Maintenance Inspections of Above Ground Detention/Retention Basins (Ponds)

COMAR Sec. 26.17.02.11. Maintenance

A. Maintenance requirements established in this regulation shall be contained in all county and municipal ordinances and shall provide for inspection and maintenance. The owner shall perform or cause to be performed preventive maintenance of all completed ESD treatment practices and structural stormwater management measures to ensure proper functioning. The responsible agency of the county or municipality shall ensure preventive maintenance through inspection of all stormwater management systems. The inspection shall occur during the first year of operation and then at least once every 3 years after that.

Why do we do these?

- The law-all counties and municipalities shall “provide for” inspection and maintenance of SWM facilities.
- Safety- poorly maintained detention/retention facilities are a hazard to life and property.
- MS4 Permit Credit- facilities must be in proper operational condition for credit (if applicable).
- Liability- Facility owners can be directly liable for any damage or injury resulting from a facility failure.
- Stewardship- our mission is to protect the environment and reduce the impact of human activity on the watershed.

Dam failures are bad …

Planning an inspection

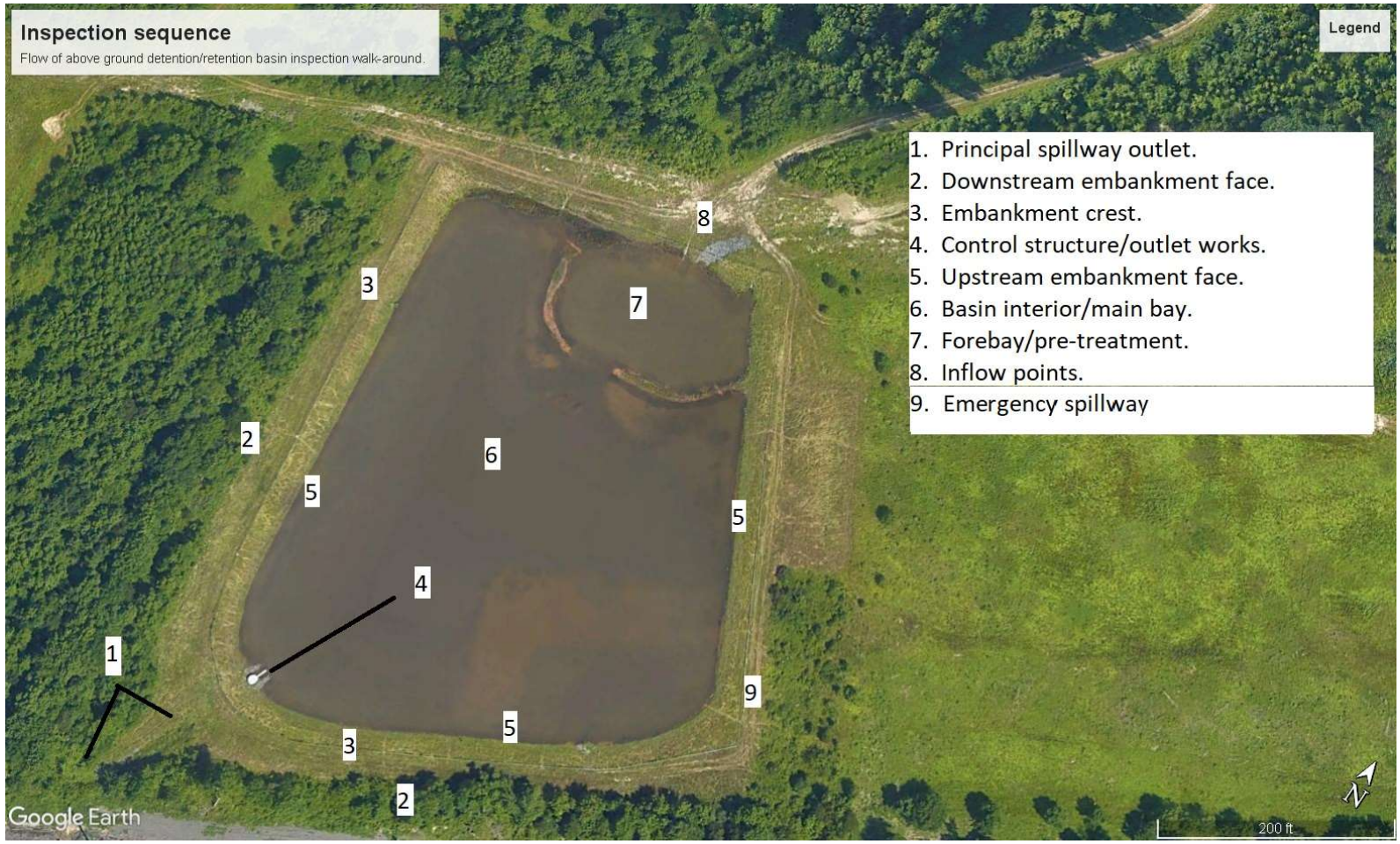
- Review of available data. As-Built package and plans as a starting point (discuss why).
- Additional data (prior inspection reports, Google Earth/Bing history, review of the file, site contacts)
- Field kit (minimum)- PPE, paper plans, checklists, notebook, camera(activate date stamp), flashlight, white board, credentials. Expand as necessary.

Basic inspection kit.

OK, here we are! Basin overview

Photo courtesy SMC, LLC

Plan of attack-downstream to upstream



Outfall and points beyond.

Other than trees within 15’ of the outfall, looks OK, yes?

Outfall and points beyond.

Take a look downstream …

How is the principal spillway?

This one "looks" pretty good.

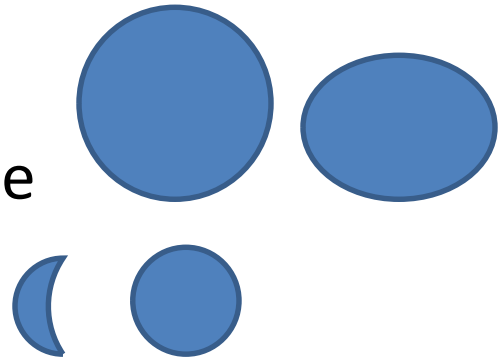
This one, not so good.

Photo courtesy SMC, LLC

Concrete spillways have issues too

What to look for

- Condition of spillway invert
- Joints- soil, roots, displacement
- “Egging” of metal and plastic pipe
- Misalignment
- Foreign objects/obstructions
- Evidence of “piping”.
- Condition of headwall, drain outlets(document flow and fines)



Headwall/outfall with drains

Downstream embankment face- needs to be cleared for proper inspection. Looking for animal burrows, erosion, slumping, wet areas(seepage), “boils”, woody growth, bare soil.

Slumping and erosion on downstream face of embankment and outfall

Woody growth limitations

- Dam owners must maintain all areas of the dam free from trees and woody vegetation.
- These include areas within 15 feet of the upstream and downstream toe of embankment.
- Within a 25-foot radius of the control structure.
- Within 15 feet of the abutment contacts, outlet, spillway area, and plunge pool.
- In emergency/auxiliary spillway channels, trees and woody vegetation must be removed in the zone extending 15 feet (horizontal) from the bottom edge of the spillway channel, or to a point two (2) feet above the water surface elevation in the channel during the design storm, whichever is greater. **MDE DAM SAFETY POLICY MEMORANDUM #1**

Embankment crest and upstream face

- Look for: slumping, animal activity/burrows, sinkholes, whirlpools, woody vegetation, bare soil, eroded areas, backwater into inflow pipes.

Control structures

Control Structures- What to look for

- Structural integrity- rust, leaking joints, spalled concrete, cracking, plumb, manhole covers
- Hydraulic function- low flow clear, weir openings clear, valves (if present) properly configured, record of exercise, interior clear
- External factors- woody growth within 25', animal burrows, erosion, piping, vegetation
- Trash racks (if applicable)- present, secure, not deteriorated, clear of debris

Concrete spalling

Control structure issues

Photo courtesy SMC, LLC

Basin interior

Photo courtesy SMC, LLC

Photo courtesy SMC, LLC

Basin Interior- What to look for

- Hydraulic function- flow paths/channels clear, intact
- Free of debris- trash, dead wood, yard waste
- Animal activity- burrows, dens, dams, food stockpiles
- Structural- presence of sinkholes, standing water (or lack of), excessive vegetation, excessive sediment
- Interior features- sand filters, wetlands, berms, etc.

Forebays/pre-treatment/inflows

Forebays/Inflows- What to look for

- Hydraulic performance- de-watering, inflows clear, no “short-circuiting”, backwater/sediment in inflow pipes
- Pollutant capture- sediment levels, trash, evidence of illicit discharge/upstream problems
- Structural- berms intact, animal activity, condition of monitoring wells/cleanouts

Forebay/inflow issues

Final thoughts

- Safety is priority #1. Safety for the public, property owners, downstream habitat, and the inspector. Safety training for inspection staff is critical.
- This presentation is limited in scope due to time constraints and is focused on structural issues.
- Please do not hesitate to reach out to me for further discussion on maintenance/performance inspection protocols of any BMP.
- MDE is developing comprehensive guidance documents for both construction and maintenance/performance inspections for all BMP's.
- What are your specific training needs as far as field inspections and reporting?
- Note- all photos property of MDE unless otherwise noted.

Photo courtesy SMC, LLC

Questions?

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