

BMP ID	
MO-Res-07	
Benefits	
Peak Flow Attenuation	
Nutrient Uptake	
Sediment Removal	✓
Beautification	✓
Improved Stream Function	✓

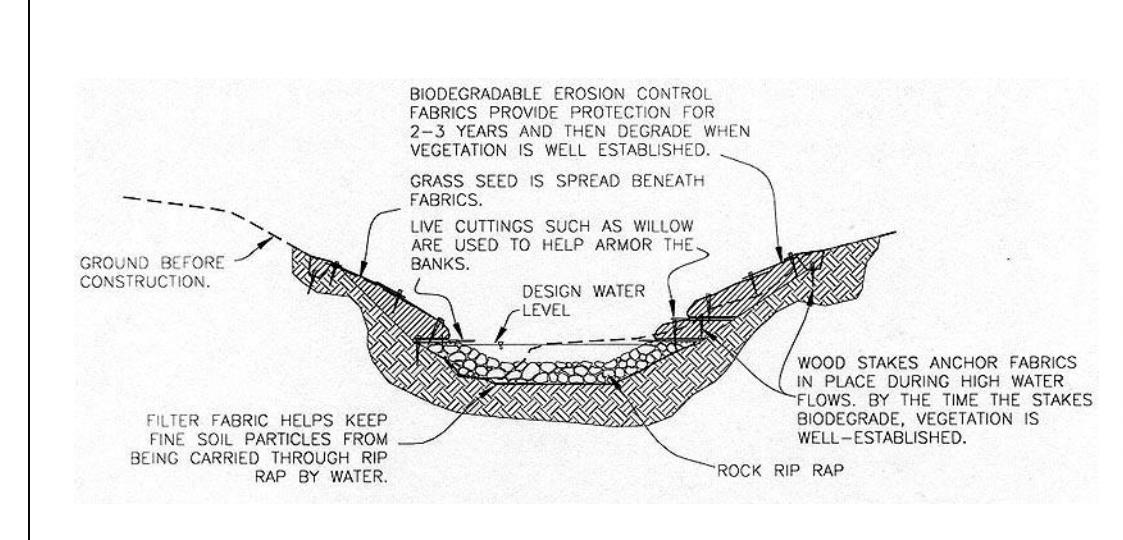
ATHENS-CLARKE COUNTY WATERSHED MANAGEMENT PLAN LOCATION: MIDDLE OCONEE RIVER WATERSHED



Erosional activity near outfalls from residential areas, facing SW



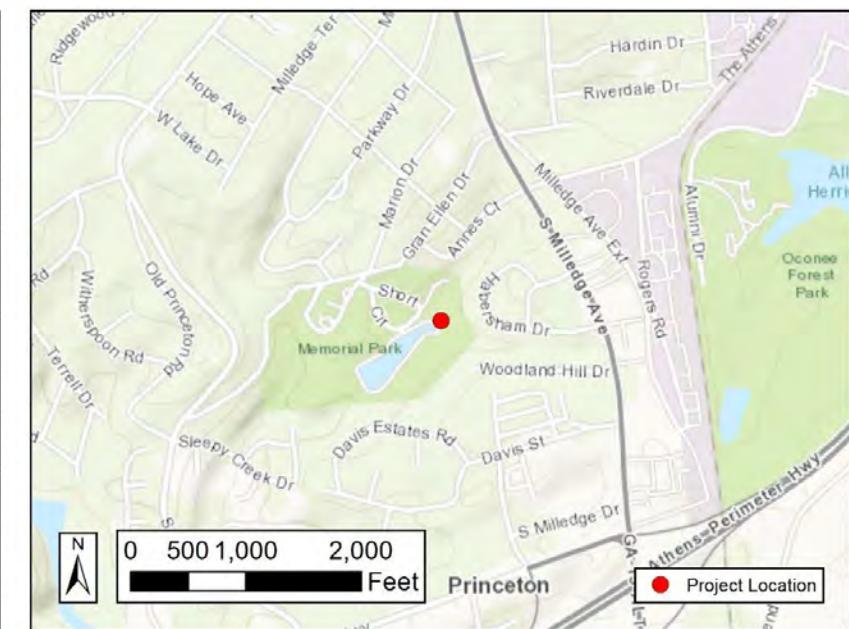
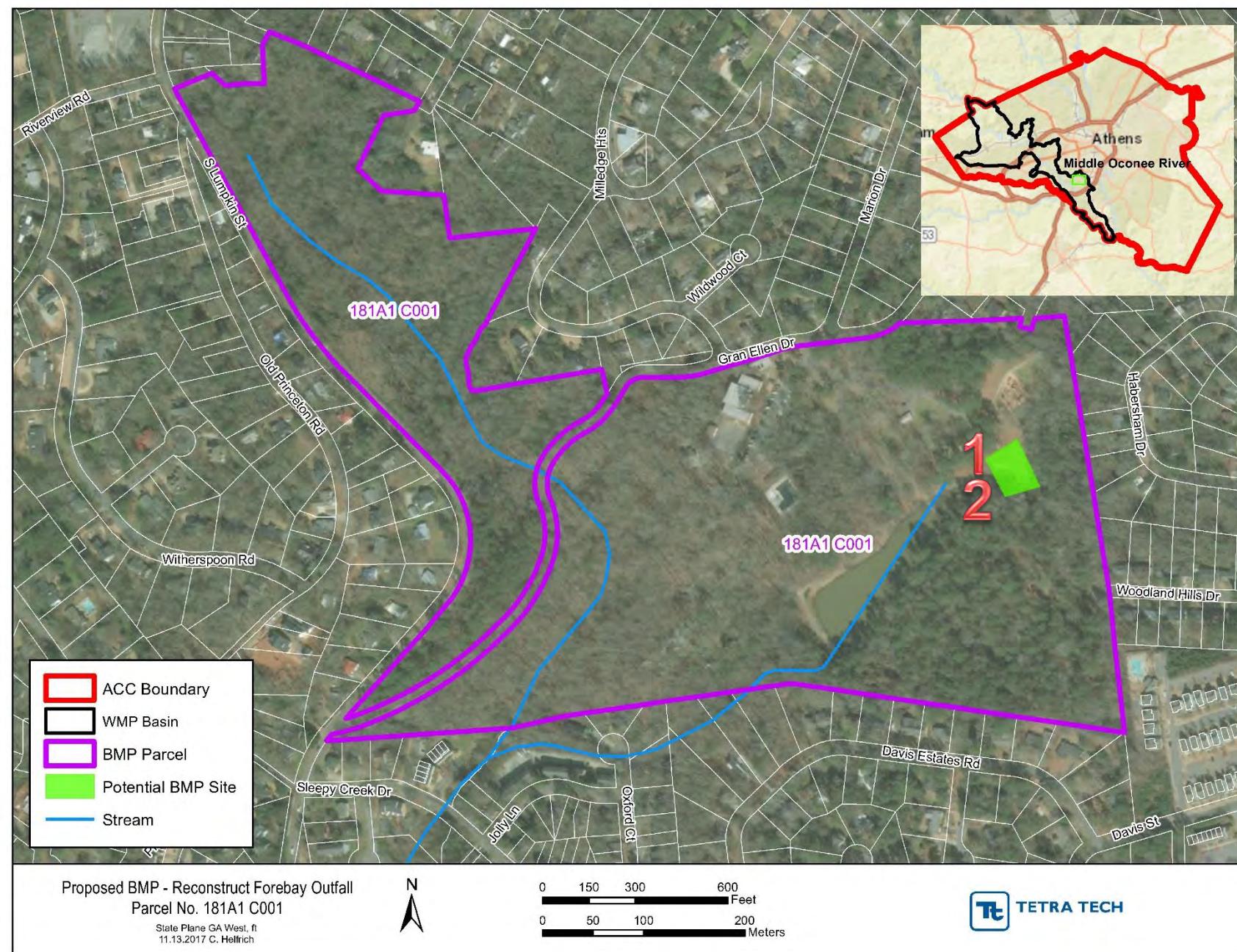
Unstable outfall along Gran Ellen Dr., facing West



Example stabilization cross section using rip rap channels and a vegetated buffer



TETRA TECH



BMP ID	MO-Res-08
Benefits	
Peak Flow Attenuation	
Nutrient Uptake	
Sediment Removal	✓
Beautification	✓
Improved Stream Function	

ATHENS-CLARKE COUNTY
WATERSHED MANAGEMENT PLAN
LOCATION: MIDDLE OCONEE RIVER WATERSHED



Existing deteriorating forebay outfall, facing NE



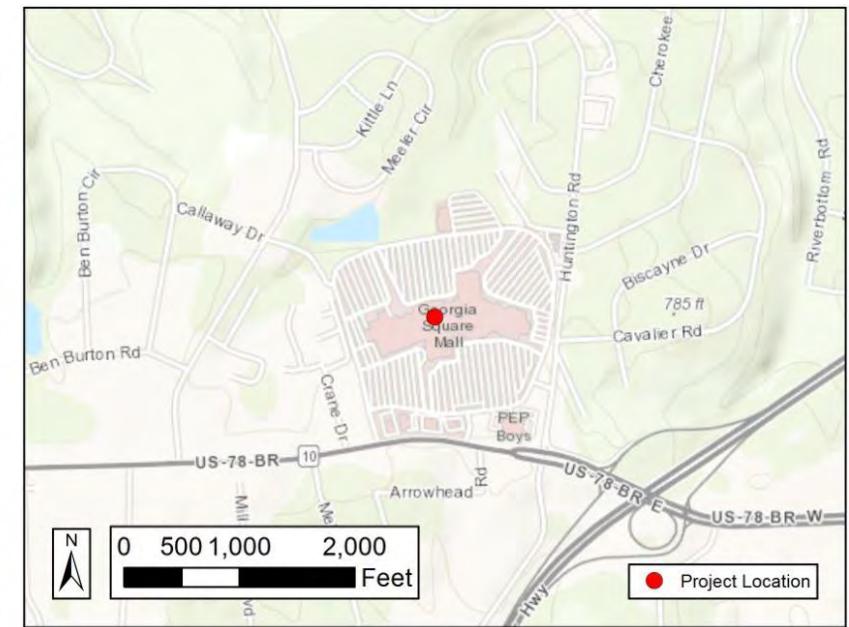
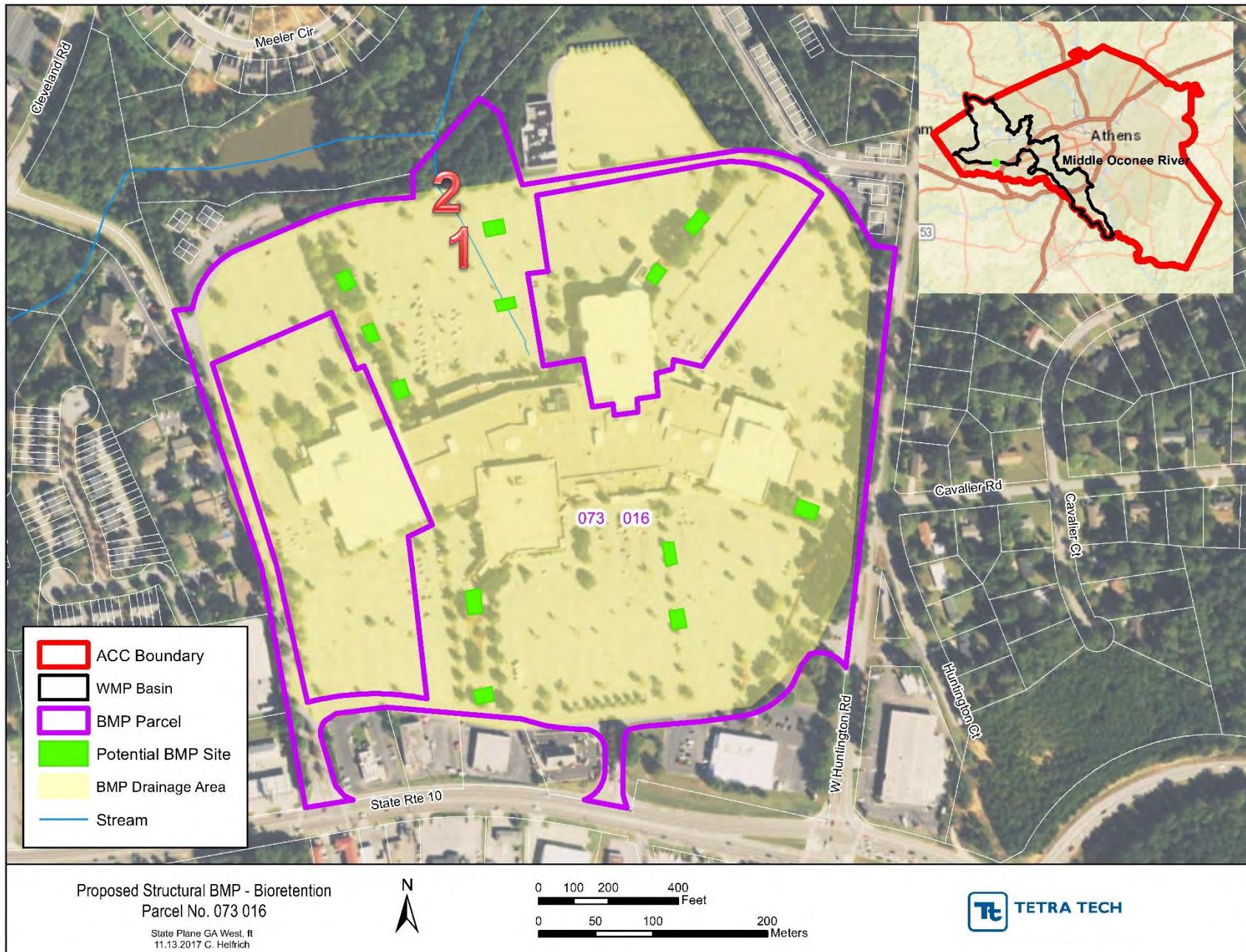
Forebay accumulating sediment, facing NE



Example outfall with cascading water feature



TETRA TECH



Site Location

Parcel Number	073 016	Latitude	33° 56' 56.63" N
Date of Field Visit	06/02/2017	Longitude	83° 28' 04.57" W
Field Visit Personnel	JC, JK	Street Address	Atlanta Hwy
Major Watershed	Middle Oconee	Landowner	KDI Athens Mall LLC

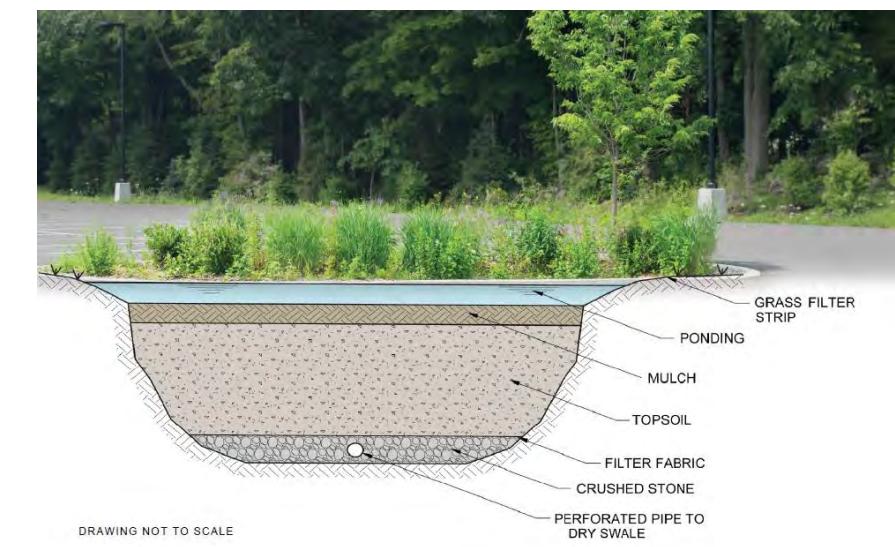
Project Narrative

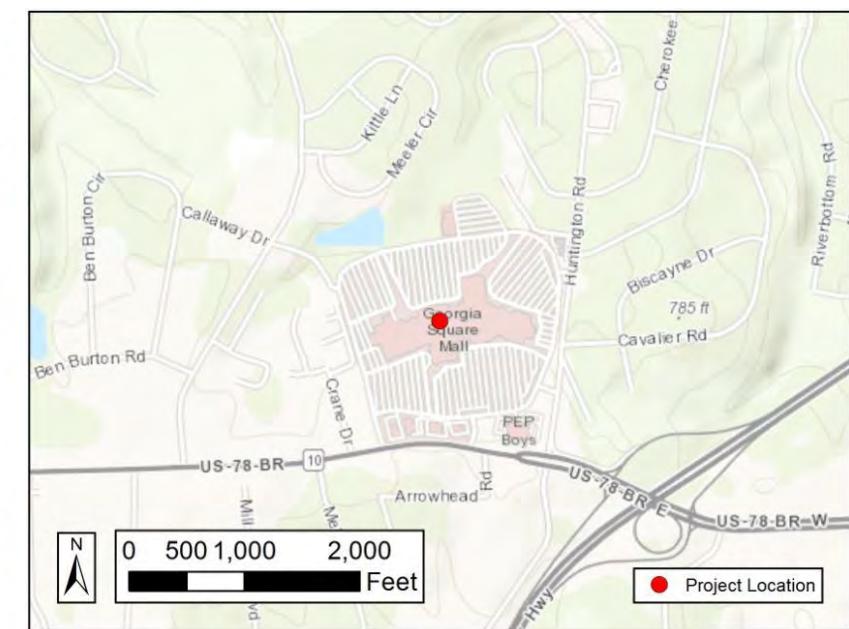
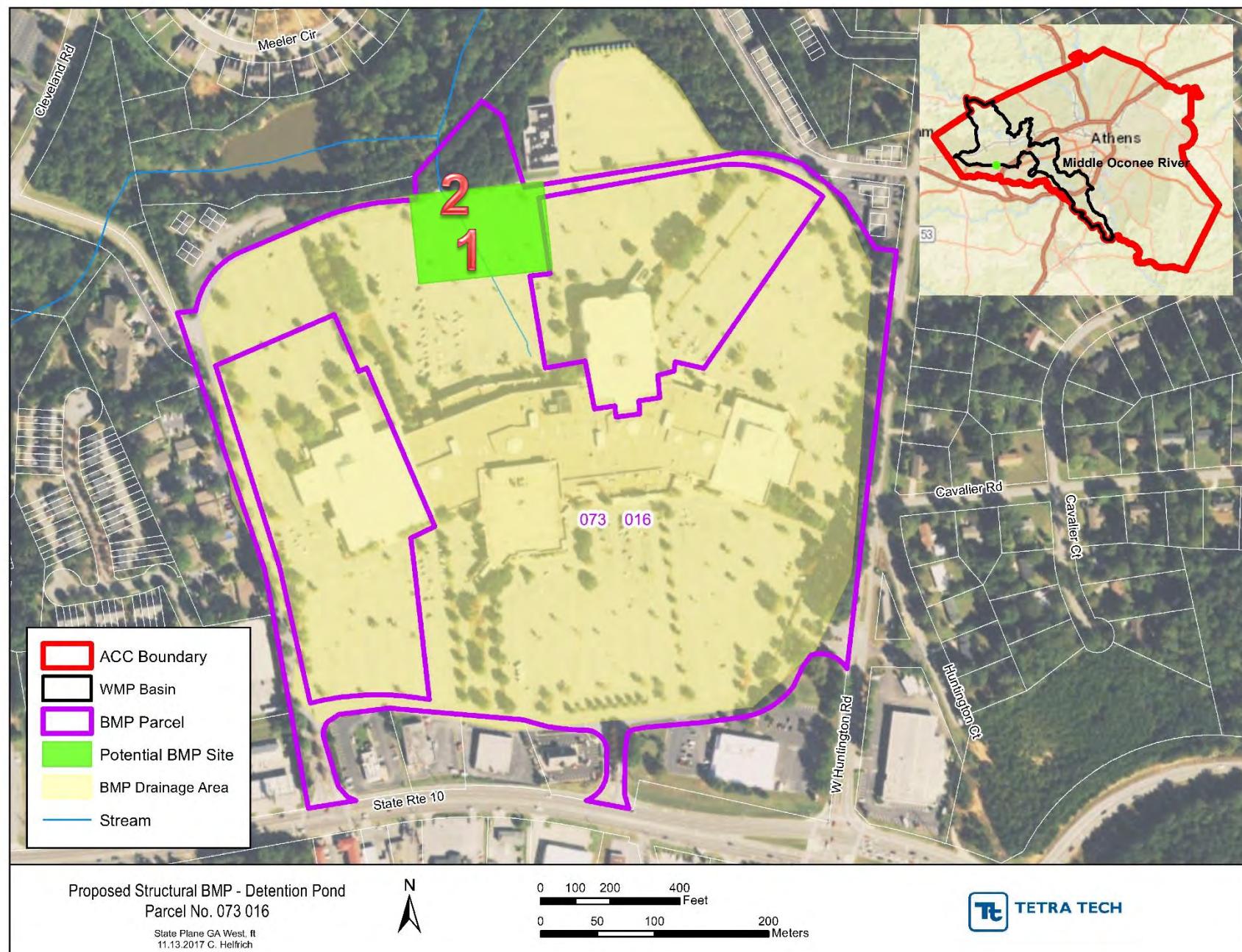
Georgia Square Mall Bioretention

This project involves retrofitting the current parking lots through a system of bioretention cells distributed throughout the property. Bioretention cells outfitted with underdrains would collect stormwater runoff from the mall roof and parking lots currently serviced by a conventional drain system. Overflow from larger storms could be routed to the existing stormwater drainage system. Bioretention would provide nutrient uptake, remove sediment from runoff, and beautification benefits.

Cost Level

LOW	MODERATE	HIGH	VERY HIGH
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Site Location

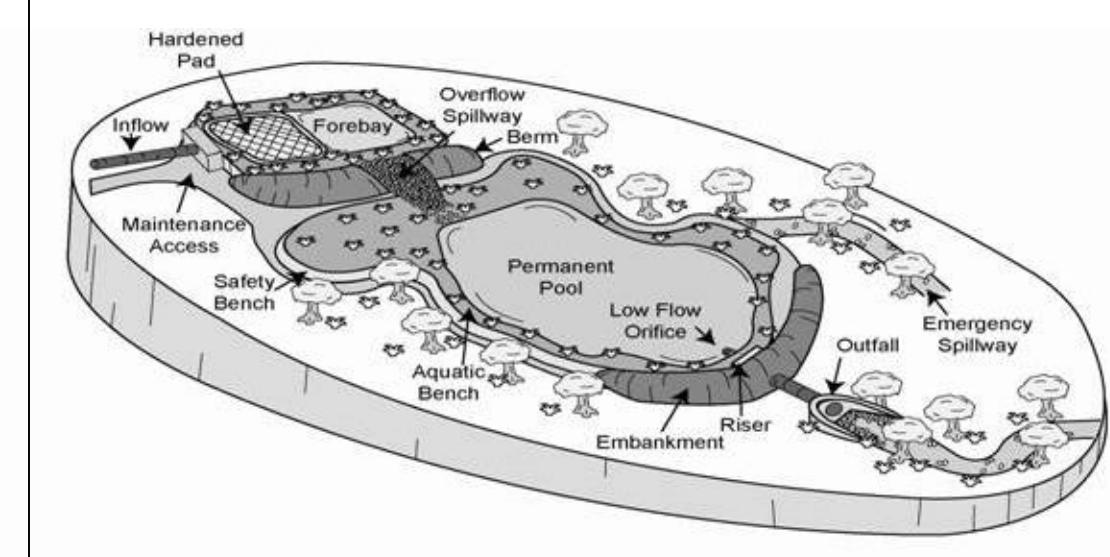
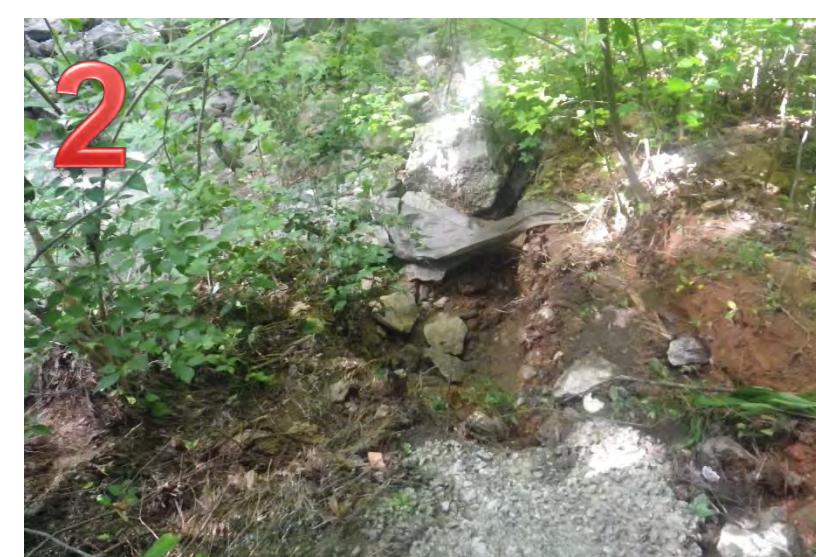
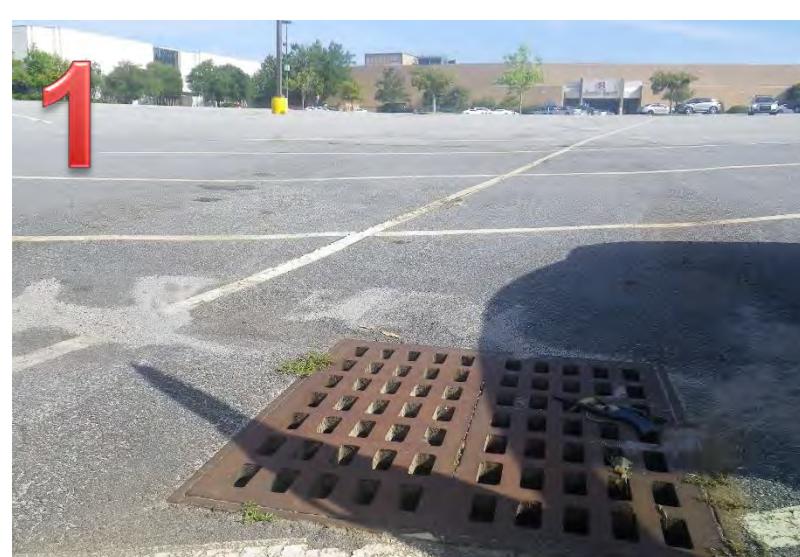
Parcel Number	073 016	Latitude	33° 56' 56.63" N
Date of Field Visit	06/02/2017	Longitude	83° 28' 04.57" W
Field Visit Personnel	JC, JK	Street Address	Atlanta Hwy
Major Watershed	Middle Oconee	Landowner	KDI Athens Mall LLC

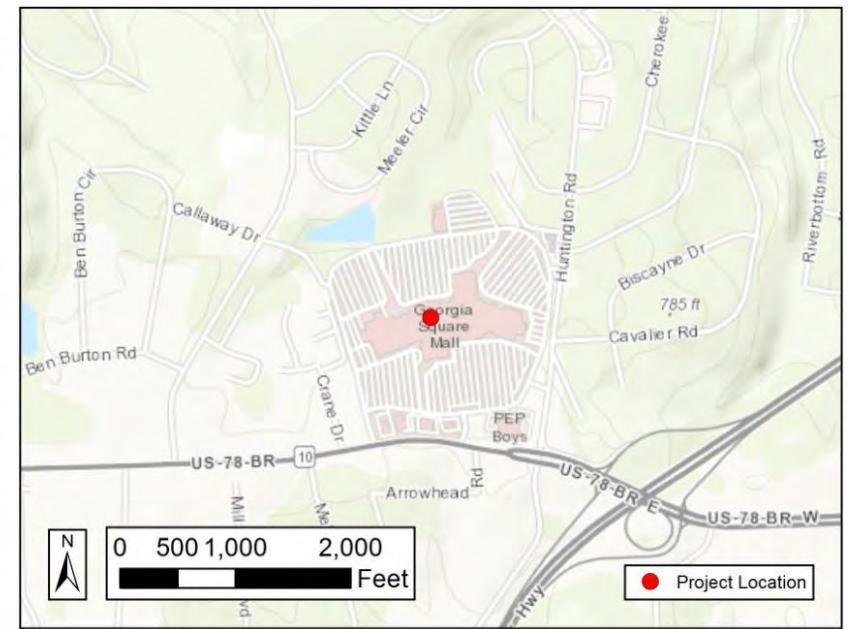
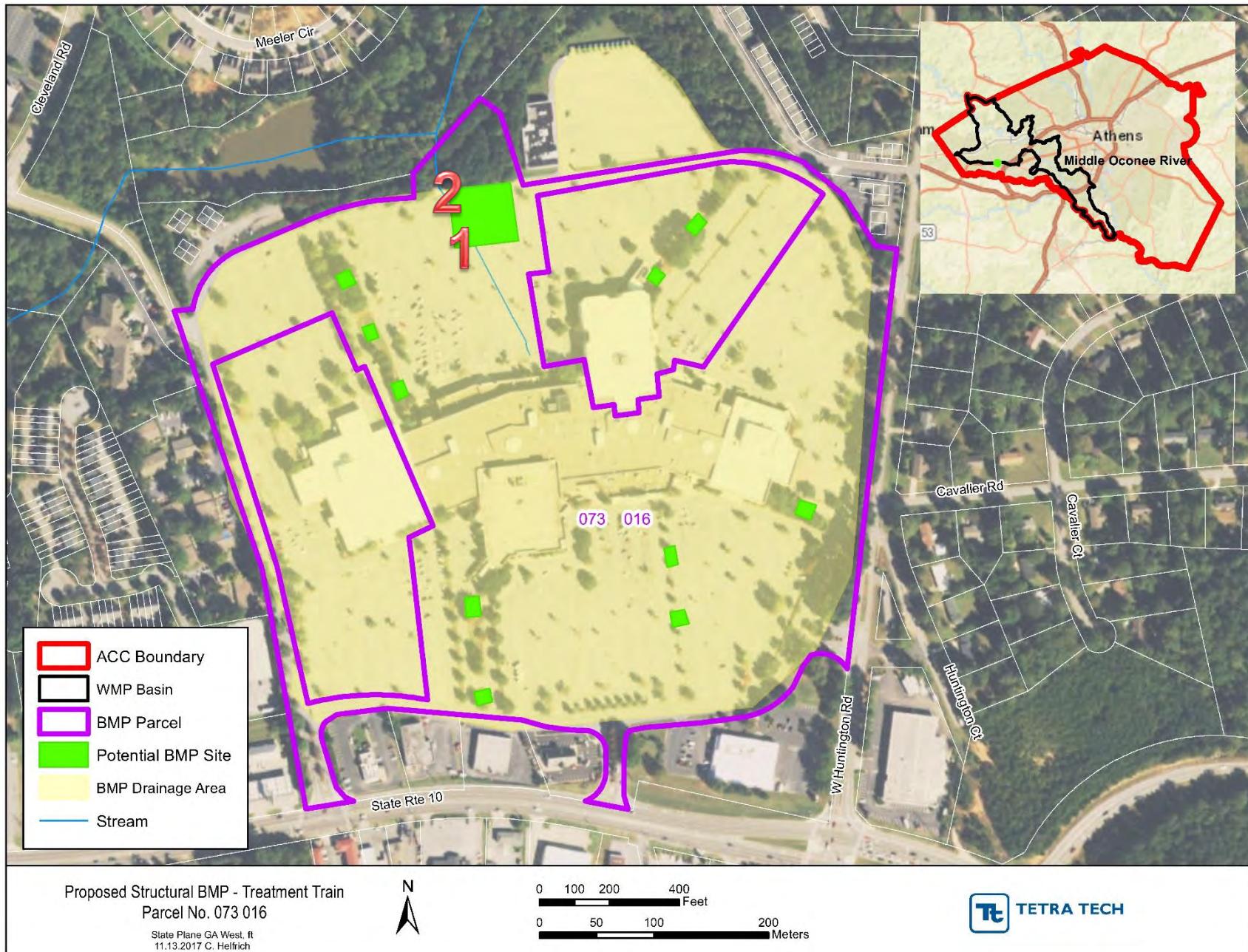
Project Narrative

Georgia Square Mall Detention
This project involves the construction of a large wet detention pond to manage stormwater runoff for the Mall property. The mall property is 95% impervious. Stormwater runoff is conveyed through a conventional stormwater system that does not contain any stormwater BMPs and does not meet current stormwater management requirements. Benefits include substantial peak flow attenuation, sediment removal, beautification, and improved stream function.

Cost Level

LOW	MODERATE	HIGH	VERY HIGH
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Site Location

Parcel Number	073 016	Latitude	33° 56' 56.63" N
Date of Field Visit	06/02/2017	Longitude	83° 28' 04.57" W
Field Visit Personnel	JC, JK	Street Address	Atlanta Hwy
Major Watershed	Middle Oconee	Landowner	KDI Athens Mall LLC

Project Narrative

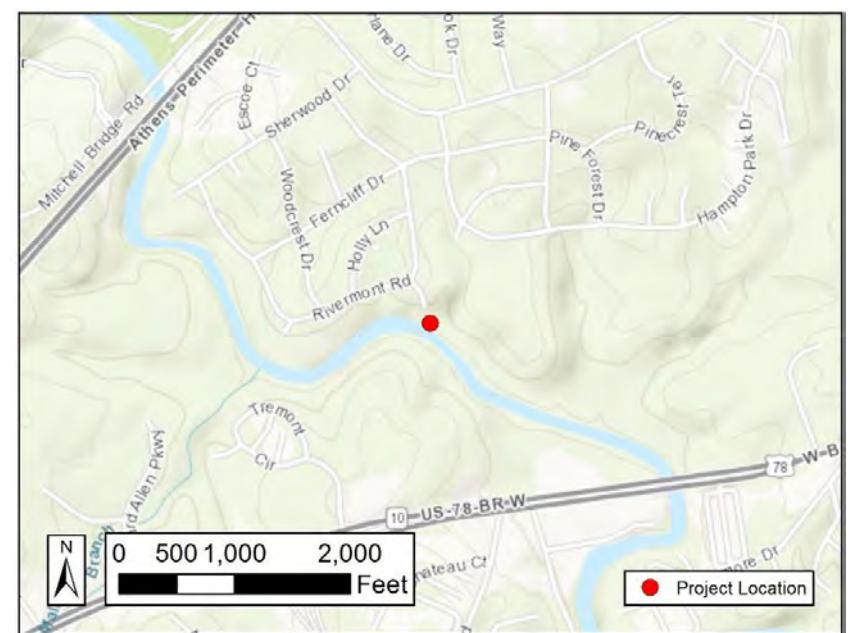
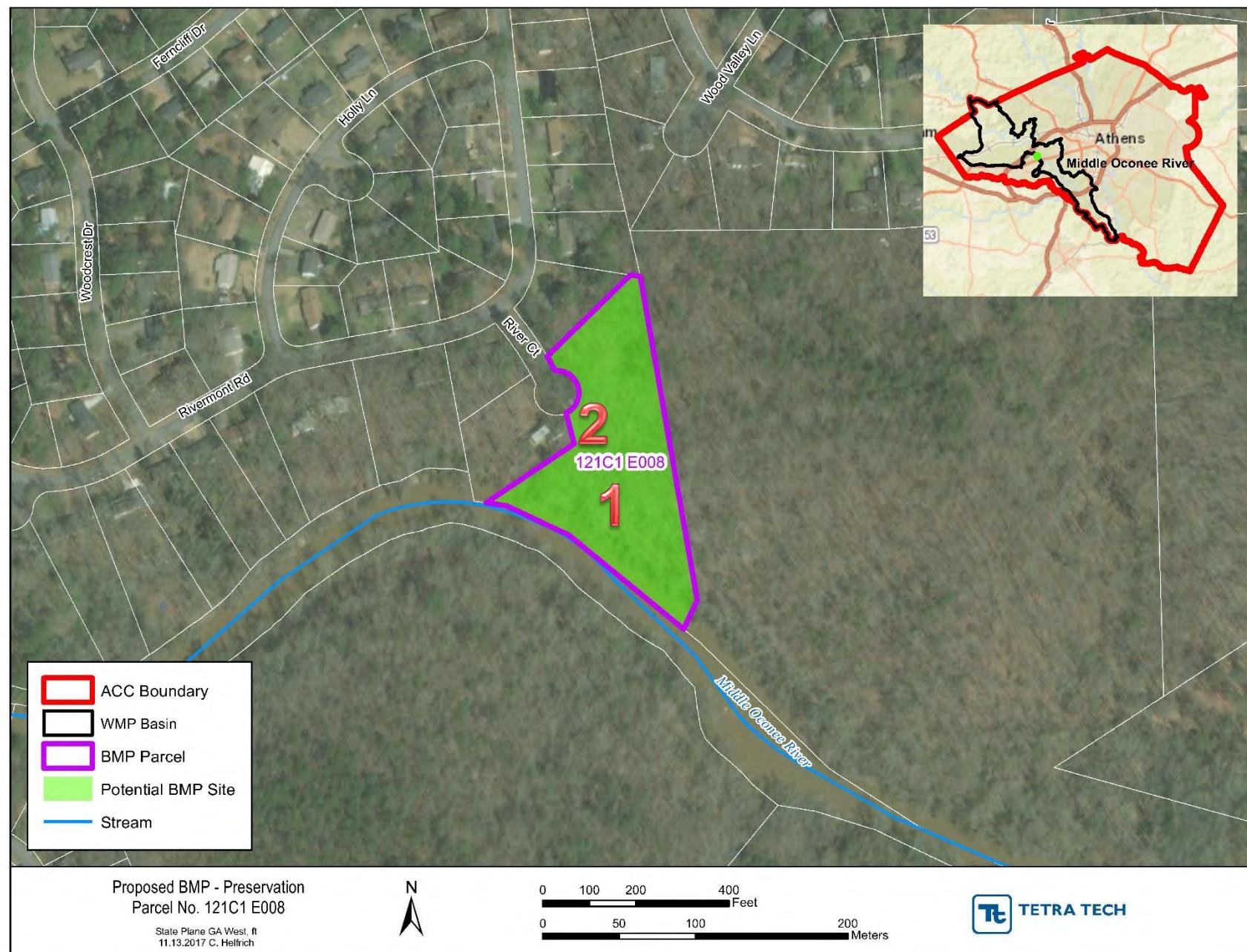
Georgia Square Mall Treatment Train

This project involves the design and construct a stormwater runoff treatment train consisting of bioretention cells in the mall parking lots that overflow into a detention basin. The combination of these two BMP practices is a cost effective strategy to gain the benefits of each, including peak flow attenuation, nutrient uptake, sediment removal, and beautification.

Cost Level

LOW MODERATE HIGH **VERY HIGH**

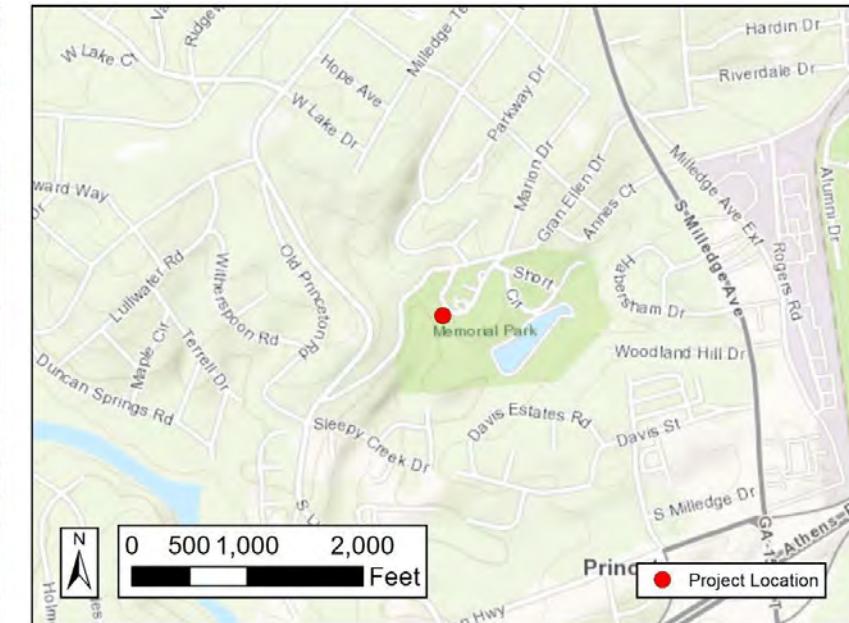
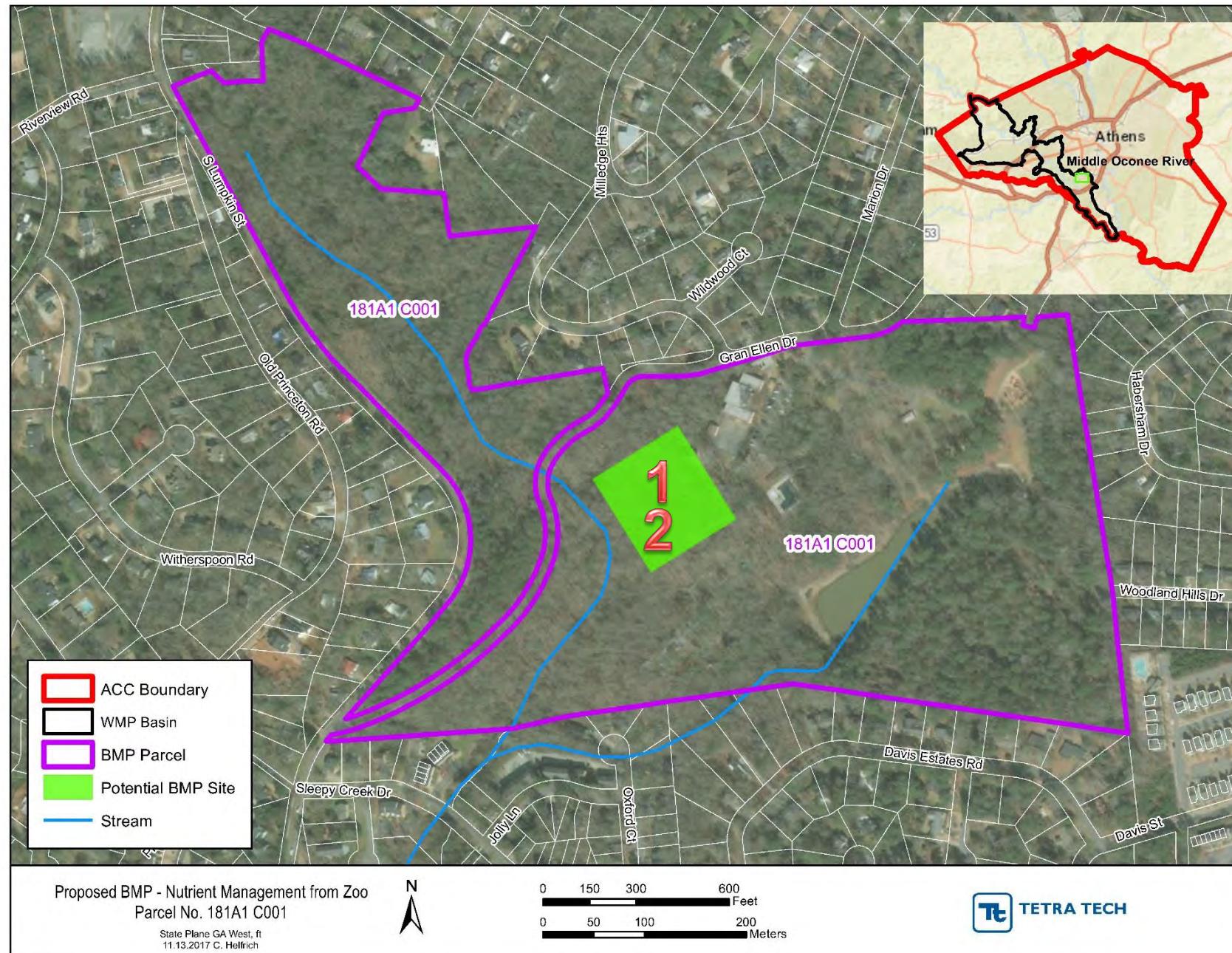




BMP ID	
MO-Res-02	
Benefits	
Peak Flow Attenuation	
Nutrient Uptake	✓
Sediment Removal	✓
Beautification	✓
Improved Stream Function	✓

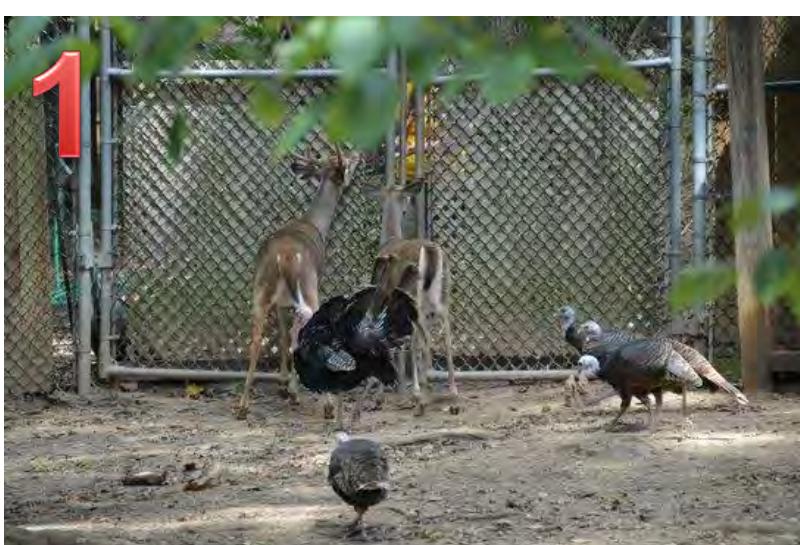
ATHENS-CLARKE COUNTY
WATERSHED MANAGEMENT PLAN
LOCATION: MIDDLE OCONEE RIVER WATERSHED





BMP ID	
MO-Prog-02	
Benefits	
Peak Flow Attenuation	
Nutrient Uptake	✓
Sediment Removal	
Beautification	
Improved Stream Function	

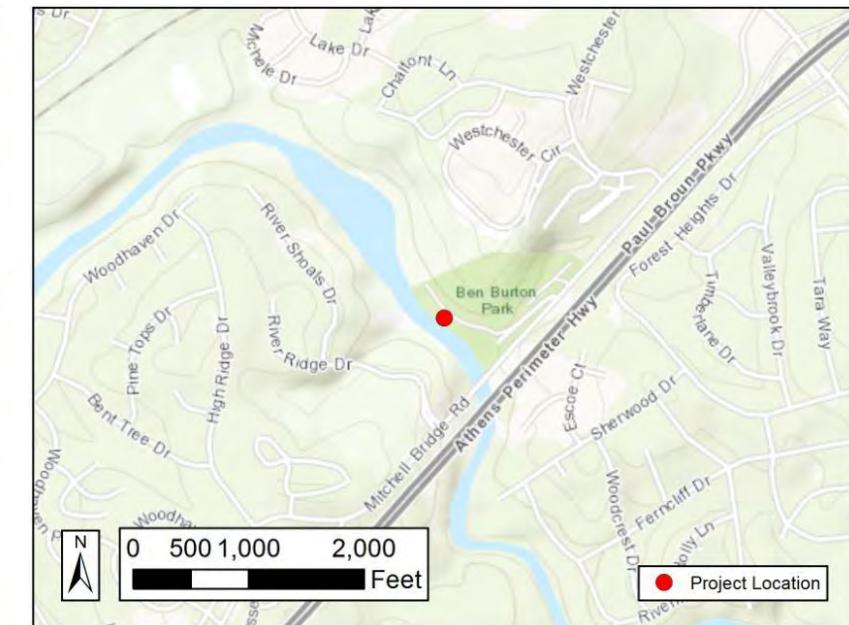
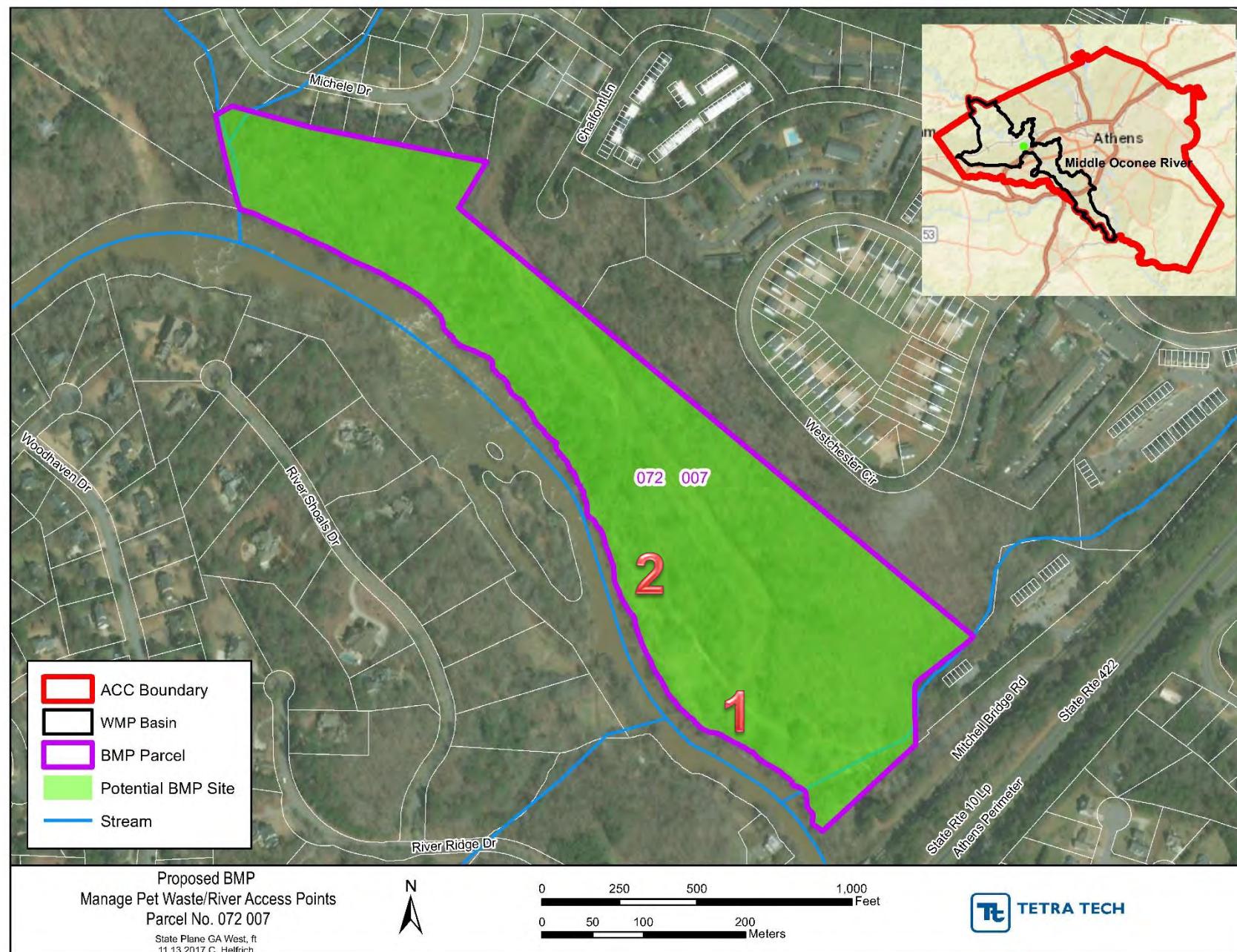
ATHENS-CLARKE COUNTY WATERSHED MANAGEMENT PLAN LOCATION: MIDDLE OCONEE RIVER WATERSHED



Innovative solution to animal waste management at the Detroit Zoo



TETRA TECH

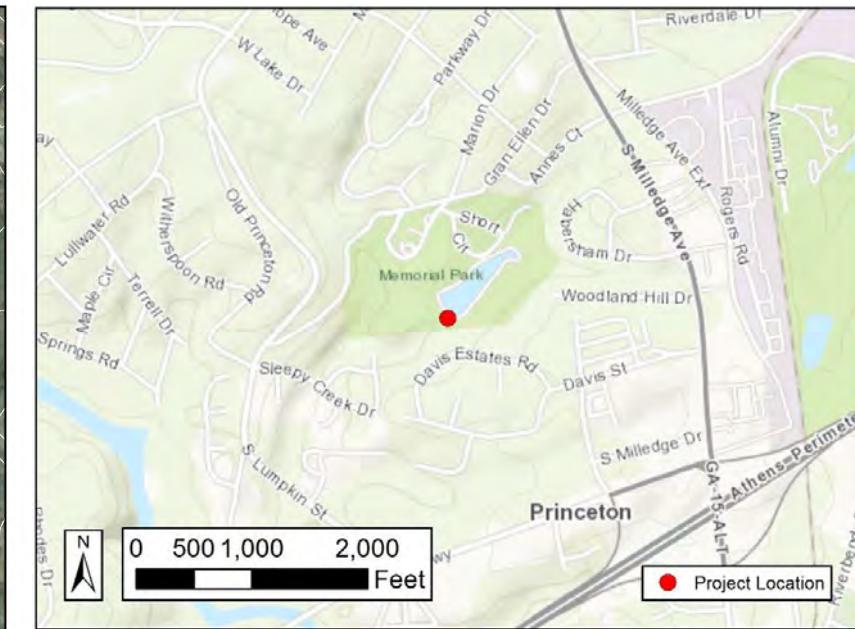
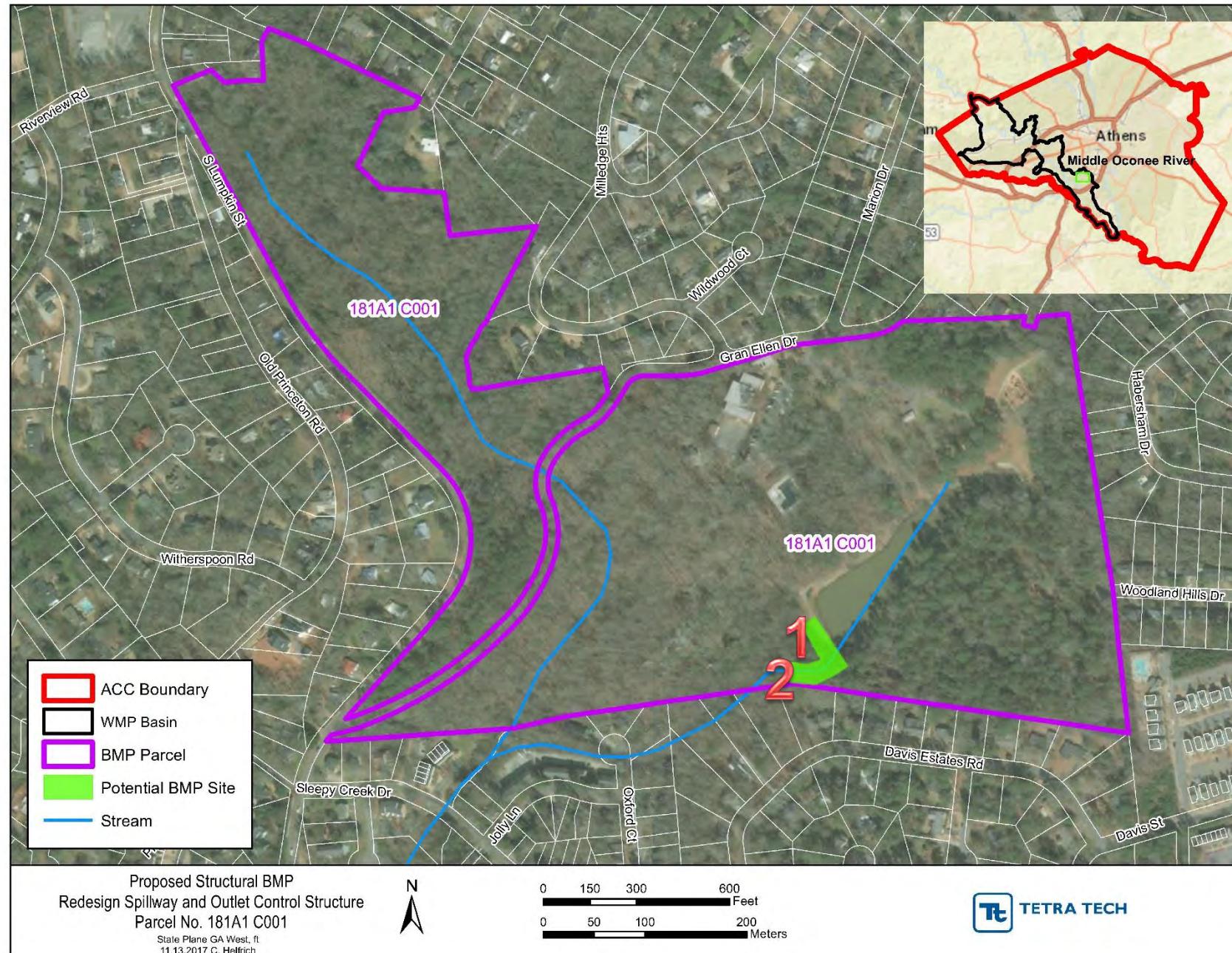


BMP ID	
MO-Res-01	
Benefits	
Peak Flow Attenuation	
Nutrient Uptake	✓
Sediment Removal	✓
Beautification	✓
Improved Stream Function	

ATHENS-CLARKE COUNTY
WATERSHED MANAGEMENT PLAN
LOCATION: MIDDLE OCONEE RIVER WATERSHED

TETRA TECH

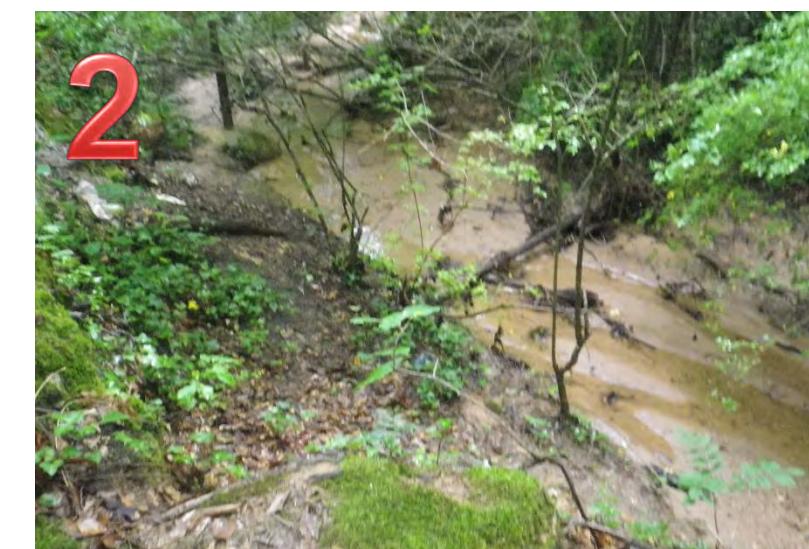




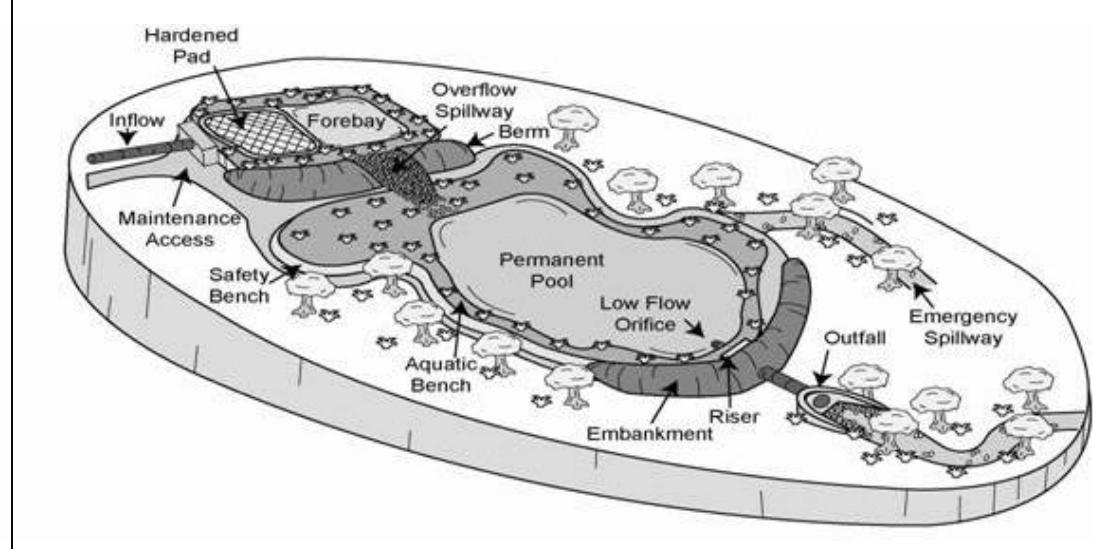
**ATHENS-CLARKE COUNTY
WATERSHED MANAGEMENT PLAN
LOCATION: MIDDLE OCONEE RIVER WATERSHED**



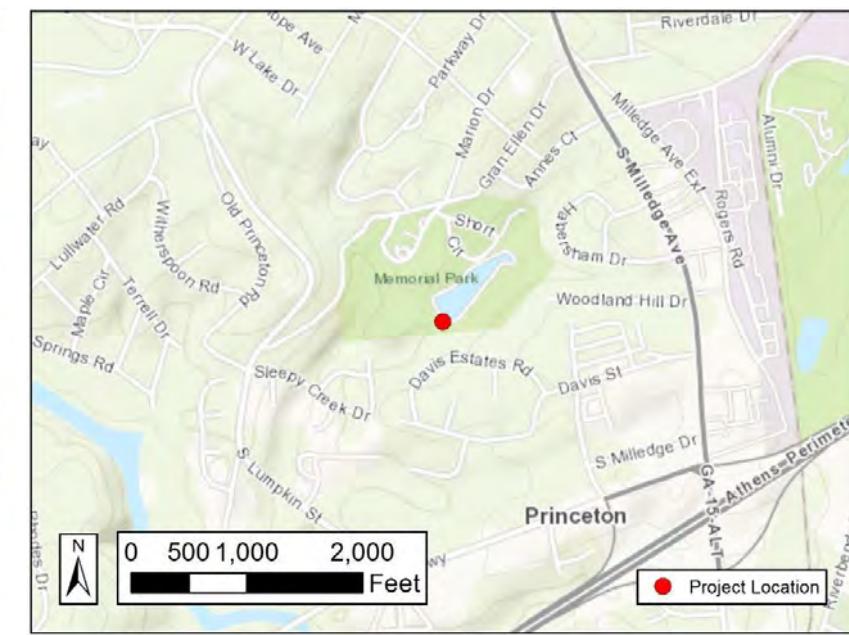
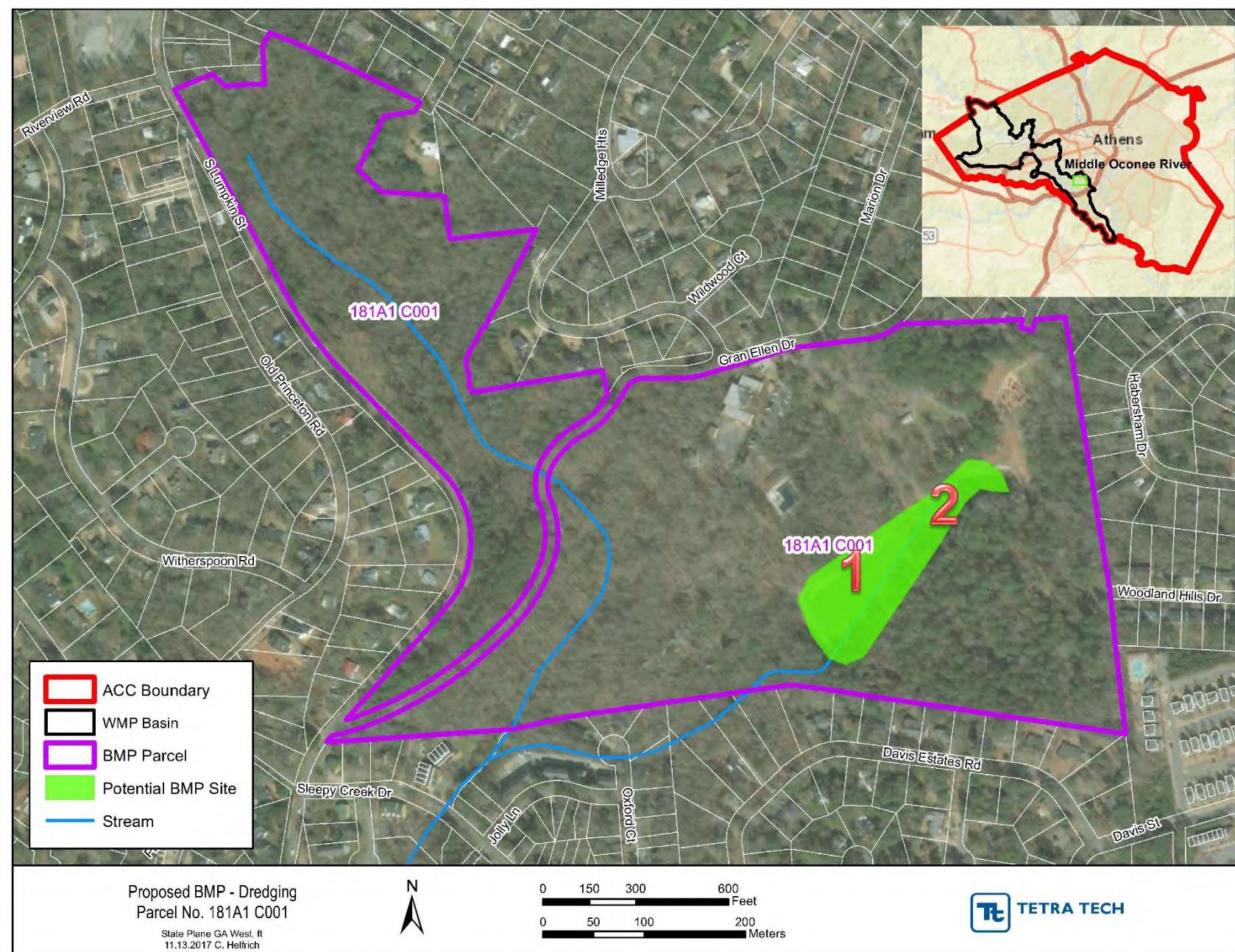
Location of emergency spillway, facing NE towards pond



Typical conditions of the emergency spillway gully, facing West



TETRA TECH



BMP ID	
MO-Res-04	
Benefits	
Peak Flow Attenuation	
Nutrient Uptake	✓
Sediment Removal	✓
Beautification	✓
Improved Stream Function	

ATHENS-CLARKE COUNTY WATERSHED MANAGEMENT PLAN LOCATION: MIDDLE OCONEE RIVER WATERSHED



Site Location

Parcel Number	181A1 C001	Latitude	33° 55' 55.54" N
Date of Field Visit	10/11/2017	Longitude	83° 23' 09.03" W
Field Visit Personnel	EG, CH	Street Address	Gran Ellen Dr.
Major Watershed	Middle Oconee	Landowner	Athens-Clarke Co.

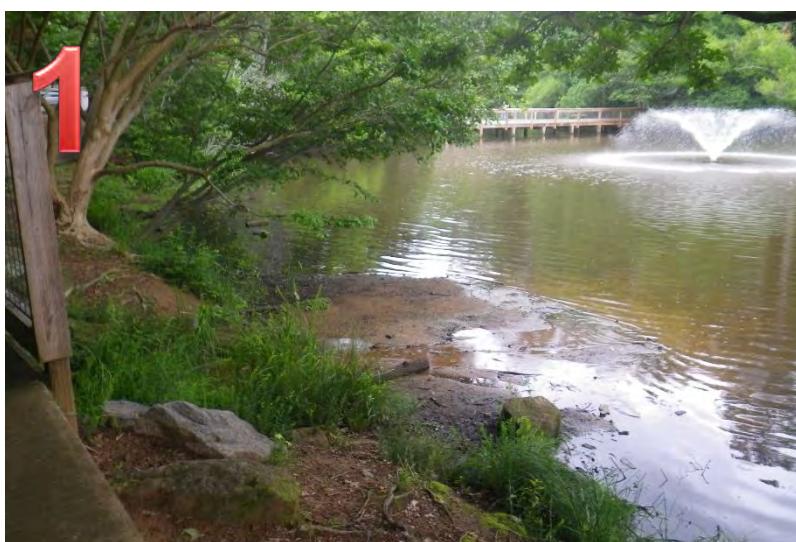
Project Narrative

Memorial Park Pond Dredging

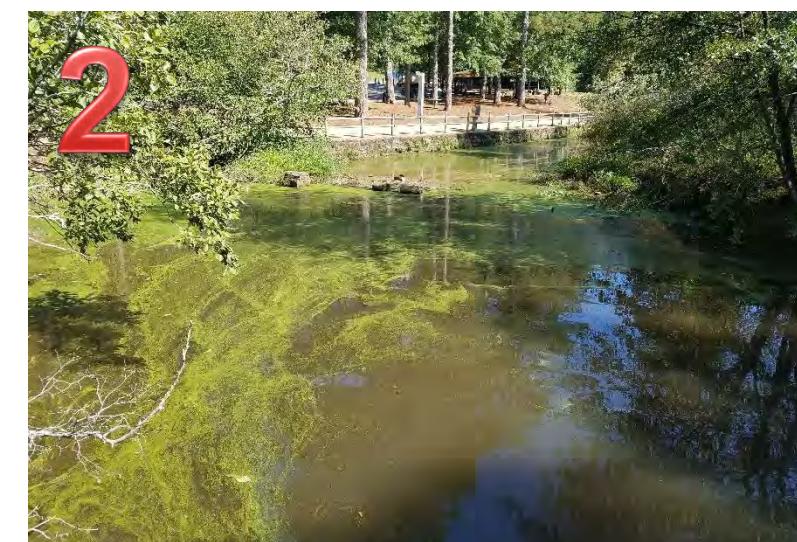
This project involves the analysis of sediment load being delivered to the Memorial Park Pond and desired amount of material, and possibly remove the island in the upper portion of the pond, to continue to provide a safe and enjoyable public amenity. Benefits include nutrient uptake, sediment removal, and beautification.

Cost Level

LOW	MODERATE	HIGH	VERY HIGH
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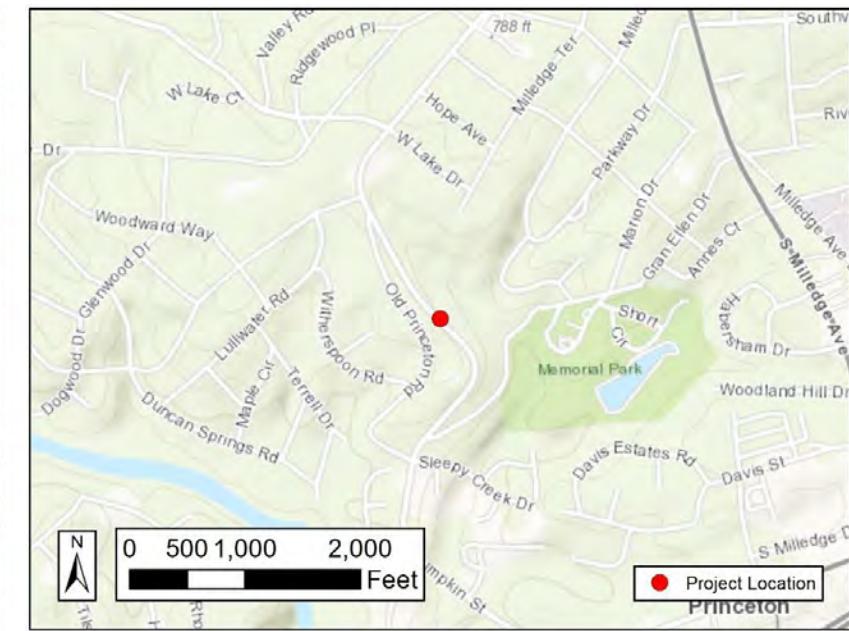
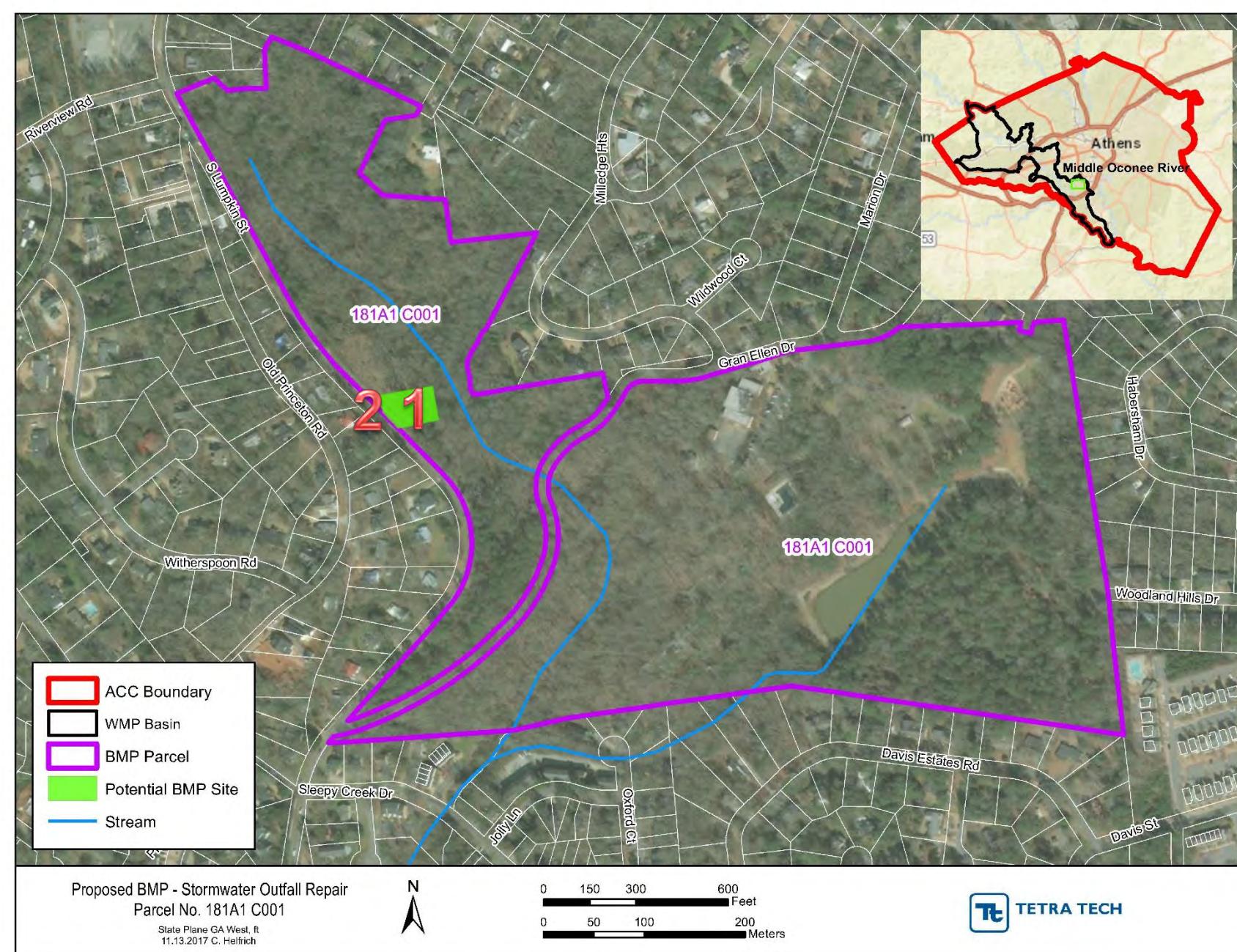
Pond tributary contributing sediment, facing NE



Algal buildup near "island" at North end of pond, facing North



Typical mechanical pond dredging operations



BMP ID	
MO-Res-05	
Benefits	
Peak Flow Attenuation	
Nutrient Uptake	
Sediment Removal	✓
Beautification	✓
Improved Stream Function	✓

Site Location

Parcel Number	181A1 C001	Latitude	33° 55' 55.67" N
Date of Field Visit	10/11/2017	Longitude	83° 23' 26.07" W
Field Visit Personnel	EG, CH	Street Address	S. Lumpkin St.
Major Watershed	Middle Oconee	Landowner	Athens-Clarke Co.

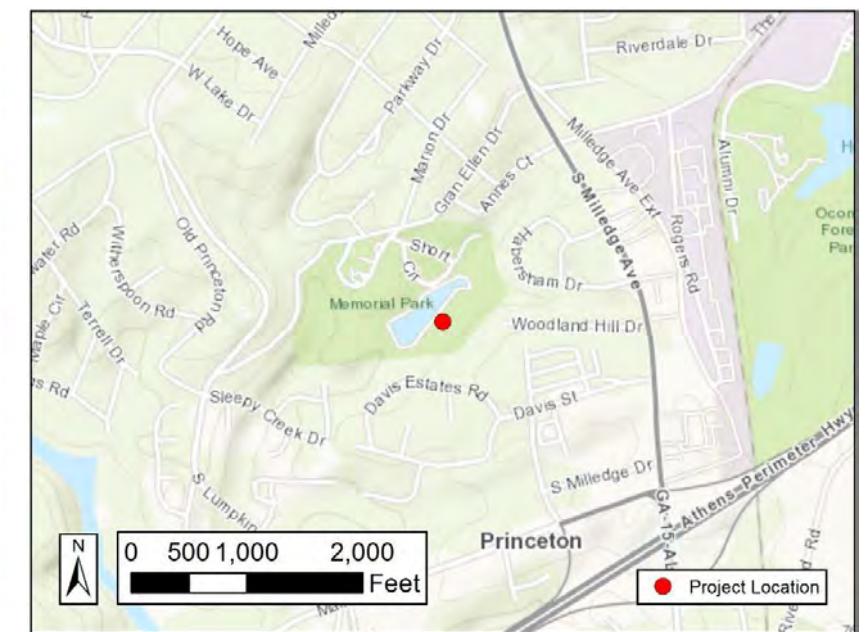
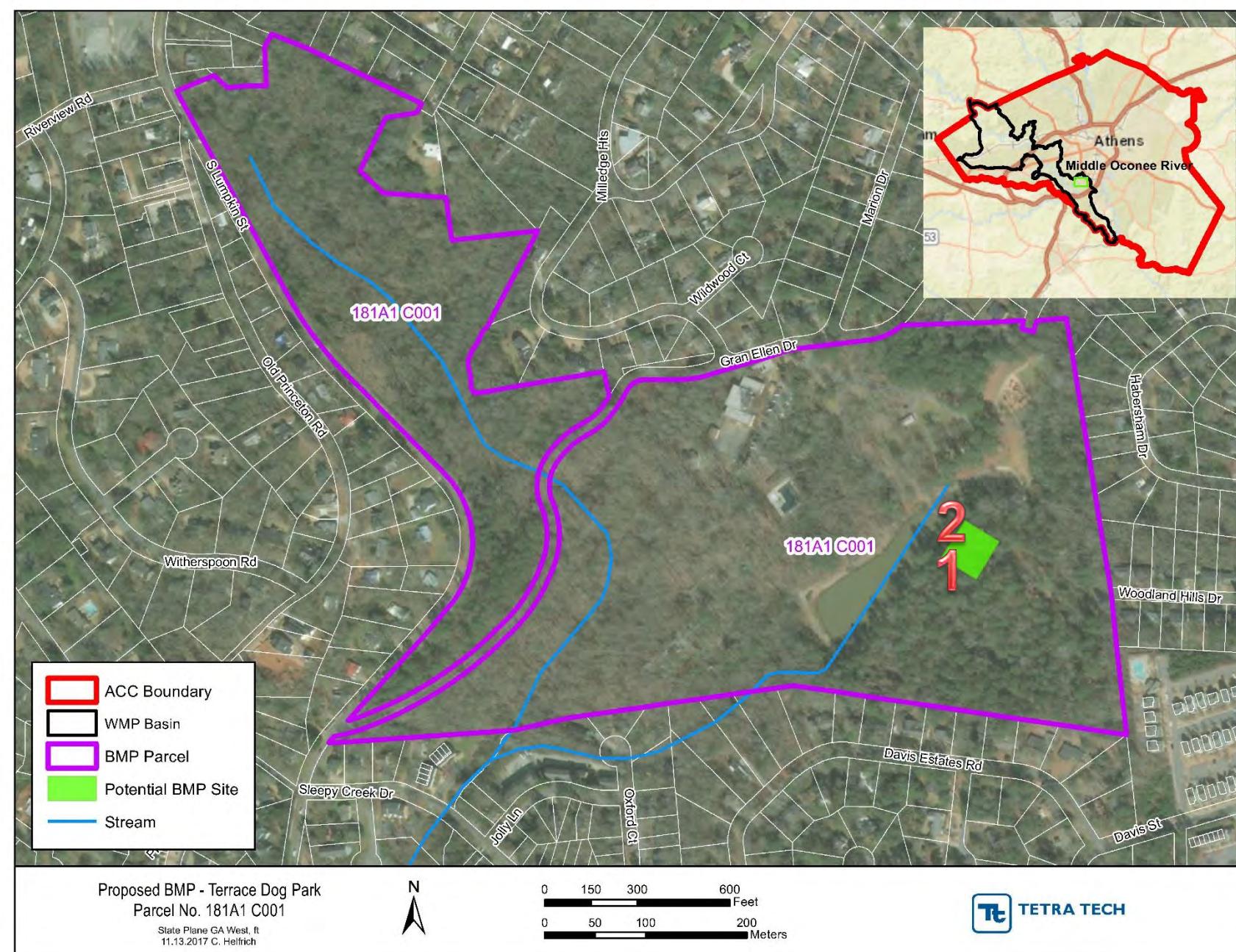
Project Narrative

Memorial Park - South Lumpkin Street Outfall Repair and Bank Stabilization
 This project involves the construction of a stormwater outfall and reshape/stabilize the banks of a drainage channel that are currently mass wasting during high flows from a road culvert crossing South Lumpkin Street. The channel is nearly six feet deep with bare vertical walls and is a tributary to one of the main streams flowing through Memorial Park. Benefits include reduced sediment transport, beautification, and improved stream function.

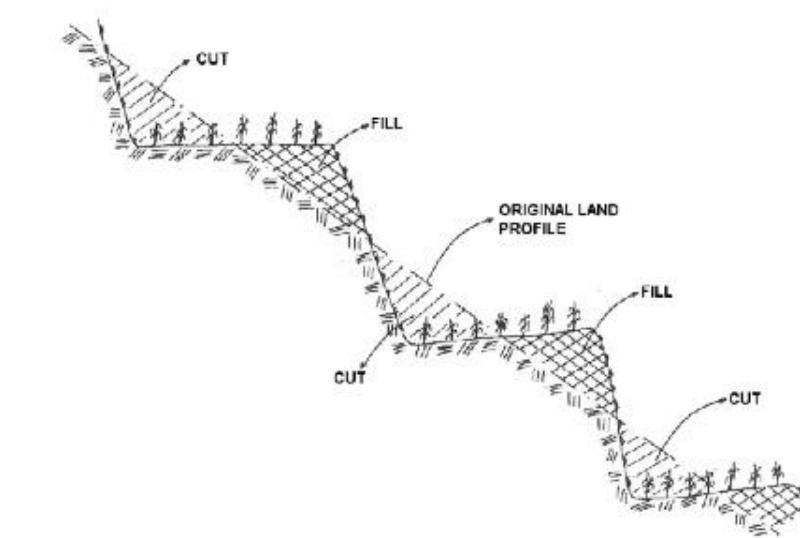
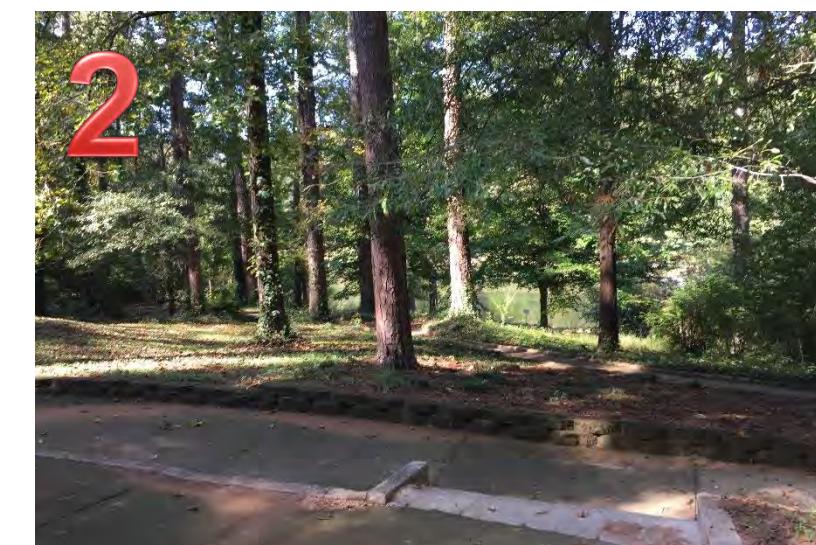
Cost Level

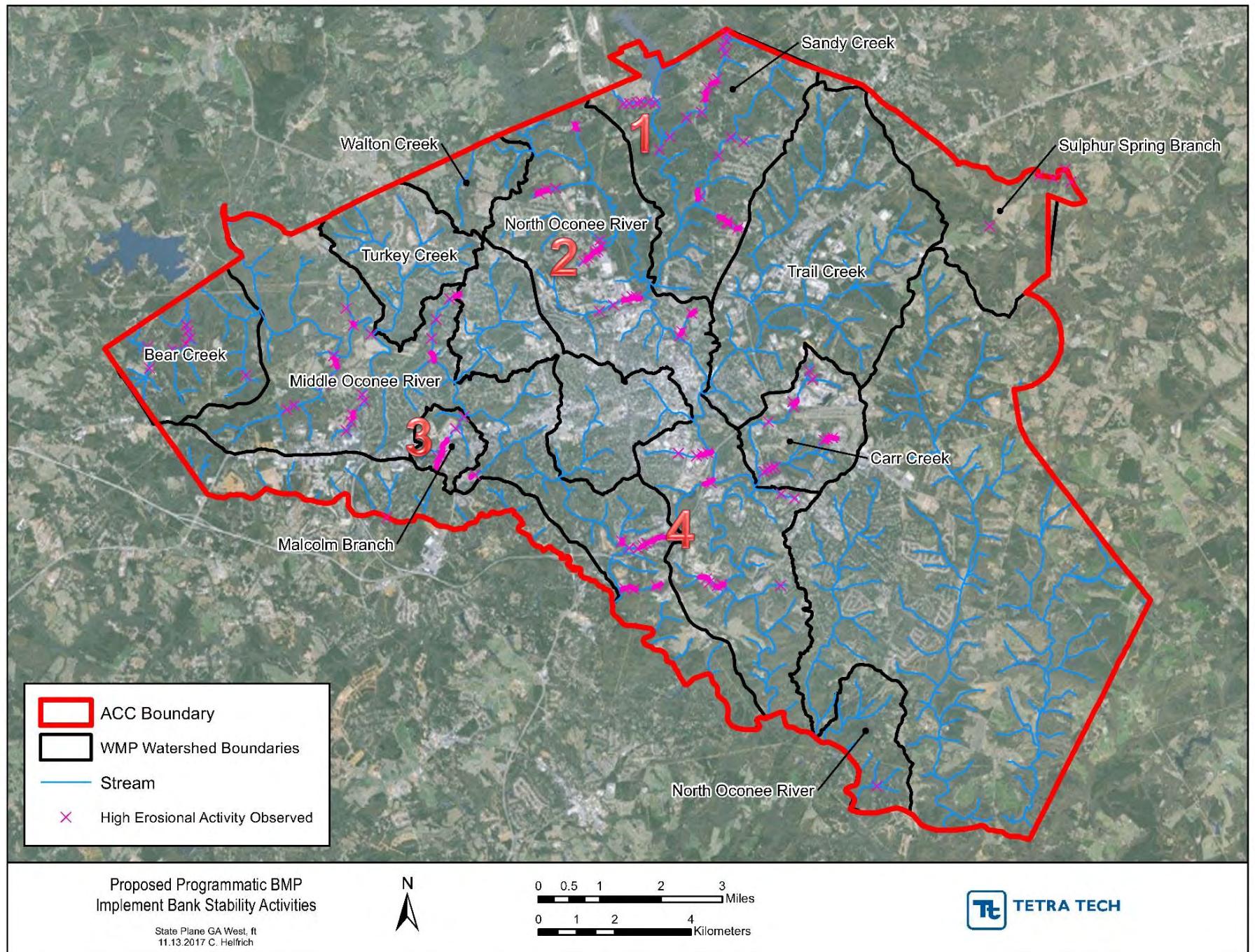
LOW	MODERATE	HIGH	VERY HIGH
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ATHENS-CLARKE COUNTY
WATERSHED MANAGEMENT PLAN
LOCATION: MIDDLE OCONEE RIVER WATERSHED





Bank erosion and failure along Sandy Creek/Cooks Trail



Bank erosion along a tributary to the North Oconee River

BMP ID	
ACC-Prog-02	
Project Narrative	
Bank Stabilization	
Bank stabilization activities along Sandy Creek/Cooks Trail and other high erosion areas can control and prevent erosion at problem spots along ACC streams. Measures such as vegetative stabilization, bioengineering, sills, riprap, revetment, gabion baskets, stream barbs, and bulkheads, or combinations of these techniques can be implemented under Nationwide Permit #13, provided the activity is no more than 500 feet in length along the bank, and will not exceed an average of one cubic yard per running foot below the ordinary high water mark. Work with the Sustainability Office to utilize silviculture and forestry options as part of vegetative maintenance.	
Peak Flow Attenuation	
Nutrient Uptake	✓
Sediment Removal	✓
Beautification	✓
Improved Stream Function	

Cost Level	
VARIES	



Bank erosion along Malcolm Branch

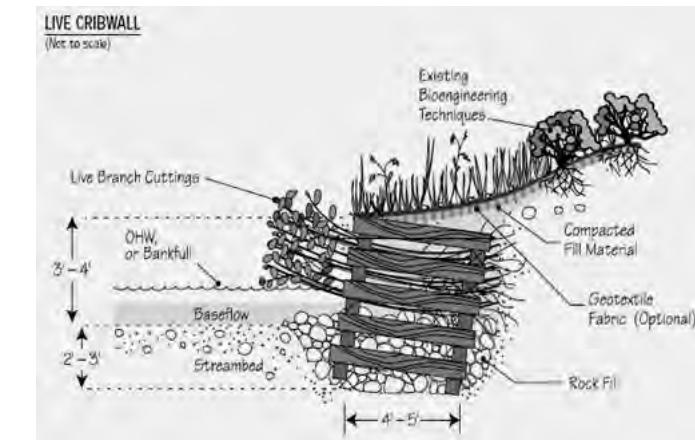
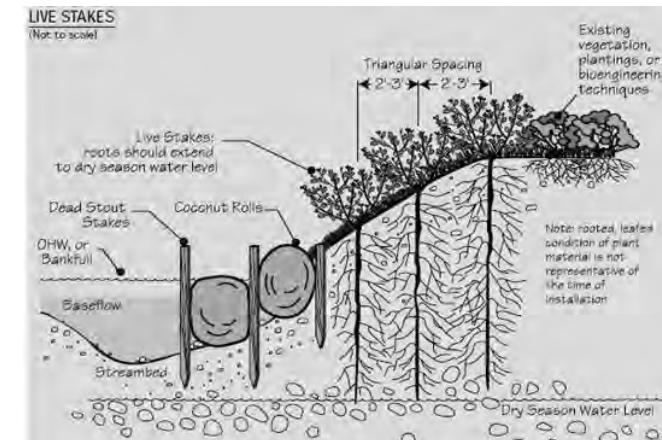
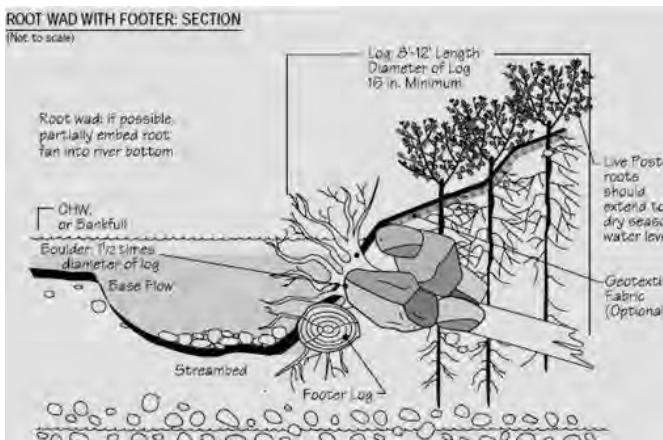
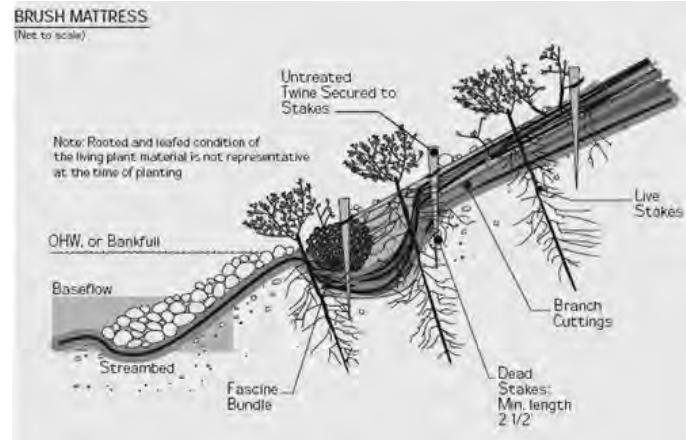


Bank erosion and failure along a tributary to the Middle Oconee River

ATHENS-CLARKE COUNTY
WATERSHED MANAGEMENT PLAN
LOCATION: HIGH EROSION AREAS

TETRA TECH

TYPICAL STREAM BANK STABILIZATION DESIGNS AND EXAMPLES



ALTERNATIVES

Concrete revetment at tributary entrance



Gabion baskets



Riprap revetment



ATHENS-CLARKE COUNTY
WATERSHED MANAGEMENT PLAN
LOCATION: HIGH EROSION AREAS