COMMUNITY-BASED DESIGN USING NATURE-BASED SOLUTIONS TO MEET CLIMATE CHANGE CHALLENGES ALONG URBAN HILLSBOROUGH RIVER, TAMPA

USF Project Team:

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Other Partners:

Applied Sciences, Inc. (Engineering & Planning)
OJLA, LLC (Landscape design)

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UNIVERSITY of SOUTH FLORIDA

NATIONAL ACADEMIES Sciences Engineering Medicine

GULF RESEARCH PROGRAM

Research Team:

UNIVERSITY of SOUTH FLORIDA

NATIONAL ACADEMIES Sciences Engineering Medicine

GULF RESEARCH PROGRAM

Background:

USF (with Applied Sciences, Inc. and OJLI, LLC), in collaboration with City of Tampa, received funding from *National Academies Gulf Research Program*.

Goal:

Design NBS (Nature Based Solution) projects for the Lower Hillsborough River, through

1) Engaging communities to co-design the projects: to ensure community buy-in and ownership.
2) Applying innovative forward-looking science: nature-based solutions.
3) Engaging stakeholders: to ensure the designed projects are technically sound and feasible.

Products:

Design of Nature Based Solution at three selected sites.

Next Steps:

Seeking funding for project construction.

Community design workshop:

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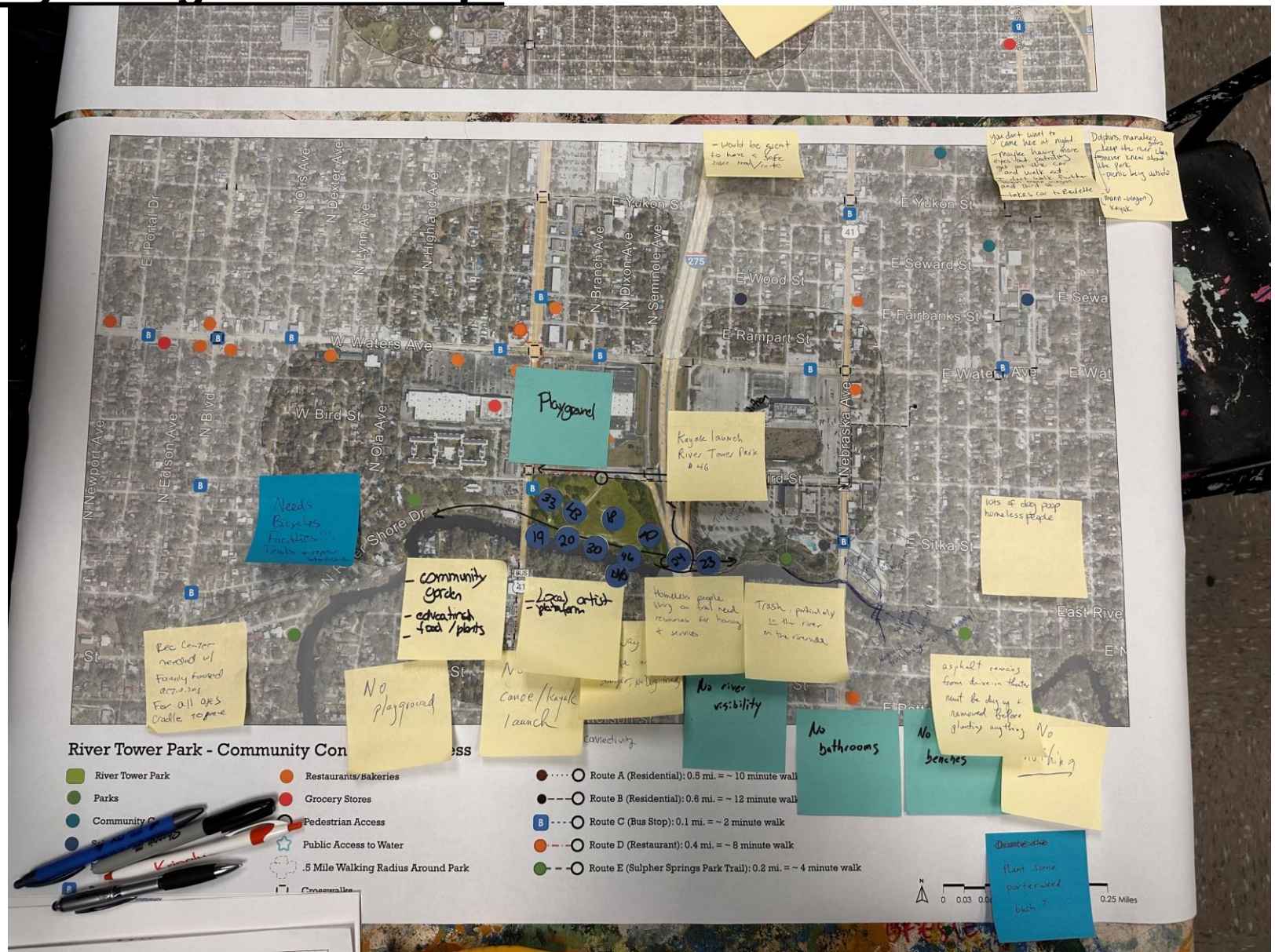
Community design workshop:



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COMMUNITY-BASED DESIGN USING NATURE-BASED SOLUTIONS TO MEET CLIMATE CHANGE CHALLENGES ALONG URBAN HILLSBOROUGH RIVER, TAMPA

Progress Presentation

Design NBS (Nature Based Solution) projects for Lower Hillsborough River, through

1) Engaging communities to co-design the projects: to ensure community buy-in and ownership.
2) Applying innovative forward-looking science: nature-based solutions.
3) **Engaging stakeholders: to ensure the designed projects are technically sound and feasible.**

Products:

Design of Nature Based Solution at three selected sites.

Next Steps:

Seeking funding for project construction.

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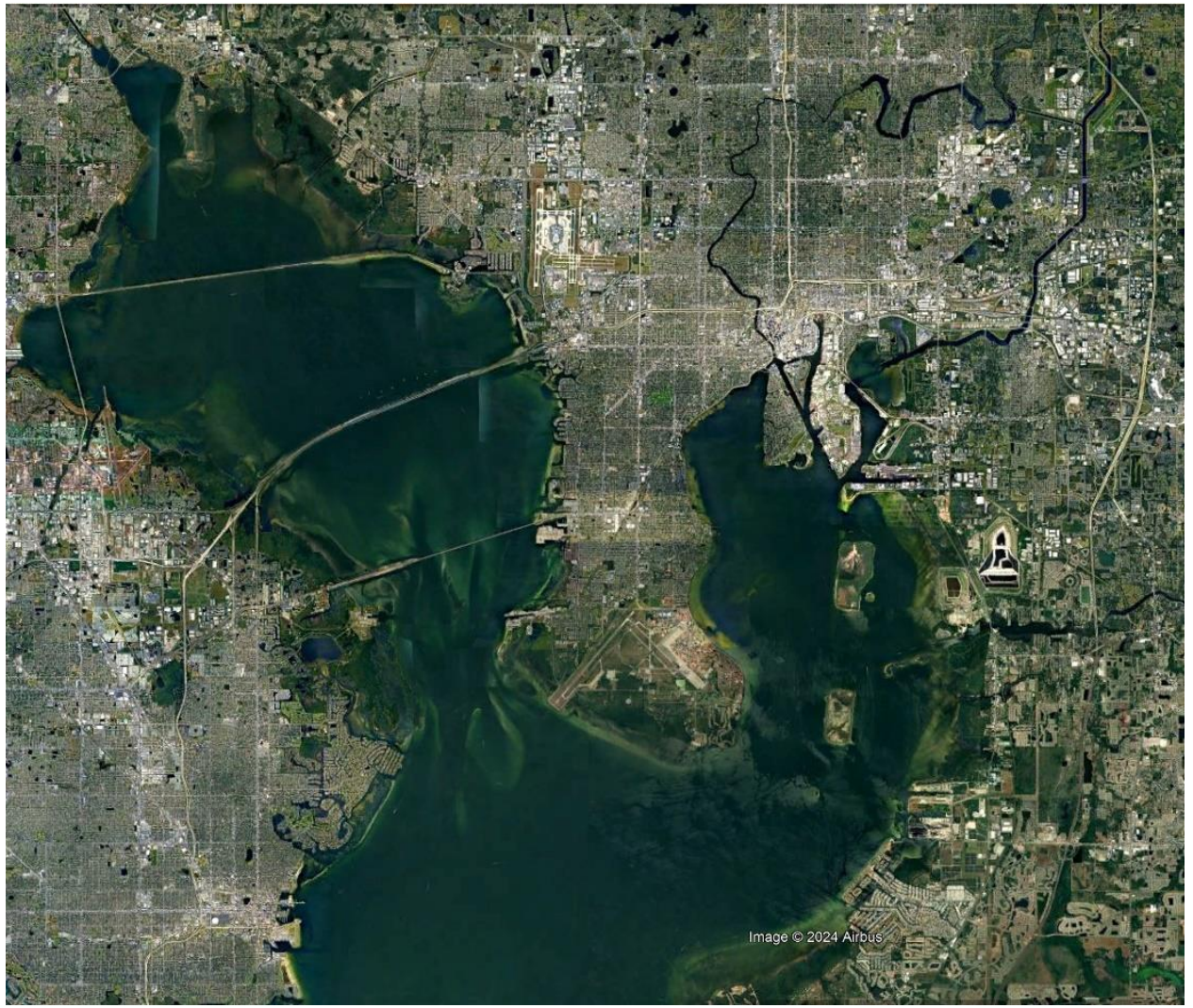
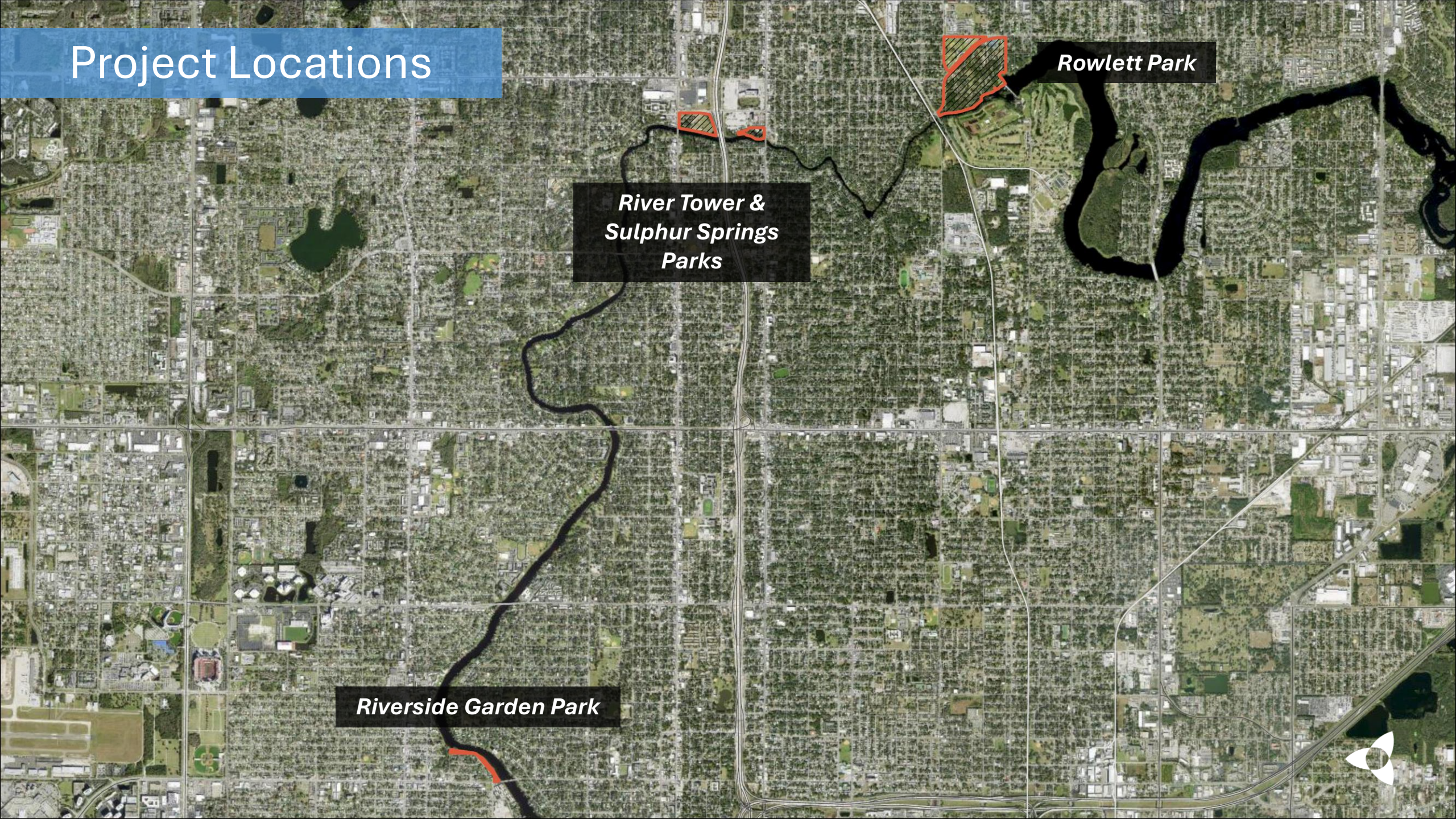
Problems facing the Hillsborough River and beyond

- Stormwater runoff is the primary cause of poor water quality in Hillsborough River and Tampa Bay

- Some sections of the Hillsborough River, particularly in the downtown area, have low riverbank and vulnerable to flooding and bank erosion.



Project Locations



Our Sites

Riverside Garden Park

Water Tower Park

Rowlett Park

Issues at the sites:

- Rowlett Park: Large amounts of untreated stormwater and runoff entering the Hillsborough River at the very upstream.
- Sulphur Springs Water Tower Park: Large amounts of untreated stormwater and runoff entering the Hillsborough River, contributing to impaired water quality.
- Riverside Garden Park: Erosion of the bank and flooding by sea-level rise and storm surge. Large amounts of untreated stormwater entering the Hillsborough River.

Local Examples of NBS:

Improved natural spring at Lowry Park

Rain garden and well vegetated stream entering Hillsborough River at Rowlett Park

Improved Ulele Spring at Water Works Park

General NBS concepts at the three sites

Rowlett Park: Daylight a buried stream, currently located in a stormwater pipe, and integrate the open creek into the existing watershed and restore with native vegetation. This solution enhances the water ecosystem and improves water quality before reaching the river.

Sulphur Springs Water Tower Park: Create a large stormwater treatment wetland which replaces the less permeable grass field and enhance the river's edge with vegetation. This solution creates habitat, prevents riverbank erosion, treat stormwater, improves water quality before entering the river.

Riverside Garden Park: Create a living shoreline composed of an artificial reef and constructed wetland. This solutions prevents bank erosion and protects against flooding due to storm surge and sea-level rise by building elevation naturally.

Understanding the Communities and the River

Learning from the community

The community cares about the river deeply
The community agrees that the river needs help
The community is eager to help

Focus group discussion at:
Mann-Wagnon Memorial Park
(the River museum)

MOSI: Water Day

MOSI: EcoFest

Understanding the Communities and the River

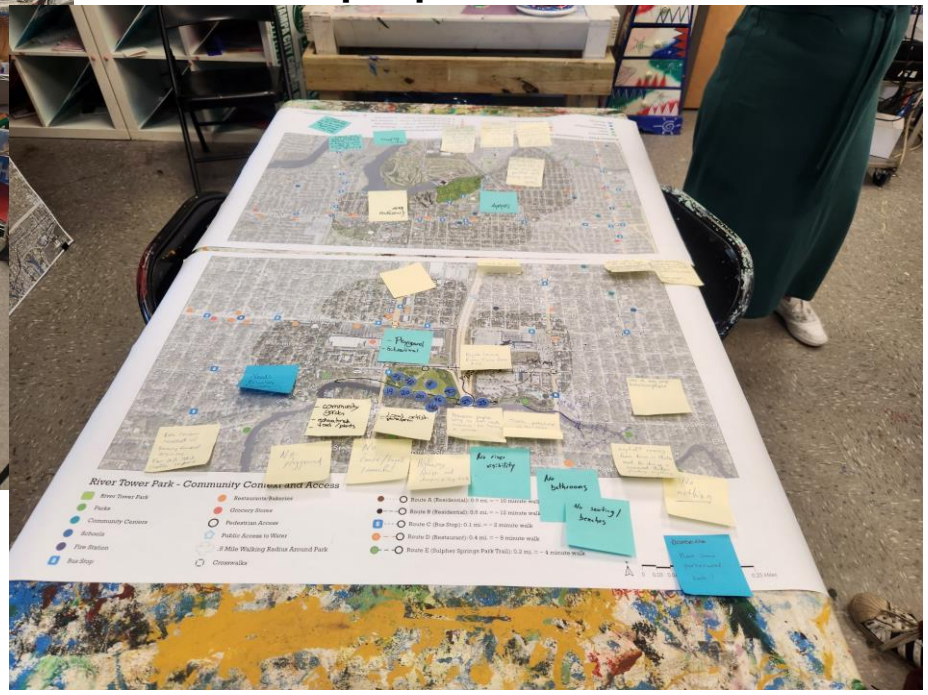
Learning from the community

The community has many ideas.
The community links our projects to other ongoing and potential future projects.
Our project should be one piece of a larger coherent plan.

Community design workshop at Martin Luther King, Jr. Community Center, June 27 2024

Community design workshop at Community Stepping Stones at Mann-Waggon Park, June 29 2024

An example product

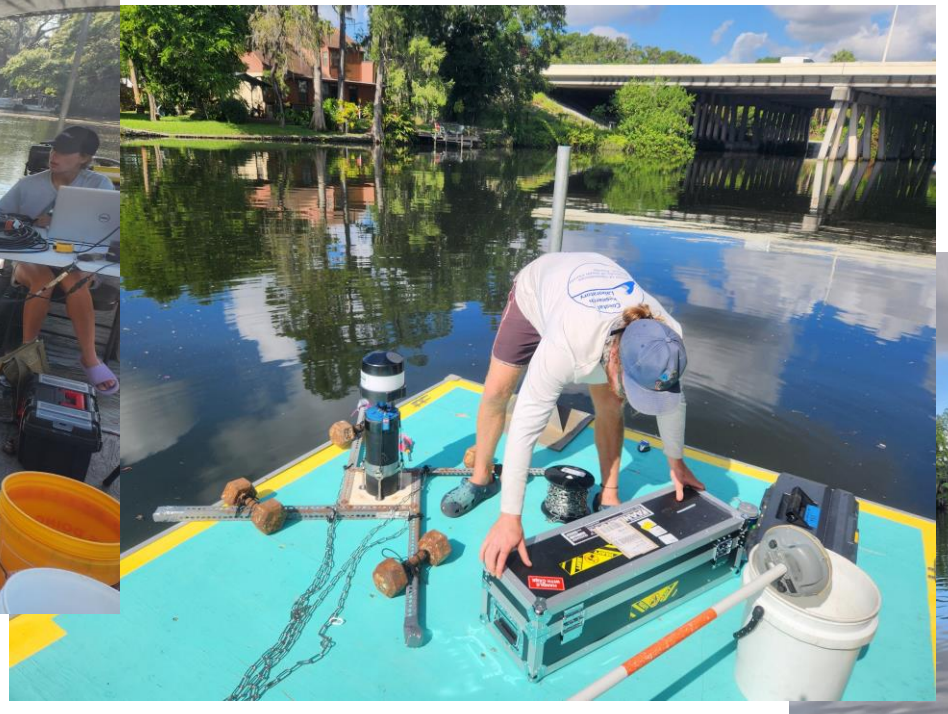


Understanding the Communities and the River

Understanding the river

Except localized riverbank erosion, overall deposition and erosion along the river is not significant.

Sediment sampling, bathymetry survey, and observations of existing shoreline conditions.



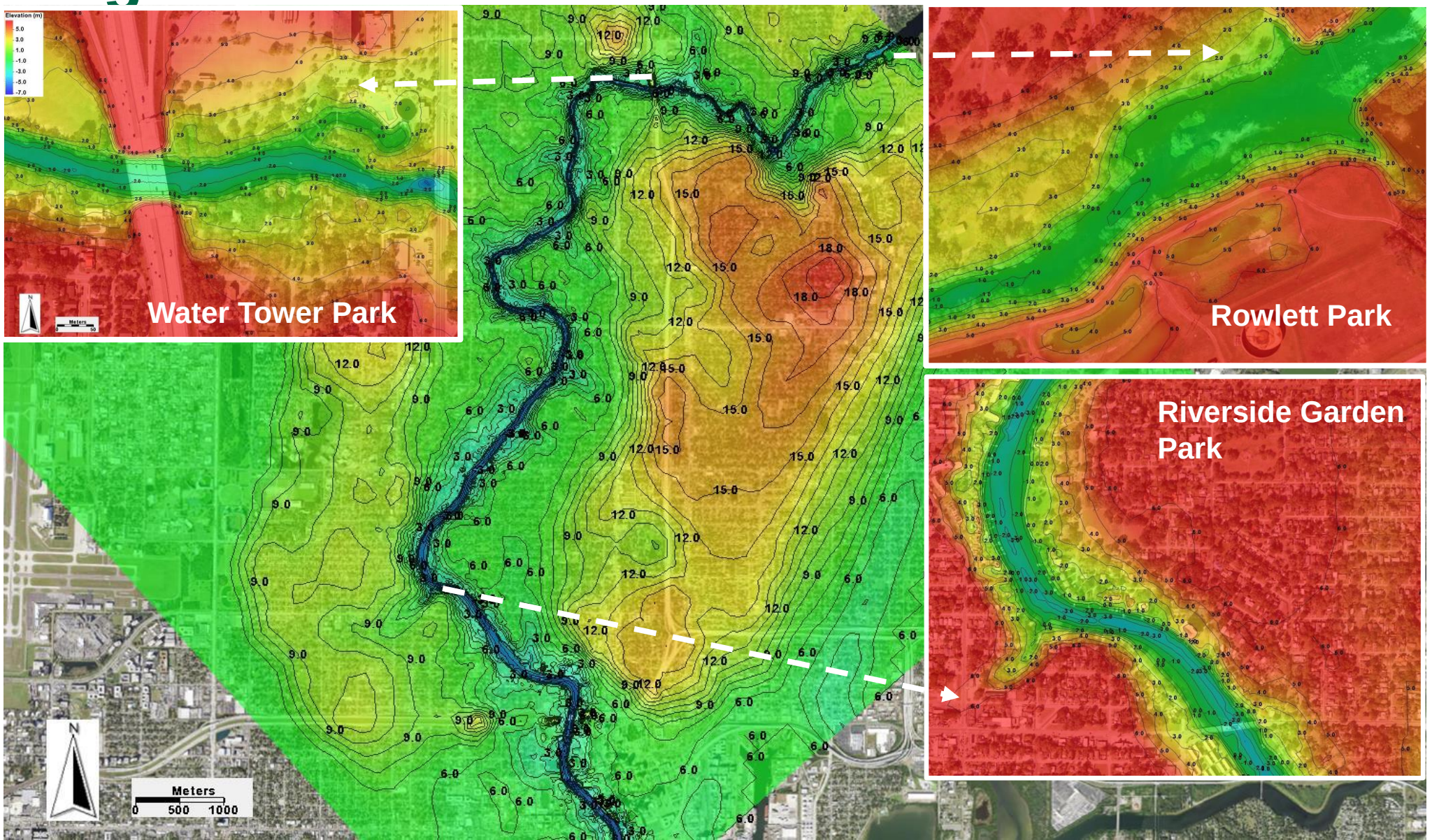
Measuring flow velocity during dry and wet seasons.

Measuring salinity and turbidity

Understanding the Communities and the River

Understanding the river

Detailed bathymetry and land DEM



Understanding the Communities and the River

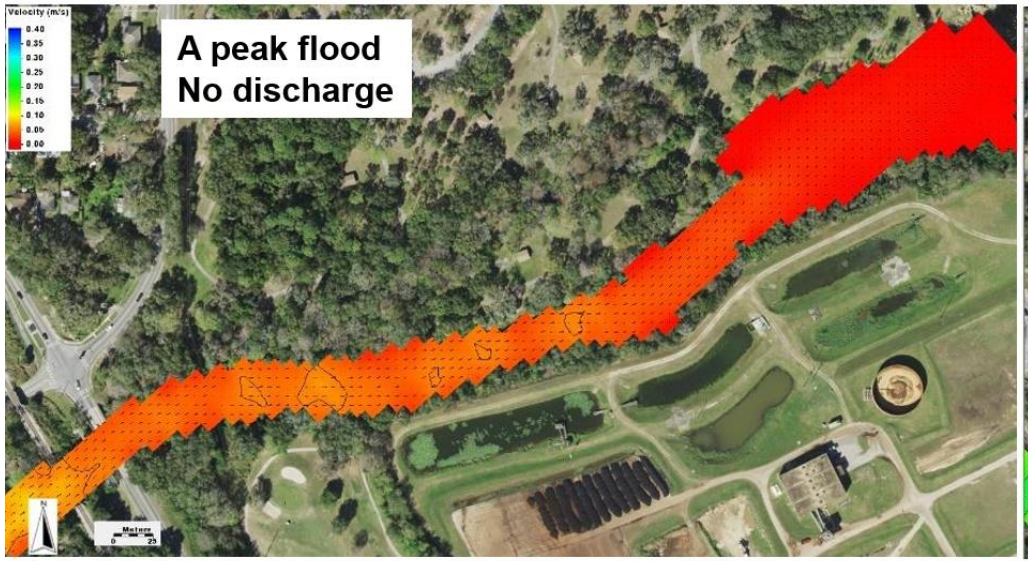
Understanding the river

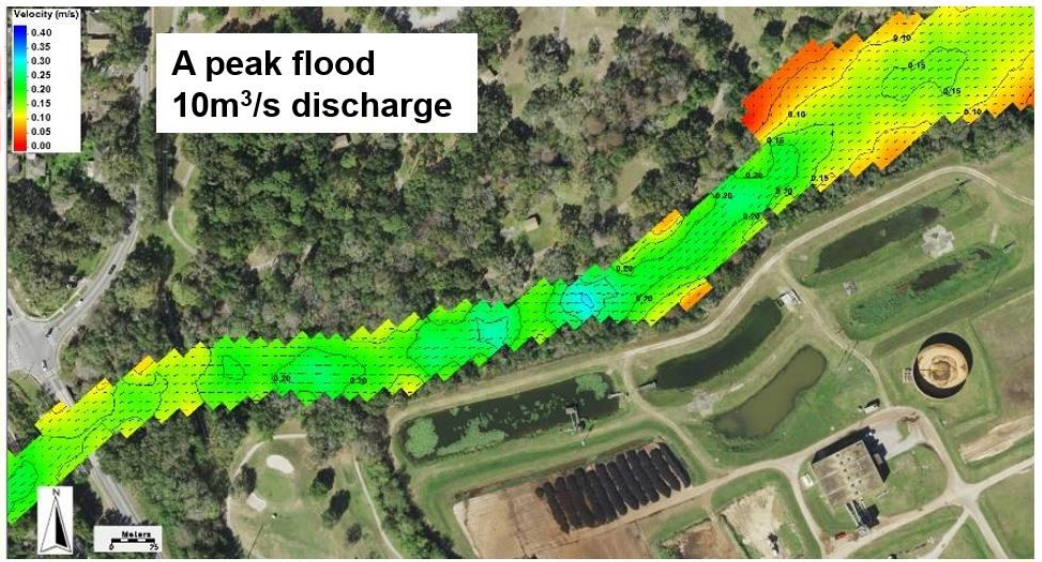
Simulating flow using numerical models.

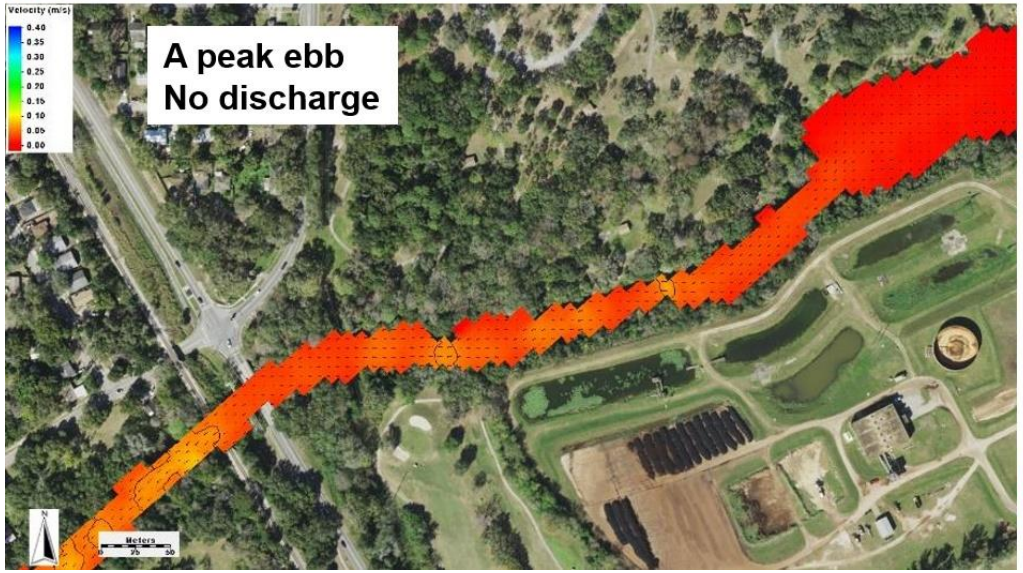
Simulating salinity regime will be difficult:

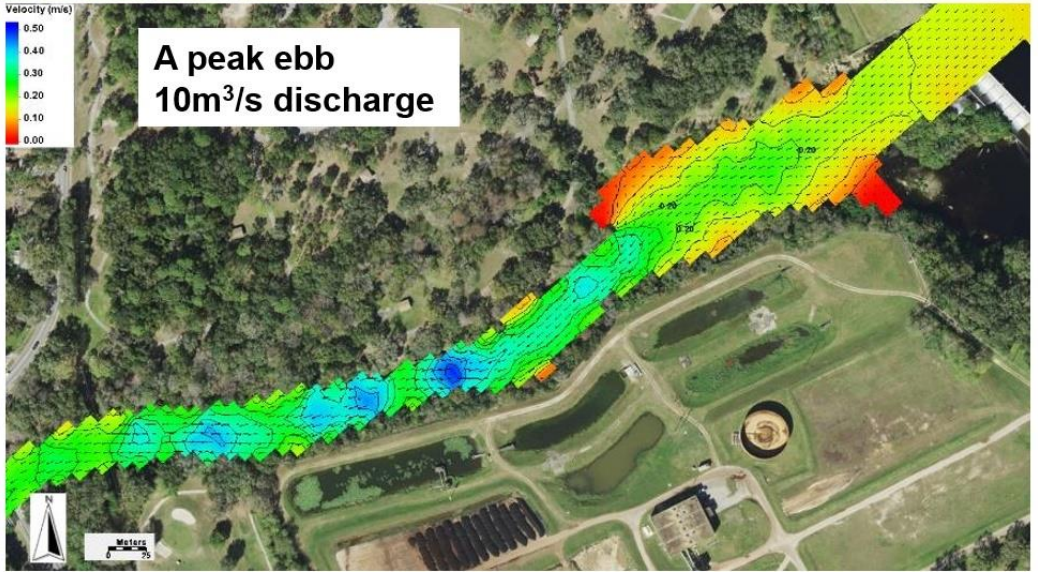
Significant vertical salinity gradient was measured.

May use field measurements to examine salinity regime.



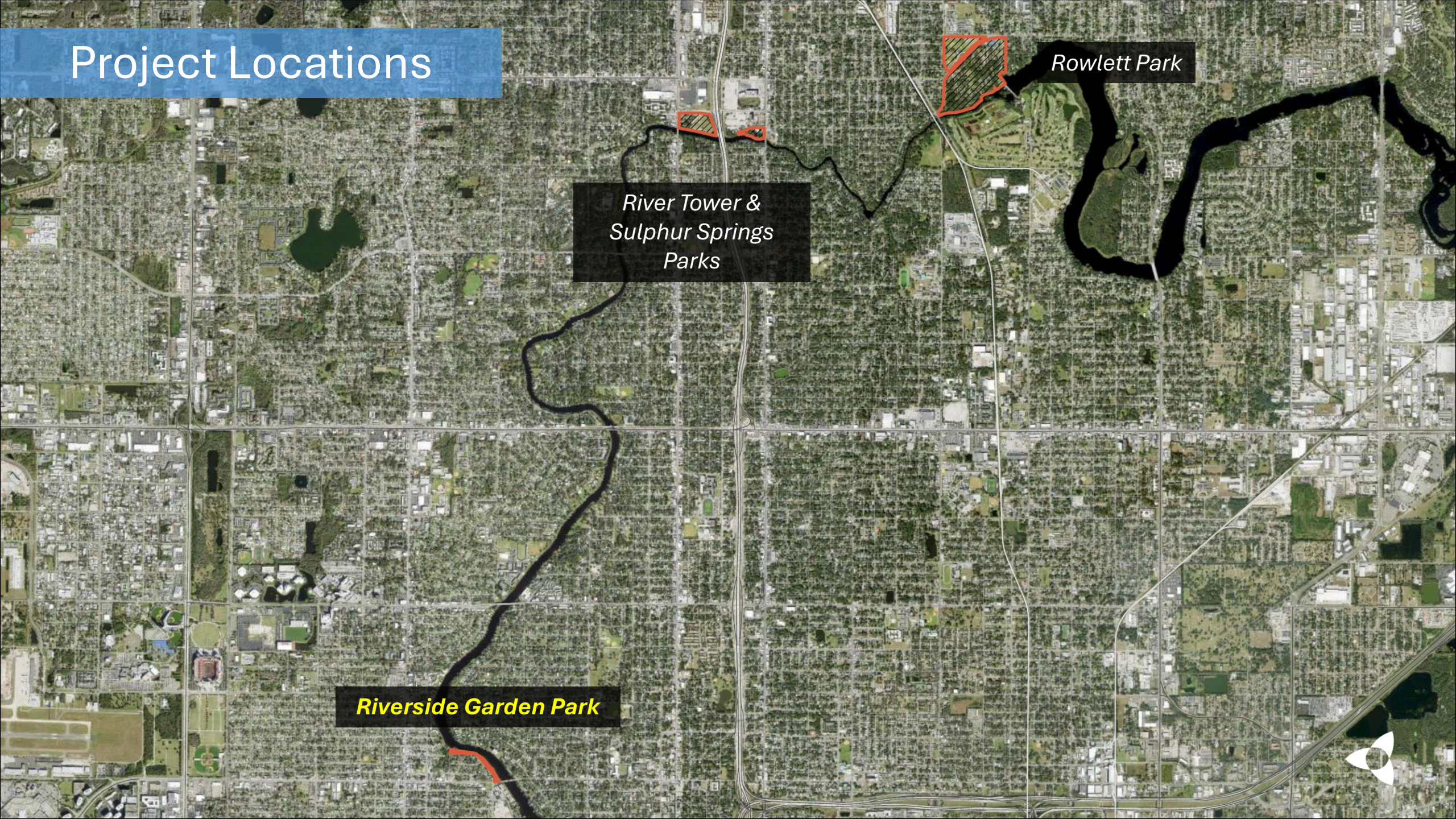






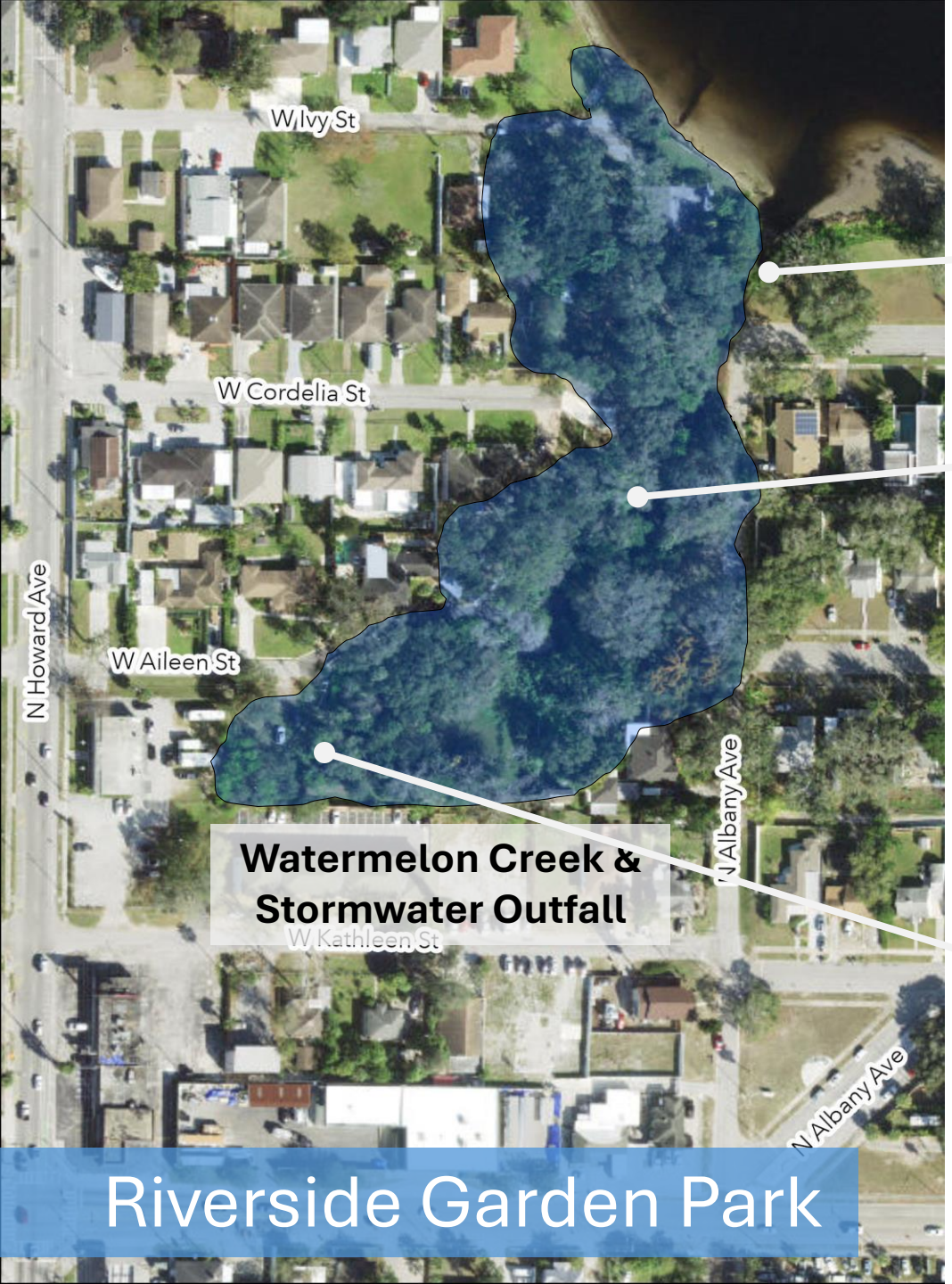
Technical Details at Each Site

Project Locations




W Ivy St
W Cordelia St
N Howard Ave
W Aileen St
W Aileen St
N Albany Ave
N Rome Ave
N Fremont Ave
W Kathleen St
W Kathleen St
N Albany Ave
W Columbus Dr
Riverside Garden Park

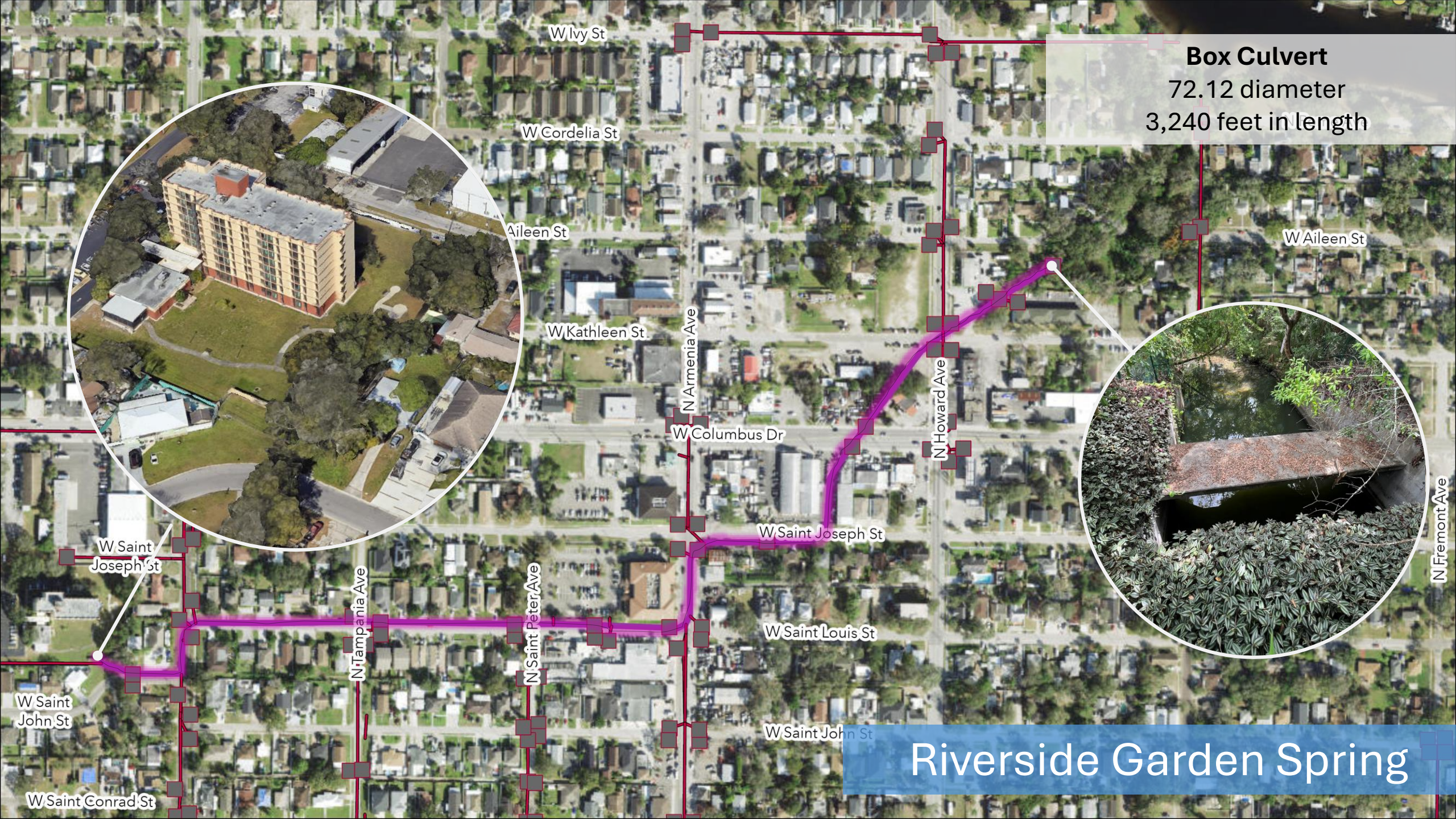
Riverside Garden Park

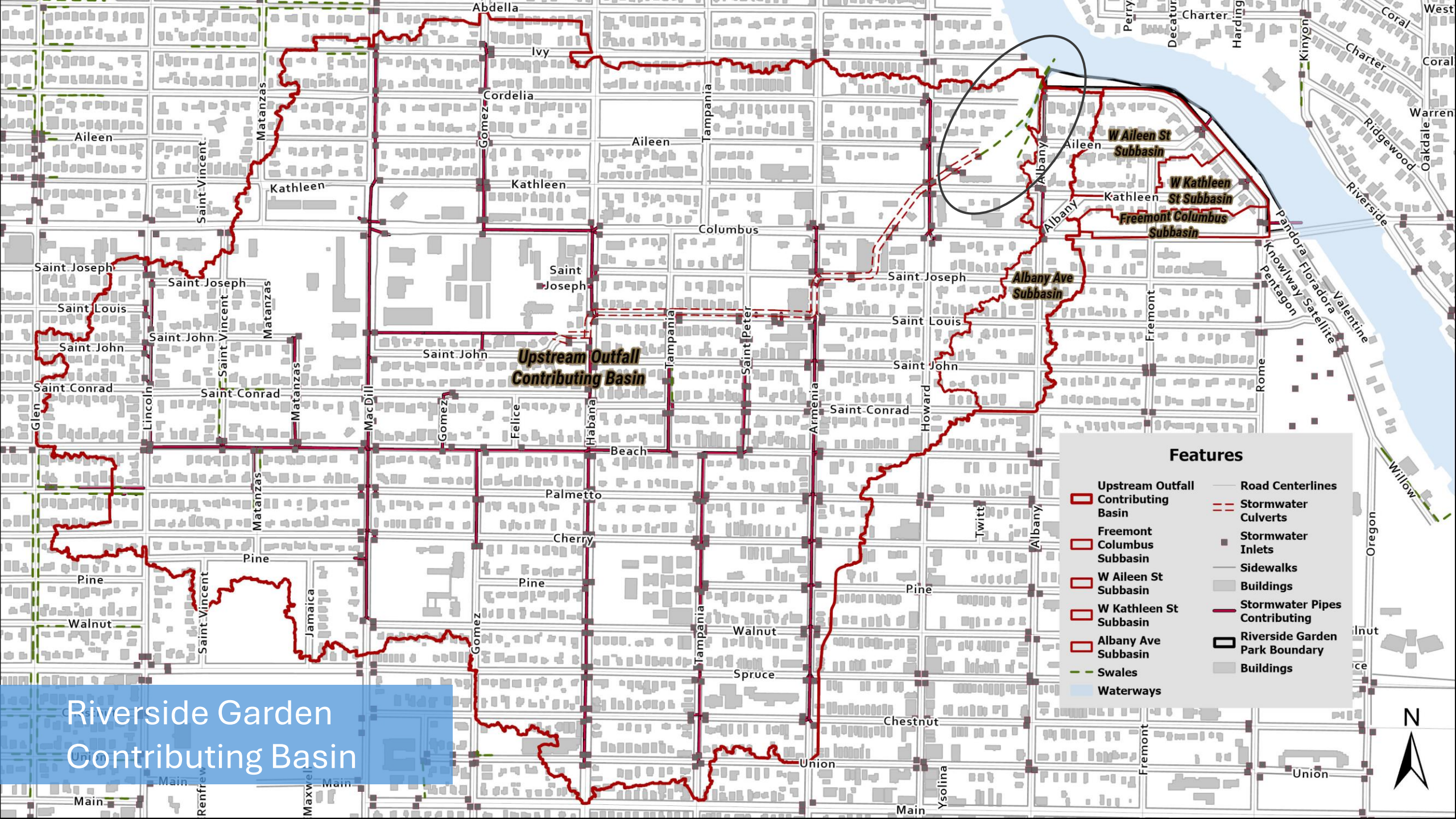


Riverside Garden Park

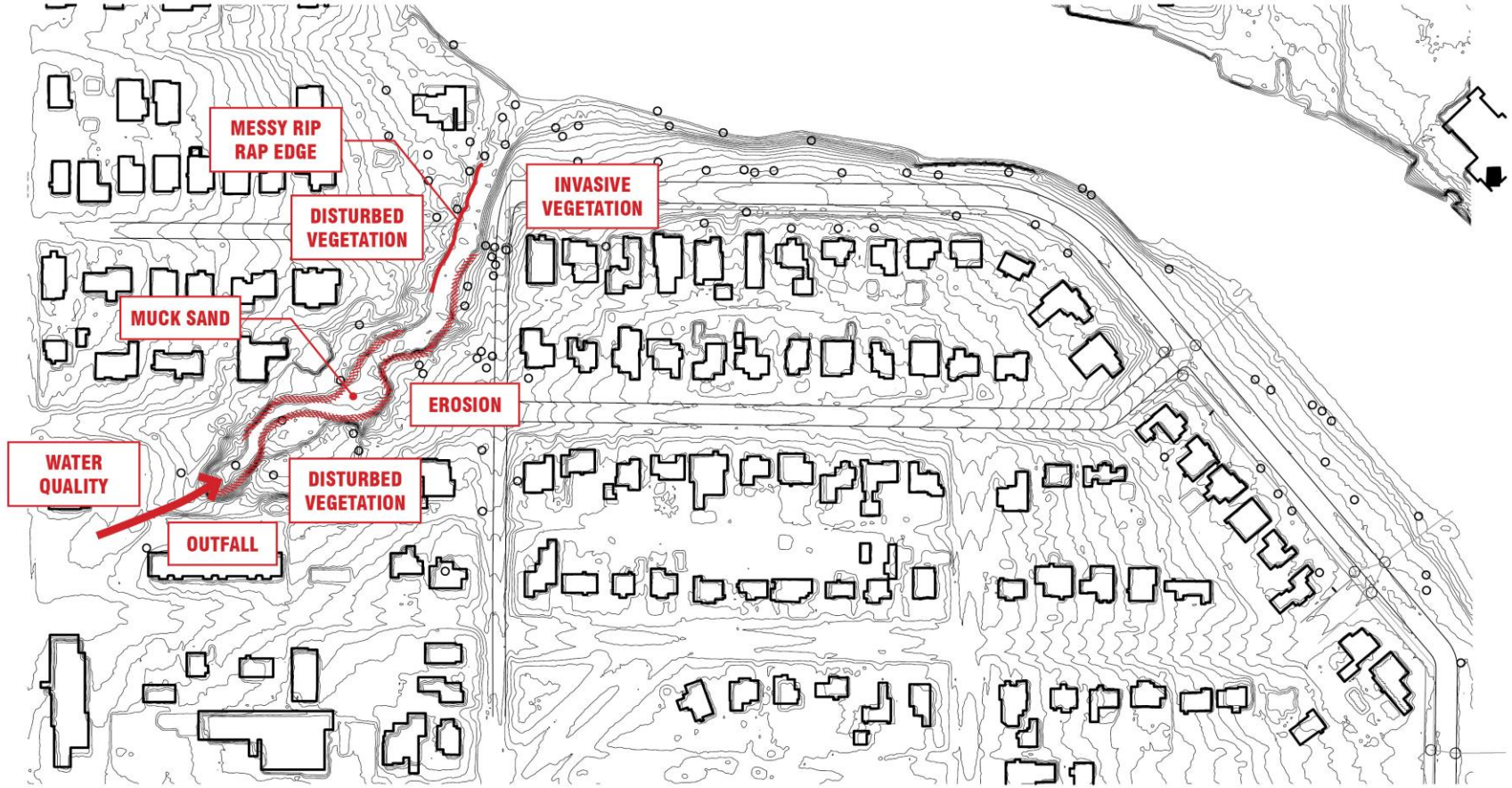

“There used to be sand in the creek, the bottom used to be white.”
- Nelson Coniglio, 78


City Owned
Coniglio Properties
Other Privately Owned Property


W Ivy St
W Cordelia St
Aileen St
W Aileen St
W Kathleen St
N Armenia Ave
N Howard Ave
W Columbus Dr
W Saint Joseph St
W Saint Joseph St
N Tampania Ave
N Saint Peter Ave
W Saint Louis St
W Saint John St
W Saint John St
W Saint Conrad St
N Fremont Ave
Box Culvert
72.12 diameter
3,240 feet in length
Riverside Garden Spring

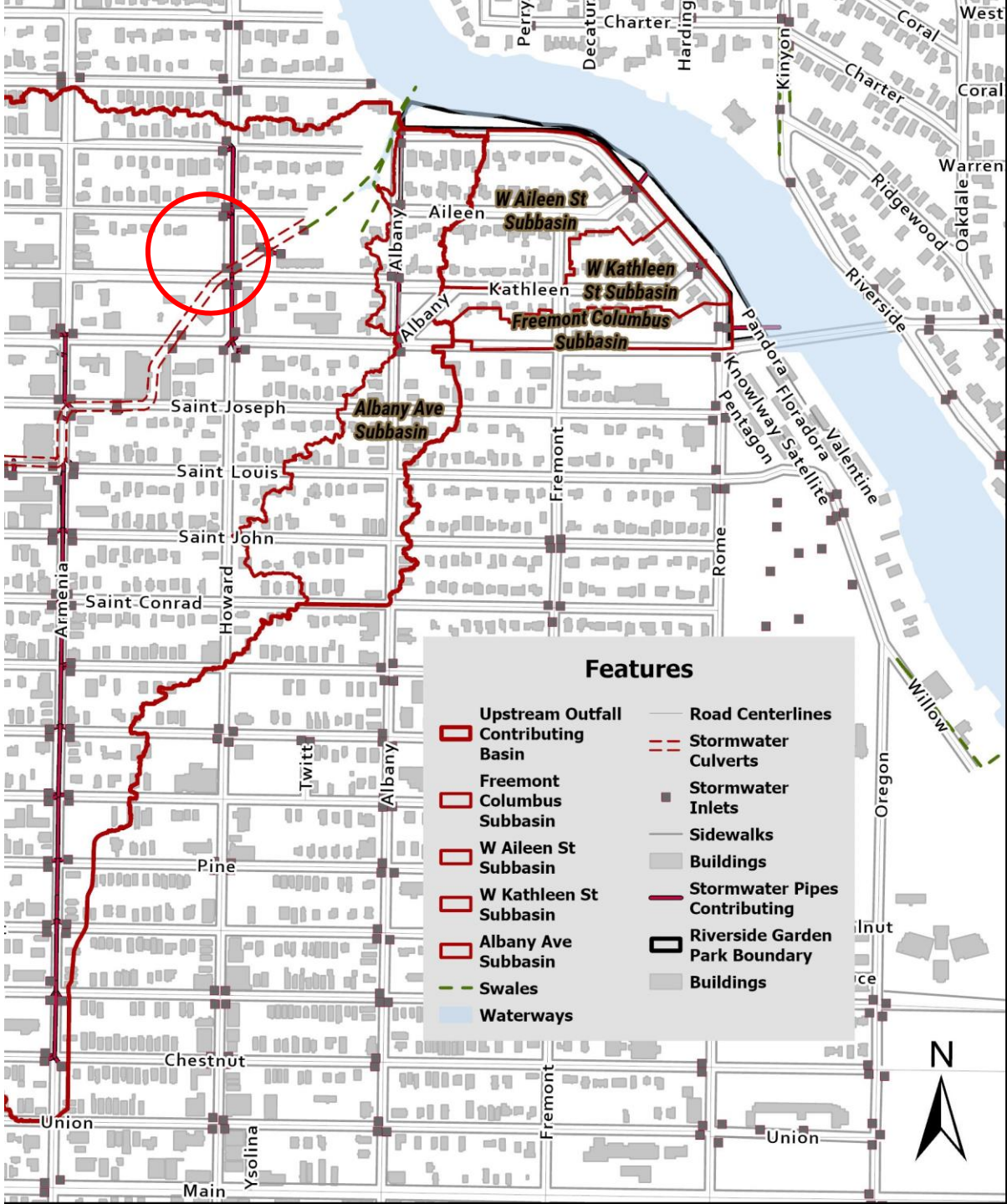


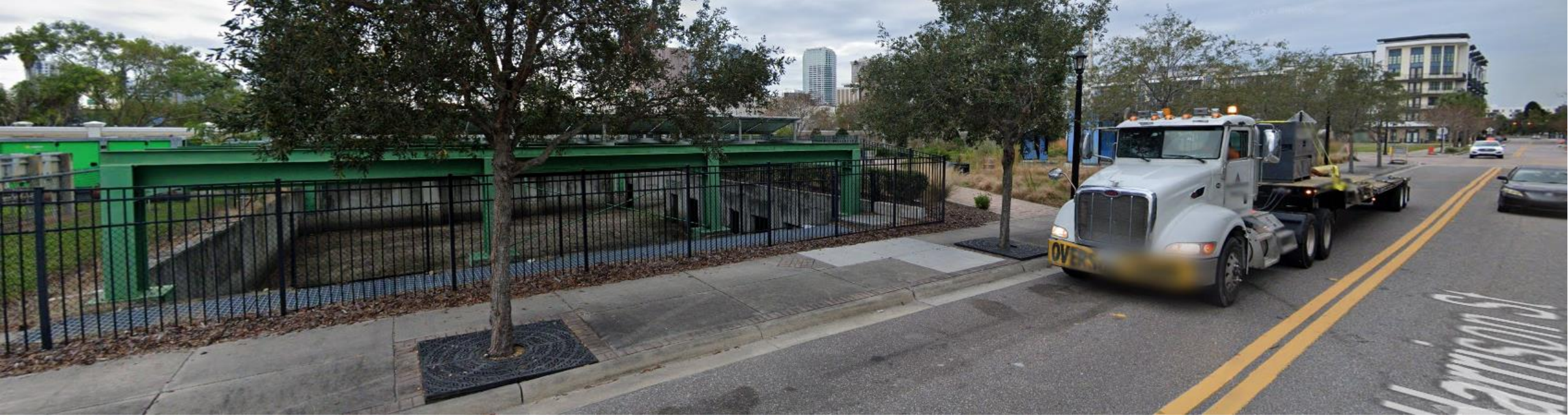
Riverside Garden Contributing Basin



Riverside Garden Park


W Howard
Julieen
SPEED LIMIT
35


Perry
Decatur
Charter
Harding
Kinyon
Coral
West
Coral
Charter
Warren
Ridgewood
Oakdale
Riverside
Aileen
Albany
W Aileen St Subbasin
W Kathleen St Subbasin
Kathleen
Albany
Freemont Columbus Subbasin
Pandora
Floradora
Knowlway
Satellite
Pentagon
Valentine
Saint Joseph
Albany Ave Subbasin
Saint Louis
Fremont
Saint John
Rome
Armenia
Howard
Saint Conrad
Twitt
Albany
Oregon
Willow
Pine
Chestnut
Union
Ysolina
Main
Fremont
Union
Features
Upstream Outfall Contributing Basin
Freemont Columbus Subbasin
W Aileen St Subbasin
W Kathleen St Subbasin
Albany Ave Subbasin
Swales
Waterways
Road Centerlines
Stormwater Culverts
Stormwater Inlets
Sidewalks
Buildings
Stormwater Pipes Contributing
Riverside Garden Park Boundary
Buildings
N

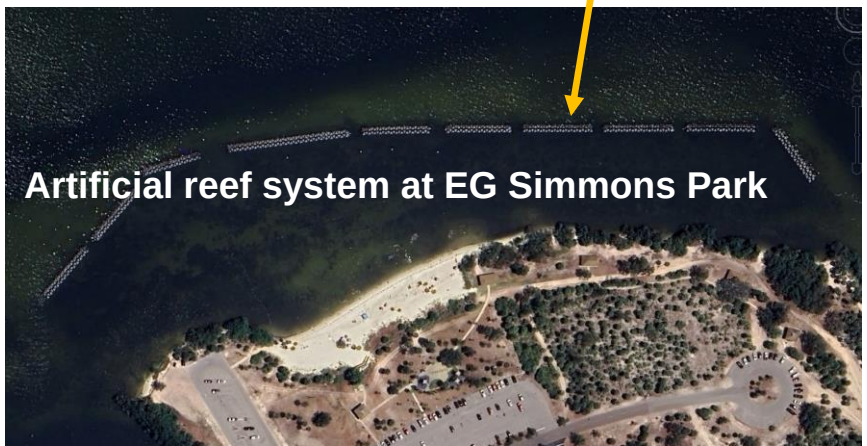



AHEAD


Site context
• 2.3 acres
• 1,800 feet linear park
• 30 to 75 feet wide
N Rome Ave
N Riverside Dr
W Aileen St
N Albany Ave
N Fremont Ave
W Kathleen St
W Kathleen St
N Albany Ave
W Columbus Dr
Riverside Garden Park

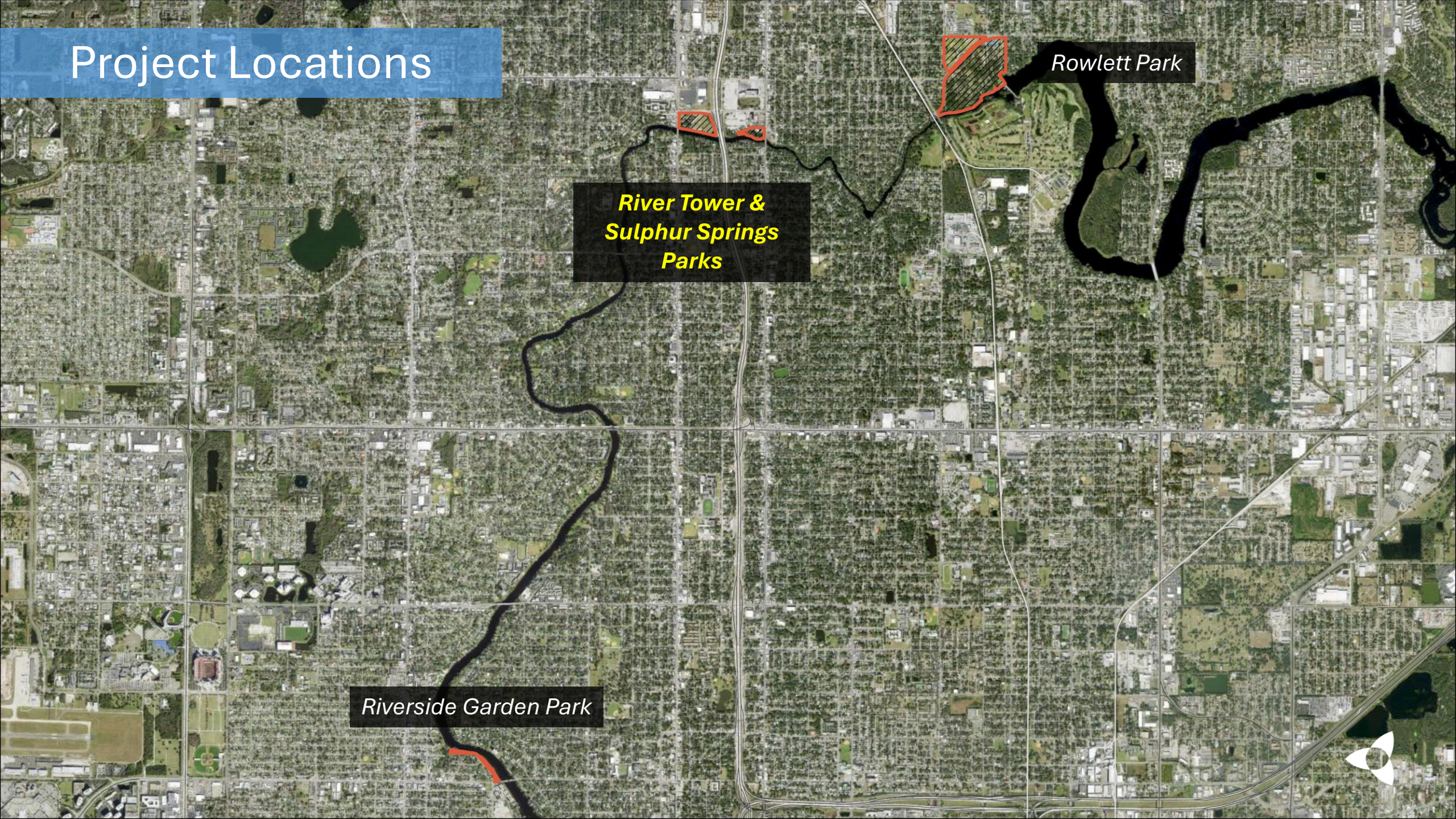

N Rome Ave
Site context
• 2.3 acres

Riverside Garden Park



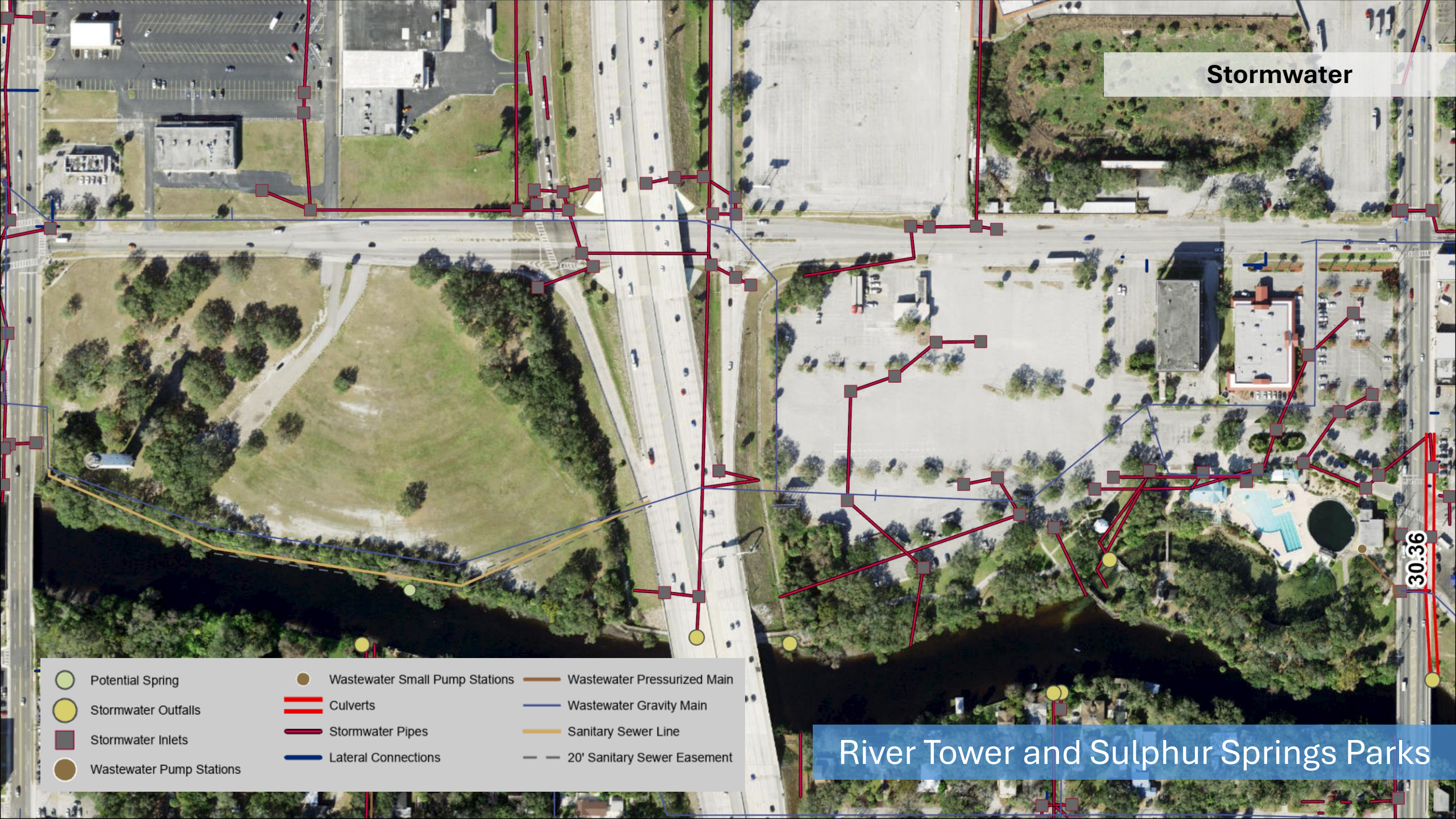
Riverside Garden Park

Project Locations

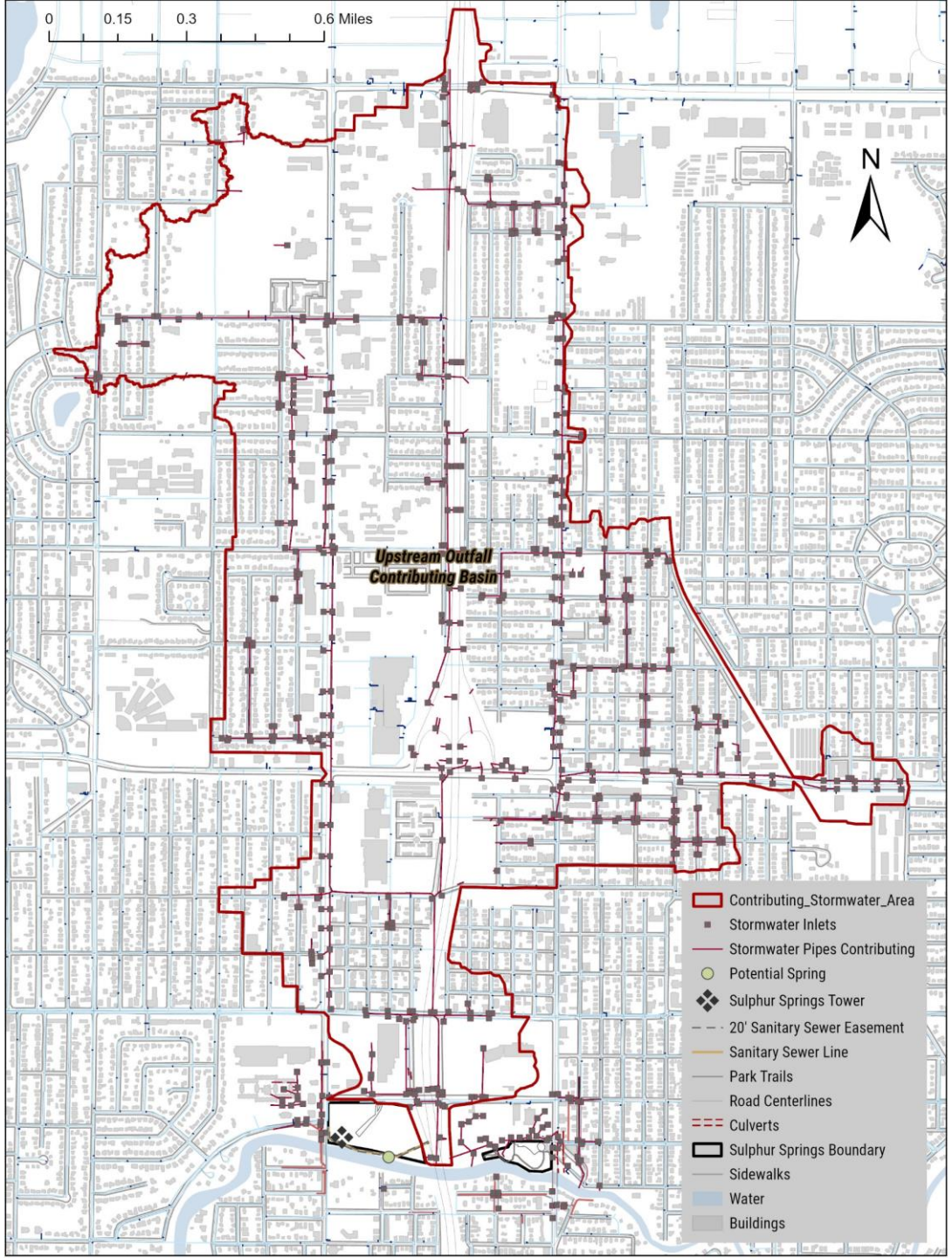



River Tower and Sulphur Springs Parks


N Florida Ave
N Seminole Ave
N Lamar Ave
E Bird St
Interstate 275 S
Interstate 275 N
N Nebraska Ave
N Van Dyke Pl
E Grant Ave
River Tower Park
Sulphur Springs Park
N Branch Ave
E Hollywood St
N Riverdale Ave
N Talaro Ave
River Tower and Sulphur Springs Parks


Stormwater
Potential Spring
Stormwater Outfalls
Stormwater Inlets
Wastewater Pump Stations
Wastewater Small Pump Stations
Culverts
Stormwater Pipes
Lateral Connections
Wastewater Pressurized Main
Wastewater Gravity Main
Sanitary Sewer Line
20' Sanitary Sewer Easement
30.36
River Tower and Sulphur Springs Parks

Stormwater



Riverside Garden Contributing Basin

Site context

- 14 acres
- Historic River Tower located in southwest corner

River Tower Park

Park Conditions: Safety

River Tower Park


Park Depth & River Access
1,000’
2,000’
1,500’
540’
River Tower Park

1952

Today

THE TAMPA TRIBUNE - Oct. 22, 1952

Site Topography

Topography Contours

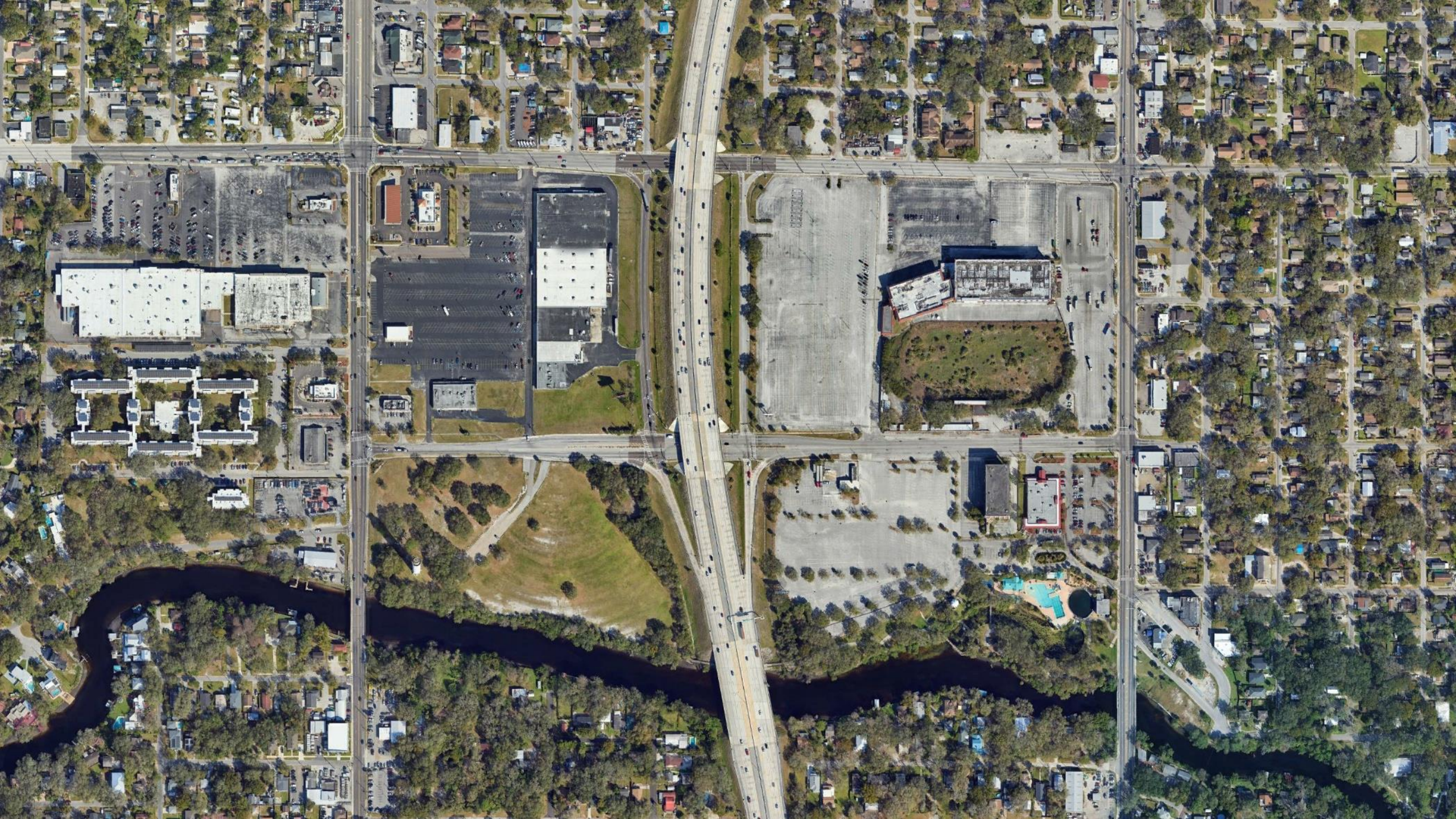
- One Ft. Contours
- Five Ft. Contours
- Tree Canopy
- Water
- Sulphur Springs Tower

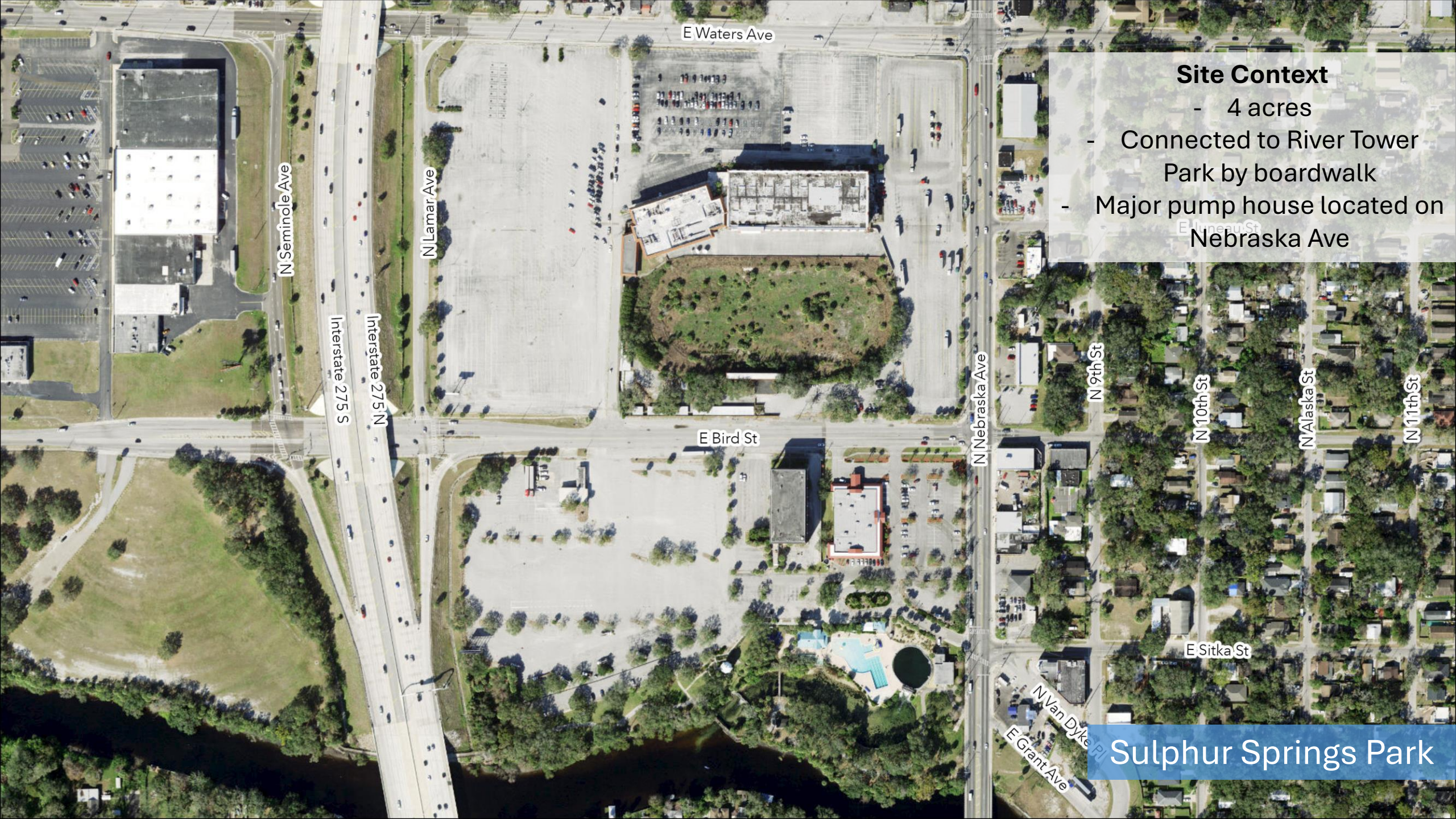
River Tower Park

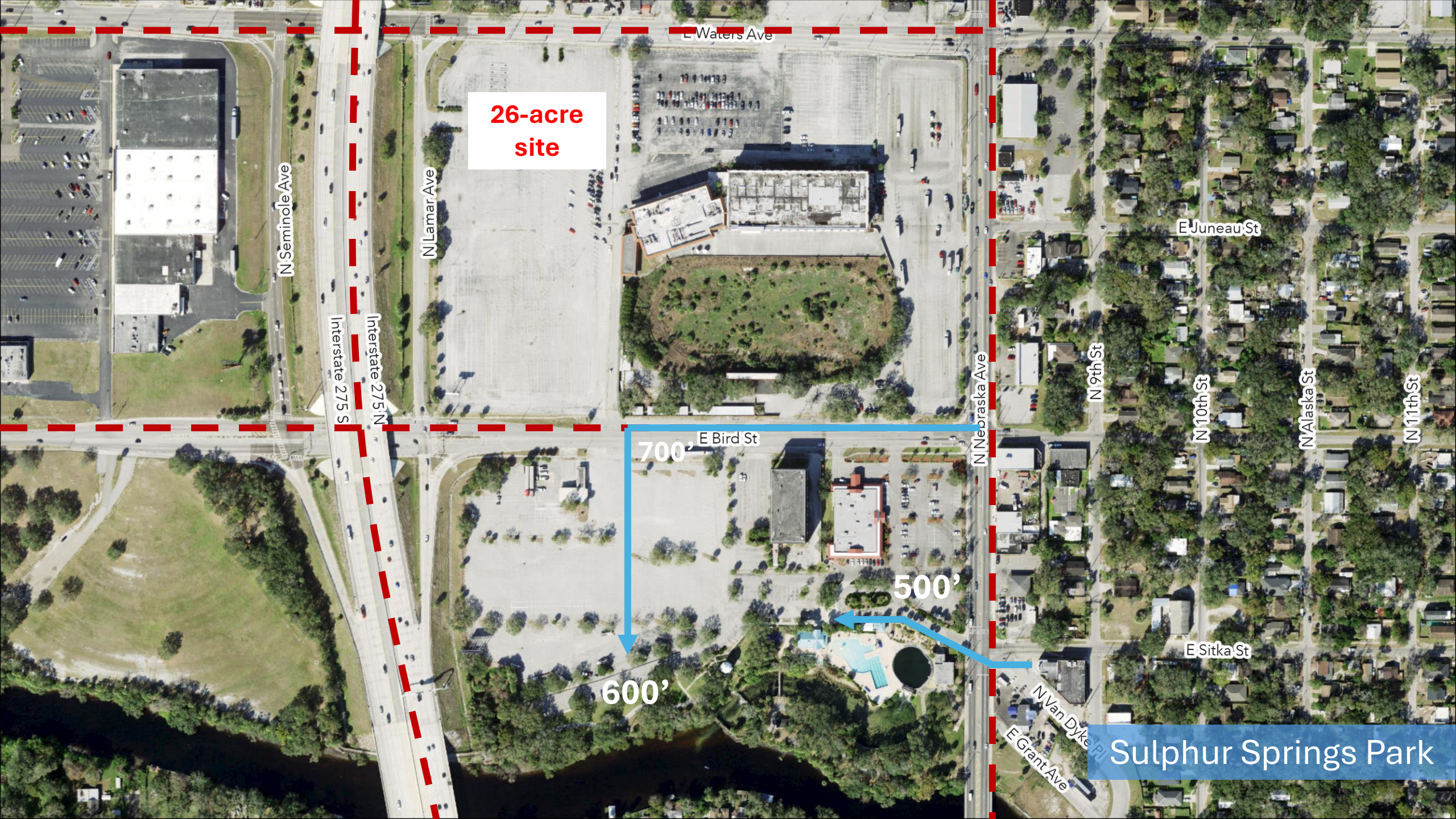

40'
36'
32'
28'
24'
20'
16'
12'
8'
4'
0'
-4'
Wastewater Gravity Main
Potable Water Main
Stormwater Pipe


40'
36'
32'
28'
24'
20'
16'
12'
8'
4'
0'
-4'
Wastewater Gravity Main
Potable Water Main
Stormwater Pipe

E Bird St
N Seminole Ave
N Lamar Ave
N River Shore Dr
N Florida Ave
Interstate 275 S
Interstate 275 N
PARKING
GRASS
Sidewalk
100'
250'




E Waters Ave
N Seminole Ave
Interstate 275 S
Interstate 275 N
N Lamar Ave
E Bird St
N Nebraska Ave
N 9th St
N 10th St
N Alaska St
N 11th St
E Sitka St
N Van Dyke Pl
E Grant Ave
Site Context
- 4 acres
- Connected to River Tower Park by boardwalk
- Major pump house located on Nebraska Ave
Sulphur Springs Park


26-acre site
E Waters Ave
N Seminole Ave
N Lamar Ave
Interstate 275 S
Interstate 275 N
E Bird St
700’
N Nebraska Ave
500’
600’
E Juneau St
N 9th St
N 10th St
N Alaska St
N 11th St
E Sitka St
N Van Dyke Pl
E Grant Ave
Sulphur Springs Park

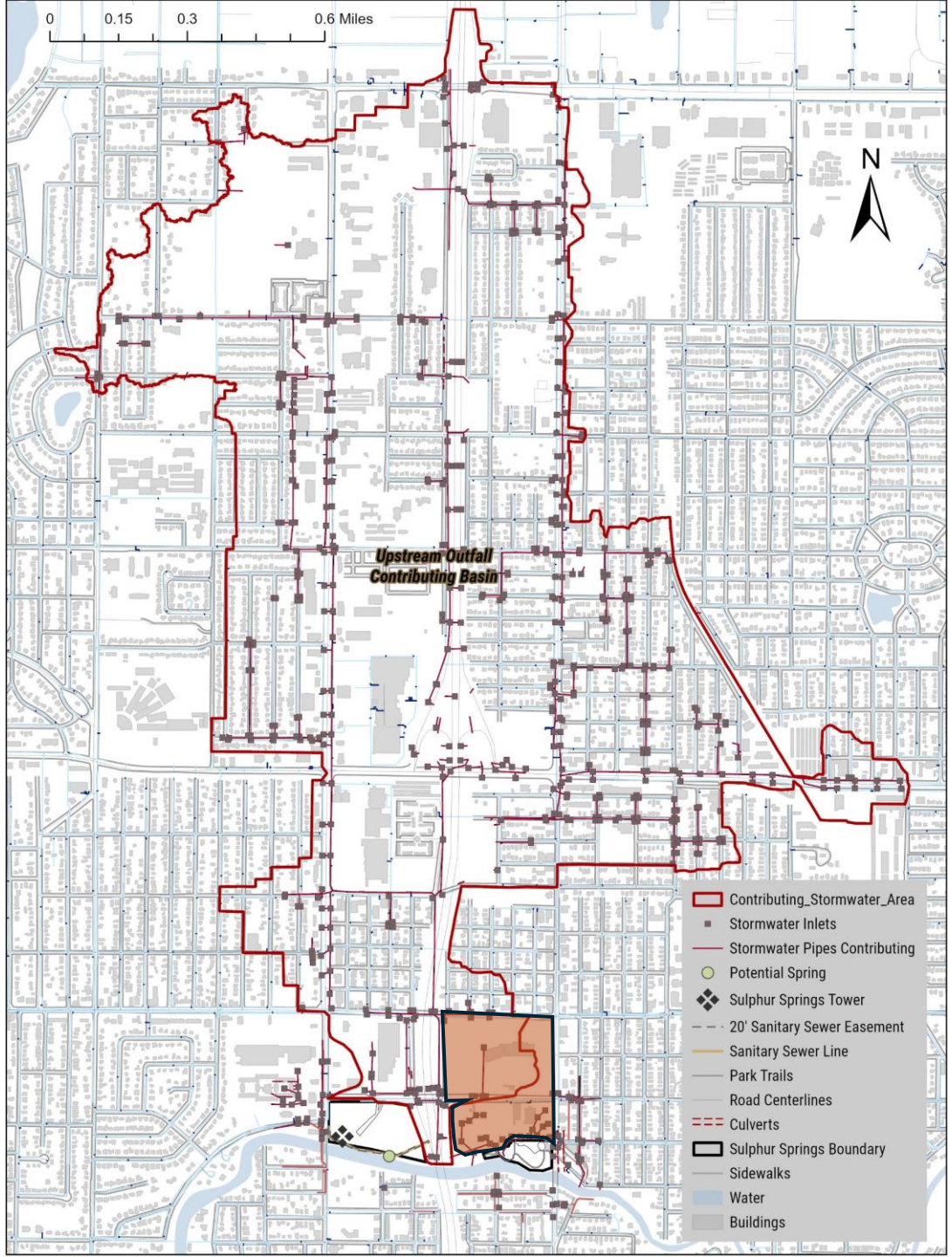
Impervious Cover & Direct Runoff to River

44-acres combined

E Waters Ave
N Lamar Ave
E Bird St
N Nebraska Ave
E Juneau St
N 9th St
N 10th St
N Alaska St
N 11th St
E Sitka St
N Van Dyke Pl
E Grant Ave

Sulphur Springs Park

Impervious Cover & Direct Runoff to River



Sulphur Springs Park

Sulphur Springs Site

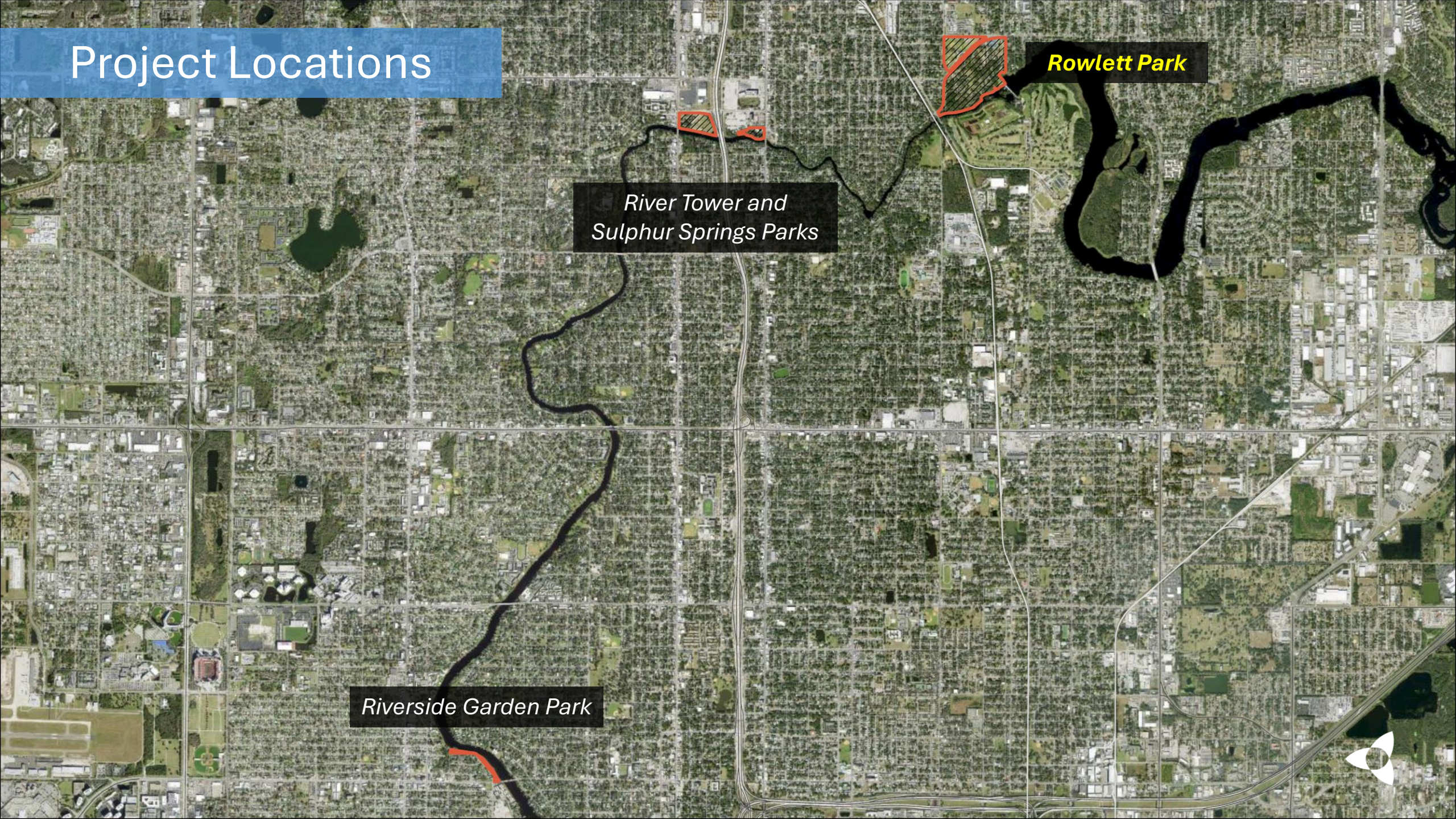
Related Capital Improvements

- *$1.5M in FY 2024 for improvements to River Tower Park required by Florida Communities Trust Management Plan and approved site Master Plan*
- *$1.6M in FY 2023 for various improvements to Sulphur Springs Pool, including deck repairs and seawall replacement*
- *$495K for replacement of Sulphur Springs Pool deck and gutter system*
- *$526K in FY 2023 for River Tower repainting & improvements. Work completed January 2024*

Parks Master Plan details

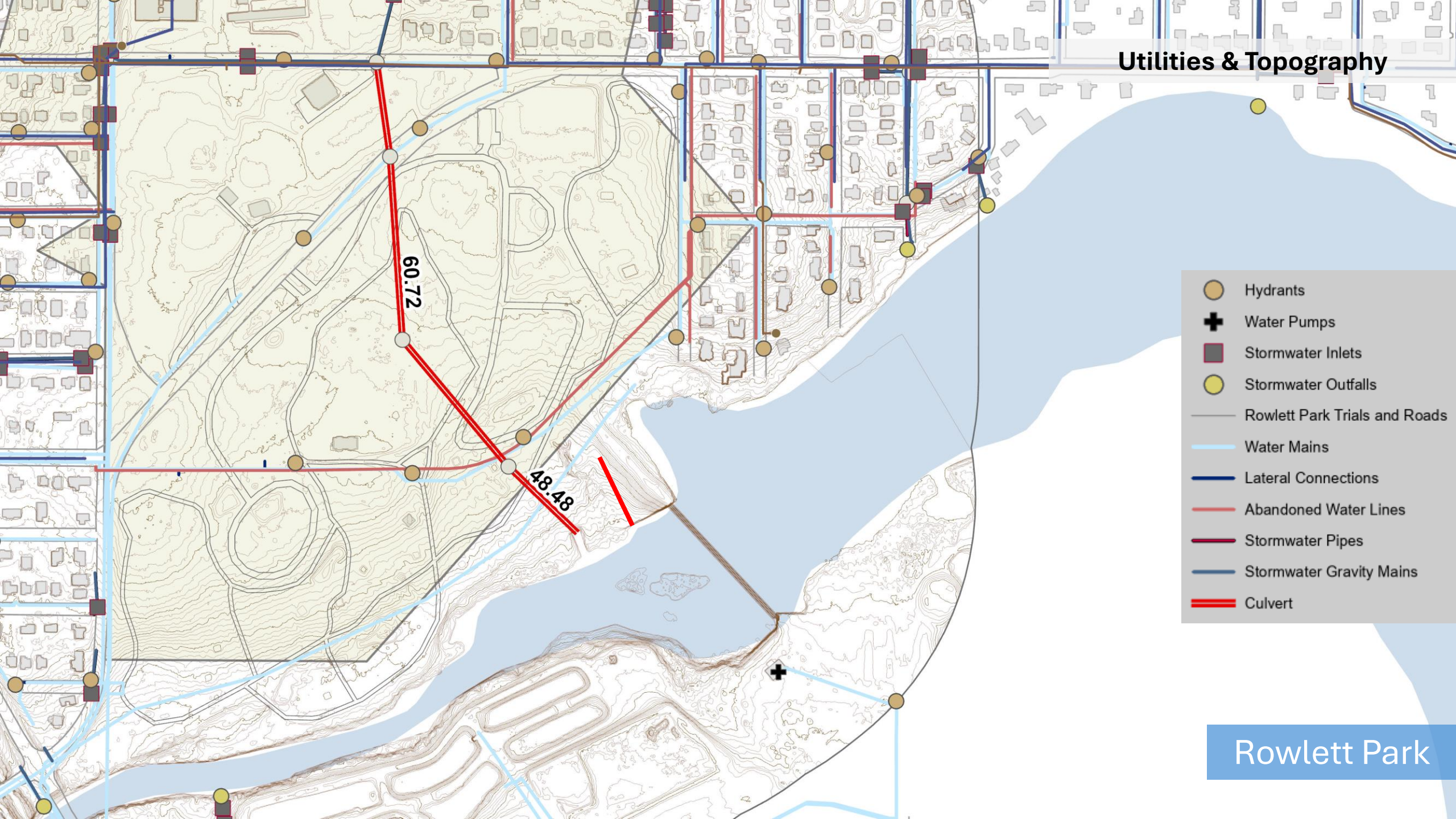
- *Sulphur Springs Pool identified as one of pools in need of critical repair*
- *Plan recommends relocation of pool and redevelopment of current pool site*
- *Relocation/redevelopment identified as short-term need (1-5 years)*
- *Project identified as needed further planning*

Project Locations

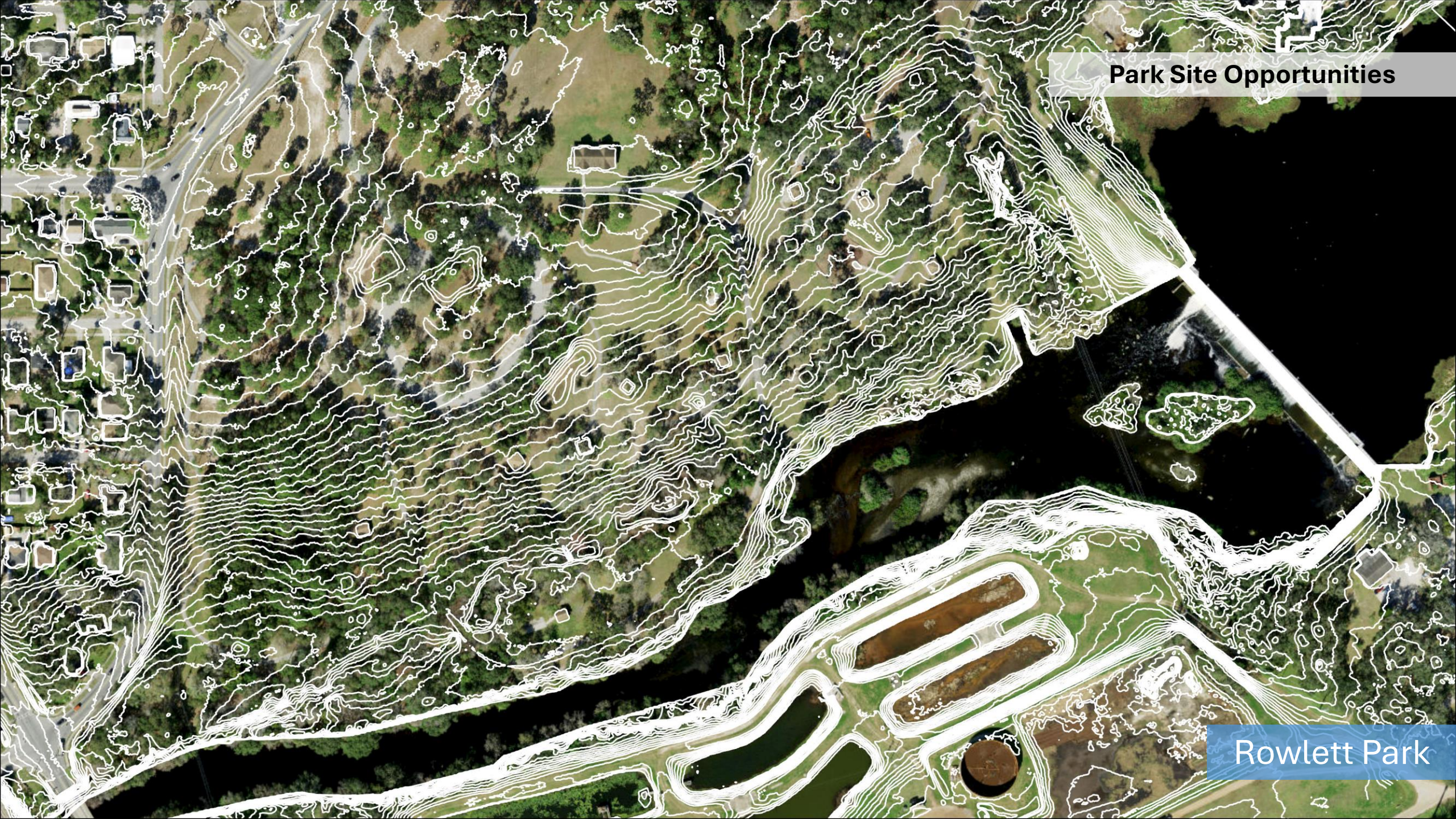


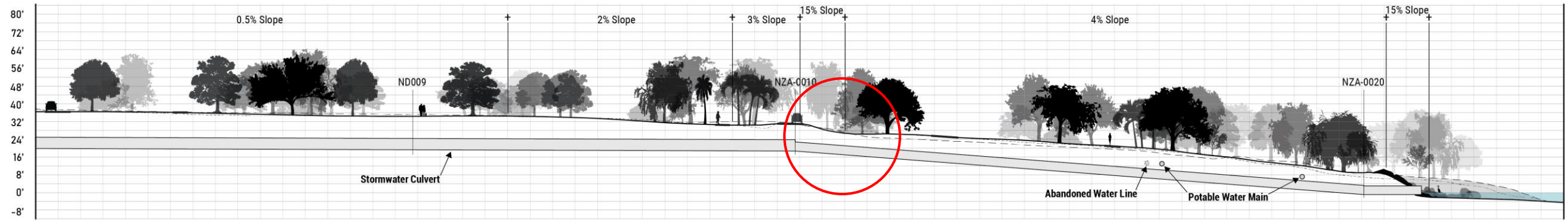

E Yukon St
N 26th St
N 27th St
N Linda Ct
Ruth Pl
N Calder Pl
N 33rd St
N 34th St
N Wick Pl
Riverview Dr
E Seward St
E Wood St
E Fairbanks St
E Rampart St
E Waters Ave
E Nedro Rd
E Juneau St
Wissahickon Ave
Rowlett Park Dr
River Hills Dr
N 22nd St
N 28th St
N 29th St
N 30th St
E Waters Ave
Ruth Pl
E Waters Ave
Rowlett Park

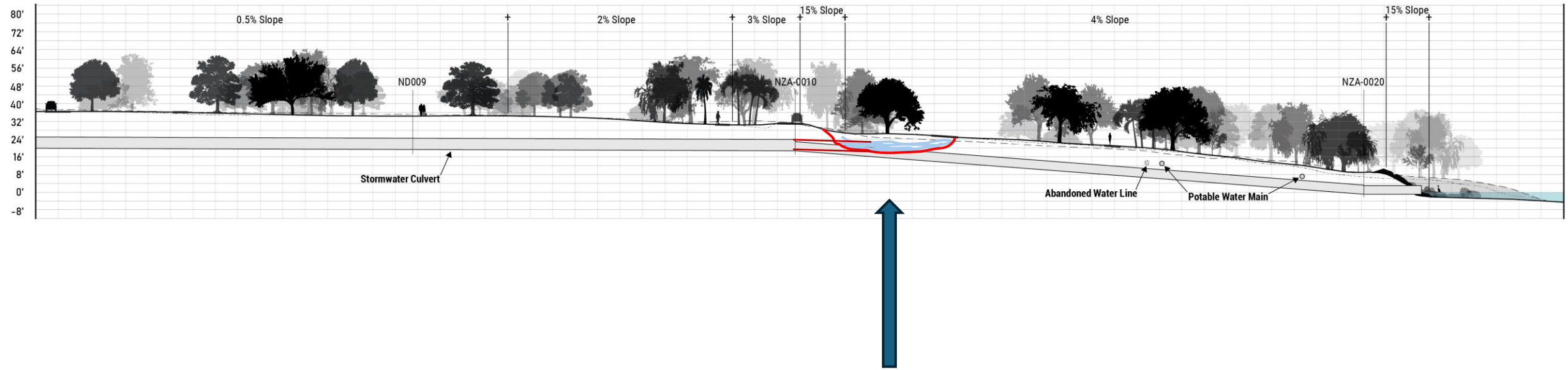

Utilities
60.72
48.48
Hydrants
Water Pumps
Stormwater Inlets
Stormwater Outfalls
Rowlett Park Trials and Roads
Water Mains
Lateral Connections
Abandoned Water Lines
Stormwater Pipes
Stormwater Gravity Mains
Culvert
Rowlett Park


Utilities & Topography
60.72
48.48
Hydrants
Water Pumps
Stormwater Inlets
Stormwater Outfalls
Rowlett Park Trials and Roads
Water Mains
Lateral Connections
Abandoned Water Lines
Stormwater Pipes
Stormwater Gravity Mains
Culvert
Rowlett Park

Stormwater Outfall & Dam


Park Site Opportunities
Rowlett Park


80'
72'
64'
56'
48'
40'
32'
24'
16'
8'
0'
-8'
0.5% Slope
2% Slope
3% Slope
15% Slope
4% Slope
15% Slope
ND009
NZA-0010
NZA-0020
Stormwater Culvert
Abandoned Water Line
Potable Water Main


80'
72'
64'
56'
48'
40'
32'
24'
16'
8'
0'
-8'
0.5% Slope
2% Slope
3% Slope
15% Slope
4% Slope
15% Slope
ND009
NZA-0010
NZA-0020
Stormwater Culvert
Abandoned Water Line
Potable Water Main

Park Site Opportunities

Rowlett Park

Park Site Opportunities

Rowlett Park