

# Repetitive Loss Area # 61

**Bell Creek  
E. 46<sup>th</sup> St. & S. 86<sup>th</sup> E. Ave. Area**



August 17, 2017





## 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 work together to develop a plan to reduce or eliminate flooding in the 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  
Stormwater Project Coordination



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# Acknowledgements

The City of Tulsa Repetitive Loss Area Analysis Plans were developed by Engineering Services with local funding from the City of Tulsa in compliance with the Federal Emergency Management Agency's Community Rating System's requirements. Numerous agencies, departments, organizations and individuals participated in these studies, including:

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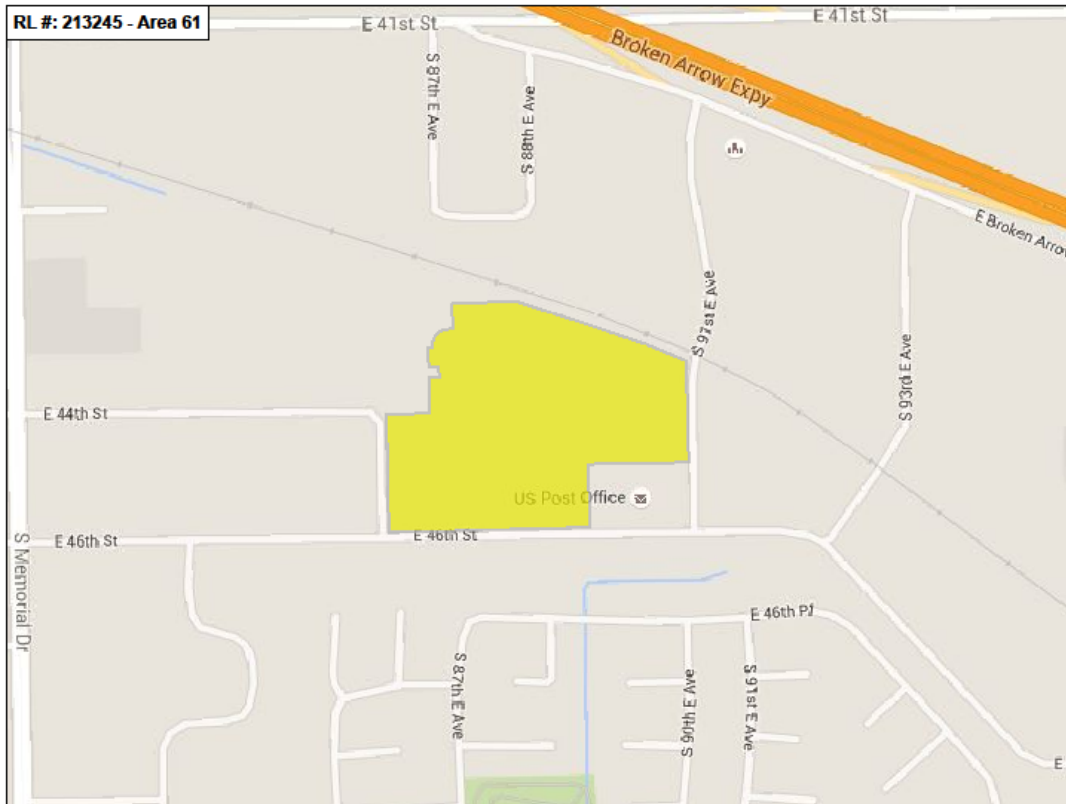


# Repetitive Loss Area # 61

## Bell Creek E. 46<sup>th</sup> St. & S. 86<sup>th</sup> E. Ave. Area

### Overview

Repetitive Loss Area #61 is comprised of one heavy industrial building and one commercial warehouse on three lots in the E. 46<sup>th</sup> St. and S. 86<sup>th</sup> E. Ave. area. The properties are in the Bell Creek drainage, in an area of shallow flooding. The two properties are impacted by backup flooding behind the Broken Arrow Expressway and the MKT tracks along both the West and East branches of Bell Creek (Mingo Creek Tributaries 11A and 11B, respectively)—the industrial building is touched by an area of shallow flooding on the West Branch, and the commercial warehouse property by shallow flooding on the East Branch. The industrial property was developed in 1965 and the warehouse in 1985, both at an elevation of approximately 670 ft. Only one property in the RLA, the repetitive loss property, has made flood damage claims: one in 2011 for \$40,335 and another in 2012 for \$15,108 (a total of \$55,443). The owner of the repetitive loss property stated that flooding occurs about every other year to a depth of three inches. In 2011, the water came into the front door and caused problems for business, and in



RLA #61 is located in the Bell Creek drainage, on the south side of the MKT railroad and the north side of E. 46<sup>th</sup> St. at about S. 86<sup>th</sup> E. Ave.

2012, heavy rains sent 8 to 10 inches of water into the building. The owners say they have made the recommended repairs on their end, but the City's drainage system is not working properly. There has been no flooding at the second property in the RLA since its purchase in 1983.

## **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 may have been the result of storm sewer backup or overland flow. The location of RLA #61 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**

Bell Creek is a 2.5-mile-long, left-bank tributary to Mingo Creek that drains 2.5-square-miles of southeast Tulsa. The basin is fully developed with a combination of residential, commercial and industrial properties. The creek has two primary branches, the West and East (Mingo Tributaries 11A and 11B) that rise in the south Tulsa hills near E. 51<sup>st</sup> and S. 76<sup>th</sup> E. Ave. and E. 55<sup>th</sup> and S. Memorial Blvd., respectively. The two branches flow generally north north-east to join at E. 39<sup>th</sup> St. and S. 93<sup>rd</sup> E. Ave. before continuing north to junctions with Fulton Creek near 33<sup>rd</sup> Pl. and S. 93<sup>rd</sup> E. Ave. and Mingo Creek at about E. 32<sup>nd</sup> Pl. and S. 93<sup>rd</sup> E. Ave.

Repetitive Loss Area #61 is located in about the 8600-8800 blocks of E. 46<sup>th</sup> St. The properties are in the Bell Creek drainage, in an area of shallow flooding, and are impacted by backup flooding behind the Broken Arrow Expressway and the MKT tracks. The industrial building is touched by an area of shallow flooding from the West Branch, and the commercial warehouse property by shallow flooding from the East Branch. The channelized East Branch of Bell Creek passes about 500 feet south and east of the warehouse property, and the West Branch passes beneath the MKT tracks about 1,400 feet west of the industrial property. The 100-year floodplain of the East Branch in this reach is at between 664 and 668 ft., and touches the northern edge of the industrial building and the southeast edge of the warehouse property.

## **III. History**

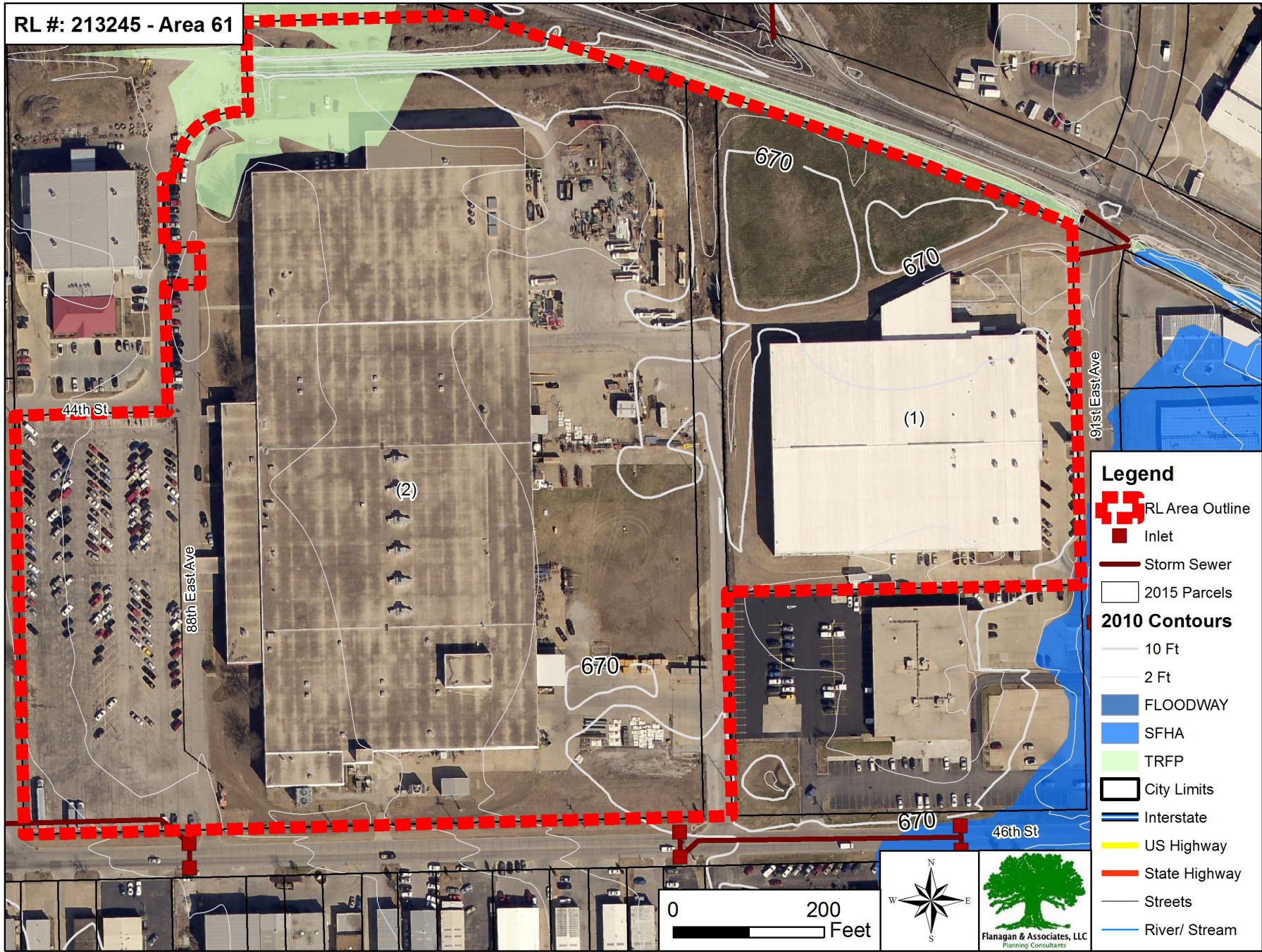
### ***Development***

As stated above, the properties in RLA #61 were developed in 1965 and 1985 along the north side of E. 46<sup>th</sup> St. The land on which the buildings are constructed is generally flat floodplain. The structures are situated at an elevation of around 670 ft. As stated above, Bell Creek's 100-year floodplain in this reach is currently delineated at between 668 and 666 ft.

### ***Flooding***

The repetitive loss property of RLA #61 suffered flood damage on two occasions, on August 10, 2011 and June 3, 2012. Total damage was \$55,443. The owner of the damaged property reported that flooding occurs about every other year. In 2011, the water came through the front door and interfered with business operations, damaging both structure and contents. In 2012 as much as 8 to 10 inches of water entered the

RL #: 213245 - Area 61



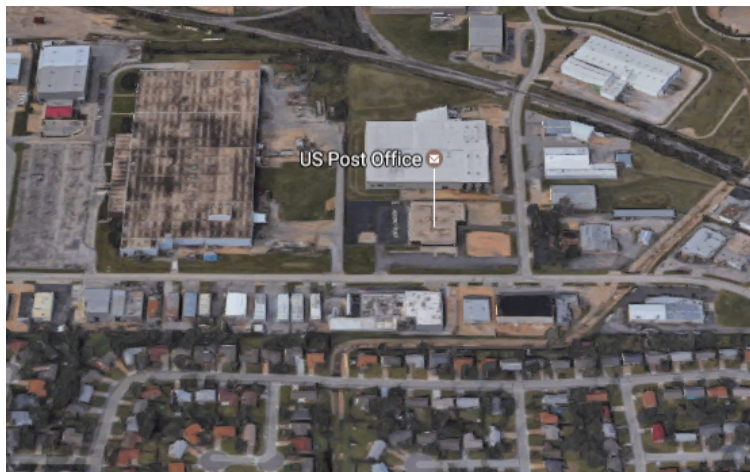
building, but did only structural damage. There has been no flooding at the warehouse property in the RLA since the current owner's purchase of the property in 1983.

### ***Improvements***

Both the West and East branches of Bell Creek have been channelized through this reach, and the culverts beneath 41<sup>st</sup> St. and the Broken Arrow Expressway enlarged. The area is no longer in FEMA's AE zone. Nevertheless, because of the constricted passage beneath the MKT railroad grade, occasional shallow flooding occurs during heavy storms along both the East and West branches. The owners of the industrial building report that they have made the necessary improvements on their property to prevent flood damage, but that the City's drainage system is not working properly.

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

The analysis of Repetitive Loss Area #61 was conducted by the Project Team through interviews with City officials, research into Engineering Services and Stormwater Drainage files, including the *Mingo Creek Master Drainage Plan*, 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.



**RLA #61 is located along the north side of E. 46<sup>th</sup> St. Flooding has been due to overland flow in the level terrain of the floodplain.**

### ***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
- *Mingo Creek Master Drainage Plan for Tributaries between I-44 and the Broken Arrow Expressway*, June 1981
- “The Effects of Urbanization on the Mingo Creek Watershed,” Tim Mars, 1984.
- *Guidebook to Conducting Repetitive Loss Area Analyses*, UNO and FEMA

### ***Capital Improvements Plans***

No City of Tulsa Capital Improvements are currently planned that could have a positive impact on the flooding problems in Repetitive Loss Area # 61. There are storm sewer improvement and regional detention facilities on the existing CIPs along with Master Drainage Plan recommendations that are not yet on the CIPs. None are presently funded.

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

None of the properties in the RLA currently carries flood insurance. 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 property nor address-specific claims data are detailed in this Plan.

### ***Claims Data.***

One property in the RLA has made two flood damage claims, one in 2011 and another in 2012, for a total of \$55,443. Individual claims were \$40,335 in 2011 and \$15,108 in 2012. There have been no claims or reported flooding in this neighborhood since 2012.

### ***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 #61 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 #61 are one heavy industrial building and one commercial warehouse.

***Foundation Type.***

The type of foundation was determined by field investigation and query of Tulsa County Assessor records. All structures in RLA #61 are built on slab-on-grade foundations.

***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 condition. These findings are summarized in the following table.

**Properties in the RLA**

Address	Structure Type	Year Built	Foundation Type	Building Condition	Flood plain
Property 1	Storage/Warehouse	1985	Slab on Grade	Average	Bell East
Property 2	Heavy Industry	1965	Slab on Grade	Average	Bell West

***Notification***

**Annual Floodplain Notification.** Each year, in March, the City 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 and employees, including the purchase of flood insurance.

**Annual Repetitive Loss Area Notification.** Property owners and occupants in Repetitive Loss Area #61 are notified annually that their properties are located in a Repetitive Loss Area, and are potentially subject to flood damage from overbank flooding, storm drainage backup 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 repetitive loss property in the RLA, and the only property that has made flood damage claims, stated that the structure floods about every other year to a depth of three inches. In 2011, the water came into the front door and caused problems for business. In 2012 overland flow sent 8 to 10 inches of water into the building. The owners stated that they have made the necessary repairs, but the City's drainage system is not functioning properly. The owner of the commercial warehouse property reported that there has been no flooding since it purchase in 1983.

### ***Conclusions***

Flooding issues in RLA #61 are related overland flow in the generally level terrain and backup flooding behind the MKT railroad grade along both the East and West branches of Bell Creek. The eastern-most property in the RLA (a commercial warehouse) is touched by FEMA's 100-year floodplain on the East Branch, and the industrial building is touched by a zone of shallow backup flooding on the West Branch. According to the City of Tulsa's Regulatory Flood Atlas, both properties are touched by the 100-year flood. Greater than 100-year rainfall events, like the 300-year storm of 1984, will likely continue to pose a flooding threat to the properties.

## **V. Mitigation Measures**

### ***Overview***

The channelization of lower Bell Creek, the enlargements of culverts beneath 41<sup>st</sup> St. and the Broken Arrow Expressway, and various storm sewer improvements in the vicinity of the RLA appear to have solved most of the overland flow and backup flooding problems in the neighborhood that caused considerable damage to other properties along Bell Creek in 1982 and 1984. Nevertheless, potential flooding from severe storms, like the 300-event of 1984, will likely continue to threaten the area with shallow flooding. Both properties in the RLA continue to be touched by zones of shallow flooding, according to the City's Regulatory Floodplain Atlas. The issues that remain are related to potential backup flooding behind the MKT tracks and local site drainage problems that would be best addressed by berms or other methods of blocking overland flow.

### ***Individual Mitigation 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 and 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.



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

**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. Contact the Customer Care Center at (918) 596-2100. This is the most feasible solution for areas with flooding due to overland flow, as in RLA #61.

**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 have 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 was 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. If you would like more information about this program contact the Customer Care Center at [\(918\) 596-2100](tel:9185962100).

Acquisition is usually not feasible or cost effective for areas of shallow flooding, as in RLA #61. 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. None of the structures in RLA #61 is a candidate for elevation.

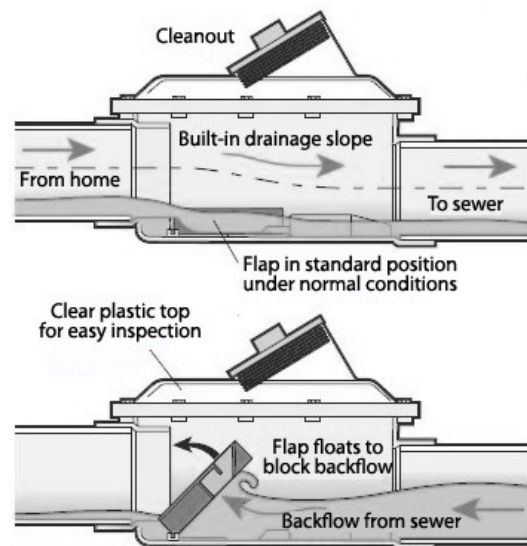
**Dry Floodproof Your Structure.** This can include actions that seal a structure and prevent floodwaters from entering. This method is best in areas where flood depths are no more than two or three feet. Buildings can be made watertight by sealing the walls with waterproof coatings, impermeable membranes, 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 sanitary 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. 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 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, bar ditches and storm sewer inlets and must be kept free of debris. Residents and property owners should



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

do their part in keeping inlets and drainage ways clear of brush and debris. Do not attempt to clear debris during a flood event.

**Correct Sanitary Sewer Backup Problems.** Sanitary sewer backup can be a cause of home damage in low-lying, flood-prone areas like RLA #16. 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 #61.

- Extend and/or improve the storm sewer system to better collect storm water runoff.
- Create overland flow path to allow better drainage of ponded water to the Creek.
- Improve conveyance of Creek to mitigate overbank flooding.
- Improve downstream hydraulic structures (bridges, culverts, etc.) to reduce backwater in the RLA.

## **VI. Funding**

Due to the nature of the flooding problems and the localized damages involved in RLA #61, the funding of needed improvements will have to be borne by the individual property owner. The City will investigate the possibility of increasing the storm sewer capacity with any future street projects in the area.

## **VII. Conclusions and Recommendations**

Repetitive Loss Area #61 contains two buildings on three property lots in the 8600-8800 blocks of E. 46<sup>th</sup> St. in the Bell Creek drainage. Both properties are situated at an elevation of around 670 ft., with the nearby Bell Creek's 100-year floodplain reaching to the 664 to 668 elevation contour. The RLA is about 500 feet north of the East Branch of Bell Creek and 1,400 feet east of the West Branch. Both properties in the RLA are touched by zones of shallow flooding according to the City's Regulatory Floodplain Atlas. The slab-on-grade industrial building was developed in 1965 and the commercial warehouse in 1985. One property in RLA #61 suffered flood damage on two occasions, in 2011 and 2012. Flooding was due to overland flow and backup flooding in the generally level terrain. Drainage improvements by the City appear to have solved most of the overbank and backup flooding along Bell Creek. However, Master Drainage Plans for Southeast Tulsa caution property owners that 300-year storms, like the one that devastated the city in 1984, will likely continue to cause damage in areas troubled by shallow flooding due to overland flow.

Property owners are encouraged to maintain flood insurance. The City of Tulsa is a Community Rating System (CRS) Class II Community, and all property owners qualify for up to a 40% discount on their flood insurance premiums. Property owners 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.