



STORMWATER MANAGEMENT MULTIFAMILY OUTREACH PROGRAM

Melissa Walker – City of Arlington Stormwater
Education Specialist

FY2021

Stormwater Education



STORMWATER
POLLUTION PREVENTION



FLOODPLAIN MAP
UPDATES



FLOOD SAFETY AND
PREPAREDNESS



STORMWATER POLLUTION PREVENTION PROGRAMS



BASIC DEFINITIONS

Water Pollution - The presence in water of harmful or objectionable material in sufficient quantity to measurably degrade water quality.

Point source pollutants – single identifiable source of a specific pollutant

Non-Point source pollutant – multiple unidentifiable or diffuse sources of multiple types of pollutants.

Storm Drain System – An Infrastructure System that is designed to carry away excess rainwater (stormwater) during heavy rain events.

Stormwater Runoff – Rainwater carries natural and man-made pollutants from impervious surfaces and deposits them in the storm drain system, streams, creeks, rivers, lakes and other water bodies.



Common Stormwater Pollution Sources

- ❖ Waste Dumpsters
- ❖ Pet Waste
- ❖ Landscape Maintenance
- ❖ Building Maintenance/Parking lot cleaning
- ❖ Car Washing/Maintenance
- ❖ Sanitary Sewer Overflows
- ❖ Swimming Pool Discharges
- ❖ Trash, Litter and other Debris
- ❖ Bacteria and other pathogens from multiple sources

Best Management Practices (BMPs)

Landscape Maintenance problems

- Landscape waste such as grass clippings, leaves and tree trimmings can clog storm drains resulting in localized flooding.
- Landscape waste are blown into storm drains will decay, use up oxygen and release large amounts of nutrients into our local waterways.
- Landscape waste can transport pesticides, herbicides and fertilizers into our local waterways.

Landscape Maintenance BMPs

Commercial properties should develop and Integrated Pest Management program.

- IPM programs are developed to reduce the use of pesticides, herbicides and fertilizers.
- IPM programs include **Prevention, Monitoring, Identification, and Treatment Thresholds, Control Measures** and **Evaluation**.

If you use pesticides and fertilizers

- Do not apply before it rains or near any local stream, creek, pond or other local waterbody

LITTER AND TRASH

- Diminishes the natural beauty of our streams, creeks, and lakes
- Harmful to fish and wildlife; interferes with movement; ingestion by wildlife
- Hinders sunlight penetration causing low-oxygen levels
- Blocks storm drain inlets and pipes



BMPs

- Provide outside waste receptacles for residents
- Prevent rain from entering trash dumpsters by having secure lids and remove overflowing trash quickly.
- Ensure that drain plug on dumpster is secure and that there are no holes which would allow liquids to seep out.
- No Littering signage
- Storm Drain Inlet markers



PET WASTE

- Pet waste decays in the water using up oxygen and releasing ammonia. Low oxygen levels and ammonia combined with warm water temperatures can kill fish and other aquatic life.
- Pet waste also contains nutrients that encourage weed and algae growth. Nutrient loaded waters can become cloudy, green and unattractive for swimming, boating and fishing.
- Pet waste also carries bacteria, viruses and other pathogens which are unsafe for humans. Diseases can include Salmonellosis, Campylobacteriosis and Toxocaris.



BMPs

- Pet Waste Disposal Stations
- Provide educational material for residents with pets.
- Pet Waste signs



- 🐾 Pick up pet waste from your yard. It's not fertilizer. Bacteria and other pathogens are dangerous to children playing in the yard and can contaminate vegetables growing in your garden.
- 🐾 Carry disposable bags while walking your dog to pick up and dispose of the waste in the trash. Leaving pet waste on the ground is not only bad manners it can get washed into our local waterways through the storm drain system.
- 🐾 Never dispose of cat or dog waste in your composting bin. Composting will not generate enough heat to kill pathogens and bacteria from pet waste.
- 🐾 Tell friends and neighbors about the harmful effects of pet waste and encourage them to clean up after their pets.

Learn more by visiting our Environmental Education page at www.arlingtontx.gov/stormwater



Protect Arlington's Waterways
Public Works & Transportation Dept.
Stormwater Management Division
817-459-6550



Sanitary Sewer Overflows: Common Causes

- Blockages due to Tree roots; fats, oils and grease; **“flushable wipes”** and other types of non-flushables
- Stormwater inflow and infiltration
- Broken pipes (aged system, damaged system, lack of maintenance)
- Vandalism
- Improper designs
- Power failures



Sanitary Sewer Overflows: Best Management Practices

- Education of residents and staff
- Know your system/ Create map of your system
- Where are the access points to clear your lines? Where does your system connect to the city system?
- Have updated after hours Emergency Contact #'s
- Quick response to small problems
- Regular maintenance of the system

RESOURCES

Sanitary Sewer Overflow Response

Sanitary sewer overflows impact local water quality by discharging bacteria and other dangerous waste into the City's storm drain system. The following are steps that commercial property managers and maintenance staff can follow to prevent these pollutants from entering our local waterways.



- **Contain and Control spill.** Keep sewage on private property by shutting off water until repairs are made.
- **Use sandbags, dirt, plastic sheeting or other means** to prevent sewage from leaving your property and entering the storm drain system.
- **Clear sewer blockage.** It is recommended to contact a professional plumber for clearing blockages and making necessary repairs.
- **Remove and dispose of sewage,** paper products and solid waste to prevent contamination of the storm drain system or natural waterways.
- **Disinfect contaminated areas** with a 10% bleach solution. Any rinse water used must not enter the storm drain system and contaminated soil must be treated and turned over to allow for natural filtration.
- Maintenance staff should always **wear gloves and wash their hands,** clothes and any supplies to prevent exposure to raw sewage and the health hazards associated with it.
- **If the City's sewer service is clogged or if the sewage enters the City's storm drain system,** notify the City of Arlington's Water Utilities department at 817-459-5900.

For more information or to request on site training for your maintenance staff, contact Stormwaterreduction@arlingtontx.gov or call 817-459-6572



Respuesta de desbordamiento de alcantarillado sanitario

Los desbordamientos de alcantarillas sanitarias afectan la calidad del agua local mediante la descarga de bacterias y otros desechos peligrosos en el sistema de drenaje pluvial de la ciudad. Los siguientes son pasos que los gerentes de propiedades comerciales y el personal de mantenimiento pueden seguir para evitar que estos contaminantes ingresen a nuestros cursos de agua locales.

- Contener y controlar el derrame. Mantenga las aguas negras en propiedades privadas cerrando el agua hasta que se realicen las reparaciones.
- Use bolsas de arena, tierra, láminas de plástico u otros medios para evitar que las aguas residuales salgan de su propiedad y entren en el sistema de drenaje pluvial.
- Eliminar el bloqueo del alcantarillado. Se recomienda contactar a un plomero profesional para despejar bloqueos y hacer las reparaciones necesarias.
- Retire y deseché las aguas residuales, los productos de papel y los desechos sólidos para evitar la contaminación del sistema de drenaje pluvial o las vías fluviales naturales.
- Desinfecte las áreas contaminadas con una solución de cloro al 10%. Cualquier agua de enjuague utilizada no debe ingresar al sistema de drenaje de aguas pluviales y el suelo contaminado debe ser tratado y volteado para permitir la filtración natural.
- El personal de mantenimiento siempre debe usar guantes y lavarse las manos, la ropa y los suministros para evitar la exposición a las aguas residuales sin procesar y los riesgos para la salud asociados.
- Si el servicio de alcantarillado de la Ciudad está obstruido o si las aguas residuales ingresan al sistema de drenaje pluvial de la Ciudad, notifique al departamento de Servicios de Agua de la Ciudad de Arlington al 817-459-5900.

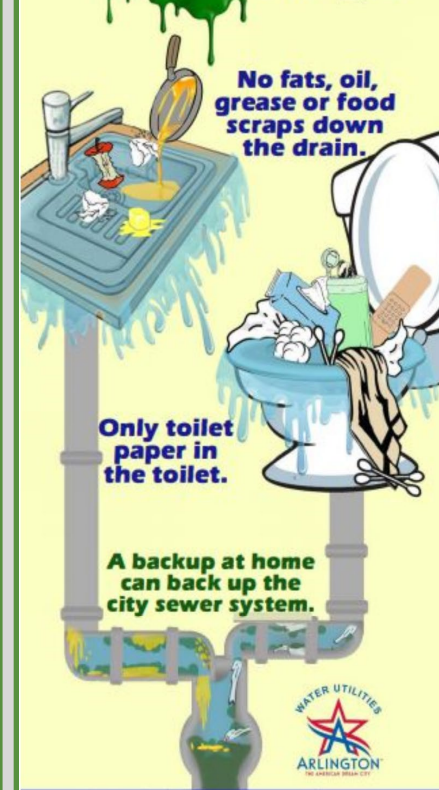
Para obtener más información o para solicitar capacitación en el sitio para el personal de mantenimiento, comuníquese con Stormwaterreduction@arlingtontx.gov o llame al 817-459-6572.

Protect Arlington's Waterways



Stormwater Management's Sanitary Sewer Overflow Response Guide

You can stop sewer clogs.



Usted puede prevenir obstrucciones en las alcantarillas.





FEMA FLOODPLAIN MAP UPDATES

Special Flood Hazard Area - The land area covered by floodwaters of the Base Flood.

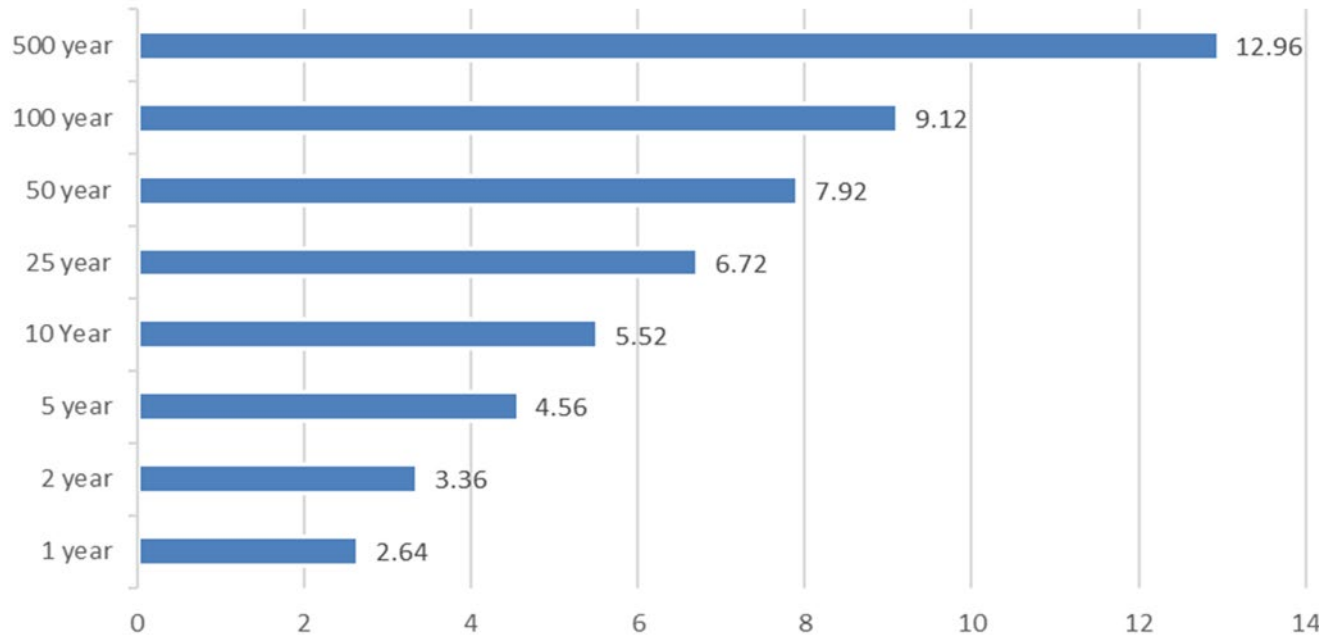
100-year flood (No one knows what it means)

- **Base Flood Elevation** – height above sea level that flood water is projected to rise to in a “100 year” storm (1% /chance of occurring)
- Zone A - 1% probability of flooding every year or 100-year floodplain, no developed BFE's
- Zone AE – 1% probability of flooding every year or 100-year floodplain, determined BFE's
- Shaded X or B- .2% probability of flooding every year or 500-year floodplain
- Zone X – areas determined to be outside the 500-year floodplain which is outside the 1% or .2% annual chance floodplain

NCTCOG iSWM Design Manual for Site Development – Rainfall Tables for North Central Texas

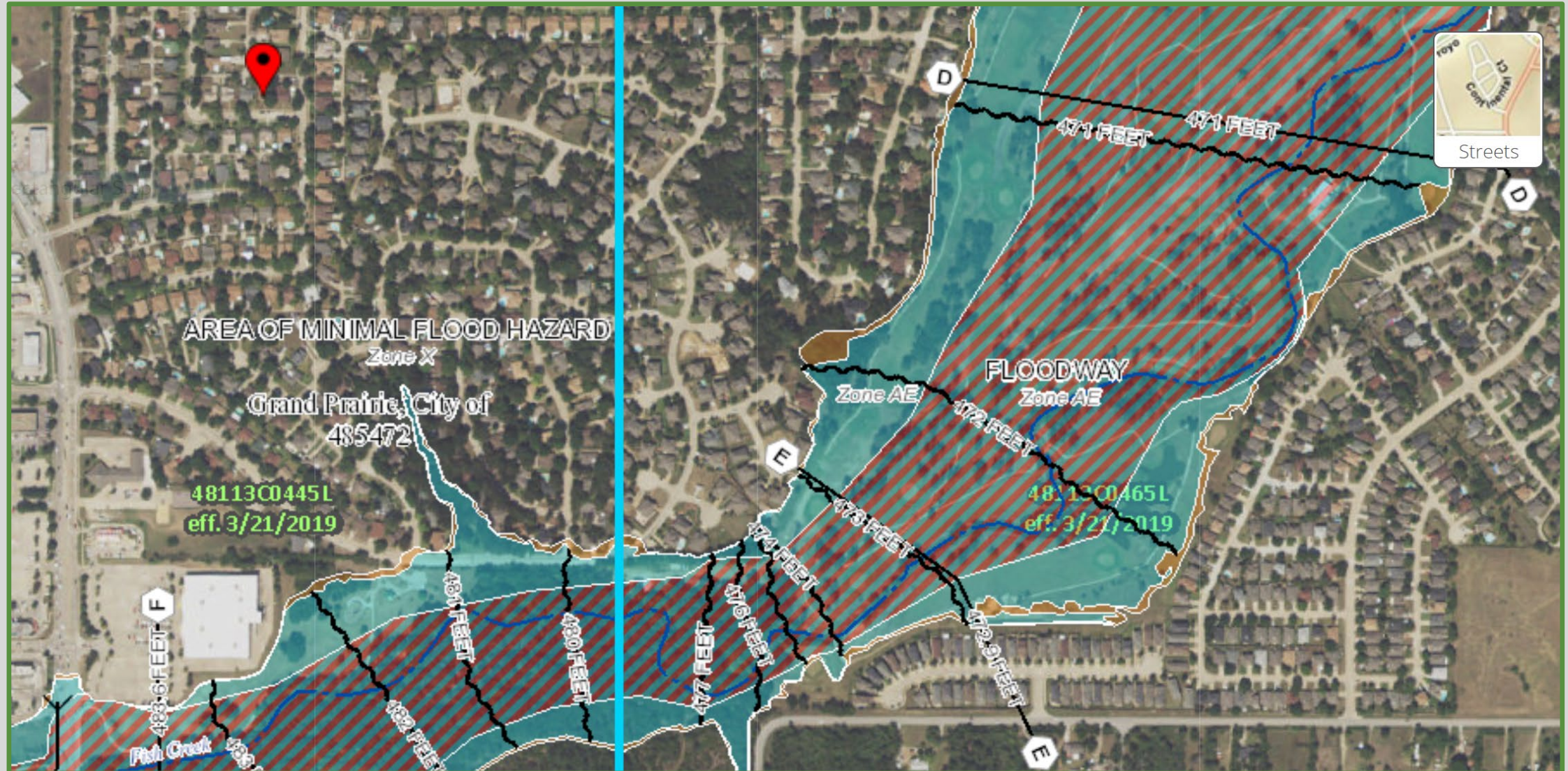
12	720	0.19	0.24	0.33	0.40	0.48	0.56	0.64
24	1440	0.11	0.14	0.19	0.23	0.28	0.33	0.38

Rainfall (inches/24 hours)

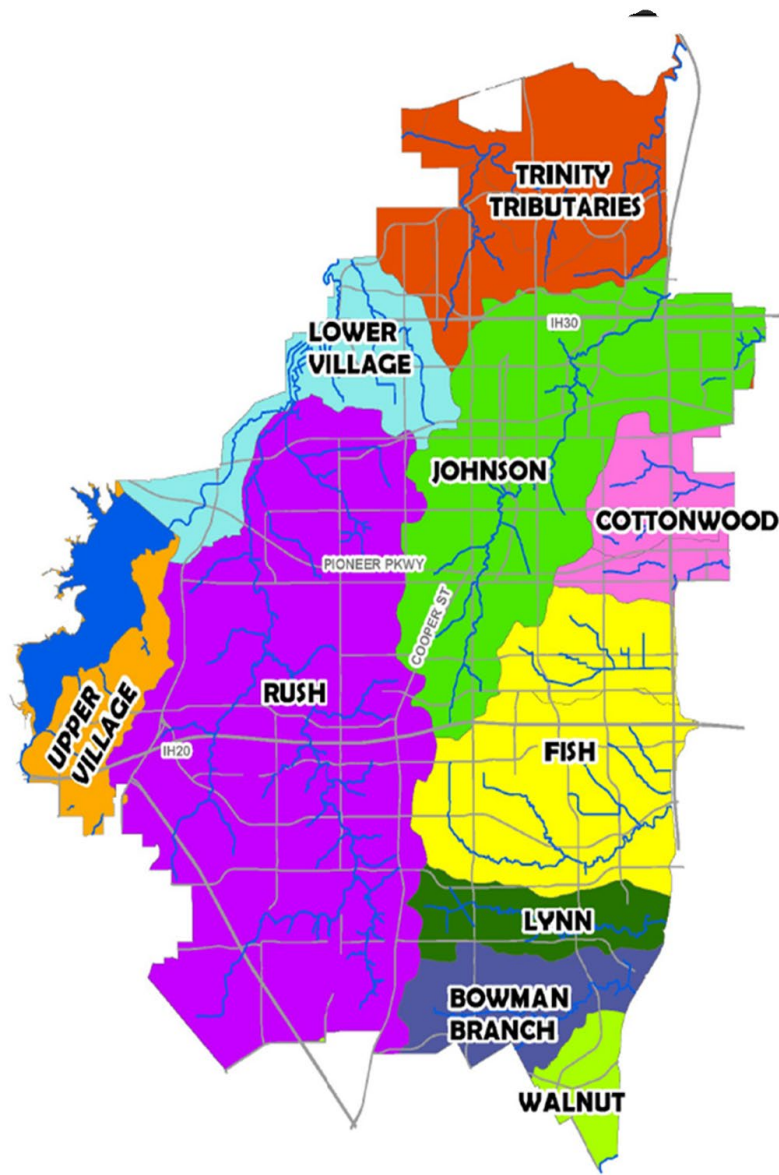


Coefficients	Return Period (Years)	Return Period (Years)												
		1	2	5	10	25	50	100						
		e	b	d	g	h	i	j						
0.82169	43.653	0.81144	51.393	0.81423	71.154	0.79952	77.103	0.79381	90.982	0.78265	97.721	0.77982	110.202	
		8	9	12	12	13	13	14						
Hours	Minutes	Rainfall Intensity (inches per hour)												
0.083	5	5.31	6.04	7.08	8.00	9.17	10.18	11.09						
	6	4.99	5.71	6.76	7.65	8.79	9.75	10.66						
	7	4.72	5.42	6.47	7.32	8.44	9.37	10.26						
	8	4.47	5.16	6.21	7.03	8.12	9.02	9.89						
	9	4.26	4.92	5.97	6.76	7.82	8.70	9.56						
	10	4.06	4.71	5.74	6.51	7.55	8.40	9.24						
	11	3.88	4.52	5.54	6.29	7.30	8.12	8.95						
	12	3.72	4.35	5.35	6.08	7.07	7.87	8.68						
	13	3.58	4.18	5.18	5.88	6.85	7.63	8.43						
0.250	14	3.44	4.04	5.01	5.70	6.65	7.41	8.20						
	15	3.32	3.90	4.86	5.53	6.46	7.20	7.98						
	16	3.21	3.77	4.72	5.37	6.28	7.01	7.77						
	17	3.10	3.65	4.59	5.22	6.12	6.82	7.57						
	18	3.00	3.54	4.46	5.08	5.96	6.65	7.39						
	19	2.91	3.44	4.34	4.95	5.81	6.49	7.21						
	20	2.82	3.34	4.23	4.83	5.67	6.33	7.05						
	21	2.74	3.25	4.13	4.71	5.54	6.19	6.89						
	22	2.67	3.17	4.03	4.60	5.41	6.05	6.74						
	23	2.60	3.09	3.94	4.49	5.29	5.91	6.60						
	24	2.53	3.01	3.85	4.39	5.18	5.79	6.46						
	25	2.47	2.94	3.76	4.30	5.07	5.67	6.33						
	26	2.41	2.87	3.68	4.21	4.97	5.56	6.21						
	27	2.35	2.81	3.60	4.12	4.87	5.45	6.09						
	28	2.30	2.74	3.53	4.04	4.77	5.34	5.98						
0.500	29	2.25	2.69	3.48	3.96	4.68	5.24	5.87						
	30	2.20	2.63	3.39	3.88	4.60	5.15	5.76						
	31	2.15	2.58	3.33	3.81	4.51	5.05	5.66						
	32	2.11	2.52	3.27	3.74	4.43	4.97	5.57						
	33	2.06	2.48	3.21	3.68	4.38	4.88	5.47						
	34	2.02	2.43	3.15	3.61	4.28	4.80	5.38						
	35	1.99	2.38	3.10	3.55	4.21	4.72	5.30						
	36	1.95	2.34	3.04	3.49	4.14	4.65	5.22						
	37	1.91	2.30	2.99	3.43	4.08	4.57	5.14						
	38	1.88	2.26	2.94	3.38	4.01	4.50	5.06						
	39	1.85	2.22	2.90	3.33	3.95	4.44	4.98						
	40	1.81	2.18	2.85	3.27	3.89	4.37	4.91						
	41	1.78	2.15	2.81	3.22	3.84	4.31	4.84						
	42	1.75	2.11	2.76	3.18	3.78	4.25	4.77						
	43	1.73	2.08	2.72	3.13	3.73	4.19	4.71						
0.750	44	1.70	2.05	2.68	3.09	3.67	4.13	4.65						
	45	1.67	2.02	2.65	3.04	3.62	4.07	4.58						
	46	1.65	1.99	2.61	3.00	3.57	4.02	4.52						
	47	1.62	1.96	2.57	2.96	3.53	3.97	4.47						
	48	1.60	1.93	2.54	2.92	3.48	3.91	4.41						
	49	1.57	1.91	2.50	2.88	3.44	3.87	4.36						
	50	1.55	1.88	2.47	2.84	3.39	3.82	4.30						
	51	1.53	1.85	2.44	2.81	3.35	3.77	4.25						
	52	1.51	1.83	2.41	2.77	3.31	3.72	4.20						
	53	1.49	1.81	2.38	2.74	3.27	3.68	4.15						
	54	1.47	1.78	2.35	2.71	3.23	3.64	4.10						
	55	1.45	1.76	2.32	2.67	3.19	3.60	4.06						
	56	1.43	1.74	2.29	2.64	3.16	3.55	4.01						
	57	1.41	1.72	2.26	2.61	3.12	3.51	3.97						
	58	1.40	1.69	2.24	2.58	3.09	3.48	3.92						
	59	1.38	1.67	2.21	2.55	3.05	3.44	3.88						
	60	1.36	1.65	2.19	2.52	3.02	3.40	3.84						
	1	0.81	1.00	1.34	1.55	1.88	2.13	2.42						
2	0.59	0.73	0.98	1.15	1.40	1.59	1.81							
3	0.34	0.42	0.57	0.68	0.83	0.95	1.09							
6	0.19	0.24	0.33	0.40	0.48	0.56	0.64							
12	0.11	0.14	0.19	0.23	0.28	0.33	0.38							
24	0.083	0.104	0.138	0.172	0.215	0.267	0.328							

FEMA Flood Insurance Rate Maps



STREAM	MULTIFAMILY	# OF UNITS
◦ WF(A)-1	2	470
◦ WF(A)-2	8	1,848
◦ VC(A)-3	0	0
◦ VC(A)-4	0	0
◦ VC(A)-5	0	0
◦ VC(A)-6	0	0
◦ WFT-001	4	739
◦ WFT-002	2	375



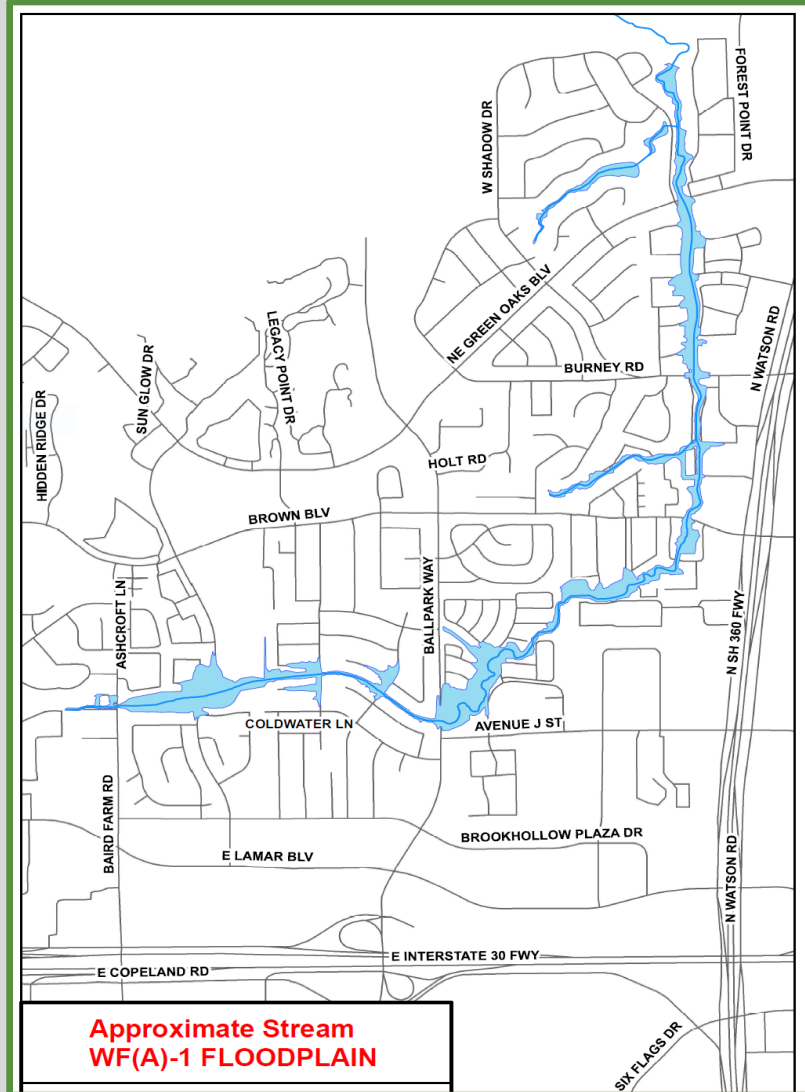
FEMA Map Updates

The City's Watershed study program developed after Tropical Storm Hermine in 2010. The goal is to update all engineering data for Arlington's watersheds. This data is used to provide better project planning, identify and classify erosion risks and update FEMA Flood Insurance Rate maps (FIRMs).

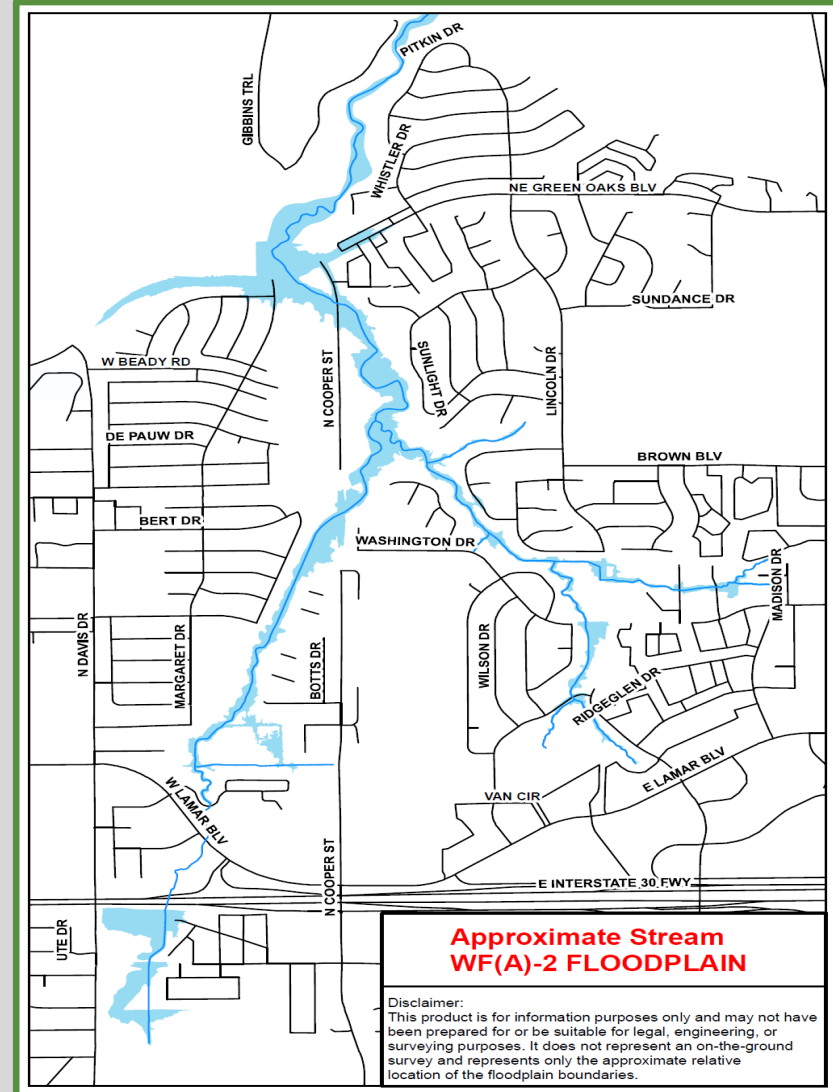
FEMA Map Service Center
msc.fema.gov/portal/home

www.arlingtontx.gov/mapupdates

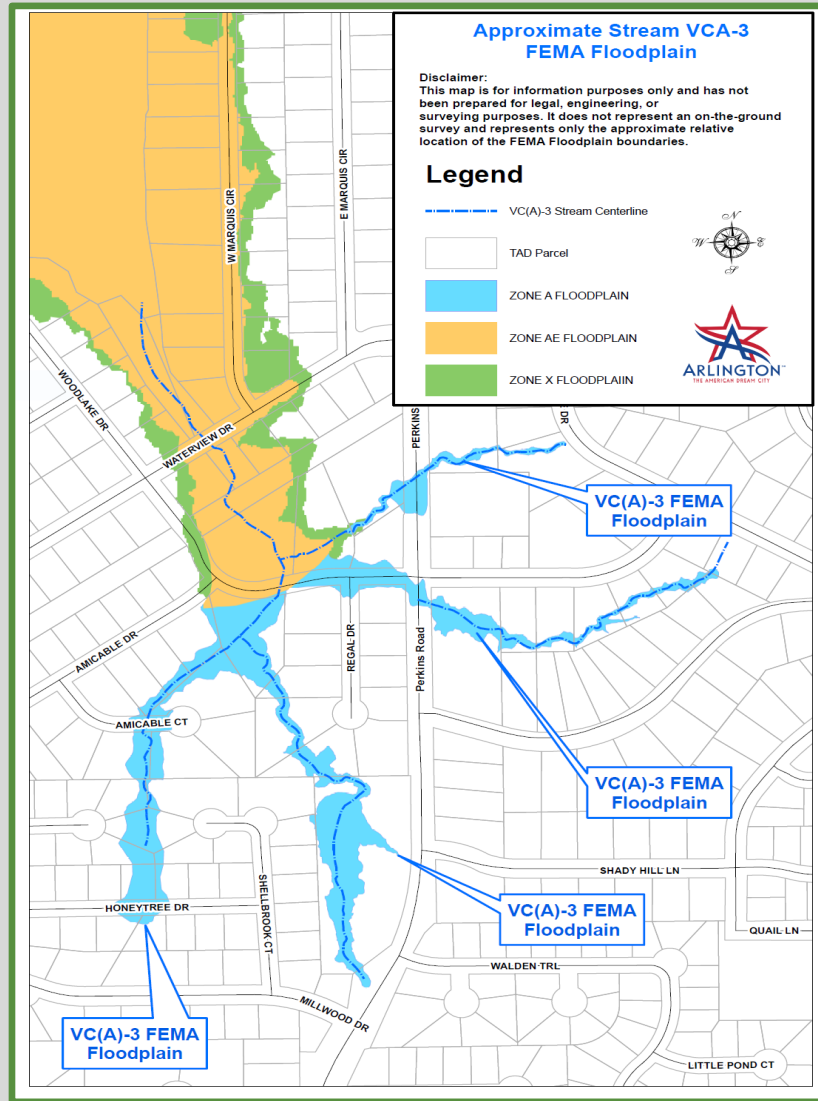
WF(A)-1



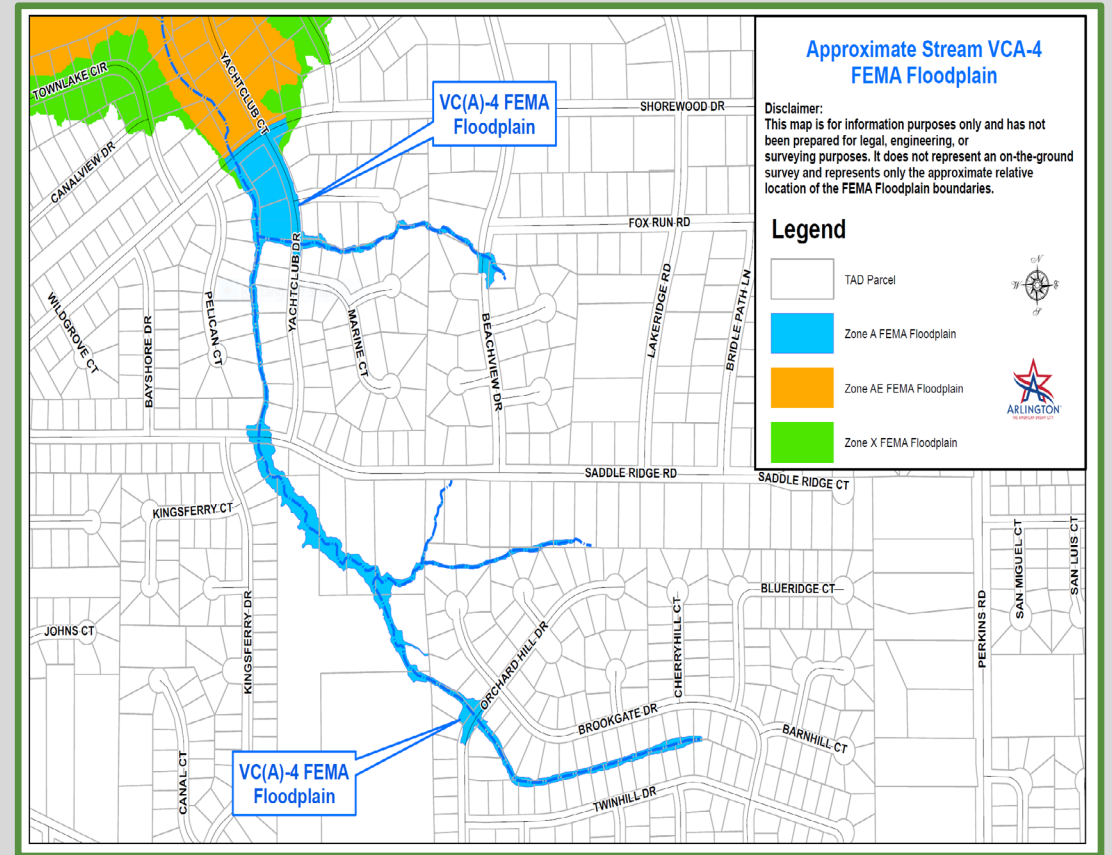
WF(A)-2



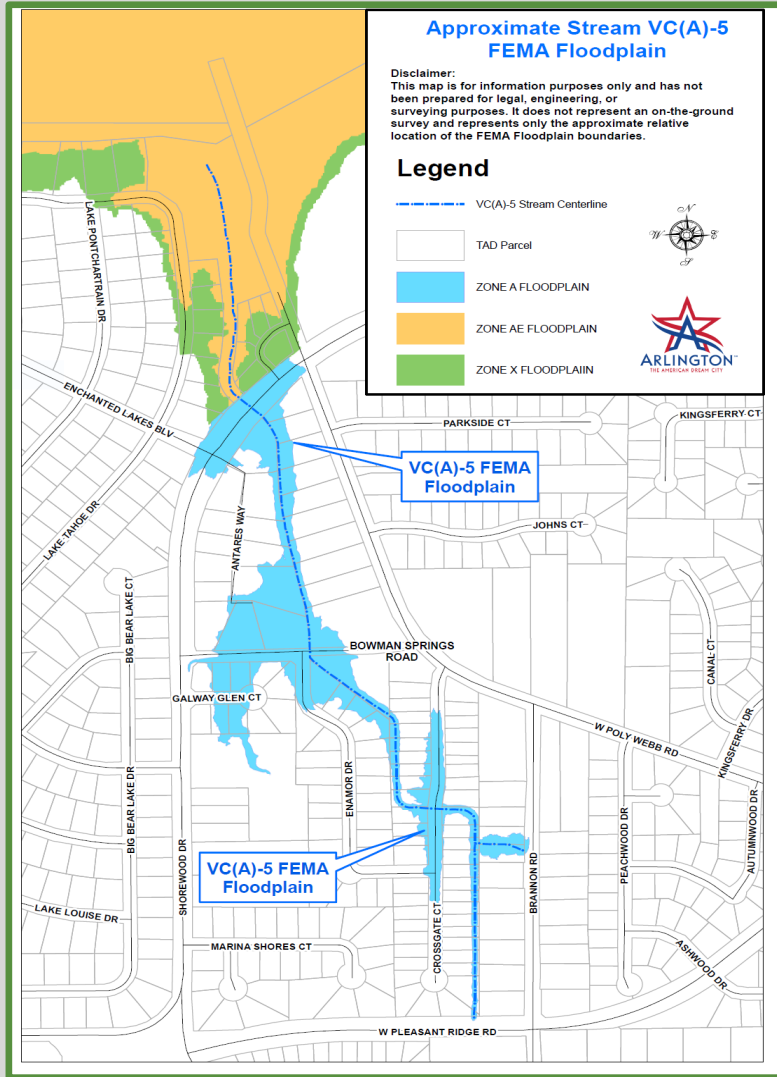
VC(A)-3



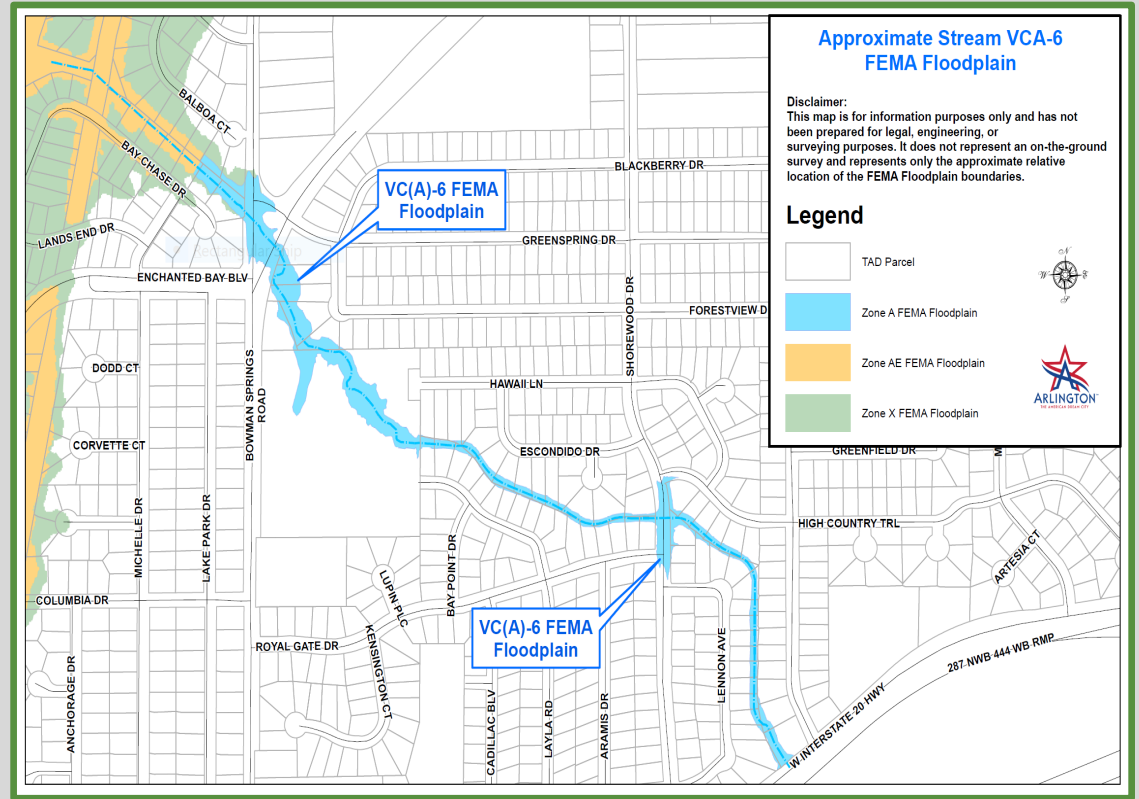
VC(A)-4



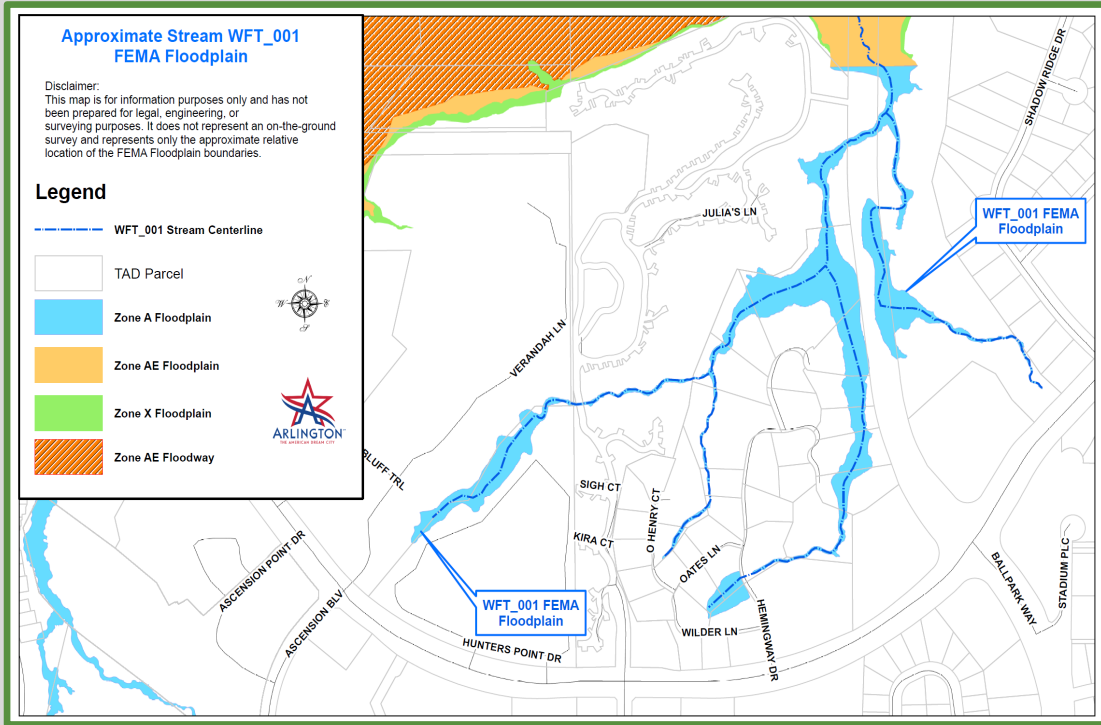
VC(A)-5



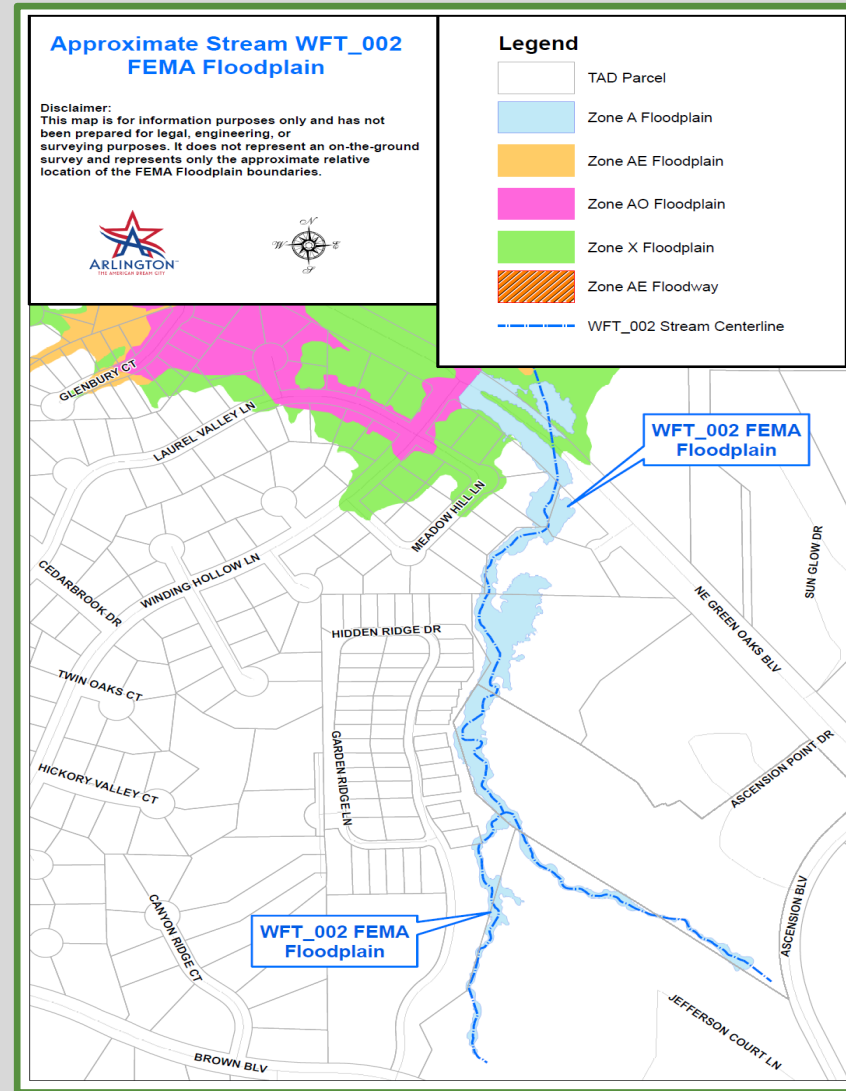
VC(A)-6



WFT-001



WFT-002





FLOOD SAFETY

LEARN YOUR FLOOD RISK

Types of Flooding

- Riverine Flooding – Excessive rainfall over an extended period of time, causing a river to exceed its capacity
- Surface Flooding – Intense, high velocity of water that overwhelms the storm drainage system
- Flash Flooding - Intense, high velocity of water that occurs in a river, stream or other channel with little or no notice

Flood Information Services

- Special Flood Hazard Area
- Historical Flood area
- Local Drainage Issues
- Flood Insurance Rate Map (FIRM) information
- National Flood Insurance Program (NFIP)
- Contact the Public Works and Transportation Department at 817-459-6550

Riverine Flooding- May 4, 2015 to June 22, 2015- DFW area received 20-25 inches of rain



5.29.2015 Rush Creek

Surface Flooding



Flash Flooding

Tropical Storm Hermine
Johnson Creek 9.7.2010



9.8.2010



9.9.2010



GET FLOOD PREPARED

Emergency Supply Kit

- **Water** - one gallon of water per person per day for at least three days, for drinking and sanitation
- **Food** - at least a three-day supply of non-perishable food
- Battery-powered or hand crank radio and a NOAA Weather Radio with tone alert
- Flashlight
- First aid kit
- Extra batteries
- Whistle to signal for help
- Moist towelettes, garbage bags and plastic ties for personal sanitation
- Manual can opener for food
- Local maps
- Cell phone with chargers and a backup battery
- **Prescription Medications**
- Non-prescription medications such as pain relievers, anti-diarrhea medication, antacids or laxatives
- Glasses and contact lense solution
- Infant formula, bottles, diapers, wipes, diaper rash cream
- **Don't Forget Your Pets!** Pet food and extra water for your pet
- Cash or traveler's checks
- Important family documents such as copies of insurance policies, identification and bank account records saved electronically or in a waterproof, portable container
- Mess kits, paper cups, plates, paper towels and plastic utensils
- Paper and pencil
- Books, games, puzzles or other activities for children
- Sleeping bag or warm blanket for each person
- Complete change of clothing appropriate for your climate and sturdy shoes



Communications Plan

Create a plan for sheltering, evacuating and communicating during a disaster

Agree on safe places your family will go for protection or to reunite:

- ✓ Pick one location in your neighborhood
- ✓ Pick one location outside your neighborhood like a shelter, friend's house, place of worship or another family member

Make a paper list of family contact information for each family member to carry. Include family phone number, social media, family doctors, work numbers or schools.

Agree on one friend or relative outside the disaster area that every member will contact.

- ✓ Keep this person's number in your wallet or purse
- ✓ Text first. Talk Second
- ✓ If cell lines are down, use a land line

Evacuation Plan

Depending on the emergency, you may have to shelter in place. Do you have your emergency supply kit?

Severe Thunderstorms and Flooding- Know where the low points are located.

Make a plan for home, school and work.

Have a designated meeting place

Include an outside of the area family member or friend in the planning.

Be Weather Aware! Pay attention to local weather reports and listen to your local officials



FLOOD INSURANCE

- Community must be an NFIP participant; This can be a city or county program
- Any homeowner or renter (residential policy)
- Business owner or tenet (non-residential policy)
- Homes and Businesses in a Special Flood Hazard Area (mapped High-Risk areas) if they have a federally backed mortgage are required to carry flood insurance. Some lenders may require it even if the property is not in a SFHA.
- **Most homeowners, business or renter's insurance does not cover flood damage.**
- There are options for building/structural coverage and contents coverage; These are separate policies.
- **Apartment residents are eligible for contents coverage**
- This pays regardless of presidential disaster Declaration
- **Document Your Property Before Damage Occurs**
- Contact your local insurance agent for more information on rates and policies.

Don't wait to purchase insurance! There is a 30-day waiting period for flood policies to take effect.

<https://www.fema.gov/national-flood-insurance-program>

Websites

- www.weather.gov/fwd/
- <https://waterwatch.usgs.gov/>
- www.ready.gov
- www.floodsmart.gov
- <https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/flood.html>
- www.arlingtontx.gov/stormwater

Contact Information

Melissa Walker – Stormwater Education Specialist

- 817-459-6572
- Melissa.Walker@arlingtontx.gov
- Stormwatereducation@arlingtontx.gov

Traci Peterson – Public Information Officer Water Department

- Traci.Peterson@arlingtontx.gov



QUESTIONS?