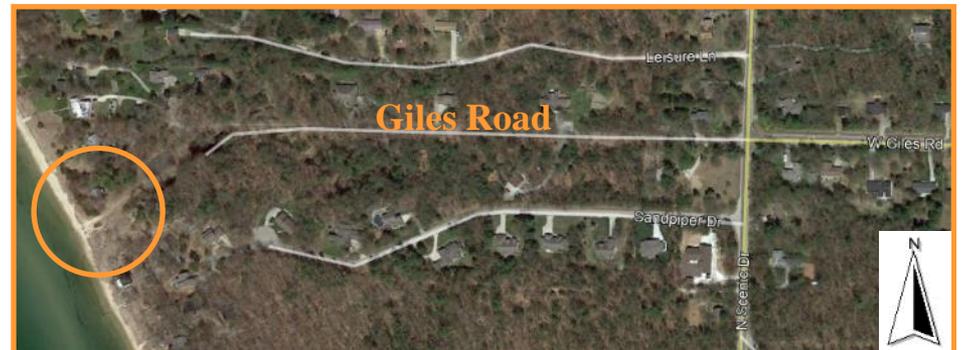


EXISTING DRAINAGE CONDITIONS



Debris filled and eroded outlet of Chaddock drain into Lake Michigan

Eroded channel of Chaddock Drain upstream of outlet into Lake Michigan



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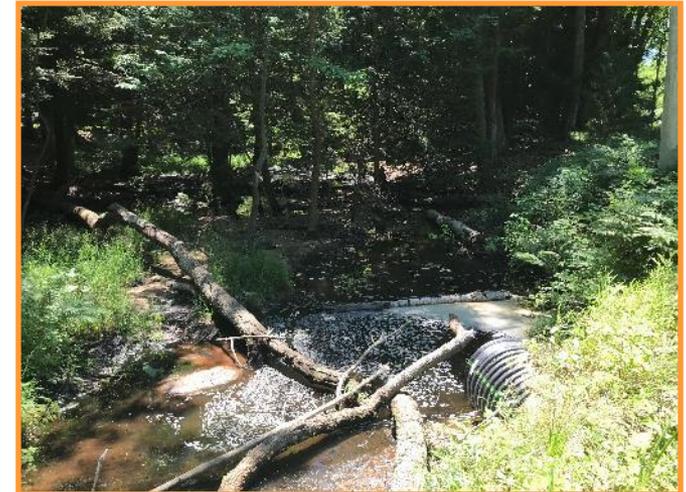


EXISTING DRAINAGE CONDITIONS



Undersized perched culvert 400' upstream of outlet causing water backups and scouring

Undersized culvert and lack of a defined open drain 1300' upstream of outlet



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EXISTING DRAINAGE CONDITIONS



Excessive sediment and debris build up on the upstream side of 24-inch CSP culvert crossing Scenic Dr causing flooding during heavy rain events

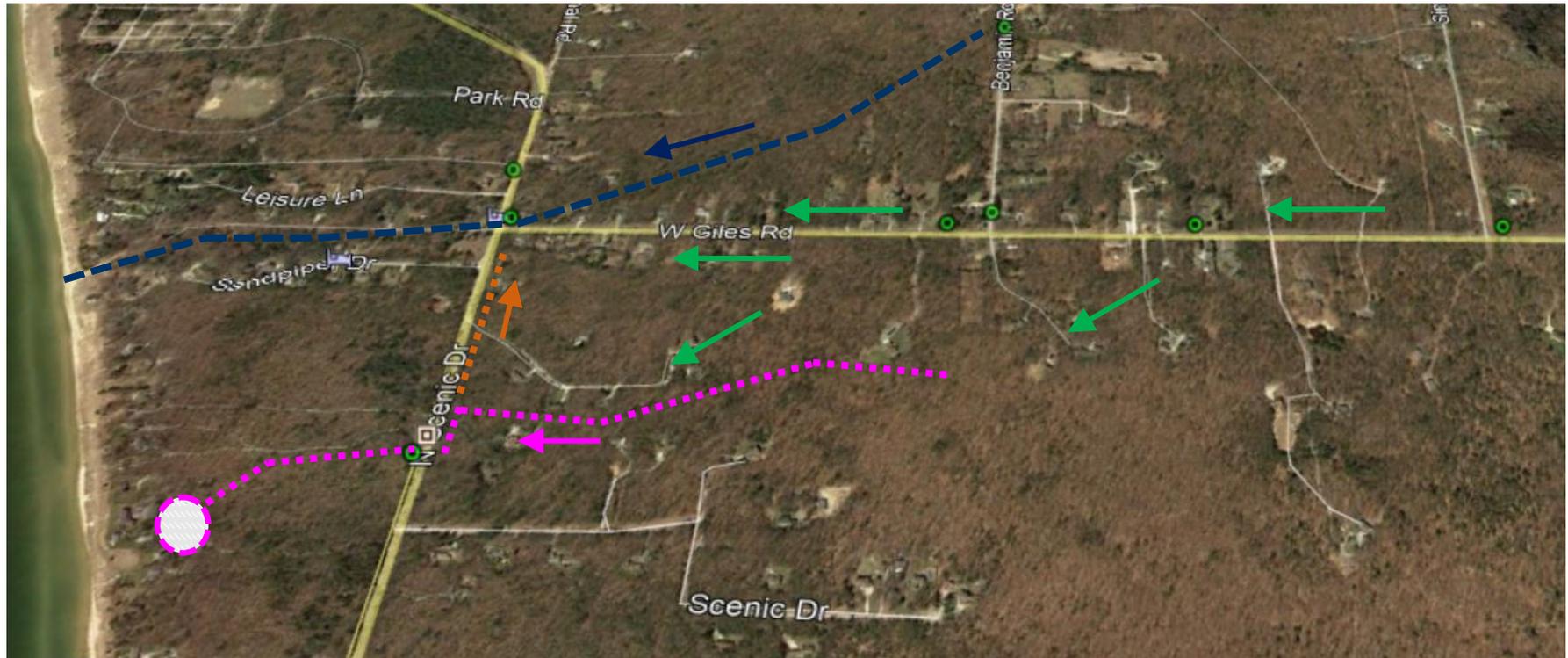
Woody debris and sediment deposits within open drain section approximately 200' downstream of Benjamin Dr



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EXISTING DRAINAGE CONDITIONS



Blue Line: Outlets to Lake Michigan

Pink Line: Infiltrates east of Homes / Bluff at Lake Michigan

Brown Line: Proposed Alignment to Positive Outlet

Giles Road: Road Ditching not capable of conveying contributing area



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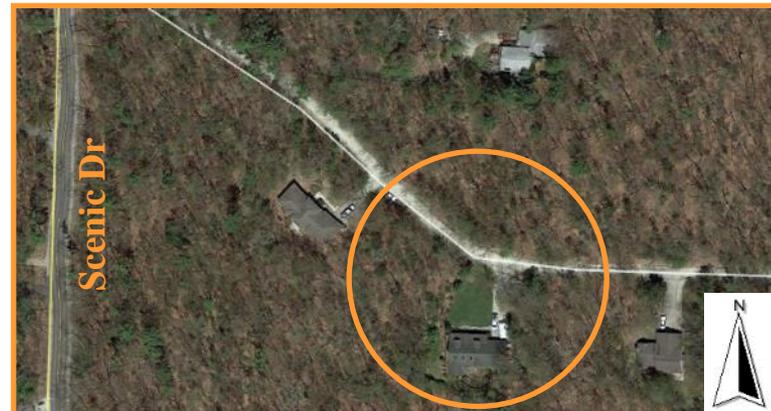


EXISTING DRAINAGE CONDITIONS



Standing water across private drive
650' south of Giles Rd off Scenic Dr

Water
surrounding
home south
of Giles Road
on a Private
Drive



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EXISTING DRAINAGE CONDITIONS



Flowing water moving westerly
between the garage and shed

Property owner
utilizing multiple
pumps to keep
water out of home



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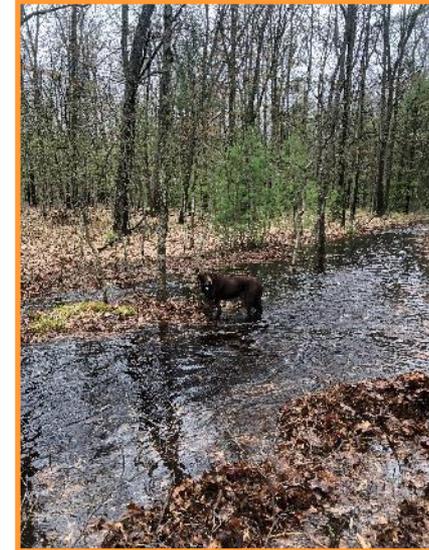
EXISTING DRAINAGE CONDITIONS



Flooding in the rear yard of
4421 Giles Rd

Flowing water
moving westerly
through back yards
toward Scenic Drive

No defined drain
exists in this area



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EXISTING DRAINAGE CONDITIONS



Open drain along Benjamin Rd across from Ford Rd with standing water and debris

Undersized and failing driveway culvert off Benjamin Rd



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EXISTING DRAINAGE CONDITIONS



Flooding in the rear yards of residences on River Rd east of Benjamin Rd

Properties are at the upper boundary of the Drainage District



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EXISTING DRAINAGE CONDITIONS



Flooded structures on River Rd

Foundation waterproofing at residence on River Rd due to rear yard flooding



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EXISTING DRAINAGE CONDITIONS SUMMARY



- **Widespread drainage and flooding issues along and south of Giles Road; north at River Road**
- **Lack of adequate storm water infrastructure and properly designed conveyance systems to alleviate drainage issues**
- **Lack of adequate outlet for lands south of Giles Road**
- **Extensive erosion to existing Drain west of Scenic Drive causing sedimentation and loss of land**

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NEXT STEPS

- **Public Testimony**
- **Board to Determine Necessity of Petition**
- **If project found not necessary:**
 - Project ends
- **If project found necessary:**
 - Evaluate scope of project and design alternatives
 - Scope meeting to discuss design with property owners and municipalities
 - Finalize design (obtain easements and permits, if necessary, and prepare bid plans)

