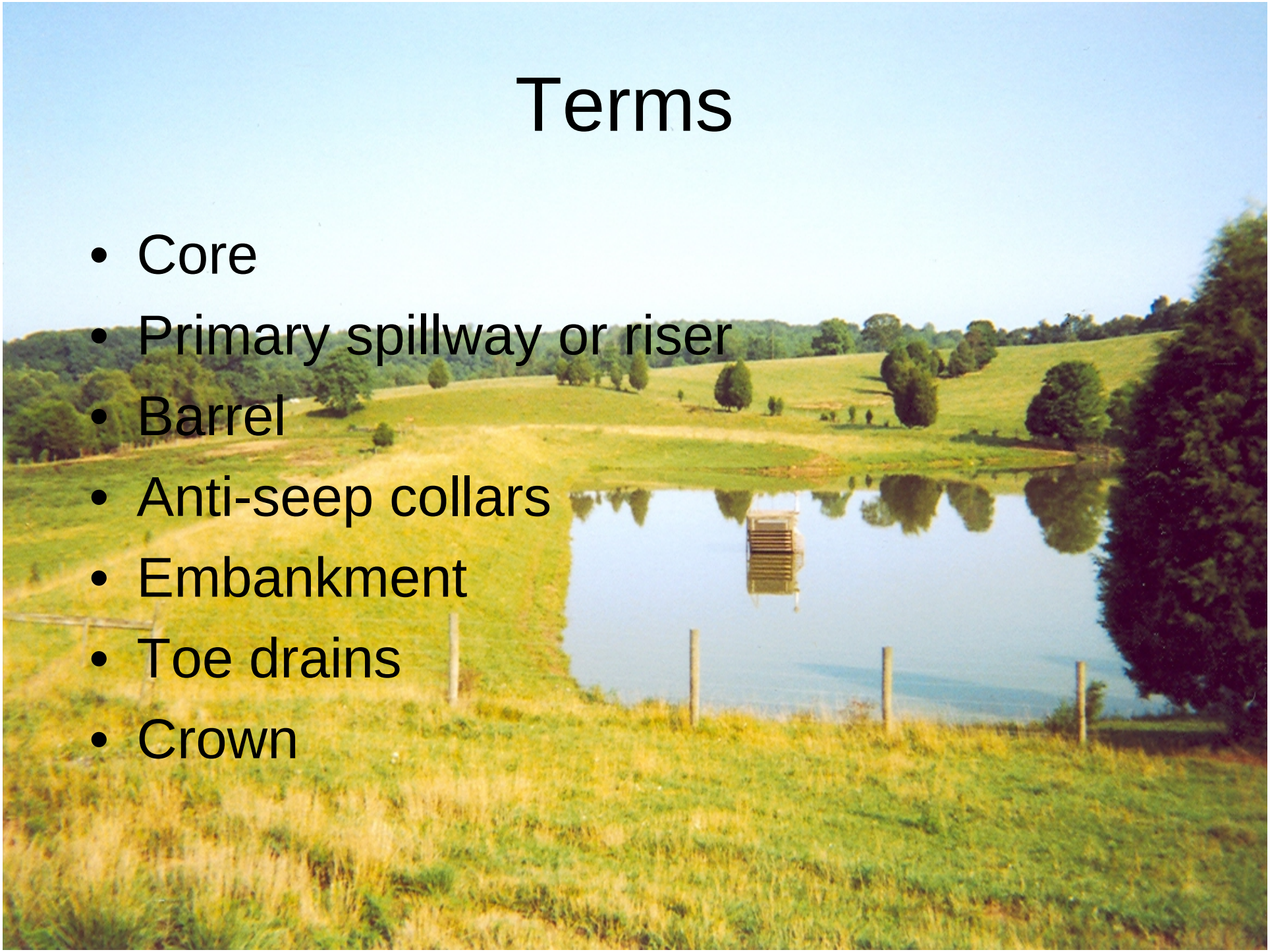
PONDS

Design, Construct, Maintain

Terms



- Core
- Primary spillway or riser
- Barrel
- Anti-seep collars
- Embankment
- Toe drains
- Crown

Terms

- Emergency spillway
- Pool area, normal pool elevation, maximum pool elevation
- Watershed or drainage area
- Outlet basin or stilling basin
- Water supply value

Why a Pond?

- Fishing
- Swimming
- Wildlife
- Livestock
- Fire suppression
- Zen
- “Wanta” club

Selecting the Site

- Drainage area
- Embankment vs. excavation
- Economics
- Utility
- Accessibility
- Flat Area
- Watershed impacts
- Property boundaries

If You Dig It Will It Fill?

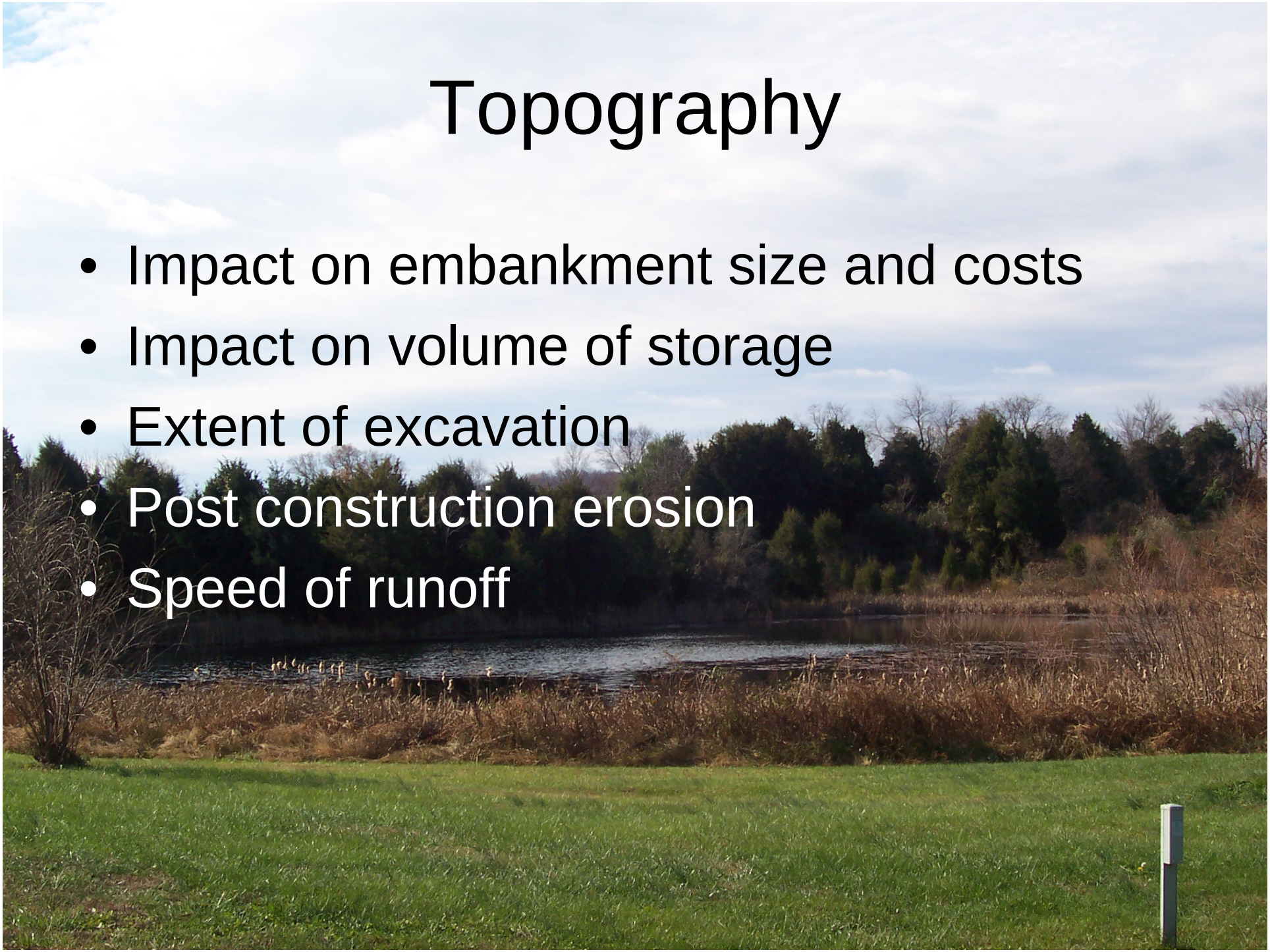
- Clay – 20% or greater
- Adequate compaction – ball test
- Permeability
- Organic material
- Bedrock
- Depth of investigation
- Import soil

Design Considerations

- Engineering
- Water use
- Shoreline
- Islands
- Maintenance drawdown
- Riser materials
- Emergency spillway
- Shallow edges/ deep edges

Topography

- Impact on embankment size and costs
- Impact on volume of storage
- Extent of excavation
- Post construction erosion
- Speed of runoff



Permits & Regulations

- Local
- State
- Regional
- Federal

Building the Pond

- Competent contractor, references, several bids
- Good oversight
- Contract??
- Install erosion control/sediment control measures
- Clear brush, trees, stumps from embankment area & borrow area

Building the Pond

- Strip & stockpile topsoil
- Build core, riser, embankment, emergency spillway
- Compaction
- Seeding/stabilization/mulch

Maintenance

Older Ponds/Common Problems

- No engineering originally
- Poor construction – poor compaction
- Corroded/failed primary spillway (riser)
- Eroded embankment
- Woody vegetation dominates
- Loss of pool capacity -- sedimentation

Older Ponds/Common Problems

- Aquatic weeds
- Seepage
- Drought induced perceptions
- Rodents
- Geese

Inspections

- http://www.dcr.virginia.gov/forms/DCR199-098.pdf

DCR
Virginia Department of Conservation & Recreation
State Parks • Soil & Water Conservation • Natural Heritage
Chesapeake Bay Local Assistance • Land Conservation
Outdoor Recreation Planning • Dam Safety & Floodplains

Date Prepared: _____
Prepared By: _____

ANNUAL INSPECTION REPORT FOR VIRGINIA REGULATED IMPOUNDING STRUCTURES

Reference: Impounding Structures Regulations, 4VAC 50-20-10 et seq., including 4VAC 50-20-105, Virginia Soil and Water Conservation Board

Owner's Information

Name of Dam: _____ Inventory Number: _____
Owner's Name: _____ Location-County/City: _____
Contact Person (if different from above): _____
Owner's Address: _____ Hazard Classification: _____
Name of reservoir: _____
Purpose of reservoir: _____
Telephone No.: (Residential) _____ (Business) _____
Other means of communication: _____

Owner's Engineer

Name of Engineering Firm and Engineer: _____
Professional Engineer Virginia License Number: _____
Mailing Address: _____

_____

_____

Telephone No.: (Business) _____

Directions: Make note of all pertinent conditions and changes since the last inspection, or, if this is the first inspection, since the filing of a design report.

Date of This Inspection _____
Date of Last Inspection _____

1. EMBANKMENT

a. Any alteration made to the embankment? _____

b. Erosion on embankment? _____

c. Settlement, misalignment or cracks in embankment? _____

d. Seepage? If so, seepage flow rate and location (describe any turbidity and observed color within the flow): _____

2. UPSTREAM SLOPE

a. Woody vegetation discovered? _____
b. Rodent burrows discovered? _____
c. Remedial work performed? _____

3. INTAKE STRUCTURE

a. Deterioration of concrete? _____
b. Exposure of rebar reinforcement? _____
c. Is there a need to repair or replace the trash rack? _____
d. Any problems with debris? _____
e. Was the drawdown valve operated? _____

4. ABUTMENT CONTACTS

a. Any seepage? If so, estimate the flow rate and describe the location of the seep or damp areas (describe any turbidity and observed color within the flow):

5. EARTHEN EMERGENCY SPILLWAY

a. Obstructions to flow? If so, describe plans to correct:

b. Rodent burrows discovered?

c. Any deterioration in the approach or discharge channel?

6. CONCRETE EMERGENCY SPILLWAY

a. Deterioration of concrete?

b. Exposed steel reinforcement?

c. Any leakage below concrete spillway?

d. Obstructions to flow? If so, lists plans to correct:

7. DOWNSTREAM SLOPE

a. Woody vegetation discovered?

b. Rodent burrows discovered?

c. Are seepage drains flowing?

d. Any seepage or wet areas?

8. OUTLET PIPE

a. Any water flowing outside of discharge pipe through the Impounding Structure?

b. Describe any deflection or damage to the pipe:

9. STILLING BASIN

a. Deterioration of concrete structures?

b. Exposure of rebar reinforcement?

c. Deterioration of the basin slopes?

d. Repairs made?

e. Any obstruction to flow?

10. GATES

a. Gate malfunctions or repairs?

b. Corrosion or damage?

c. Were any gates operated? If so, how often and to what extreme?

11. RESERVOIR/WATERSHED

a. New developments upstream of dam?

b. Slides or erosion of lake banks around the rim?

c. General comments to include silt, algae or other influence factors:

12. INSTRUMENTS

a. List all instruments
b. Any readings of instruments?
c. Any installation of new instruments?

13. DOWNSTREAM/HAZARD ISSUES

a. New development in downstream inundation zone?
b. Note the maximum storm water discharge or peak elevation during the previous year.
c. Was general maintenance performed on dam? If so, when?
d. List actions that need to be accomplished before the next inspection:

14. OVERALL EVAULATION OF IMPOUNDING STRUCTURE AND APPURTENANCES

(Check one) ☐ **EXCELLENT** ☐ **GOOD** ☐ **POOR**

General Comments:

Recommendations:

CERTIFICATION BY OWNER'S ENGINEER (required only when an inspection by an engineer is required)

I hereby certify that the information provided in this report has been examined by me and found to be true and correct in my professional judgment.

Signed: _____ Virginia Number: _____
Professional Engineer's Signature Print Name

This _____ day of _____ , 20 ____ .

Engineer's Virginia Seal:

CERTIFICATION BY OWNER

I hereby certify that the information provided in this report has been examined by me.

Signed: _____
Owner's Signature Print Name

This _____ day of _____ , 20 ____ . _____

Mail the executed form to the appropriate
Department of Conservation and Recreation
Division of Dam Safety and Floodplain Management
Regional Engineer

Resources

- www.culpeper.vaswcd.org & click on Pond Planning
- Ponds – Planning, Design, Construction: http://www.vaex.edu/wneal/Pond_Management/pdf/NRCS590.pdf
- Private Pond Management: http://www.dgif.virginia.gov/fishing/pondmanagement/

Resources

- Control Methods for Aquatic Plants in Ponds: http://www.vt.edu/pubs/fisheries/420-251/420-251.html
- Pond Construction: Some Practical Considerations http://www.ext.vt.edu/pubs/fisheries/420-011/420-011.html

Resources

- Virginia Impounding Structure Regulations: Search “Virginia Administrative Code” Title 4 Agency 50 Chapter (4VAC50-20)
- Search for other land grant universities