



CITY OF  
**Tulsa**  
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## Repetitive Loss Area # 21

**Audubon Creek  
E. 38<sup>th</sup> St. & S. 69<sup>th</sup> E. Ave. Area**



August 17, 2017



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Bill Robison, P.E., CFM  
Engineering Services





## ENGINEERING SERVICES

August 17, 2017

Dear Resident/Property Owner:

Once considered the most flood-prone city in America, Tulsa has worked hard to reduce or eliminate flooding of its homes and neighborhoods. The City joined the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP) in 1974 and through decades of effort is now recognized as a national leader in flood hazard mitigation. As a result, property owners in Tulsa receive as much as 40% discount on their flood insurance.

A key component of the NFIP has been its focus on Repetitive Loss Properties, which make up only 1 percent of insured properties, but account for over 30 percent of flood insurance claims payments. A Repetitive Loss Property is defined by FEMA as any property that has been paid two or more flood insurance claims of \$1,000 or more in a 10-year time period.

The NFIP recently expanded its flood hazard mitigation program to include the identification of "Repetitive Loss Areas" (RLA)—those properties near an existing Repetitive Loss Property that may be subject to the same general flooding conditions. In most instances, 95% of the properties in an RLA will never have experienced flooding—especially if the cause of damage is shallow, overland flow due to local drainage conditions. Once the City has identified an RLA, we are required to contact the owners and residents of the area and, working together, develop a plan to reduce or eliminate flooding in their neighborhood.

Your property has been identified as being in a Repetitive Loss Area. We want to re-emphasize that this does not mean your property has flooded or is even likely to flood—only that it is in the same area, and in a similar geographical situation, as an existing Repetitive Loss Property.

You can protect your property from flooding. We would like to invite you to participate in our flood prevention and mitigation efforts for your neighborhood. We need your input. What can we do, working together, to eliminate potential flood losses in your area? We look forward to hearing from you.

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 at (918) 596-7777.

Sincerely,  
**CITY OF TULSA, ENGINEERING SERVICES**

Bill Robison, P.E., CFM  
Senior Special Projects Engineer  
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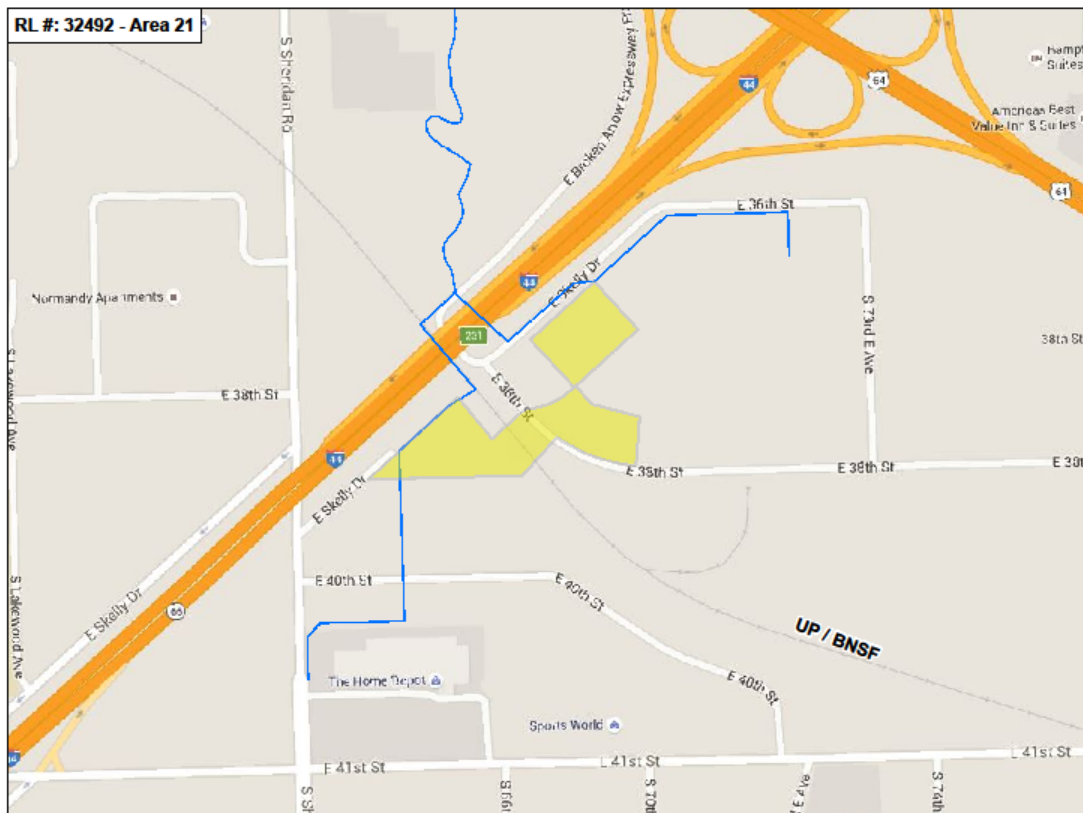


# Repetitive Loss Area # 21

## Audubon Creek E. 38<sup>th</sup> St. & S. 69<sup>th</sup> E. Ave. Area

### Overview

Repetitive Loss Area #21 is comprised of four commercial buildings on five property lots in the upper Audubon Creek drainage. The RLA reaches about 1,200 ft. along the southeast side of I-44 (Skelly Bypass) and E. 38<sup>th</sup> St., just east of Sheridan Rd. Before improvements, the 100-year floodplain of Audubon Creek at this location was at 717 ft. elevation, while the structures in RLA #21 were situated at between 712 and 722 ft. Subsequent improvements reduced the 100-year flood level in the RLA to about 715 ft. As a result, RLA #21 is no longer within FEMA's SFHA, although two of the RLA's four commercial structures remain within or touched by City of Tulsa's more stringent regulatory floodplain. Flood damage has been largely due to inadequate storm sewer and bar ditch capacity, overland flow, and backup flooding behind undersized conduits beneath I-44, Skelly Dr., E. 38<sup>th</sup> St., and the MKT/BNSF railroad. There is one repetitive loss property in the RLA which made three claims in 1980 and 1981, two of which were paid, for a total of \$20,500. There have been no flood claims in the RLA since 1981.



RLA #21 is located in the upper Audubon Creek drainage at E. 38<sup>th</sup> St. and Skelly Dr. area.

## **I. Background**

During the post-World War building boom of the 1950s and 1960s, Tulsa expanded rapidly east and south into the basins of Mingo, Joe and Fred creeks. Because of the city's climate and the broad floodplains along these creeks, this growth brought with it an increased risk of flooding. And indeed, by the mid-1980s floods were occurring almost yearly and flooding had become Tulsa's most destructive natural hazard. One researcher at the time declared Tulsa "the most flood-prone community in the nation."

Tulsa was not unique in its rapid post-war development and attendant risks. Cities across America were experiencing similar problems as they spread out into prosperous subdivisions. In response, the U.S. Congress created the National Flood Insurance Program (NFIP) in 1968 to help property owners protect themselves from flood losses. The NFIP offered flood insurance to homeowners, renters, and business owners if their community participated in the NFIP and agreed to adopt and enforce ordinances that met or exceeded FEMA requirements for reducing the risk of flooding.

Tulsa joined the NFIP in 1974, and through great effort and considerable expense has significantly reduced its exposure to flooding. As a result, Tulsa has been awarded a Class II rating in the NFIP's Community Rating System (CRS), which grants its residents a 40 percent discount on the cost of flood insurance for structures in the Special Flood Hazard Area (SFHA), also known as the 1% or 100-year floodplain. Since the Biggert-Waters Flood Insurance Reform Act of 2012, many properties have seen a substantial increase in their premiums, making this discount even more important.

For its part, the NFIP is continually faced with the job of paying claims while trying to keep the price of flood insurance at an affordable level. Properties that flood repeatedly—known as "repetitive loss properties," have been a particular problem for the program: Although they make up only 1 percent of insured properties, they account for one-third of all claims payments (about \$200 million per year, or \$4.5 billion to date). A repetitive loss property is defined by FEMA as any property that has been paid two or more flood insurance claims of \$1,000 or more in a 10-year time period.

Consequently, one of the requirements of the CRS is that communities identify all repetitive loss properties in their jurisdiction and work with the owners to find ways to reduce or eliminate future flood damage. This initiative has been very successful in reducing flood losses and claims.

FEMA recently extended its repetitive loss program to include "Repetitive Loss Areas" (RLA). To maintain a Class II rating in the CRS, Tulsa is now required to analyze the area surrounding each of its repetitive loss properties and identify any neighboring properties (including uninsured ones) that may be subject to the same general flooding conditions. This group of nearby properties is then designated an "RLA." The City is required to contact the owners of the properties in the RLA, inform them that they are located in an area subject to flooding, and develop a plan for mitigating or eliminating flooding in the area, much as has been done for the individual repetitive loss properties.

It is important to note that most of the structures in a Repetitive Loss Area—perhaps as many as 80% or 90%—may not have experienced flooding of any kind. What they have in common is being subject to the same general geographical and flood conditions as the nearby repetitive loss property. In addition, the flooding events in question may have had little to do

with overbank flooding from a creek, but perhaps been the result of storm sewer backup or overland flow. The location of RLA #21 is shown on the aerial photo/topography map on page 4, below. The map identifies residential properties, County Assessor parcels, floodplains and the existing storm drainage system.

## **II. Location.**

Audubon Creek is a 3-mile-long, left-bank tributary to Mingo Creek that drains about 2.64 square miles of east Tulsa. The creek flows generally east-northeast through residential, commercial and industrial neighborhoods to join Mingo Creek at about E. 26<sup>th</sup> St. and S. 95<sup>th</sup> E. Ave. Audubon Creek mainstem is formed from two tributaries which drain to the north from the high ground around E. 41<sup>st</sup> St. and Sheridan Ave. and from E. 38<sup>th</sup> and S. 73<sup>rd</sup> E. Ave. The eastern tributary emerges from storm sewers beneath the Space Center Industrial District and flows southwest along Skelly Dr. before turning north under I-44. The western tributary flows northeast from the 41<sup>st</sup> and Sheridan area, passes under the MKT/BNSF railroad tracks near E. 38<sup>th</sup> St., turns north under I-44 and then east under E. 38<sup>th</sup> St. to join the other tributary on the north side of I-44 to become Audubon Creek mainstem.

The four commercial buildings that make up RLA #21 are along the open channels of these two Audubon Creek tributaries, on the west and east sides of E. 38<sup>th</sup> St. and the MKT/BNSF railroad. In this upper reach, the creek emerges from storm sewers and flows in an improved channel on the west side of the railroad and E. 38<sup>th</sup> St., and in bar ditches along either side of Skelly Dr. on the east side. The RLA is situated just north of the ridgeline that separates the Audubon Creek and Fulton Creek basins. Less than 500 feet south of the RLA, the land begins sloping to the southeast into the Fulton Creek drainage.

The structures of RLA #21 are slab-on-grade at elevations of between 712 and 721 feet, while the 100-year flood elevations at this location were originally at about 717 feet. Subsequent channel improvements and conduit enlargements in the late 1980s and early 1990s reduced the 100-year flood elevations by about two feet, to between 714 and 715 feet. Flood damage has been largely due to inadequate bar ditches and storm sewer capacity, overland flow, and backup flooding behind undersized conduits beneath the MKT/BNSF railroad, E. 38<sup>th</sup> St., Skelly Dr. and I-44.

## **III. History**

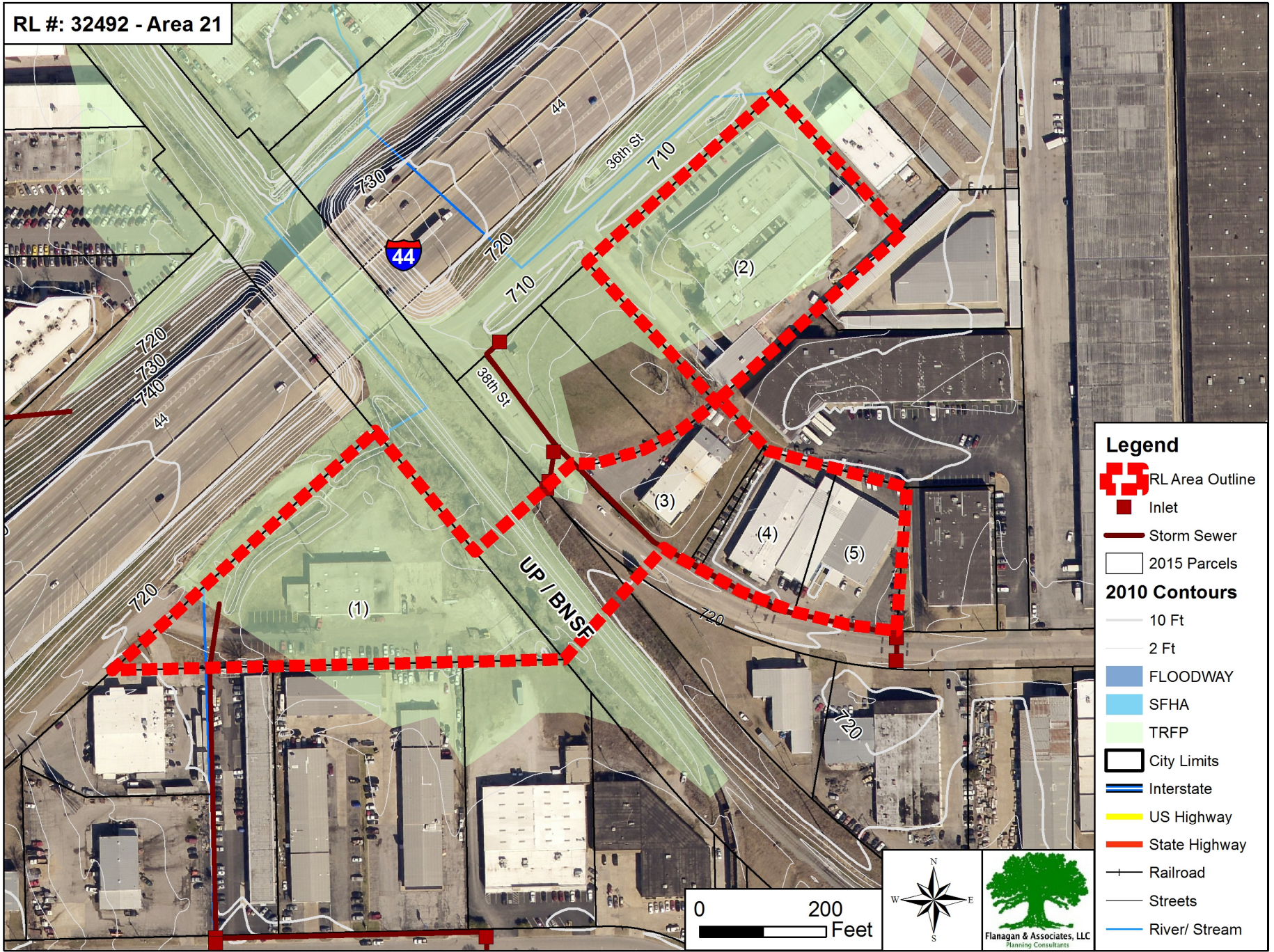
### ***Development***

The properties in RLA #21 were developed on unplatted land and the Space Center Industrial District between 1960 and 1984. The terrain on which the buildings are located is in the City of Tulsa's regulatory floodplain for Audubon Creek, which touches two of the RLA's four structures, as shown on the detailed topographical map on page 4, above.

### ***Flooding***

The *Upper Mill, Audubon and Jones Creeks Basin Drainage Study*, written in 1993, mentions severe flooding along Audubon Creek in May 1984. The Master Drainage Plan attributed flooding to undersized storm sewers, culverts and bar ditches, overland flow, and backup flooding behind the conduits beneath I-44, E. 38<sup>th</sup> St., Skelly Dr., and the MKT/BNSF railroad grade.

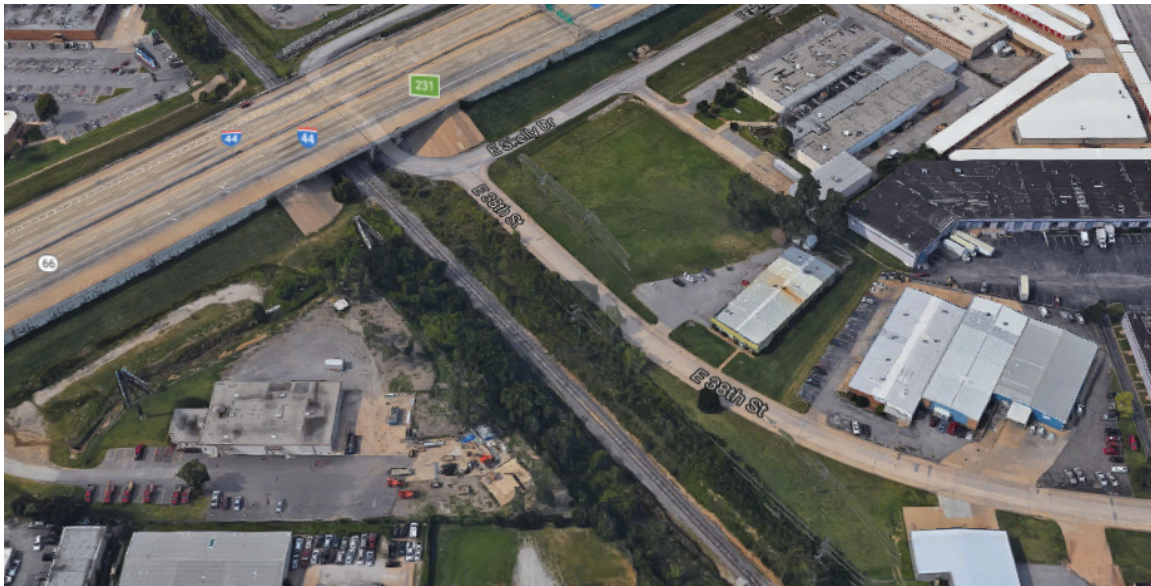
RL #: 32492 - Area 21



One property in RLA #21, the repetitive loss property, has submitted three claims for flood damage—two in 1980 and one in 1981. Two claims were approved for damage on April 24, 1980 (\$10,500) and September 13, 1981 (\$10,000). A third claim, for March 20, 1980, was not approved. There have been no flood damage claims in the RLA since 1981.

### ***Improvements***

The Master Drainage Plan for the basin identified the most cost-effective structural solutions (channel improvements, enlarged conduits, and stormwater detention) for Audubon Creek—specifically, a stormwater detention facility on the south side of the Broken Arrow Expressway immediately north of the PSO substation, enlarged conduits under I-44, Skelly Dr., the MKT/BNSF railroad and E. 38<sup>th</sup> St., and improved channels on the north and south sides of I-44, particularly on the south side of I-44 west of the railroad tracks.



RLA #21 viewed from the south. The MKT/BNSF railroad cuts through the RLA. The Repetitive Loss property is at the lower right, on the north side of E. 38<sup>th</sup> St. The open channel in the lower left of the image, is one of several tributaries that feed into Audubon Creek mainstem.

### **IV. Research and Analysis**

The analysis of Repetitive Loss Area #21 was conducted by the Project Team through interviews with City officials, research into Engineering Services and Stormwater Drainage files, including the *Upper Mill, Audubon and Jones Creeks Basin Drainage Study*, review of the City's extensive flood history documentation, assessment of insurance claims, field trips to the RLA, interviews with home owners and questionnaires mailed to the property owners and occupants soliciting information about prior and existing flooding issues, if any.

### ***Agencies and Organizations***

The City of Tulsa's Storm Drainage & Hazard Mitigation Advisory Board (SDHMAB), which also serves as the City's Hazard Mitigation and CRS Committee, and the CRS Public Participation Involvement & Information Committee (PPI) met monthly during the

two-year Repetitive Loss Area Planning process. Each committee was updated on the status of the planning process, discussed issues, and provided guidance. Research and analysis were done in accordance with guidelines from the Federal Emergency Management Agency (FEMA), the National Flood Insurance Program (NFIP) and the Community Rating System (CRS).

Local, State & Federal Agencies and non-profit organizations are represented on the PPI Committee. The RLA plans were discussed at the PPI Committee meetings, and other agencies such as TAEMA were contacted by phone or email. The RLA plans were presented to City Council for adoption; the agenda was made public and furnished to the media. The council meeting is a public meeting and the local media was present at the meeting. In addition the council meetings are aired on our local government network TV channel TGOV.

Participating agencies and organizations involved were: City of Tulsa (CoT) Storm Drainage & Hazard Mitigation Advisory Board, CRS PPI Committee, CoT Communications Department, CoT Development Services, Working in Neighborhoods, CoT Engineering Services, CoT Finance Department, CoT Legal Department, CoT Streets & Stormwater, CoT Water & Sewer Department, Child Care Resource Center, Indian Nations Council of Governments, Tulsa Area Emergency Management Agency (TAEMA), Disaster Resilience Network, Metropolitan Environmental Trust, Oklahoma Insurance Department, Tulsa Association of Realtors, U.S. Army Corps of Engineers.

### ***Studies and Documents***

The following City of Tulsa and FEMA documents were used in the analysis:

- *Flood Insurance Rate Map*, City of Tulsa, October 16, 2012
- *Regulatory Floodplain Map Atlas*, Tulsa Engineering Services, October 2016
- *2014 City of Tulsa Hazard Mitigation Plan Update*, Flanagan & Assoc., 2014
- *City of Tulsa Stormwater Management Plan*
- *Stormwater Design Criteria Manual: Critical Neighborhood Flood Control Projects*
- *Stormwater Capital Improvements List*, City of Tulsa, Engineering Services
- *Upper Mill, Audubon and Jones Creeks Basin Drainage Study, Tulsa, OK*, FHC Inc., May 28, 1993
- *Mill, Jones and Audubon Creeks Basin Drainage Study, Tulsa, OK*, FHC Inc., October 29, 1992
- “The Effects of Urbanization on the Mingo Creek Watershed,” Tim Mars, 1984
- *Guidebook to Conducting Repetitive Loss Area Analyses*, UNO and FEMA

### ***Flood Insurance Data***

One property in RLA #21 currently carries flood insurance on one structure. Because the Privacy Act of 1974 (5 USC 522a) restricts the release of flood insurance policy and claims information to the public, neither the repetitive loss properties nor address-specific claims data are detailed in this Plan.

***Claims Data.***

Only one property in RLA #21 has made claims for flood damage. As stated above, the repetitive loss property has submitted three claims—two in 1980 and one in 1981, two of which were approved: one for damage on April 24, 1980 (\$10,500) and a second for flooding on September 13, 1981 (\$10,000). There have been no flood damage claims in the RLA since 1981.

***Field Surveys and Site Visits***

Site visits were conducted during the study, primarily to confirm foundation type and view local on-site overland flow drainage patterns.

***Review Drainage Patterns.***

The Project Team examined aerial topography maps, master drainage plans, storm sewer plans, City Customer Care Center complaints and comments, and conducted field checks to determine area drainage patterns and identify flooding problem areas. The results of the research and analysis are described in the following paragraphs and summarized in the table below.

***Structures***

The Project Team made a number of visits to RLA #21 to determine the situation and condition of the structures. Visual analysis was verified by queries of Tulsa County Assessor data.

***Structure Type.***

The structures in RLA #21 are comprised of four commercial buildings on five property lots.

***Foundation Type.***

The type of foundation was determined by field investigation and query of Tulsa County Assessor records. The commercial buildings are all built on concrete slabs.

***Condition of Structures.***

The condition of the structures in the RLA was determined by field investigation and a search of the County Assessor’s records. The structures were considered to be in Average to Average+ condition. These findings are summarized in the following table.

**Properties in the RLA**

<b>Address</b>	<b>Structure Type</b>	<b>Year Built</b>	<b>Foundation Type</b>	<b>Building Condition</b>	<b>Flood plain</b>
Property 1	Commercial	1975	Slab	Average	Audubon Creek
Property 2	Commercial	1975	Slab	Average	Audubon Creek
Property 3	Commercial	1960	Slab	Average	Audubon Creek
Property 4	Commercial	1970	Slab	Average+	Audubon Creek
Property 5	Commercial	1984	Slab	Average	Audubon Creek

## ***Notification***

**Annual Floodplain Notification.** Each year, in March, the City of Tulsa notifies all property owners and occupants within a 100-year floodplain that their properties are subject to flooding and informs them of what steps they can take to protect their buildings, contents and employees, including the purchase of flood insurance.

**Annual Repetitive Loss Area Notification.** Property owners and occupants in Repetitive Loss Area #21 are notified annually that their structures are located in a Repetitive Loss Area, and are potentially subject to flood damage from storm sewer backup, street flooding and overland flow.

**Property Owners/Residents Notification.** Property owners and occupants were advised of the Repetitive Loss Area study and analysis by letter, were sent a questionnaire soliciting information and input, and asked to contact the City for more information or a copy of the completed RLA Plan.

**Public Participation and Involvement.** City Staff/Consultants interviewed homeowners to brief them on the Repetitive Loss Area Analysis Study/Plan, receive their input, and discuss possible mitigation measures.

**Property Owner Response to Notifications.** There have been two comments concerning flooding from property owners in response to notification. The owner of the property on the westernmost side of the RLA along I-44 stated that the property has not flooded since purchase in 2012. The owner of the easternmost property on I-44 reported that the structure has never flooded.

## ***Conclusions***

Flooding issues in RLA #21 have been due to overland flow, backup behind undersized culverts beneath I-44, the MKT/BNSF railroad, Skelly Dr., and E. 38<sup>th</sup> St., and narrow or clogged channels and bar ditches along Skelly Dr. and I-44. These constrictions resulted in a 100-year flood elevation of approximately 717 ft. in the RLA, whose structures were situated at elevations between 712 and 722 feet. Subsequent improvements recommended by the *Upper Mill, Audubon and Jones Creeks Basin Drainage Study* and put in place in the 1990s included improved drainage channels along I-44 west and east of E. 38<sup>th</sup> St., enlarged conduits beneath the MKT/BNSF railroad grade, Skelly Dr., I-44 and E. 38<sup>th</sup> St., and increased bar ditch capacity along the north and south sides of I-44 and Skelly Dr. These improvements have reduced the 100-year flood elevation in RLA #21 by two feet, from 716-717 feet to 713-715 feet, and removed the RLA from FEMA's SFHA. Two buildings remain touched by the City of Tulsa's more stringent regulatory floodplain.

## **V. Mitigation Measures**

### ***Overview***

The construction of the PSO detention facility between the Broken Arrow



**This platform and wall protect the home and air conditioning equipment from shallow flooding.**



Expressway and I-44, the enlargement of conduits under E. 38<sup>th</sup> St., Skelly Dr., I-44 and the MKT/BNSF railroad, along with the improved channels on the north and south sides of Skelly Dr. and I-44 have done much to reduce flooding on this reach of Audubon Creek—but have not removed the RLA from the City’s regulatory floodplain or FEMA’s 500-year floodplain. The properties in the RLA remain at some risk of shallow flooding from storms greater than a 100-year event, like those of 1974 and 1984.

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

Individual property protection actions are usually undertaken by property owners on a lot-by-lot, building-by-building basis, and include private floodproofing, moving mechanical equipment above flood levels, installing French drains, minor site grading to move local drainage to the street, sanitary sewer backup protection, and flood insurance.

The City of Tulsa is willing to have a stormwater engineer do a site visit to assist you in analyzing your specific drainage problems and discuss potential solutions. Contact the Customer Care Center at (918) 596-7777, or go online to [www.cityoftulsa.org/connect/contact-the-city](http://www.cityoftulsa.org/connect/contact-the-city).

**Know and Understand Your Flood Risk.** As stated above, being located in a Repetitive Loss Area does *not* mean a property will flood. Nevertheless, it is important that property owners in flood hazard areas know and understand their flood risk and take what steps they can to protect their buildings, furnishings and equipment. City staff is available to explain the local flood risk, interpret floodplain maps, and determine if an area or property has drainage problems or a history of prior flooding. Staff can also discuss the ways a specific property can be protected from flooding. An Elevation Certificate can help define a property’s flood risk under various rainfall scenarios (e.g., in a 10-year, 50-year, 100-year, or 300-year storm). You can receive a free flood zone determination by contacting the City with the correct legal description and street address, or the Tax Assessor/Parcel Number of the property.

**Make a Disaster Preparedness Plan.** It is always a good idea for people in flood hazard zones to have a disaster preparedness and response plan that addresses all the steps and details that will demand attention once a flood watch or warning is issued. A Building Permit is required to install a safe room in a flood-prone area.

**Create Berms, Swales or Redirected Drainage.** Flood waters can be diverted away from structures using berms, brick planter boxes and swales, but these may not be done in ways that cause damage to other properties. Owners and occupants can request a meeting with a City Engineer to discuss the best ways to solve existing drainage problems, and whether a Building Permit will be required. This may be the most feasible solution for areas with flooding due to overland flow, as is the case with several properties in RLA #21.

**Install Local, Property-Specific Paving, Plantings and Catchment Basins.** City Engineering staff can explain the natural functions of floodplains and how they act to slow and purify urban runoff and reduce flooding. Staff can also suggest low-impact development projects which imitate natural floodplain functions by slowing runoff and filtering out impurities. These include such things as rain gardens, catchment basins and pervious paving materials.

**Acquisition.** The City of Tulsa has a repetitive loss acquisition program to purchase repeatedly flooded properties. This voluntary program offers owners who are in this situation with a way out. The City applies to FEMA for funds using the Hazard Mitigation Grant Program. Once the grant is awarded, the property is appraised as if it were not a flooded property, and the offer for the property is based on this appraisal. In addition to getting the best possible price, the owner receives moving expenses, a \$1,000 stipend for purchasing a home outside the floodplain, and a 30-day rent free period after closing in which to move. All closing costs and other fees are paid by the City. Once the owner has moved out, the home is demolished and restored as open space to protect the natural and beneficial function of the floodplain. To get more information about this program, contact the Customer Care Center at (918) 596-7777.

Acquisition is usually not feasible or cost effective for areas of shallow flooding, as in RLA #21. However, if a property is located in a FEMA Floodway or Special Flood Hazard Area, demolition, acquisition and relocation may be feasible and cost-effective.

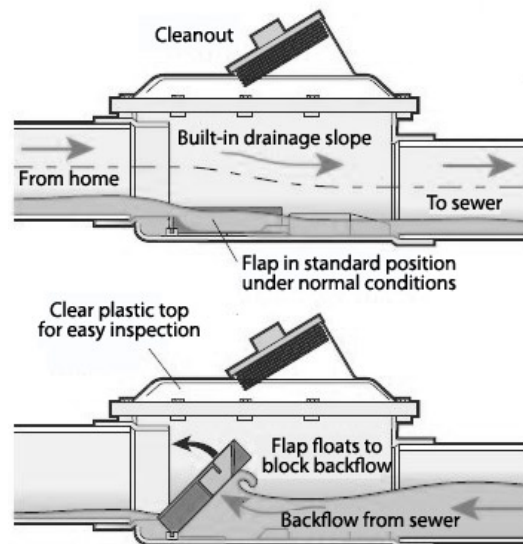
**Elevate Your Structure.** Elevating the structure is only suitable for areas of shallow flooding, and is usually not feasible or cost-effective for masonry structures built on concrete slabs. It can sometimes be cost-effective for wood frame buildings on crawlspaces.

**Dry Floodproof Your Structure.** This can include actions that seal a structure and prevent floodwaters from entering. This method is best utilized in areas where flood depths are no more than two or three feet. Buildings can be made watertight by sealing the walls with waterproof coatings, impermeable membranes, or additional layers of masonry or concrete. Doors, windows, and other openings below the base flood elevation must also be equipped with permanent or removable shields, and backflow valves must be installed in sewer lines and drains. Dry floodproofing needs to be designed by an engineer to ensure the structure can resist the force of the water.

**Wet Floodproof Your Building.** Wet floodproofing allows water to enter a structure, while removing, protecting or elevating items that can be damaged, such as air conditioning equipment. This is often used on structures with crawl spaces and shallow flood depths, and may be appropriate for some of the commercial structures in RLA #21. The City does not allow basements in flood-prone areas, or the wet floodproofing of basements.

**Wet Floodproof Your Garage.** The garage, with its slab-on-grade construction, is one of the most vulnerable areas of your home to overland flow flooding. Remove, relocate, elevate, or otherwise protect items that can be damaged from flooding.

**Elevate Damage-Prone Components.** Critical items such as furnace or air conditioning units, should be elevated to avoid



**Sewer backflow prevention valves are essential components for homes in low-lying, flood-prone areas.**

flood damage. This should be done for components that are in the wet-floodproofed area of the building as well as for units that are outside of the structure but subject to shallow flooding.

**Maintain Nearby Streams, Ditches, and Storm Drains.** Local flooding can often be caused by brush and other debris blocking drainage ways and culverts. Culvert blocking by limbs, grass cuttings and other debris could contribute to future flooding in RLA #21. Storm sewer inlets must be regularly inspected and kept free of blockage. Residents and property owners should do their part to keep storm drains and bar ditches clear of brush and debris, and report trees that have fallen into the creek channel and are blocking flow. Do not attempt to clear debris during a flood event.

**Correct Sanitary Sewer Backup Problems.** Sewer backup can be a problem in low-lying, flood-prone areas like RLA #21. The installation of backflow prevention valves on your sanitary sewer lines is highly recommended.

**Purchase and Maintain Flood Insurance.** Flood Insurance is available and recommended for the structure and contents for all properties in Tulsa. A large percentage of all flood insurance claims are for properties that are outside the FEMA floodplain. Because of the City of Tulsa's sustained efforts to reduce flooding, you are entitled to a discount on your flood insurance. A property does not have to be in a floodplain to qualify for flood insurance.

***. Repetitive Loss Area Mitigation Measures: What the City Can Do***

The City of Tulsa is actively committed to the following floodplain management activities:

- Preventative activities to keep flood problems from getting worse.
- Natural resource protection activities to preserve or restore natural areas or the natural functions of floodplain and watershed areas.
- Emergency services measures taken during an emergency to minimize its impact.
- Structural projects to keep flood waters away from properties.
- Public information activities to advise property owners, potential property owners, and visitors about flood hazards, ways to protect people and property from the hazards, and the natural and beneficial functions of local floodplains.

As funding becomes available for this Repetitive Loss Area, the City will undertake a more detailed Mini-Master Drainage Plan to identify alternative solutions to the flooding problems and recommend a public works project. The actual construction of any public works project may require the acquisition of properties and/or drainage easements. The City will continue to fulfill its maintenance responsibility for channels, drainageways, and storm sewer inlets and pipes. At this time, the City has identified the following actions which are appropriate for RLA #21.

- Extend and/or improve the storm sewer system to better collect storm water runoff.
- Improve roadside ditches and drainage structures to improve drainage..
- Construct upstream detention to reduce storm water runoff into the RLA.

## **VI. Funding**

Due to the nature of the flooding problems and the localized damages involved in RLA #21, the funding of needed improvements will have to be borne by the individual property owner.

## **VII. Conclusions and Recommendations**

Repetitive Loss Area #21 is comprised of four buildings on five property lots in the Audubon Creek drainage, along the southeast side of I-44 and Skelly Dr., immediately east and west of E. 38<sup>th</sup> St. and the MKT/BNSF railroad. Two structures are within or touched by the City of Tulsa's regulatory floodplain. Historically, undersized conduits beneath Skelly Dr., I-44, E. 38<sup>th</sup> St. and the MKT/BNSF railroad have caused backup flooding along the creek's two main tributaries. One property in the RLA made three flood damage claims in 1980 and 1981, two of which were approved for a total of \$20,500. The bottlenecks that caused the flooding have been removed and the channels along the north and south sides of I-44 and Skelly Dr. enlarged and improved. These measures have removed the repetitive loss property from both FEMA's and the City's regulatory floodplains. There have been no flood damage claims in the RLA since 1981. Nevertheless, storms greater than 100-year magnitudes—like those of 1974 and 1984, could cause flooding within the RLA.

Homeowners are encouraged to maintain flood insurance. The City of Tulsa is a Community Rating System (CRS) Class II Community, and all homeowners qualify for up to a 40% discount on their flood insurance premiums. Homeowners are also encouraged to undertake individual mitigation measures to reduce their risk of overland flooding. The City of Tulsa is ready to assist in this effort with advice.