
MDOT's
Post-Construction
Stormwater Program
Barb Barton
Water Quality Specialist
MDOT

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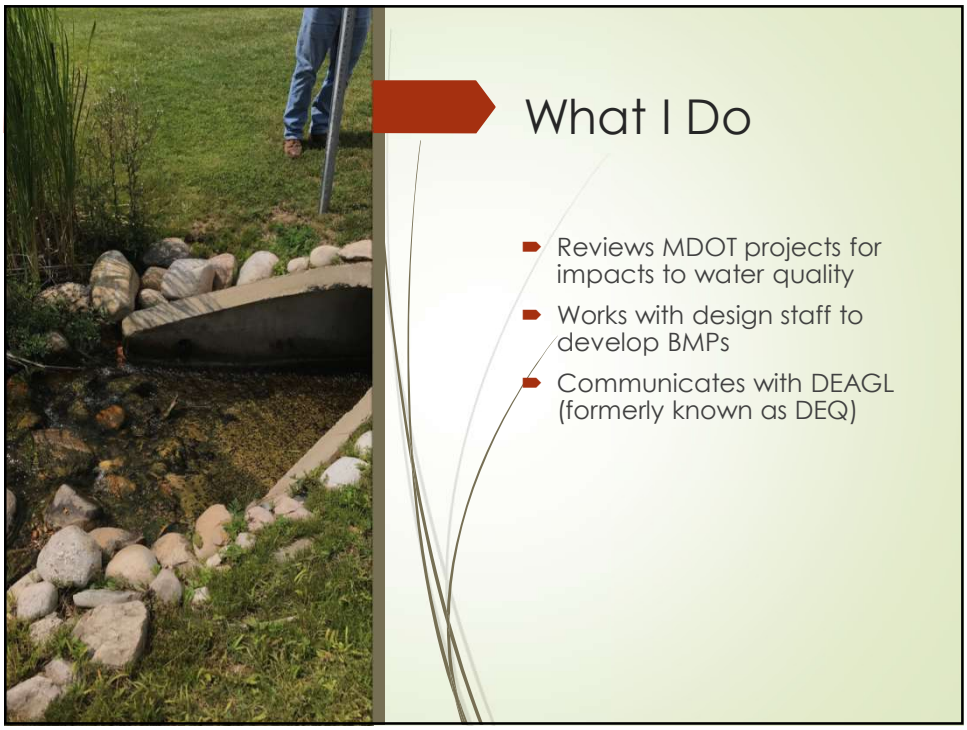
What I Do
Reviews MDOT projects for impacts to water quality
Works with design staff to develop BMPs
Communicates with DEAGL (formerly known as DEQ)

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The Clean Water Act's long-range goal is zero discharge of pollutants.

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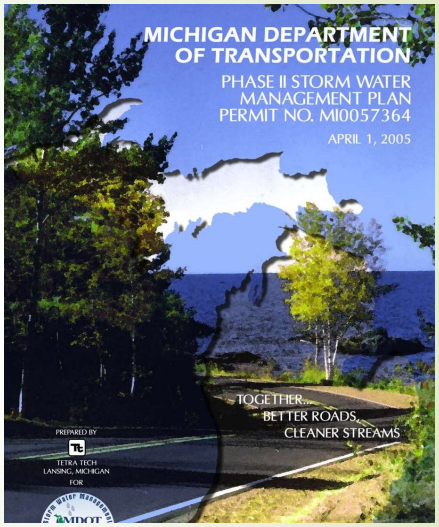
MDOT Stormwater Management Program

- National Pollutant Discharge Elimination System (NPDES) Permit took effect on April 1, 2005
- New permit application in 2013
- Expecting new permit 2019



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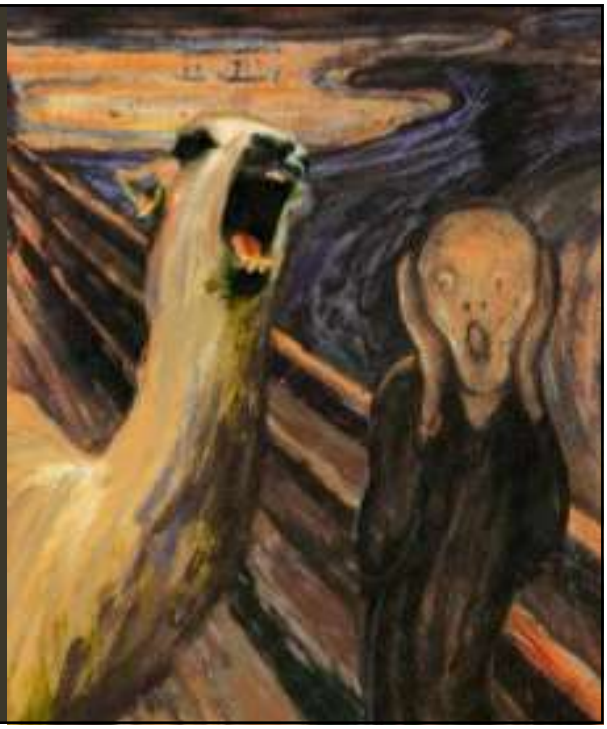
New Stormwater Permit Standards

- Water Quality
- Channel Protection



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What Are Water Quality Standards?

State rules established to protect the Great Lakes, the connecting waters, and all other surface waters

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Water Quality Goals Defined by State Rules

- Uses of the lakes and streams
- Safe levels to protect the uses
- Procedures to protect high quality waters

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Designated Uses of Michigan's Waters

- Other indigenous aquatic life and wildlife
- Coldwater and warmwater fisheries
- Total and partial body contact
- Fish consumption

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Surface Waters of the State

- Lakes
- Ponds
- Rivers
- Streams
- Drains
- Wetlands

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OUTSTANDING STATE WATERS

- Trout Streams and Coldwater Lakes
- Natural Rivers
- Wild and Scenic Rivers
- National Parks and Lakeshores

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Impairments

- *E. coli*
- **Sedimentation/Siltation**
- Mercury
- **Gas and Oil**
- **Other substrate alteration**
- **Nitrogen**
- Low dissolved oxygen
- Phosphorous
- PCBs

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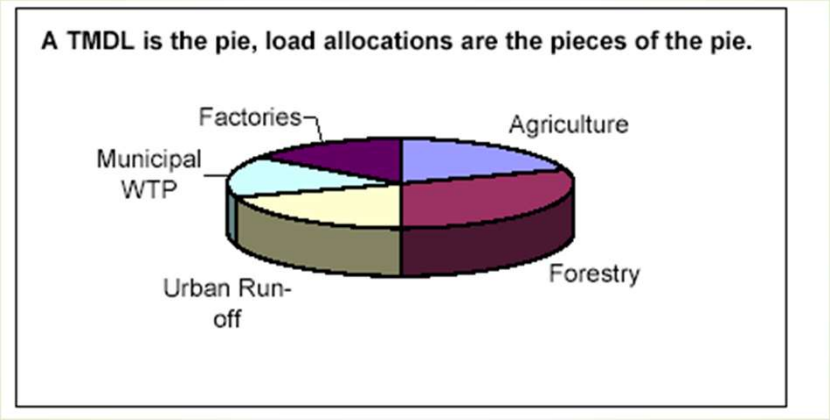
TMDLs - **T**otal **M**aximum **D**aily **L**oad



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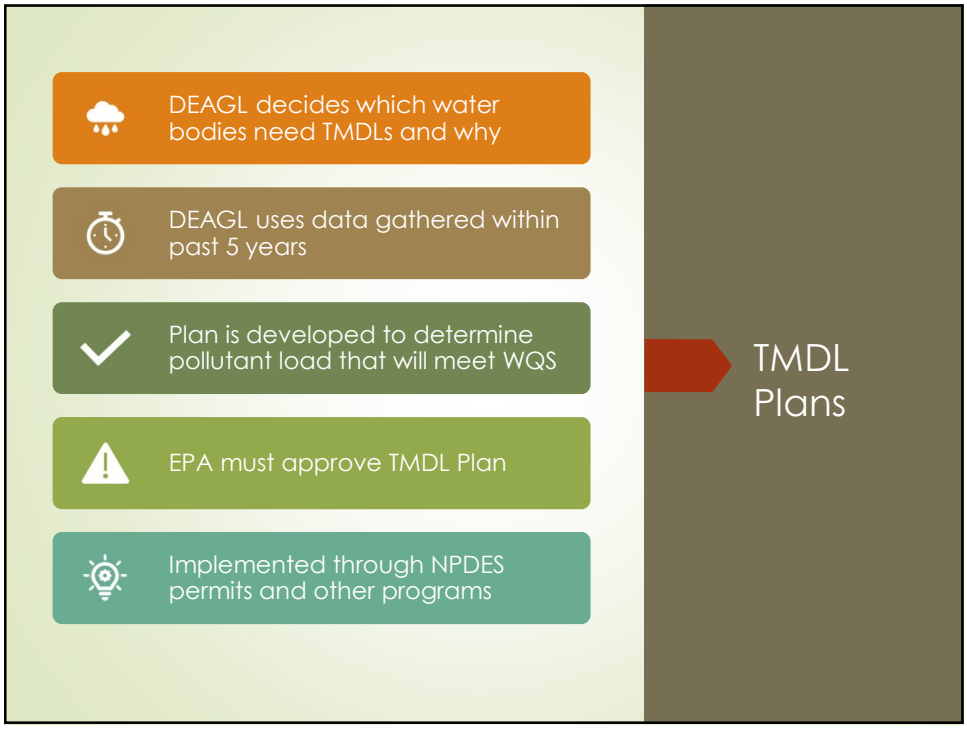
DEAGL decides which water bodies need TMDLs and why
DEAGL uses data gathered within past 5 years
Plan is developed to determine pollutant load that will meet WQS
EPA must approve TMDL Plan
Implemented through NPDES permits and other programs
TMDL Plans

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Channel Protection Standard
Protects streams from erosion
Applies if we increase impervious surface
No increase in volume
Retention – 2 year/24 hour storm event

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Review Process Overview

- Is the permit applicable?
- Look at scope of work – can we do anything?
- Identify surface waters that might be impacted
- Identify TMDLs (Total Maximum Daily Load)
- Identify potential impacts of project to water quality

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The Water Quality Review Process

Question 1

Does the Permit Apply?

YES

- If it impacts 1 acre or more of soil

HOWEVER…

- Less than one acre of soil disturbance – TMDL requirements still apply if present

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Post-Construction Permit Exemptions

Stormwater is discharged into a combined storm sewer (CSS) or is treated at a waste water treatment plant

Channel Protection does not apply if water is discharged to certain water bodies.

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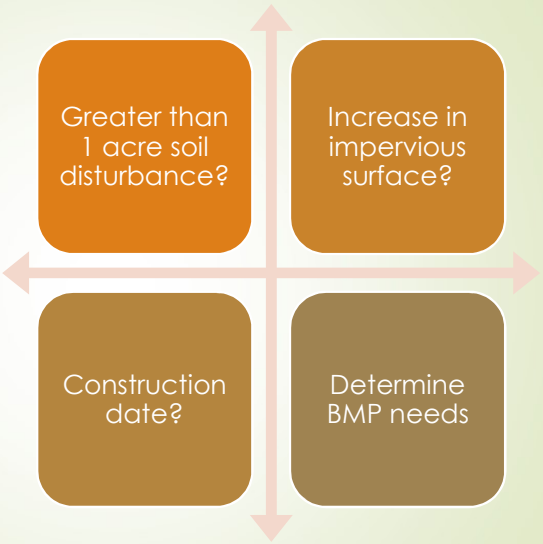
Questions for Project Manager



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Follow-up Questions for Project Manager

Request information on BMP selection

Provide guidance on potential BMPs

Direct PM to others for assistance

Frequent reminders because…

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Mitigation Measures

Need proposed BMPs to meet anticipated new permit conditions before sign-off

- Sediment removal
- Retention if required
- TMDL requirements

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BMP Determination Factors

- Volume
- Flow rates
- Site conditions
- ROW availability
- Constituents of stormwater

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Some Common BMPs

- Grassy swales
- Detention/retention basins
- Widen ditches to reduce velocities and provide increased filtration
- Swirl separators
- Green infrastructure

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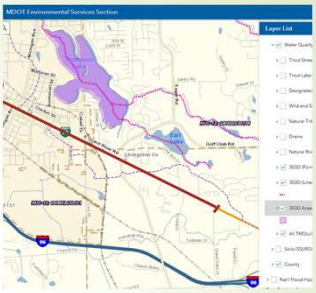
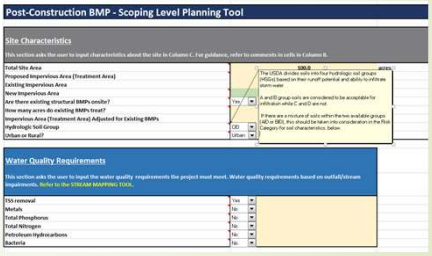
Scoping Tool

- BMP online scoping tool
- Excel spreadsheet
- GIS map with applicable features
- Allows budgeting considerations





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BMP Scoping Tool Summary

- Tool assists during scoping for five year plan
- Coarse filter to allow for BMP budgeting
- Supports NPDES compliance
- Easy to use
- Second phase – more detail for design

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Example Project

US-23
Harrisville
Bay Region

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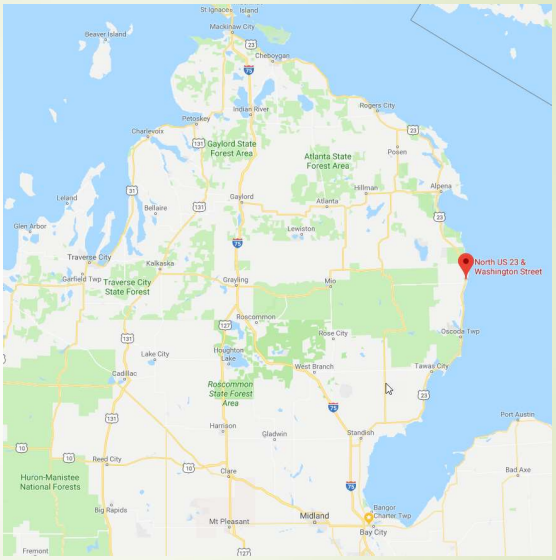
US-23 Bay Region JN 126605

- HMA reconstruction with ditching
- 2021 scheduled construction
- Widening of paved shoulders



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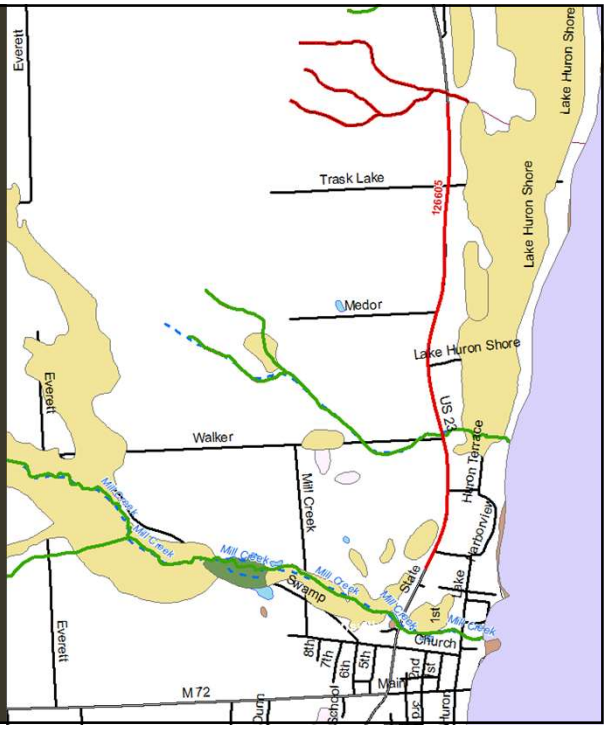
Process

- Surface waters identified
  - Trout streams
  - Wetlands
- Increased impervious surface
- Construction after 2020
- Retention and infiltration required



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BMP Development

- Calculated how much water to retain
- Designed retention trench
- Used vegetated ditches for sediment removal

US-23 Additional Runoff
Proposed Runoff Calculations

Onsite Devel. Runoff Coeff. = 0.90
Offsite Runoff Coeff. = 0.00
Tc (onsite) = 1440.0 min
Tc (offsite) = 0.0 min
Onsite area to basin = 1.16 acres
Offsite area to basin = 0.00 acres
Total area to basin, AD = 1.16 acres
Design of Detention/Retention Basin(s)
Basin Vol. Provided = 3,480 cft
Direct Release Allowed = 0.00 cfs
Perc. Rate, P = 1 in/hr Assumed saturated soils.
Infiltrating Basin Area, AB = 8,700 sft Assumed infiltration along sides of trench.
Storage Required, S2 = V2 - Qr*td = c*i2*td - 0.13*AD - P*(AB/AD)*td
S2 = c*i2*td - ((Qallow/AD)*td) - P*(AB/AD)*td
Storm Event: 2 yr (pick 100, 50, 25, 10, 5, 3, or 2)
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Detention Calcs. Onsite Offsite Total

I2 yr Storage Storage Storage
td (min) (in/hr) (in) (in) (in)
15 2.22 0.46 0.00 0.46
30 1.60 0.63 0.00 0.63
60 1.03 0.75 0.00 0.75
120 0.63 0.79 0.00 0.79
180 0.46 0.73 0.00 0.73
360 0.27 0.43 0.00 0.43
720 0.16 -0.38 0.00 -0.38
1440 0.09 -2.19 0.00 -2.19
0.79
Vol. Required 3,317 cft
0.08 acre-ft
Vol. Supplied 3,480 cft OK
PROPOSED DETENTION STORAGE
Volume (A x L) 8,700 CFT
Depth 2.0 FT
Void Ratio 40.0 %
Storage Area 1,740 SFT
Storage Volume 3,480 CFT
Perforated Pipe Volume CFT
Drywell Storage Volume CFT
Net Storage Capacity 3,480 CFT

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Can't Meet Requirements?

- Site conditions most common reason
- New permit may allow
  - Mitigation
  - Payment in lieu

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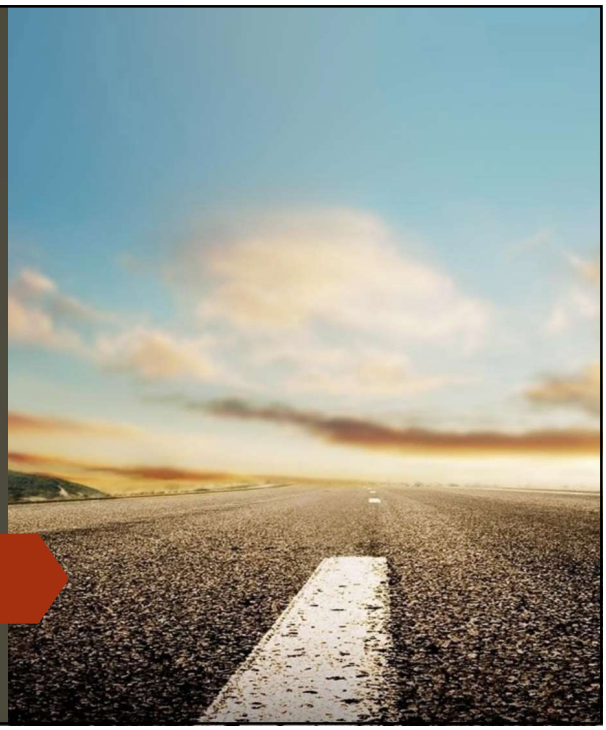
We can build good roads <u>and</u> protect the water.



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Questions?

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