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# CITY OF JOHNS CREEK STORMWATER MASTER PLAN SUMMARY

October 2023

# STORMWATER MASTER PLAN SUMMARY

**FOR**

## Johns Creek, GA




Oct 16 2023 9:47 AM

**PREPARED BY**

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**October 2023**

## A Plan to Improve Water Quality in Johns Creek

The City of Johns Creek, as the name indicates, is defined by its water bodies. Over 130 miles of stream flow through the City to the Chattahoochee River, providing an important natural resource and community amenity to residents and visitors. Protecting these waters is critical to securing a sustainable future for the City so that it remains a vibrant and desirable place to call home.

To ensure that waters in and around the City remain safe for drinking, recreation, fishing, and tourism and do not endanger citizens or their pets, the United States Geographic Service (USGS), State of Georgia, Fulton County, the City of Johns Creek, and the City of Alpharetta have routinely sampled the water quality of Long Indian Creek, Johns Creek, Cauley Creek and the Chattahoochee River. As required by Section 303(d) of the Clean Water Act, the State of Georgia Environment Protection Division (GAEPD) compares the sampling results to their water quality standards and classifies each water body as supporting or not supporting its designated use (such as fishing, recreation, or drinking water). Any water body not supporting the designated use is designated as "impaired" by GAEPD, who then develops a target reduction (known as a Total Maximum Daily Load or TMDL) in pollutants for each water body.

The sampling results collected for Long Indian Creek, Johns Creek, Cauley Creek and the Chattahoochee River have shown elevated levels of fecal coliform and sediment (also referred to as Biota F), leading each to be listed as impaired (as shown in Figure 1). While bacterial source testing has only been completed in limited areas to determine the specific source of fecal coliform, the concentrated residential land use within the City indicates that dog waste is likely the primary contributor to the elevated bacteria levels in the watershed, with some potential for human and waterfowl contributions. Elevated sediment levels are likely caused by runoff from developed areas flowing at high velocity into adjacent streams, where increased flow rates erode stream banks. Additionally, erosion from sites under construction may also be a contributing factor.

The City completed a master planning process in October 2023 for the watersheds draining to each stream. The master plan outlined a variety of best management practices (BMPs) to address fecal coliform and sediment pollution at key sites throughout the City. These BMPs range from educational and citizen driven efforts such as a pet waste cleanup program and green infrastructure incentives to capital improvement projects such as detention pond improvements, stream stabilization, and roadside ditch retrofits. Each of these BMPs support the goal of removing Long Indian Creek, Johns Creek and Cauley Creek from the GAEPD list of impaired waters, which would in turn also benefit the Chattahoochee River.

In total, the master plan identified $48,256,000 of capital improvement opportunities, as well as $1,080,000 of yearly programmatic investments across the City. The capital improvements were prioritized to identify the opportunities with the most potential impact for their project cost. As the highest priority projects are completed, continued water quality monitoring will aid the City in determining which additional projects need to be completed to meet the TMDLs for each water body. Figure 2 shows the location of each capital improvement project, while Table 1 lists the costs and rank of each project.

The remainder of this summary document contains information about the master planning methodology, recommendations, project identification, costs and prioritization.

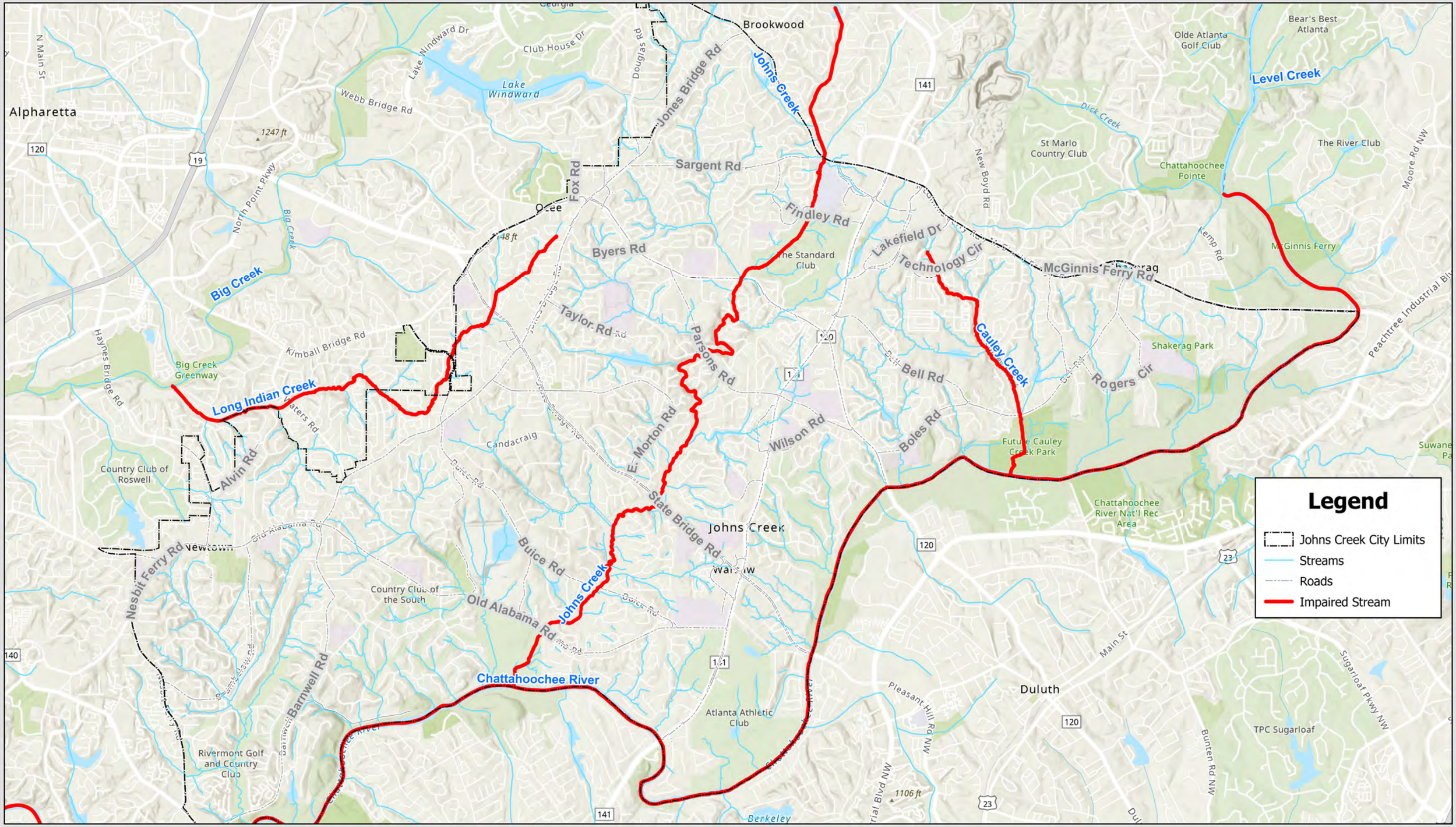


**Figure 1**
**City of Johns Creek Stormwater Master Plan**
**Impaired Streams Map**

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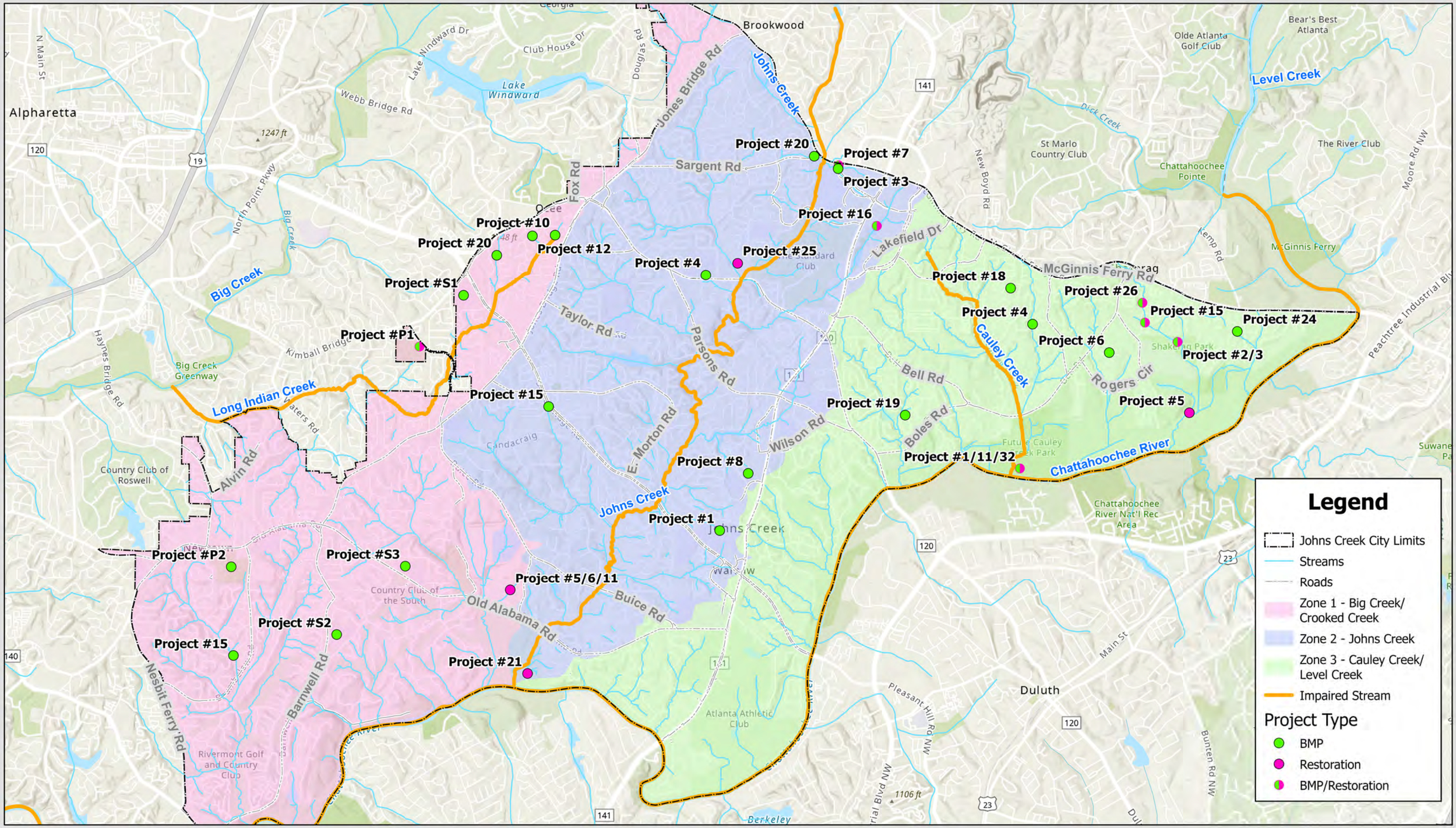


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**Figure 2**
**City of Johns Creek Stormwater Master Plan**
**Capital Project Locations**

TABLE 1. WATER QUALITY PROJECT PRIORITIZATION

| Project Rank | Project ID | Zone ID | Project Name | Project Type | Prioritization Score | Total Cost |
|---|---|---|---|---|---|---|
| 1 | Site No. S2 | Zone 1 | Barnwell Elementary Bioretention | Bioretention | 79 | $193,000 |
| 2 | Site No. S3 | Zone 1 | Autrey Mill Middle Bioretention | Bioretention | 79 | $370,000 |
| 3 | Site No. 1/11/32 | Zone 3 | Cauley Creek Park Stream Restoration and RSC | Riparian Enhancement/ Regenerative Stormwater Conveyance | 79 | $8,636,000 |
| 4 | Site No. S1 | Zone 1 | Ocee Elementary Bioretention | Bioretention | 75 | $186,000 |
| 5 | Site No. 20 | Zone 2 | Sargent Road Daylighting and RSC | Pipe Daylighting/ Regenerative Stormwater Conveyance | 74 | $562,000 |
| 6 | Site No. 8 | Zone 2 | Fire Station Bioretention and Cistern | Bioretention/Cistern/Wet Pond Retrofit | 73 | $293,000 |
| 7 | Site No. P2 | Zone 1 | Newtown Park Bioretention, RSC and Pond Improvements | Dry Pond Retrofit/ Bioretention/ Regenerative Stormwater Conveyance | 71 | $840,000 |
| 8 | Site No. 2/3 | Zone 3 | Shakerag Park Pond Improvements, Bioretention and Stream Restoration | Wet Pond Retrofit/Bioretention/ Riparian Enhancement | 71 | $3,379,000 |
| 9 | Site No. 7 | Zone 2 | Hospital Stream Enhancements and Bioswale | Riparian Enhancement/Floodplain Storage | 69 | $886,000 |
| 10 | Site No. 16 | Zone 2 | Town Center Wet Pond and Stream Improvements | Wet Pond Enhancement and Riparian Enhancement | 69 | $2,954,000 |
| 11 | Site No. 12 | Zone 1 | Hampton Square Bioretention | Bioretention | 68 | $112,000 |
| 12 | Site No. P1 | Zone 1 | Ocee Park Bioretention, Bioswale and Stream Restoration | Bioretention/Bioswale/ Riparian Enhancement | 67 | $483,000 |
| 13 | Site No. 19 | Zone 3 | Sugar Mill Rain Gardens | Right-Of-Way Enhancement | 65 | $3,681,000 |
| 14 | Site No. 4 | Zone 2 | Abbotts Hill Elementary Bioretention/Wetland | Bioretention/Wetland | 64 | $732,000 |
| 15 | Site No. 18 | Zone 3 | Laurelwood Rain Gardens | Right-Of-Way Enhancement | 63 | $750,000 |
| 16 | Site No. 3 | Zone 2 | Hospital Wetland | Constructed Wetland | 61 | $148,000 |
| 17 | Site No. 26 | Zone 3 | Blackstone Pond Improvements, Bioretention and Stream Restoration | Dry Pond Retrofit/Bioretention/ Riparian Enhancement | 61 | $2,033,000 |
| 18 | Site No. 25 | Zone 2 | Abbotts Bridge Stream Restoration | Riparian Enhancement | 61 | $6,403,000 |
| 19 | Site No. 20 | Zone 1 | Brookhollow Rain Garden | Right-of-Way Enhancement | 59 | $64,000 |
| 20 | Site No. 6 | Zone 3 | Bellacree Rain Gardens | Right-Of-Way Enhancement | 59 | $144,000 |
| 21 | Site No. 21 | Zone 2 | River Pines Golf Course Stream Restoration | Riparian Enhancement | 59 | $4,027,000 |
| 22 | Site No. 10 | Zone 1 | Churchill Downs Bioretention | Bioretention | 58 | $91,000 |
| 23 | Site No. 24 | Zone 3 | Jaden Woods Bioretention | Bioretention | 57 | $143,000 |
| 24 | Site No. 1 | Zone 2 | Johns Creek High School Bioretention | Bioretention | 57 | $958,000 |
| 25 | Site No. 15 | Zone 1 | Hartridge Bioretention | Bioretention | 56 | $186,000 |
| 26 | Site No. 5/6/11 | Zone 1 | Atlanta/Fulton County WTP Stream Restoration and Pipe Replacement | Riparian Enhancement/Asset Management | 56 | $524,000 |
| 27 | Site No. 15 | Zone 2 | State Bridge Park RSC | Regenerative Stormwater Conveyance | 56 | $1,263,000 |
| 28 | Site No. 4 | Zone 3 | Amberleigh Bioretention | Bioretention | 55 | $155,000 |
| 29 | Site No. 15 | Zone 3 | Tavistock Pond Improvements, Bioretention and Stream Restoration | Dry Pond Retrofit/Bioretention/ Riparian Enhancement | 55 | $1,059,000 |
| 30 | Site No. 5 | Zone 3 | Embry Property Stream Restoration | Riparian Enhancement | 55 | $7,001,000 |
| **Total Capital Project Cost** | | | | | | **$48,256,000** |
| Pet Waste Program | | | $80,000 initial investment per zone, may decrease to just cover O&M | | | |
| Green Infrastructure Program | | | $500,000 per year per zone, may increase based on community interest | | | |
| Ditch Retrofit Program | | | $500,000 per year per zone, may increase based on road improvement schedule | | | |

## Project Background

The City of Johns Creek is seeking to improve water quality throughout the watersheds that are within the city limits. To aid in managing stormwater infrastructure across the City, stormwater staff have divided the City into three zones, which include portions of five large watersheds. A separate master plan was developed for each zone, as detailed in Table 2. These master plans combine to provide the City with management strategies to improve water quality as well as a prioritized list of capital improvement projects that will help the City to achieve measurable reductions in the presence of pollutants in each watershed.

TABLE 2. WATERSHED OVERVIEW

| Zone ID* | Watershed | Area (Sq Miles) | Residential Percentage | Date Master Plan Completed |
|---|---|---|---|---|
| 1 | Big Creek/Crooked Creek | 10.0 | 70% | October 2023 |
| 2 | Johns Creek | 11.3 | 65% | January 2023 |
| 3 | Cauley Creek/Level Creek | 10.1 | 50% | May 2023 |

*Zone boundaries are displayed in Figure 1

One of the primary goals of the master plans is to address stormwater quality throughout the watersheds, focusing predominantly on the pollutants for which each receiving water body is impaired. Table 3 outlines the pollutants of concern for each water body, as well as the associated watershed. Fecal Coliform is the common pollutant across all four water bodies, likely driven by pet waste from the highly residential land use of each watershed. Addressing pollutant concerns in a watershed typically includes reducing the source of pollutants prior to entering the drainage system and when further source reduction is not possible, provide stormwater treatment to facilitate pollutant removal.

TABLE 3. POLLUTANTS OF CONCERN

| Water Body | Contributing Zone(s) | Pollutants of Concern |
|---|---|---|
| Long Indian Creek | Zone 1 | Fecal Coliform |
| Johns Creek | Zone 2 | Fecal Coliform, Sediment |
| Cauley Creek | Zone 3 | Fecal Coliform, Sediment |
| Chattahoochee River | Zone 1,2,3 | E Coli, Fecal Coliform |

## Programmatic Source Reduction

City staff have been working diligently to reduce the sources of pollution throughout each watershed. The master plans outlined the following programs that can be undertaken or enhanced to address pollutant sources:

- *Pet Waste Cleanup:* The City should continue to educate residents on the importance of cleaning up pet waste. Pet waste disposal stations and educational signage should be located throughout the City to encourage proper disposal, particularly along greenways, walking trails and public parks. Allocating $80,000 to this program per zone would support the installation of 100 pet waste stations, signage, educational activities and waste disposal within each zone. Once waste stations are installed the yearly allocation could be reduced to the amount needed for disposal and maintenance.

- *Sanitary Sewer Screening:* Leaking sanitary sewers and sanitary overflows can contribute to high bacteria concentrations. The City should consider a targeted dry weather sampling program to identify sources of bacteria not associated with stormwater runoff. This sampling program could be conducted in conjunction with the dry weather screening required by the City's Large Municipal Separate Storm Sewer System (MS4) permit.

- *Waterfowl Deterrance:* Waterfowl are routinely found near ponds throughout the City. Modification of design standards associated with wet detention ponds can help reduce the potential for waterfowl as sources of bacterial.

- *Green Infrastructure Program:* The City should develop an incentive program to encourage home and business owners to install green infrastructure on their property. Examples include rain gardens, permeable driveways or sidewalks, rain barrels and downspout disconnection. The City should consider reductions in stormwater utility fees or cost-sharing to incentivize these types of projects, as well as provide educational materials on the benefits, proper installation and maintenance of green infrastructure. Allocating a yearly amount for installation of green infrastructure on private property would help intercept stormwater runoff at the source and reduce pollutants reaching the waterways. Allocating $500,000 per year per zone (maximum of $100,000 per project) to fund green infrastructure on private property would likely provide treatment for over 2 acres of impervious area per year per zone based on available literature values. Requiring cost sharing by residents or businesses could be used to stretch the allocated funds further. If community interest in the program is sufficient, the City should consider increasing the yearly allocation to support further green infrastructure development across the watersheds.

- *Erosion Control:* The City should continue to enforce the existing erosion and sediment control regulations on major and minor development and monitor the rate of development to ensure that sufficient personnel is available to regularly inspect the compliance of each construction site.

- *Riparian Buffer Preservation:* Riparian buffers are important ecological zones around streams and rivers that support plant and animal life, filter pollutants from runoff, and provide stream bank stabilization, thus improving water quality in the adjacent streams. The City should establish a Riparian Area Management Plan for all riparian buffers currently owned by the City. The plan should include policies for invasive plant removal, native species plantings, no-mow zones and educational signage in public access areas.

- *Wetland Preservation:* Preservation of the existing wetland areas within Johns Creek is important to maintain water quality treatment for stormwater that flows through these wetlands, in addition to habitats for native plants and animals. The City should continue enforcing existing development standards to prevent construction impacts to adjacent wetlands.

- *Drainage Ditch Maintenance:* Fecal coliform can proliferate in conditions that are warm, shaded and contain sufficient organic matter. These conditions may be present in open ditches that become clogged with sediment and debris. The City should enhance the current maintenance plan for publicly owned infrastructure to include clearing debris and organic matter. In addition to enhanced maintenance, the City should also seek opportunities to retrofit existing swales or ditches within public right-of-way to function as enhanced swales or linear bioretention areas. Investing $500,000 of yearly funding in each zone would provide treatment for approximately 3 acres of impervious area per year per zone. Depending on funding availability and suitable sites, the yearly funding allocation could be increased to provide larger impacts on the watersheds.

## Capital Projects

A total of thirty (30) capital projects (10 per zone) have been identified to address the water quality of runoff in the City. Where feasible, projects are proposed to meet multiple goals for stormwater management including quantity control, stream stabilization and asset management in addition to water quality treatment. Potential project sites were identified by a watershed-wide desktop screening process (discussed in detail in the respective master plan documents), followed by field investigation and further prioritization of the top candidate locations. In total, over 280 neighborhoods, 1,200 stormwater outfalls, 430 existing BMPs, 15,000 pipes and 26,000 parcels were analyzed through the desktop screening process. From these, the top 75 candidate sites were visited by WKD and City personnel to identify the 30 best suited for capital projects.

The water quality projects typically include some type of best management practice (BMP) which have been shown to reduce pollutant concentrations from stormwater runoff. Reduction of pollutant concentrations in BMPs occurs through settling, filtration, ultraviolet (UV) exposure, and microbial predation. Riparian enhancement can include buffer restoration, stream stabilization and stream restoration. Regenerative stormwater conveyances and bioretention are structural water quality BMPs which utilize settling and infiltration to remove pollutants from stormwater runoff. Right-of-way enhancement can include planters or rain gardens designed to receive flow from the street and retain pollutants. The most effective BMPs for pollutant removal typically include multiple mechanisms. Locating BMPs optimized for pollutant removal throughout the watersheds in conjunction with source reduction will have a significant net impact on fecal coliform and sediment levels at the downstream discharge.

To properly allocate City resources, proposed capital projects were prioritized on a 100-point scale based on the following categories:

- Property Ownership: Location of the proposed project and whether it is situated on publicly or privately-owned land. (Maximum score – 18)
- Drainage Area: The approximate amount of drainage acreage treated by the proposed project. (Maximum score –8)
- Pollutant Removal Efficiency: Based upon the pollutant removal efficiency of the BMP. (Maximum score – 30)
- Constructability: Evaluation of potential utility conflicts, stream impact or other construction impediment. (Maximum score – 15)
- Tree Cover: Based on the current estimated tree cover of the site. (Maximum score – 10)
- Ease of Access: Level of difficulty to bring maintenance equipment to the site and whether or not paved access roads or paths are fully or partially available. (Maximum score – 4)
- Permittability: Based on the location and type of project, an evaluation of whether local/State or Federal permits may be required. A less desirable score involves Federal permits. (Maximum score – 3)

- CIP Integration: The integration of a proposed water quality project with existing stormwater pipes ranked highly on the City's CIP prioritization scale. (Maximum score – 12)

Appendix A contains conceptual fact sheets and more detailed cost information for each project. The costs include estimates for capital costs such as construction, project management, grading, survey, design and permitting, geotechnical and structural evaluation, real estate acquisition, materials testing, utility relocation, and construction inspection, as well as three years of post-construction operation and maintenance.

The recommended projects provide an important step in the proactive management of stormwater runoff for the City of Johns Creek. Stormwater management is a continually evolving process. The Capital Improvement Plan priority list should be reviewed annually to re-prioritize projects based on public safety and funding opportunities. Grants available from organizations such State Revolving Fund (SRF), Environmental Protection Agency (EPA), and Federal Emergency Management Agency (FEMA) may allow projects to move up the priority list. As priorities shift and development or re-development occurs, projects may be added to or removed from the Capital Improvement Plan.

# APPENDIX A

## Water Quality Project Fact Sheets and Maps

# NAME OF PROJECT: BARNWELL ELEMENTARY BIORETENTION (SITE NO. S2)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Barnwell Elementary between Barnwell Road and Old Southwick Pass

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Bioretention (1 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade in new bioretention area at south end of parking lot with curb cuts to direct flow from lot.
- Install bioretention media and plantings.
- Install new outfall structure.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 15 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **79** |

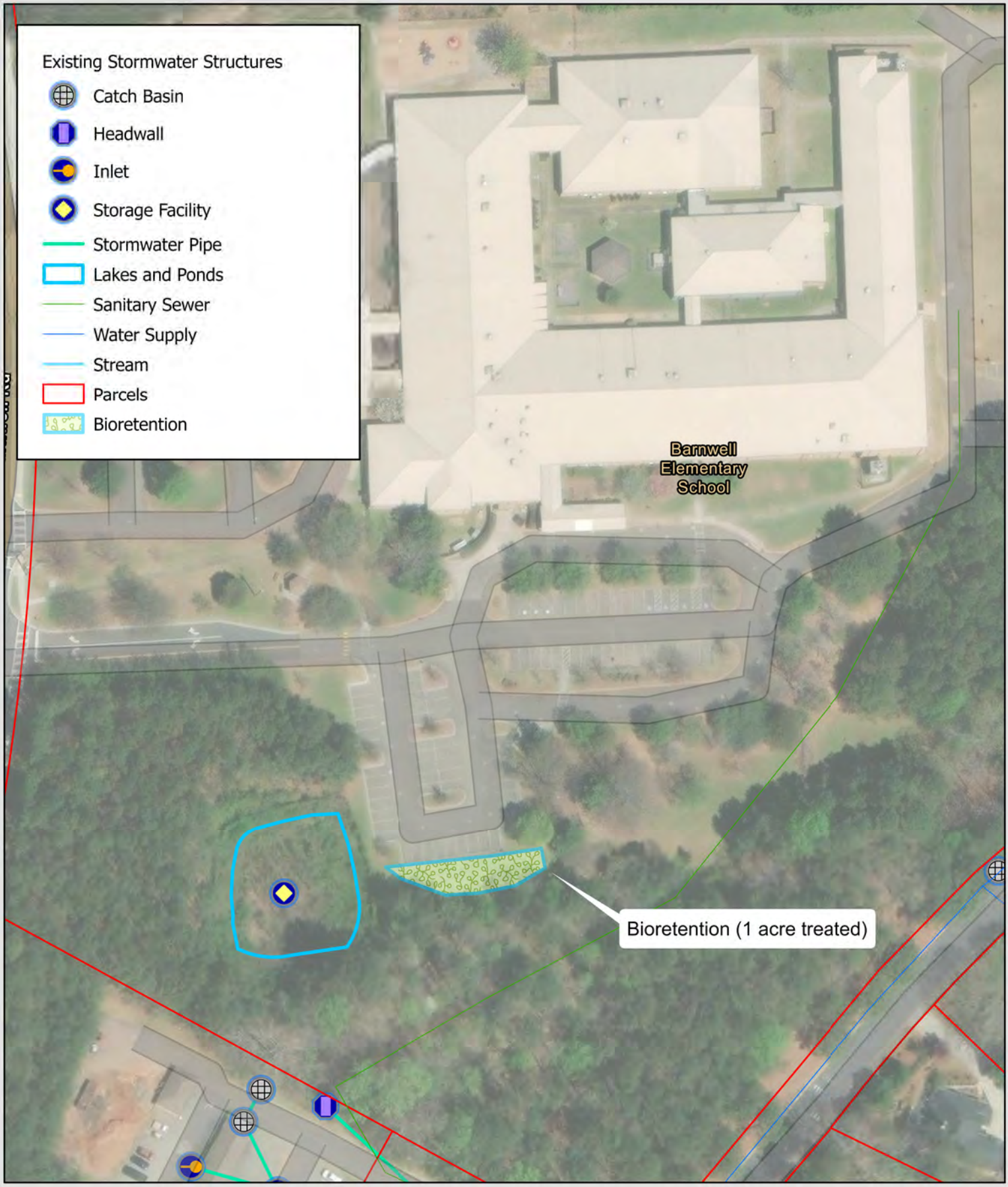
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $131,000 |
| Design, Permitting, Ancillary | $61,000 |
| Real Estate, Maintenance | $7,000 |
| **Total Planning Cost** | **$199,000** |

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**Johns Creek**
**Zone 1 Master Plan**
**Barnwell Elementary**
**Concept Design Exhibit**

0 25 50 100 Feet

N W E S

# NAME OF PROJECT: AUTREY MILL MIDDLE BIORETENTION (SITE NO. S3)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Autrey Mill Middle School near the intersection of Old Alabama Road and Autry Falls Way

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Bioretention (1 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade in new bioretention areas in parking lot west of school with curb cuts to direct flow from lot.
- Install bioretention media and plantings.
- Install new outfall structures.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 15 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **79** |

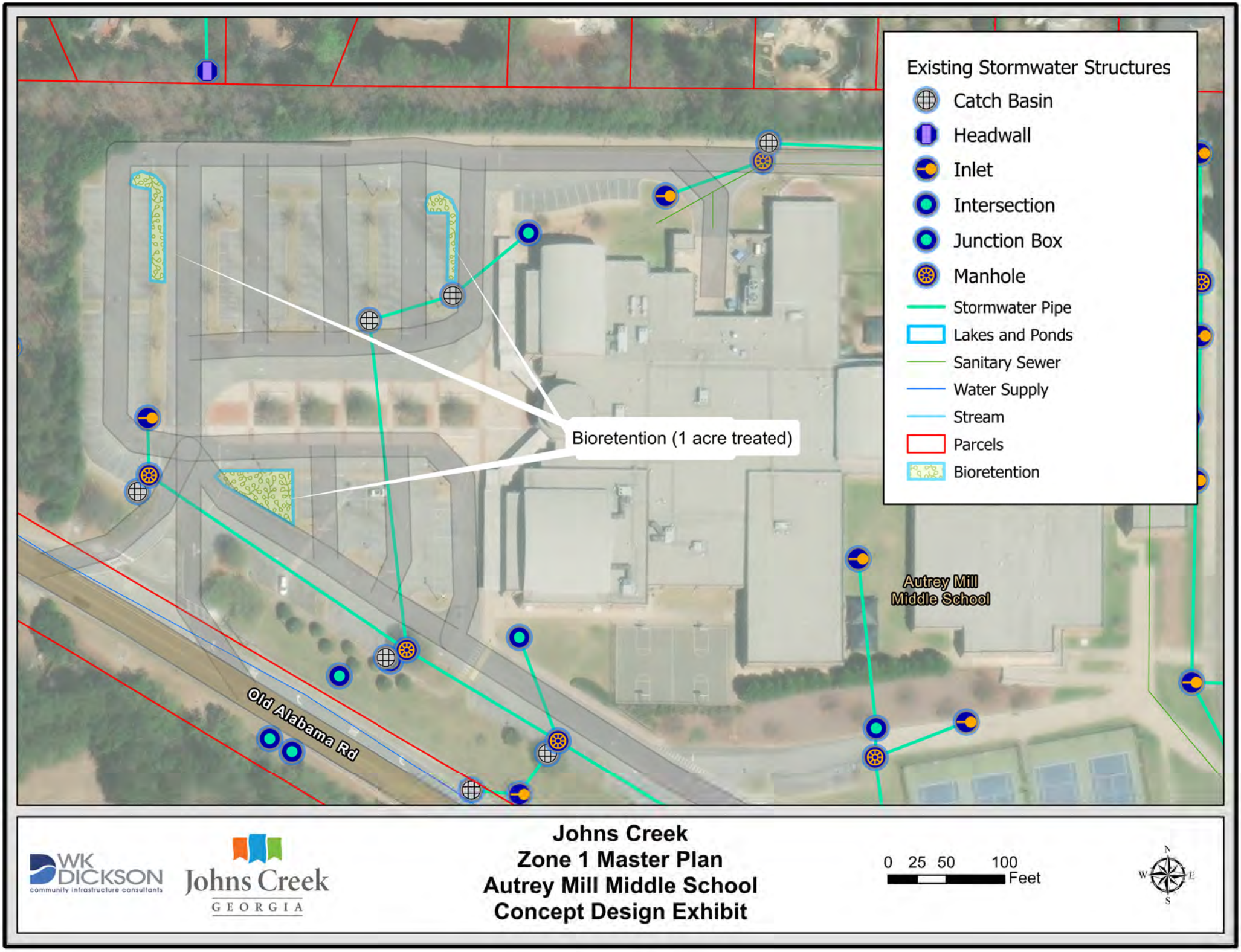
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $239,000 |
| Design, Permitting, Ancillary | $119,000 |
| Real Estate, Maintenance | $12,000 |
| **Total Planning Cost** | **$370,000** |

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**Johns Creek**
**Zone 1 Master Plan**
**Autrey Mill Middle School**
**Concept Design Exhibit**

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# NAME OF PROJECT: CAULEY CREEK PARK STREAM RESTORATION & RSC (SITE NO. 1, 11, & 32)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Cauley Creek Park south of Bell Road

WATERSHED PRIORITY: High

DRAINAGE AREA to PROJECT: Approximately 1,550 acres

## PROJECT DESCRIPTION and BENEFIT

Stream Restoration: Provide stream stabilization, restoration and riparian buffer restoration as follows:

- Stabilize both banks of Cauley Creek and the tributary streams on the Cauley Creek Park property.
- Install riparian plantings along the Chattahoochee River on the south end of the Cauley Creek Park property
- This estimate is highly conceptual and would require a detailed stream assessment to develop the most cost-effective solution for uplift.

RSC (2 acres treated): Provide approximately 2 acres of treatment for pollutant removal as follows:

- Install media and plantings at the pipe discharge located on the southwest side of the Bell Road traffic circle.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Site 1 Score | Site 11 Score | Site 32 Score |
|---|---|---|---|
| Land Ownership | 18 | 18 | 18 |
| Drainage Area Treated | 8 | 8 | 2 |
| Pollutant Removal Efficiency | 21 | 21 | 27 |
| Constructability | 10 | 10 | 15 |
| Tree Cover | 6 | 2 | 10 |
| Ease of Access | 2 | 1 | 4 |
| Permit Requirements[1] | 1 | 1 | 3 |
| Integrated with Existing CIP | 0 | 0 | 0 |
| **TOTAL SCORE** | **66** | **61** | **79** |

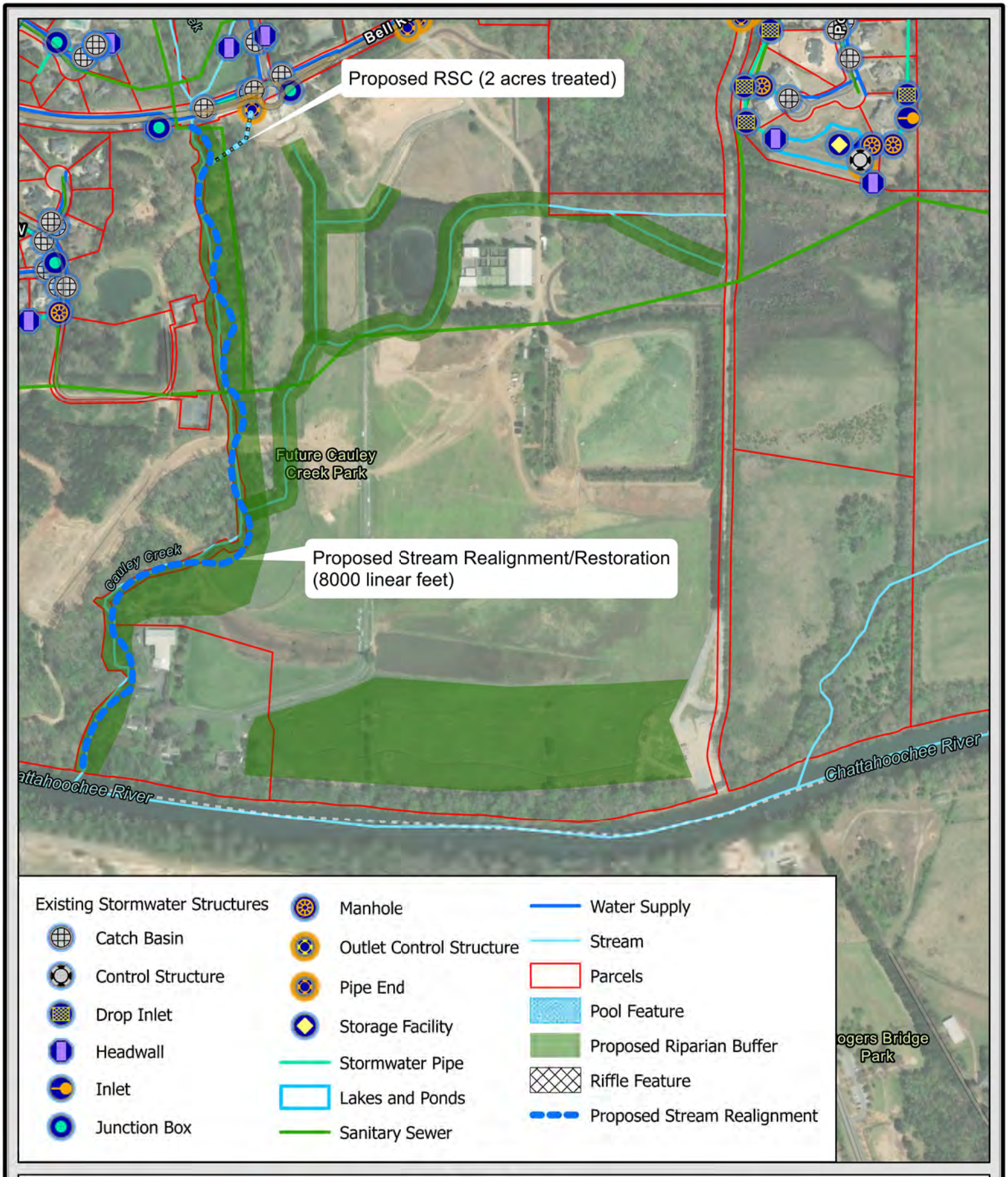
[1] *Federal permits are not likely required for the RSC, but will be required for stream restoration*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Total Cost Opinion |
|---|---|
| Construction | $5,682,000 |
| Design, Permitting, Ancillary | $2,670,000 |
| Real Estate, Maintenance | $284,000 |
| **Total Planning Cost** | **$8,636,000** |

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**Johns Creek**
**Zone 3 Master Plan**
**Site Nos. 1, 11, 32**
**Concept Design Exhibit**

0 125 250 500 Feet

N W E S

# NAME OF PROJECT: OCEE ELEMENTARY BIORETENTION (SITE NO. S1)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Ocee Elementary School near the intersection of State Bridge Road and Kimball Bridge Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Bioretention (1 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

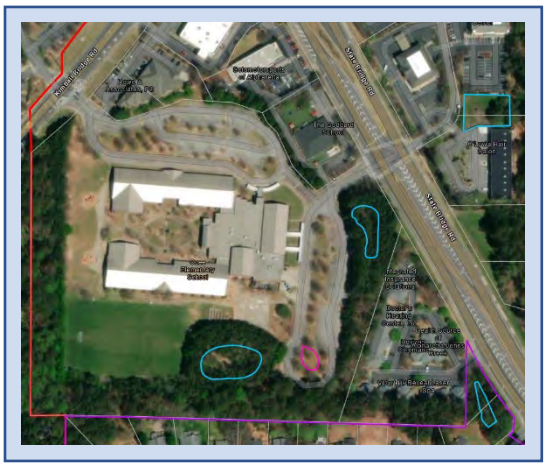
- Grade in new bioretention area in parking lot southeast of school with curb cuts to direct flow from lot.
- Install bioretention media and plantings.
- Install new outfall structure.

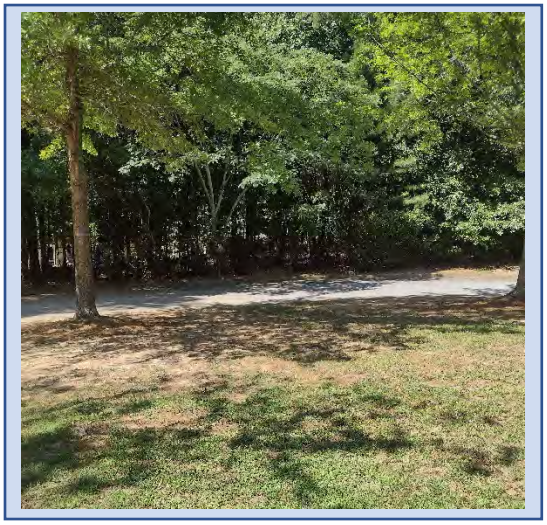
PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 15 |
| Tree Cover | 6 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **75** |

[1] *Federal permits are not likely required.*



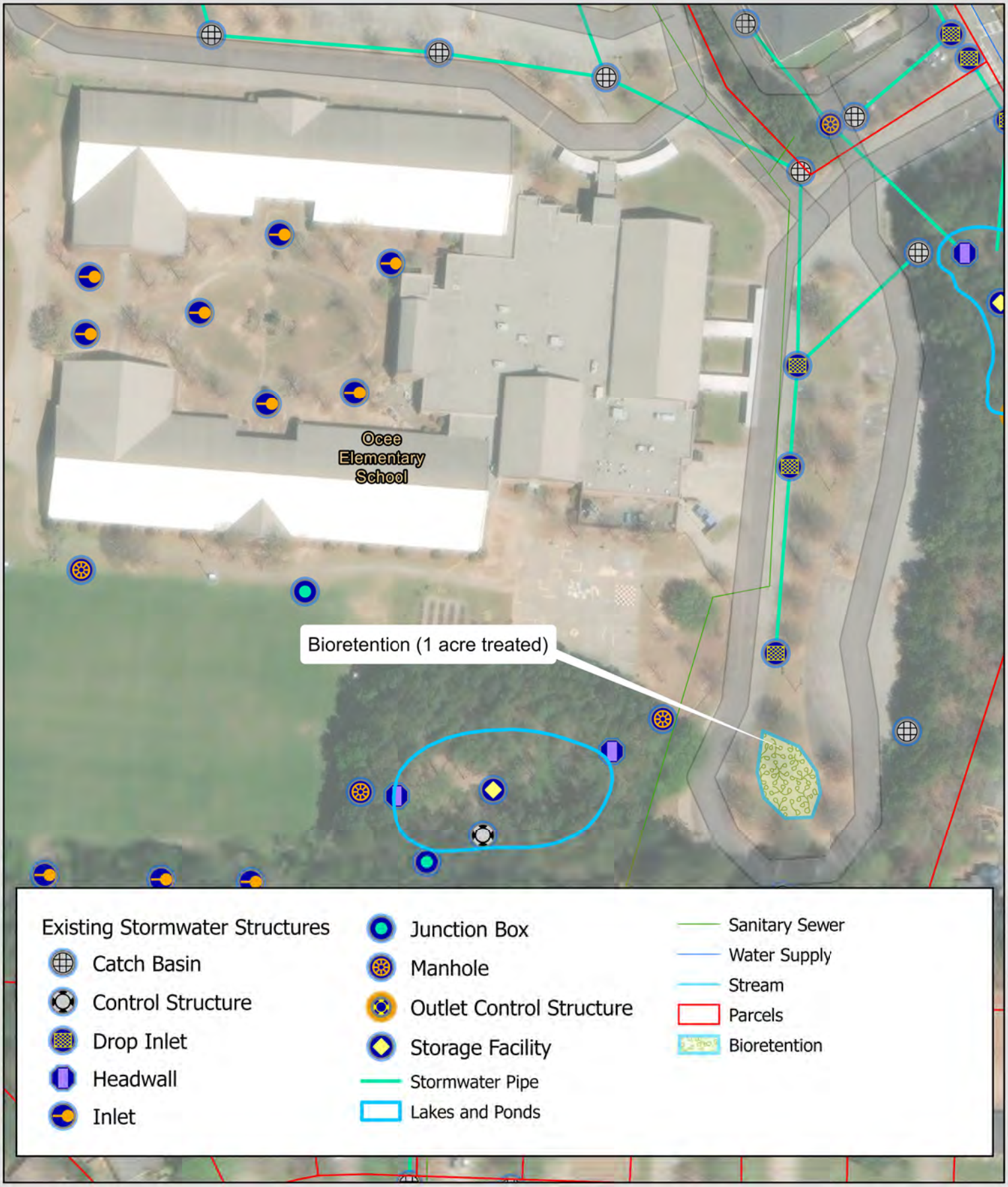


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $120,000 |
| Design, Permitting, Ancillary | $60,000 |
| Real Estate, Maintenance | $6,000 |
| **Total Planning Cost** | **$186,000** |

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Johns Creek
GEORGIA

**Johns Creek**
**Zone 1 Master Plan**
**Ocee Elementary**
**Concept Design Exhibit**

0 25 50 100 Feet

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# NAME OF PROJECT: SARGENT ROAD DAYLIGHTING AND RSC (SITE NO. 20)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Intersection of McGinnis Ferry Road and Sargent Road

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 25 acres


## PROJECT DESCRIPTION and BENEFIT

RSC (25 acres treated): Provide approximately25 acres of treatment for pollutant removal as follows:

- Daylight existing 48-inch pipe.
- Install approximately 25 feet of 18-inch pipe to route flow from Sargent Road into RSC.
- Install media and plantings.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 4 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 5 |
| Tree Cover | 8 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 1 |
| **TOTAL SCORE** | **74** |

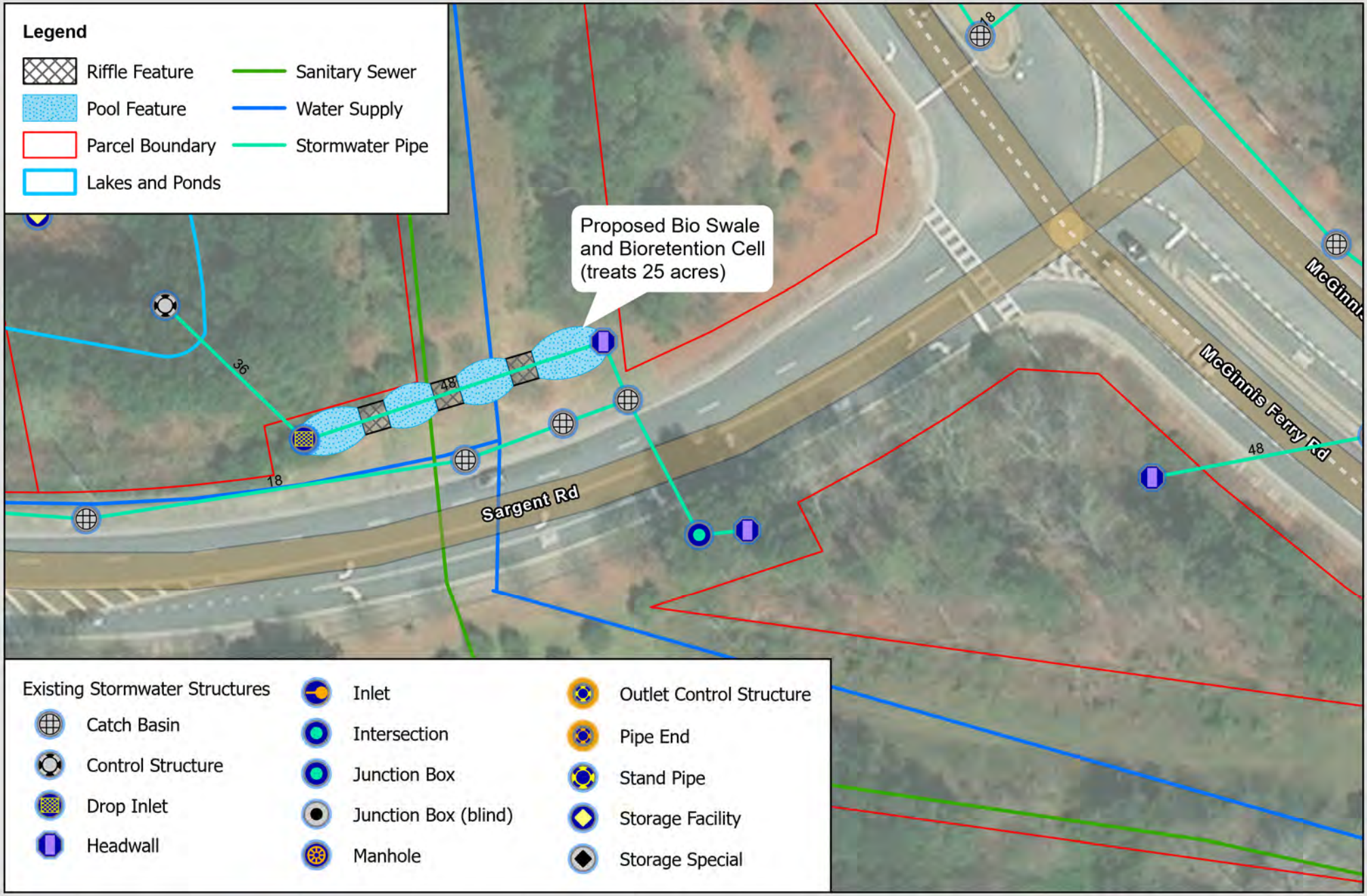
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $359,000 |
| Design, Permitting, Ancillary | $181,000 |
| Real Estate, Maintenance | $22,000 |
| **Total Planning Cost** | **$562,000** |

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GEORGIA

# Johns Creek
# Stormwater Master Plan
# Site No. 20 Concept Design Exhibit

0 15 30 60 Feet

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# NAME OF PROJECT: FIRE STATION BIORETENTION AND CISTERN (SITE NO. 8)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS


LOCATION: Fire Station #61 off Medlock Bridge Parkway

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 0.7 acres

## PROJECT DESCRIPTION and BENEFIT

BIORETENTION (0.7 acres treated): Provide approximately 0.1 acres of treatment for bacteria removal as follows:

- Convert edge of parking/drive into bioretention.
- Install bioretention media and plantings.
- Replace existing outfall structure.

CISTERN (0.1 acres treated): Provide an underground cistern as follows:

- Install cistern beside fire station to capture rainwater from fire station roof.
- Re-route downspouts to direct flow to cistern.

DRY POND ENHANCEMENT (0.7 acres treated): Enhance existing dry pond to provide water quality benefits by:

- Modify or replace the outlet structure to maintain a permanent wet pool.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 21 |
| Constructability | 15 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **73** |

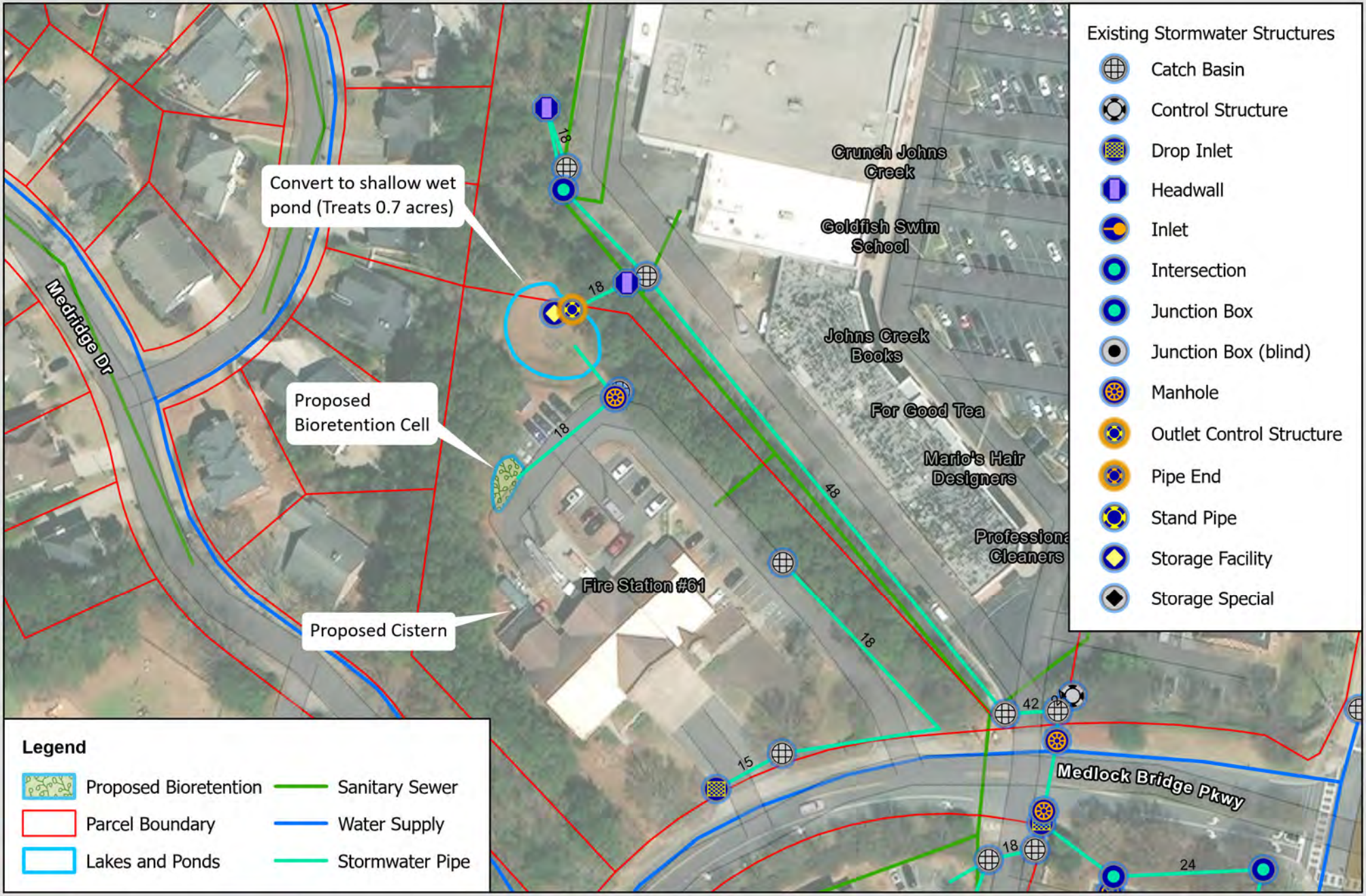
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $189,000 |
| Design, Permitting, Ancillary | $95,000 |
| Real Estate, Maintenance | $9,000 |
| **Total Planning Cost** | **$293,000** |

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GEORGIA

# Johns Creek
# Stormwater Master Plan
# Site No. 8 Concept Design Exhibit

0 25 50 100 Feet

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## NAME OF PROJECT: NEWTOWN PARK BIORETENTION, RSC AND POND IMPROVEMENTS (SITE NO. P2)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Newtown Park on Brumbelow Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 17 acres

## PROJECT DESCRIPTION and BENEFIT

Pond Improvements (7 acres treated): Add additional water quality treatment to the existing pond as follows:

- Modify riser structure to detain the water quality volume within the pond.

RSC (9 acres treated): Provide approximately 1300 linear feet of stream stabilization and restoration as follows:

- Replace the existing rip rap channel between the tennis courts and wet pond with media and plantings.

Bioretention (1 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade open areas adjacent to soccer fields for bioretention cells.
- Install bioretention media and plantings.
- Install new outfall structures.

## PROJECT PRIORITIZATION CRITERIA SCORE

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 8 |
| Pollutant Removal Efficiency | 27 |
| Constructability | 5 |
| Tree Cover | 8 |
| Ease of Access | 4 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **71** |

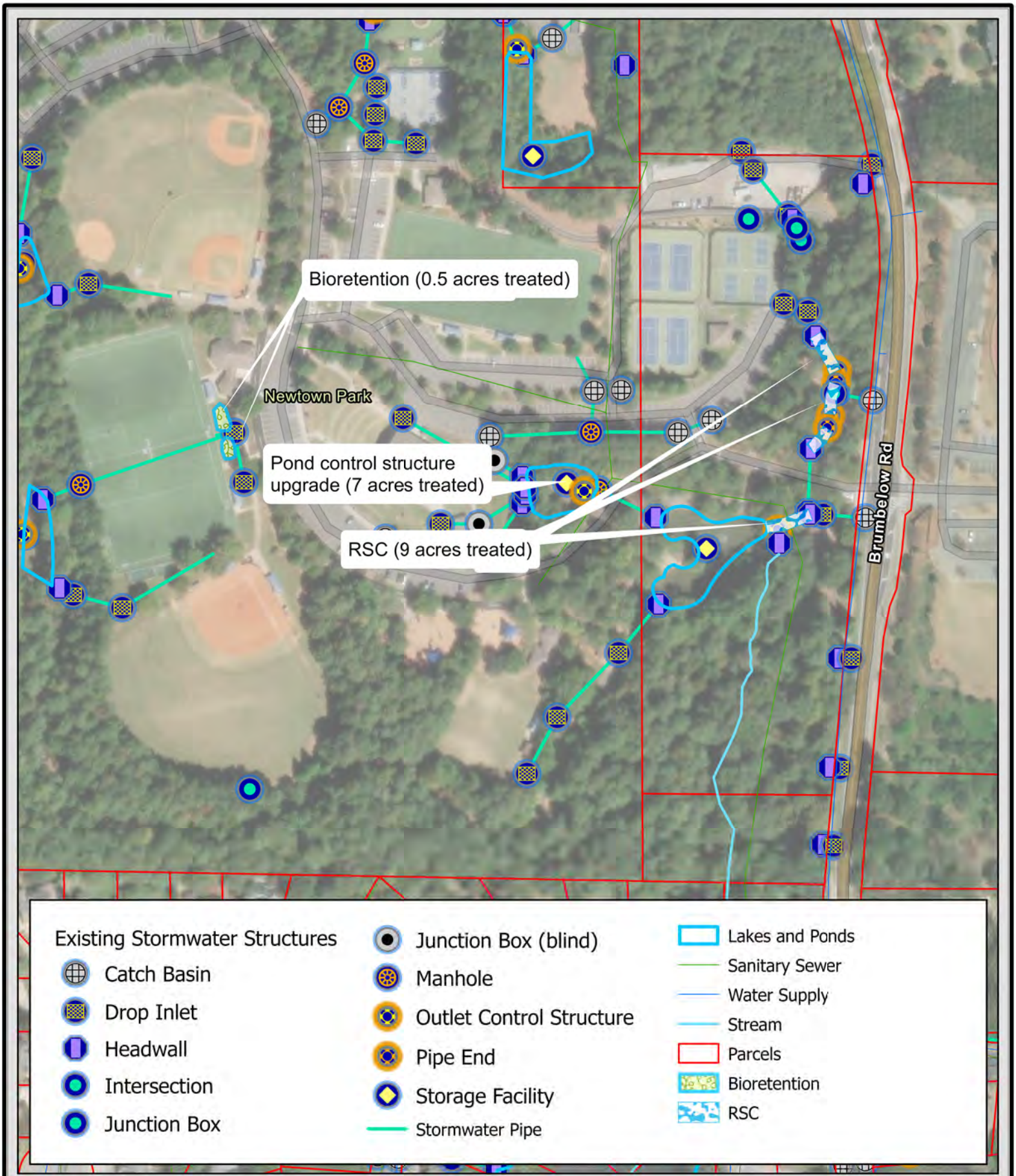
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Total Cost Opinion |
|---|---|
| Construction | $543,000 |
| Design, Permitting, Ancillary | $270,000 |
| Real Estate, Maintenance | $27,000 |
| **Total Planning Cost** | **$840,000** |

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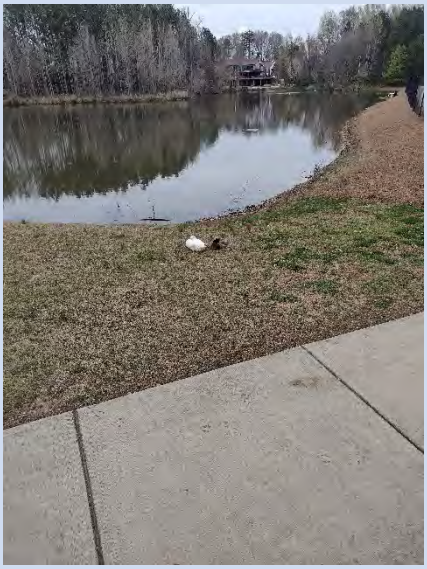
**Johns Creek**
**Zone 1 Master Plan**
**Newtown Park**
**Concept Design Exhibit**

0 50 100 200 Feet

N W E S

## NAME OF PROJECT: SHAKERAG PARK POND IMPROVEMENTS, BIORETENTION AND STREAM RESTORATION (SITE NO. 2 & 3)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS



LOCATION: Shakerag Park at Embry Farm Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 305 acres

## PROJECT DESCRIPTION and BENEFIT

Wet Pond Improvements (200 acres treated): Add additional water quality treatment to the existing wet pond as follows:

- Install floating wetland treatment.
- Add littoral shelf to reduce presence of waterfowl.

Stream Restoration: Provide approximately 1300 linear feet of stream stabilization and restoration as follows:

- Stabilize both banks of the stream downstream of the existing wet pond on the Shakerag Park property.

Bioretention (9 acres treated): Provide approximately 0.7 acres of treatment for pollutant removal as follows:

- Grade open areas upstream of existing fire station pond for bioretention cells.
- Install bioretention media and plantings.
- Install new outfall structures.
- Provide bypass for high-flow conditions.

## PROJECT PRIORITIZATION CRITERIA SCORE

| Prioritization Category | Site 2 Score | Site 3 Score |
|---|---|---|
| Land Ownership | 18 | 18 |
| Drainage Area Treated | 8 | 8 |
| Pollutant Removal Efficiency | 27 | 21 |
| Constructability | 5 | 10 |
| Tree Cover | 8 | 2 |
| Ease of Access | 4 | 1 |
| Permit Requirements[1] | 1 | 1 |
| Integrated with Existing CIP | 0 | 0 |
| **TOTAL SCORE** | **71** | **61** |

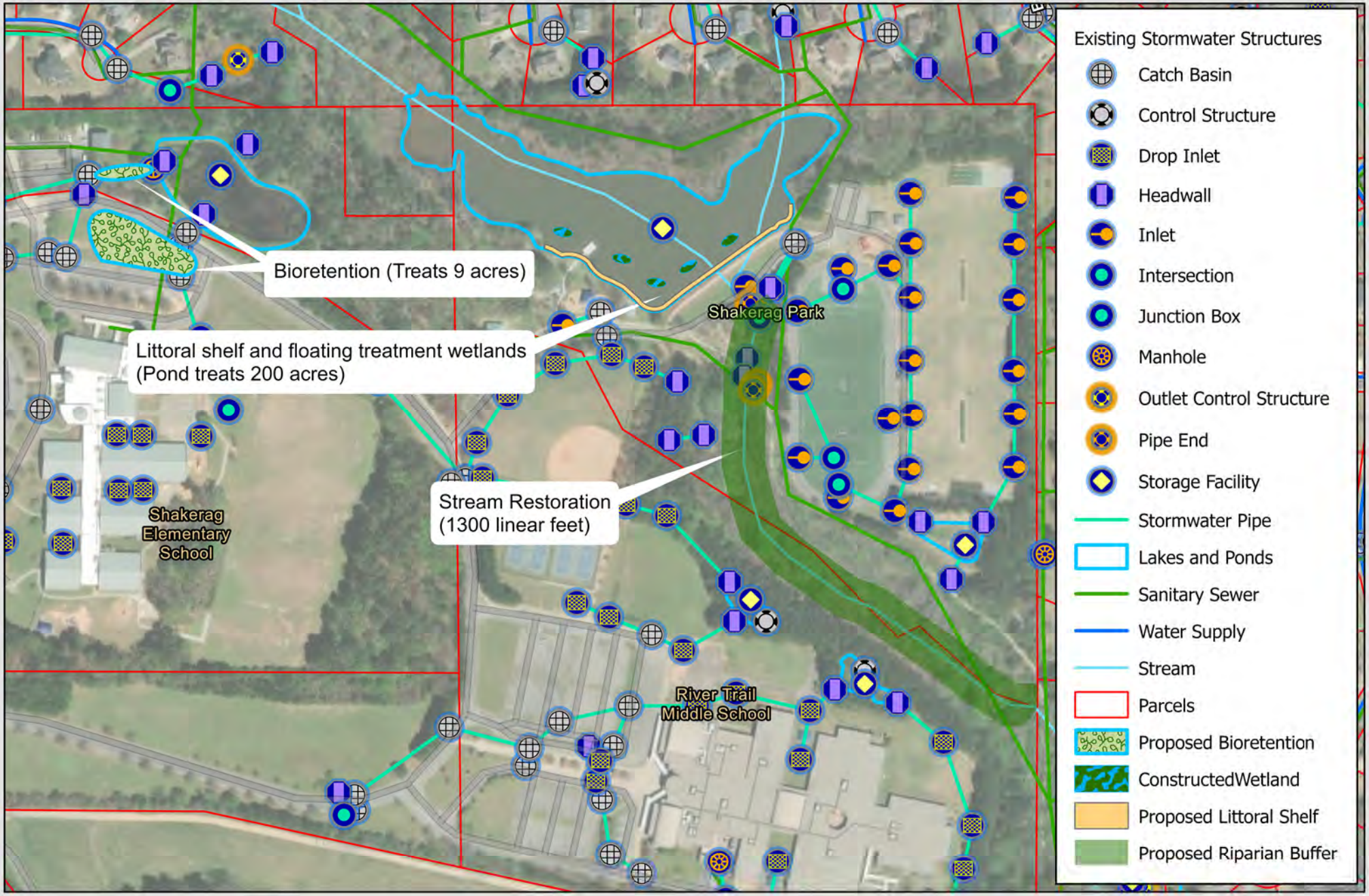
[1] *Federal permits are likely required for inline pond improvements and stream restoration, not for bioretention.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Total Cost Opinion |
|---|---|
| Construction | $2,180,000 |
| Design, Permitting, Ancillary | $1,090,000 |
| Real Estate, Maintenance | $109,000 |
| **Total Planning Cost** | **$3,379,000** |

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# Johns Creek
# Zone 3 Master Plan
# Site Nos. 2 and 3 Concept Design Exhibit

0 75 150 300
Feet

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# NAME OF PROJECT: HOSPITAL WATER QUALITY IMPROVEMENTS (SITE NO. 7 & 3)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Emory Hospital by McGinnis Ferry Road

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 52 acres


## PROJECT DESCRIPTION and BENEFIT

CONSTRUCTED WETLAND (22 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Regrade existing low area for a stormwater wetland.
- Install wetland media and plantings.
- Install control structure.

STREAM ENHANCEMENT AND FLOODPLAIN STORAGE (28 acres treated): Provide approximately 0.9 acres of treatment for pollutant removal as follows:

- Stabilize stream along McGinnis Ferry Road east of entry drive and install riparian plantings.
- Grade floodplain to provide additional treatment area

BIOSWALE (30 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Regrade existing swale.
- Install infiltration media.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Site 7 Score | Site 3 Score |
|---|---|---|
| Land Ownership | 12 | 12 |
| Drainage Area Treated | 6 | 4 |
| Fecal Coliform Removal Efficiency | 27 | 21 |
| Constructability | 5 | 5 |
| Tree Cover | 8 | 8 |
| Ease of Access | 4 | 4 |
| Permit Requirements[1] | 2 | 2 |
| Integrated with Existing CIP | 5 | 5 |
| **TOTAL SCORE** | **69** | **61** |

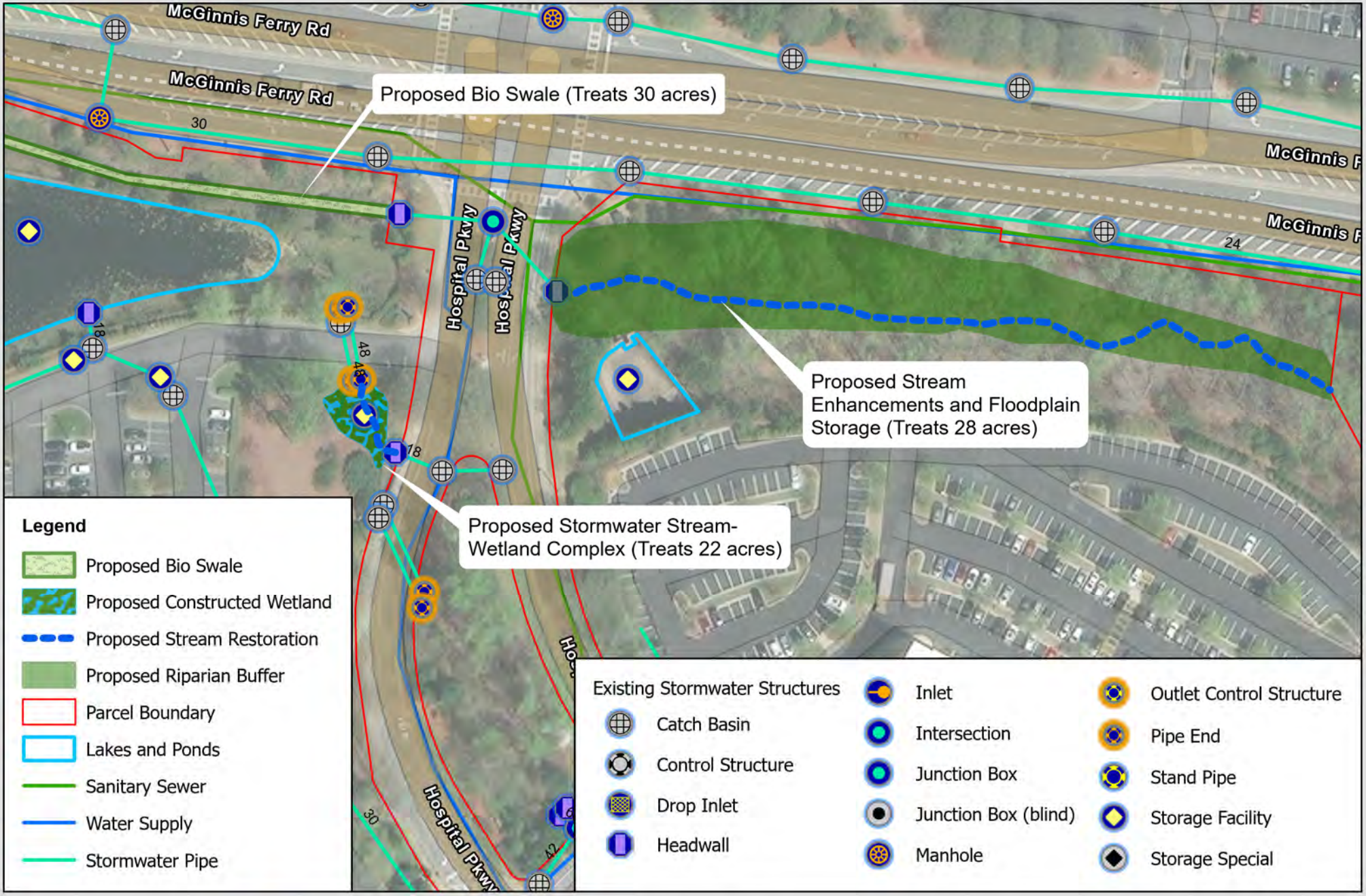
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Site 7 Cost Opinion | Site 3 Cost Opinion |
|---|---|---|
| Construction | $537,000 | $91,000 |
| Design, Permitting, Ancillary | $268,000 | $43,000 |
| Real Estate, Maintenance | $81,000 | $14,000 |
| **Total Planning Cost** | **$886,000** | **$148,000** |

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# Johns Creek
# Stormwater Master Plan
# Sites No. 3 and 7 Concept Design Exhibit

0 25 50 100 Feet

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# NAME OF PROJECT: TOWN CENTER WET POND IMPROVEMENTS (SITE NO. 16)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: City Hall and upstream to McGinnis Ferry Road

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 162 acres

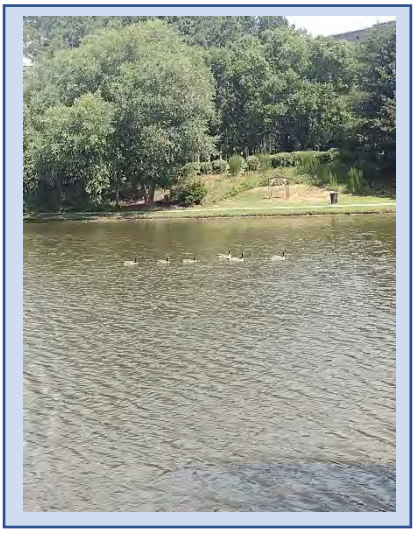
## PROJECT DESCRIPTION and BENEFIT

WET POND ENHANCEMENT (162 acres treated): Provide approximately 6.2 acres of wet pond water quality enhancements for pollutant removal as follows:

- Conduct sediment removal in the pond.
- Install wetland plantings in shallow areas around the perimeter of the pond.
- Create a forebay at the inflow locations.
- Retrofit the existing outfall structure for water quality volume treatment.

STREAM RESTORATION: Provide approximately 1770 linear feet of stream stabilization, restoration and riparian buffer restoration as follows:

- Stabilize both banks of the channel between the wet detention pond and McGinnis Ferry Road.
- Install riparian plantings.
- Re-align stream and/or existing greenway as necessary to protect public safety.



## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 8 |
| Fecal Coliform Removal Efficiency | 18 |
| Constructability | 10 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **69** |

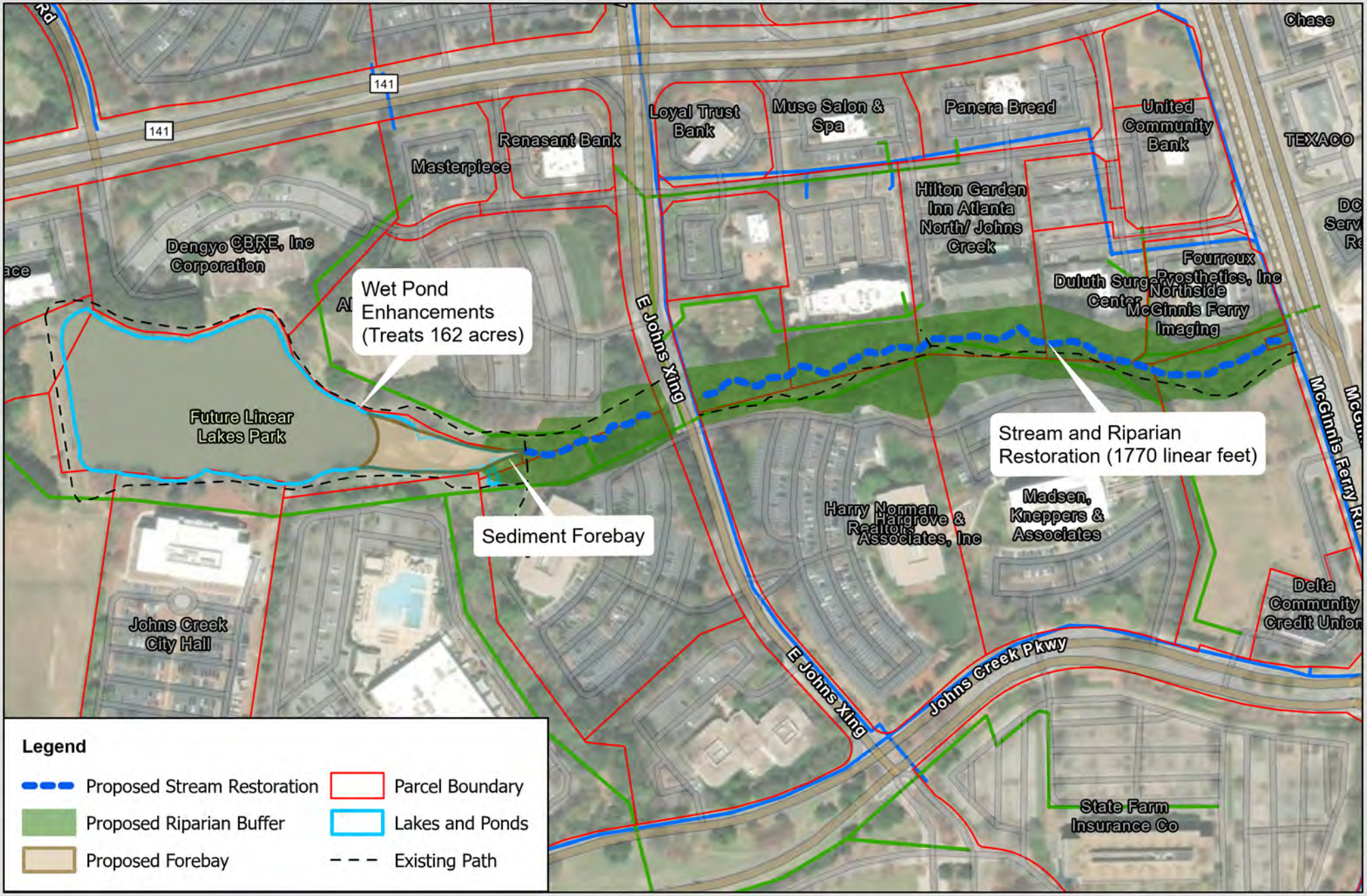
[1] *Federal permits are likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $1,882,000 |
| Design, Permitting, Ancillary | $884,000 |
| Real Estate, Maintenance | $188,000 |
| **Total Planning Cost** | **$2,954,000** |

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# Johns Creek
# Stormwater Master Plan
# Site No. 16 Concept Design Exhibit

0 80 160 320
Feet

# NAME OF PROJECT: HAMPTON SQUARE BIORETENTION (SITE NO. 12)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Hampton Square Drive near the intersection with Frellig Trace

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Bioretention (1 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

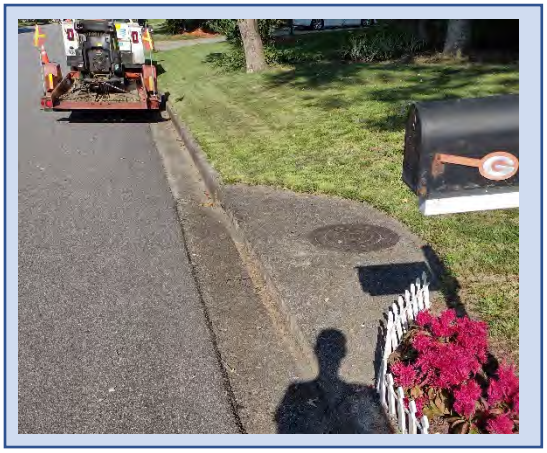
- Grade in new bioretention area in right of way adjacent to piped crossing at 4710 Hampton Square Drive.
- Install bioretention media and plantings.
- Install new outfall structure.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 5 |
| Tree Cover | 10 |
| Ease of Access | 2 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **68** |

[1] *Federal permits are not likely required.*

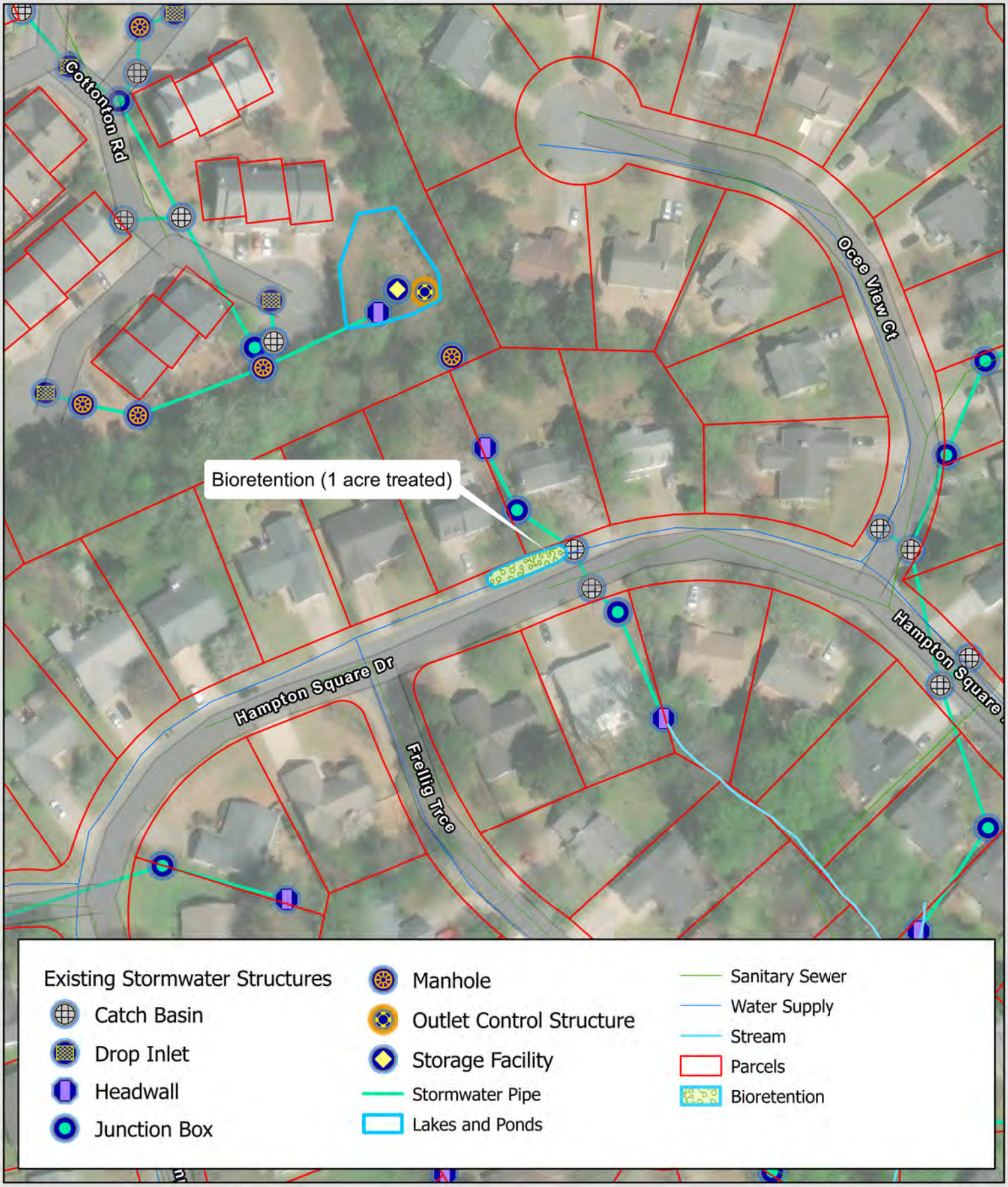


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $73,000 |
| Design, Permitting, Ancillary | $34,000 |
| Real Estate, Maintenance | $5,000 |
| **Total Planning Cost** | **$112,000** |

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**Johns Creek**
**Zone 1 Master Plan**
**Site No. 12**
**Concept Design Exhibit**

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Feet

# NAME OF PROJECT: SUGAR MILL RAIN GARDENS (SITE NO. 19)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Sugar Mill Subdivision between Bell Road and Abbotts Bridge Road

WATERSHED PRIORITY: Medium/Low

DRAINAGE AREA to PROJECT: Approximately 105 acres

## PROJECT DESCRIPTION and BENEFIT

Rain Gardens (58 acres treated): Provide approximately 2.8 acres of treatment for pollutant removal as follows (actual length of retrofits can be adjusted based on available budget):

- Convert space between curb and property line to rain gardens/bioretention planters to capture and treat road runoff.
- Retrofits will be focused in areas with no existing landscaping, flat slopes and minimal driveways.
- Install media and plantings in selected areas and provide curb cuts to direct runoff from street into rain gardens.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 8 |
| Fecal Coliform Removal Efficiency | 24 |
| Constructability | 5 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **65** |

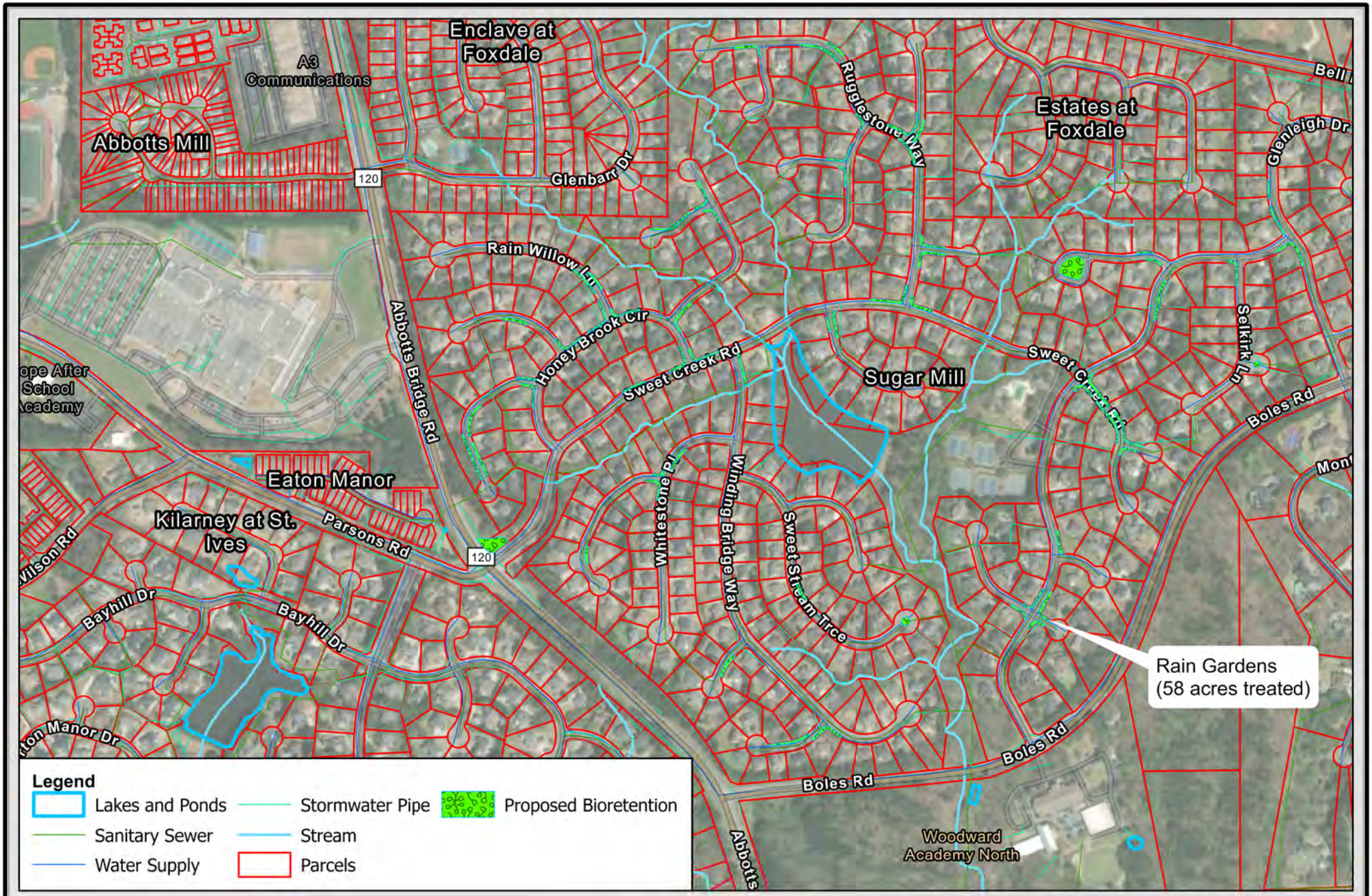
[1] *Federal permits are not likely required.*


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $2,358,000 |
| Design, Permitting, Ancillary | $1,181,000 |
| Real Estate, Maintenance | $142,000 |
| **Total Planning Cost** | **$3,681,000** |

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GEORGIA

# Johns Creek
# Zone 3 Master Plan
# Site No. 19 Concept Design Exhibit

0 150 300 600 Feet

N W E S

# NAME OF PROJECT: ABBOTTS HILL ELEMENTARY RETROFIT (SITE NO. 4)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Abbotts Hill Elementary off Abbotts Bridge Road

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 10 acres


## PROJECT DESCRIPTION and BENEFIT

BIORETENTION (5 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade open area north of school for a bioretention cell.
- Install bioretention media and plantings.
- Install new outfall structure.
- Provide bypass for high-flow conditions.

WETLAND RETROFIT (5 acres treated): Provide approximately 0.5 acres of treatment for pollutant removal as follows:

- Retrofit existing dry pond south of school for stormwater wetland.
- Install wetland media and plantings.
- Replace existing outfall structure

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 21 |
| Constructability | 10 |
| Tree Cover | 6 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **64** |

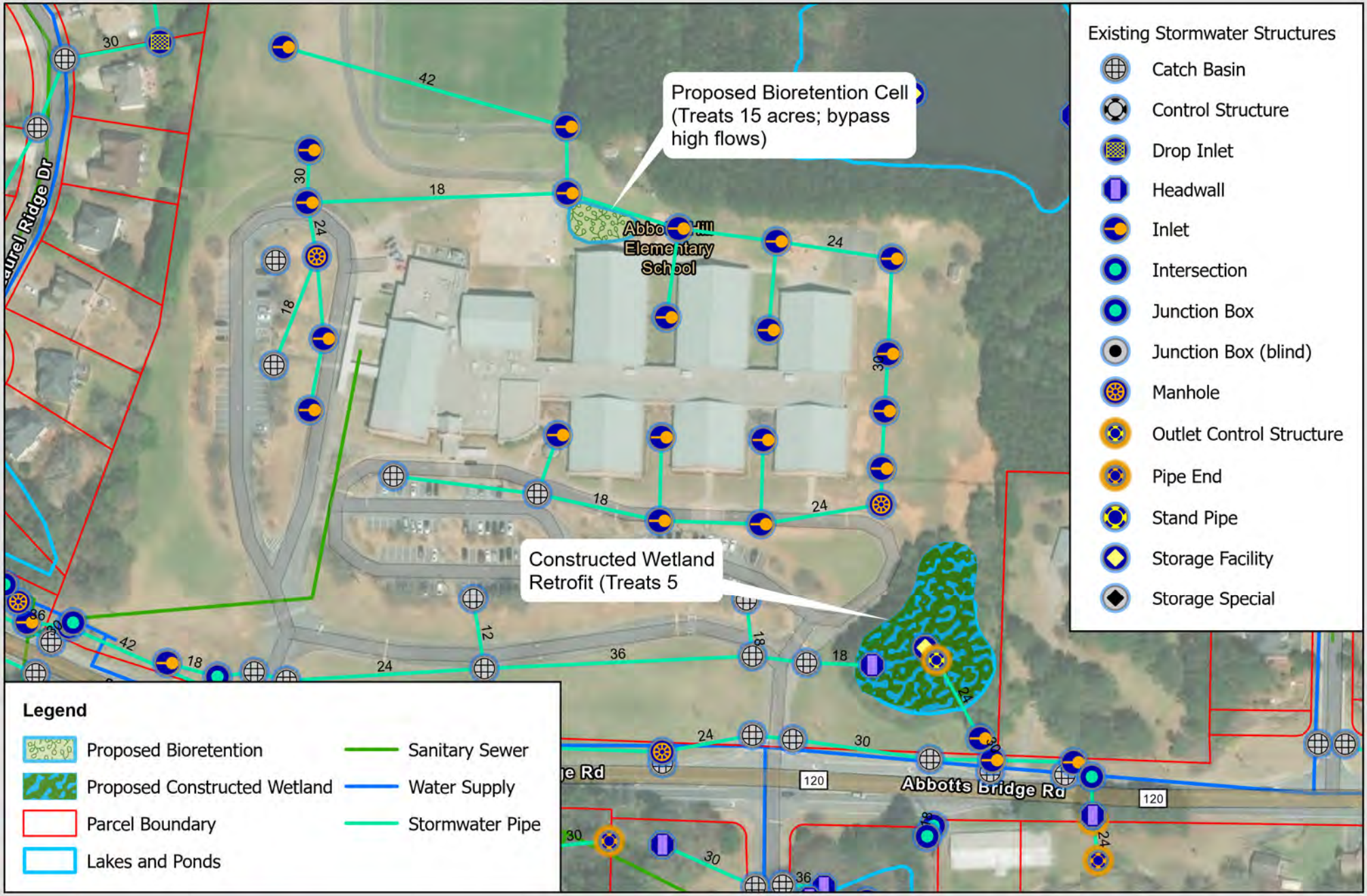
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $482,000 |
| Design, Permitting, Ancillary | $226,000 |
| Real Estate, Maintenance | $24,000 |
| **Total Planning Cost** | **$732,000** |

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GEORGIA

# Johns Creek
# Stormwater Master Plan
# Site No. 4 Concept Design Exhibit

0 40 80 160 Feet

N W E S

# NAME OF PROJECT: LAURELWOOD RAIN GARDENS (SITE NO. 18)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Laurelwood Subdivision south of McGinnis Ferry Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 37 acres

## PROJECT DESCRIPTION and BENEFIT

Rain Gardens (37 acres treated): Provide approximately 0.6 acres of treatment for pollutant removal as follows (actual length of retrofits can be adjusted based on available budget):

- Convert space between curb and property line to rain gardens/bioretention planters to capture and treat road runoff.
- Retrofits will be focused in areas with no existing landscaping, flat slopes and minimal driveways.
- Install media and plantings in selected areas and provide curb cuts to direct runoff from street into rain gardens.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 6 |
| Fecal Coliform Removal Efficiency | 24 |
| Constructability | 5 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **63** |

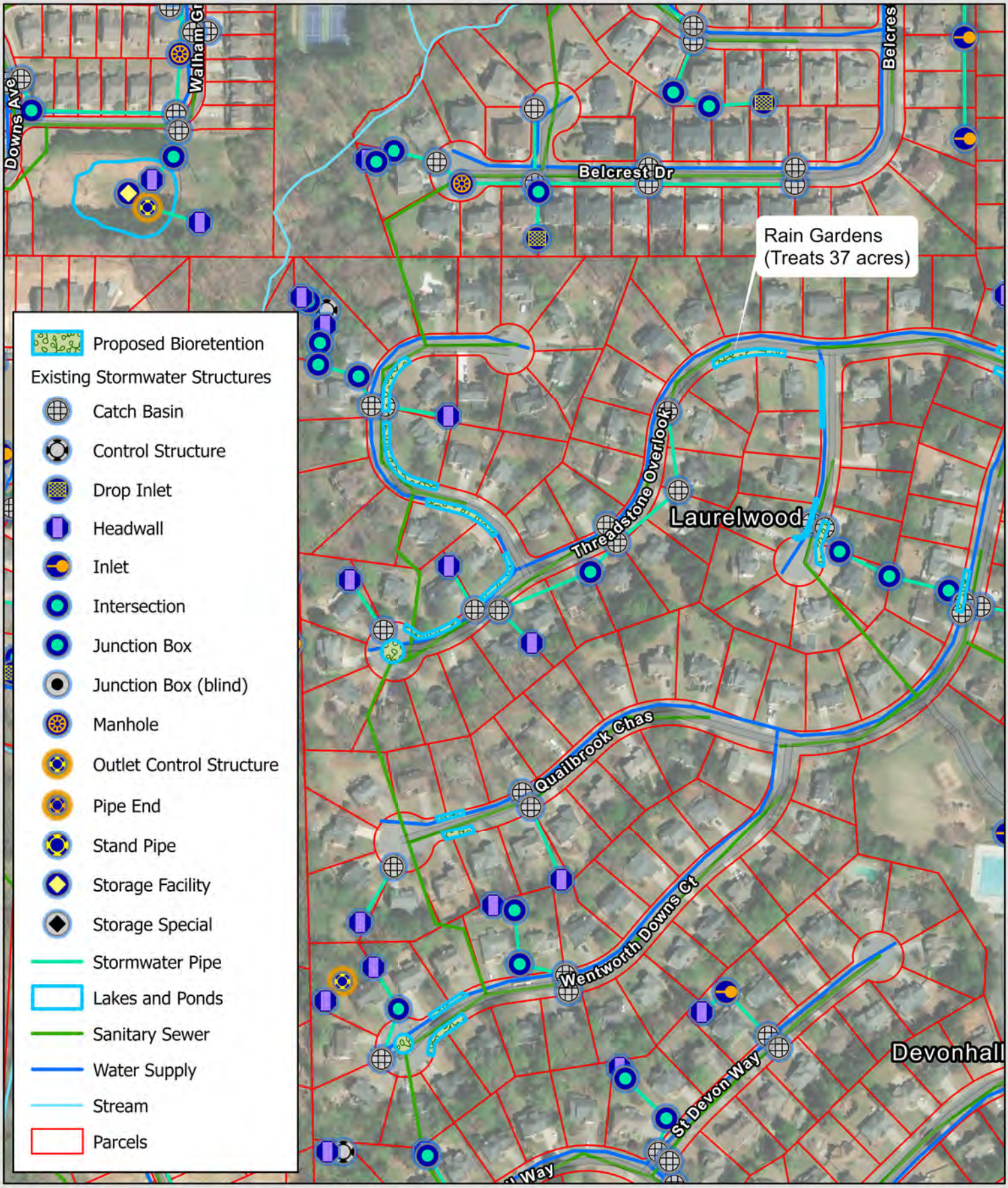
[1] *Federal permits are not likely required.*


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $481,000 |
| Design, Permitting, Ancillary | $240,000 |
| Real Estate, Maintenance | $29,000 |
| **Total Planning Cost** | **$750,000** |

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**Johns Creek**
**Zone 3 Master Plan**
**Site No. 18 Concept Design Exhibit**

0 125 250 Feet

N W E S

## NAME OF PROJECT: BLACKSTONE POND IMPROVEMENTS, BIORETENTION AND STREAM RESTORATION (SITE NO. 26)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Cavendish Place south of McGinnis Ferry Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 65 acres

## PROJECT DESCRIPTION and BENEFIT

Pond Improvements (65 acres treated): Add additional water quality treatment to the existing pond as follows:

- Remove sediment from upstream end.
- Construct forebay at upstream to intercept pollutants.

Stream Restoration: Provide approximately 600 linear feet of stream stabilization and restoration as follows:

- Stabilize both banks of the stream upstream of the existing pond.

Bioretention (2 acres treated): Provide approximately 0.2 acres of treatment for pollutant removal as follows:

- Grade open areas west of existing pond for bioretention.
- Install bioretention media and plantings.
- Install new outfall structure.
- Provide bypass for high-flow conditions.

## PROJECT PRIORITIZATION CRITERIA SCORE

| Prioritization Category | Site 26 Score |
|---|---|
| Land Ownership | 0 |
| Drainage Area Treated | 8 |
| Pollutant Removal Efficiency | 27 |
| Constructability | 10 |
| Tree Cover | 6 |
| Ease of Access | 4 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **61** |

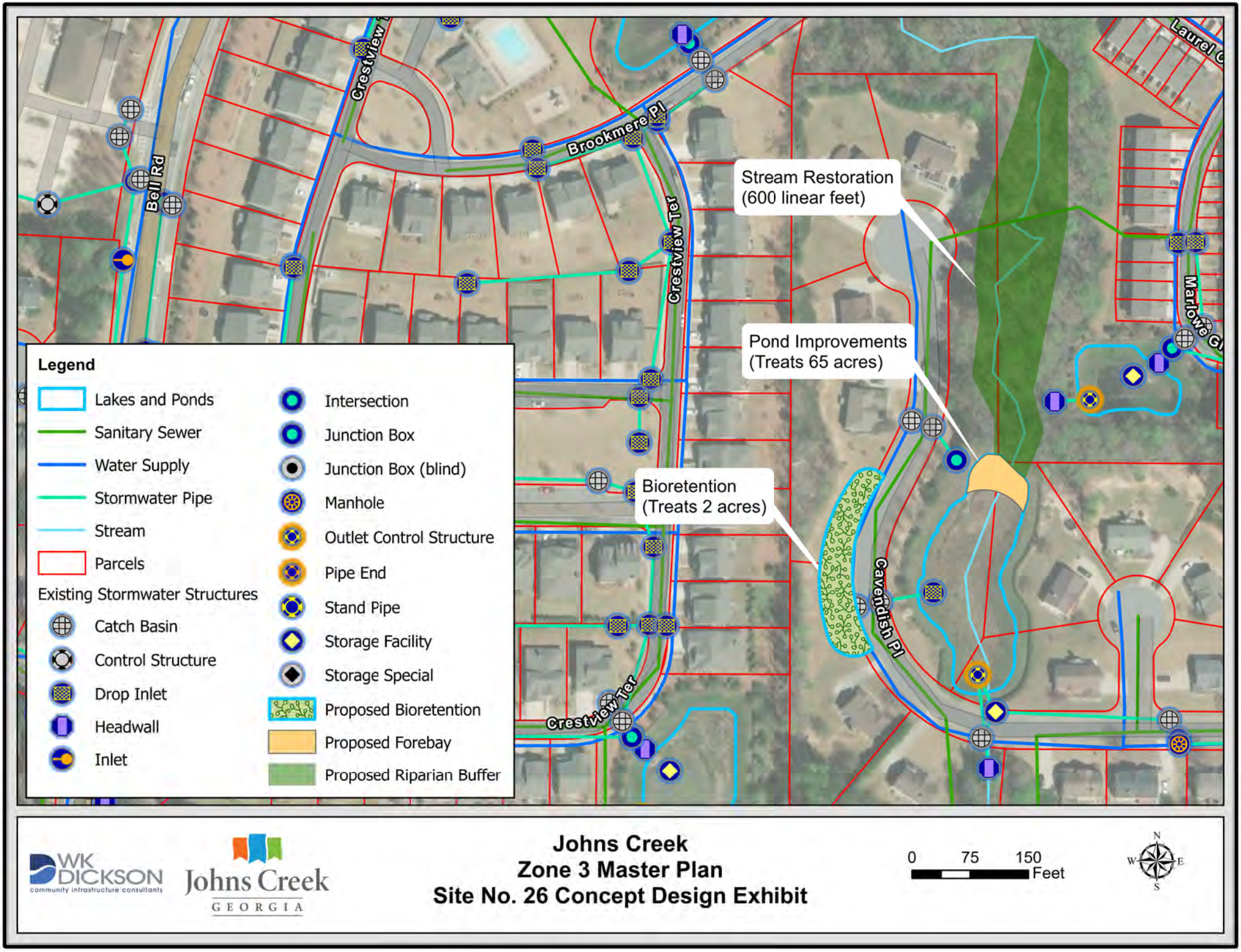
[1] *Federal permits are likely required for inline pond improvements and stream restoration, not for bioretention.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $1,206,000 |
| Design, Permitting, Ancillary | $567,000 |
| Real Estate, Maintenance | $260,000 |
| **Total Planning Cost** | **$2,033,000** |

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GEORGIA

# Johns Creek
# Zone 3 Master Plan
# Site No. 26 Concept Design Exhibit

0 75 150 Feet

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# NAME OF PROJECT: ABBOTTS BRIDGE STREAM RESTORATION (SITE NO. 25)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Undeveloped property at Abbotts Bridge Road and Donnington Drive

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 3000 acres


## PROJECT DESCRIPTION and BENEFIT

STREAM AND RIPARIAN BUFFER RESTORATION: Acquire property and restore approximately 3000 linear feet of stream as follows:

- Acquire property at 5700 Abbotts Bridge Road.
- Realign and restore stream to restore natural meanders.
- Remove existing private culvert crossing
- Install riparian plantings.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 12 |
| Drainage Area Treated | 8 |
| Fecal Coliform Removal Efficiency | 21 |
| Constructability | 5 |
| Tree Cover | 5 |
| Ease of Access | 4 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **61** |

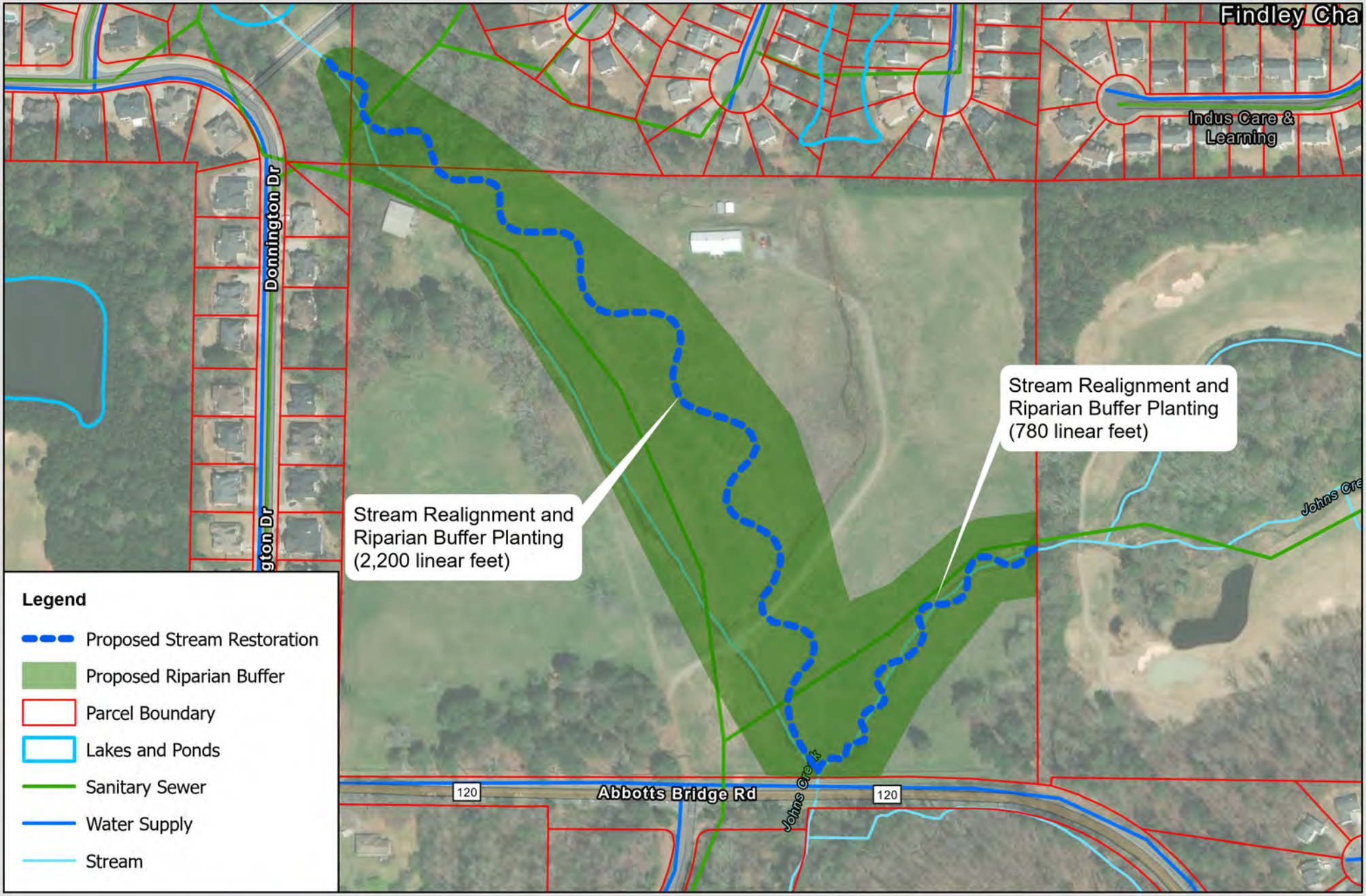
[1] *Federal permits are likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $4,081,000 |
| Design, Permitting, Ancillary | $1,918,000 |
| Real Estate, Maintenance | $404,000 |
| **Total Planning Cost** | **$6,403,000** |

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# Johns Creek
# Stormwater Master Plan
# Site No. 25 Concept Design Exhibit

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# NAME OF PROJECT: BROOKHOLLOW RAIN GARDEN (SITE NO. 20)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Brookhollow Subdivision near the intersection of Brookhollow Trail and Creekside Drive

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Rain Garden (1 acre treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Convert space between curb and property line to rain garden/bioretention planter to capture and treat road runoff.
- Retrofit will be placed by neighborhood clubhouse to provide example to homeowners of what could be implemented on their streets.
- Install media and plantings and provide curb cuts to direct runoff from street into rain garden.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 24 |
| Constructability | 5 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **59** |

[1]*Federal permits are not likely required.*

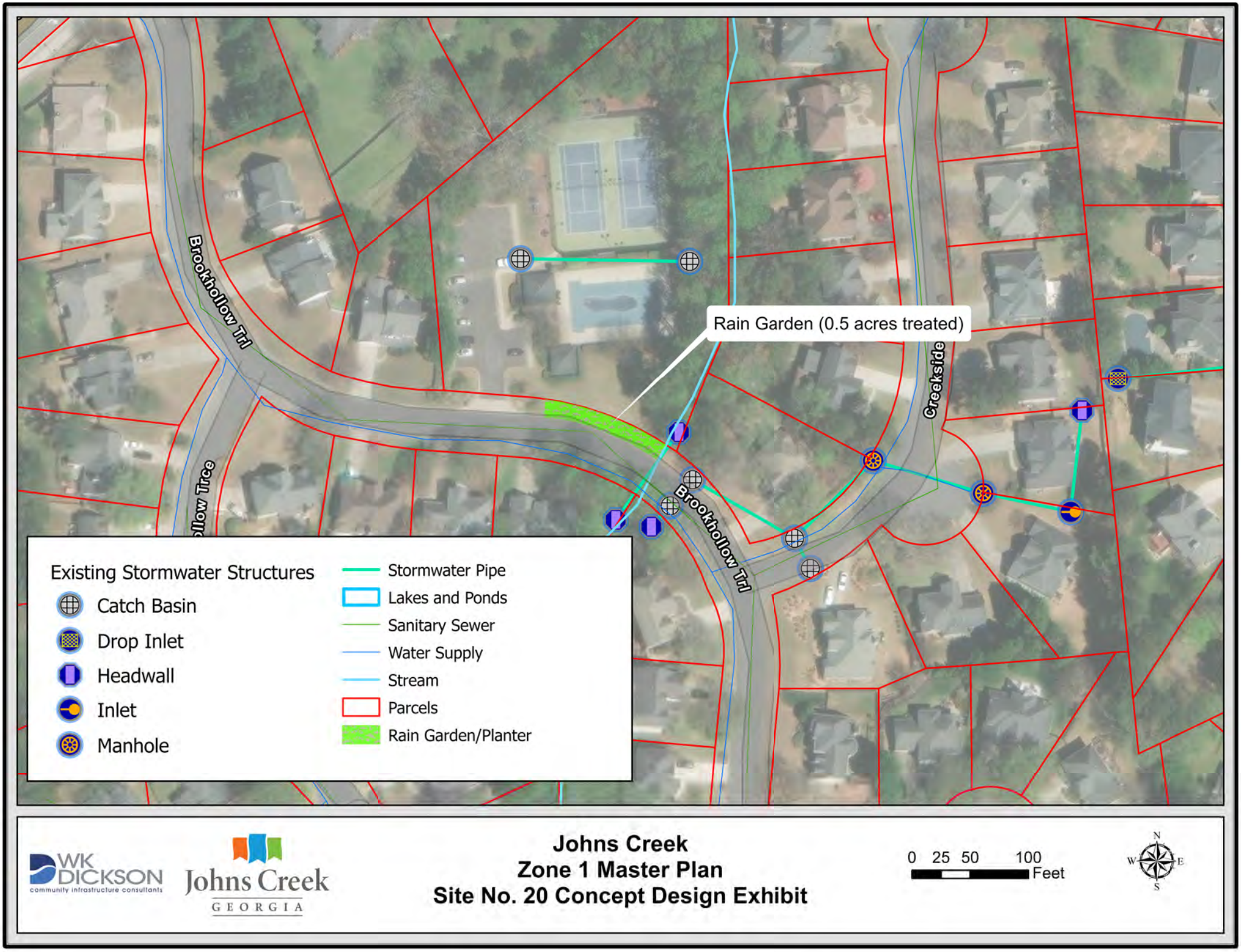


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $40,000 |
| Design, Permitting, Ancillary | $21,000 |
| Real Estate, Maintenance | $3,000 |
| **Total Planning Cost** | **$64,000** |

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# Zone 1 Master Plan
# Site No. 20 Concept Design Exhibit

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# NAME OF PROJECT: BELLACREE RAIN GARDENS (SITE NO. 6)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Bellacree Subdivision off Bell Road

WATERSHED PRIORITY: Low

DRAINAGE AREA to PROJECT: Approximately 2 acres

## PROJECT DESCRIPTION and BENEFIT

Rain Gardens (2 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows (actual length of retrofits can be adjusted based on available budget):

- Convert space between curb and property line to rain gardens/bioretention planters to capture and treat road runoff.
- Retrofits will be focused in areas with no existing landscaping, flat slopes and minimal driveways.
- Install media and plantings in selected areas and provide curb cuts to direct runoff from street into rain gardens.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 24 |
| Constructability | 5 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **59** |

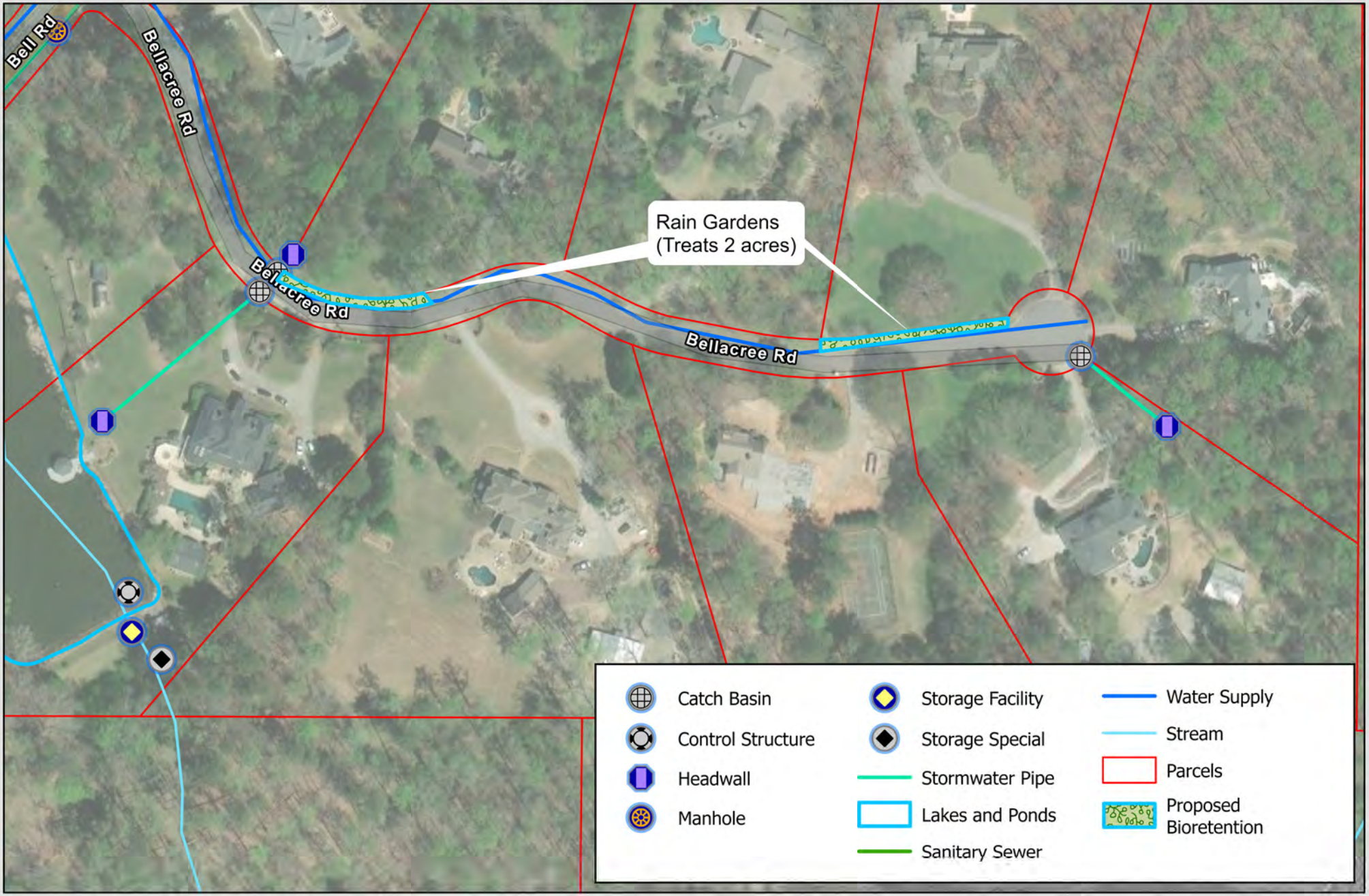
[1] *Federal permits are not likely required.*


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $92,000 |
| Design, Permitting, Ancillary | $46,000 |
| Real Estate, Maintenance | $6,000 |
| **Total Planning Cost** | **$144,000** |

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# Johns Creek
# Zone 3 Master Plan
# Site No. 6 Concept Design Exhibit

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# NAME OF PROJECT: RIVER PINES GOLF COURSE STREAM RESTORATION (SITE NO. 21)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: River Pines Golf Course off Old Alabama Road

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 8400 acres


## PROJECT DESCRIPTION and BENEFIT

STREAM AND RIPARIAN BUFFER RESTORATION: Acquire easements and restore approximately 3130 linear feet of stream as follows:

- Acquire easements along stream on River Pines Golf Course.
- Stabilize stream between Chattahoochee River and Old Alabama Road
- Install riparian plantings.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 12 |
| Drainage Area Treated | 8 |
| Fecal Coliform Removal Efficiency | 21 |
| Constructability | 10 |
| Tree Cover | 6 |
| Ease of Access | 1 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **59** |

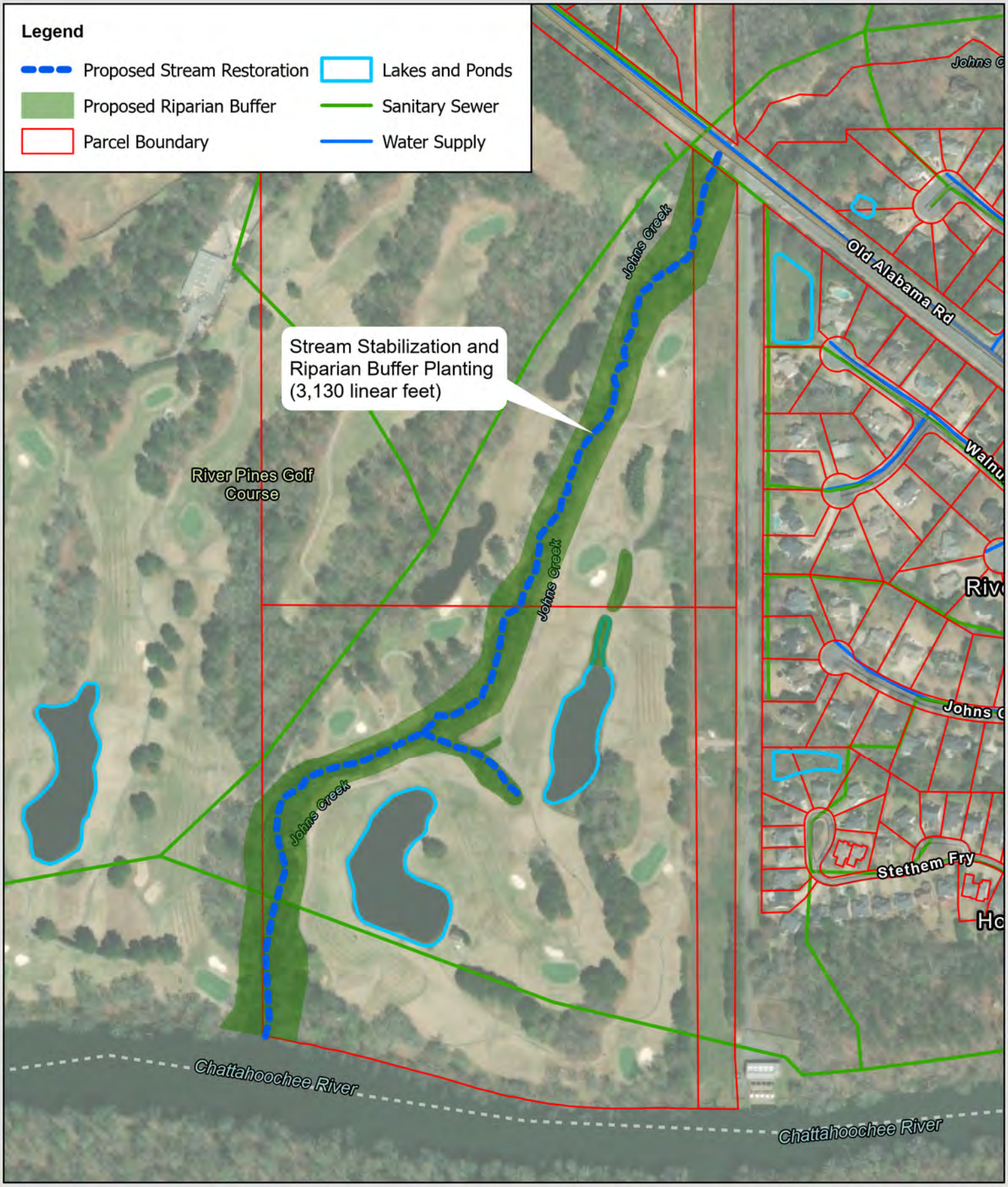
[1] *Federal permits are likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $2,502,000 |
| Design, Permitting, Ancillary | $1,175,000 |
| Real Estate, Maintenance | $350,000 |
| **Total Planning Cost** | **$4,027,000** |

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**Stormwater Master Plan**
**Site No. 21 Concept Design Exhibit**

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# NAME OF PROJECT: CHURCHILL DOWNS BIORETENTION (SITE NO. 10)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Weathervane Drive in Churchill Downs neighborhood

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Bioretention (1 acre treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

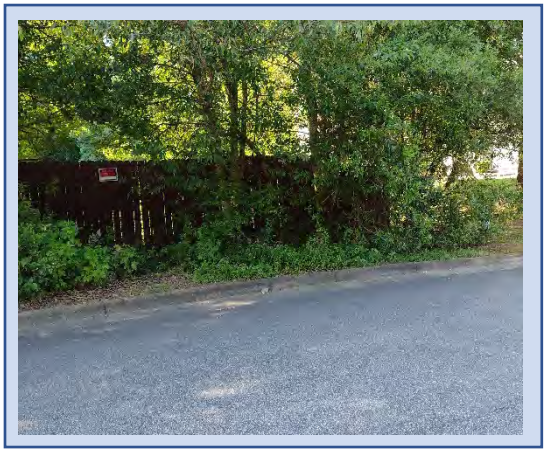
- Grade in new bioretention area in right of way adjacent to detention pond at 4550 Hampton Square Drive.
- Install bioretention media and plantings.
- Install new outfall structure.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 5 |
| Tree Cover | 2 |
| Ease of Access | 1 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **58** |

[1] *Federal permits are not likely required.*

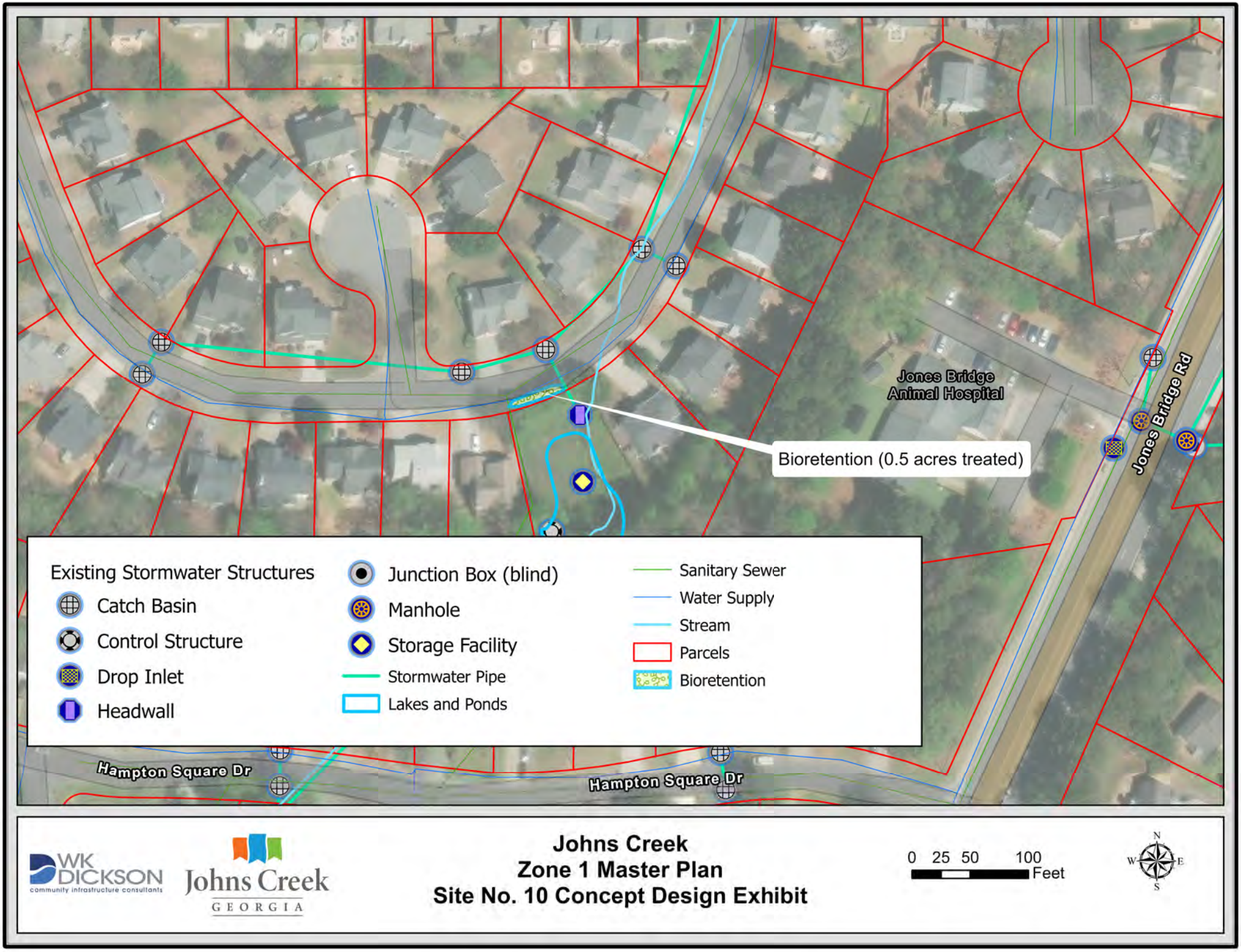



## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $57,000 |
| Design, Permitting, Ancillary | $30,000 |
| Real Estate, Maintenance | $4,000 |
| **Total Planning Cost** | **$91,000** |

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# Johns Creek
# Zone 1 Master Plan
# Site No. 10 Concept Design Exhibit

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# NAME OF PROJECT: JADEN WOODS BIORETENTION (SITE NO. 24)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Morganton Drive south of McGinnis Ferry Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Bioretention (1 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade in new bioretention area in common area along Morganton Drive with curb cuts to direct flow from street.
- Install bioretention media and plantings.
- Install new outfall structure.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 5 |
| Tree Cover | 10 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **57** |

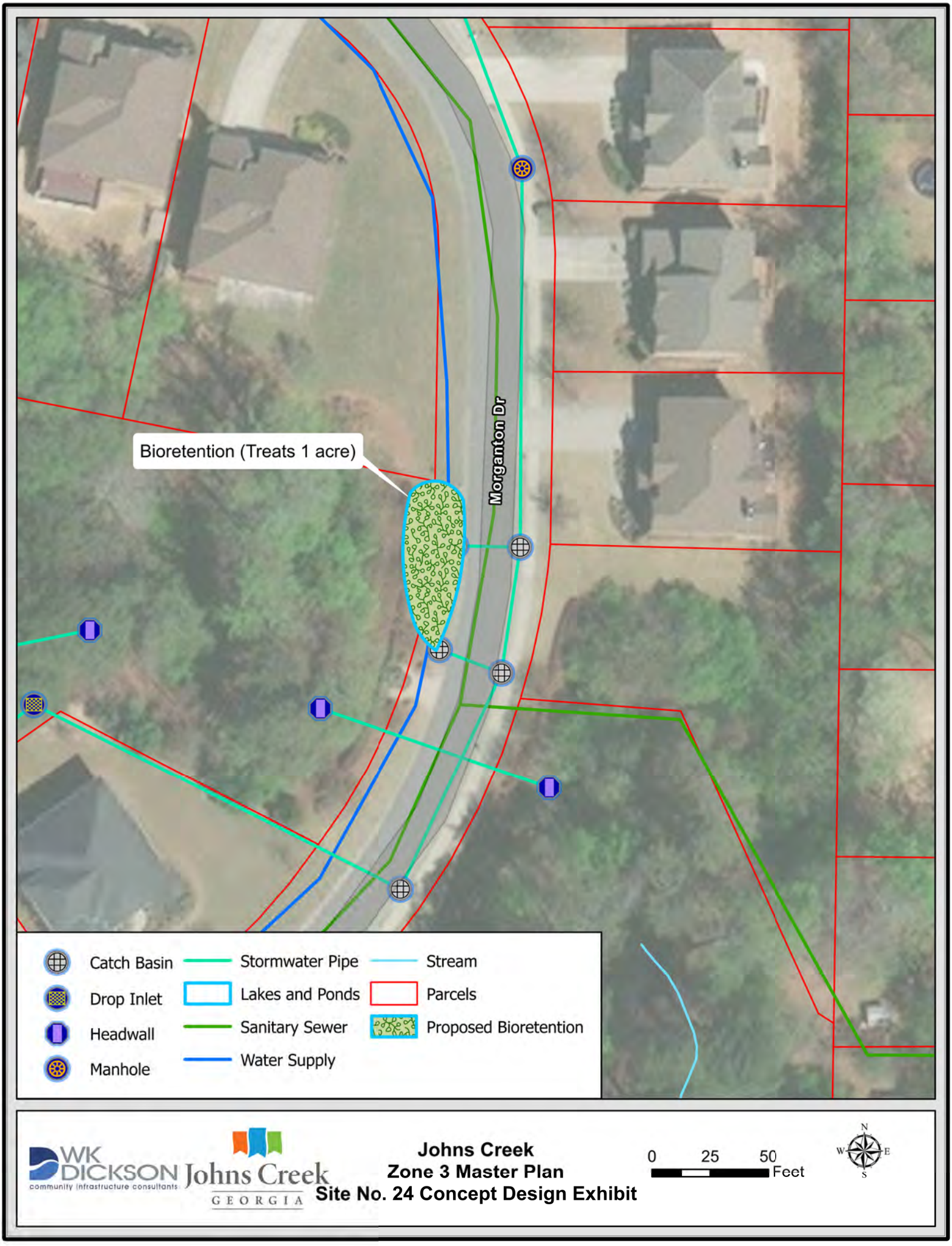
[1]*Federal permits are not likely required.*


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $86,000 |
| Design, Permitting, Ancillary | $44,000 |
| Real Estate, Maintenance | $13,000 |
| **Total Planning Cost** | **$143,000** |


Bioretention (Treats 1 acre)
Morganton Dr
Catch Basin
Drop Inlet
Headwall
Manhole
Stormwater Pipe
Lakes and Ponds
Sanitary Sewer
Water Supply
Stream
Parcels
Proposed Bioretention
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Johns Creek
Zone 3 Master Plan
Site No. 24 Concept Design Exhibit
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# NAME OF PROJECT: JOHNS CREEK HIGH SCHOOL BIORETENTION (SITE NO. 1)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Johns Creek High School off State Bridge Road

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 5 acres


## PROJECT DESCRIPTION and BENEFIT

BIORETENTION (5 acres treated): Provide approximately 0.3 acres of treatment for pollutant removal as follows:

- Grade in new bioretention area between Johns Creek High School and northern parking lot.
- Install bioretention media and plantings.
- Install new outfall structure.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 21 |
| Constructability | 5 |
| Tree Cover | 6 |
| Ease of Access | 2 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **57** |

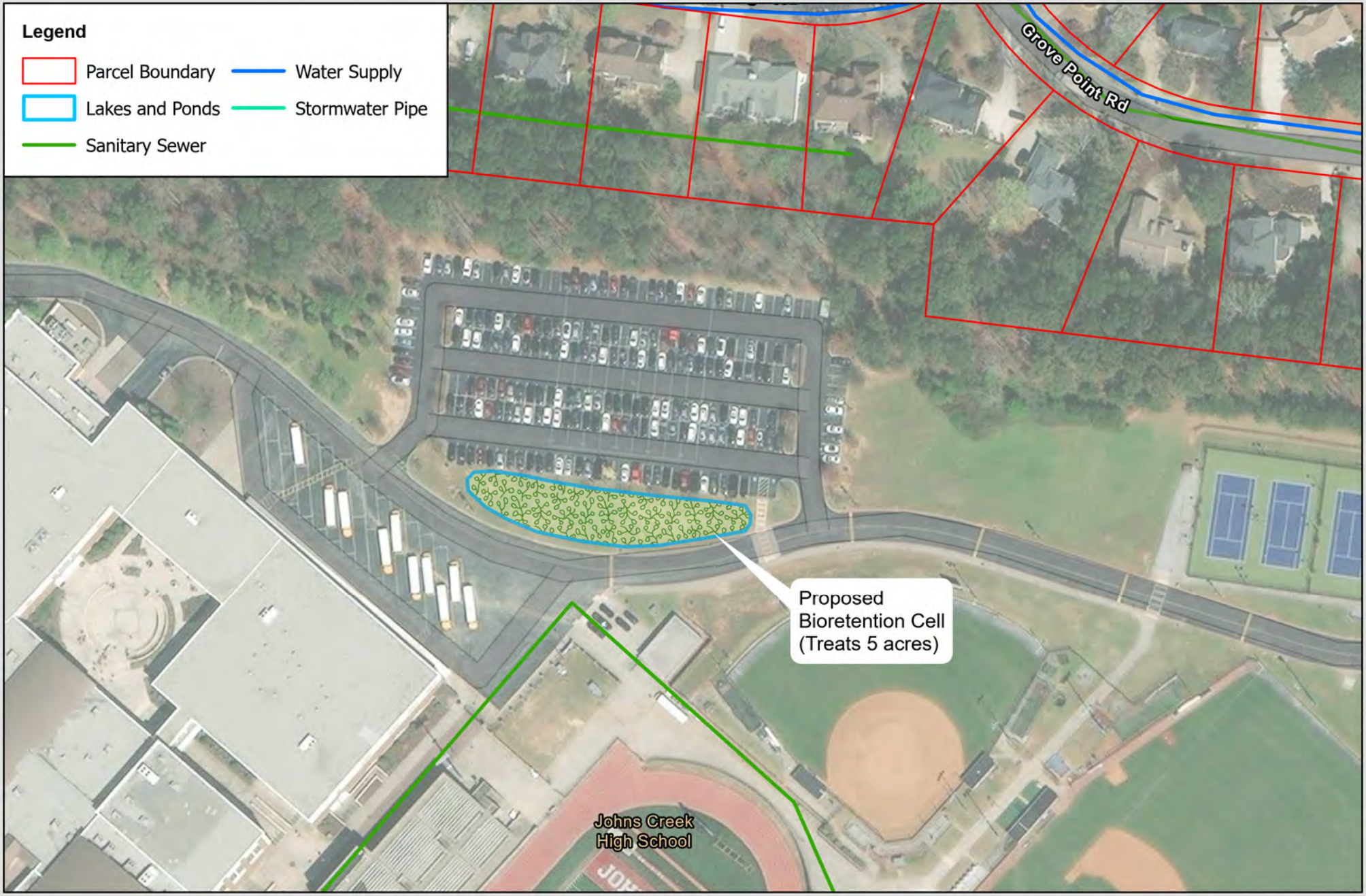
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $630,000 |
| Design, Permitting, Ancillary | $296,000 |
| Real Estate, Maintenance | $32,000 |
| **Total Planning Cost** | **$958,000** |

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# Johns Creek
# Stormwater Master Plan
# Site No. 1 Concept Design Exhibit

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# NAME OF PROJECT: HARTRIDGE BIORETENTION (SITE NO. 15)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Arbor Woods Drive between Lord N Lady Lane and King Arms Way

WATERSHED PRIORITY: Low

DRAINAGE AREA to PROJECT: Approximately 1 acre

## PROJECT DESCRIPTION and BENEFIT

Bioretention (1 acre treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade in new bioretention area in right of way adjacent to detention pond at 3230 Arbor Woods Drive.
- Install bioretention media and plantings.
- Install new outfall structure.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 5 |
| Tree Cover | 6 |
| Ease of Access | 2 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **56** |

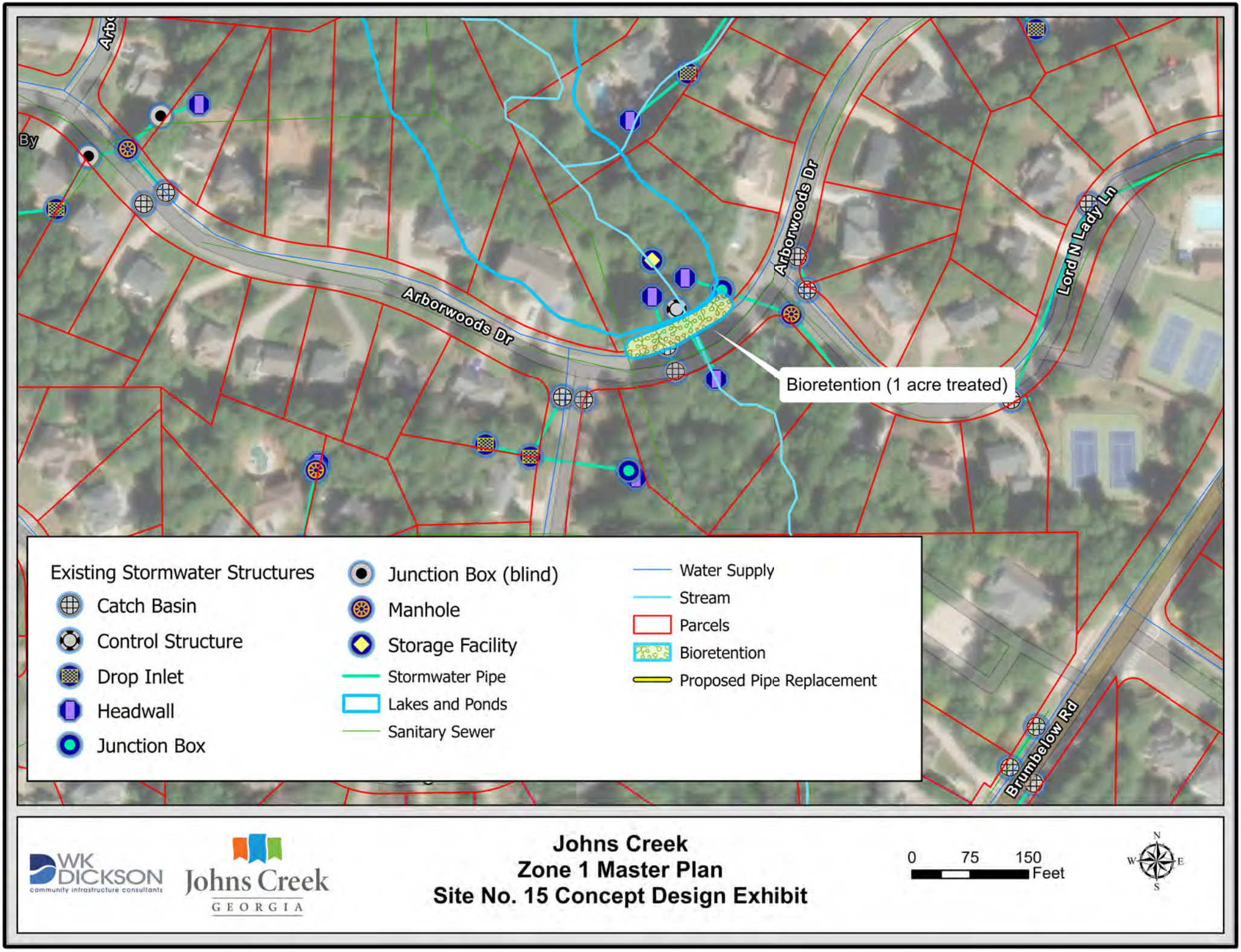
[1] *Federal permits are not likely required.*


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $95,000 |
| Design, Permitting, Ancillary | $45,000 |
| Real Estate, Maintenance | $46,000 |
| **Total Planning Cost** | **$186,000** |

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# Johns Creek
# Zone 1 Master Plan
# Site No. 15 Concept Design Exhibit

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## NAME OF PROJECT: ATLANTA/FULTON COUNTY WTP STREAM RESTORATION AND PIPE REPLACEMENT (SITE NO. 5/6/11)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Atlanta/Fulton County WTP on Spruill Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 6 acres

## PROJECT DESCRIPTION and BENEFIT

Stream Restoration: Provide stream stabilization, restoration and riparian buffer restoration as follows:

- Stabilize both banks of the channel for 250 feet downstream of the wet pond and add riparian plantings.

Pipe Replacement: Replace failing twin 24" CMP pipes with new 24" RCP under access road west of plant.

## PROJECT PRIORITIZATION CRITERIA SCORE

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 2 |
| Pollutant Removal Efficiency | 21 |
| Constructability | 10 |
| Tree Cover | 2 |
| Ease of Access | 1 |
| Permit Requirements[1] | 2 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **56** |

[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Total Cost Opinion |
|---|---|
| Construction | $345,000 |
| Design, Permitting, Ancillary | $162,000 |
| Real Estate, Maintenance | $17,000 |
| **Total Planning Cost** | **$524,000** |


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**Johns Creek**
**Zone 1 Master Plan**
**Site Nos. 5, 6, and 11**
**Concept Design Exhibit**

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# NAME OF PROJECT: STATE BRIDGE PARK RSC (SITE NO. 15)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: State Bridge Park off State Bridge Road

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 19 acres


## PROJECT DESCRIPTION and BENEFIT

RSC (19 acres treated): Provide approximately 0.3 acres
of treatment for pollutant removal as follows:

- Grade and install RSC series downstream of western outfall at State Bridge Road.
- Install media and plantings.
- Replant riparian buffer along channel through State Bridge Park

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 18 |
| Drainage Area Treated | 6 |
| Fecal Coliform Removal Efficiency | 12 |
| Constructability | 10 |
| Tree Cover | 2 |
| Ease of Access | 2 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **56** |

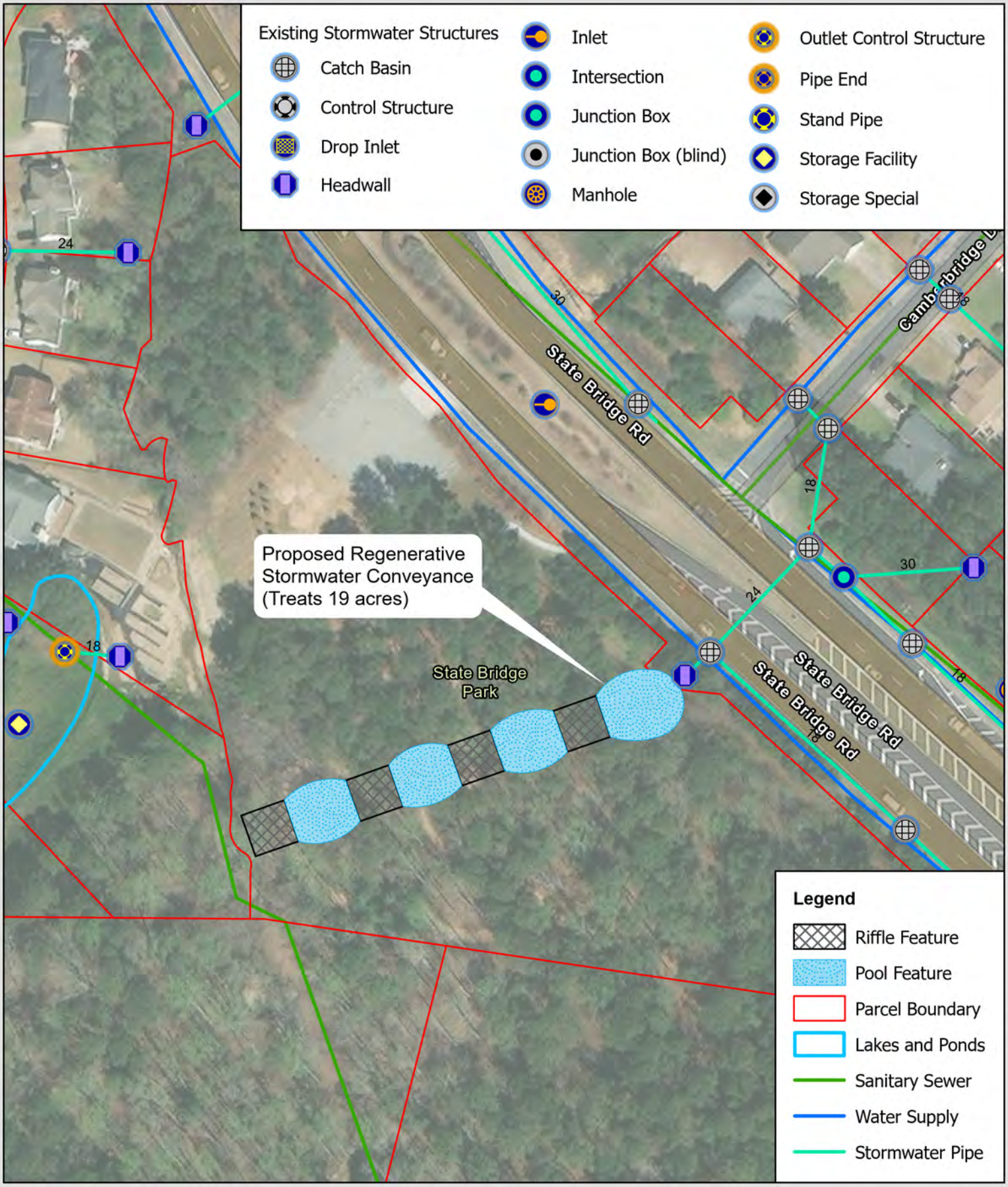
[1] *Federal permits are not likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $825,000 |
| Design, Permitting, Ancillary | $389,000 |
| Real Estate, Maintenance | $49,000 |
| **Total Planning Cost** | **$1,263,000** |

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**Johns Creek**
**Stormwater Master Plan**
**Site No. 21 Concept Design Exhibit**

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# NAME OF PROJECT: AMBERLEIGH BIORETENTION (SITE NO. 4)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Amberleigh Way off Rogers Bridge Road

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 2 acres

## PROJECT DESCRIPTION and BENEFIT

Bioretention (2 acres treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade in new bioretention area in common area along Amberleigh Way with curb cuts to direct flow from street.
- Install bioretention media and plantings.
- Install new outfall structure.

PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 2 |
| Fecal Coliform Removal Efficiency | 27 |
| Constructability | 5 |
| Tree Cover | 8 |
| Ease of Access | 4 |
| Permit Requirements[1] | 3 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **55** |

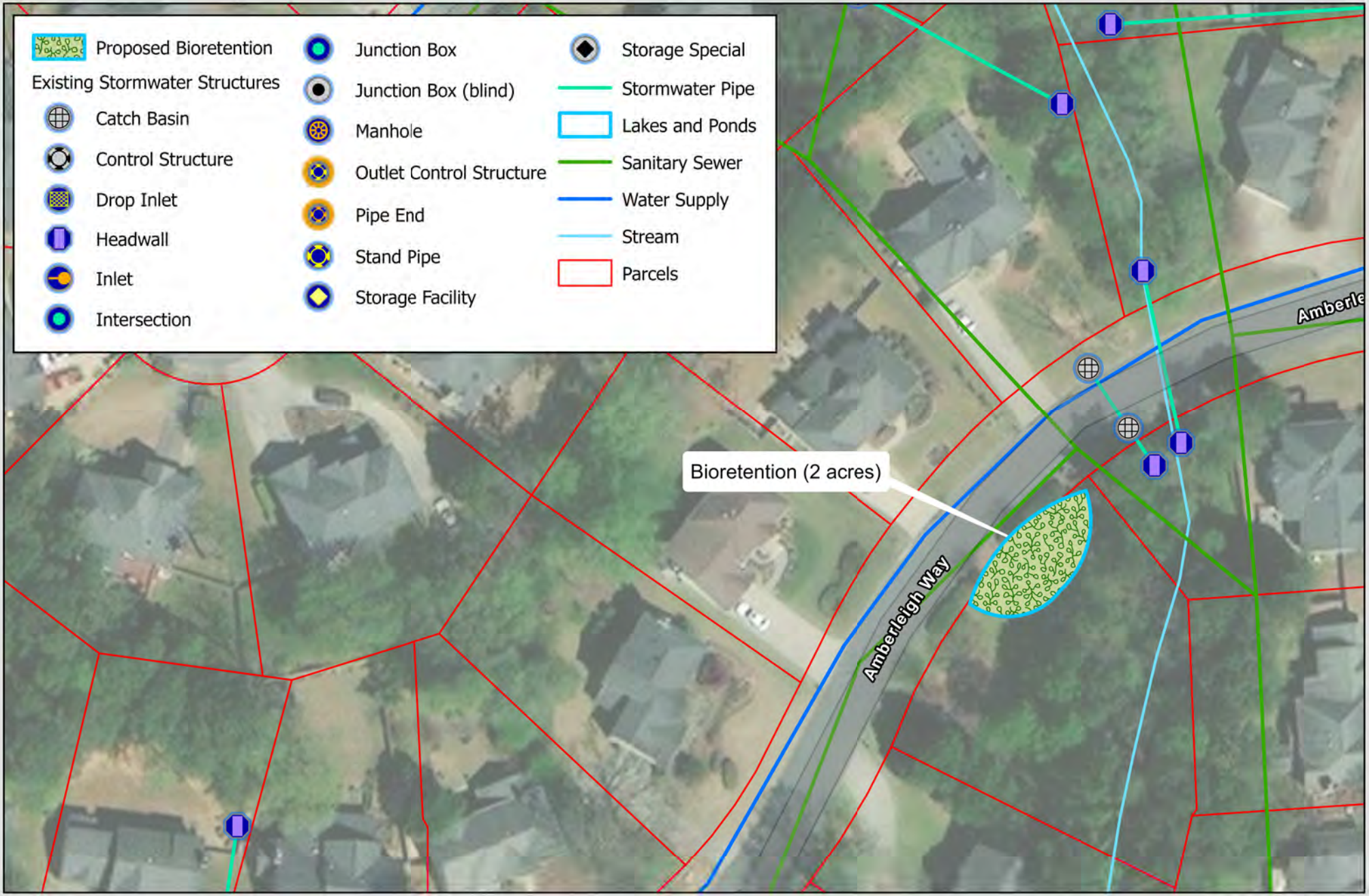
[1]*Federal permits are not likely required.*


## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $94,000 |
| Design, Permitting, Ancillary | $47,000 |
| Real Estate, Maintenance | $14,000 |
| **Total Planning Cost** | **$155,000** |

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# Johns Creek
# Stormwater Master Plan
# Sites No. 4 Concept Design Exhibit

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## NAME OF PROJECT: TAVISTOCK POND IMPROVEMENTS, BIORETENTION AND STREAM RESTORATION (SITE NO. 15)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS


LOCATION: Taconic Way east of Rogers Circle

WATERSHED PRIORITY: Medium

DRAINAGE AREA to PROJECT: Approximately 118 acres

## PROJECT DESCRIPTION and BENEFIT

Pond Improvements (118 acres treated): Add additional water quality treatment to the existing pond as follows:

- Remove sediment from upstream end.
- Construct forebay at upstream to intercept pollutants.
- Modify riser to detain additional water quality volume.

Stream Restoration: Provide approximately 300 linear feet of stream stabilization and restoration as follows:

- Stabilize both banks of the stream upstream of the existing pond.
- Install riparian plantings.

Bioretention (1 acre treated): Provide approximately 0.1 acres of treatment for pollutant removal as follows:

- Grade open area upstream of existing pond for bioretention.
- Install bioretention media and plantings.
- Install new outfall structure.
- Provide bypass for high-flow conditions.

## PROJECT PRIORITIZATION CRITERIA SCORE

| Prioritization Category | Site 26 Score |
|---|---|
| Land Ownership | 0 |
| Drainage Area Treated | 8 |
| Pollutant Removal Efficiency | 27 |
| Constructability | 10 |
| Tree Cover | 6 |
| Ease of Access | 4 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 5 |
| **TOTAL SCORE** | **61** |

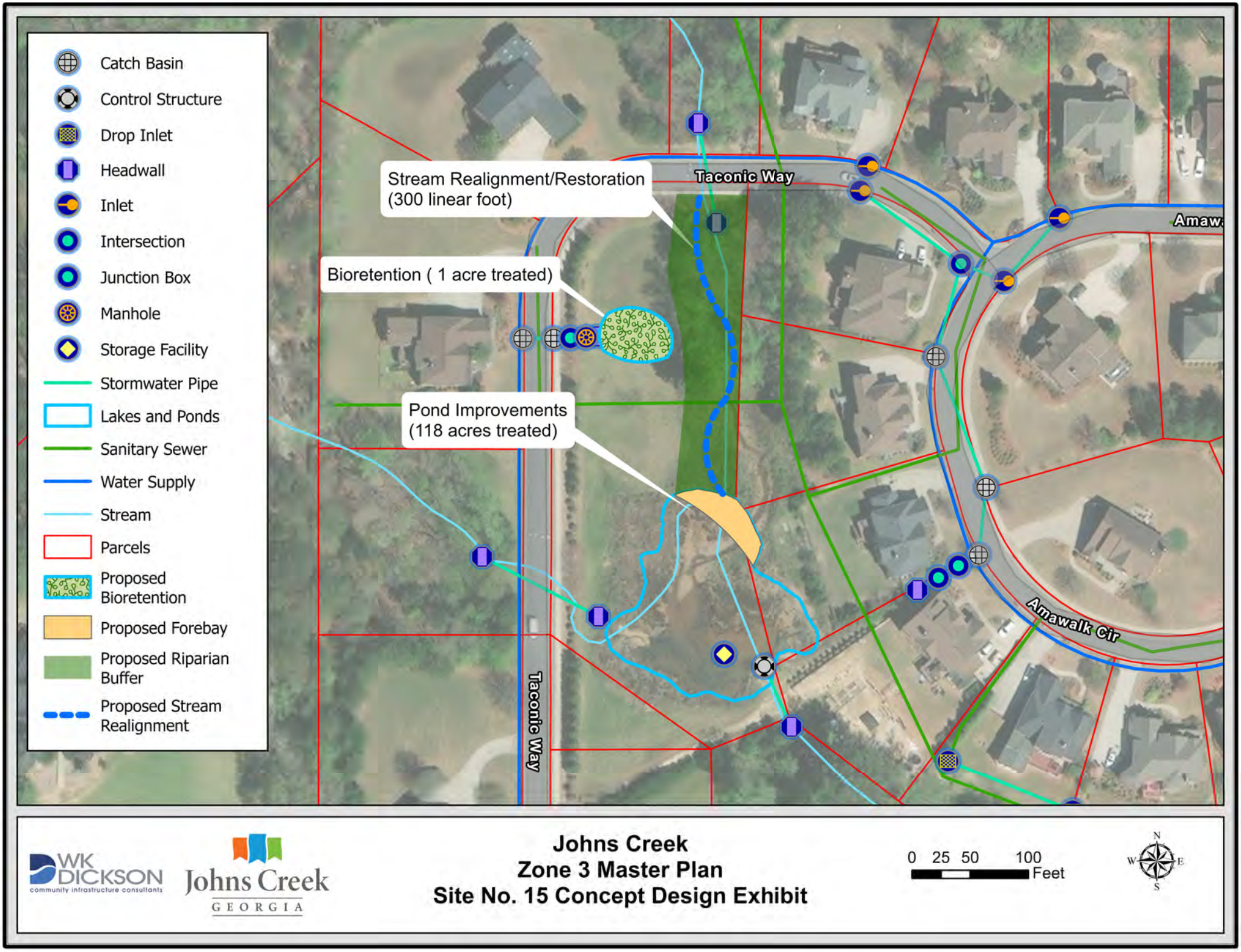
[1] *Federal permits are likely required for inline pond improvements and stream restoration, not for bioretention.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $653,000 |
| Design, Permitting, Ancillary | $308,000 |
| Real Estate, Maintenance | $98,000 |
| **Total Planning Cost** | **$1,059,000** |


Catch Basin
Control Structure
Drop Inlet
Headwall
Inlet
Intersection
Junction Box
Manhole
Storage Facility
Stormwater Pipe
Lakes and Ponds
Sanitary Sewer
Water Supply
Stream
Parcels
Proposed Bioretention
Proposed Forebay
Proposed Riparian Buffer
Proposed Stream Realignment
Stream Realignment/Restoration (300 linear foot)
Bioretention ( 1 acre treated)
Pond Improvements (118 acres treated)
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Taconic Way
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GEORGIA
Johns Creek
Zone 3 Master Plan
Site No. 15 Concept Design Exhibit
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# NAME OF PROJECT: EMBRY PROPERTY STREAM RESTORATION (SITE NO. 5)

## PROBLEM IDENTIFICATION and SITE CHARACTERISTICS

LOCATION: Undeveloped property along Chattahoochee River south of Shakerag Elementary

WATERSHED PRIORITY: MEDIUM

DRAINAGE AREA to PROJECT: Approximately 719 acres


## PROJECT DESCRIPTION and BENEFIT

STREAM AND RIPARIAN BUFFER RESTORATION: Acquire property and restore approximately 2700 linear feet of stream as follows:

- Acquire property at 10555 Embry Farm Road.
- Realign and restore stream to restore natural meanders.
- Install riparian plantings along stream and along Chattahoochee River to enhance buffer.

## PROJECT PRIORITIZATION CRITERIA SCORE

**Table 1. Prioritization Criteria Score**

| Prioritization Category | Score |
|---|---|
| Land Ownership | 6 |
| Drainage Area Treated | 8 |
| Fecal Coliform Removal Efficiency | 21 |
| Constructability | 10 |
| Tree Cover | 8 |
| Ease of Access | 1 |
| Permit Requirements[1] | 1 |
| Integrated with Existing CIP | 0 |
| **TOTAL SCORE** | **55** |

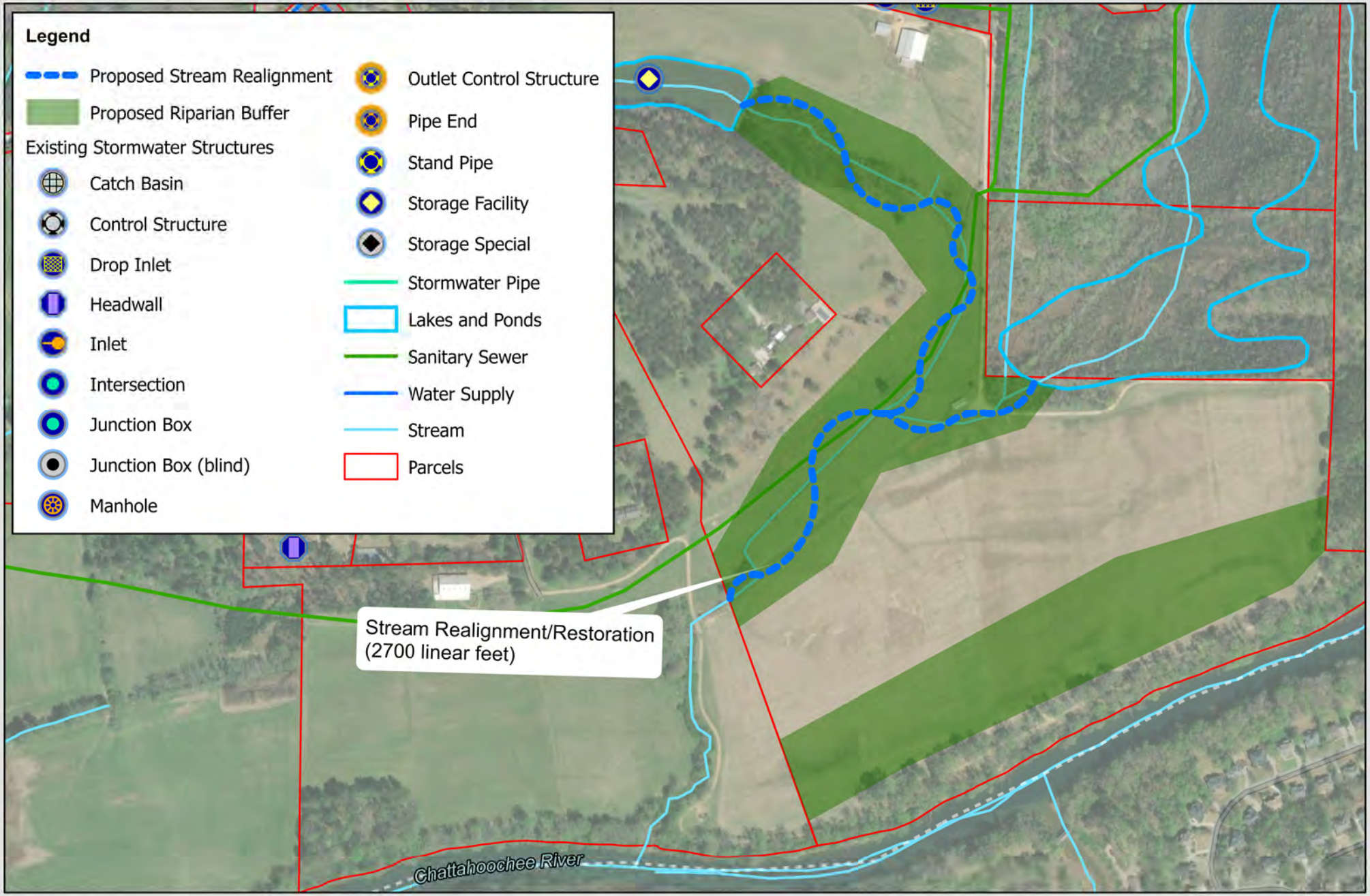
[1] *Federal permits are likely required.*

## PLANNING LEVEL OPINION OF COST

- Construction estimate includes 30% contingency for planning purposes.
- Proposed project footprints based on GIS analysis.

**Table 2. Planning Level Opinion of Cost**

| Item | Cost Opinion |
|---|---|
| Construction | $4,107,000 |
| Design, Permitting, Ancillary | $1,005,000 |
| Real Estate, Maintenance | $1,889,000 |
| **Total Planning Cost** | **$7,001,000** |




WK DICKSON
community infrastructure consultants

Johns Creek
GEORGIA

# Johns Creek
# Zone 3 Master Plan
# Site No. 5 Concept Design Exhibit

0 125 250 500 Feet

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