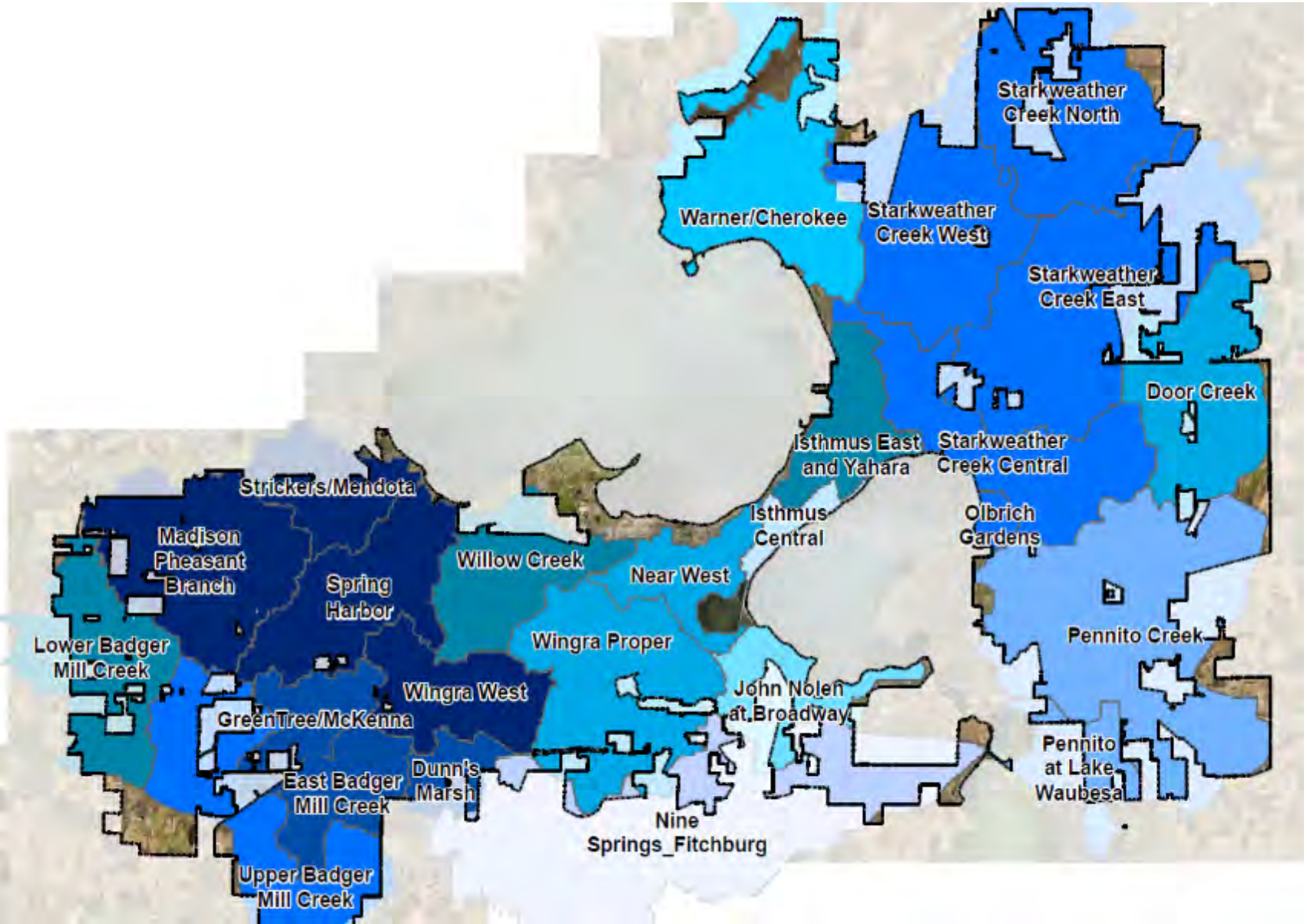
Wingra West Watershed Study Solutions

by City of Madison Engineering Division

June 8, 2022

Watershed Study Phasing



Legend

Municipal Boundary

Watershed Study Areas

Start Year and Month

- 2019 March
- 2019 July
- 2020 March
- 2021 March
- 2022 March
- 2023 March
- 2024 March
- 2025 March
- 2026 March
- 2027 March

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Proposed and Actual Schedule

Round 1 Watershed Studies

Projected: Spring-Summer 2019 **Actual**: Spring-Winter 2019

Create and Calibrate Model

Projected: Summer-Fall 2019 **Actual**: Fall-Winter 2019

Identify Flood Impacts

Projected: Fall-Winter 2019 **Actual**: Summer 2020

2nd Public Meeting

Projected: Winter-Spring 2020 **Actual**: Spring-Winter 2020

Evaluate Solutions

Projected: Spring-Summer 2020 **Actual**: Spring-Summer 2021

3rd Public Meeting

Projected: Summer-Fall 2020 **Actual**: Summer-Fall 2021

Finalize Study

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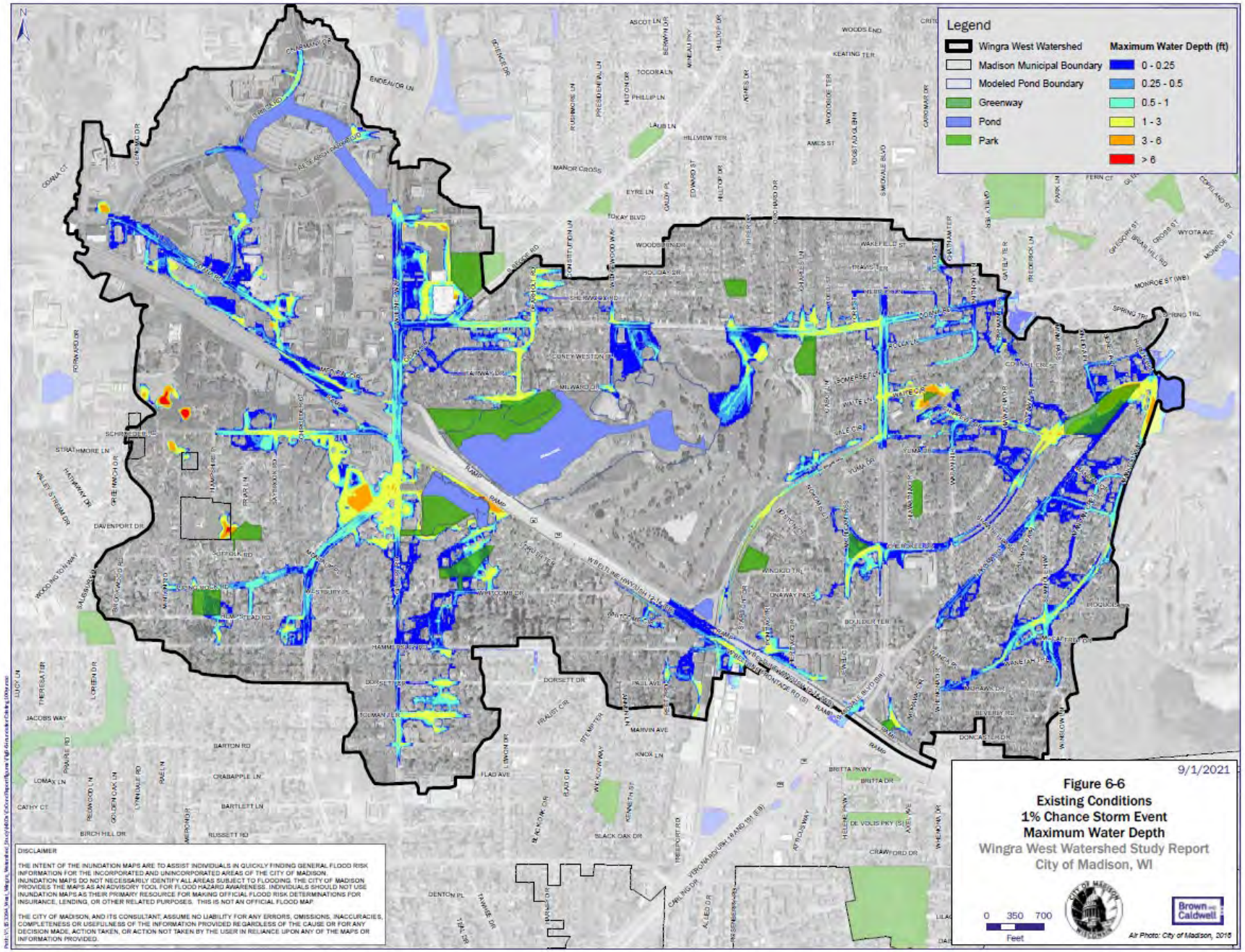
Wingra West Watershed Report Milestones

- PIM 1: 5/1/2019
- PIM 2: 7/23/2020
- PWI : 12/3/2020
- Parks Specific: 12/14/2020
- Golf Specific: 2/3/2021
- PIM 3: 6/17/2021
- Report Final Draft finished : 11/3/2021
  Report Public comment periods 2/4/2022-3/4/2022
- Golf Sub committee: 4/28/2022
- BPC : 5/11/2022
- BPW: 06/08/2022

Existing Conditions 1% Chance (100-yr) Event Inundation Mapping



Wingra West Watershed Proposed Mitigation Measures

Storm Sewer Pipe Size Increases

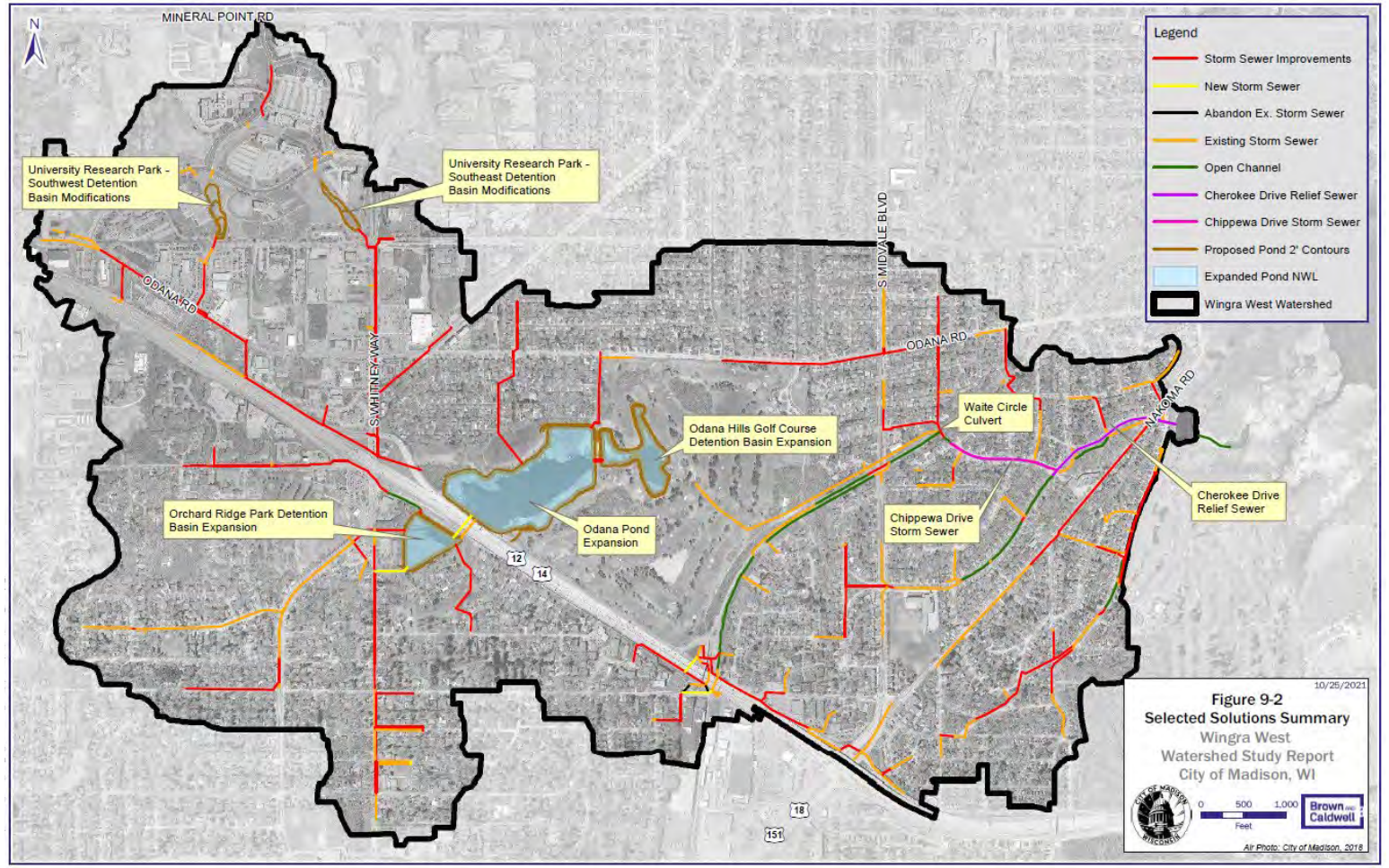
Detention Improvements

- UW Research Park Southeast
- UW Research Park Southwest
- Odana Hills Golf Course
- Odana Pond
- Orchard Ridge Park

Relief Sewers

- Cherokee / Chippewa
- Waite Circle Culvert (completed 2020)

Total Major Project Costs
(not including local storm sewer projects)
$42.9 million



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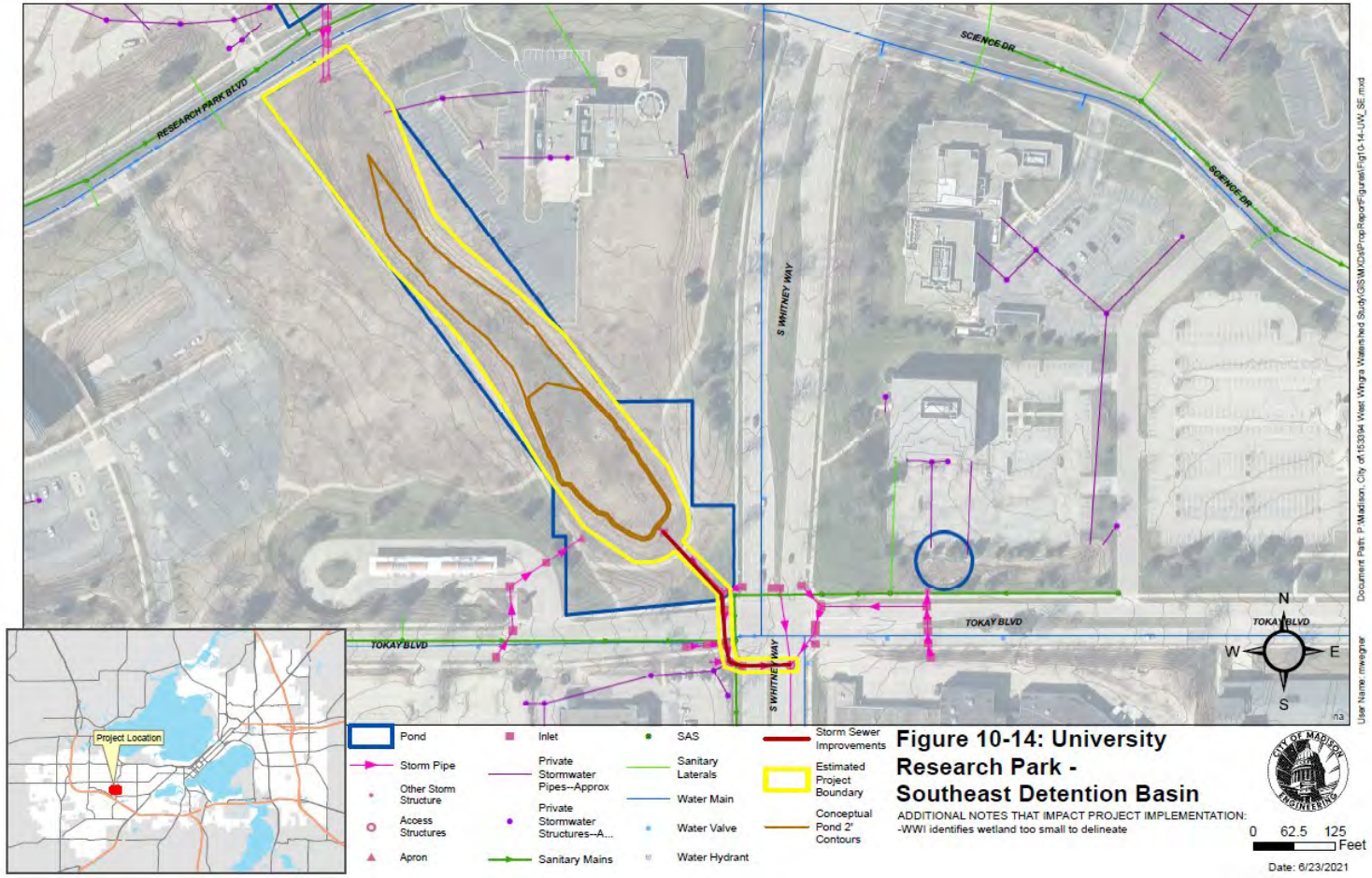
Results

- 10% Chance Target (4.08 inches) – no ponding on streets
  - Existing Conditions: 7.0 miles out of 15.9 miles of storm sewer not meeting target (44%)
  - Proposed Conditions: 0.5 miles out of 15.9 miles of storm sewer not meeting target (3%) – reduced 6.5 miles
- 4% Chance Target (5.01 inches)– streets passable for emergency vehicles
  - Existing Conditions: 8.3 miles out of 41.6 miles of streets not meeting target (20%)
  - Proposed Conditions: 0.4 miles out of 41.6 miles of streets not meeting targets (1%) – reduced 7.9 miles
- 1% Chance Target (6.66 inches) – no structure flooding
  - Existing Conditions: 167 out of 2,914 structures not meeting target (6%)
  - Proposed Conditions: 33 out of 2,914 structures not meeting target (1%) – reduced 134 structures

University Research Park – Southeast



Details

- Outlet modification
- 1,750 cy excavation
- Remains as a dry basins similar to current state
- $707,000

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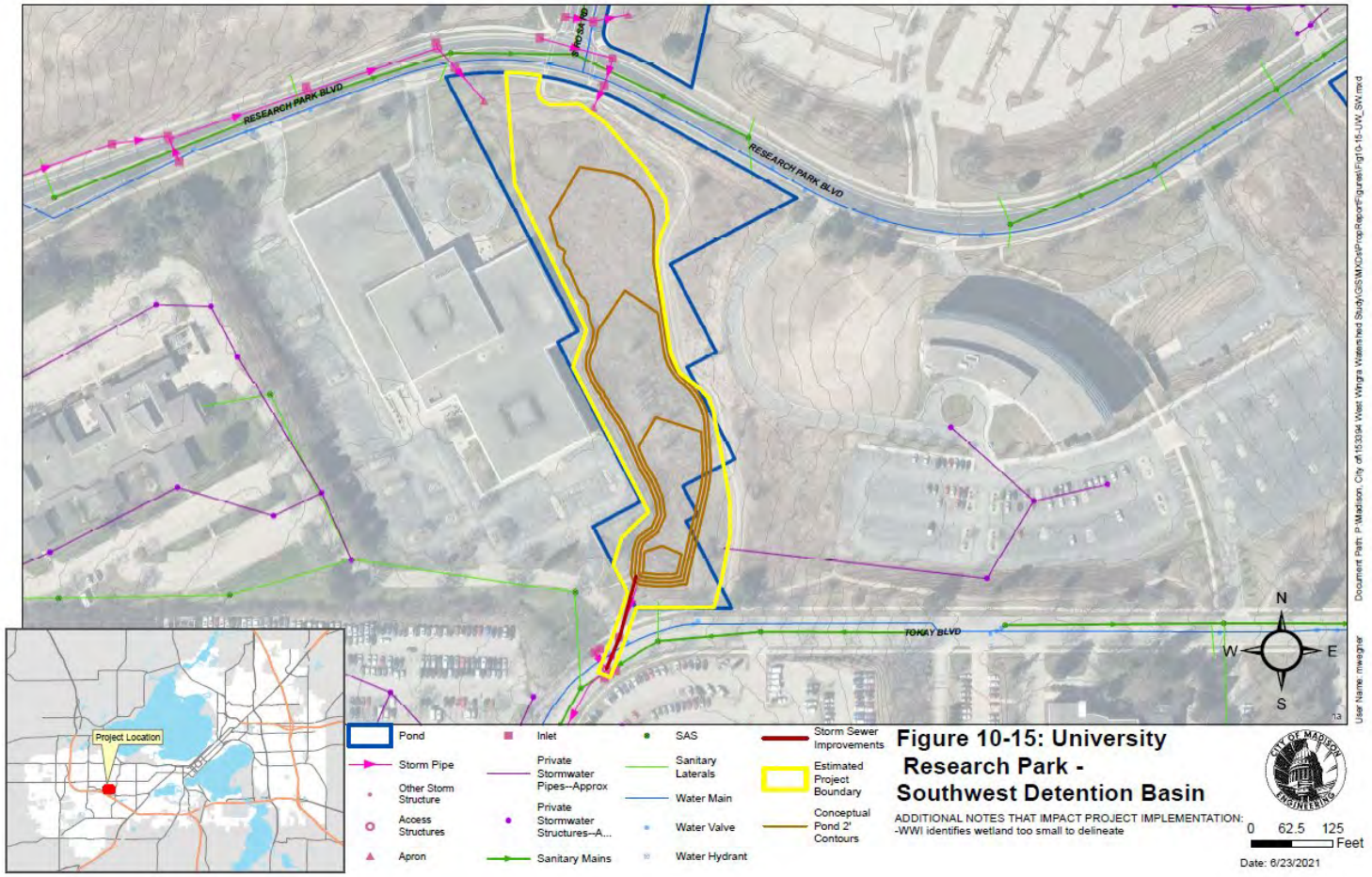
University Research Park – Southwest



Details

- Outlet modification
- 4,230 cy excavation
- Remains as a dry basins similar to current state
- $626,000

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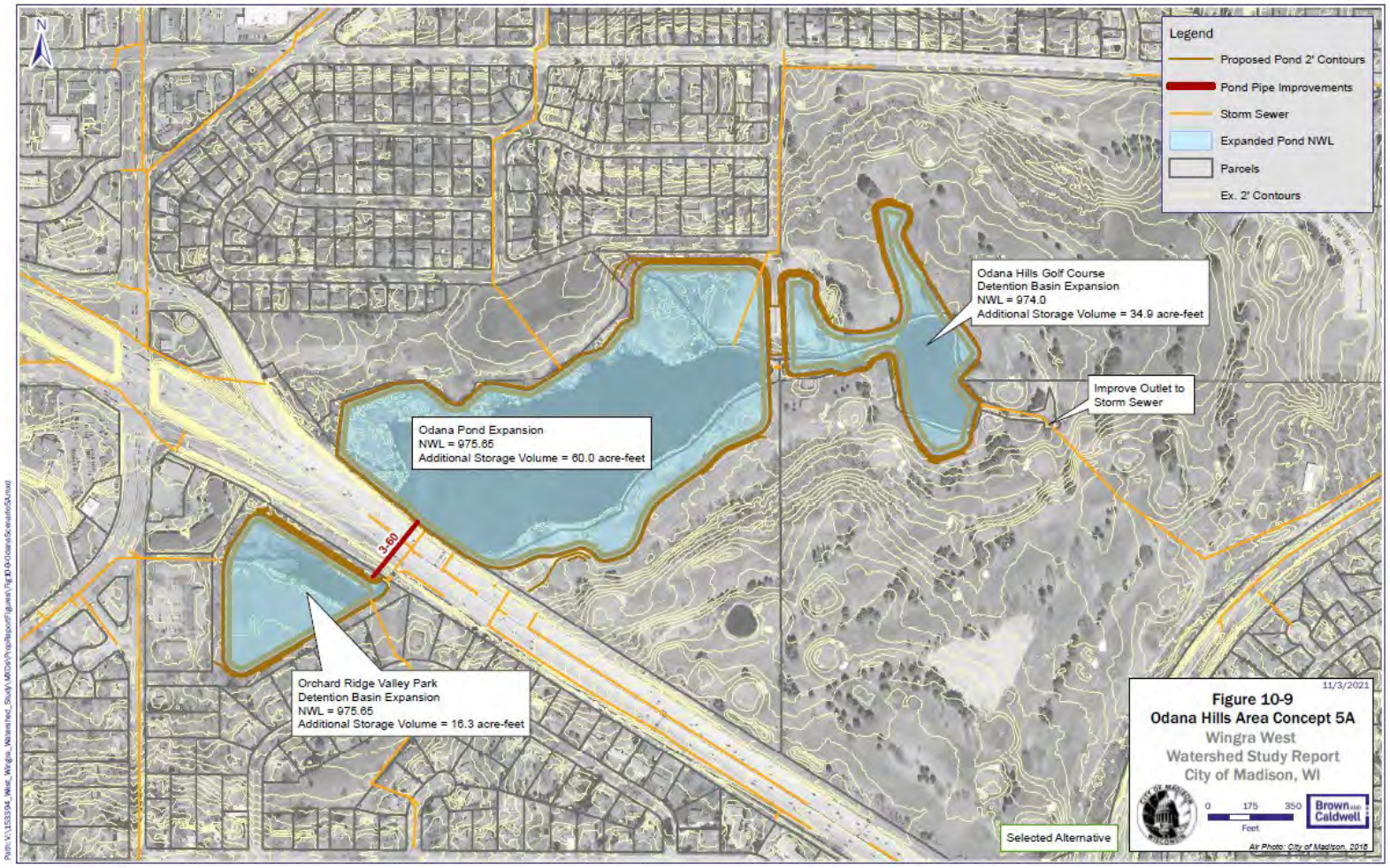
Modified Golf Course / Odana Pond NWL = 975.65’



Details

- Outlet pipe remains in place
- Weir plate removed on Odana Pond
- All ponds expanded and dredged
- Significant permitting hurdles
- Concept used to size storage and develop cost estimate, pond footprint flexible

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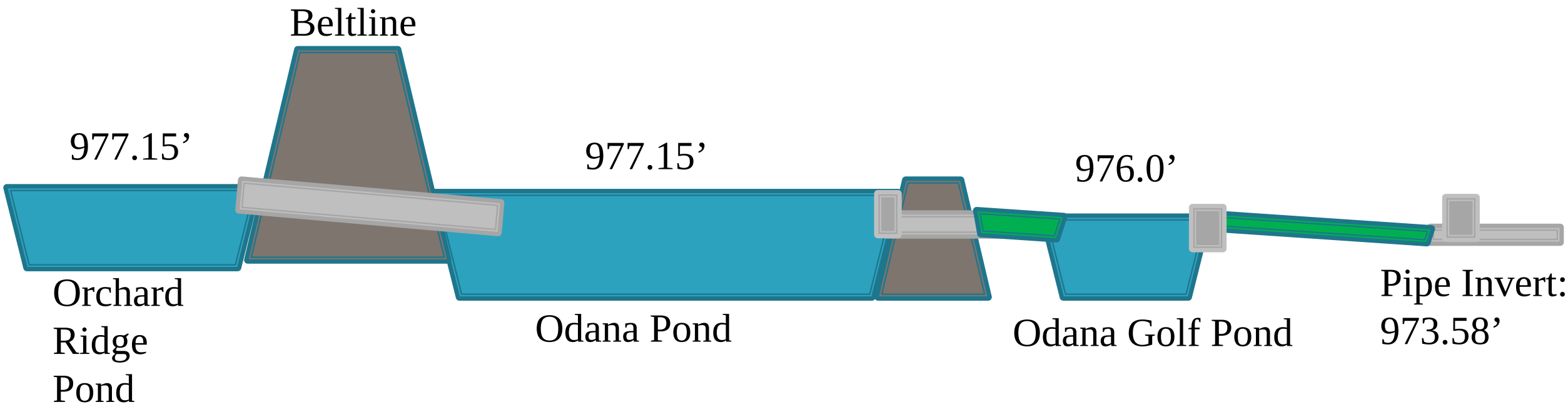
Existing Conditions Odana Pond Complex Schematic



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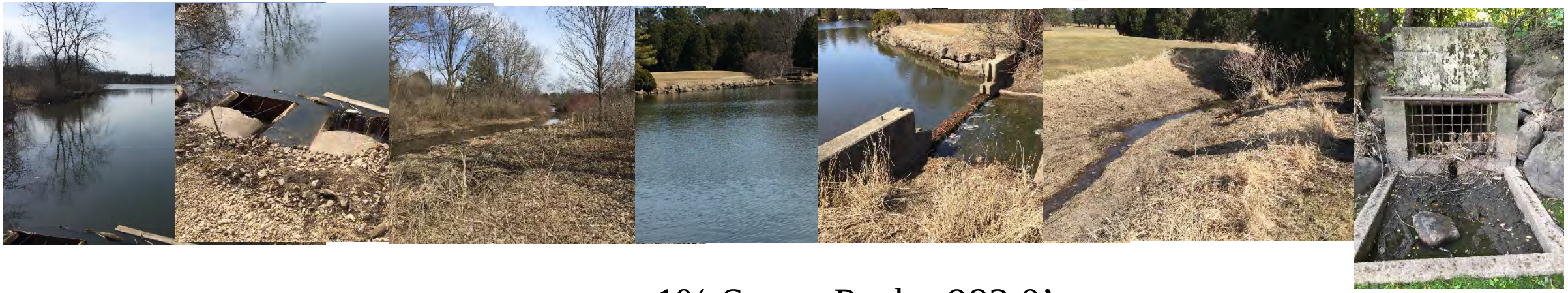
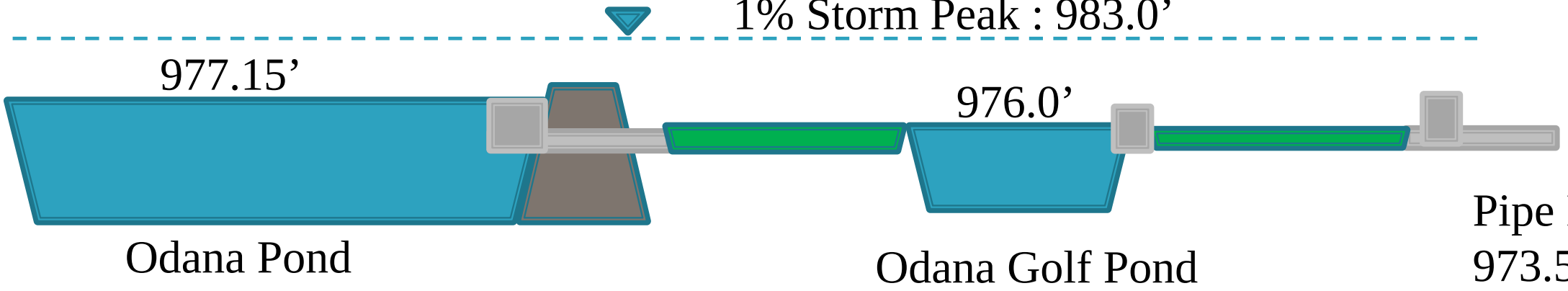
Pond Complex Schematic: Existing Conditions





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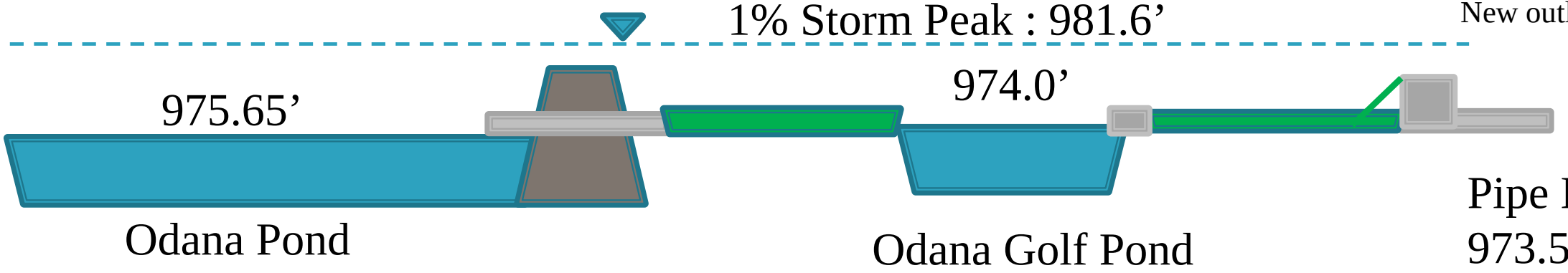
Pond Complex Schematic: Proposed Conditions

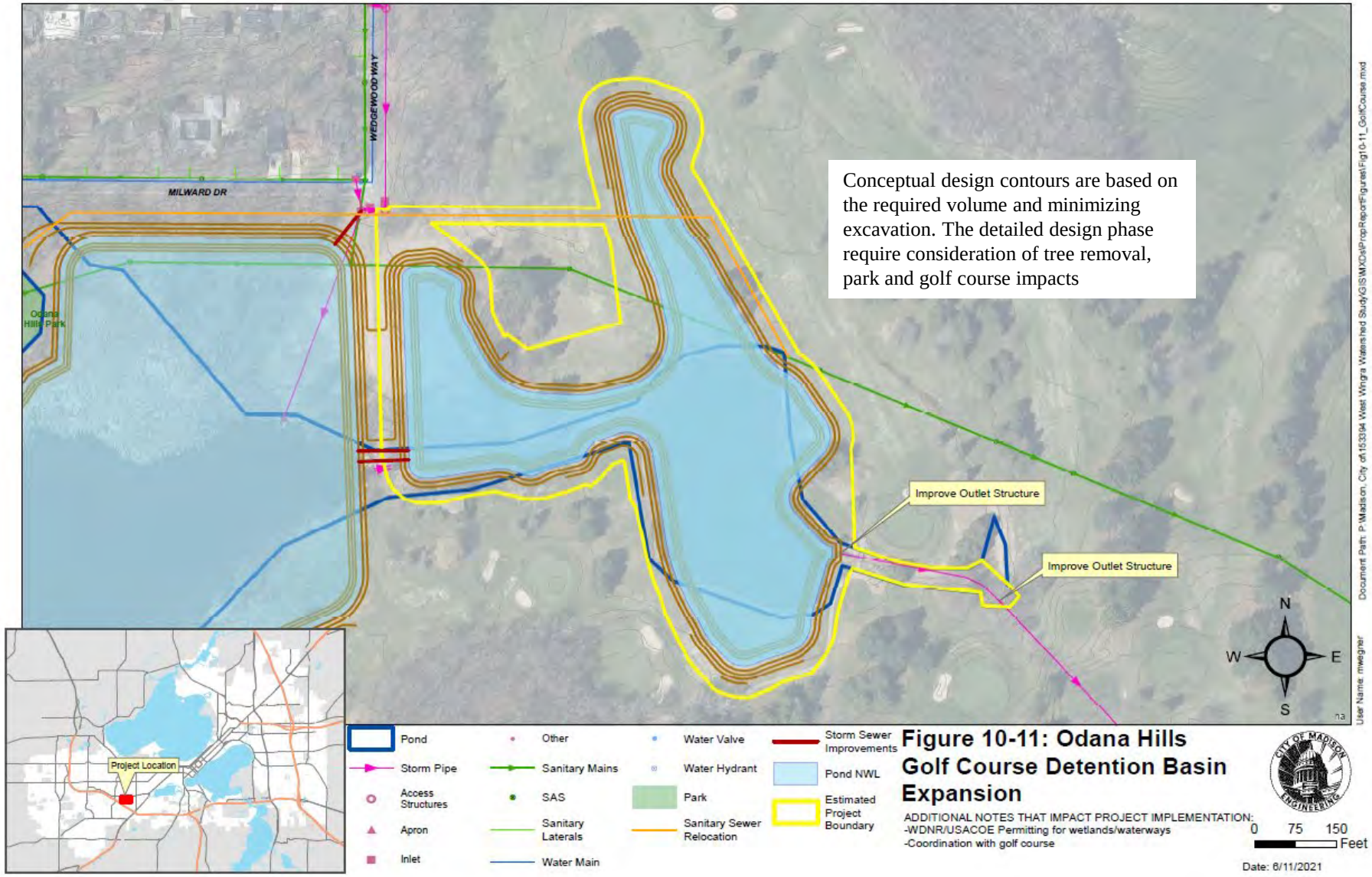
Lower Odana Pond NWL

Lower Odana Golf Pond NWL and expand pond footprint

New outlet: less clogging



Proposed Odana Hills Golf Course Pond



- 80,000 cy of excavation
- 20,000 cy dredging
- Lower pond 2’
- Improve outlet
- Cost Estimate
  - $ 6.1 million
- Could be done in stages

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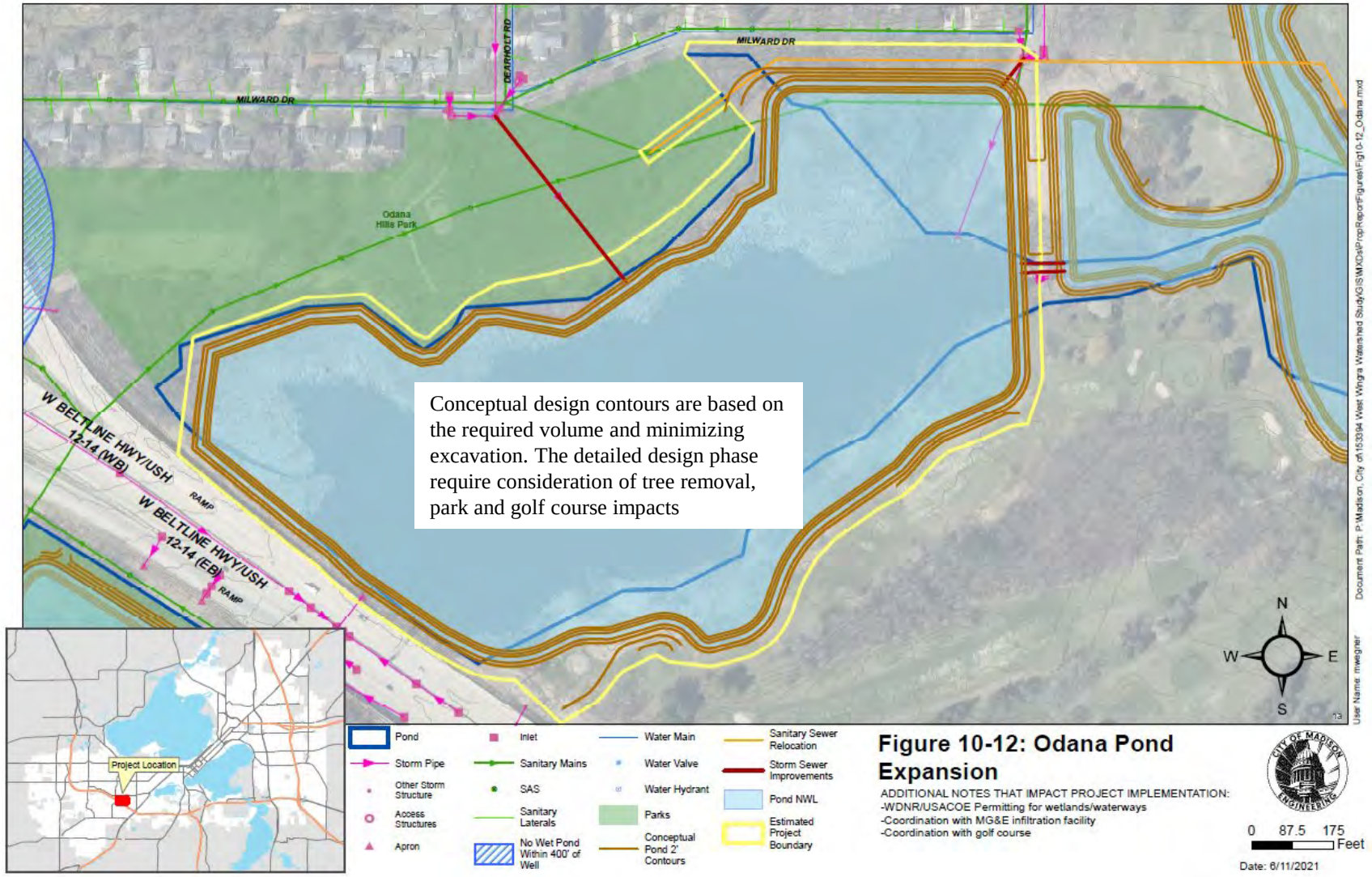
Proposed Odana Pond



- 188,000 cy of excavation
- 121,000 cy dredging
- Lower pond 1.5’
- Cost Estimate
  - $ 14 million
- Significant permitting hurdles

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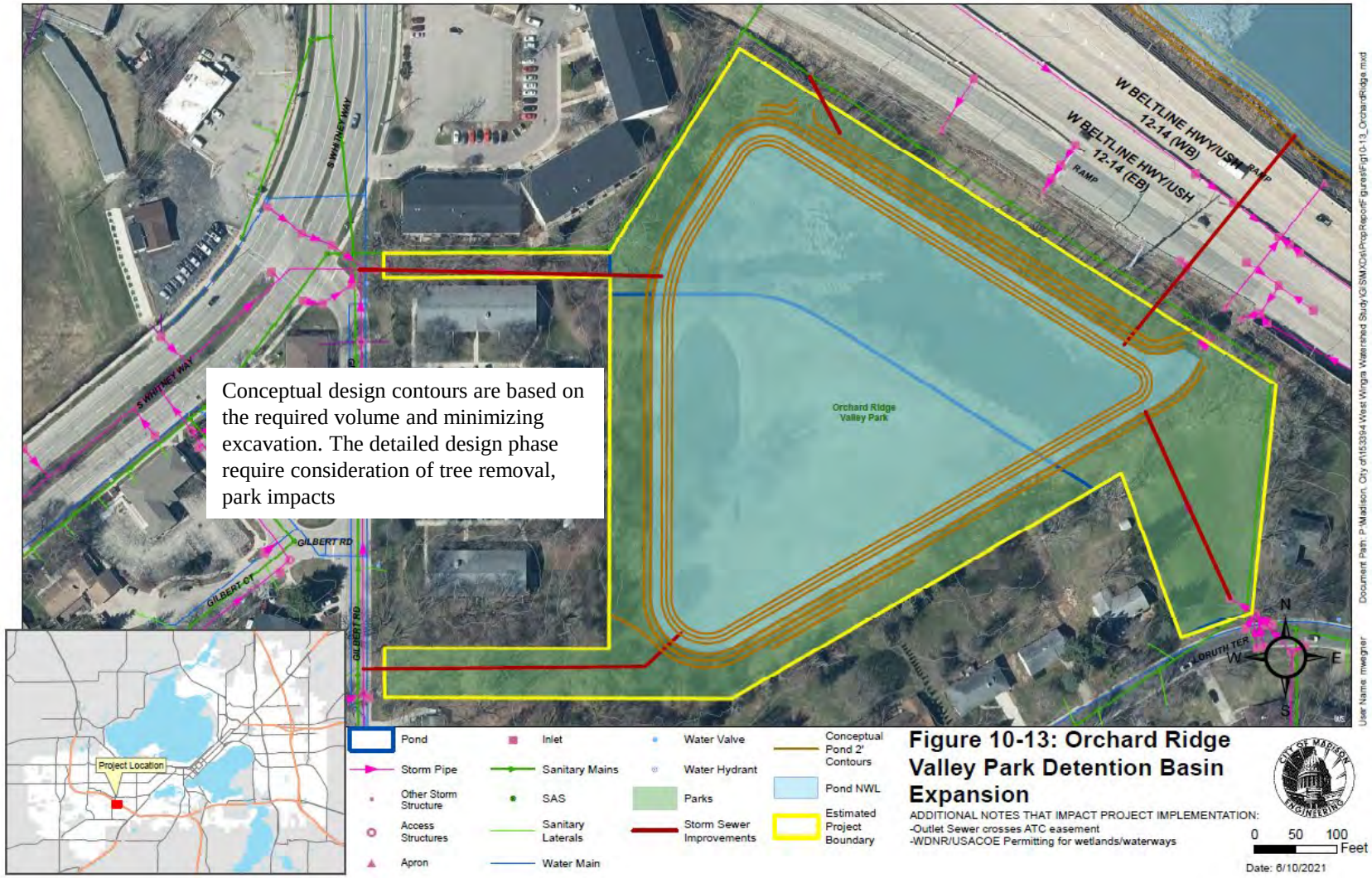
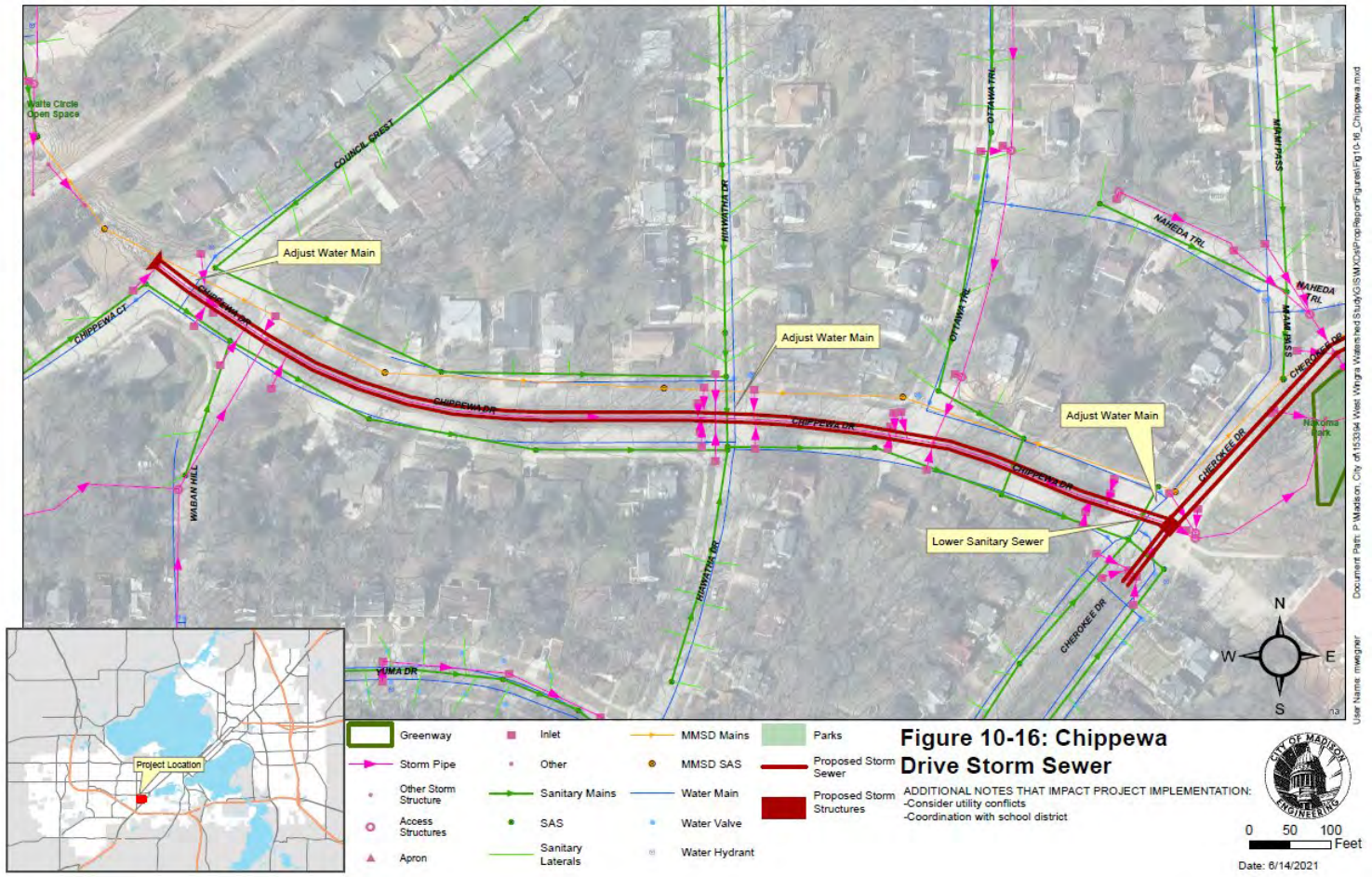
Orchard Ridge Valley Pond



- 56,000 cy of excavation
- 19,000 cy dredging
- 60” storm sewer under beltline
- Lower pond 1.5’
- Cost Estimate
  - $ 9.3 million
- Significant permitting hurdles

Chippewa Drive Storm Sewer



- 1300 linear feet of 6’ x 10’ Box Culvert
- $ 4.7 million
- All trees in boulevard would need to be replanted

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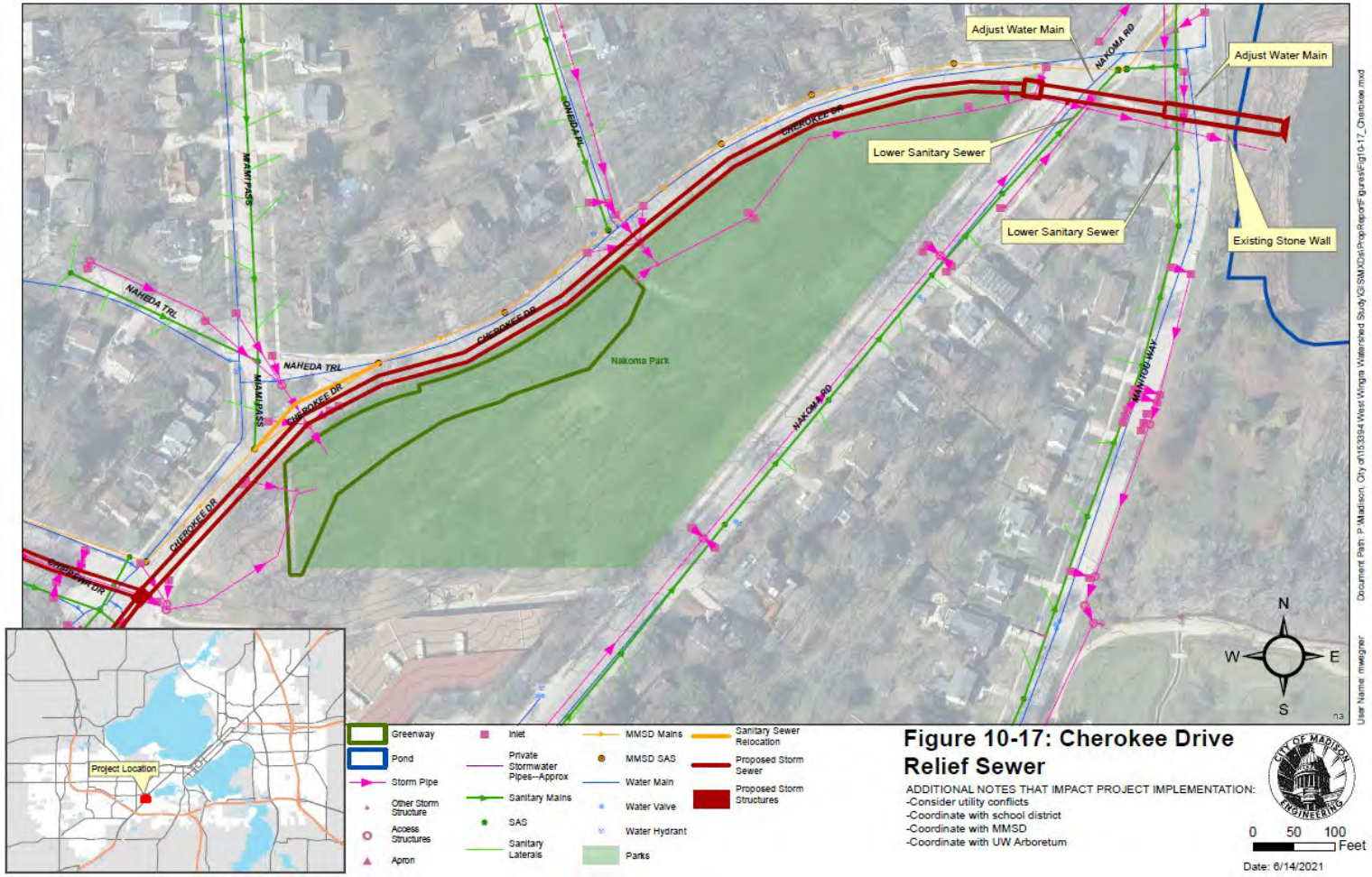
Cherokee Drive Stormsewer



- Box Culverts
  - 1300 linear feet of 6’ x 12’
  - 166 linear feet of 6’ x 14’
  - 126 linear feet of 6 x 16’
- $ 6.2 million
- Avoids significant changes to Nakoma Park
- With all proposed solutions flows into Manitou pond increase significantly
  - 330 to 1490 cfs

Questions?

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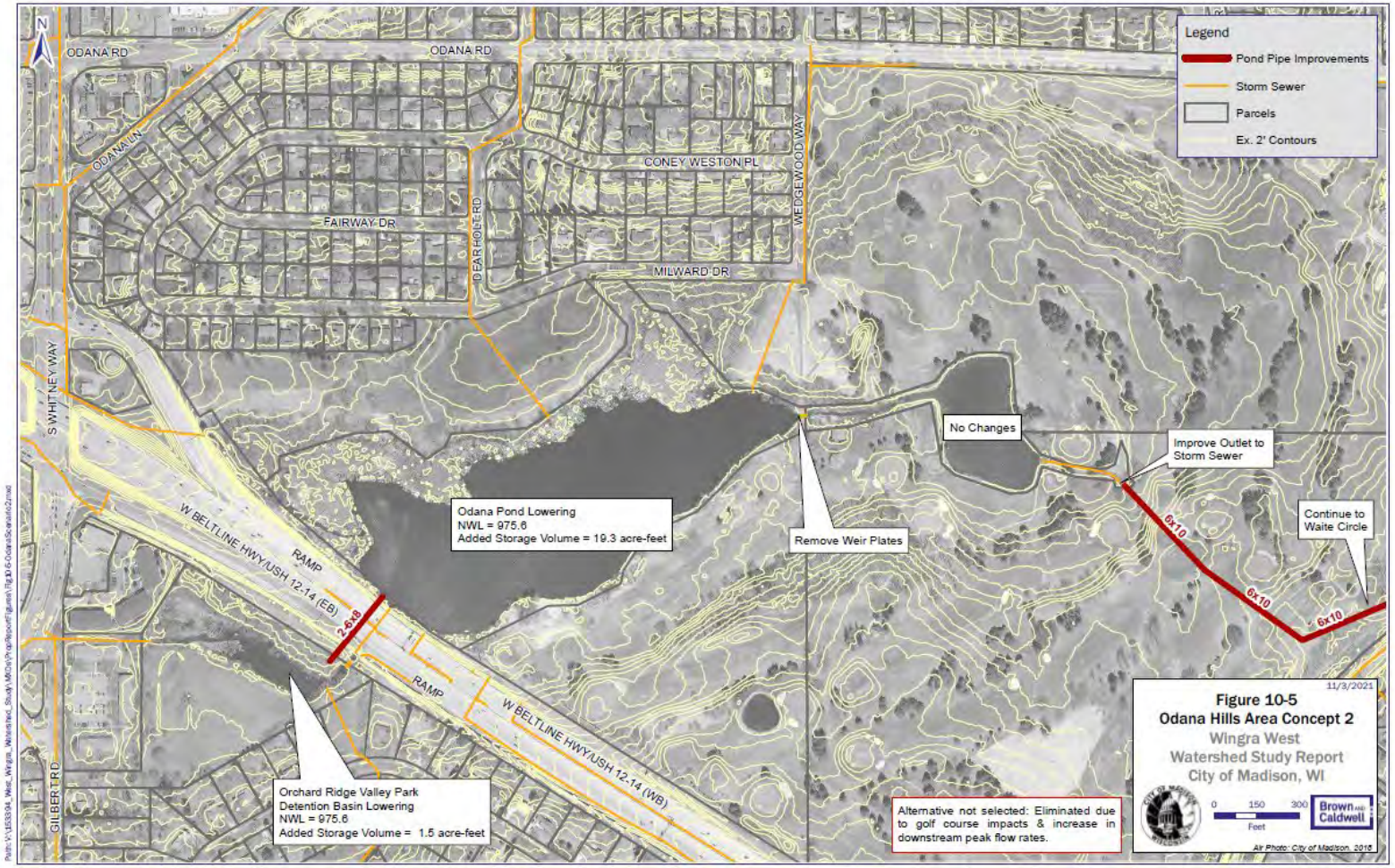
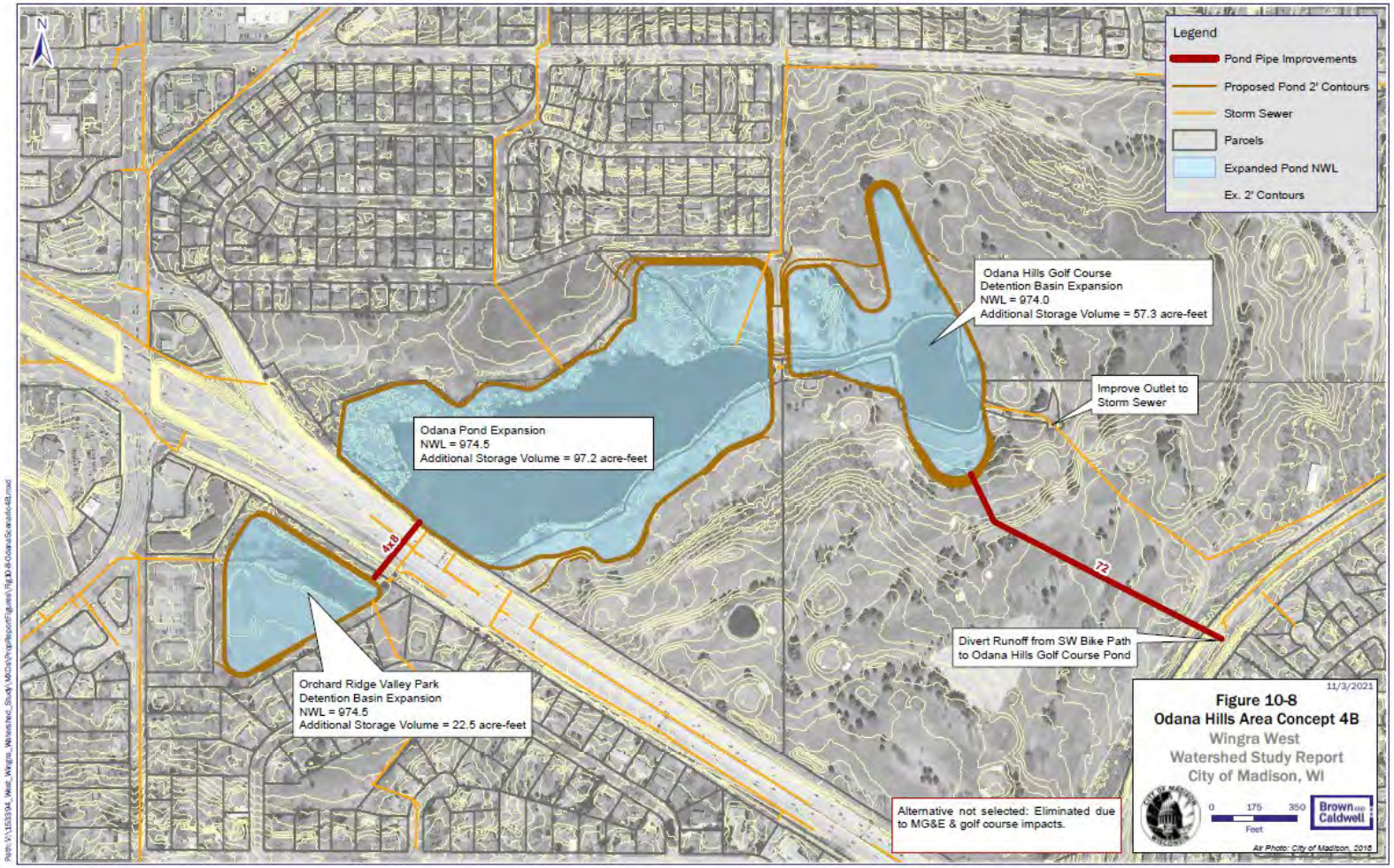
Concept 2: Not Selected – Maximize Conveyance



Details

- Sized outlet pipe required to achieve goals without expanding ponds.
- Weir plate removed on Odana Pond
- 6’ x 10’ outlet required
- Significant impacts downstream do to increased flow
- <u>Concept Not Selected</u>

Concept 4B: Not Selected- Maximize Storage



Details

- Ponds lowered to lowest possible level while utilizing existing 42” pipe 974.5’
- Diversion of flow from SW bike Path routed to pond in 72” pipe
- Plan reduces flow at Waite Circle by 220 cfs . Proposed flow is 860 cfs.
- Significant Golf Course Impacts
- Concept Not Selected

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