Ribe Drain
Preliminary Engineering Summary

Ribe Drain
Board of Determination

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Ribe Drain
Preliminary Engineering Summary

BOARD OF DETERMINATION OVERVIEW

• **Petition(s)** filed from 10 freeholders of land for Drainage District improvements

• **Michigan Drain Code** requires a Board of Determination meeting

• **Board** composed of 3 disinterested members from outside Townships affected

• Determine project **necessity** based on public health, welfare and/or convenience after hearing testimony
WORK PERFORMED:

• Review the file and history of the drain system at the MCDC’s office

• Review and research existing record information (GIS, aerial photographs, topographic info, previous design drawings, etc.)

• Determine the lands drained (“Drainage District”) by the Ribe Drain

• Survey and inspect the entire length of the existing Ribe Drain

• Prepare plan and profile drawings of the entire length of the Ribe Drain

• Provide an independent and unbiased assessment of the storm water conditions within the Drainage District

• Compile all analyses and report on these findings at a Board of Determination
**Ribe Drain**

**Preliminary Engineering Summary**

**HISTORY OF THE DRAIN:**

- 1907 Established as a County Drain
- 1929 Petition to “clean and extend” found necessary
- 1937 Petition to “establish 2 control dams and fill in a section of the drain” – 1 dam found necessary
- 1974 Maintenance Assessment
- 1976 Emergency Resolution from Township Board to “repair, reconstruct, and improve the drain and to restore the drain to provide an adequate outlet”
- 1981 Agreement with Township to “clean between Michillinda and Riley Thompson Roads”
- 1982 Petition from Township Board to “clean, relocate, widen, deepen, straighten, tile, extend, add structures or mechanical devices as may be necessary to purify or improve the flow in order to stabilize the lake levels of Twin, North, Middle, and West Lakes”

**Current Petition:**

Dated June 13, 2015 for the cleaning out, relocating, widening, deepening, straightening, tiling, extending, or relocating, adding lands and/or adding one or more branches of the Drain.
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DISTRICT BOUNDARY OVERVIEW:

DISTRICT BOUNDARIES:

- Existing Ribe Drain Drainage District Boundary
- Proposed Drainage District Boundary

How Determined:
- Topographic Maps
- Muskegon Co. GIS
- Culvert Review
- Site Inspections
- Survey

DRAIN CENTERLINES:

Existing Ribe Drain Centerline

Legend:
- Existing Ribe Drain Drainage District Boundary
- Proposed Ribe Drain Drainage District Boundary
- Existing Ribe Drain Centerline
- Section Line or Quarter Section Line
- Lands Added to Drainage District Boundary
- Lands Deleted from Drainage District Boundary
What is a Drainage District / Watershed Boundary?

- It is the area of land that catches rain and snow and drains or seeps into a marsh, stream, river, lake or groundwater through which these inputs of water then seek a common outlet.

- You are sitting in a watershed now. Homes, farms, ranches, forests, small towns, big cities and more can make up watersheds. Some cross county, state, and even international borders. Watersheds come in all shapes and sizes. Some are millions of square miles, others are just a few acres. Just as creeks drain into rivers, watersheds are nearly always part of a larger watershed.

Drainage District Boundary Information

- Existing Drainage District Boundary = 5715 Acres
- Proposed Drainage District Boundary = 5275 Acres
  - Dalton Township = 4453 Acres
  - Cedar Creek Township = 822 Acres
  - Approximately 1712 properties within Proposed Drainage District Boundary
SUMMARY OF DRAIN SYSTEM:

- Length of Ribe Drain: 5.20 miles
- Outlet near McMillan Road, extends northerly to Twin Lake
- Tributary of the Bear Creek Watershed
- Furman & Brandstrom County Drains discharge to the Ribe Drain
- Variable Width Easements over the Drain
- Includes Lake Level Control for Twin, Middle, West & North Lakes
WHAT IS THE DIFFERENCE BETWEEN A COUNTY DRAIN AND A PRIVATE (PROPOSED) DRAIN OR WATERCOURSE?

County – An existing drain for which the County Drain Commissioner maintains and oversees any improvements.

Private – Not under the jurisdiction of the Drain Commissioner. Private landowners, County Road Commission, Township, etc. must maintain or improve.
EXISTING DRAINAGE CONDITIONS OVERVIEW

• Open Channel Conditions
• Culvert Capacity & Condition
• Lake Level Control
  • Control Structure Operation
  • Control Between Lakes
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EXISTING OPEN CHANNEL CONDITIONS

Open Channel with heavy vegetation between Middle Lake Road and the R.R. Tracks

Open Channel and upper terminus of the Ribe Drain south of Middle Lake Road

Ribe Drain at Beattie Road – heavy brush and vegetation
CULVERT CAPACITY & CONDITIONS

Notable Conditions:
• Failing Culverts
• Sediment Accumulation Reducing Drain & Culvert Capacity

Existing CMP culvert at Bard Road 90% filled w/ sediment and near end of lifespan

Failing timber headwall at private culvert north of the R.R. tracks
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CULVERT CAPACITY & CONDITIONS
Sediment Accumulation Reducing Capacity

Ex. 36”x54” (2) Culvert at Bard Road (~90% Sediment Accumulation)
Ex. 24” Culvert at Overhead Utility Easement near R.R. tracks (~50% Sediment Accumulation)
Ex. 42”x75” Culvert at Riley Thompson Road (~50% Sediment Accumulation)
LAKE LEVEL CONTROL

Control Structure Configuration

MDNR Permit - Lake levels to be 678.5 USGS during May 15 - October 15 and 678.0 USGS the remainder of the year. (June 1984)

24” Inv. At Outlet to Ribe Drain = 677.73

Current Water Level

14 inches
May 2015 (679.10)
LAKE LEVEL CONTROL
Control Structure Configuration
Profile View from Twin Lake to Headwall at the Ribe Drain

Lake Level Observed May 2015 ~14 inches above Legal Lake Level or 679.10
LAKE LEVEL CONTROL

Issues with Current Lake Level Control

- Extremely flat gradient on Ribe Drain at outlet headwall (0.06%)  
- Existing design only operates correctly with a free flowing outlet  
- Any drain encumbrance (sediment accumulation, log jam, vegetation growth, dead animal, blocked culvert) will impact lake levels
LAKE LEVEL CONTROL

Lake Level Control Between Lakes

Current Lake Levels:
- Twin Lake: 679.10
- Middle Lake: 679.20
- West Lake: 679.52
- North Lake: 678.50

Creek Between West Lake & Middle Lake w/ Concrete Culvert under Middle Lake Road

Small channel connecting Middle Lake & Twin Lake

Pipe was proposed between North Lake & Middle Lake with 1983 project although pipe could not be located or verified in field

*Currently no easements exist over channels between the lakes for MCDC to maintain
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 for construction)