# Watkins Mill HOA #1
# Stormwater Management Facility Repair/Retrofit
# Pond 11150

DEPARTMENT OF
ENVIRONMENTAL
PROTECTION
MONTGOMERY COUNTY • MARYLAND

Working together for a cleaner, greener
economically vibrant community

Public Meeting January 16, 2019
Watkins Mill High School
10301 Apple Ridge Rd, Gaithersburg, MD 20879

# Introductions

**Pamela Rowe**
Planner
Montgomery County DEP- Stormwater Facility Maintenance Program

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Engineer III
Montgomery County DEP- Stormwater Facility Maintenance Program

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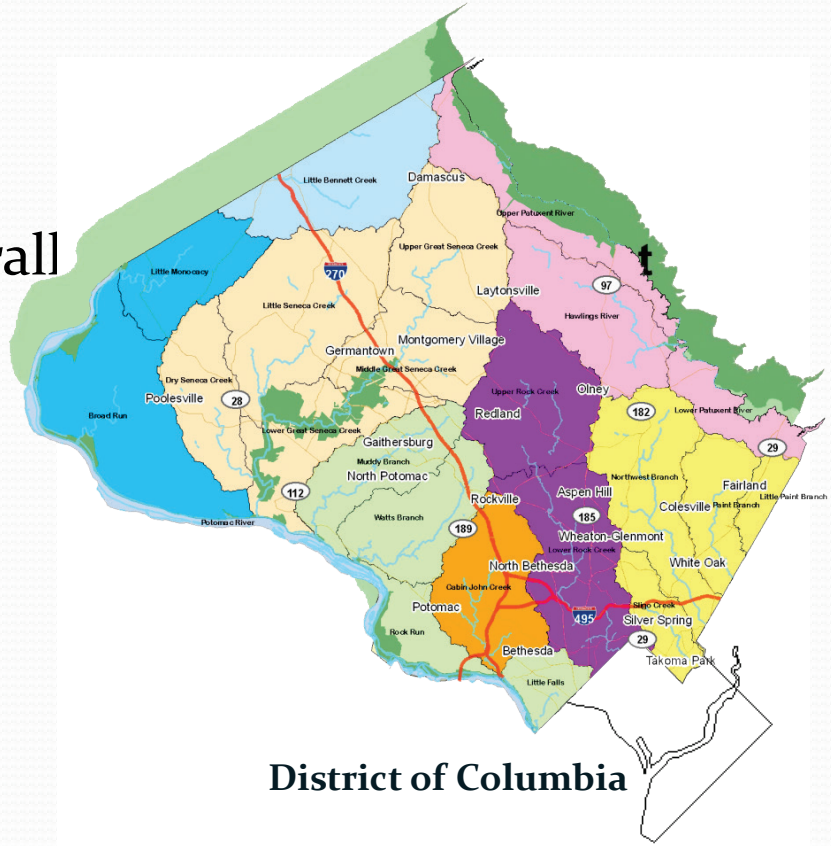
Associate/Water Resource Engineer
A. Morton Thomas and Associates

# Tonight's Agenda

- Background
- Project goals
- Proposed pond retrofit designs
- Examples of similar projects
- What to expect during construction
- Project schedules
- Questions/Comments

# Montgomery County, MD

- Over 1,000,000 people
- 500 sq. miles
- About 12% impervious surface overall
  - About the size of Washington DC
- Over 1,500 miles of streams
- Two major river basins:
  - Potomac
  - Patuxent
- Eight local *watersheds*




**Impervious**: Not allowing water to soak through the ground.

# DEP – Who We Are

- **Watershed Management**
- Environmnetal Policy & Compliance
- Solid Waste Services
- Water and Wastewater

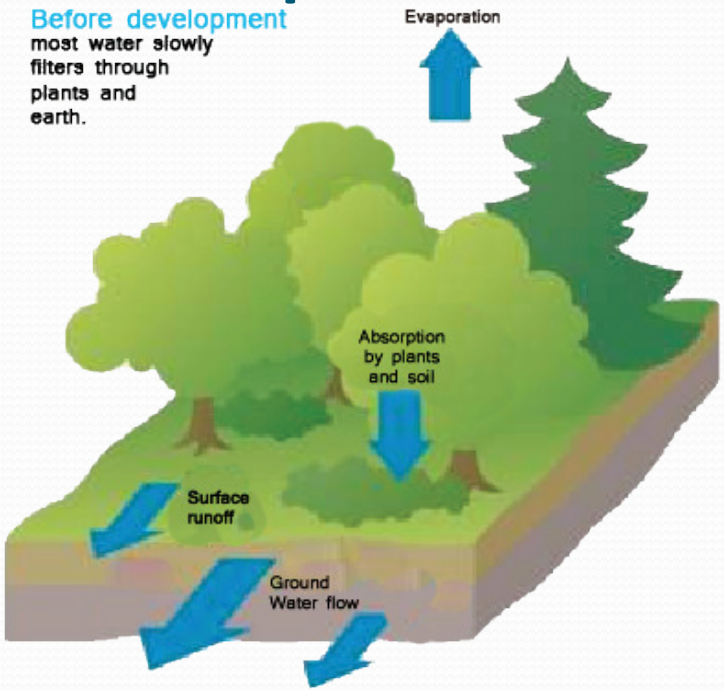
# What governs us?

National Pollutant Discharge Elimination System (**NPDES**) permit program decreases water pollution by regulating pollution sources.

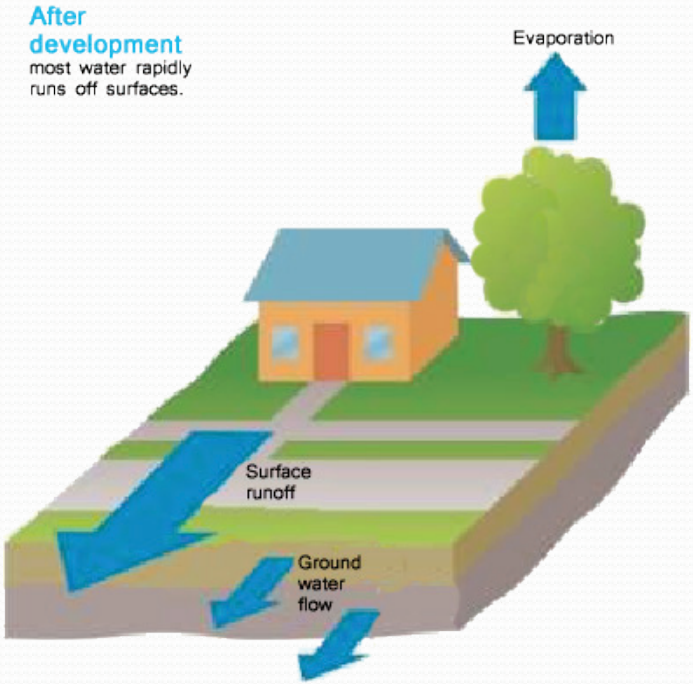
The Maryland Department of the Environment (**MDE**) requires the County to obtain an **MS-4** Permit. This regulates Stormwater Discharges and requires the County to inspect and maintain all stormwater structures.

Code of Montgomery County, Article II, Ch. 19 (**COMCOR**) requires DEP to inspect and enforce maintenance of all stormwater structures in the County.

# Development and watersheds




- Evaporation
- Infiltration into ground water
- Less issues with runoff

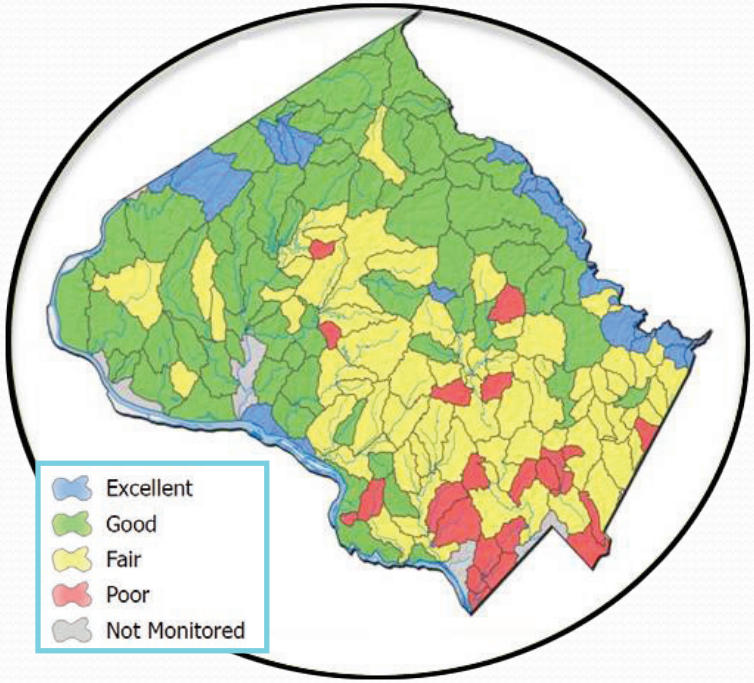



- Less evaporation
- Less infiltration into ground water
- MORE runoff!

# Meeting the MS4 Permit

**What must the County do to protect our streams?**

- Restore streams and watersheds by adding runoff management
- Meet water quality protection goals (TMDLs)
  - Reduce pollutants entering our streams
  - Focus on watersheds showing greatest impacts
- Inspect and ensure maintenance of Stormwater Management Facilities
- Educate and engage County stakeholders



# Managing Stormwater

## Protects local streams and watersheds

- **Stormwater ponds are important stormwater management tools, because they:**
- **Remove pollutants**
- **Reduce stream erosion**
- **Help to make our waters fishable and swimmable**
- **Improve the quality of the Chesapeake Bay**

# What is the Water Quality Protection Charge?

- Part of Montgomery County property tax bills.
- Calculated based on the potential for a property to contribute to stormwater runoff (impervious cover)
- All property owners in Montgomery County pay the WQPC, including businesses, HOAs, and non-profit organizations.
- The WQPC raises funds to improve the water quality of our streams and reduce the impacts of stormwater runoff.

# Stormwater Facility Maintenance Program

- DEP is responsible for inspection of all stormwater management facilities*
- DEP is responsible for ensuring all stormwater facilities* are functioning properly
- Funded by Water Quality Protection Charge

# Maintenance Responsibility

- Before 2006, property owners responsible for all maintenance
  - DEP started a shared maintenance program for residential property owners = Transfer Program
  - Property owner is responsible for non-structural maintenance
  - County performs structural maintenance

# Non-Structural Maintenance


- Landscaping
- Mowing
- Over grown vegetation
- Woody vegetation
- Trash removal
- Aesthetics

# Structural Maintenance

- Typical - Routine
  - Blocked low flow
  - Animal burrows
  - Minor sediment removal
- Sand filter tilling
- Flow splitter cleaning
- Cleaning UG facilities

# Structural Maintenance, cont.

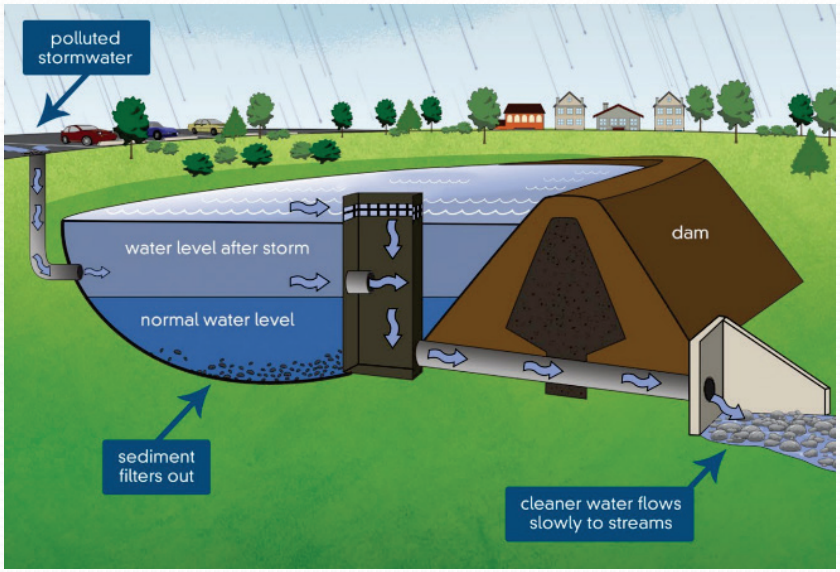
- Capital Projects
  - Dredging
  - Slip-lining
  - Dam failures
    - Barrel replacements
    - Riser replacements
  - Safety improvements
  - Retrofits

# Watkins Mill HOA #1

- Built in 1970s
- Unknown maintenance schedule prior to 2005
- DEP accepted in as-is condition in 2005
- DEP performed routine maintenance in 2013
- This project is major structural repair/retrofit
- Good opportunity exists to upgrade facility and improve stormwater management functions

# Project Goals

- Remove sediment
- Repair structures
  - Construct New/Replace Existing Control Structures
  - Remove/Replace Existing Spillway Pipes
  - Replace Storm Drain Outfalls to Prevent Erosion
- Retrofit pond to maximize storm water treatment



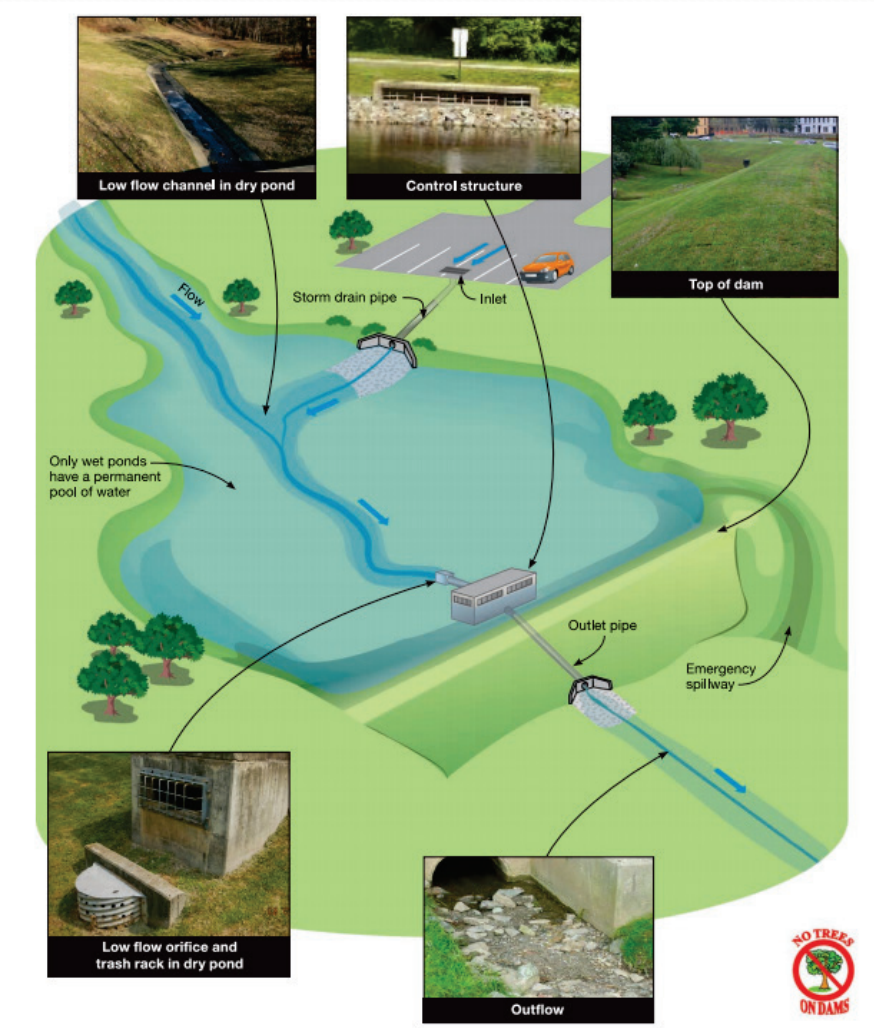
# Two types of designs for Ponds

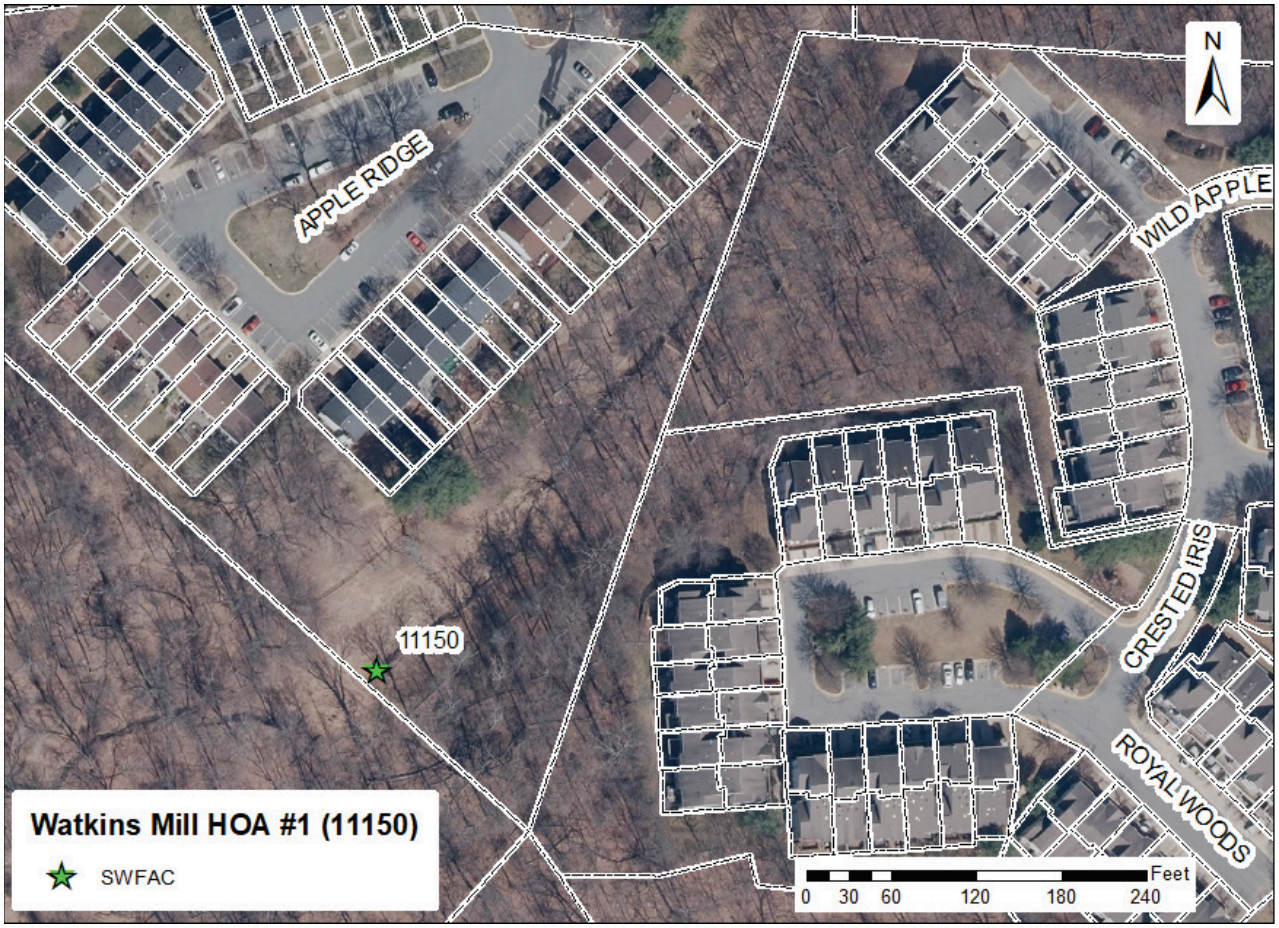
- Channel Protection Volume (CPV)
  - Designing a pond to capture 2.6 inches of rain (a 1-year storm event)
  - Storing and slowly releasing this rain event for 12 to 24 hours
  - Main Objective for this Design: Provide the greatest impact to reduce downstream erosion
- Water Quality Volume (WQV)
  - Capturing and filtering out the pollutants during a 1-inch rain event, and is based on impervious area
  - Main Objective for this Design: Reduce nutrients from entering the stream
- Ideal Situation
  - Design a facility that does both when the land area available is adequate for the project drainage area and impervious surfaces

# Stormwater Management Pond

## Components of a Typical Pond

- Inflow (Stream/Piped)
- Embankment
- Control Structure
- Outfall Pipe
- Outlet Channel






# Watkins Mill HOA #1 Location Map

# Facility 11150 Drainage Area Map

SWM Facility Retrofit Project

Montgomery County Department of Environmental Protection

*Watkins Mill HOA 1 - Pond 11150*

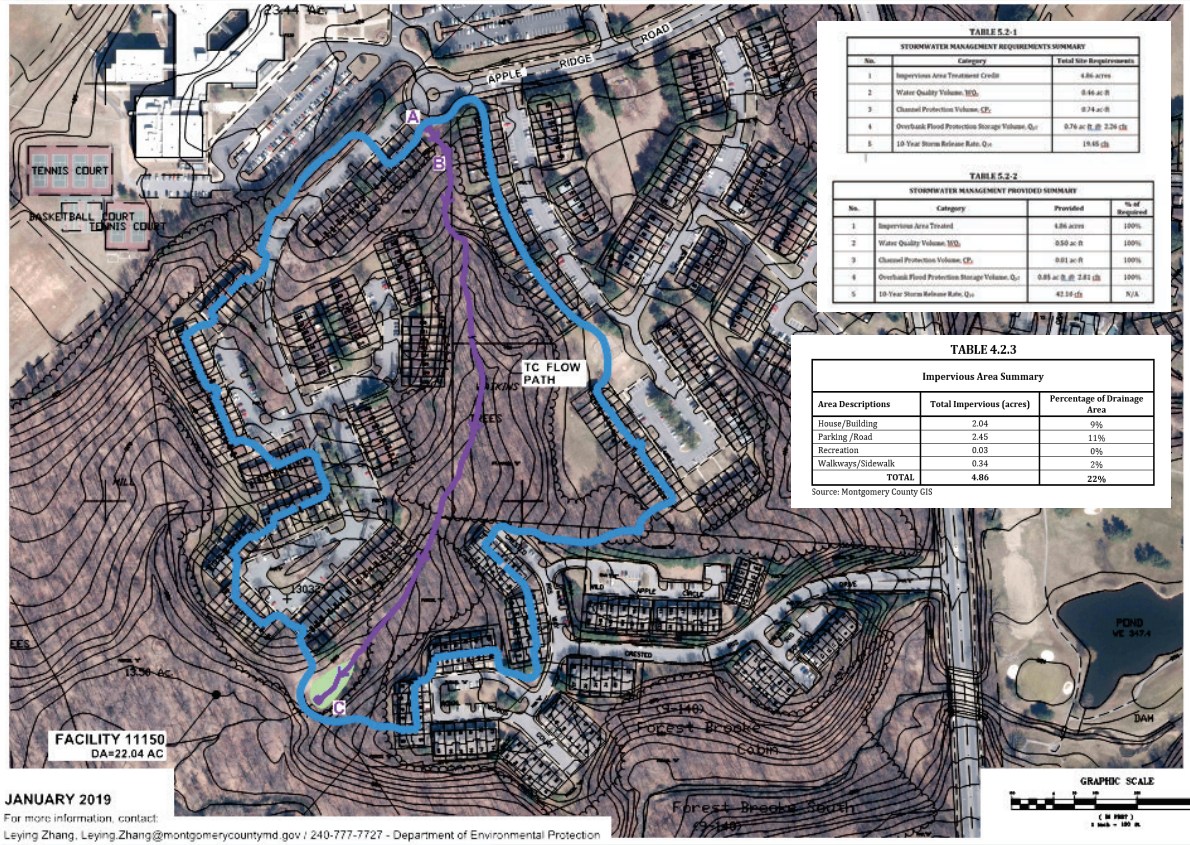



**TABLE 5.2-1**

**STORMWATER MANAGEMENT REQUIREMENTS SUMMARY**

| No. | Category | Total Site Requirements |
|---|---|---|
| 1 | Impervious Area Treatment Credit | 4.86 acres |
| 2 | Water Quality Volume, $WQ_r$ | 0.46 ac-ft |
| 3 | Channel Protection Volume, $CP_v$ | 0.74 ac-ft |
| 4 | Overbank Flood Protection Storage Volume, $Q_{p10}$ | 0.76 ac-ft @ 2.26 cfs |
| 5 | 10-Year Storm Release Rate, $Q_{10}$ | 19.45 cfs |

**TABLE 5.2-2**

**STORMWATER MANAGEMENT PROVIDED SUMMARY**

| No. | Category | Provided | % of Required |
|---|---|---|---|
| 1 | Impervious Area Treated | 4.86 acres | 100% |
| 2 | Water Quality Volume, $WQ_r$ | 0.50 ac-ft | 100% |
| 3 | Channel Protection Volume, $CP_v$ | 0.81 ac-ft | 100% |
| 4 | Overbank Flood Protection Storage Volume, $Q_{p10}$ | 0.85 ac-ft @ 2.81 cfs | 100% |
| 5 | 10-Year Storm Release Rate, $Q_{10}$ | 42.10 cfs | N/A |

**TABLE 4.2.3**

**Impervious Area Summary**

| Area Descriptions | Total Impervious (acres) | Percentage of Drainage Area |
|---|---|---|
| House/Building | 2.04 | 9% |
| Parking /Road | 2.45 | 11% |
| Recreation | 0.03 | 0% |
| Walkways/Sidewalk | 0.34 | 2% |
| **TOTAL** | **4.86** | **22%** |

Source: Montgomery County GIS

**TABLE 4.9**

**SUMMARY OF DISCHARGES – WITH EXISTING STORMWATER MANAGEMENT**
(Computed Using HydroCAD TR-20)

| Point of Study | | Current Conditions | | |
|---|---|---|---|---|
| SWM 11150 | Area | 22.04 acres | | |
| | RCN | 73 | | |
| | Tc | 14 minutes | | |
| | Storm Event | Inflow (cfs) | Outflow (cfs) | W.S.E. (ft) * |
| | 1-yr (2.6) inches | 16.33 | 1.93 | 347.43 |
| | 2-yr (3.2) inches | 27.44 | 2.26 | 348.97 |
| | 10-yr (5.1) inches | 68.90 | 19.45 | 351.77 |
| | 100-yr (7.2) inches | 120.08 | 96.96 | 352.95 |

*(W.S.E.) = Water Surface Elevation above Mean Sea Leve (MSL)

FACILITY 11150

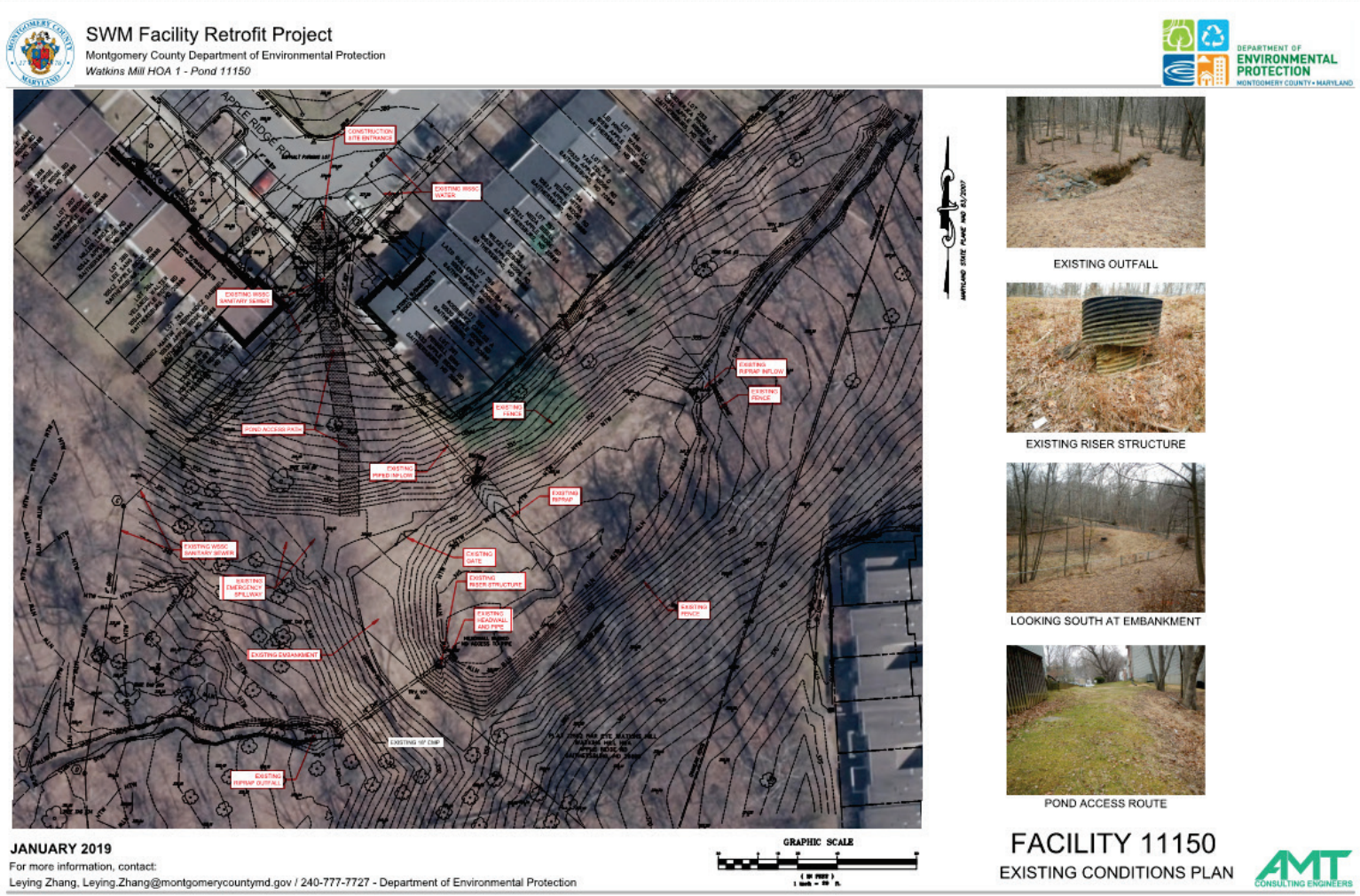
DRAINAGE AREA MAP

GRAPHIC SCALE

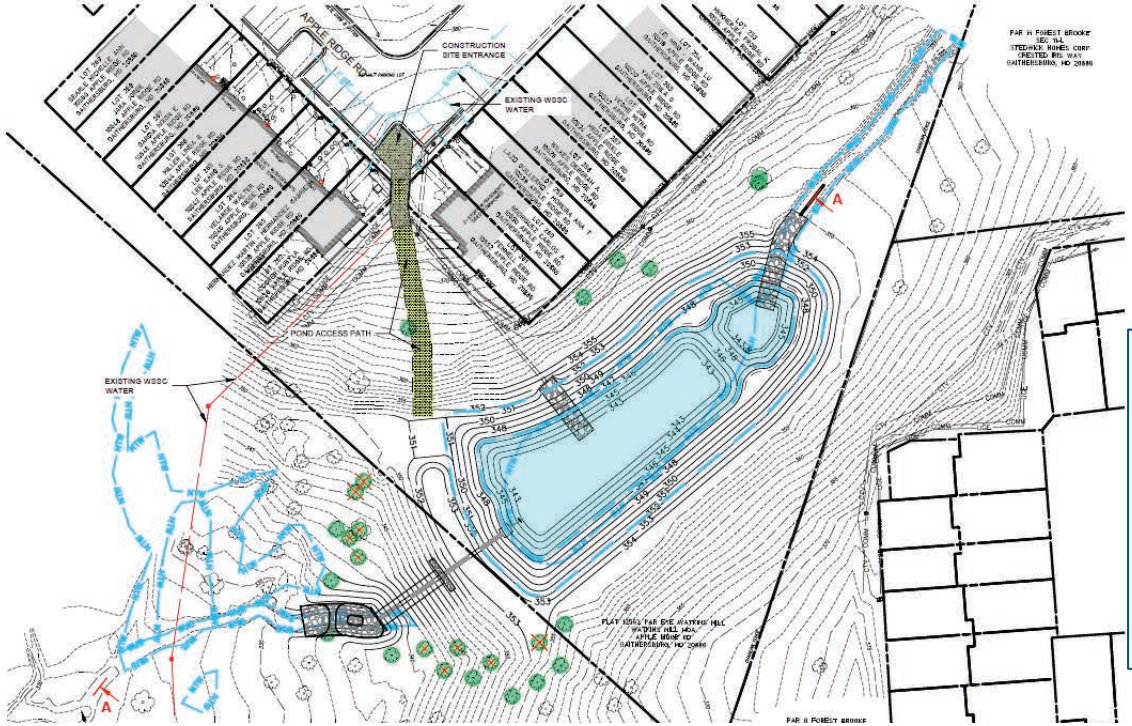
JANUARY 2019

For more information, contact:
Leying Zhang, Leying.Zhang@montgomerycountymd.gov / 240-777-7727 - Department of Environmental Protection

# Facility 11150 Site Images



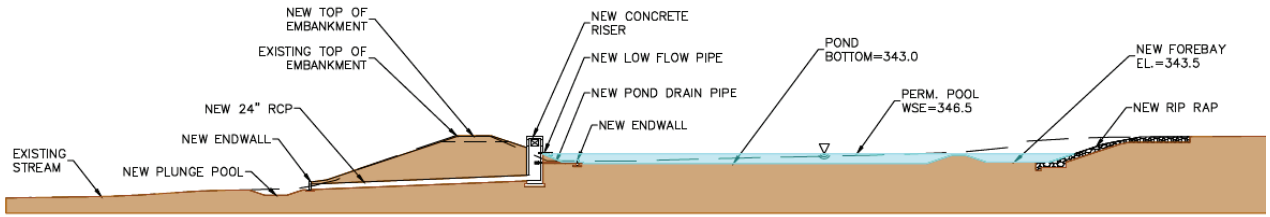
# Facility 11150 – Concept Design





**Reconstruct as a Wet Pond**

- 3.5 Foot Deep Wet Pool
- 100% Water Quality Volume
- 100% Channel Protection Volume
- 100% Qp 2-year
- Remove and replace existing riser and outfall pipe
- Long Term Maintenance
- Removal of Sediment Buildup




PROFILE A-A

**TABLE 5.4.1**

**SUMMARY OF DISCHARGES – WITH PROPOSED RETROFIT SWM POND**
(Computed Using HydroCAD TR-20)

| Point of Study | | Proposed Conditions | | |
|---|---|---|---|---|
| SWM 11150 | Area | 22.04 acres | | |
| | RCN | 73 | | |
| | Tc | 14 minutes | | |
| | Storm Event | Inflow (cfs) | Outflow (cfs) | W.S.E. (ft) * |
| | 1-yr (2.6) inches | 16.33 | 0.63 | 348.93 |
| | 2-yr (3.2) inches | 27.44 | 2.81 | 349.63 |
| | 10-yr (5.1) inches | 68.90 | 42.10 | 350.75 |
| | 100-yr (7.2) inches | 120.08 | 102.20 | 351.97 |

* (W.S.E.) = Water Surface Elevation above Mean Sea Level (MSL)

# Facility 11150
# Sample Images




# What to expect during construction

- **Duration**
  - Approximately 8-10 months (weather dependent)
- **Construction Hours**
  - Monday through Friday, 7AM – 4PM
- **Safety**
  - Work limits will be fenced with high visibility orange construction safety fence
- **Traffic**
  - Access to be determined
- **Noise**
  - Contractor is required to comply with Montgomery County Noise Ordinance
- **Sediment**
  - Contractor will be required to comply with Montgomery County Sediment Control Permit and not track dirt onto roads

# Proposed Schedule

## Watkins Mill HOA #1
## Stormwater Management Facility
## Repair/Retrofit Ponds

- **Survey and Site Analysis – 2015**
- **Public meeting to discuss concept designs– 1/16/19**
- **Revise Design Plans – Spring 2019/Summer 2019**
- **Public Meeting to discuss final designs – Winter 2019**
- **Permits issued – Spring 2020**
- **Construction – Summer 2020/Fall 2020**

# Questions/Comments?

Leying Zhang
240-777-7727
Leying.Zhang@montgomerycountymd.gov

Watkins Mill HOA #1 Project Page:
http://www.montgomerycountymd.gov/water/stormwater/major-projects.html

# Mosquito Predators in Ponds

- Non-Biting Midge
- Diving Beetle
- Damselfly Larvae
- Backswimmers
- Water Scorpion
- Dragonfly Nymph
- Phantom Midge
- Water Strider
- Swallows, Adult Dragonflies, Frogs

# Property Lines

# Construction Entrance and Staging Areas