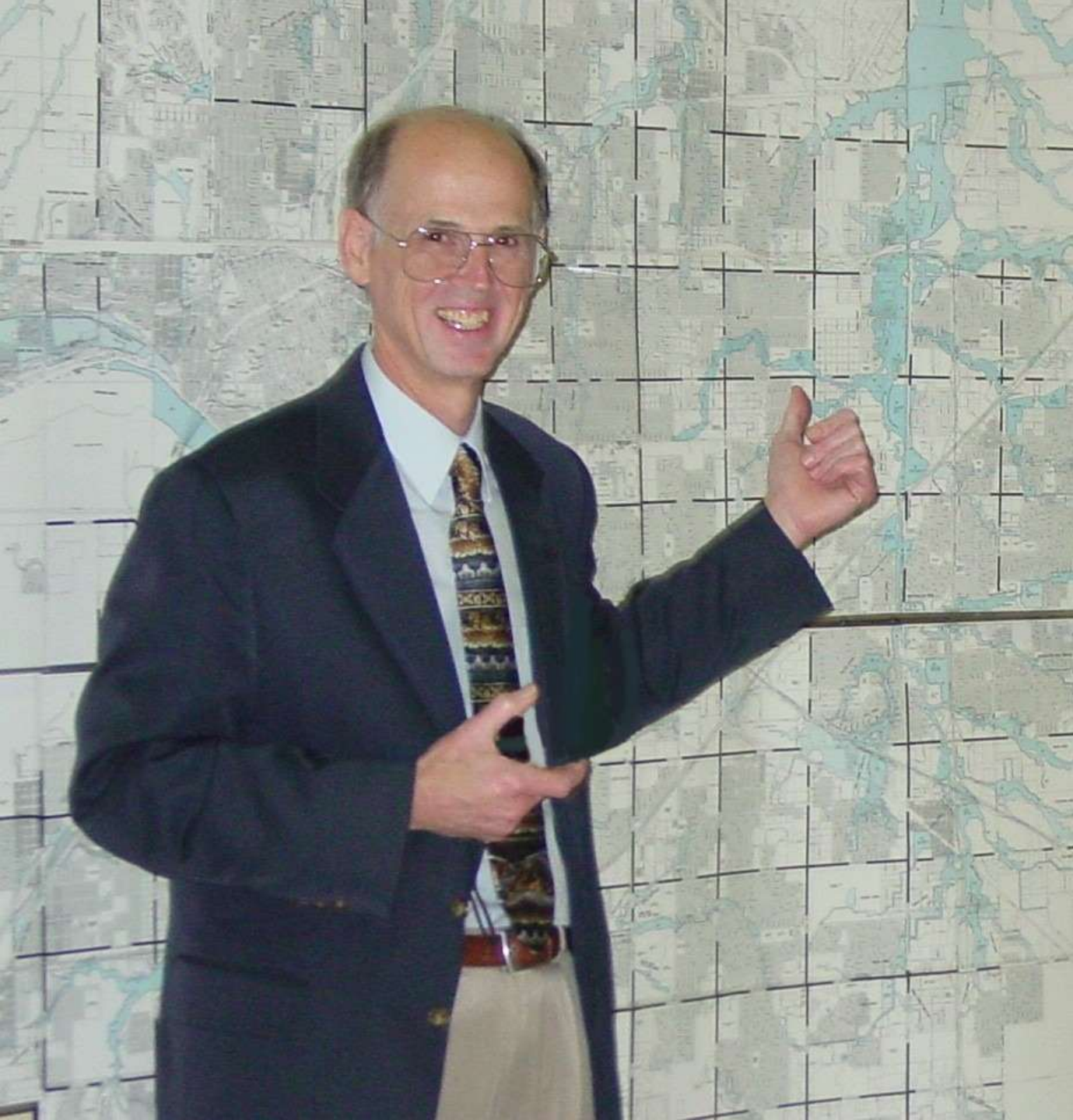




# Repetitive Loss Area Planning



Ronald D. Flanagan, CFM  
Flanagan & Associates, LLC  
Urban Environmental Planning Consultants



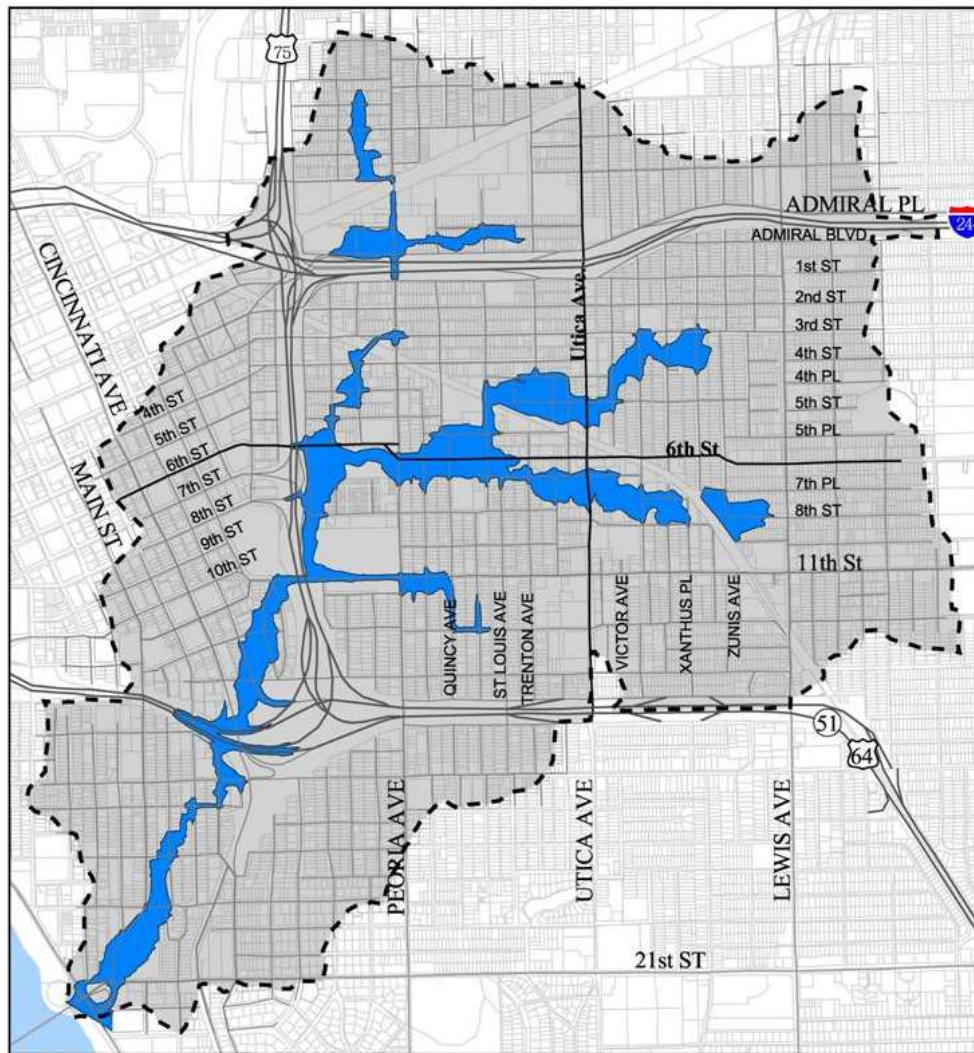
**Dedication:**

**French  
Wetmore**

**CRS  
Consultant**







3.4 square  
miles – Fully  
Urbanized –

524  
Structures in  
Floodplain

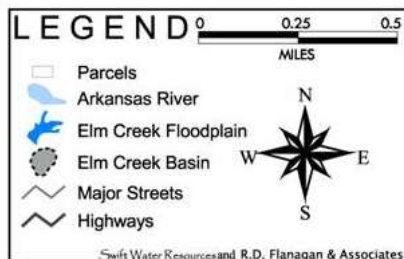
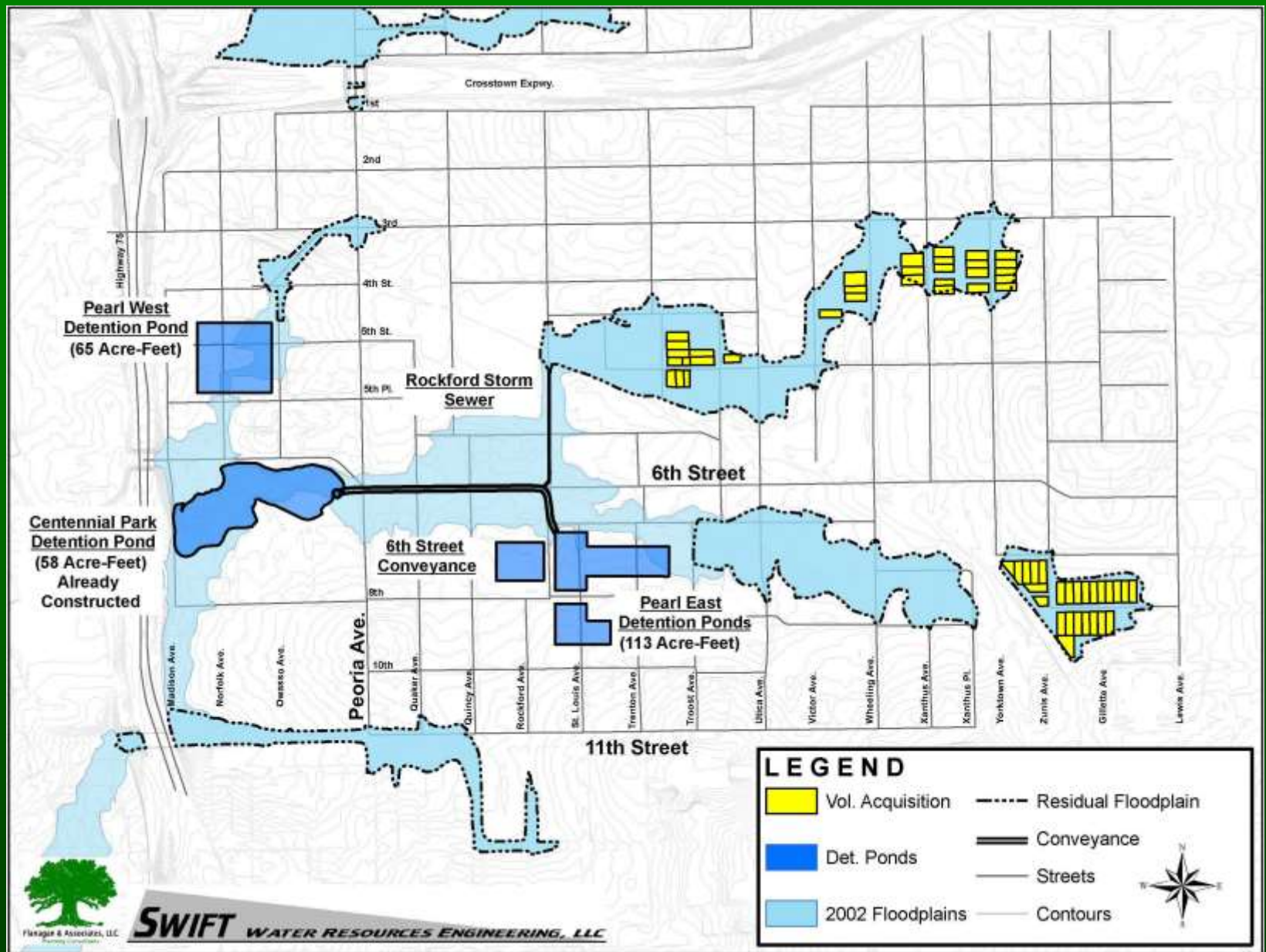


Figure 2  
*Elm Creek*  
*Master Drainage Plan*  
**Elm Creek Basin**







**Centennial Park Stormwater Detention**



**Flood Elevation.** Elevation Certificate Forms may be obtained at Development Services, 175 E. 2nd St., 4th floor. No construction, including filling, is allowed in the mapped floodway without an engineering analysis that shows the project will not increase flood damage elsewhere.

Be sure to get a building permit before installing a safe room in flood-prone areas. Old storm cellars can be a dangerous place to shelter from tornadoes if not built to current building code standards, since they may fill up with floodwater or collapse under pressure. Away from home, avoid taking shelter in flood-prone areas such as culverts or drainage tunnels during tornadoes and extreme rain events.

Before you begin construction or add on to your existing building, contact the Customer Care Center by dialing 311 or (918) 596-7777. Qualified staff can help you build a safe project and comply with local floodplain policies. Get a building permit when constructing in flood prone areas. This information could not only save you time and money – it could save your life.

#### Elevation Certificates: Available to Property Owners

Anyone who owns property within the City of Tulsa's Regulatory Floodplain needs a copy of a FEMA elevation certificate for their property in order to purchase flood insurance through the National Flood Insurance Program (NFIP). The City of Tulsa can supply elevation certificates for structures built in the floodplain after October, 1991 and for most floodplain properties built after 1971. Insurance agents selling flood insurance policies will need a copy of the elevation certificate to establish the premium.

Elevation certificates are required on any structure built in the Tulsa Regulatory Floodplain, or on which substantial improvements have been made, after Oct. 1, 1991, when the city joined FEMA's Community Rating System (CRS) program.

Copies of the elevation certificates are available to property owners and their agents. An elevation certificate can help you better understand your risk of flooding and can be requested by contacting the City's Customer Care Center by dialing 311 or (918) 596-7777. City of Tulsa property owners pay up to 40% less for flood insurance than property owners in most cities because of the City's continued re-certification in the CRS program administered by FEMA.

City staff is available to help you understand the flood risk to your property, interpret detailed floodplain maps and explain the development requirements. They can also tell you if an area or property has a history of prior flooding or drainage problems and explain the natural functions of the floodplains. For existing properties, you can request to meet with a City Engineer to discuss possible improvements to existing drainage problems.

#### Cleaner Creeks: You Can Help

Drainage systems are maintained regularly to help prevent water from backing up into streets and homes. If you spot a blocked drain or see illegal development in a flood zone, call 311 or (918) 596-7777, and an inspector will investigate.

Storm Drains are for rain. Don't pour used motor oil, antifreeze, old pesticides or any other pollutants down the storm drainage system. All storm sewers in Tulsa drain to the Arkansas River or Bird Creek and are monitored regularly for compliance with Tulsa's National Pollutant Discharge Elimination System (NPDES) Permit.

Putting foreign substances into this system can also cause flooding, and is a violation of City ordinance punishable by fines of up to \$500 a day.

Please do your part and keep the inlets and drainage ways clear of brush and debris and remember that storm drains are for rain.

#### Before the Flood

Everyone should have an emergency plan in case of flooding or

other disaster. Prepare a family flood and disaster preparedness and response plan that will help you and your family plan and think through all the details that demand attention after a flood watch or warning is issued.

Be alert when storms approach. Be prepared to grab your emergency kit and evacuate immediately, if necessary.

Put photocopies of inventory records, insurance policies, deeds, automobile titles, wills, telephone numbers, bank and credit card account numbers, and other valuable papers at a location away from your house, such as a safe deposit box.

If flooding is imminent, you should shut off the gas and electricity and move valuable contents of your home upstairs. If you're not sure how to turn off your gas and electricity, call your local utility companies.

#### Listen for Flood Sirens

Emergency sirens are located in neighborhoods throughout Tulsa.

When flooding is occurring or eminent in your area, the emergency sirens will be activated. For floods, the warning will be an alternating high-low siren followed by an explanation over the public address system located on the siren box, if required.

You should immediately turn on your radio or television for news bulletins. The warning system can interrupt all local radio and television stations, including cable. These bulletins are issued immediately upon receipt of new information.

#### When the Flood Comes

The safety of your family is the most important consideration. Flood waters can rise rapidly, so you should be prepared to evacuate before the water reaches your property.

If you're caught in the house by floodwater, move to the second floor or to the roof. Take warm clothing, a flashlight, and portable radio with you. Wait for help.

Do not walk through flowing water. Currents can be deceptive; six inches of moving water can sweep you off your feet. Use a pole or stick to ensure that the ground is still there before you enter standing water.

Remember the phrase "Turn Around, Don't Drown" and avoid driving through a flooded area. Most flood deaths occur in cars. Don't drive around road barriers; the road or bridge may be washed out.

#### After the Flood

Report flooding inside a building as soon as possible to the Customer Care Center by dialing 311 or (918) 596-7777.

Before entering a flooded building, check for structural damage and turn off outside gas lines to your meter. Let the building air out for several minutes before entering.

Watch for electrical shorts and live wires while turning off the main power switch. Stay away from power lines and electrical wires. A fiber drowning, the number two flood killer is electrocution. Electricity can travel through water.

Cover broken windows and holes in the roof or walls to prevent further weather damage.

Proceed with immediate cleanup measures to reduce any health hazards. Take pictures of items being discarded and show them to the insurance appraiser for verification.

You will need to obtain a permit to repair a flood damaged building. If the building is substantially damaged (50 percent of the value of the building), or you plan to substantially improve the building, you may be required to elevate or floodproof before you can rebuild.

## City of Tulsa 2017 Official Notice



**Tulsa**  
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## Flood Hazard Information About Your Property

**Your property is located in or near an area with a high risk of flooding. It may be within a FEMA Special Flood Hazard Area (SFHA), or the Regulatory Floodplain within the City of Tulsa.**

#### What is the risk?

Floods are the number one disaster in the United States. Everyone is at risk – even those that do not live close to rivers and creeks. Floods can happen as a result of heavy rains, snowmelt, overloaded stormwater drainage systems, runoff from land development, levee overtopping, dam breach and other reasons.

Just because you haven't experienced a flood in the past, doesn't mean you won't in the future. Flood risk isn't just based on history; it can change due to building and land development. Over the life of a 30-year loan, a home located in a high-risk flood area is more likely to be damaged by a flood than by fire.

Know your risk of flooding. To learn more about your risk of flooding visit [www.floodsmart.gov](http://www.floodsmart.gov) or contact the City of Tulsa Customer Care Center by dialing 311 or (918) 596-7777.

#### Flood Insurance Available for All Properties in Tulsa

If your home is located in a high-risk flood zone, you need flood insurance. According to FEMA there is a 26 percent chance it will flood during the life of a 30-year mortgage. Up to 25 percent of all National Flood Insurance Program claims come from structures outside of high-risk areas. City of Tulsa residents receive a 40 percent discount on flood insurance for homes in a Special Flood Hazard Area (SFHA) and a 10 percent discount for other properties. Most homeowners' policies do not cover flood losses. You can protect your home and contents with flood insurance from the NFIP.

You should obtain flood insurance coverage for both the structure and contents. There can be more damage to the contents than the structure. Renters can buy contents coverage even if the owner does not insure the structure. There is a 30-day waiting period before the policy becomes effective.

Flood insurance is required by law in order to obtain federally secured financing to buy, build, or renovate a structure located in a SFHA. This financing includes federal grants, FHA and VA loans, and most conventional mortgage loans.

To learn more about flood insurance, contact any licensed property insurance agent or call City of Tulsa Floodplain Engineer Bill Robison or Floodplain Administrator Laura Hendrix at (918) 596-7777.



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2317 S. Jackson Ave., S-312  
Tulsa, OK 74107

# City of Tulsa's Annual Floodplain Notification



**T**ulsa is located in one of the most scenic natural areas of Oklahoma. Unfortunately, many locations within the city suffer repeated flood damages when torrential storms strike. Some of these flood-prone areas are not in a designated floodplain.

In the 1970s and '80s Tulsa County had the most federal disaster declarations in the nation. In 1984, a flash flood caused \$180 million in damages and 14 deaths.

Since that time, Tulsa has made tremendous progress with dozens of flood control projects and additional projects are planned. Tulsa has established an award-winning, comprehensive floodplain management program that is cited as a national model. Overall, the risk of flooding has been substantially reduced - but not eliminated. Because of our climate and location, Tulsa can never be considered 100 percent safe from flooding. Spring is our most vulnerable time.

The Stormwater Drainage and Hazard Mitigation Advisory Board, a citizen board appointed by the Mayor, conducts public meetings to hear citizens' ideas on drainage problems. City staff provides the Board and interested citizens with updates on planned or proposed projects at each meeting.

The accompanying map shows Tulsa's creeks and rivers which have periodically flooded. Flood damages have occurred at various times along the Arkansas River and the city's numerous creeks.

### Tulsa's Natural Floodplains

Many of Tulsa's streams and floodplains are beautiful natural open-space areas and have been preserved for recreational activities, as wetland habitat for wildlife, and are open to the public. Several drainage improvements in the City include planting of special water plants and grasses to filter impurities from stormwater runoff. These Low Impact Development (LID) projects improve water quality and quantity. LID includes rain gardens and pervious materials which also serves to preserve the natural and beneficial function of the City's floodplains.

### You Can Protect Your Property From Flooding

Floodproofing buildings can help reduce the potential for flood damages to structures and their contents. A building permit may be required for this type of work. If your property is located where you can safely implement floodproofing, it could pay to investigate your options. Several informative brochures may be checked out at your library and copies can be obtained for free from FEMA.

Other Flood Mitigation Measures you might consider include:

- Raising your house above flood levels
- Wet or Dry Floodproofing
- Keep water away by re-grading your lot
- Build a small floodwall or earthen dam
- Install a valve to prevent sewer back-up
- Keep materials like sandbags, plywood, plastic sheeting and lumber handy for emergency waterproofing
- Remember that drainage ditches perform much better when kept clear of brush and debris

City staff is available to discuss specific details with you or make site visits to make recommendations during normal business hours - call the City of Tulsa Customer Care Center at 311 or (918) 596-7777 for assistance.

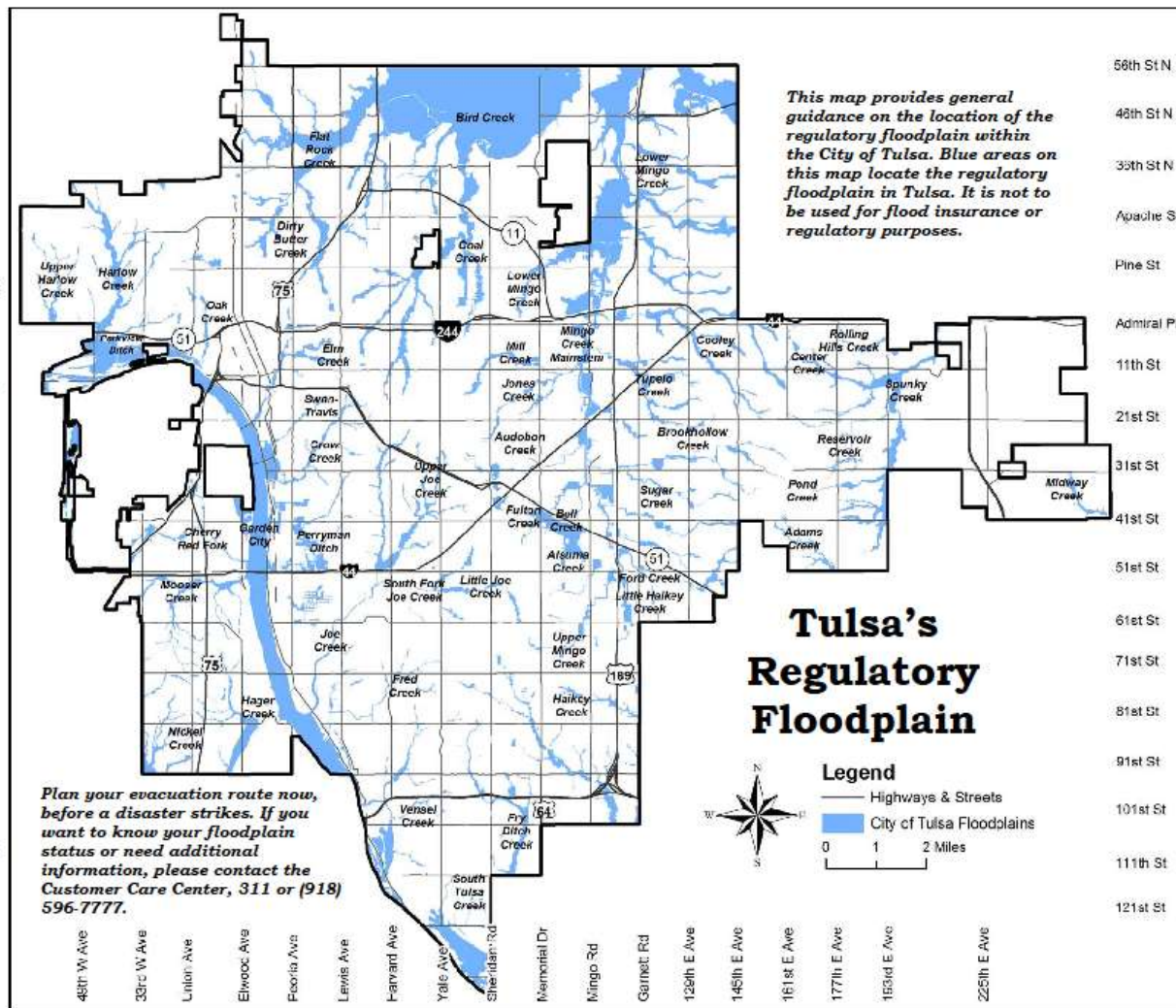
For additional information on Flood Mitigation Measures that you can make, visit the FEMA website at: [www.floodsmart.gov](http://www.floodsmart.gov)

### Permits are Required Before You Build

A floodplain watershed development permit must be obtained from the City of Tulsa before commencing any development, including grading or filling in the floodplain. Any activity outside the floodplain but within a natural or man-made watercourse also requires a permit.

For a free flood zone determination, contact the Customer Care Center with the correct address or legal description of the property. A written determination will be mailed to you. Also, detailed floodplain boundary maps are on file at City Hall, Development Services, 175 E. 2nd St., 4th floor, at Tulsa libraries, or online at [www.cityoftulsa.org](http://www.cityoftulsa.org)

New floodplain buildings must be protected from flood damage. Tulsa's building code requires that new buildings must be elevated one (1) foot above the Regulatory Base



# Reverse Side of Annual Floodplain Notification



# **Repetitive Loss Property**

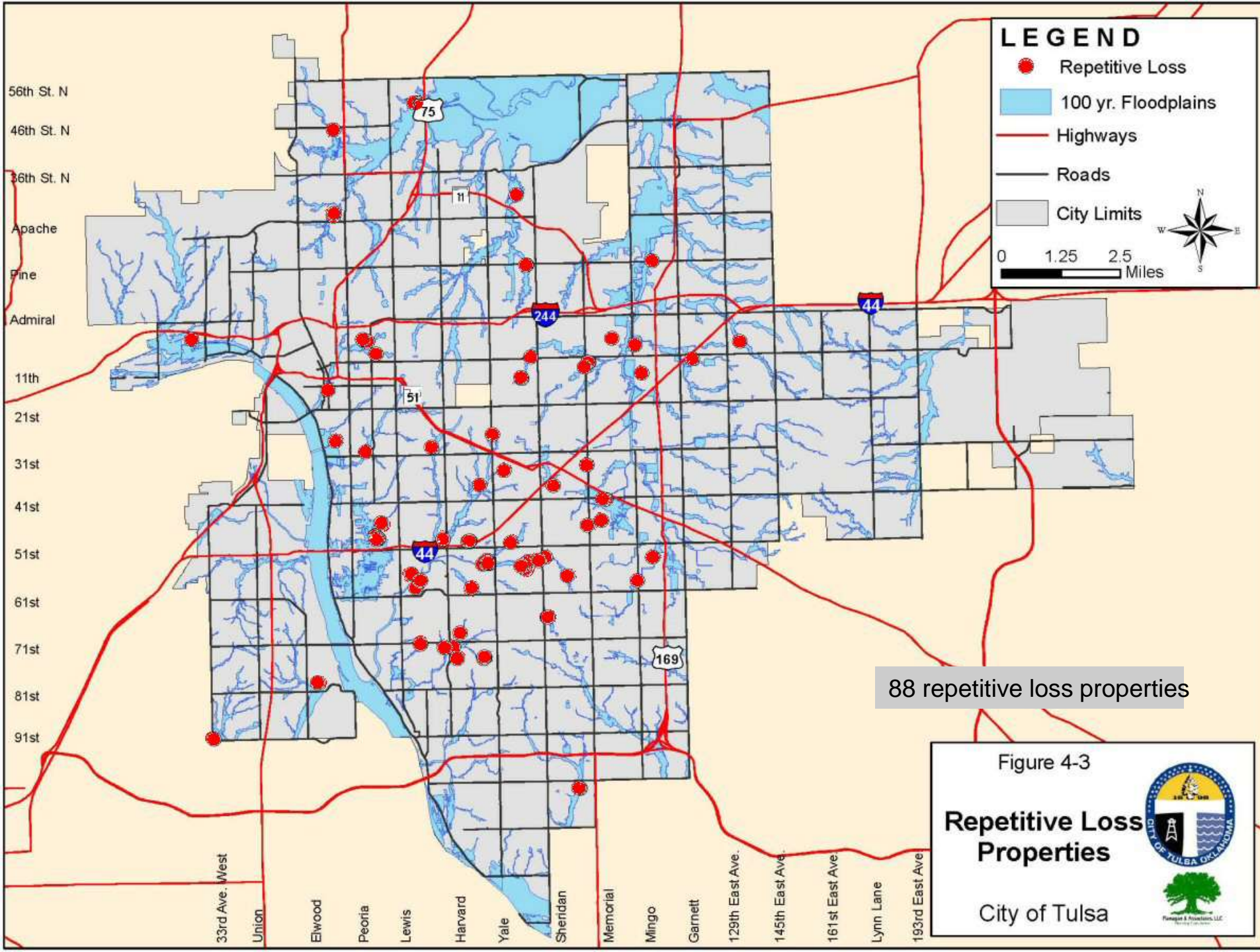
Any NFIP Insured Property  
filing two or more Claims for  
more than \$1,000 in any 10  
year period

## **Repetitive Loss Properties**

**account for only 1% of Insured Properties, but Account for over 30% of all Flood Insurance Claims Payments.**

**Over 25% of all Flood Insurance Claims are not located in a Floodplain, but are due to Overland Flow.**





# Repetitive Loss Area

A Repetitive Loss Area is located in the same vicinity/area which may have been flooded, but may not have filed insurance claims



# **Repetitive Loss Area Plan Objective:**

To identify RLA properties vulnerable to the flood event that damaged the Repetitive Loss Property, and identify the most cost-effective solution to protect the RLA properties.



## Repetitive Loss Area # 23

Joe Creek Area  
E. 56<sup>th</sup> St. & S. Birmingham Ave.



June 18, 2017



Bill Robison, P.E., CFM  
Engineering Services



# **Contents**

- I. Background**
- II. Location**
- III. History**
- IV. Research & Analysis**
- V. Mitigation Measures**

56th St. N

46th St. N

36th St. N

Apache

Pine

Admiral

11th

21st

31st

41st

51st

61st

71st

81st

91st

33rd Ave. West

Union

Elwood

Pacific

Lewis

Harvard

Yale

Memorial

Mingo

Garnett



## Repetitive Loss Area

Areas Identified as caused by overland flow issues.

### LEGEND

- |               |               |
|---------------|---------------|
| Interstate    | City Limits   |
| US Highway    | Water         |
| State Highway | Overland Flow |
| Turnpike      | Other Issues  |
| Railroad      |               |
| Roads         |               |

0 1 2  
Miles



56th St. N  
46th St. N  
36th St. N  
Apache  
Pine  
Admiral  
11th  
21st  
31st  
41st  
51st  
61st  
71st  
81st  
91st

3rd Ave. West  
Union  
Elwood  
Peoria  
Louisiana  
Harvard  
Yale  
Memorial  
Mingo  
Garnett

#### Tulsa Drainage Basins

- |                      |                   |
|----------------------|-------------------|
| ARKANSAS RIVER BASIN | MINO CREEK BASIN  |
| CENTRAL TULSA BASIN  | NORTH TULSA BASIN |
| EAST TULSA BASIN     | SOUTH TULSA BASIN |
|                      | WEST TULSA BASIN  |
|                      | Joe Basins        |

## Repetitive Loss Areas

### LEGEND

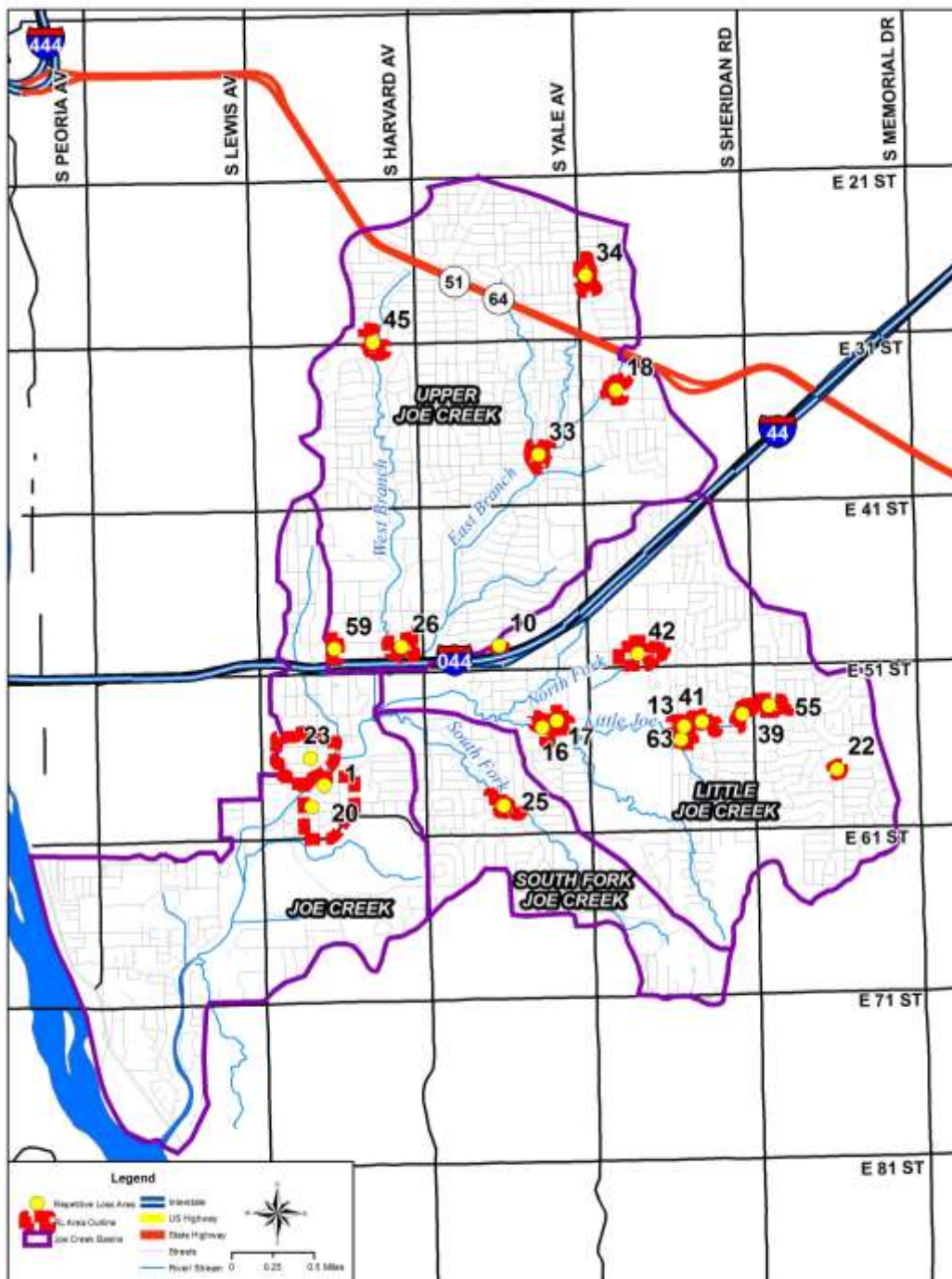
- |               |                       |
|---------------|-----------------------|
| Interstate    | City Limits           |
| US Highway    | Water                 |
| State Highway | Repetitive Loss areas |
| Turnpike      |                       |
| Roads         |                       |
| Railroad      |                       |



0 1 2 Miles

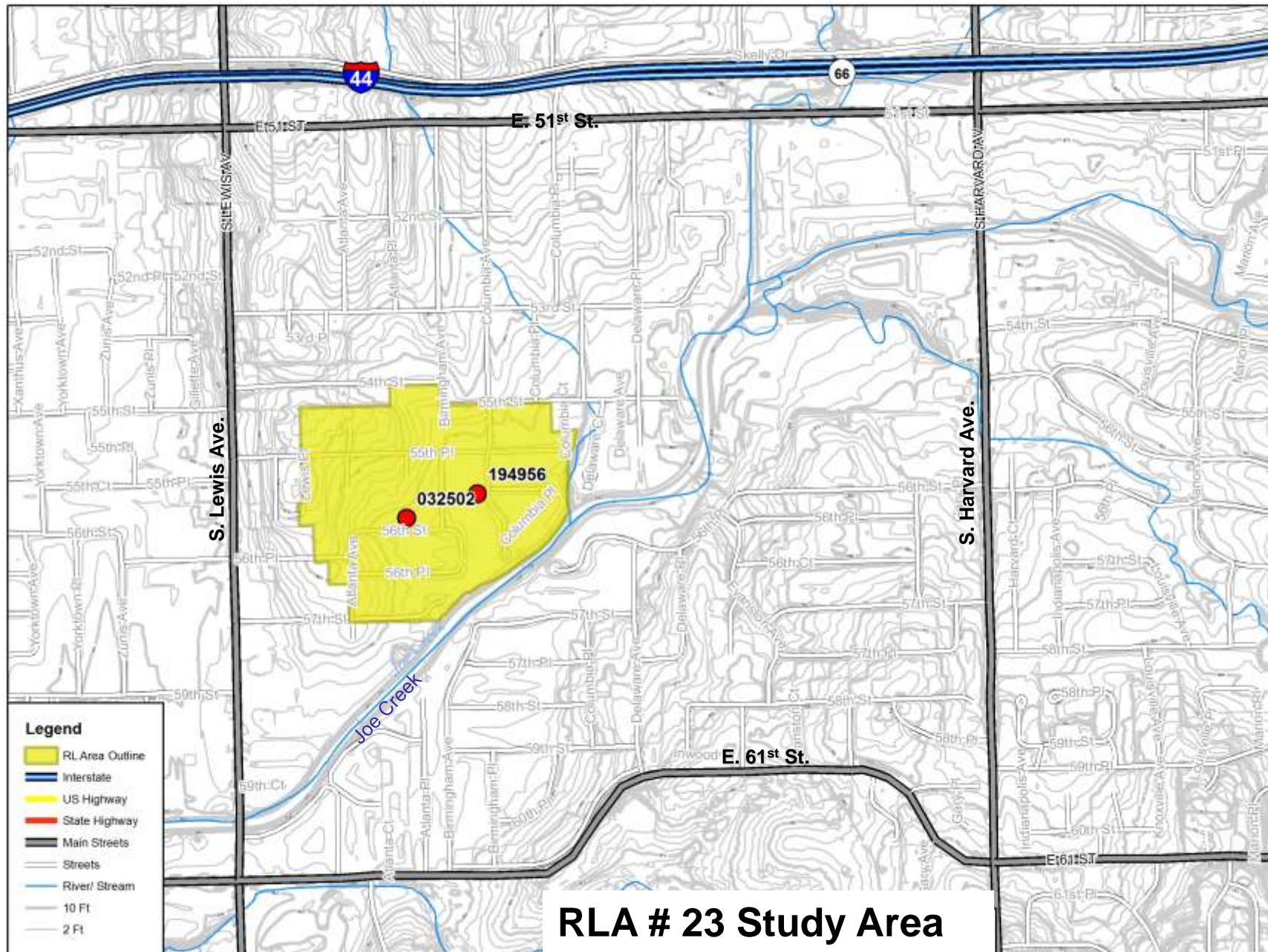






# Joe Creek Drainage Basins

Repetitive Loss Areas

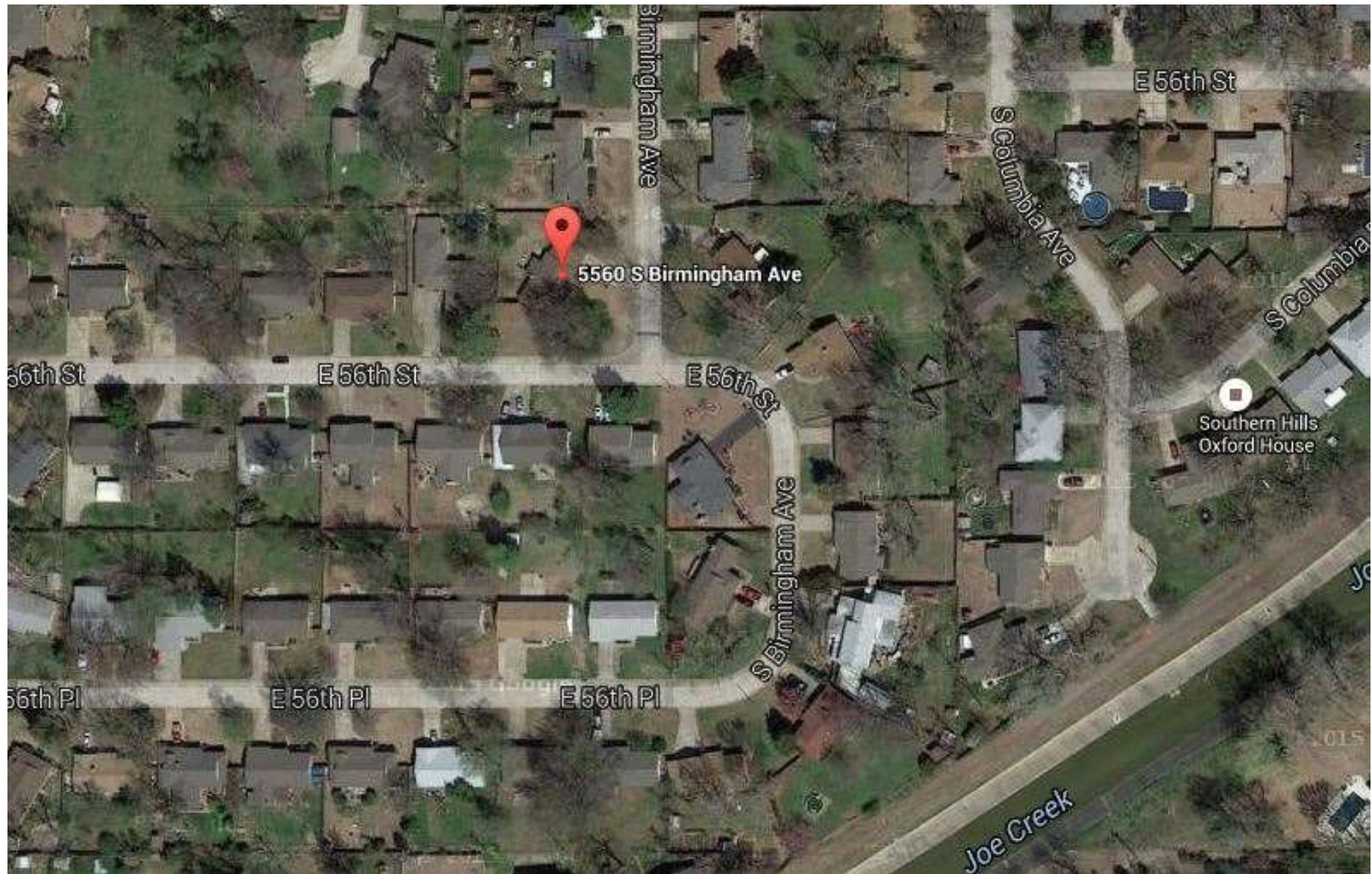






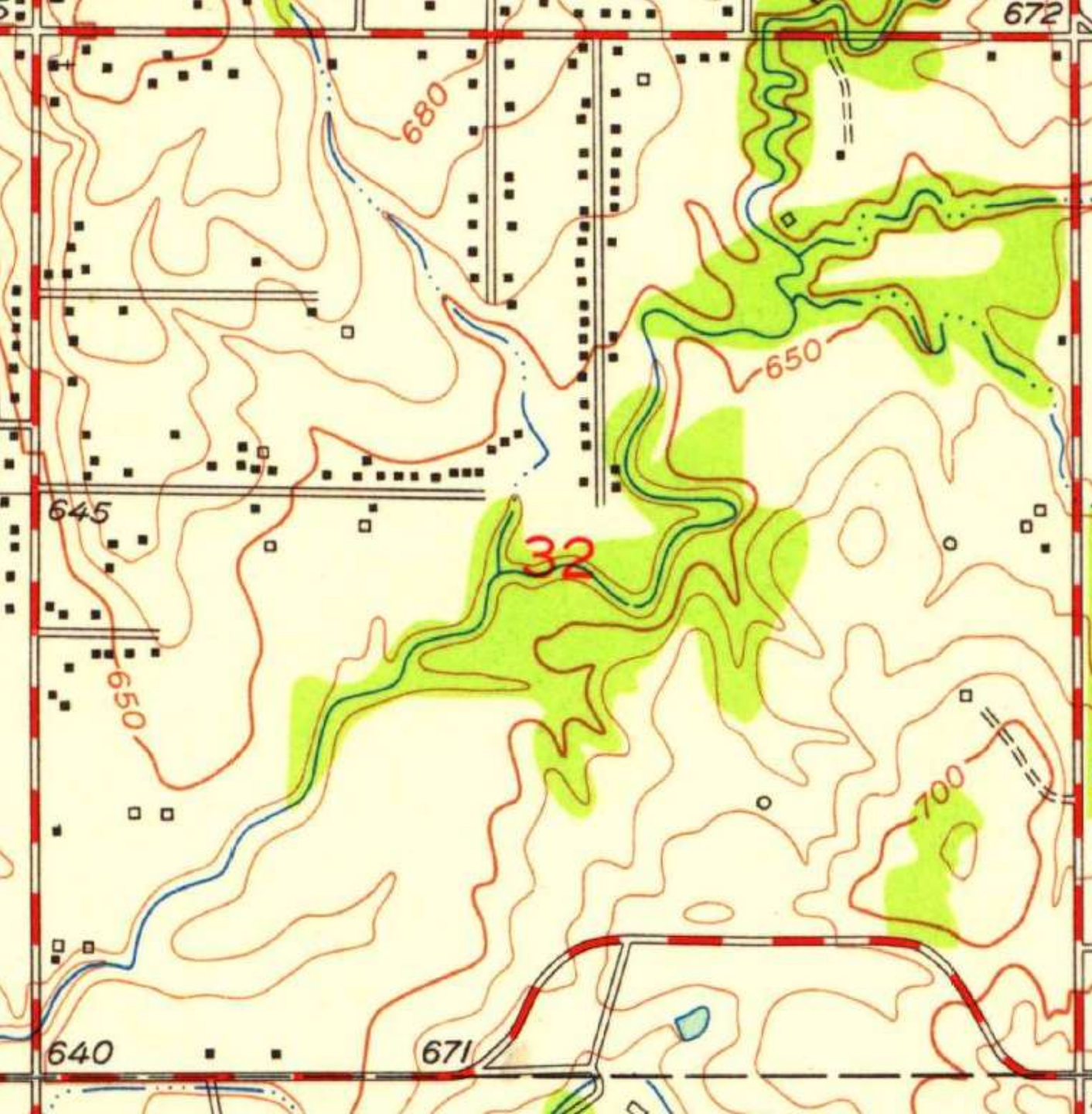
**Site Visit & Investigate the Repetitive Loss Property**





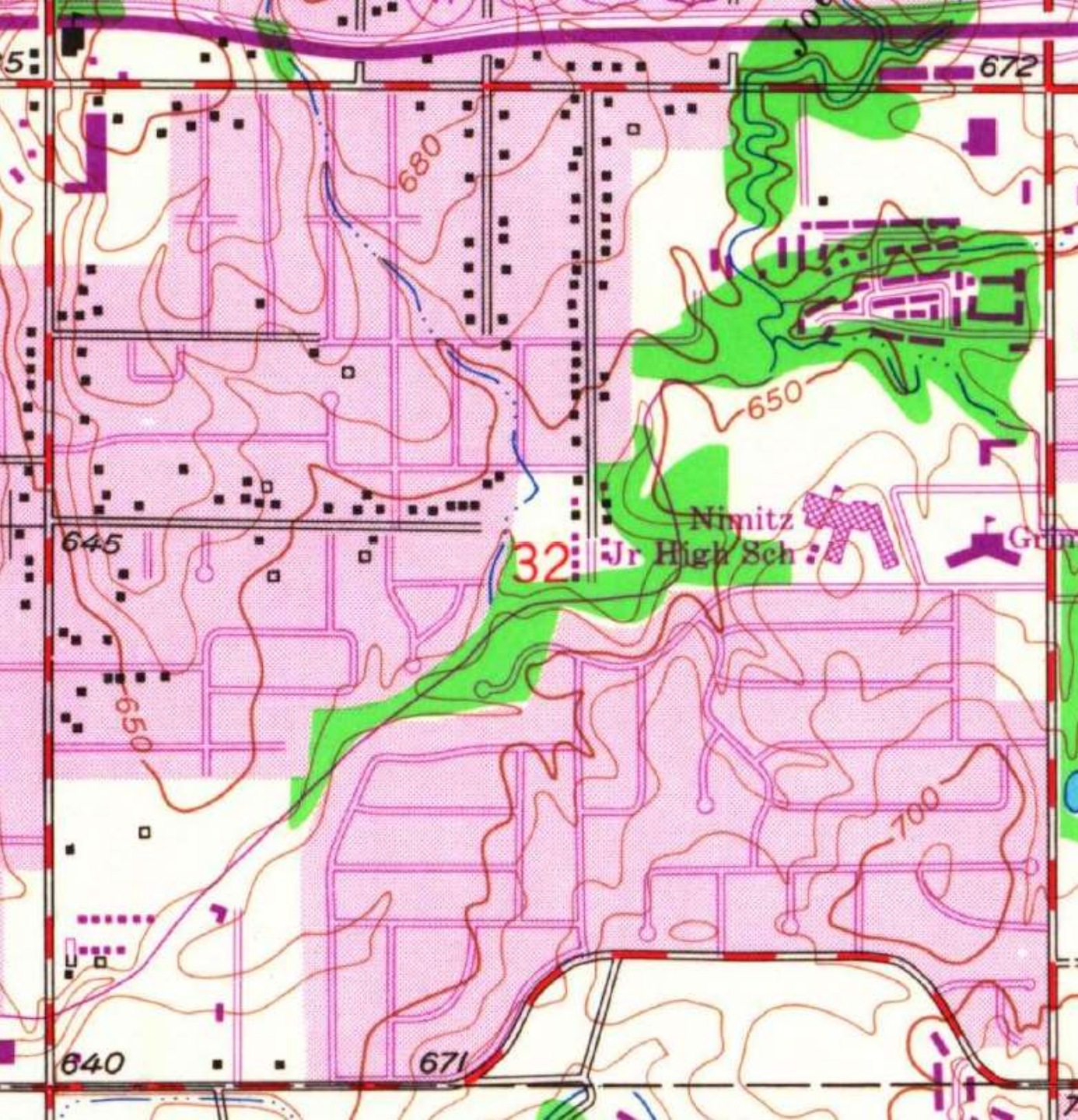
**Investigate the Immediate Area Around the Repetitive Loss Property**





**Joe Creek  
1952**

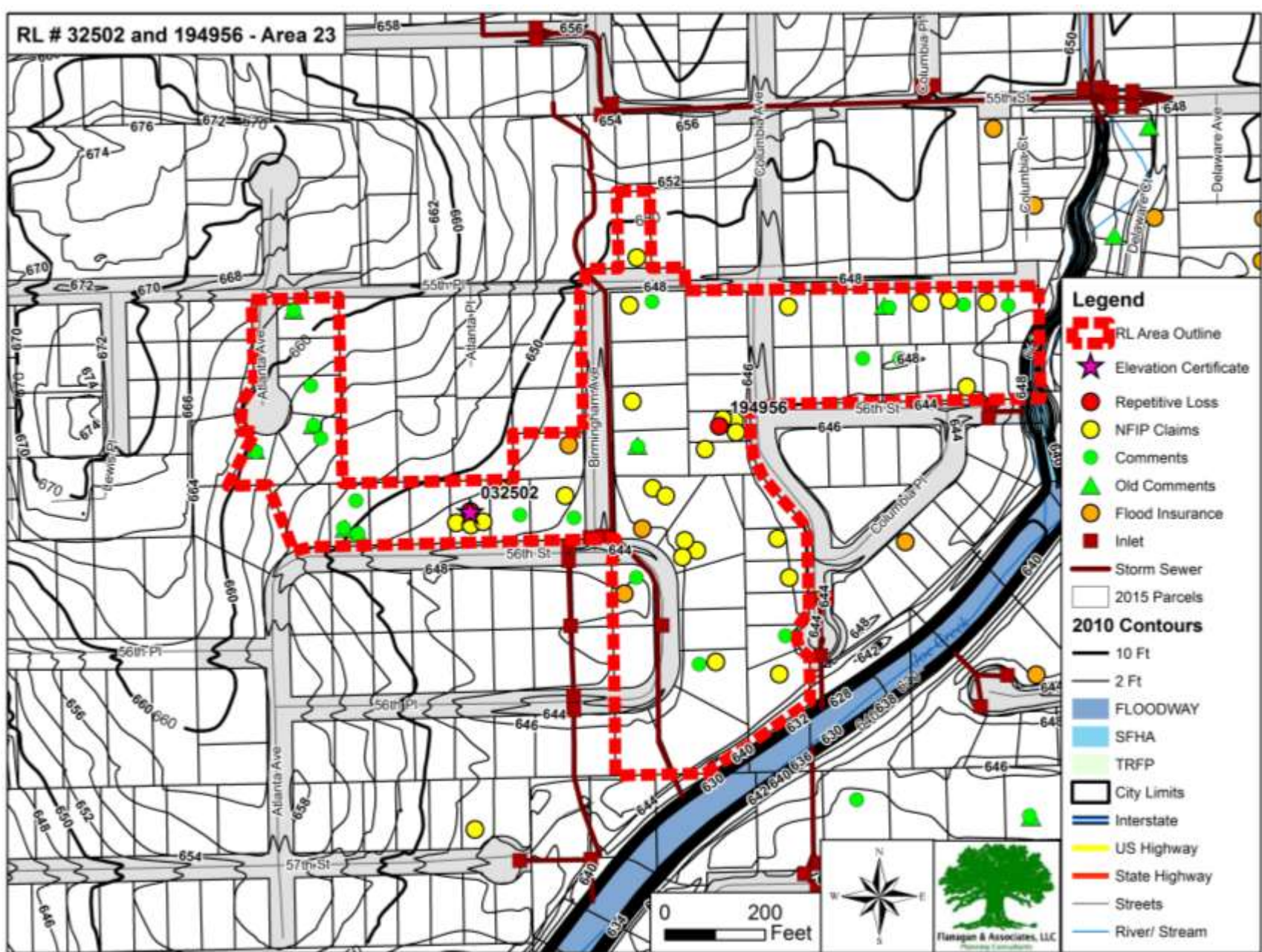




**Joe Creek  
1967**



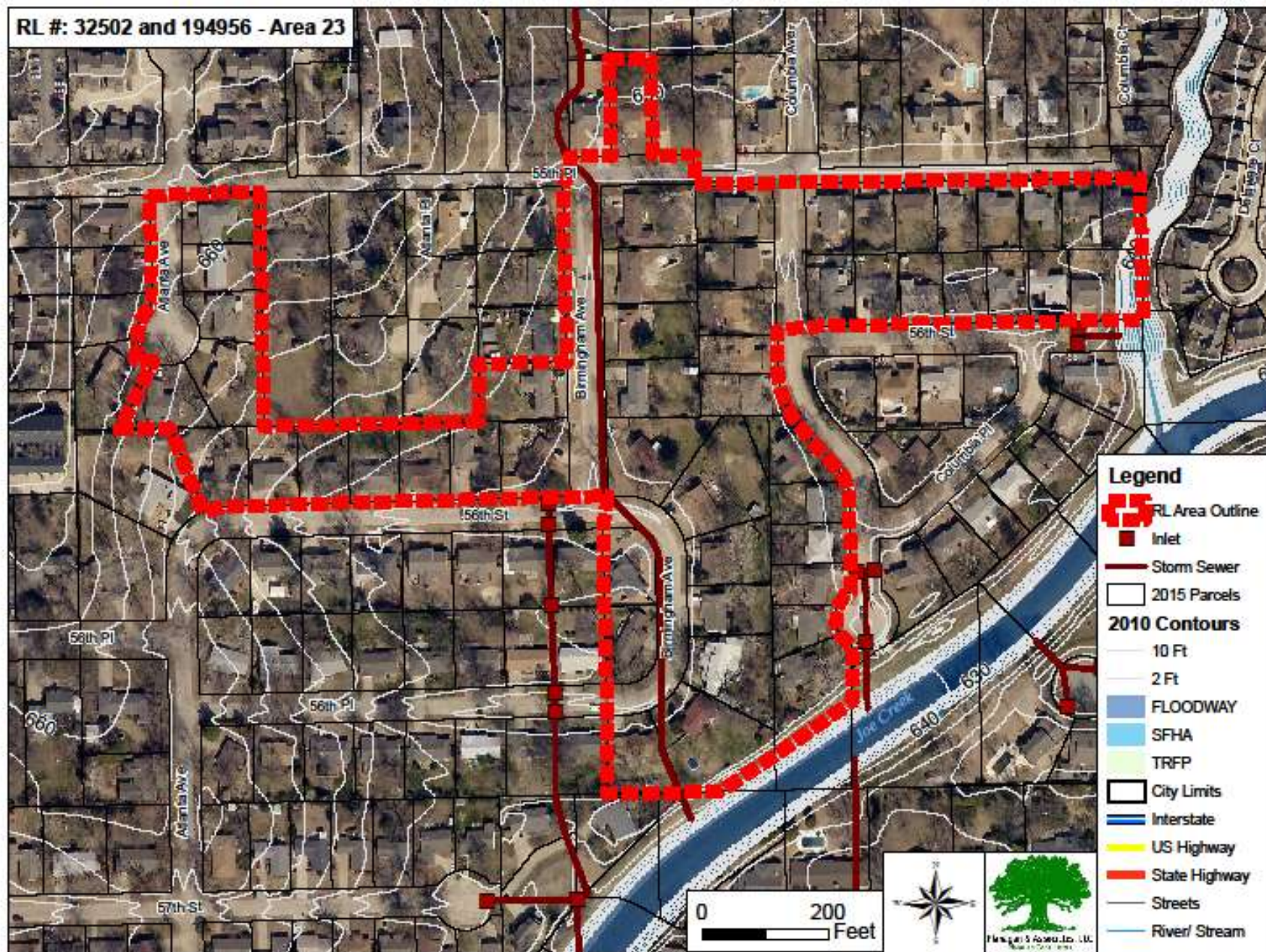
RL # 32502 and 194956 - Area 23



Initial RLA #23 Project Study Area

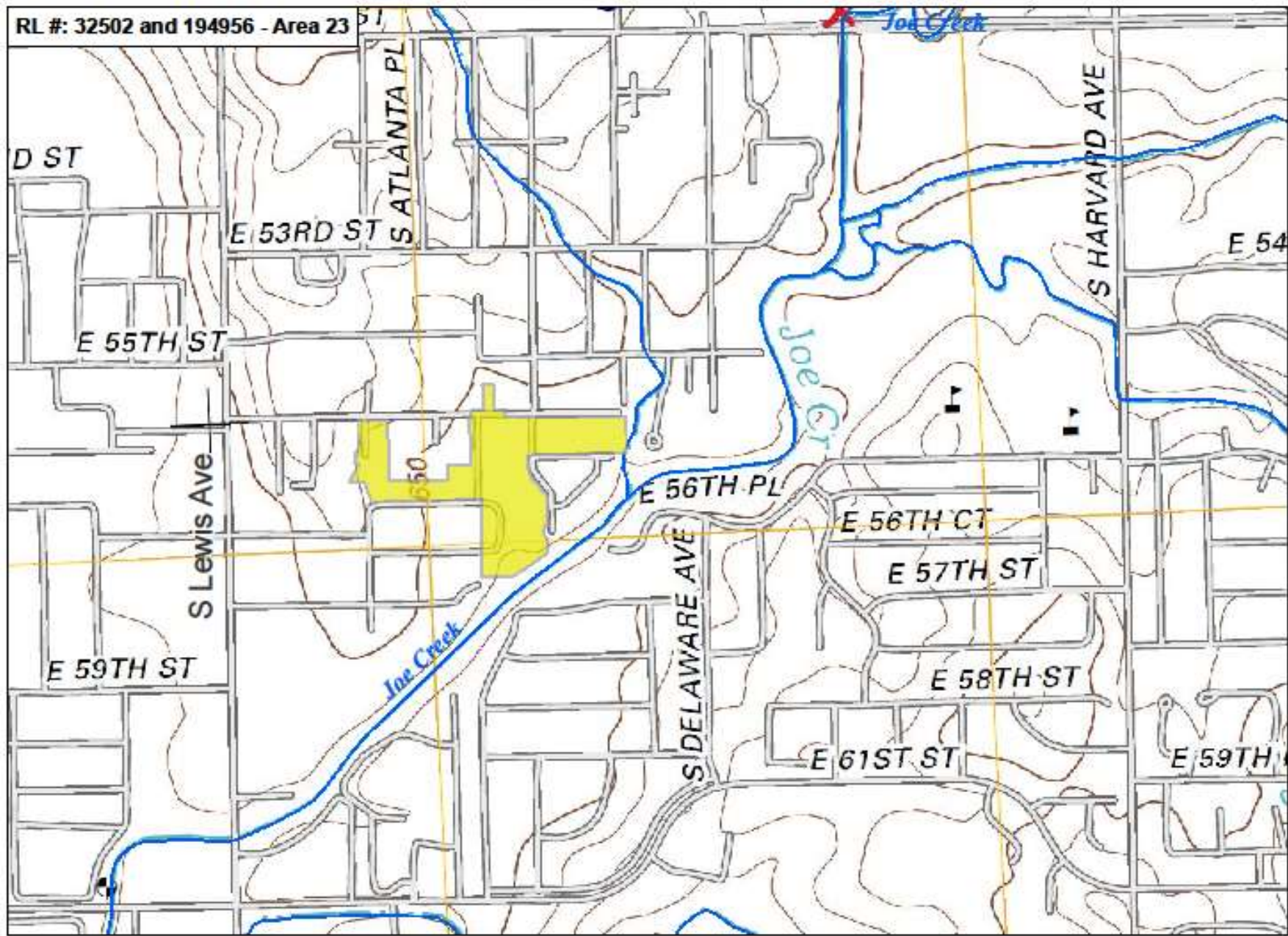


RL #: 32502 and 194956 - Area 23

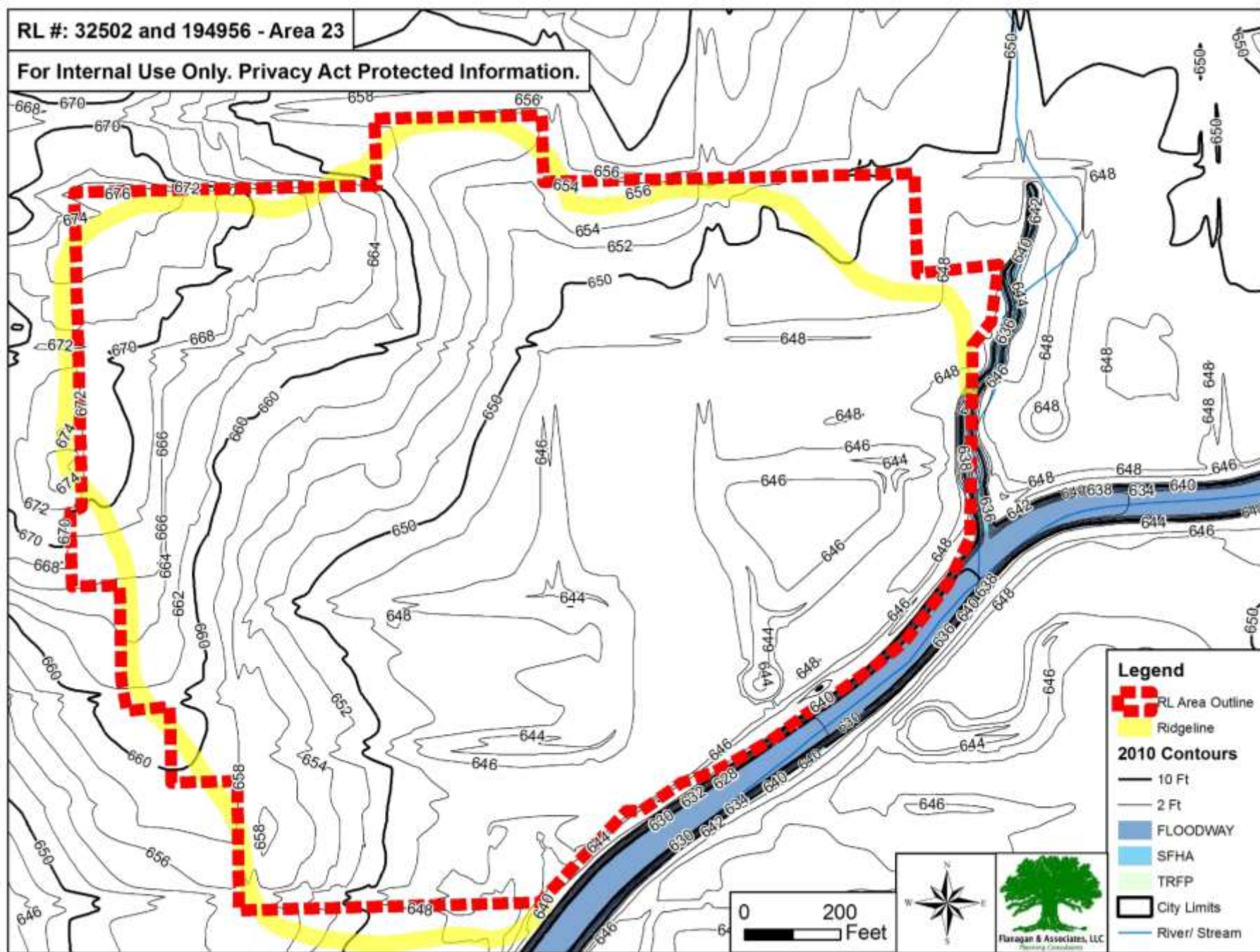




RL #: 32502 and 194956 - Area 23

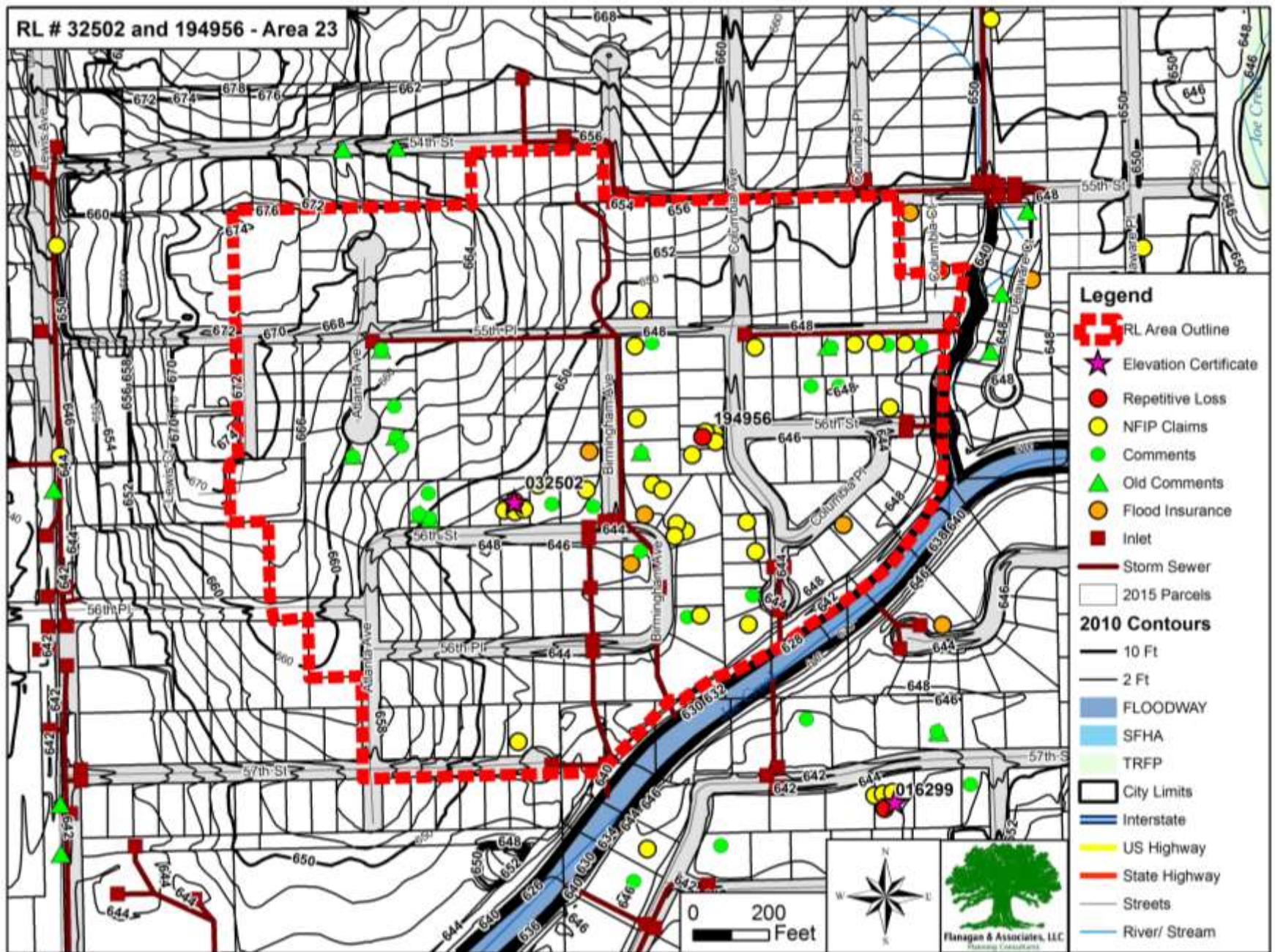






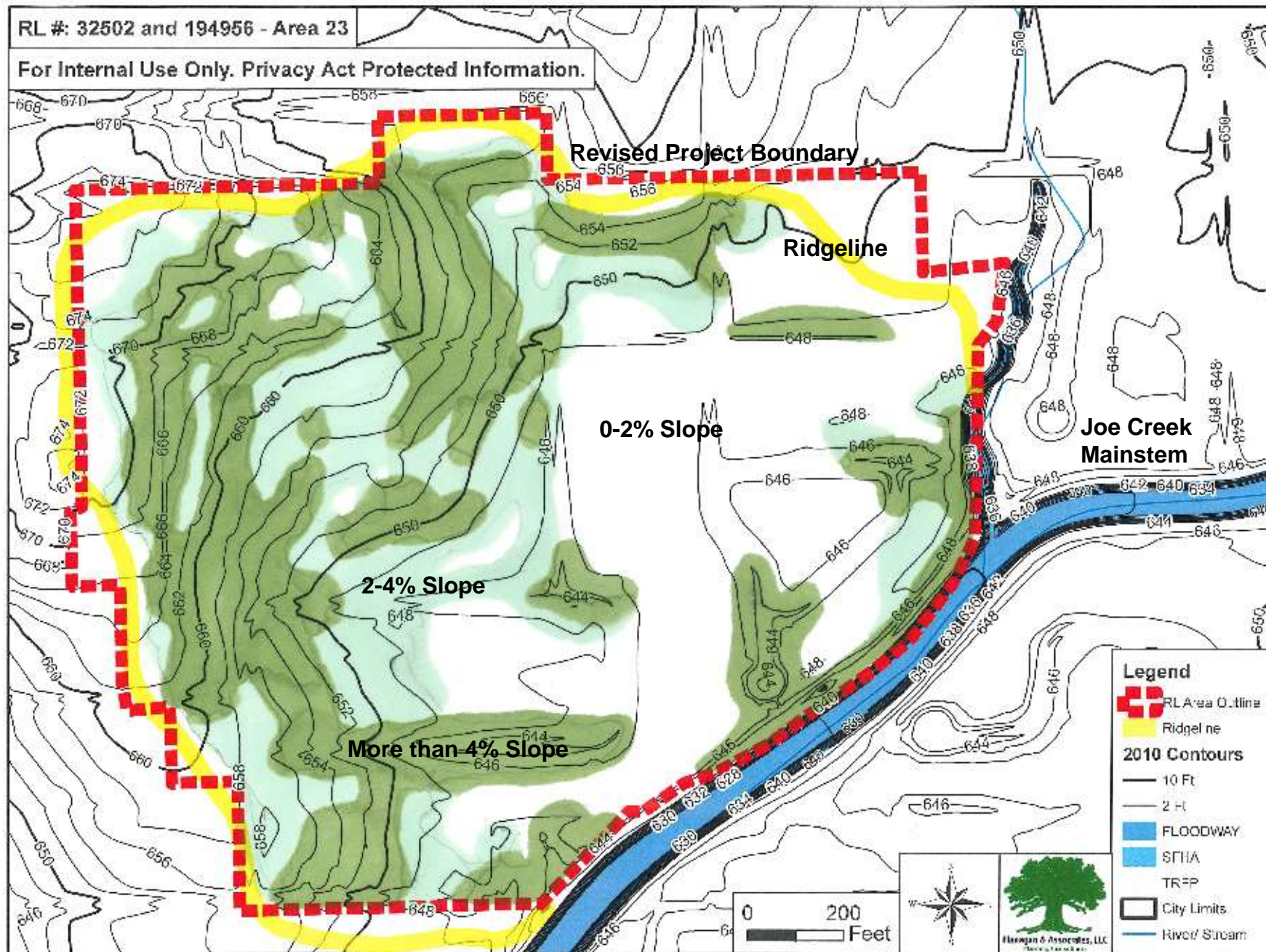
Topography ( 2 ft. contours)





RLA # 23 Revised Study Area





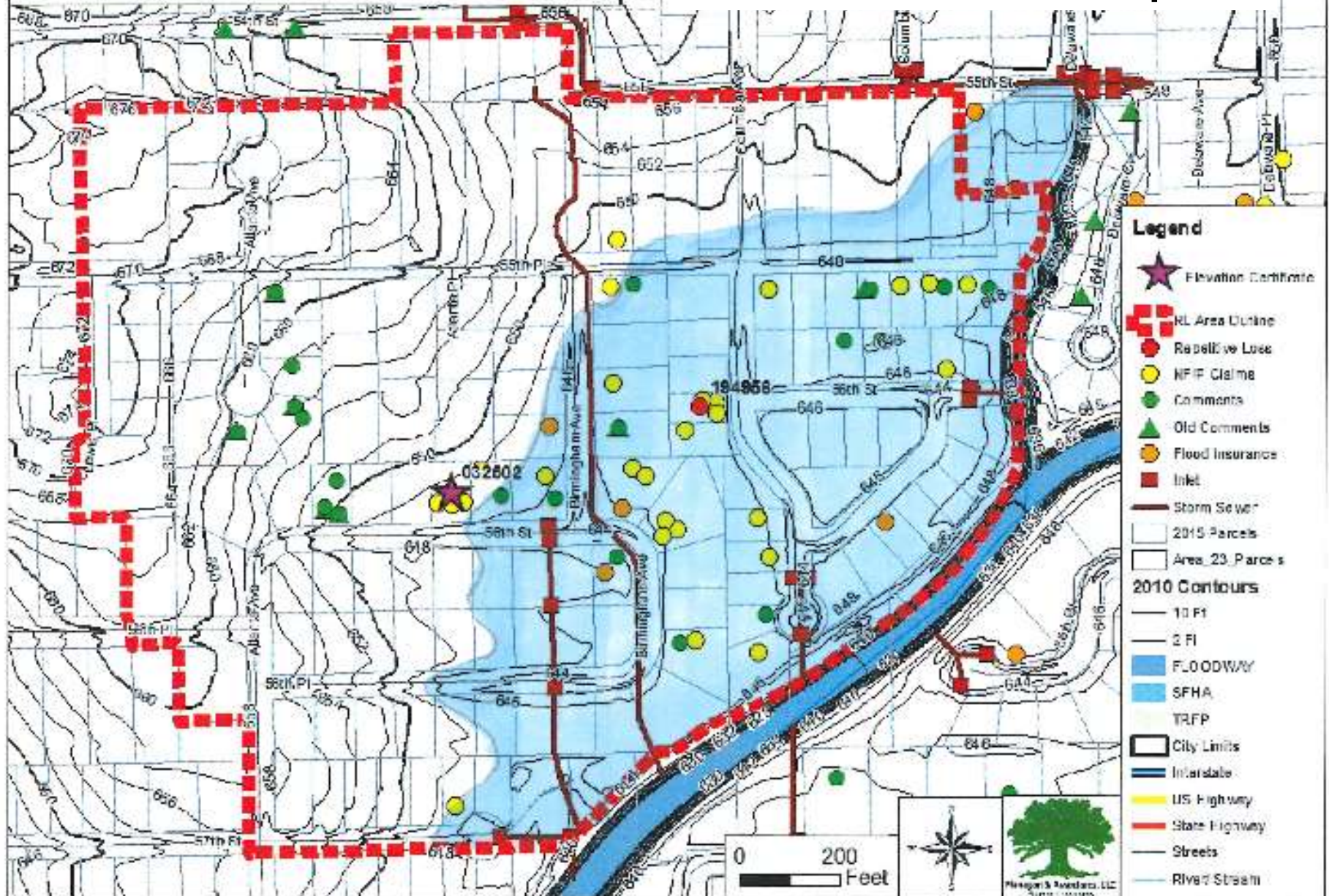
Topography Slope & Grade



RL #: 32502 and 194956 - Area 23

For Internal Use Only. Privacy Act Protected Information.

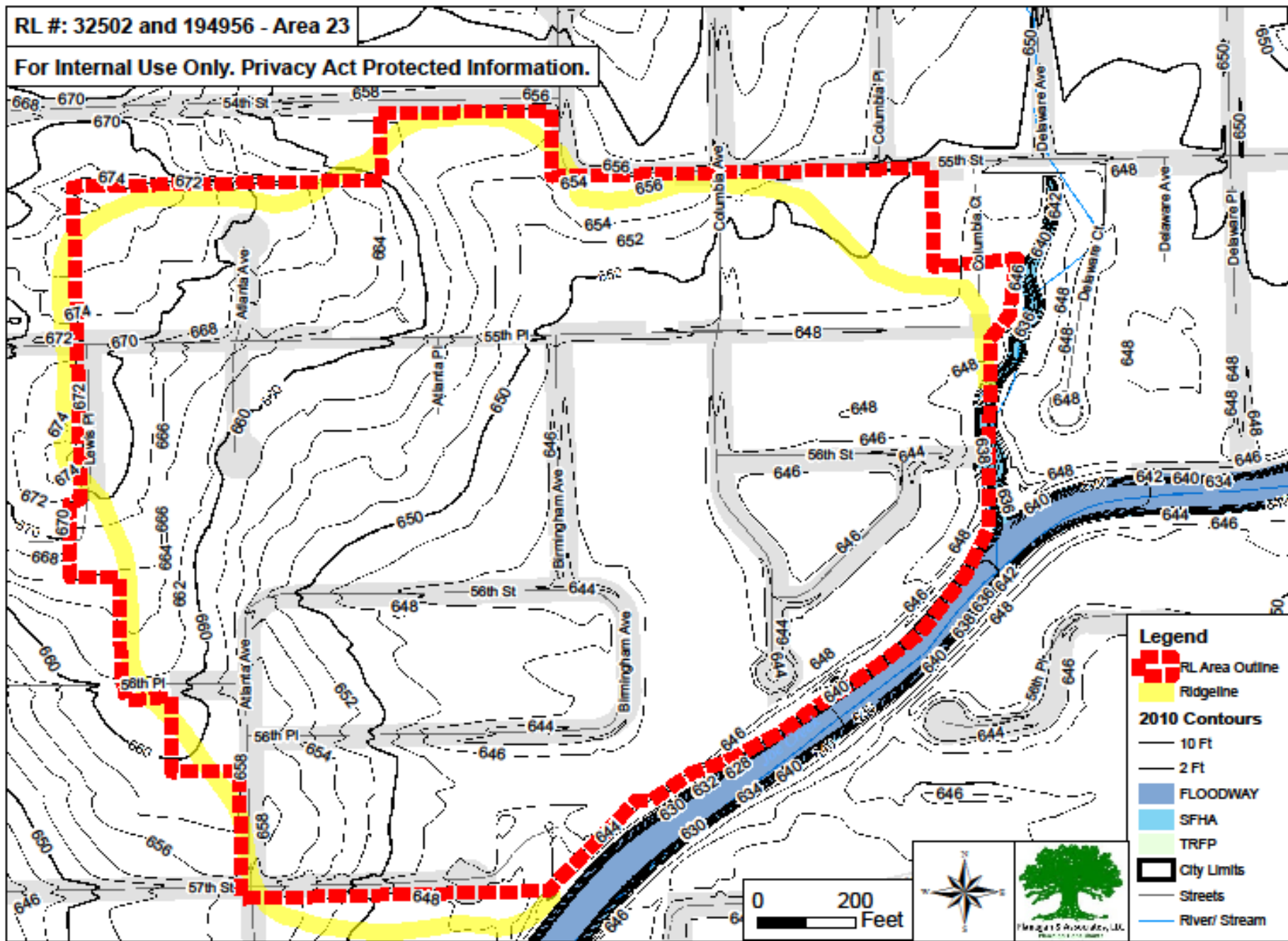
## 1955 Pre-Channel Floodplain





**RL #: 32502 and 194956 - Area 23**

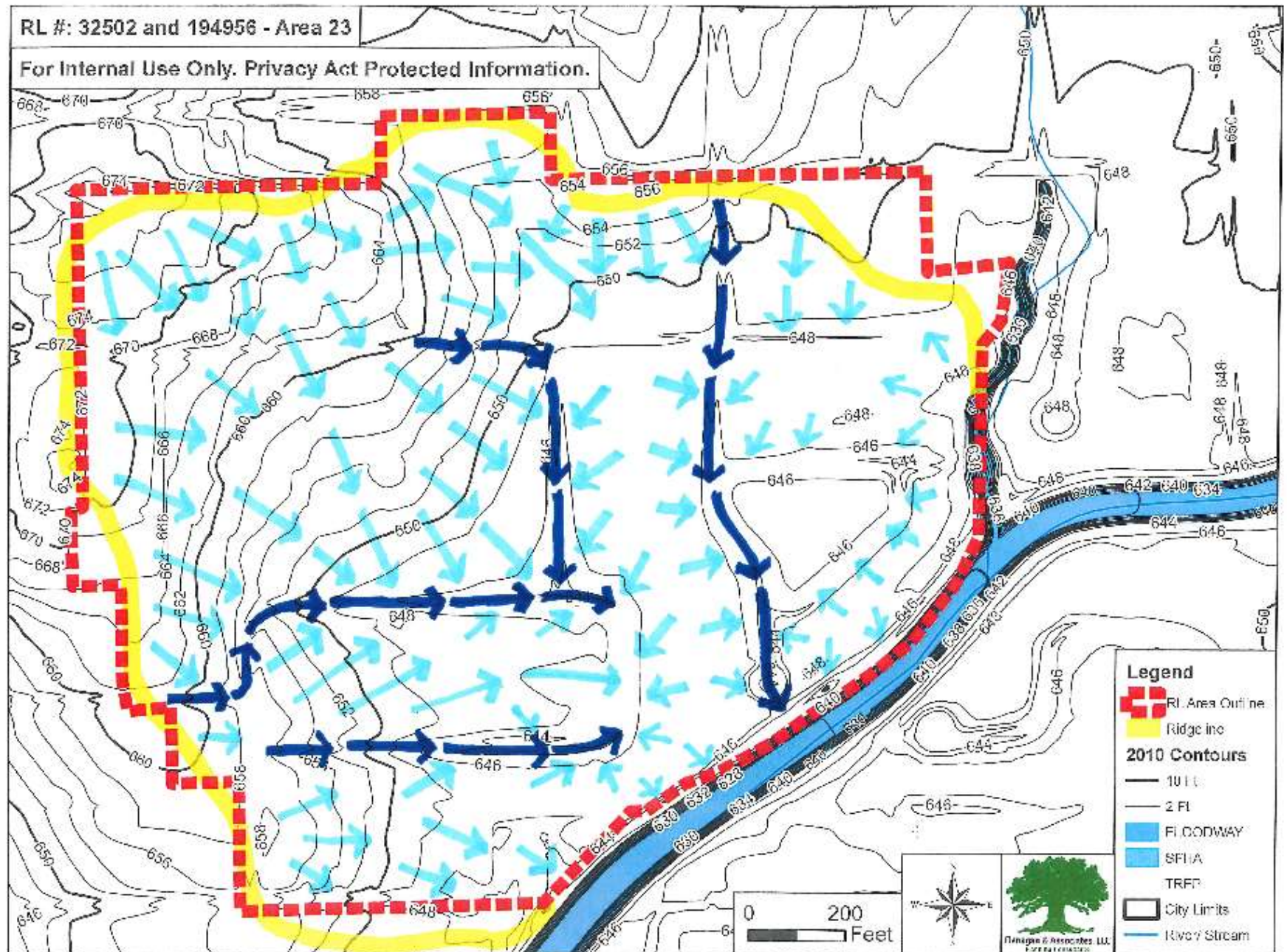
**For Internal Use Only. Privacy Act Protected Information.**



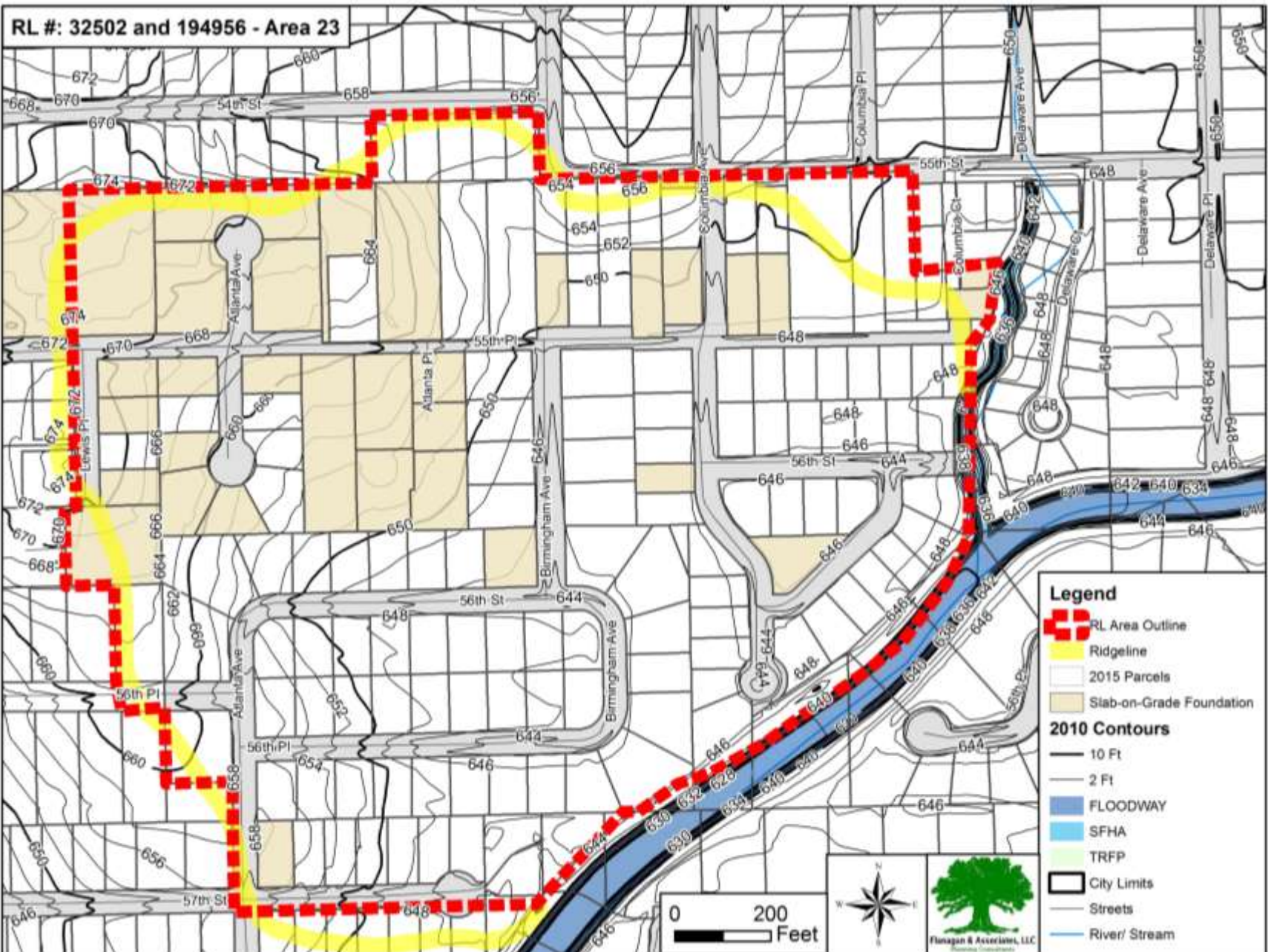
## Streets

RL #: 32502 and 194956 - Area 23

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**Slab-on-Grade Structures**









**Vineyard Town Home Drainage**  
(looking South to 55<sup>th</sup> Pl.)





**Open World Apartments**  
Looking South to 55<sup>th</sup> Pl.





**Open World Apts., Drainage  
to 55<sup>th</sup> Place**





**E. 55<sup>th</sup> Place, looking East**





**S-o-G Lewis Place Town Homes**





**Townhome Drainage**





5810

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**55<sup>th</sup> Place Slab-on-Grade**





**Slab-on-Grade Duplex**



# 2017 Repetitive Loss Area Notice



Your property is located in or near an area of Repetitive Flood Loss claims. The sources of flooding or drainage problems may be from nearby streams or shallow overland flow flooding.

## Repetitive Flood Losses

Floods are the number one disaster in the United States. Everyone is at risk – particularly properties located in repetitive loss areas. You should know your risk of flooding. To learn more about your property's risk of flooding contact the City of Tulsa Customer Care Center by dialing 311 or (918) 596-7777.

A **Repetitive Loss Property** is a property for which two or more flood insurance claims of more than \$1,000 have been paid by the National Flood Insurance Program (NFIP) within any 10-year period since 1978.

A **Repetitive Loss Area** is a portion of the community that includes buildings on the Federal Emergency Management Agency's (FEMA) list of repetitive losses and also any nearby properties that may be subject to the same or similar flooding conditions.

Flood risk still exists! You have options if you live in a repetitive loss or flood prone area. In some cases federal funding is available to help pay the cost of mitigation projects. Call the Customer Care Center at 311 or (918) 596-7777 for more information.

## You Can Protect Your Property From Flooding

Flood Mitigation Measures you might consider include:

- Raising your house above flood levels
- Wet or dry floodproofing
- Keep water away by re-grading your lot
- Build a small floodwall or earthen dam
- Install a check valve to prevent sewer back-up
- Keep materials like sandbags, plywood, plastic sheeting and lumber handy for emergency waterproofing
- Clean drainage ditches – they perform much better when kept clear of brush and debris

City staff is available to discuss specific details with you or make site visits and provide recommendations to reduce your risk of flooding – call the Customer Care Center at 311 or (918) 596-7777 for assistance.

For additional information on Flood Mitigation, visit the FEMA website at: [www.floodsmart.gov](http://www.floodsmart.gov)

## Flood Insurance Available for All Properties in Tulsa

According to FEMA, if your home is located in a high-risk flood zone, there is a 26 percent chance it will flood during the life of a 30-year mortgage. Up to 25 percent of all flood insurance claims come from structures outside of high-risk areas. Property owners in Tulsa receive up to a 40 percent discount on flood insurance. Most homeowners' policies do not cover flood losses.

You need flood insurance coverage for both the structure and contents. There can be more damage to the contents than the structure. Renters can buy contents coverage even if the owner does not insure the

structure. There is a 30-day waiting period before the policy becomes effective.

Flood insurance is required by law in order to obtain federally secured financing to buy, build, or renovate a structure located in a floodplain. This financing includes federal grants, FHA and VA loans, and most conventional mortgage loans.

To learn more about flood insurance, contact any licensed property insurance agent or call City of Tulsa Floodplain Engineer Bill Robinson at (918) 596-9475 or Floodplain Administrator Laura Hendrix at (918) 596-9685.

## Permits are Required Before You Build

Get a building permit when constructing in flood-prone areas. Permits are required before commencing any development, whether new or retrofit construction, including grading or filling in the floodplain.

For a free flood zone determination, contact the Customer Care Center with the address, parcel number and legal description of the property. A written determination will be e-mailed or faxed to you. Also, detailed floodplain boundary maps are on file at City Hall, Development Services, 175 E. 2nd St., 4th floor, at Tulsa libraries and at [www.cityoftulsa.org](http://www.cityoftulsa.org).

New buildings in the floodplain must be protected from flood damage. Tulsa's building code requires that new buildings must be elevated one (1) foot above the regulated floodplain elevation.

Be sure to get a building permit before installing a safe room in flood-prone areas. Old storm cellars can be a dangerous place to shelter from tornadoes if not built to current building code standards, since they may fill up with floodwater or collapse under pressure. Away from home, avoid taking shelter in flood-prone areas such as culverts or drainage tunnels during tornadoes and extreme rain events.

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## Elevation Certificates: Available to Property Owners

Copies of the elevation certificates are available to property owners and their agents. An elevation certificate can help you better understand your risk of flooding and can be requested by contacting the Customer Care Center at 311 or (918) 596-7777. A list of the elevation certificates on file is available on the City website: [www.cityoftulsa.org](http://www.cityoftulsa.org).

Anyone who owns property within the regulated floodplain needs a copy of a FEMA elevation certificate for their property in order to purchase flood insurance through the National Flood Insurance Program (NFIP). The City of Tulsa can supply elevation certificates for

# Annual Repetitive Loss Area Notification



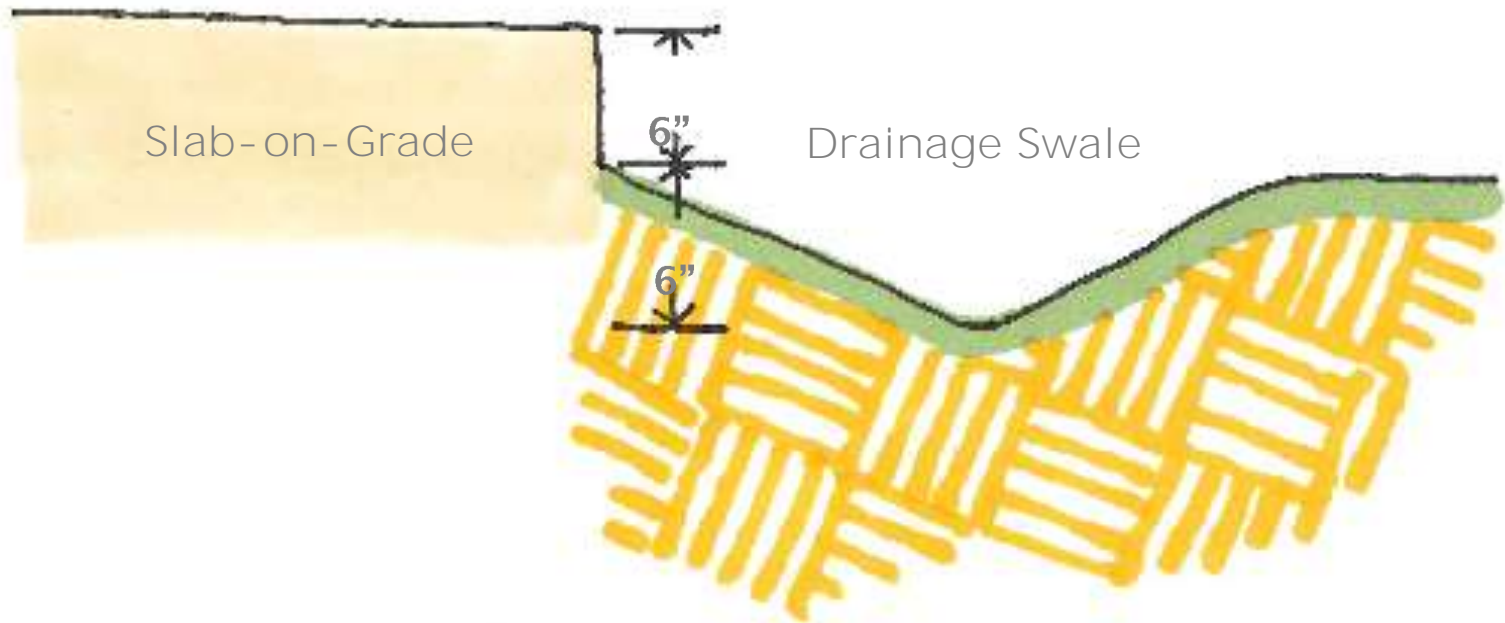
**Meet with Repetitive Loss Area Homeowners**



# **Individual Flood Protection Measures: What You Can Do**

- **Know & Understand Your Flood Risk**
- **Make a Disaster Preparedness Plan**
- **Maintain Nearby Streams, Ditches, Storm Drains**
- **Purchase & Maintain Flood Insurance**

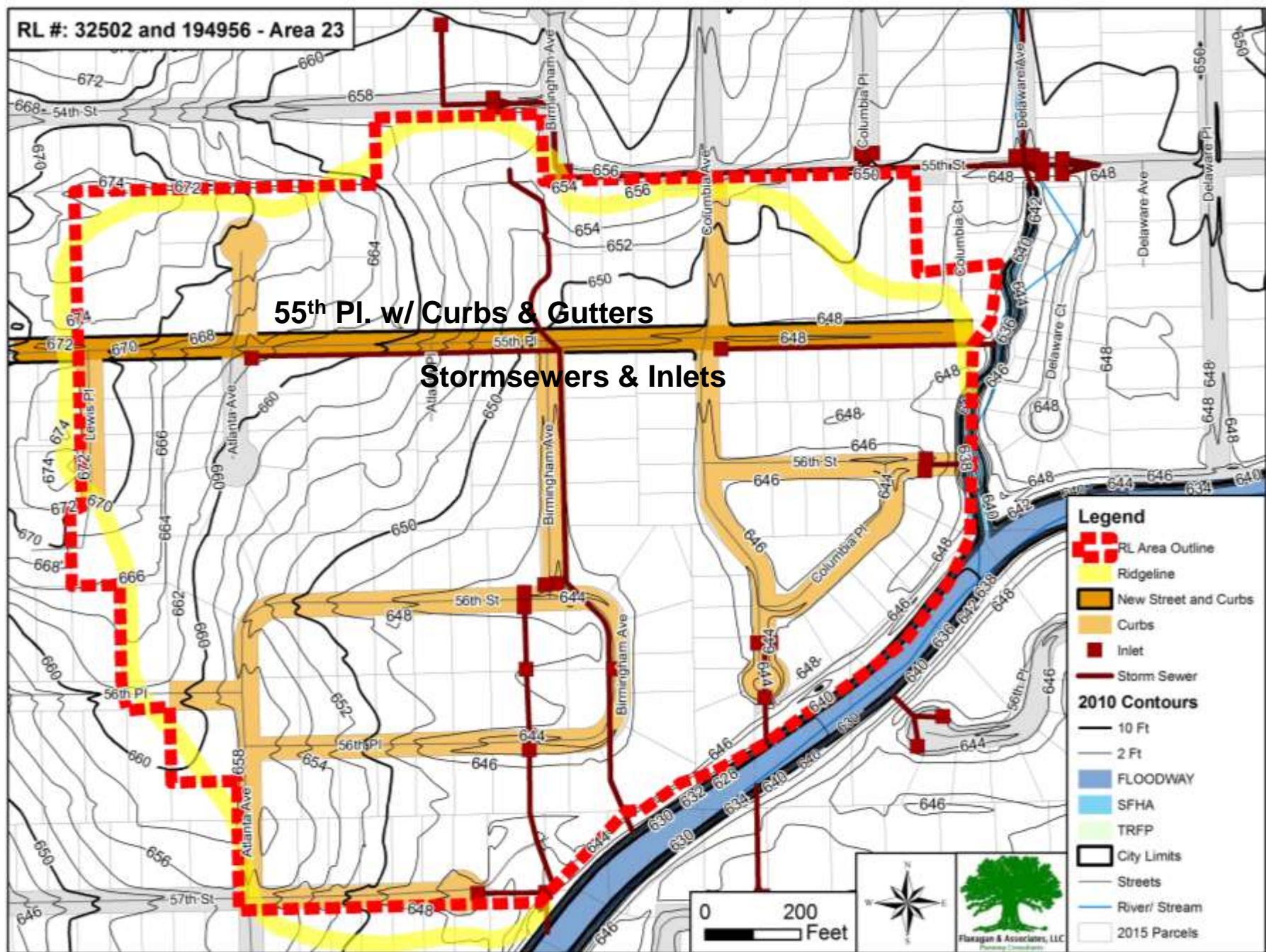
## Minimum Criteria for Slab-on-Grade and Drainage Swale





# **Mitigation Measures: What The City Can Do**

- **Develop Mini-Master Drainage Plans for Each RL Area**
- **Extend/Improve Storm Sewer System to Collect Runoff**
- **Create Overland Flow Path to Creek**
- **Create Berms, Swales, Redirect Drainage Away from Homes**
- **Acquire Flood Prone Homes on a Voluntary Basis**
- **Improve Conveyance in Creeks to Mitigate Overbank Flooding**
- **Improve Hydraulic Structures to Reduce Backwater**
- **Improve Roadside Ditches & Drainage Structures**
- **Construct Upstream Detention to Reduce Stormwater Runoff**



Possible Future City Capital Improvements





**Questions**  
**Comments**