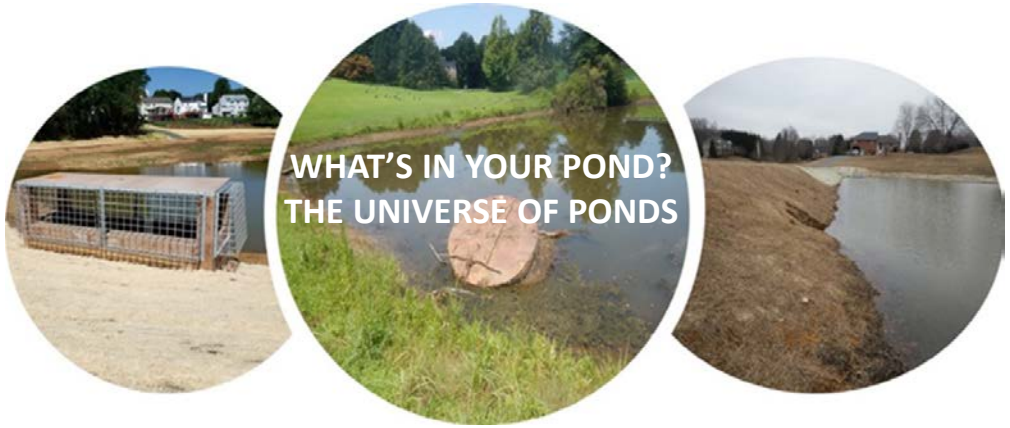
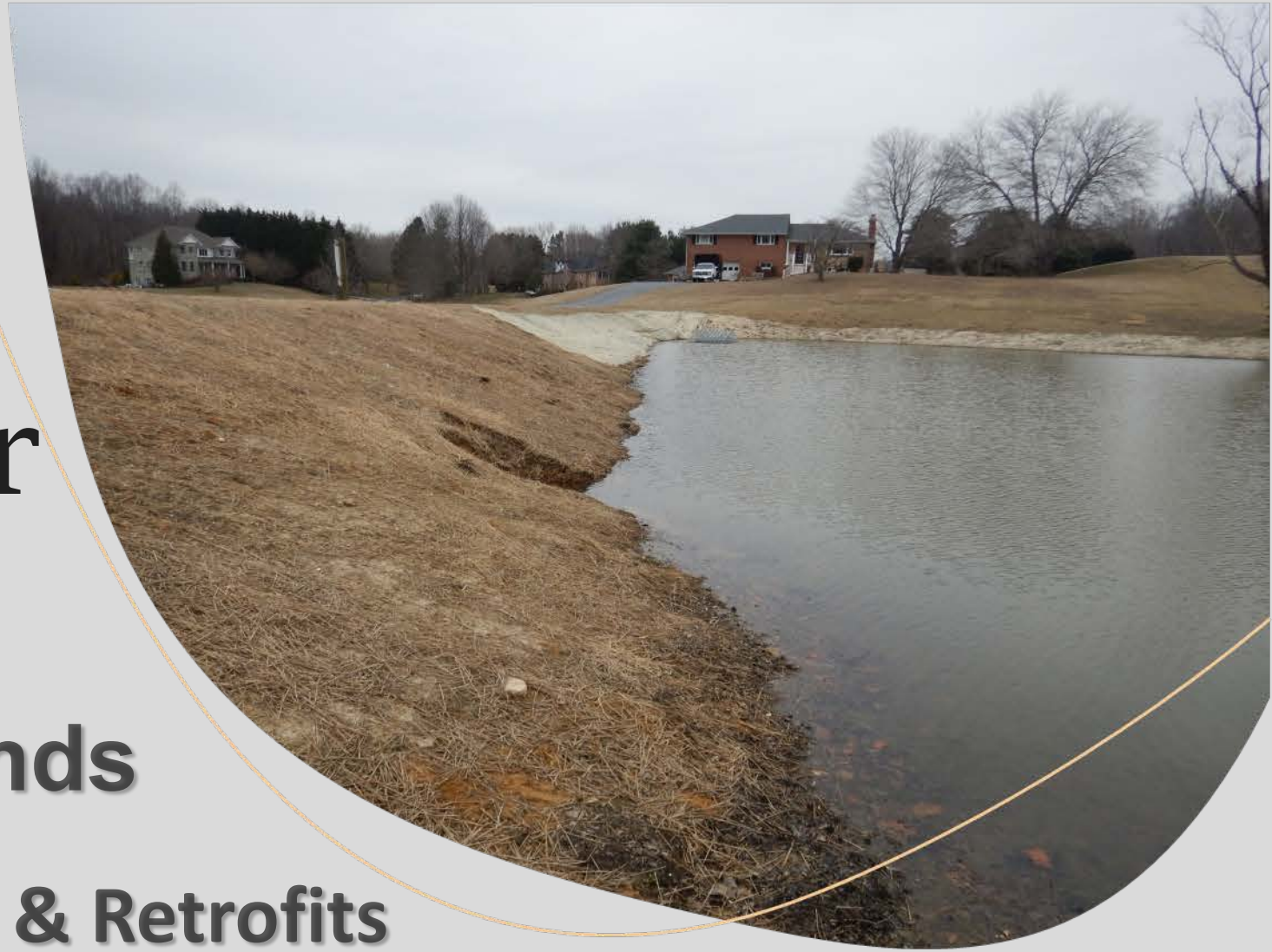


5 Minute Break

What's in Your Pond?



The Universe of Ponds

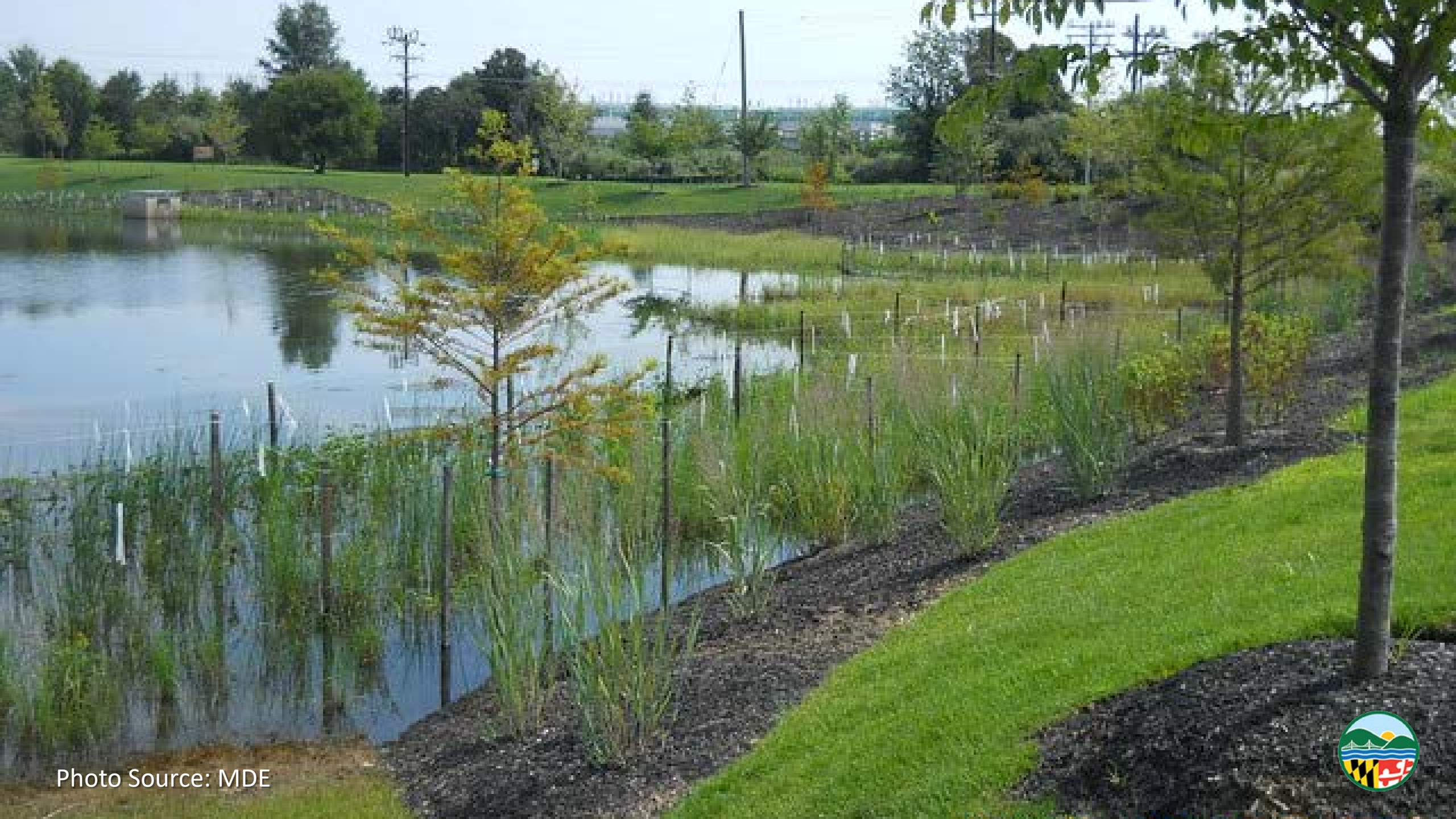
SWM Pond Maintenance & Retrofits

Stewart Comstock, P.E.

The Tip of the Iceberg…

- There are at least 15,000 small ponds
- Many of these:
  - Were built before 2002;
  - Do not have proper as-built plans;
  - Have not been properly maintained; and
  - Are opportunities for water quality retrofits.

Photo by A.S. Comstock, 2013, used with permission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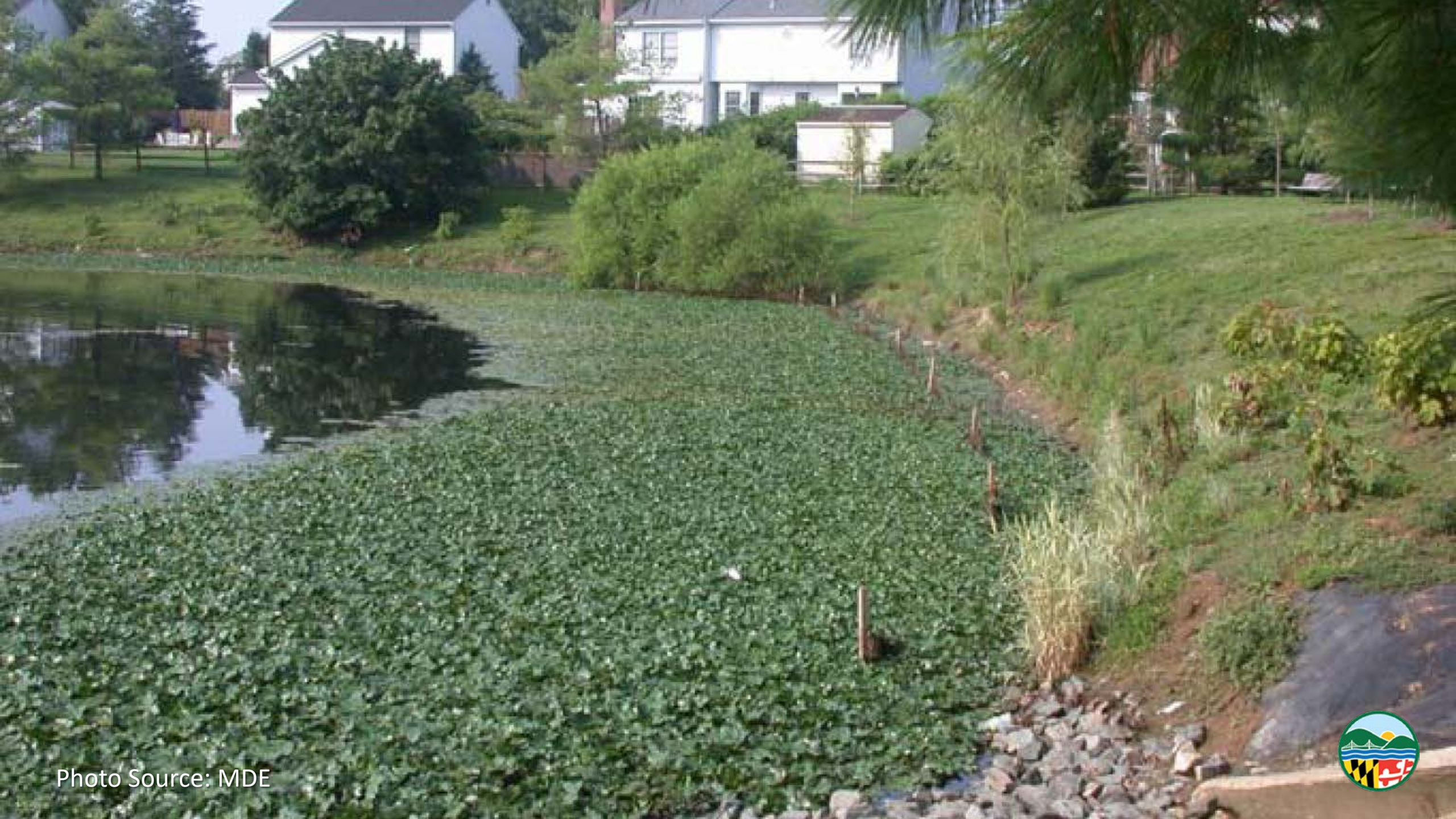


Photo Source: MDE

Routine Maintenance:

- Removal of Trees & Woody Vegetation (Flush Cut)
  - Areas within 15 feet of the upstream and downstream embankment toe;
  - 25-foot radius of the control structure;
  - Within 15 feet of the abutment contacts, outlet, spillway, and plunge pool
- Restoration of Disturbed Areas
  - Dense cover of low-growing grassy vegetation
- Mowing
- Removal of Debris

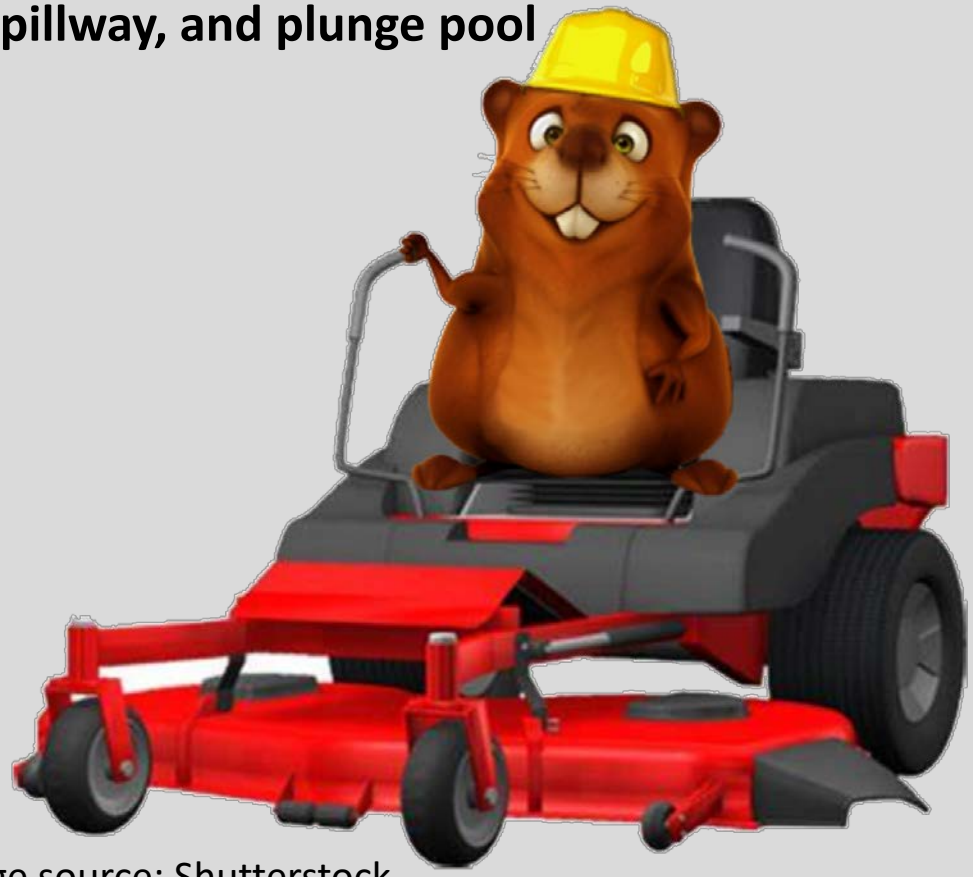
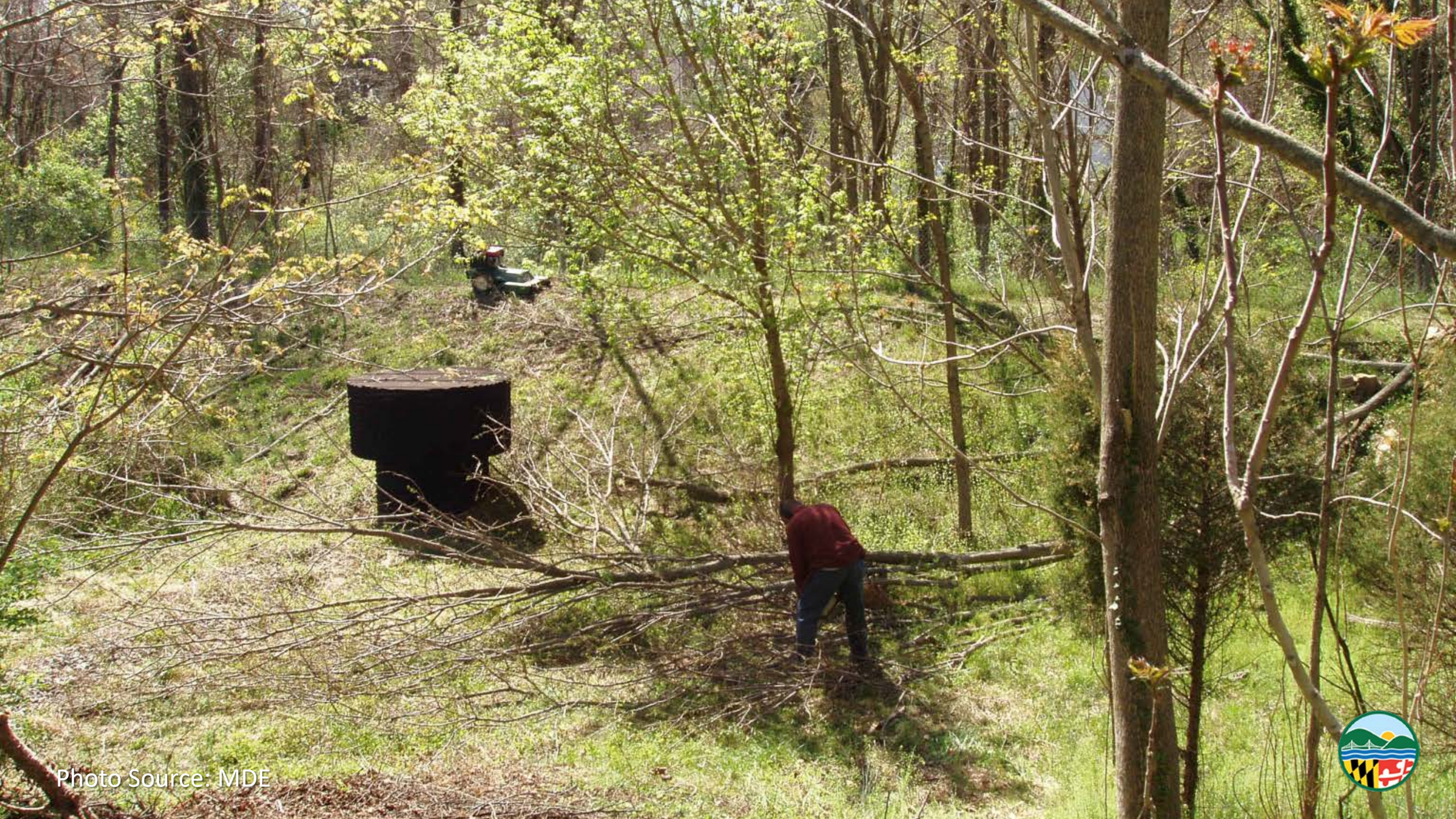


Image source: Shutterstock

Photo Source: MDE



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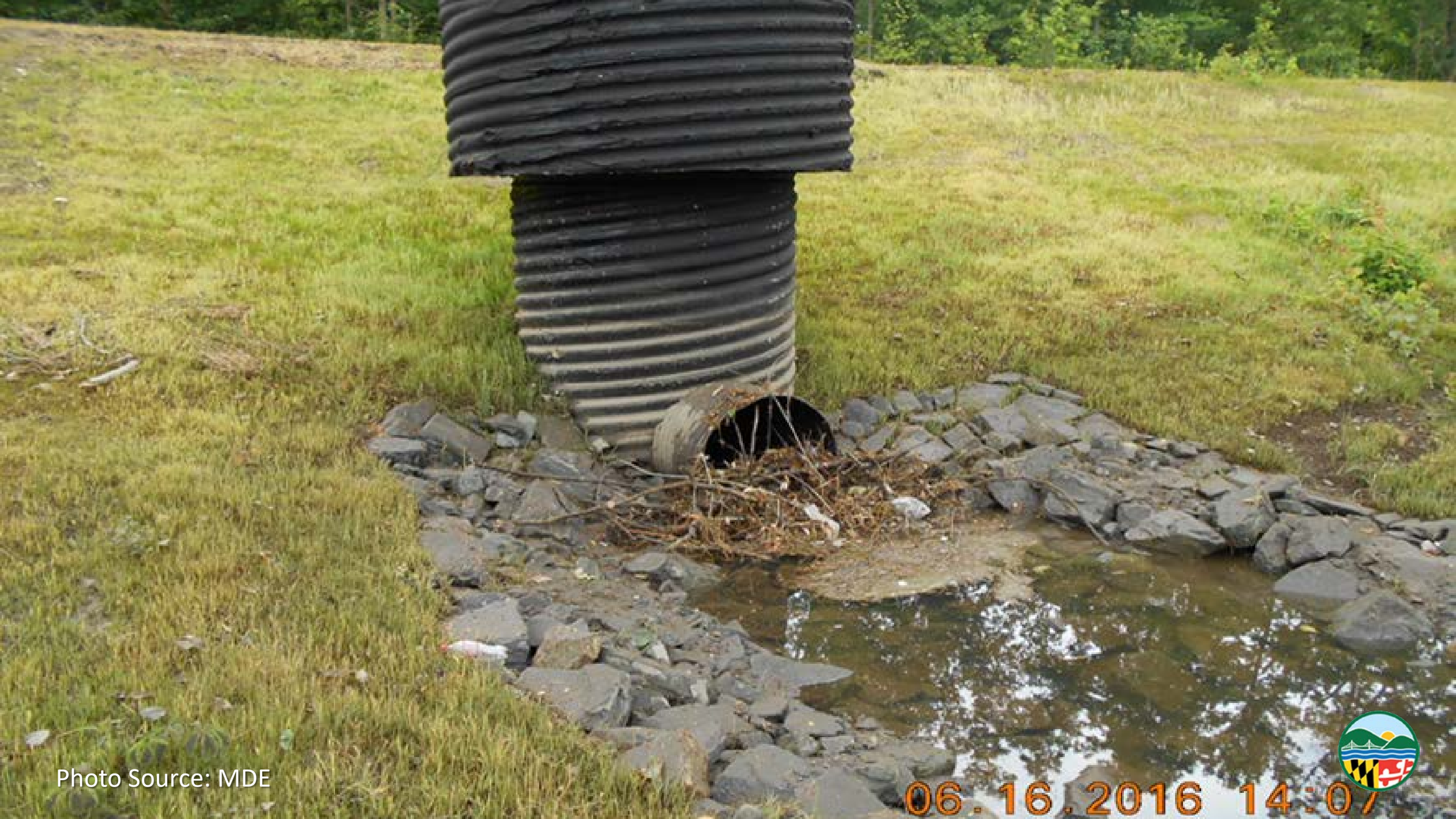
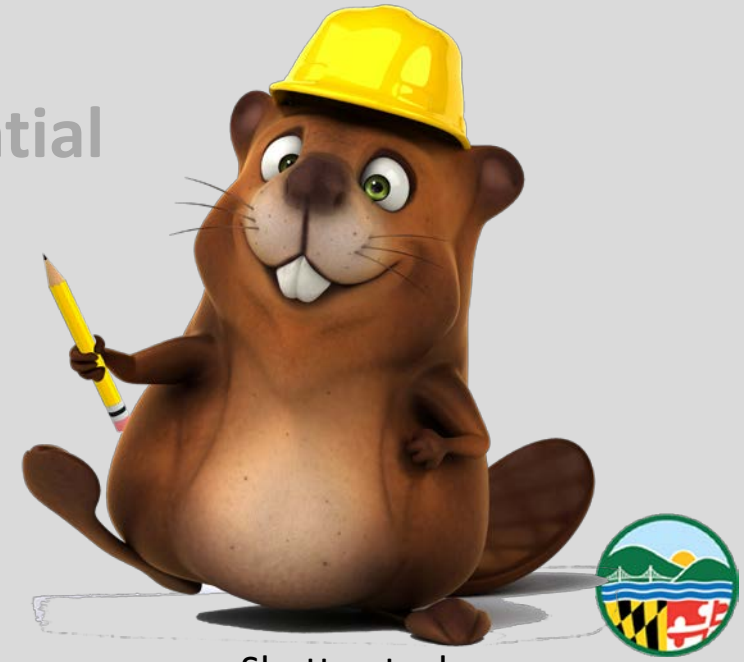


Photo Source: MDE

Maintenance that Requires a Permit:

A permit is required for construction, repairs, or modifications to a dam or reservoir. This includes:

- **Removal of tree stumps and roots, and placement of embankment fill;**
- Any modification of the dam or spillway from its original design and specifications; and
- Any repairs or reconstruction that involve a substantial portion of the structure.



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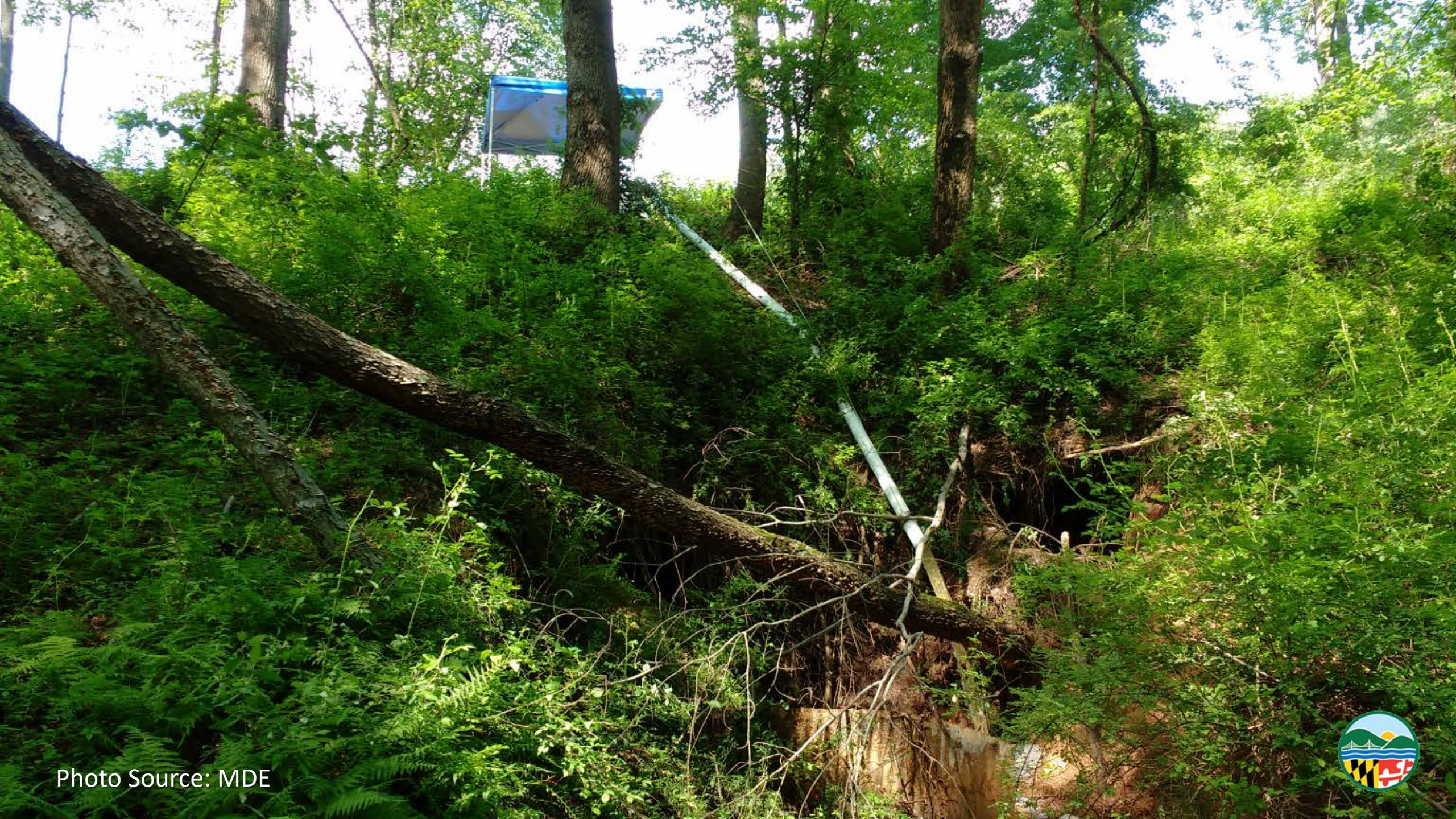

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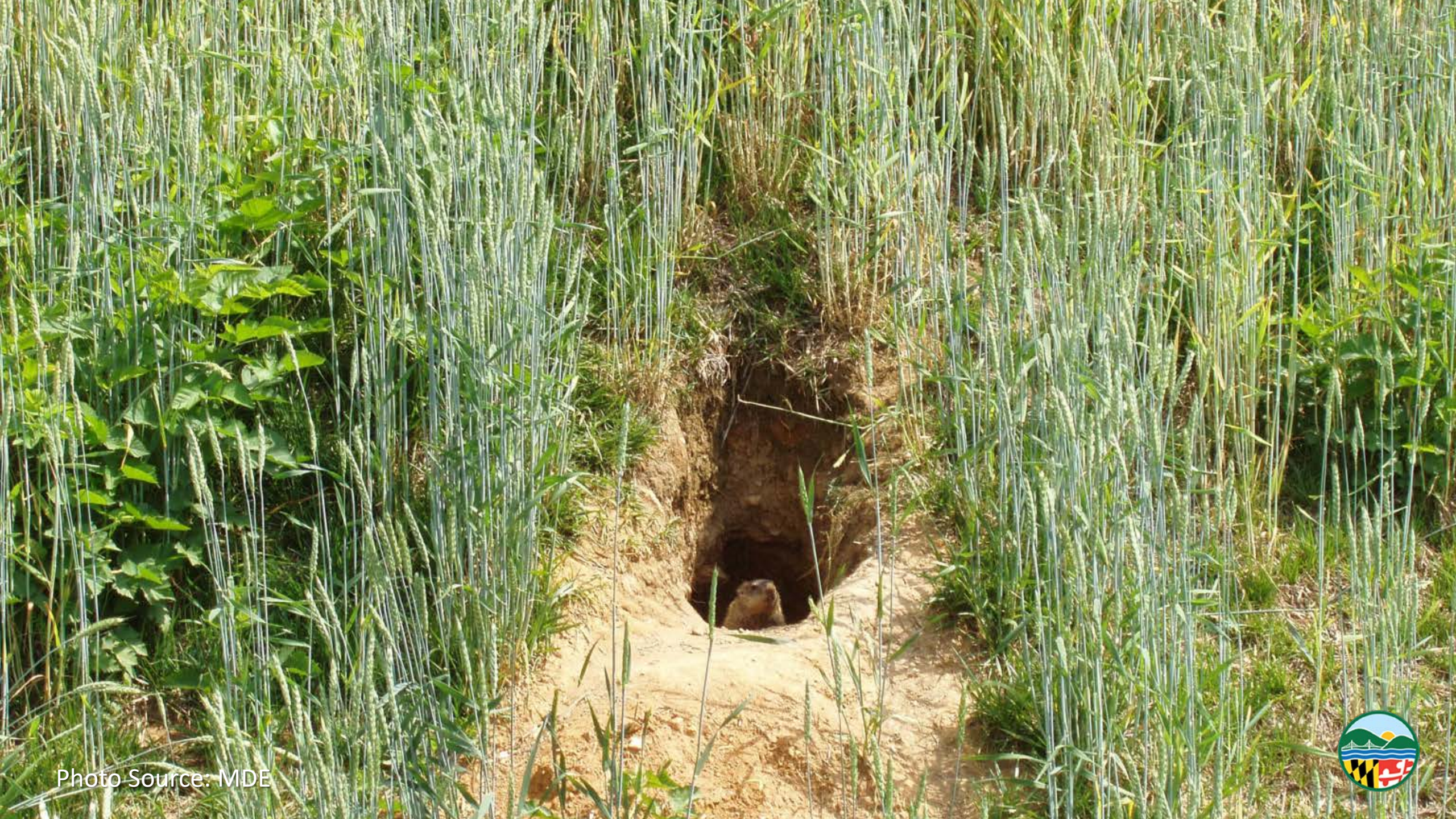

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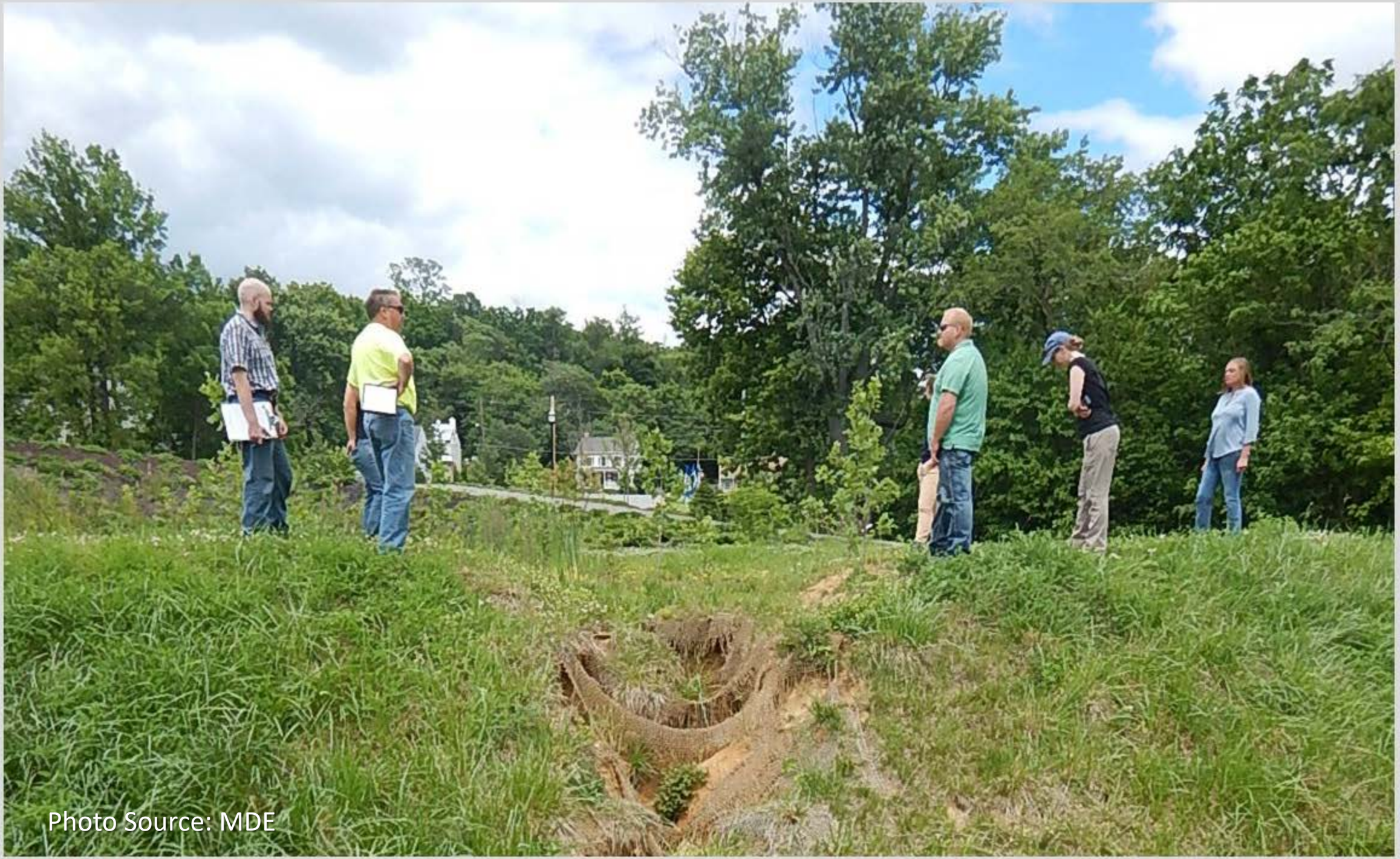
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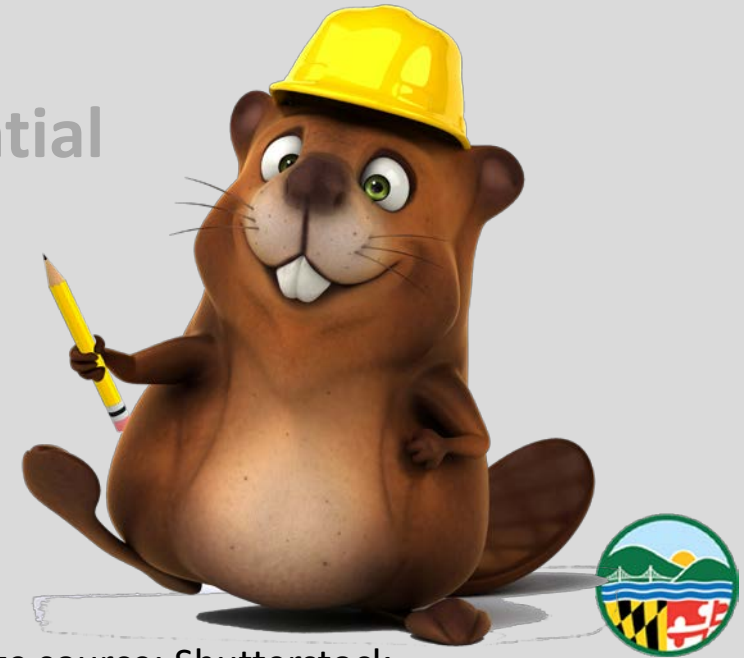

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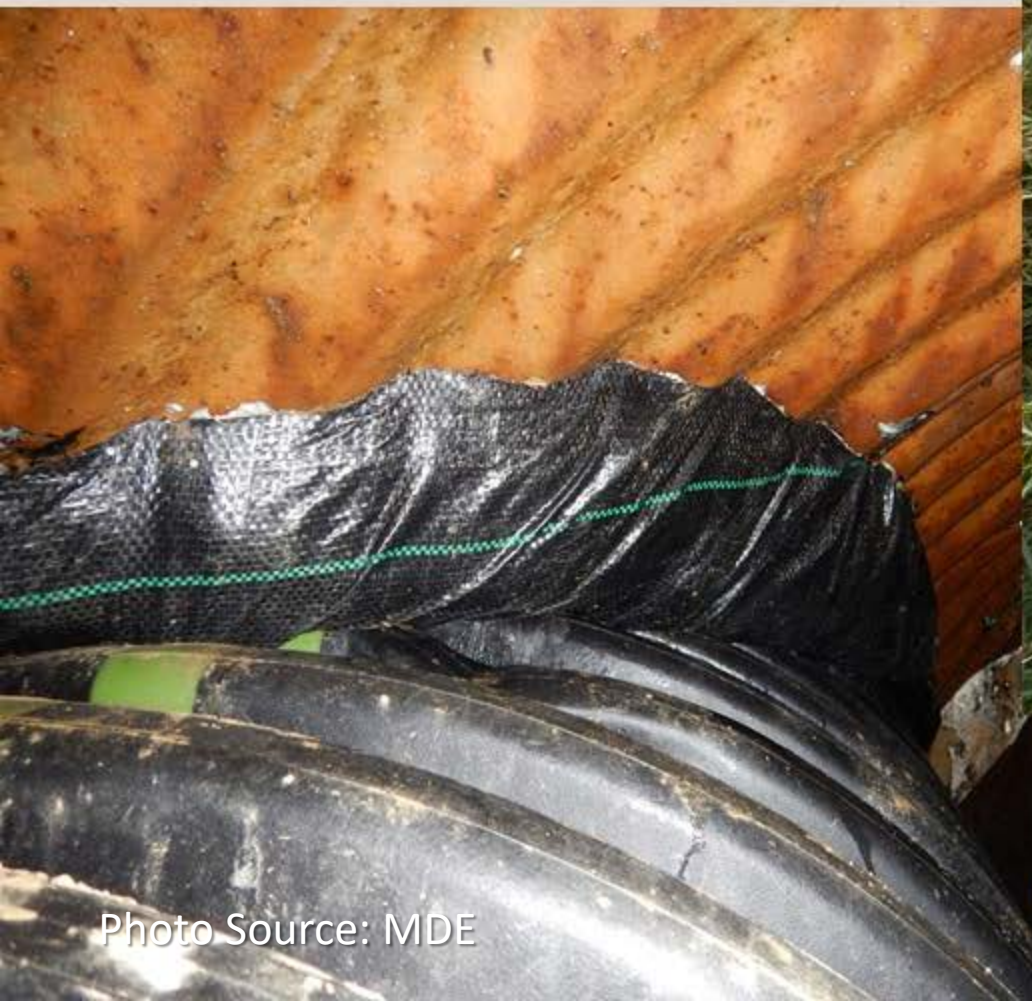
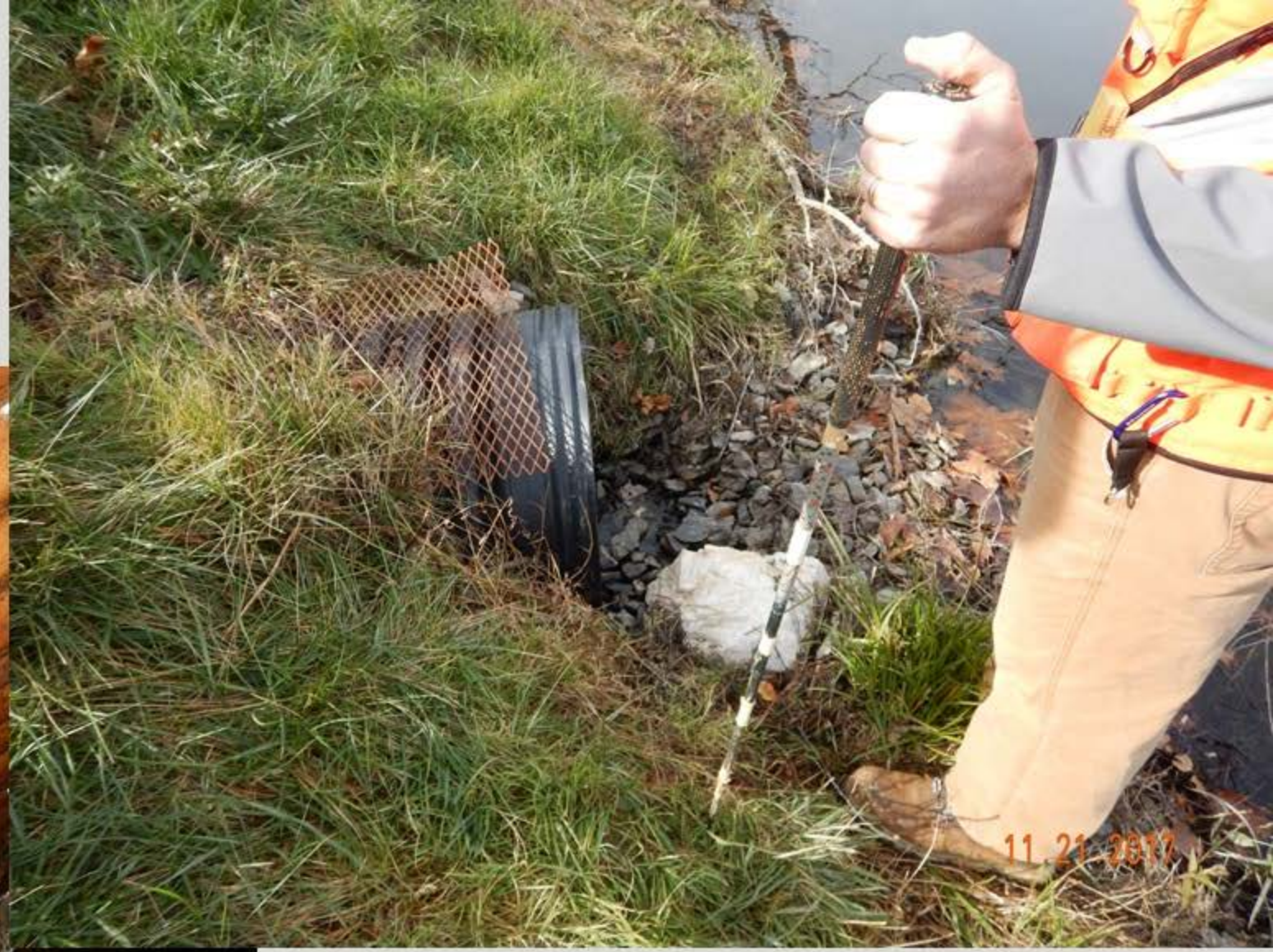
Addition of a Forebay…

Photo Source: MDE

Flow Control Modifications





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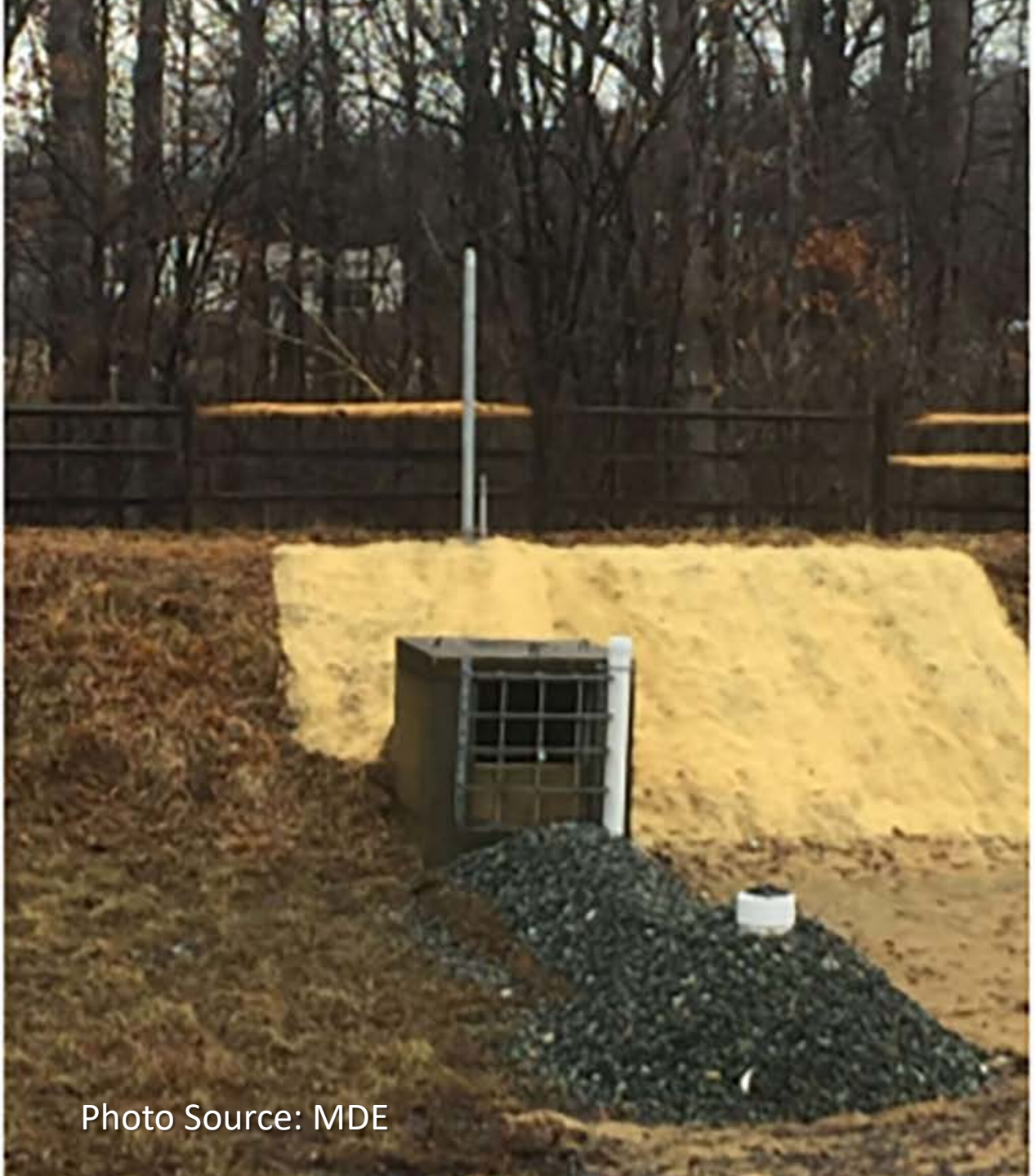

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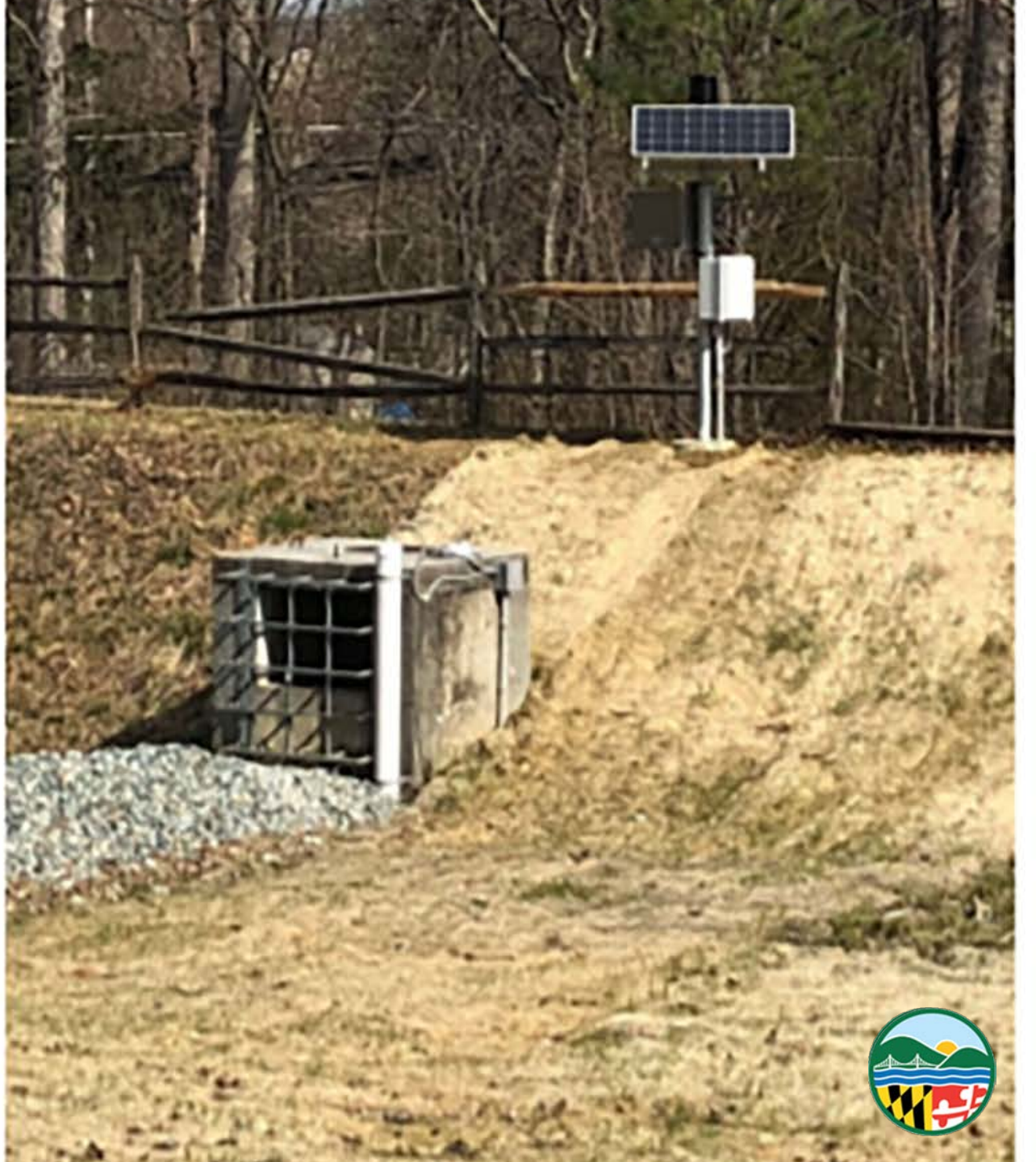

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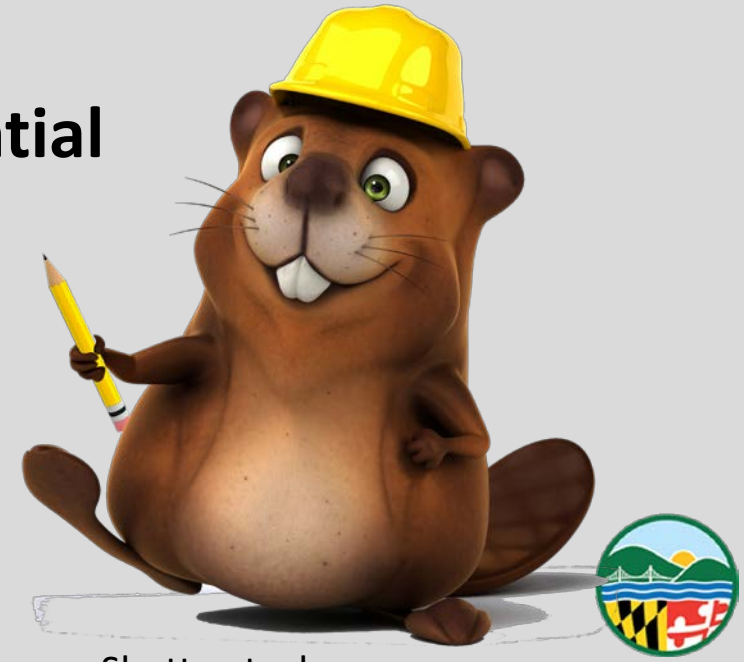

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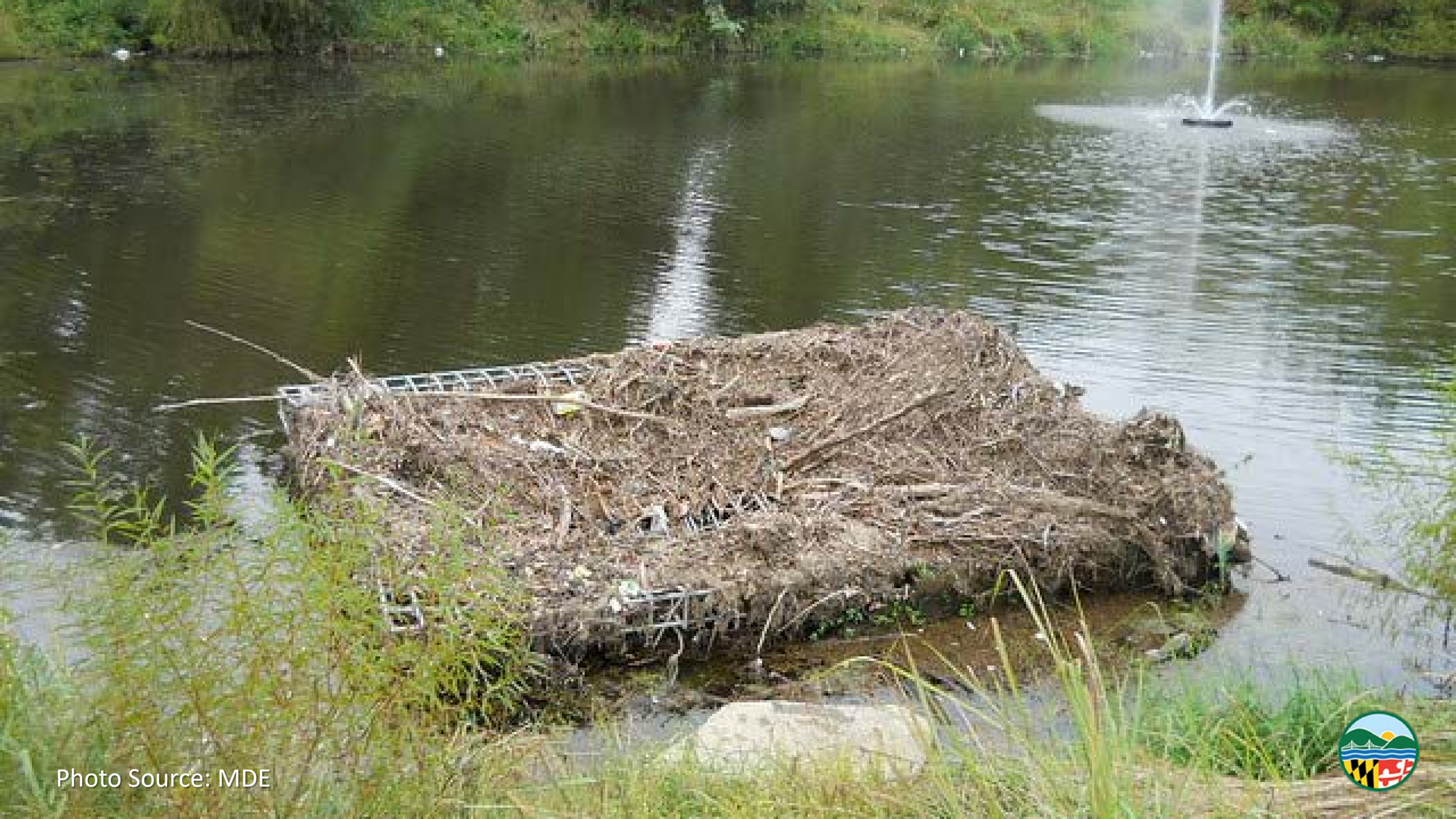

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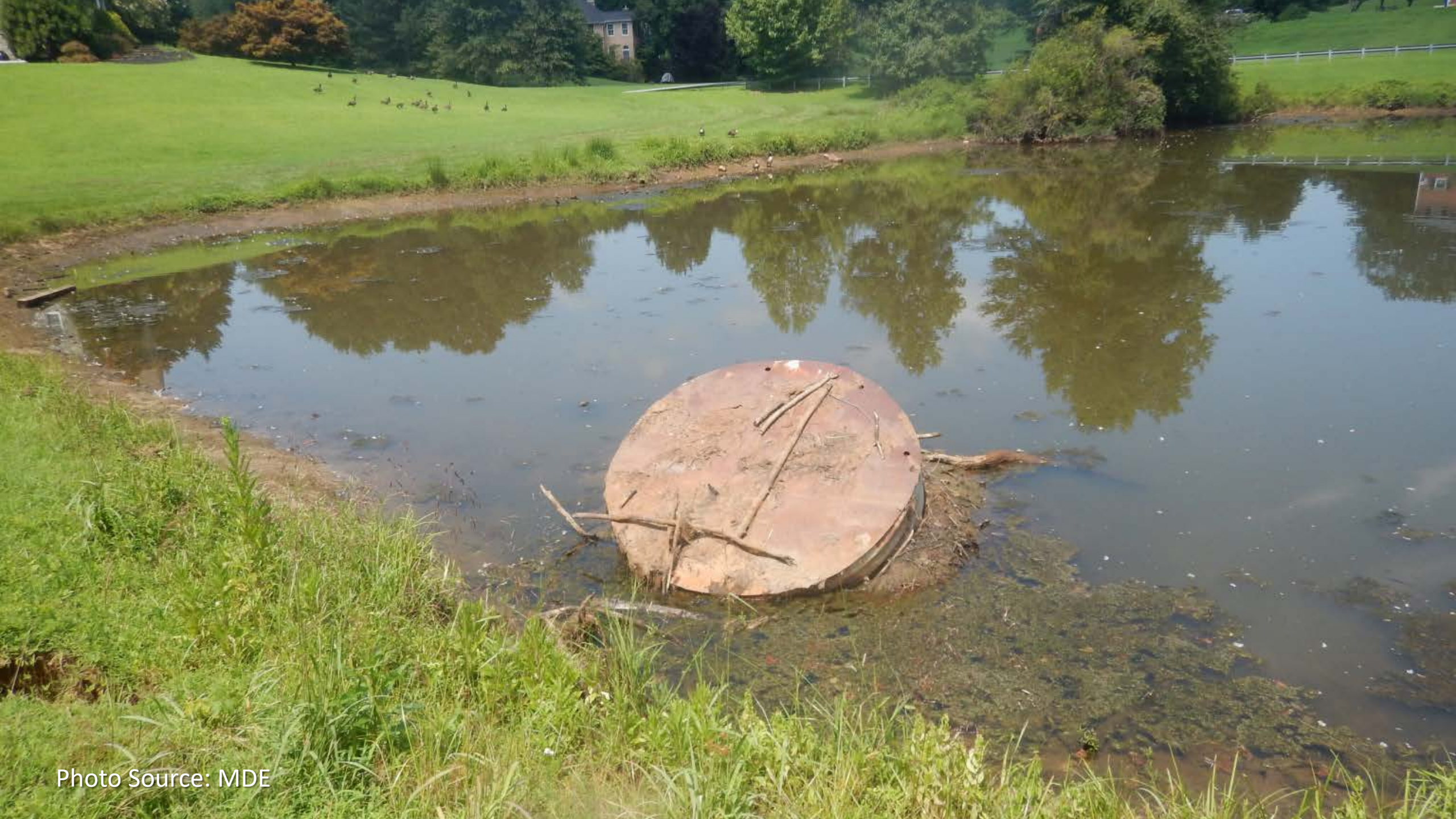

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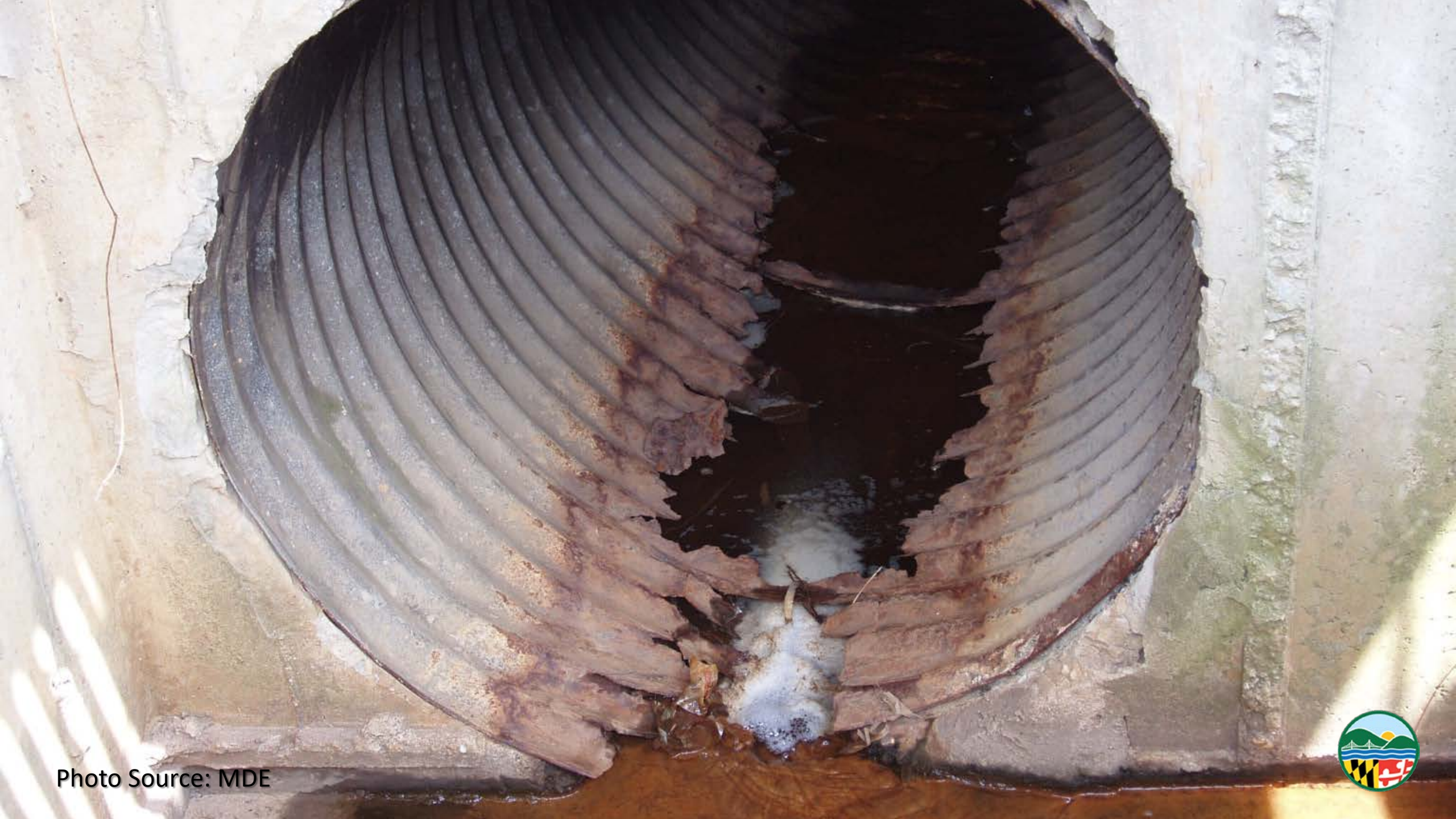


Photo Source: MDE

Maintenance that Requires Approval :

The local SCD or other delegated entity may approve if:

- **The drainage area to the pond is less than 640 acres;**
- **The height of the pond (measured from upstream toe to top of dam) is less than 20 feet;**
- **The dam is a “low hazard structure”, i.e., failure is not likely to cause loss of life or property damage (see MDE guidance on dam breach analysis);**
- **The pond is not located in a Use III watershed or the Gwynns Falls, Jones Falls, Herring Run, or other interjurisdictional watersheds; and**
- **The pond has a maximum storage volume less than 50 acre-feet**

All others must be submitted to the Dam Safety Permits Division for approval.

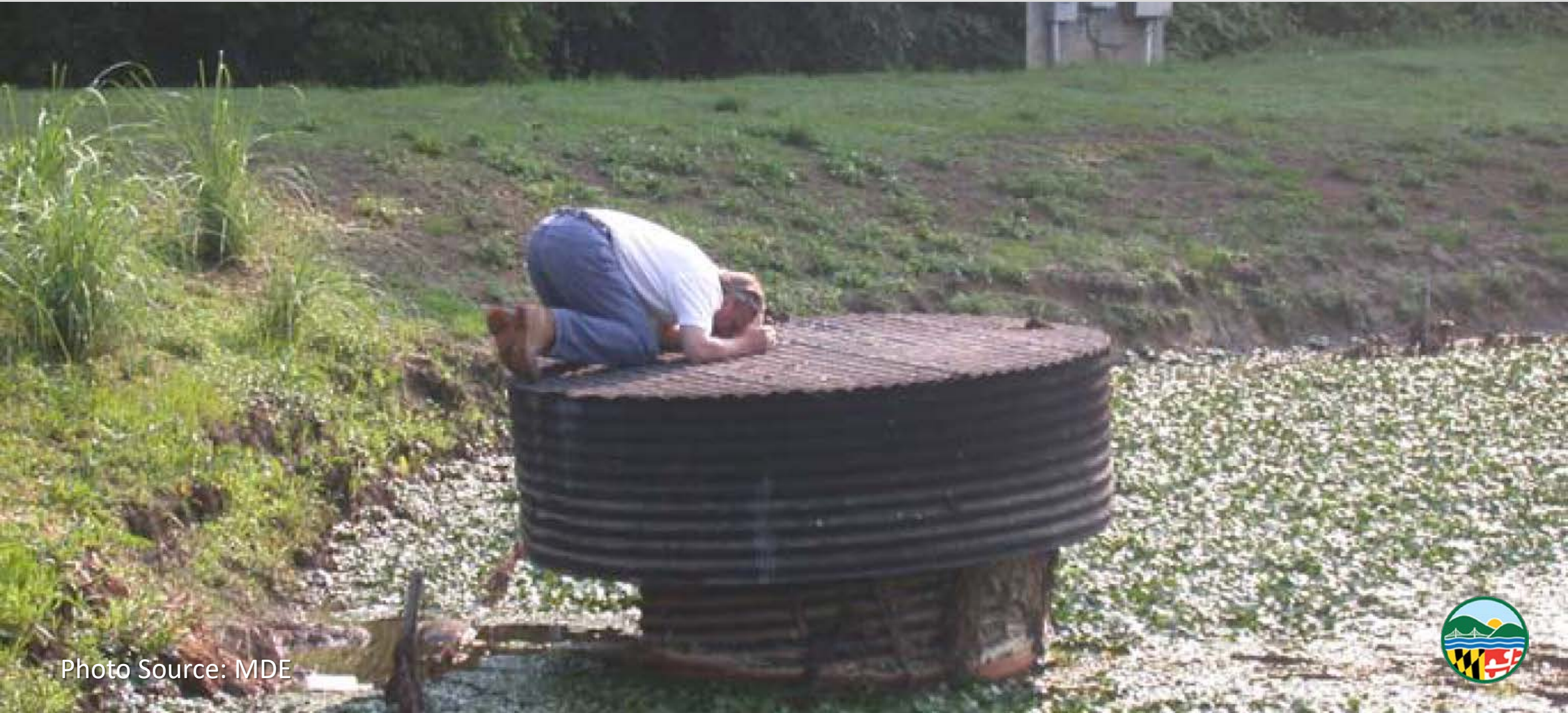
Retrofitting:

- **Modification of existing facility for water quality and/or flood control**
- **Will involve a change from the original design and specifications; and**
- **<u>Will require approval</u>!**

At a minimum, you should be asking for the following information:

- Watershed Use Designation;
- Dam height, max. storage volume, and drainage area; (local vs. Dam Safety Permits Division review);
- Dam breach analysis;
- Hazard creep assessment (future upstream and downstream build-out land use scenarios);
- Embankment construction specifications;
- Hydraulic modeling to determine the adequacy of design storm capacity;
- Condition assessment (e.g., existing seepage, holes, cracks, depressions, erosion, undercutting, sloughing of embankment on either the upstream and downstream slopes, condition of the principal spillway);
- Location of trees or woody vegetation on the dam;
- Slope stability investigation that considers water loading conditions on the dam; and
- Investigation of appropriate geo-hazards (e.g., Karst terrain, steep slopes, active or abandoned mines).

Retrofits should be in good condition…



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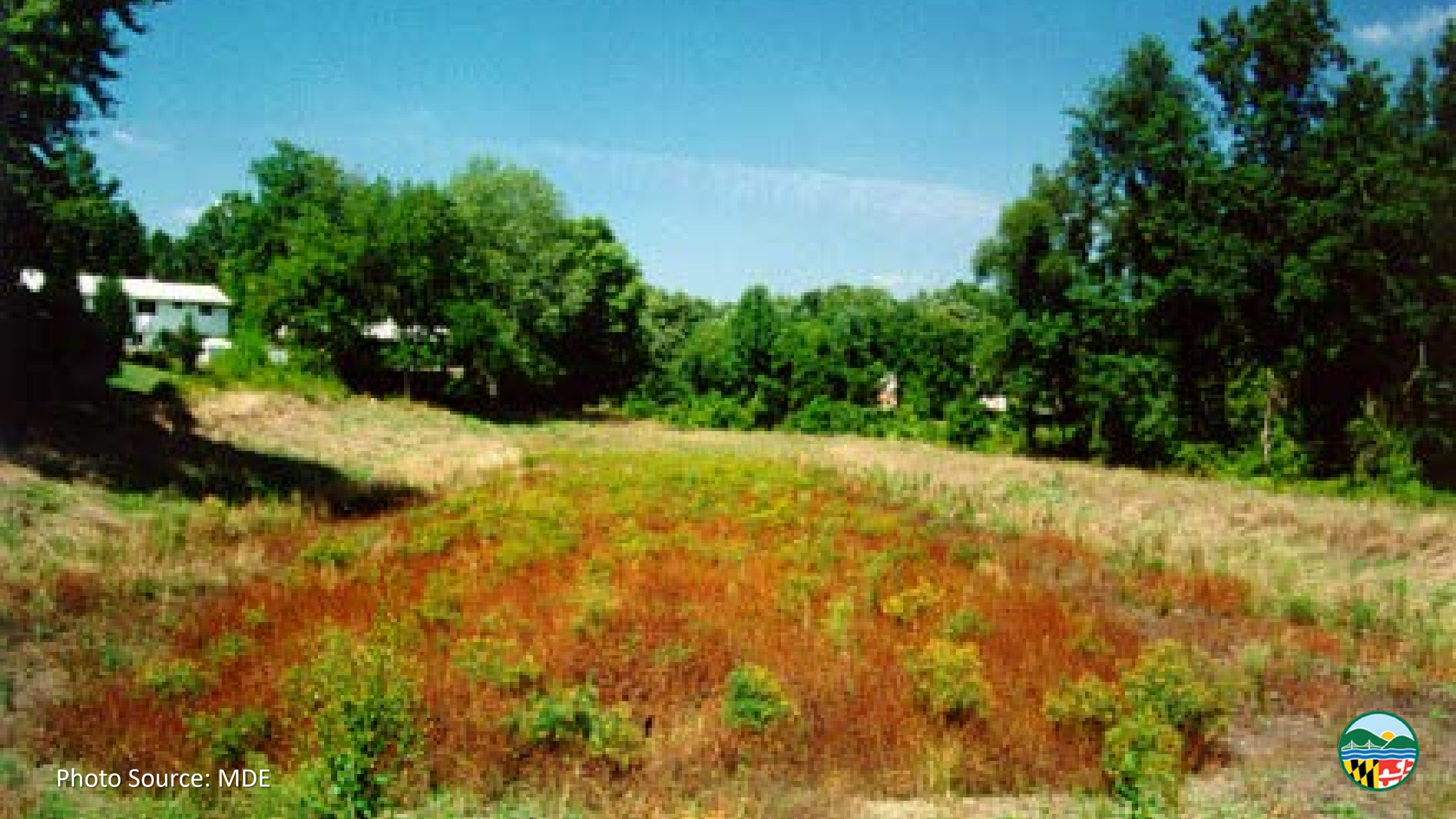
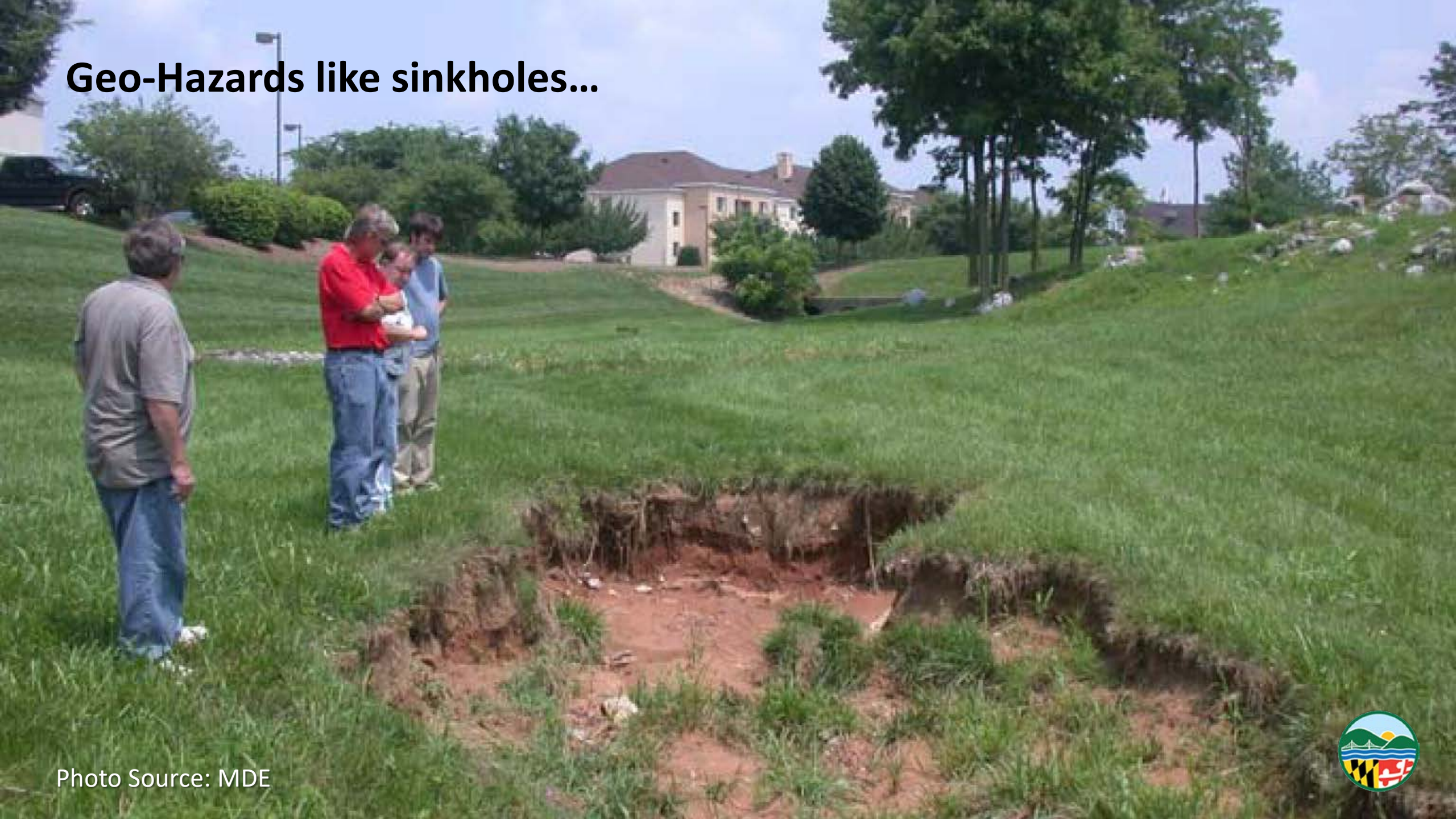


Photo Source: MDE

Geo-Hazards like sinkholes…



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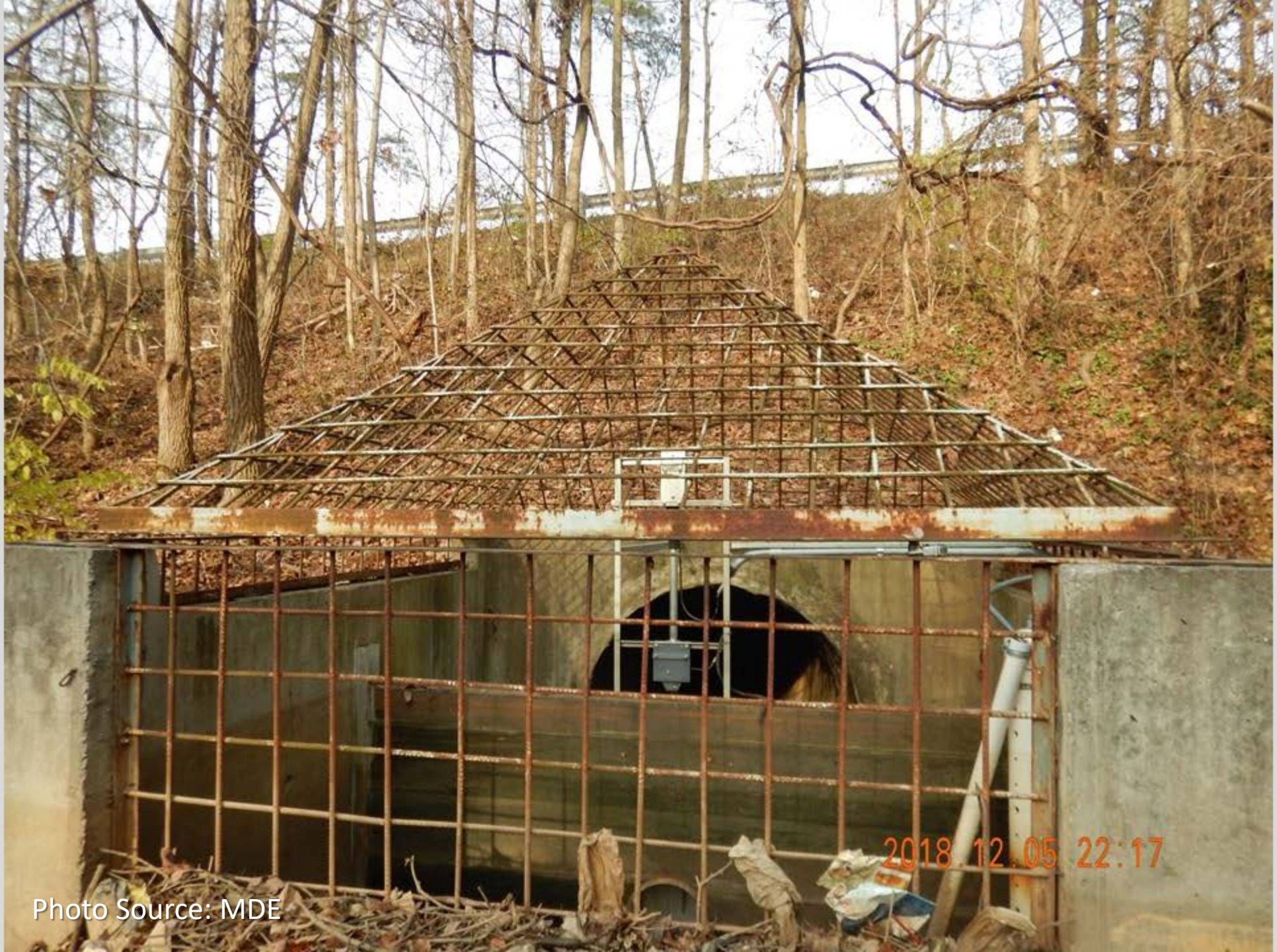


Photo Source: MDE

There are many good examples of retrofits out there…

Why the Concerns?

- **Multiple Organizations**

  - 54% of the responses to the survey have MOU's or agreements to share responsibilities

- **Consistency across all jurisdictions**

  - for example, only 50% of the responding jurisdictions review for hazard creep

- **Special Design Criteria**

  - 21% have climate change criteria
  - 29%% have supplemental design guidance

- **Improved Training and Communication**

  - 42% are aware of new Dam Safety guidance
  - 71% still allow anti-seep collars
  - 75% verify as-built plans

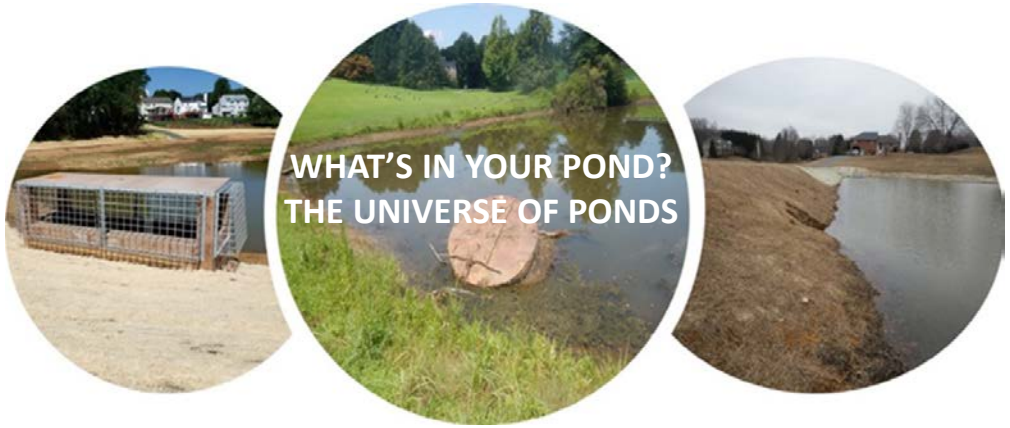
Stewart Comstock, P.E.

stewart.comstock@maryland.gov
(410) 537-3550

All images used in this presentation are from the Maryland Department of the Environment except:

Slides 4, 10, 14, 18, 23: Clip art used with permission from Microsoft and Shutterstock
Slide 3: Glacier in Patagonia, Comstock, A.S., Used with permission

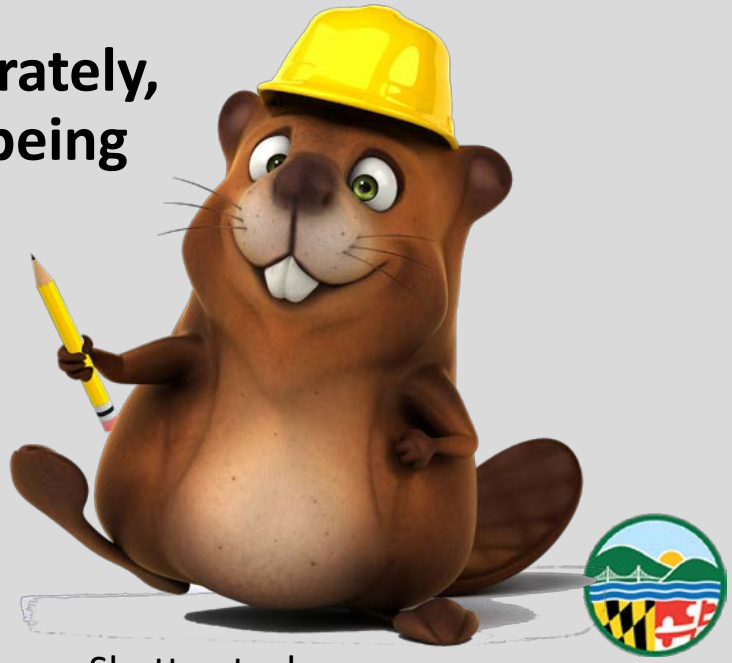
Questions?



Next Steps

The “What’s in Your Pond?” webinars are:

- A “triennial review” of stormwater management programs statewide;
- The first step in a multi-year effort to revisit Maryland’s dam safety and stormwater management regulations;
- A valued exchange of information and ideas…a modern equivalent of the Stormwater Management Regulations Committee (1995)
- If you have not completed the survey that was sent out separately, please do so. The information provided is important as it is being used to help direct next steps



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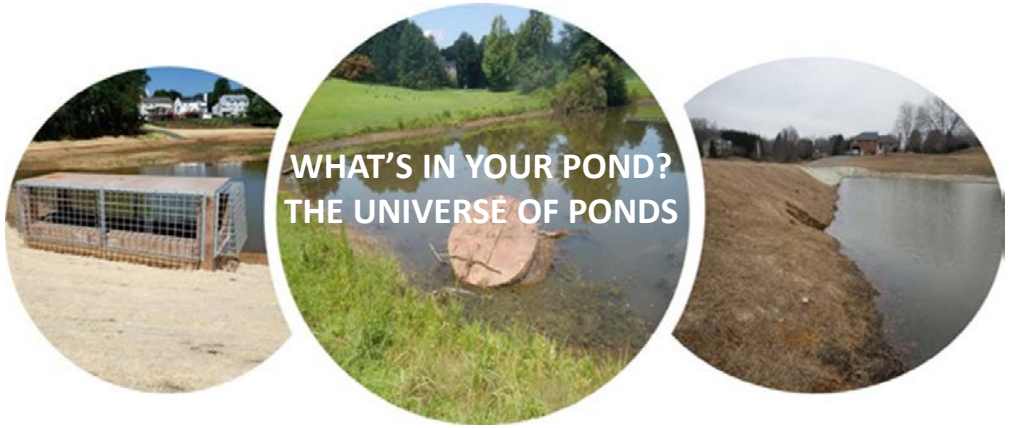
Your Participation is Important:

- Our forum for discussing trends, common issues, and new concerns (e.g., climate change);
- An ongoing process to communicate and provide training and outreach; and
- Your opportunity to participate in the development of the next generation stormwater management and dam safety programs.

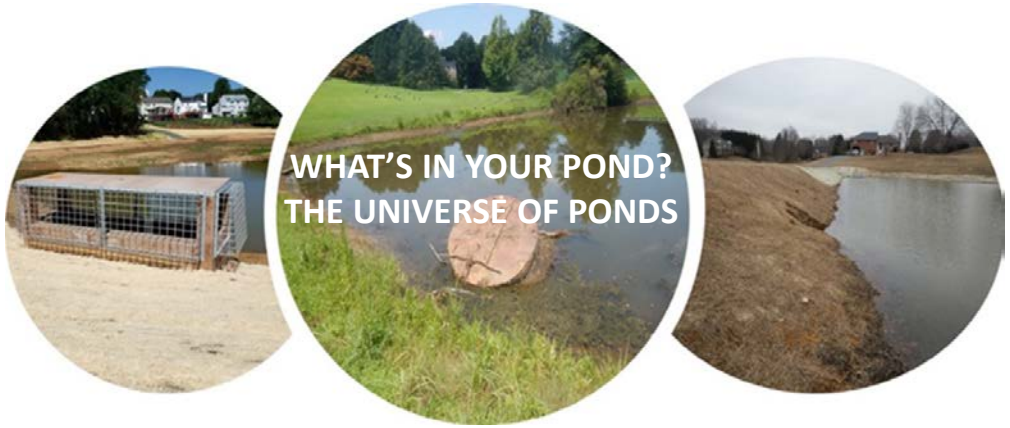
If you have not signed up for the next webinars, please do so…



Technical Issues & Solutions

October 16, 2020

9:00 am – 12:00 pm



Any Comments, Suggestions, Questions?

We have some questions for you:

- How can we make this forum more interactive?
- Are you interested in participating in developing guidance documents?
- What do you need from the Department?
- Are there topics of concern that you would like to see discussed?
- Is anyone documenting small pond failures?
- Do we know how many small ponds fail each year in Maryland?
- Do we know why these failure occurred?
- What is the status of the condition of the small ponds in your local jurisdiction?
- How can we reduce the potential for failure?

We have some questions for you:

- What is the best way for MDE to notify you of new design guidelines?
- What does climate change mean for small pond design? Should we be using different design criteria?
- What about urban flooding and stormwater conveyance issues? Should we be sizing our stormwater conveyance systems for a different storm event?
- How do we address runoff from short duration, high intensity storms that may only produce 2 to 3 inches of rain?
- Do you have any suggested criteria for weir wall design?
- Do you have any suggested criteria for ESD practice embankments?

A Few Items in Closing…

A link to your certificate will be available at the end of each session. You have to be both registered and here for the entire program to get CEUs for today.

- A link has been posted in Chat for feedback and certificates.
- We will it open for 15 minutes past the end of the program.
- This link will take you to an evaluation of the session and once completed you will receive an email with your certificate.
- Certificates will NOT be available after today's session

The next session will be October 14th and the last session on November 18th

A PDF of each Powerpoint will be sent out to all attendees in two weeks.

The College of Southern Maryland is providing CEUs/PDHs for all three sessions.

A link to your certificate is available now.

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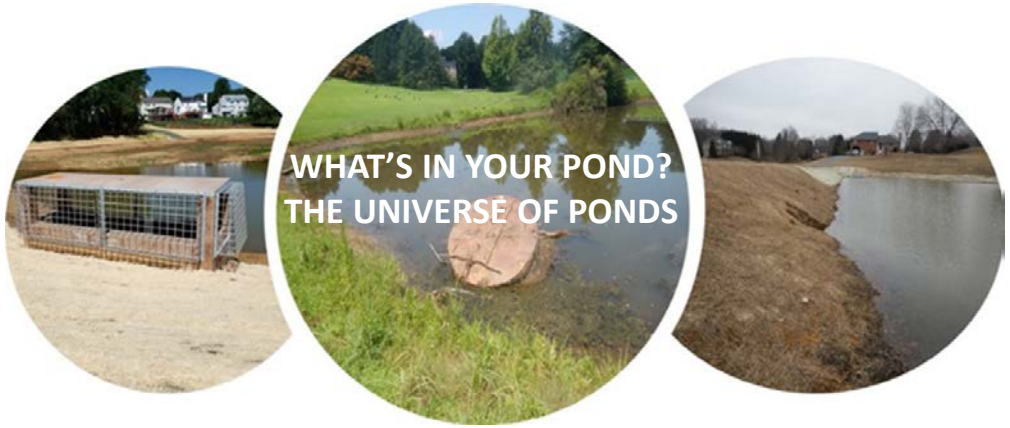

Thank You!

And again, a big
THANK YOU!
to Karen Brandt
and her staff at MCET
for all of the help and support!