

STORM WATER MANAGEMENT

March 24, 2018

Prince William County

Department of Public Works

Environmental Services Division

Watershed Management Branch



Storm Water Management

Storm Drainage Systems and Storm Water Management Facilities

- What they are
- Different types

Maintenance Responsibilities

- Prince William County
- Property Owner

Government Regulations

Federal

- Clean Water Act – EPA

Federal/ State

- National Pollutant Discharge Elimination System (NPDES) permit program - EPA and VA DEQ
- Municipal Separate Storm Sewer System (MS4) Permit

State

- Storm Water Management Program – DEQ
- Chesapeake Bay Act

Prince William County

- Storm Water Management Regulations

Storm Water Runoff



Storm water is described as water from precipitation

- Rain, snow, sleet, or snow melt

Results in surface runoff

- flows into storm drainage systems, local streams and rivers
- Chesapeake Bay

Storm Drainage Systems

- Is a system that conveys storm runoff
- Above ground types are ditches, channels, streams and swales
- Underground can be a piped, curb and yard inlets, manholes and culverts
- Typically flows to storm water management facility
- Easements (shown on subdivision plat)
- Approved by PWC
- Constructed by developer
- Not combined with sanitary sewer

Storm Drainage Systems



Curb Inlet



Drop Inlet and Swale



Channel



Piped System

Storm Drainage Systems

Maintenance Responsibilities - Determined by PWC DCSM at plan approval stage

Residential Developments (SF, TH, Condo) / PWC has major maintenance within easements

- Structures – Inlets, Pipes, Culverts
- Rip rap (erosion control stone)
- Major erosion/sedimentation
- PWC responsibility begins at bond release
- PWC inspections (post construction)

VDOT maintains systems in the right-of-way

Owner/HOA has maintenance of:

- Mowing/trimming
- Trash and small debris removal
- Trees/landscaping
- Repaving surfaces
- Areas not covered by drainage easements

Storm Drainage

Common problems

Common Drainage Problems



Erosion around inlets

Drainage Problems



Erosion at pipe outfalls

Drainage Problems



Trash/leaves/debris block flow

Drainage Problems



Blocked inlet/drainage system

Drainage Problems



Blocked yard inlet/ yard flooding

Drainage Problems



Woody vegetation above pipe

Drainage Problems



Woody vegetation in outfall channel

Storm Drainage

- Recommendations for property owners
- Pick up trash/debris before it enters drain system
- No dumping of leaves/grass clippings into drainage system
- Do not plant trees over the pipe system/ easement
- Remove debris/trash from ditches or channels
- Cut/remove woody vegetation from improved channels and above drainage pipes

Questions on Storm Drainage?

Storm Water Management Facilities

- Required per State and County standards
- Provide storage for storm water runoff
- Peak runoff from site does not exceed pre-development rate
- Prevent flooding downstream, slows runoff
- Water quality
- Filter out pollutants by allowing sediment and nutrients to settle
- Reviewed/Approved by PWC
- Constructed by developer
- Easement dedicated to PWC



Storm Water Management Facilities

Types of SWM:

- Dry Detention Facilities
- Wet Retention Facilities
- Trenches
- Bioretention (rain garden)
- Underground Facilities



959 County maintained facilities

-Shared maintenance responsibilities

1038 Privately maintained facilities

-Property owner has all maintenance responsibilities

Storm Water Management Facilities

Maintenance Responsibilities

- Determined by DCSM at plan approval
- Note on plat / deed

Residential Developments [SF, TH, Condo]

Most facilities where PWC has major maintenance are within easements

- Structures – Pipes, riser/control structure
- Rip rap (large stone)
- Major erosion/sedimentation
- Standing water
- Fences/gates
- Beaver removal (if it effects the function of the pond)
- PWC responsibility begins at bond release
- Yearly inspections

Storm Water Management Facilities

Shared Maintenance Responsibilities

Owner/HOA has maintenance of:

- Mowing / trimming
- Trash and small debris removal
- Trees / landscaping
- Nuisance vegetation (algae, cattails)
- Fountains/aerators



Dry Detention Pond



- Dry detention ponds are most common
- Holds water during and after storm event
- Water can rise quickly
- Extended detention 48-72 hours
- Emergency spillway
- Fencing required for most dry ponds
- Warning signs required

Dry Detention Pond



Owner/HOA Responsibilities:

- Mowing / trimming
- Dam Embankment – no trees
- Around/above drainage structures
- Recommend bushhog 3-4x during the growing season
- Remove shrubs/branches from fence
- Trash and debris removal
- Trees / landscaping
- Nuisance vegetation (cattails)

Dry Pond



Well maintained

Dry Pond



Punch List Item



Embankments need cut

Punch List Item



Downstream embankment needs cut

Punch List Item



Emergency spillway

Punch List Item



Trim/remove trees from fence

Punch List Item



Standing water/ litter

Wet Retention Pond



- Permanent pool of water
- Water level rises with storm
- No fencing required if conditions met
- Usually safety/aquatic bench on perimeter
- Warning signs required
- PWC - major maintenance on some wet ponds (Per note on plat/plan)
- Recommend vegetative strip along pond edge

Wet Retention Ponds



Owner/HOA Responsibilities:

- Mowing / trimming
 - Dam Embankment – no trees
 - Around drainage structures
- Trash and small debris removal
- Trees / landscaping
- Nuisance vegetation (cattails, algae)
- Geese control

Wet Pond



Well maintained

Wet Pond



Wet Pond Embankment



Before mowing

Wet Pond Embankment



After mowing

Wet Pond



Note: vegetation removed from fence

Wet Pond Litter/Debris



Owner's responsibility to remove

Wet Pond Algae



Excess nutrients

- Fertilizer, animal waste, and detergents

Algae growth depletes oxygen levels

- Loss of aquatic wildlife
- Odor

Prevention

- Grass or vegetation filter strip
- Nutrient management – limit fertilizer

Removal

- Chemical
- Mechanical

Fountain/Aerator may help

Cattails



- Usually wet pond
- Some areas of dry ponds
- Water depth of up to 1.5 feet
- Mechanical or chemical treatment
- Difficult to eradicate
- Owners decision to treat

Beaver/Muskrat Problems



- Can cause extensive damage
- PWC will trap if affecting stream or pond function
-In County easement-
- Request signed affidavit from owner

Trench



- Excavated trench filled with stone
- Stores storm water runoff and filters into soil below
- Smaller sites
- Not many in PWC
- Maintenance resp. per note on plat
- Owner maintenance – cut back vegetation

Bioretention (Rain Garden)



- Used on smaller sites
- Usually less than 500 sf
- Landscaping feature that uses native vegetation
- Filters out pollutants from storm water runoff



- Engineered soils for percolation
- Relatively new for water quality
- Most sites maintained by property owner
- General maintenance – weed/mulch/prune

Owner Access to SWM Ponds



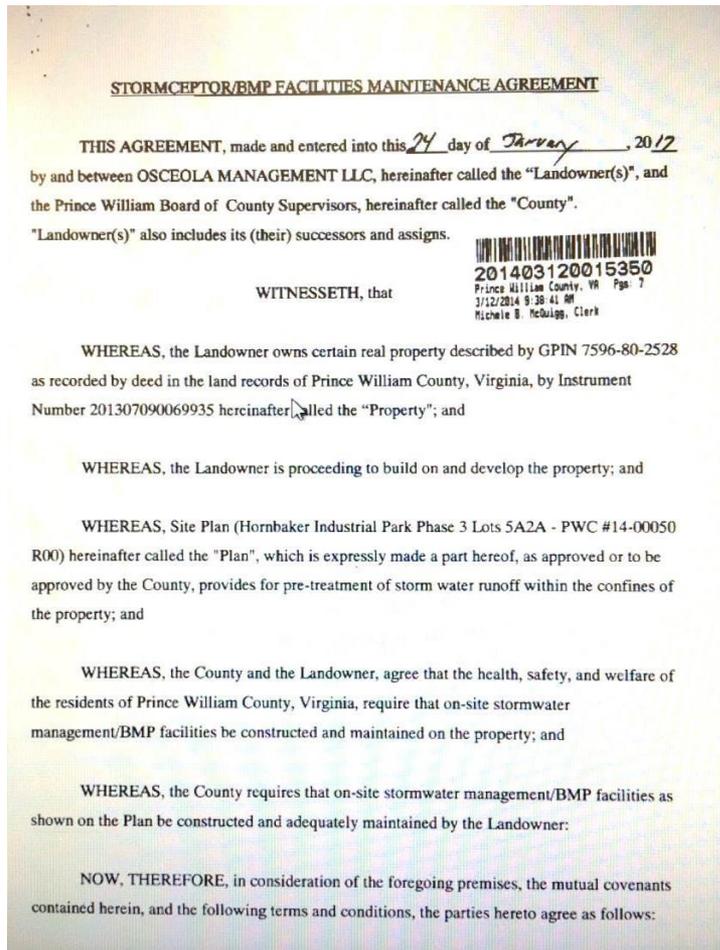
- PWC lock installed at ponds under Co. “major” maintenance
- PWC can provide key to owner/HOA
- Call Watershed Management Branch
- 703-792-7070

Mosquito Problems



- PWC Forest and Pest Management
 - Inspect
 - Larvae Count
 - Provide treatment as necessary
 - 703-792-6279

Maintenance Agreements



- Required for owner-maintained SWM facilities
- Legal/Recorded document between PWC and property owner
- Facility must be maintained per approved plan
- Inspection and maintenance reports submitted to PWC
- Transfers with sale of property

Summary/ SWM Do's and Don'ts

Do: Mow and trim (especially embankment/fence)
Remove trash
Visually inspect periodically
Contact PWC if problem

Don't: Alter pond without PWC approval
Plant trees on dam embankment
Dump grass clippings or tree branches into pond or impoundment

Can Do

- Add landscaping if it doesn't interfere with function of pond
- Add vegetative strip along pond edge
- Add fountains or aerators - Owner responsibility to install and maintain

Proposed Modifications in Easements

- Fences, Landscaping, Fountains, etc.
- Requires approval from Public Works
- Application form, details, supporting documents
- Public Works will review
- Approval requires conditions

Problems or Questions

Call PWC Public Works

703-792-7070

Questions?