Flints Grove Stream Restoration and Stormwater Management Retrofit Project

Concept Design Presentation

September 29, 2015

DEPARTMENT OF ENVIRONMENTAL PROTECTION
MONTGOMERY COUNTY • MARYLAND

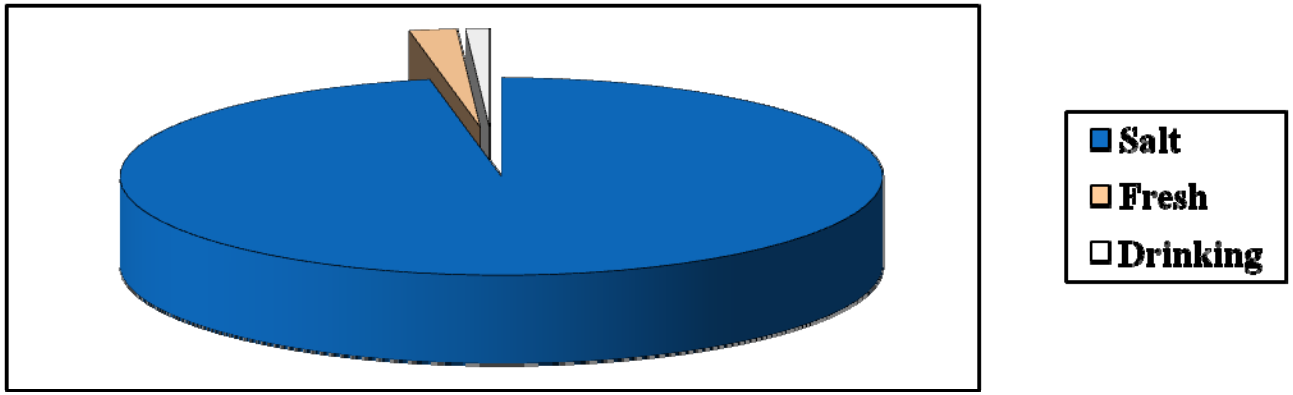
Biohabitats

CENTURY ENGINEERING

Today's Agenda

- Sources of Water on Earth
- Montgomery County background
- What is a Watershed & Runoff?
- Intro to Stormwater
- What the County is Doing to Protect Our Streams
- Goals of the Project
- Proposed Pond Retrofit
- Proposed Stream Restoration
- Questions/Comments

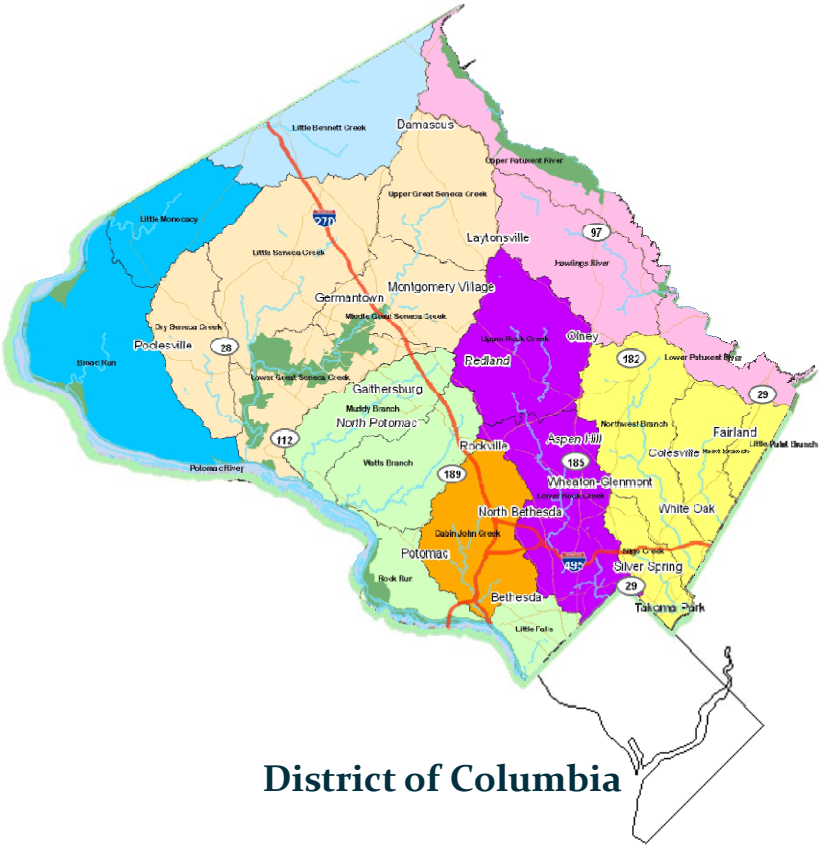
Sources of Water



- About 97% is salt water
- About 2% is frozen
- Only 1% is available for drinking water
  - 95% from groundwater across the Country
  - 32% from groundwater, 68% from surface water in Maryland
    - Potential for greater impacts from runoff in Maryland

Montgomery County, MD

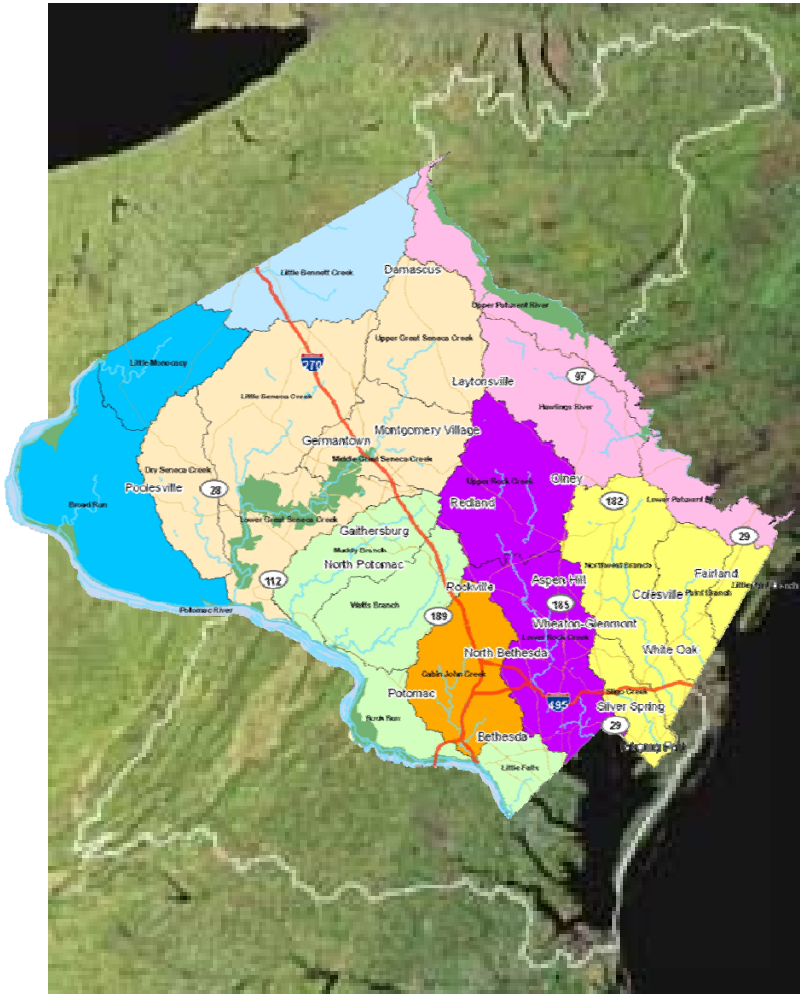
- 500 sq. miles
- Over 1 million people
  - Second only to Baltimore City within Maryland in average people per square mile
  - 184 languages spoken
- About 12% impervious surface overall
  - About the size of Washington DC
- Over 1,500 miles of streams
- Two major river basins:
  - Potomac
  - Patuxent
- Eight local *watersheds*



Impervious: Not allowing water to soak through the ground.

What is a Watershed?

- A ***watershed*** is an area from which the water above and below ground drains to the same place.
- Different scales of watersheds:
  - Chesapeake Bay
  - Eight local watersheds
  - Neighborhood (to a storm drain)

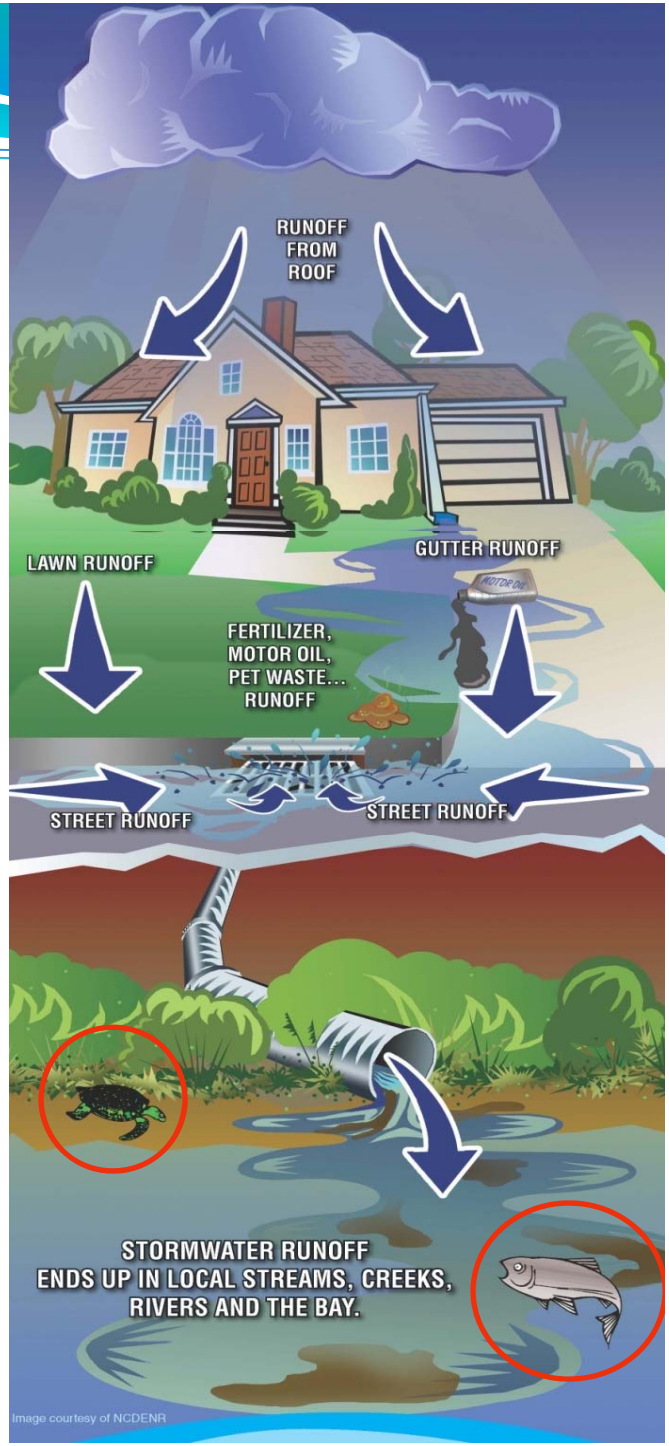


What is Runoff?

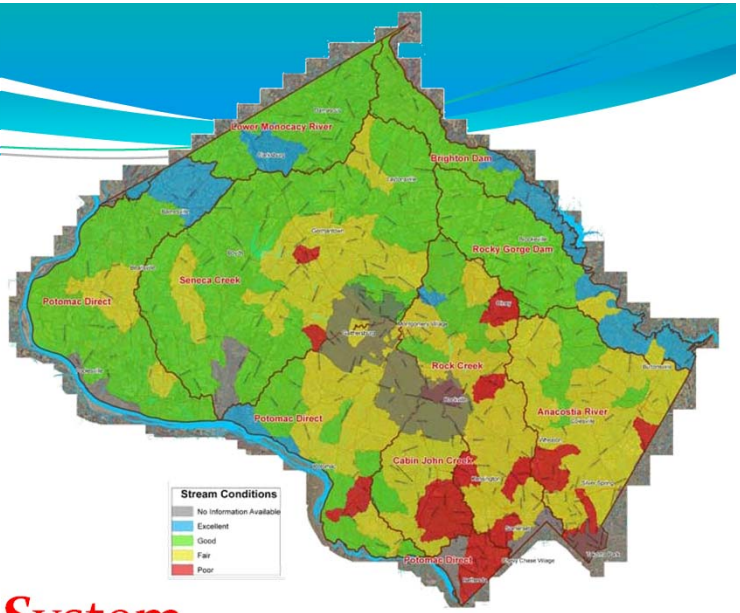
Water that does not soak into the ground becomes surface runoff. This runoff flows over hard surfaces like rooftops, driveways and parking lots collecting potential contaminants and flows:

- **Directly into streams**
- **Into storm drain pipes, eventually leading to streams**
- **Into stormwater management facilities, then streams**

<u>Two Major Issues:</u>
Volume/Timing of Runoff
Water Quality



What is the County doing to protect our Streams?



- Must meet regulatory requirements
  - Federal Clean Water Act permit program
  - **MS4** = **M**unicipal **S**eparate **S**torm **S**ewer **S**ystem
- Applies to all large and medium Maryland jurisdictions
- County programs
  - Restore our streams and watersheds
    - Add runoff management
  - Meet water quality protection goals
    - Reduce pollutants getting into our streams
  - Educate and engage all stakeholders
    - Individual actions make a difference
  - Focus on watersheds showing greatest impacts

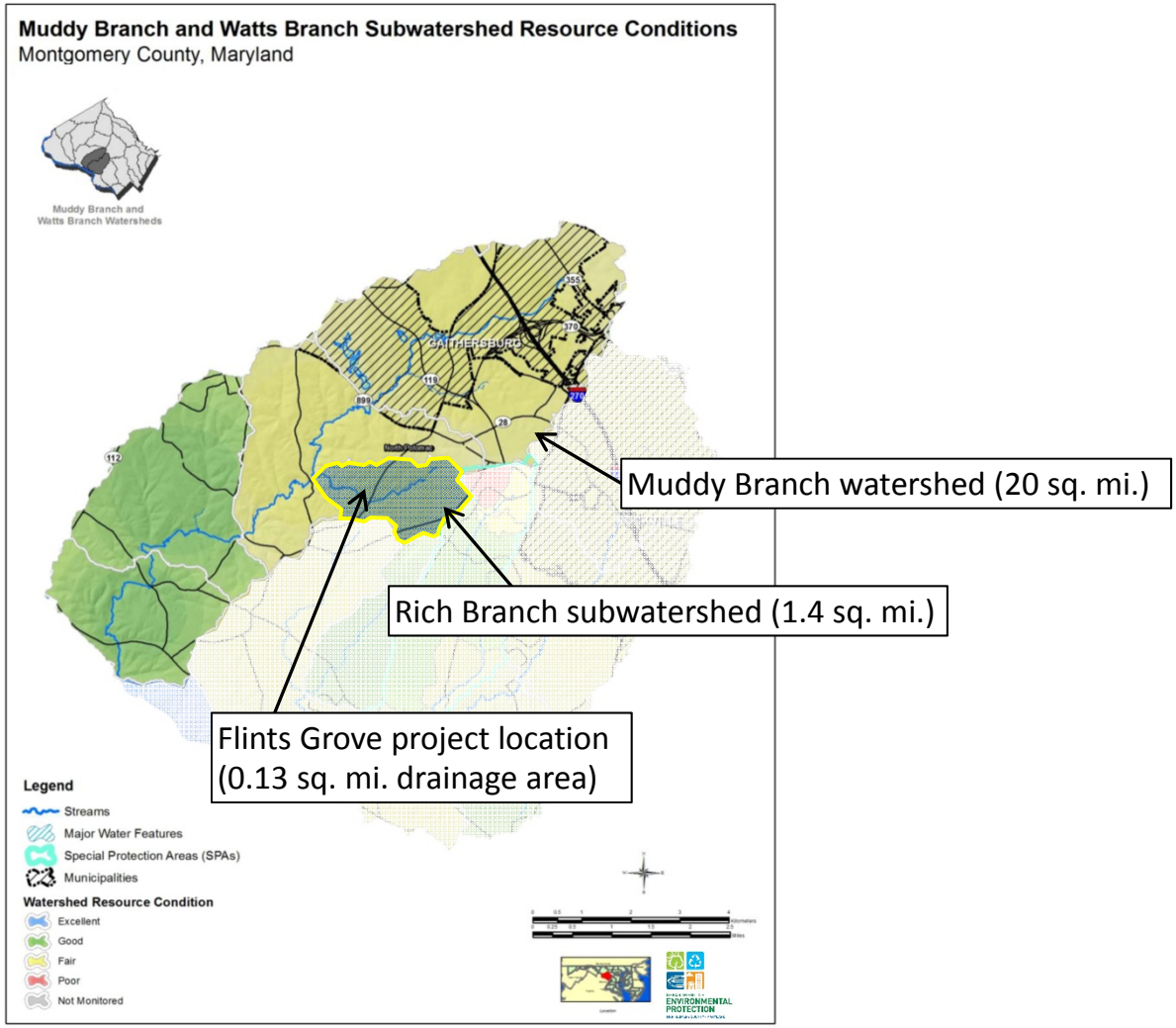
MS4 Permit: What is it?

- Montgomery County is responsible for:
  - What goes into our storm drain pipes
  - What comes out of them
  - What flows into the streams
- Requires additional stormwater management for **20 percent** of untreated impervious surfaces (currently is 3,777 acres = 5.9 square miles).
- Retrofits of existing stormwater ponds are cost-effective options for watershed restoration

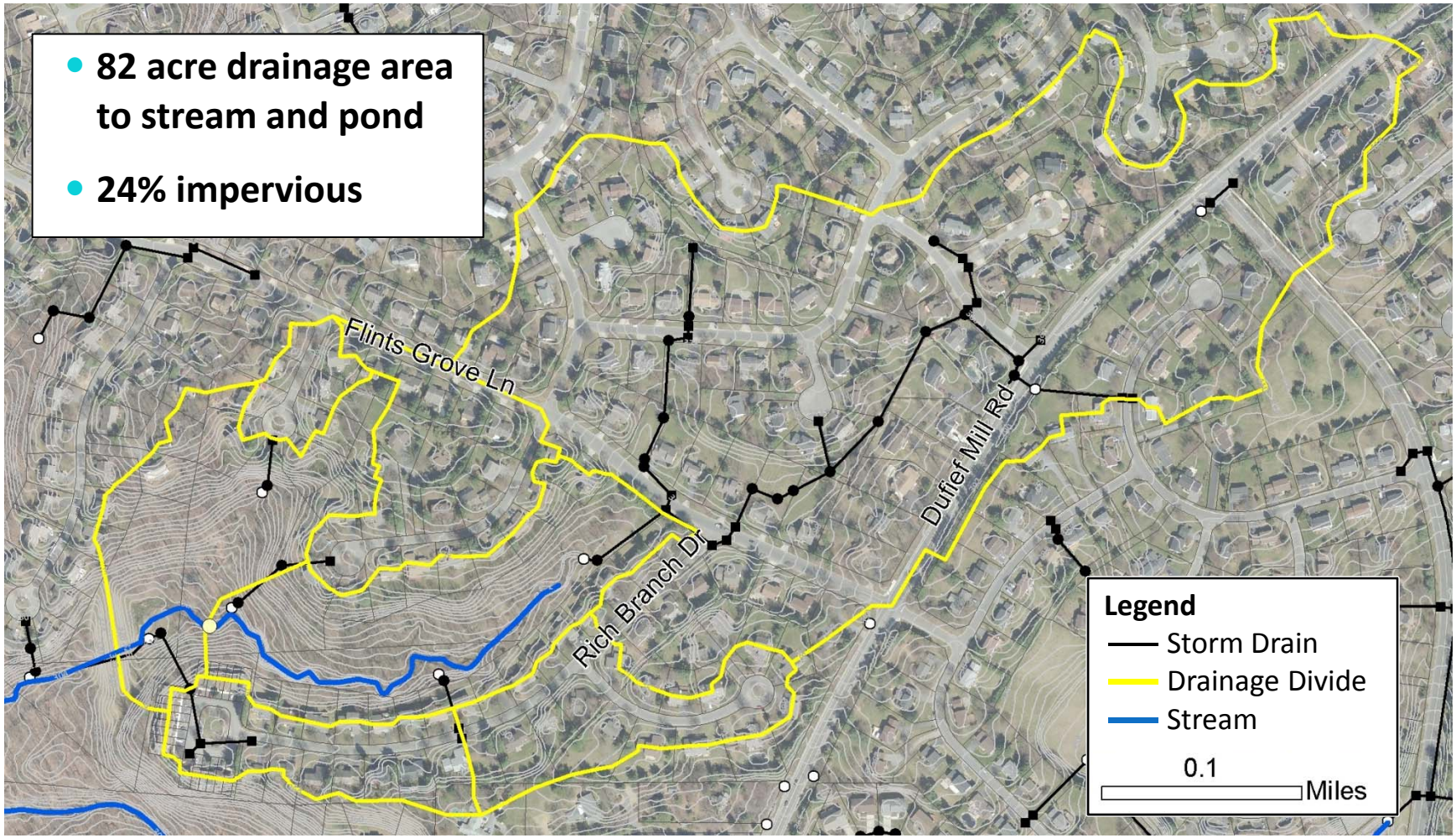
Overall Goals of the Project

- **Improve efficiency of the Flints Grove stormwater management pond**
  - **Maximize SWM facility storage volume with emphasis on treating**
    1) Water Quality Volume (WQv)
    2) Channel Protection Volume (CPv)
  - **Upgrade pond to comply with current safety and design standards**
  - **Improve access for routine maintenance**
- **Improve stream stability and habitat of the tributary to Rich Branch**

Project Location



Drainage Area



- 82 acre drainage area to stream and pond
- 24% impervious

Existing Flints Grove Pond Conditions

- Constructed in the early 1980s
- Fully developed drainage area
- Dry detention pond constructed in a stream valley
- Quantity control for 2- and 10-year storms
- Very few ecological or water quality benefits
- Good condition, but riser is nearing end of service life
- Maintenance access is inadequate
- Major sediment deposition from upstream erosion

Existing Flints Grove Pond

Pond Retrofit Goals

- Reconfigure and increase storage within the pond
- Comply with current safety and design standards
- Improve water quality and stream health
- Improve ecological value and plant diversity
- Provide an attractive community amenity

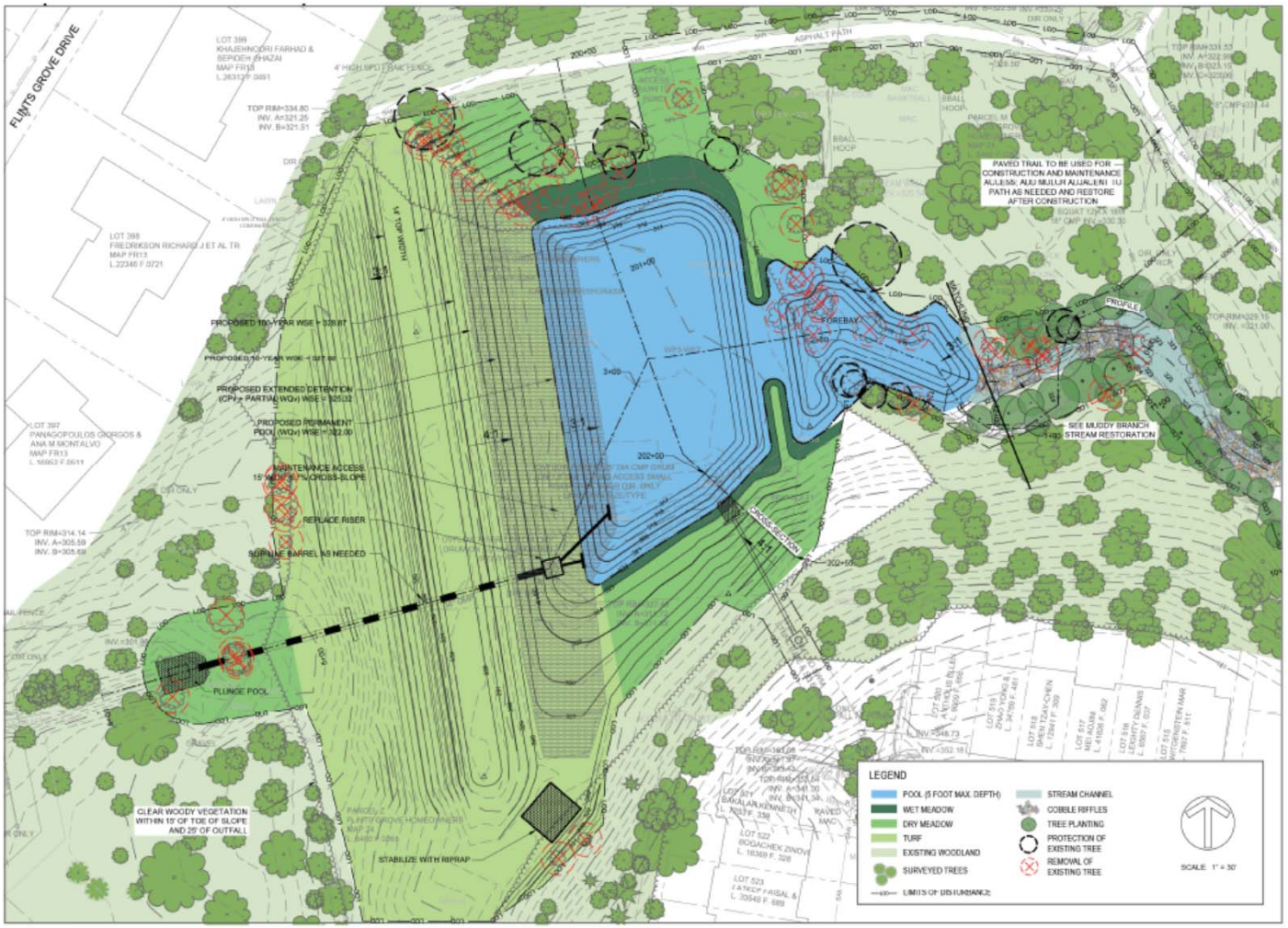
Proposed Pond Retrofit

- Enlarge the storage volume to treat 100% of the Water Quality Volume (WQv) and 100% of the Channel Protection Volume (CPv)
- Add a permanent wet pool (5 ft max depth)
- Detain and release the CPv within 24 hours
- Safely pass larger storms, including the 100-year storm

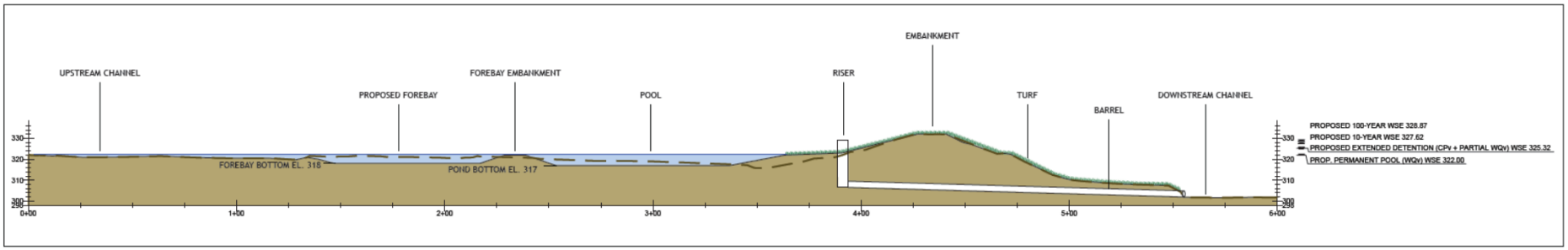
Proposed Pond Retrofit

- Install a forebay at the top of the pond to improve maintenance
- Replace existing metal riser with modern concrete riser structure
- Provide a 15 ft wide bench for maintenance access
- Slightly re-grade pond side slopes
- Revegetate pond with turf and native plants

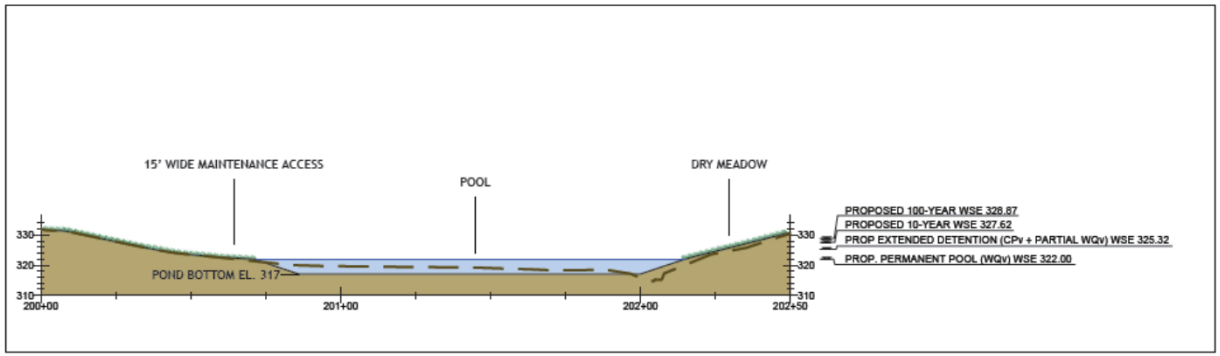
Proposed Pond Retrofit



Proposed Pond Retrofit



Profile of Proposed Retrofit



Cross-Section of Proposed Retrofit

Stormwater Pond Retrofit During Construction

Stormwater Pond Retrofit Within 1 Year After Construction

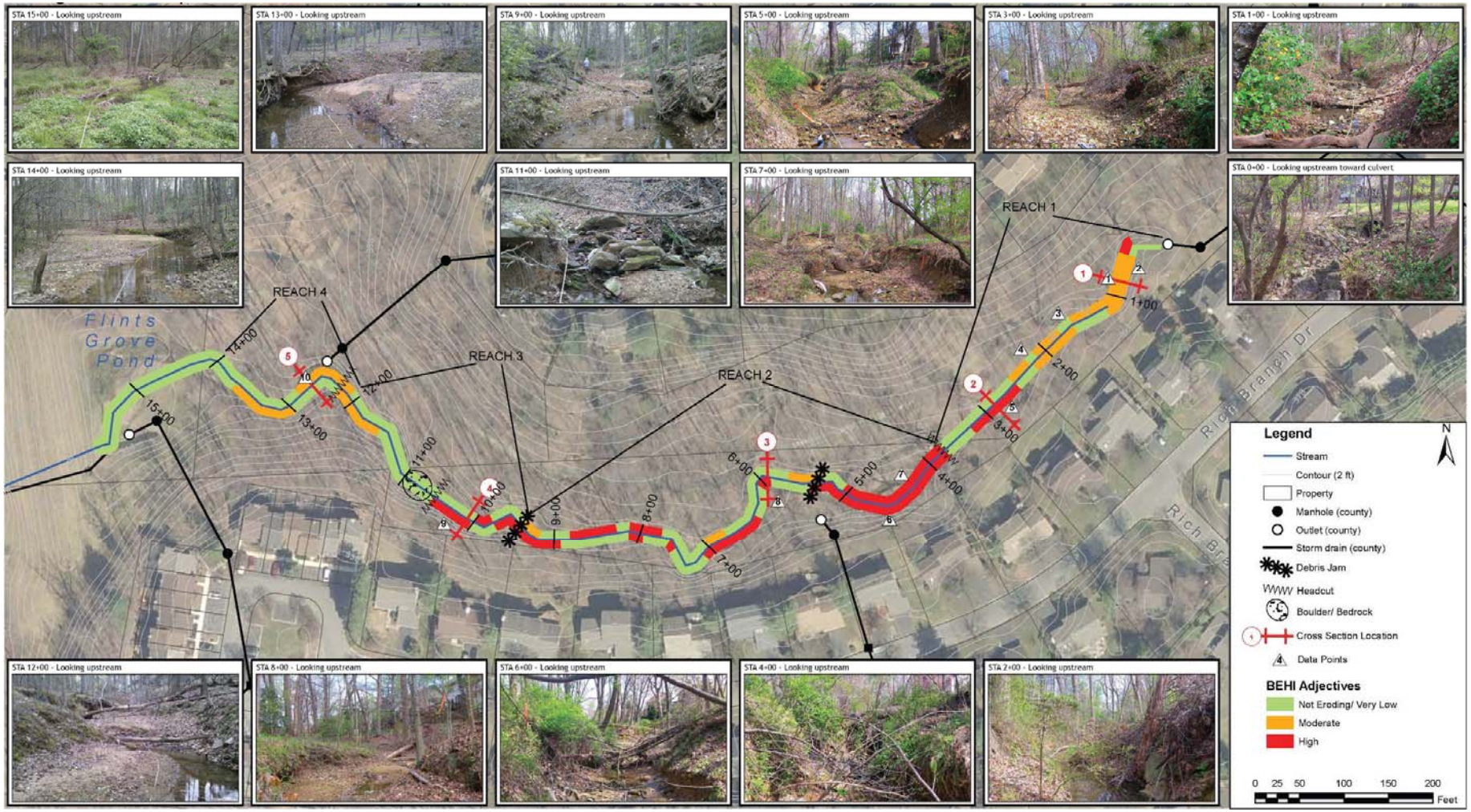
See an example with a video at:
www.mygreenmontgomery.org/2015/healthy-plants-healthy-streams

Stormwater Pond Retrofit Within 5 Years After Construction

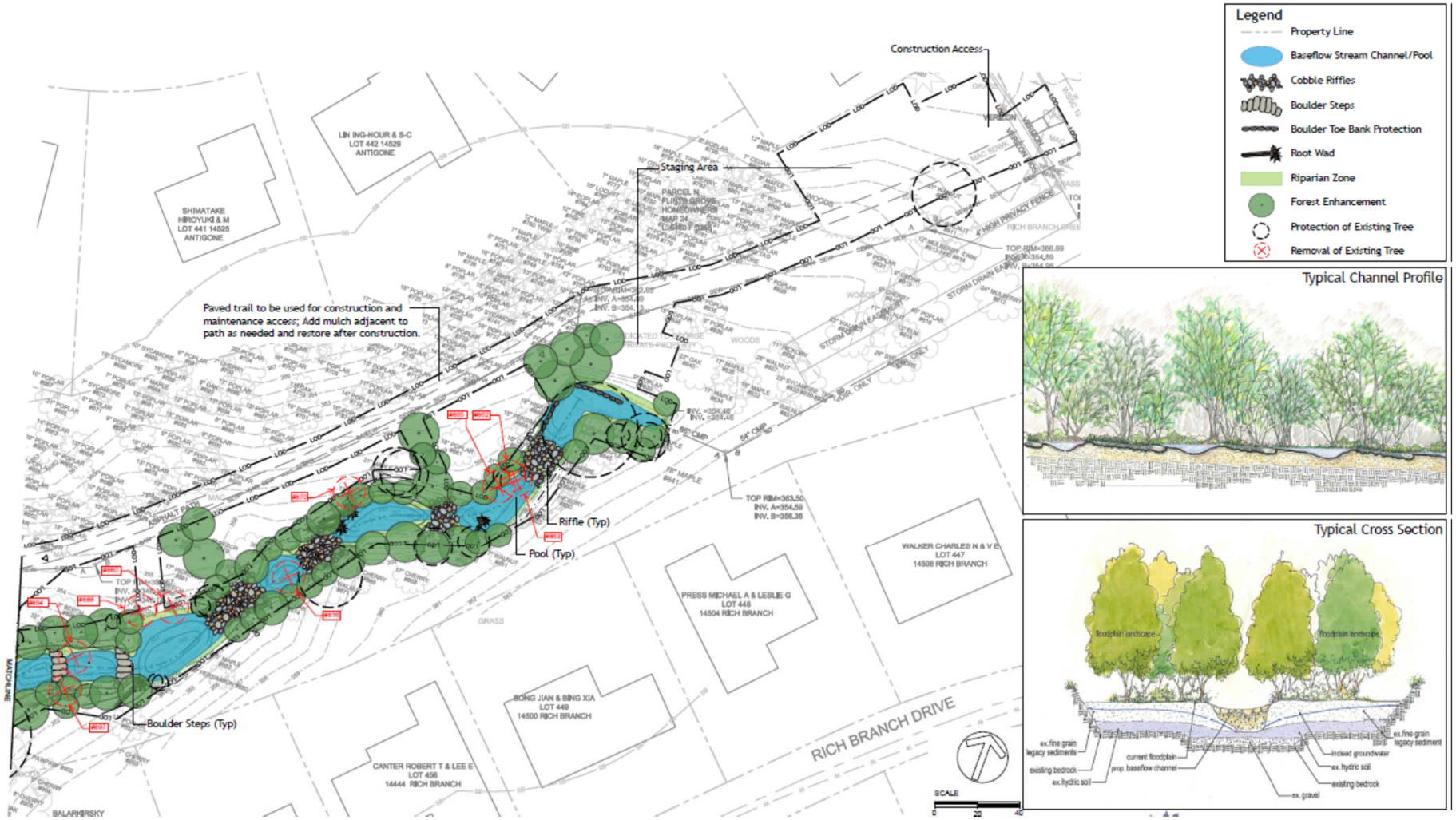
Goals of Stream Restoration

1. **Stabilize the stream channel and banks**
2. **Reconnect stream to floodplain**
3. **Improve the availability and complexity of aquatic habitat**
4. **Design in-channel features that will enhance nutrient uptake and processing**
5. **Minimize disturbance to existing mature trees**

Stream Existing Conditions

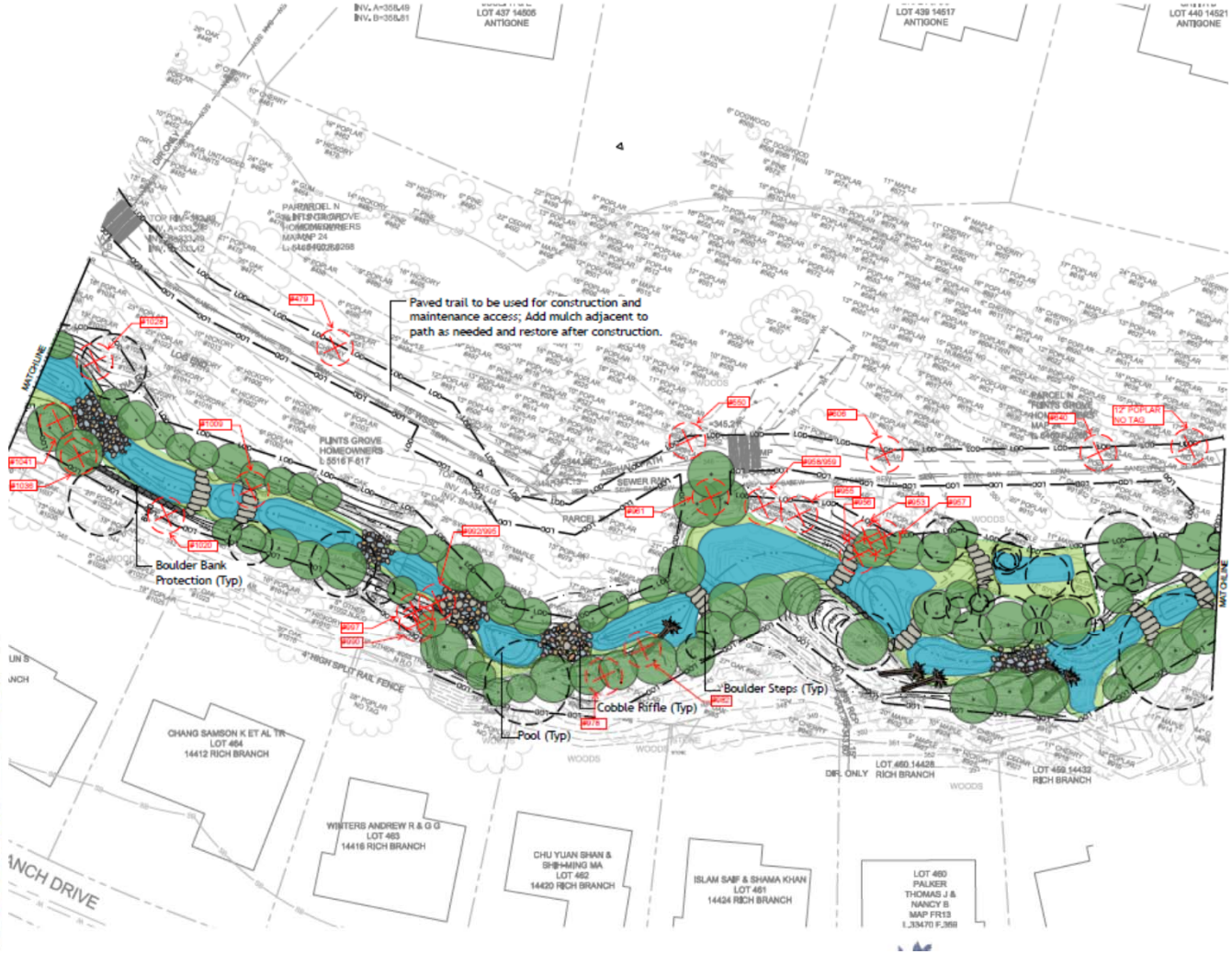


Conceptual Stream Restoration Design



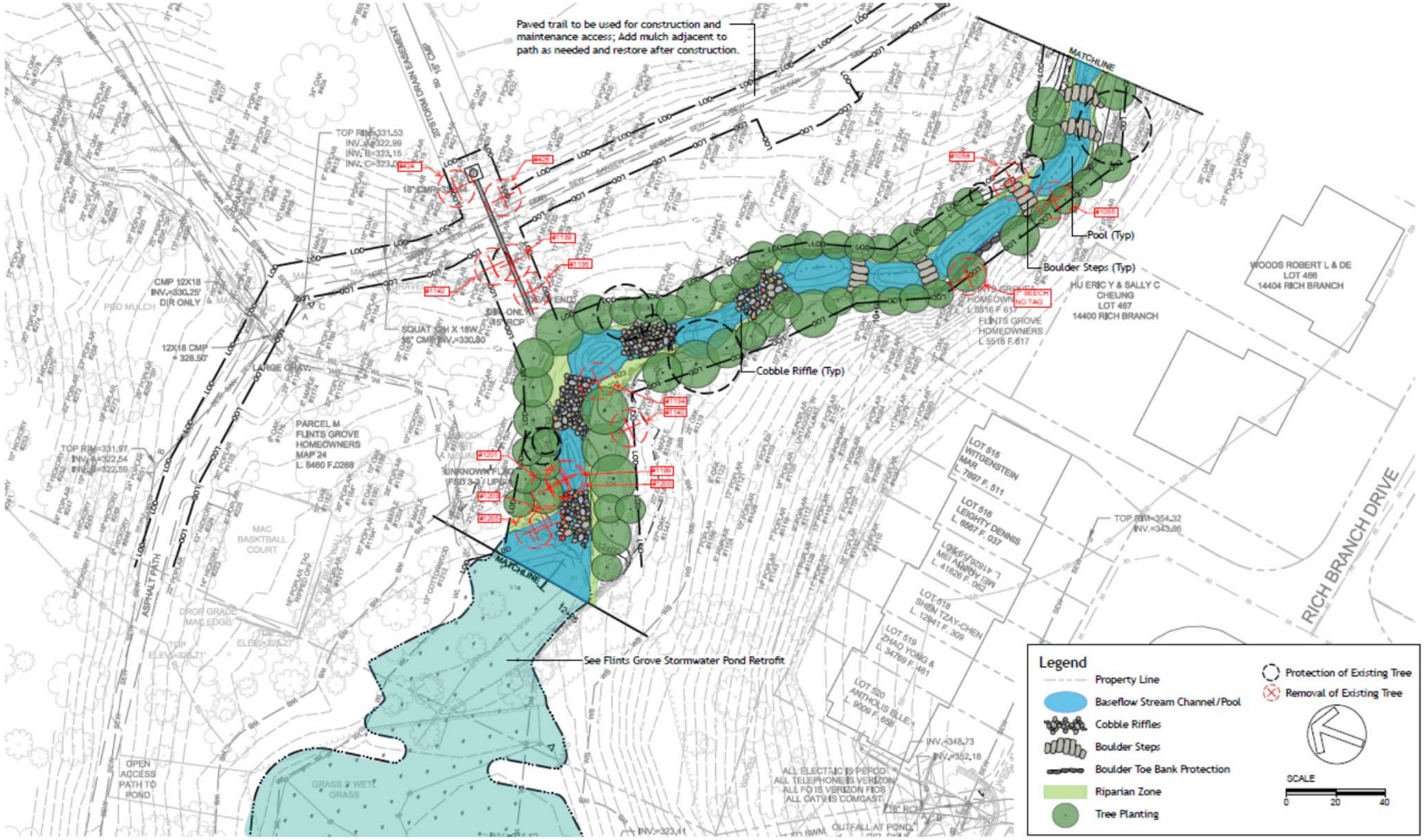
Upper Portion of Stream Restoration

Conceptual Stream Restoration Design



Middle Portion of Stream Restoration

Conceptual Stream Restoration Design



Lower Portion of Stream Restoration

Stream Restoration Approach

- **Habitat enhancement**
  - **riffle/pool system**
  - **riparian cover – shading and avian habitat**
  - **diverse and native plant communities, floodplain forested wetlands, and vernal pools**
- **Stabilization channel bed and banks**
  - **raising channel invert and minimizing bank height**
- **Increase floodplain function**
  - **reconnecting to floodplain**
  - **sediment and nutrient trapping**
  - **hydrologic retention**

Restoration Approach

Riffle/Pool Systems

Stone Toe

Boulder Cascades

Stream Restoration – During Construction

Flints Grove Construction Access

- Access along existing paved trail
- Clear width is adequate
- Tree protection where needed
- Mulch placed next to path and removed after construction

What to expect during construction

- **Duration**
  - Approximately 6-9 months (weather dependent)
- **Construction Hours**
  - Monday through Friday, 7AM – 4PM
- **Safety**
  - Open sides of site will be fenced with orange construction safety fence
- **Traffic**
  - Entrance to site from pedestrian trail off of Flints Grove Lane
- **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

Construction Access (Example)

During Construction

After Construction

Stream Restoration – Reforestation

- **Attractive, non-invasive native trees and shrubs will be planted along the entire stream corridor**

Stream Restoration – Immediately Following Construction

Stream Restoration – 1+ Year After Construction

Evaluating the Project Goals – Restoration Monitoring

- **County monitoring to evaluate whether project goals are achieved**
  - **Salamanders**
  - **Aquatic insects**
  - **Aquatic Vegetation in the Pond**
  - **Botanical Monitoring**

Schedule

Flints Grove Stream Restoration and Stormwater Management Retrofit Project

- Public meeting to discuss 30% designs 12/11/13
- 60% design – Summer 2015
- 60% public meeting and stream walk – 9/28/15
- 90% design – Fall 2015
- Permits issued – Winter 2015
- Construction – Late Summer 2016

Questions/Comments?

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240-777-7712 / Donald.Dorsey@montgomerycountymd.gov
www.montgomerycountymd.gov/watershedrestoration
Click on "Stream Restoration" and "Stormwater Pond Retrofits"

Mosquito Predators

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